VOLUME 2

Assessment of Environmental Effects

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Executive Summary

Introduction

The NZ Transport Agency (NZTA) has lodged resource consent applications and a notice of requirement for a designation (NoR) in relation to a future section of State Highway 1 (SH1), formed to an expressway standard, from Peka Peka to North Ōtaki (the Expressway).

To accommodate the Expressway, approximately 1.2km of the North Island Main Trunk Railway (NIMT) through Ōtaki will be realigned, and New Zealand Railways Corporation / KiwiRail Holdings Limited (trading as KiwiRail) has lodged an NoR for that purpose.

The NoRs and resource consent applications seek approvals required under the Resource Management Act 1991 (RMA) to construct, operate, and maintain the Project, which comprises the Expressway, associated local road connections, and the realigned NIMT.

The NZTA will be responsible for the roading aspects of the Project, and KiwiRail will be responsible for the rail aspects, but the Project has been designed and will be constructed (and construction effects managed) in an integrated, cohesive manner.

The Project passes through part of the Kāpiti district, from Te Kowhai Road (near Peka Peka) in the south to just north of Taylors Road (to the north of Ōtaki).

Once constructed, the Expressway will form part of SH1, and the current section of SH1 from Peka Peka to Ōtaki will become a local road. The Expressway will tie in with the new section of SH1 created by the MacKays to Peka Peka (M2PP) Expressway Project to the south, at Te Kowhai Road, and re-join the current SH1 north of Ōtaki.

The Project is shown in Figures 1 and 2 overleaf.

Figure 1: Location of the Peka Peka to North Ōtaki Expressway

Figure 2: Schematic View of the Peka Peka to North Ōtaki Expressway Project

Background to the Project

The Project represents the culmination of many years of consideration of how best to provide a safe, efficient, long-term route through the Kāpiti district, one of the fastest-growing parts of the Wellington Region.

As the only south-north route through the Kāpiti district, SH1 currently carries all through-traffic, as well as numerous vehicles making local trips. Given population growth trends, and the general increase nation-wide in vehicle and trip numbers, existing issues of traffic congestion, delays, and accidents are expected to worsen. Various strategic studies and investigations have been undertaken to analyse these issues and identify potential solutions.

In March 2009, this section of SH1 was classified by the government as part of the Wellington Northern Corridor Road of National Significance (RoNS), one of seven major State highways prioritised for enhancements in order to reduce congestion, increase transport efficiency, improve safety, and support economic growth.

In late 2011, a review by the NZTA of long-term route options for this section of SH1 concluded that the general corridor within which the Expressway is located best meets national, regional, and district needs for a State highway.

As an integral part of the Wellington Northern Corridor RoNS, and as a stand-alone proposal, the Project provides significant benefits in terms of safety, travel time savings, and route security through the Wellington Region, as explained below. Accordingly, the Project is a key component of a number of national, regional, and local transport strategies, policies, and plans to improve transport in the region and nationally.

The benefits of the Project include those set out below.

- The Project will achieve significant safety improvements for users of transport networks, through:
  - the separation of local traffic from State highway traffic travelling through the Kāpiti district;
  - improved road standards, due to the geometric design of the Expressway (including continuous median separation of north and south-bound traffic); and
  - an enhanced traffic environment on the local road network (which will include the current SH1), with benefits for motorists, cyclists, and rail users due to:
    - fewer vehicles using the current SH1;
    - the provision of grade-separated local road connections (i.e. bridges) across the Expressway and NIMT; and
    - the removal of five of the eight level crossings of the NIMT in the Project area.
- The Project will promote economic development, including through:
  - improvements in efficiency for freight movements and reduced travel times;

  - the reduction of traffic through the Ōtaki Railway Retail area, improving the amenity values[1] of that area as a social, employment, retail, and transport centre; and
  - increased economic activity and employment opportunities during the Project's four-year construction period.
- The Project will enhance connections between communities in the Kāpiti district, through:
  - the provision of the Expressway as an alternative route; and
  - the continued availability of the existing SH1 as part of the local road network, with a safer, improved transport environment (as discussed above).
- The Project will result in reduced and more reliable travel times along key routes, and reduced traffic congestion.
- As part of the Wellington Northern Corridor RoNS, the Project will improve access to Wellington's key facilities such as the port, international airport, hospital, and central business district (CBD).
- The Project is "lead infrastructure", in that it will meet the future needs of a growing population, as well as foster economic growth in the ways summarised above.
- The Project will improve route security and resilience of the road network in the event of a significant earthquake, road accidents, or other disruption, by providing a high-quality alternative route between Peka Peka and Ōtaki (including two bridges providing alternative crossings of the Ōtaki River).
- The Project has a high degree of alignment with key strategic planning instruments for the Kāpiti district, including the Greater Ōtaki Vision (GOV).

Description of the Environment

The Project traverses a range of different land uses along its 13km route, including farming and agricultural land, lifestyle blocks, residential areas, and urban townships and communities:

- At the southern end, the four-lane Expressway is located over the existing SH1, and a replacement section of arterial road is to be built, predominantly through low-lying areas and undulating mounds associated with sand dunes;
- North of Te Hapua Road, the Expressway and new arterial road pass through sand dunes and curve east to avoid a culturally and ecologically significant area at Mary Crest, where the Expressway crosses from the west to the east of the NIMT and the arterial road joins with the existing SH1;
- North of Mary Crest, the Expressway runs adjacent to the existing transport corridor (i.e. the NIMT and the current SH1) until the Ōtaki River, across generally flat topography and properties primarily associated with agriculture or horticulture;
- The Expressway crosses the Ōtaki River and runs across the floodplain, then passes through an urban area to the east of the Ōtaki Railway Retail area; it is in this area that the section of NIMT will be realigned to run parallel to the Expressway;

[1] "Amenity values" are those natural and physical qualities and characteristics of an area that contribute to people's appreciation of its pleasantness, aesthetic coherence, and cultural and recreational attributes.

- The Expressway and realigned NIMT pass under the existing SH1 as it exits the Ōtaki Railway Retail area in a northward direction, where the NIMT rejoins the current rail alignment; and
- The Expressway passes through a sand dune system immediately north of Ōtaki (as is the NIMT), before it reduces to two lanes, crosses the Waitohu Stream, and traverses flat rural land at the northern end of the Project area.

The Project area generally consists of rural pasture land, market gardens, discrete areas of urbanised land, sand dunes, pockets of native and exotic vegetation, and wetlands.

Much of the Kāpiti district has been modified by human activity over hundreds of years, resulting in a variable range of terrestrial (land-based) and aquatic ecological habitats along the route. Design criteria for choosing the Project route included seeking to avoid or minimise the Project's effect on high-value ecological habitats; most notably, the Project successfully avoids existing significant indigenous vegetation at Mary Crest (which is also an area of significance to the tangata whenua).

The Project traverses four main hydrological catchments and numerous smaller catchments, flowing east to west to the Kāpiti coast. The Ōtaki River is the largest water course. The Project area traverses a series of floodplains, where land drainage works predominate – initially these were to enable pastoral farming, while more recently the focus has been on flood control.

Network utilities near the Project area include high voltage overhead transmission lines, which are located to the west of the Project and will not be affected, and local electricity distribution lines, gas and water supply pipelines, and telecommunications cables. The Arcus Road irrigation scheme draws groundwater from near the Ōtaki River.

Description of the Project

Roading aspects of the Project

The Expressway has been designed to an NZTA expressway standard, which features four lanes (two in each direction) with continuous median separation.

Local access to and from the Expressway is provided by half-interchanges[2] to the north and south of Ōtaki, which will be clearly signposted and will provide legible access to Ōtaki and Te Horo. Direct access is deliberately prevented elsewhere along the alignment.

Key design features of the roading aspects of the Project include the following:

- The Project incorporates construction, operation, and maintenance of an Expressway of approximately 13km in length, a new section of local arterial road near Mary Crest, and new or reconfigured local roads (including connections from properties to local roads) throughout the Project area;
- The Expressway will have a sealed carriageway up to 26m wide, including 2.5-3m sealed shoulders on each outer edge; the new local arterial road will have a sealed

[2] A half-interchange comprises two ramps allowing, in this case, access between the Expressway and the local road network. For instance, the half-interchange to the north of Ōtaki allows southbound traffic to exit the Expressway and enter the Ōtaki Railway Retail area, and northbound traffic to leave the Ōtaki Railway Retail area and join the Expressway.

carriageway approximately 10.6m in width, including a 1.8m-wide shoulder on each side;

- Buffer areas are provided on either side of the formed carriageway to enable landscape treatment, ecological enhancements, and other facilities including stormwater controls;
- Project earthworks will all take place within the proposed designations; comprehensive landscape treatment is provided for earthworks areas, including for the finished slopes of cuts and fills;
- The Project includes ten bridge structures, comprising two parallel two-lane Expressway bridges across the Ōtaki River,[3] one two-lane Expressway bridge across the Waitohu Stream to the north of Ōtaki, six grade-separated overbridges to maintain local road connections, and one overbridge where the Expressway crosses the NIMT near Mary Crest;
- A low-noise road surface (such as Open-Graded Porous Asphalt (OGPA)) will be used near the Ōtaki urban area, from the Ōtaki Railway Station to Waitohu Valley Road;
- There will be no lighting along the Expressway, except at the interchanges;
- The Project will bring about a net increase in the physical extent of indigenous vegetation, wetlands, and stream-related habitat, and "no-net-loss" of ecological values associated with those areas;
- Mass planting will be carried out along stream edges and in other areas affected by the Expressway;
- Stormwater run-off from the new roading infrastructure is to be collected and treated using swales, filtration-type devices and constructed treatment wetlands;
- A main site compound will be formed to the north of the Ōtaki River which, among other functions, will serve as an administrative centre, delivery point for materials to the site, and plant/equipment storage area;
- Construction works will include earth embankments, areas of cut and fill,[4] reinforced soil embankments, and piling and mechanically-stabilised earth walls with concrete facing panels, predominantly around bridges;
- Approximately 800,000 cubic metres of excavated (cut) material will be used as fill within the designations;
- In addition, there will be approximately 45,000 cubic metres of imported fill used to construct the Project;
- Comprehensive erosion and sediment control measures are to be provided for all earthworks, and particular safeguards will be adopted for works in and around water bodies; and
- Construction will be undertaken by a number of work crews working on different parts of the Project, both at the same time and in different stages. Construction is expected to take approximately four years.

[3] The two bridges are numbered together on the layout plans as if they were one structure, Bridge No. 5.

[4] A cut is where earthworks operations 'cut' through soil or rock; a fill is where soil or other material is used to fill a depression or form a mound or embankment.

Rail aspects of the Project

The NIMT realignment is designed to ensure that the NIMT continues to operate to its current standard and runs to the west of the Expressway through Ōtaki.

The NIMT realignment is to be built along with the Expressway as an integrated construction project, so the earthworks management and mitigation measures referred to above will be largely common to both the roading and rail aspects of the Project.

The design of the NIMT realignment incorporates the following specific features:

- The length of the realignment is approximately 1.2km through the Ōtaki area, and features of the current designation are proposed to be replicated (including an existing passing loop past Ōtaki Railway Station, to allow trains travelling in opposite directions to pass each other, and a future-proofed double-track formation);
- The design standards for the NIMT realignment provide for an 820m minimum radius for the horizontal track curvature and a minimum 5.5m vertical clearance (for example where a road bridge passes over the rail corridor), to future-proof the line for electrification; and
- The Ōtaki Railway Station building will be reoriented on its current site so that the building and platform remain parallel to the realigned railway line.

Consideration of Alternatives

Roading designation

The NZTA and its predecessors carried out (or commissioned) numerous historical assessments of alternative State highway routes through the Kāpiti district, including between Peka Peka and Ōtaki.

In developing the Project, that historical work was examined and brought up to date. The updated assessment involved detailed multi-criteria analysis of four alternative routes, a western route, a central route closely following the existing SH1 (which was ultimately preferred for the Expressway), and two routes to the east – the 'eastern plains' and 'eastern foothills' routes.

The NZTA's conclusion (in late 2011) was that the central route, which had previously been presented to and discussed with the local communities as the NZTA's preferred option, achieved the best fit with the NZTA's statutory obligations and the Project objectives. In large part this is because the route chosen for the Expressway allows ready access between the Expressway and Ōtaki (including the Ōtaki Railway Retail area), and best integrates the Project with the Kāpiti district's existing infrastructure and land use planning framework.

Parallel processes for defining the Expressway route were conducted during 2010 and 2011. These processes focused on the location of interchanges and cross-corridor local connections, and specific Expressway route choices. The processes were informed by specialist inputs from a multi-disciplinary expert team. Public consultation and meetings with key stakeholders provided valuable feedback that was factored into the NZTA's decisions on options.

As a result of these processes, the Project design incorporates:

- Half-interchanges to the north and south of Ōtaki, providing full access from the Expressway to the Ōtaki Railway Retail area and vice versa;[5]
- The following cross-corridor local connections:
  - At Te Horo, a local road bridge over the Expressway, NIMT, and the existing SH1, connecting residences and businesses to the east and west of the transport corridor (a more northerly location was chosen because of preferences expressed by Te Horo residents during consultation);
  - Just south of Ōtaki River, new local roads and bridges across the Expressway and NIMT, connecting Ōtaki Gorge Road and Old Hautere Road with the existing SH1 to provide access to and from Ōtaki, and linking to the Expressway (heading south); and
  - At Rahui Road in Ōtaki, a local road bridge across the Expressway and realigned NIMT, linking the Ōtaki Railway Retail area with residential areas to the east;
- Specific provision for cyclists and pedestrians on all cross-corridor local connections;
- An alignment at Mary Crest that avoids significant indigenous vegetation remnants and sites/areas of cultural significance; and
- An alignment at Te Horo that facilitates the benefits of the Mary Crest alignment, and enhances safety and urban design outcomes.

Rail designation

KiwiRail has also considered alternatives in relation to the realignment of the short section of the NIMT through Ōtaki, necessitated by the route of the Expressway.

The realigned NIMT largely runs parallel and immediately to the west of the Expressway, which minimises the inaccessible land between the two. The chosen alignment also enables the continued use of the historic Ōtaki Railway Station in its current setting, with the Station building and platform adjusted to remain parallel to the realigned railway track.

Consultation and Engagement

Consultation on the Project has been guided by recognised good practice principles and has featured significant levels of interaction with stakeholders over a number of years.

The community's views have been sought on the Project as a whole, and on specific matters such as cross-corridor local connections and the measures proposed to mitigate the Project's environmental effects.

The Project has benefited greatly from feedback provided by stakeholders through various consultation channels, including one-on-one and group meetings, a series of public open days in 2009, 2011, and 2012, written submission processes, a project email address, and

[5] The option of an interchange at Te Horo was discounted several years earlier because (among other reasons) such an interchange would promote residential development in that area, contrary to Kāpiti Coast District Council's strategies for growth in the district.

a free-phone service. Information has also been disseminated through the Project website, media releases, and brochures and newsletters sent to households and businesses.

The NZTA has kept in close touch with the tangata whenua, Ngāti Raukawa and Nga Hapū o Ōtaki, as the Project has developed. This collaborative engagement has included numerous briefings, workshops, and hui, an open day at Raukawa Marae in Ōtaki, site walkovers, and various meetings with specialists.

Likewise, on-going consultation with Kāpiti Coast District Council (KCDC), Greater Wellington Regional Council (GWRC), and other relevant regulatory agencies has been undertaken in developing the Project to date.

Open channels of communication and stakeholder engagement will remain important features of the Project as it is constructed and becomes operational.

Assessment of Effects on the Environment

An Assessment of the Environmental Effects (AEE) of the Project has been carried out in accordance with the relevant provisions of the RMA, and an AEE report prepared. The AEE report describes in detail the wide range of actual or potential effects, both positive and adverse, that the Project will have on the environment.

Many of the Project's adverse effects will be limited to the period during which the Project is constructed. The Project's effects also vary in significance, scale (local, regional, and national), and intensity.

A comprehensive suite of measures is proposed to address the Project's adverse effects on the environment. The various effects and the range of mitigation measures are summarised below.

Traffic and Transport

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

- Improved safety and reduced road accident risk, due to:
  - the separation of local traffic from State highway traffic travelling through the Kāpiti district, which will address the very poor current performance of the intersections of local roads with SH1;
  - improved road standards, due to the geometric design of the Expressway (including continuous median separation of north- and south-bound traffic); and
  - an enhanced traffic environment on the local road network (which will include the current SH1), with benefits for motorists, cyclists, and rail users due to:
    - fewer vehicles using the current SH1;
    - the provision of grade-separated local road connections across the Expressway and NIMT; and
    - the removal of five of the eight level crossings of the NIMT in the Project area;
- Enhanced connections between communities in the Kāpiti district, through:
  - the provision of the Expressway as an alternative route; and

  - the continued availability of the existing SH1 as part of the local road network, with a safer, improved transport environment (as discussed above);

- Reduced and more reliable travel times along key routes and reduced traffic congestion, which in turn will improve efficiencies in freight movement;
- Improved access to Wellington's key facilities such as the port, international airport, hospital, and CBD; and
- Improved route security and resilience of the road network in the event of a significant earthquake, road accidents, or other disruption.

During construction, there will be localised, short-term, adverse traffic effects, including delays or inconvenience arising from increased heavy construction traffic and the need to do work on some local roads adjacent to the Expressway. These effects will be managed through a comprehensive Construction Traffic Management Plan (CTMP), a draft of which is provided with the AEE report.

Geotechnical Engineering and Resilience

A detailed geotechnical assessment has been undertaken to inform the design of the Project's earthworks, bridges, and other structures, to assess earthquake hazards, and to identify and address potential environmental effects such as ground settlement[6] and effects on groundwater levels.

As noted above, a key benefit of the Project is that it is designed to be resilient to natural hazards and be readily reopened in the event of a significant earthquake. This will improve route security and resilience of the road network in such an event (or indeed if road accidents or other disruptions occur), by providing a high-quality alternative route between Peka Peka and Ōtaki, including two additional bridges across the Ōtaki River.

Project works have been assessed to have a negligible effect on the groundwater regime. Some ground settlement is anticipated in discrete areas (where there are no buildings), due to groundwater drawdown, fill embankments, or the construction of bridge foundations. This will be monitored and managed through common construction techniques.

Urban Form and Function

The Project will be a significant addition to the urban form of the Kāpiti district, and urban design principles have therefore been key considerations in developing the Project.

Particular regard has been had to urban form and land use patterns, and addressing potential issues relating to amenity, community severance, and connectivity (both to and across the Expressway).

An Urban and Landscape Design Framework (ULDF) has been developed as a key document to capture the urban design decisions made, and set out further methods for achieving optimal urban design outcomes in future (as the details of the Project's design are finalised).

The Project's overall urban design outcome is rated as "low (positive)", meaning that the Project's benefits in terms of urban design moderately outweigh its adverse effects.

[6] The lowering of ground level caused by a volume change or movement within the soil.

The Project does not significantly affect existing urban form and land use patterns, as the Expressway alignment broadly follows the existing transport corridor on what is mainly rural land. A positive outcome is retention of the underlying urban form within Ōtaki, and the reduction of traffic through the Ōtaki Railway Retail area will have a positive effect on local connections and cross-town movement.

The Project will adversely affect existing amenity values enjoyed by nearby residents. Accordingly, the Project's design focuses on integrating its various elements (including interchanges and bridges) into the landscape as much as practicable. Other detailed mitigation measures have been developed, particularly in terms of landscape treatment, and extensive plantings and localised bunding (planted embankments) are proposed. Residents adjacent to the existing SH1 will benefit through amenity improvements arising from reduced traffic flows.

The Project generally achieves or enhances connectivity between communities. There are existing severance issues at Te Horo, which are increased by the Project[7]; mitigation is provided by way of a local road bridge over the Expressway, NIMT, and the existing SH1, connecting residences and businesses to the east and west of the transport corridor.

Landscape and Visual

As a large roading and rail infrastructure development, the Project will inevitably result in changes to the landscape and adverse visual effects. The scale and extent of those effects vary along the Project's length.

Landscape and visual experts have been involved throughout the design of the Project, with the aim of avoiding adverse landscape and visual effects as far as practicable, and mitigating any remaining adverse effects.

Those guiding aims of avoidance/mitigation, and the numerous measures proposed to mitigate adverse landscape and visual effects, are set out in the ULDF. Mitigation has largely been incorporated into the Project design, including extensive planting and the use of trees and bunds to screen or enhance views. Specific mitigation is also proposed in respect of the Pare-o-Matangi reserve, an open space area valued by the tangata whenua and the wider community.

The Project's adverse effects on natural character are limited, given the highly modified nature of the Project area as a whole. This is illustrated by the Project's two bridges across the Ōtaki River; natural character is already compromised by the existing road and rail bridges across the River in that area (which is nonetheless identified as a 'significant amenity landscape' in the Proposed Kāpiti Coast District Plan).

Some native vegetation (approximately half a hectare) is to be removed to construct the Project and, as discussed below, extensive mitigation is proposed.

Hydrology

The Project crosses four significant waterways – the Waitohu and Mangapouri Streams, the Ōtaki River, and the Mangaone Stream – and their floodplains.

[7] Different parts of the Te Horo community are currently separated or "severed" by the existing State highway and NIMT corridor. The raised Expressway will add a visual severance effect.

As an elevated transport structure, the Project has the potential to interfere with the natural drainage function of these and other catchments. Hydrological modelling has therefore played a key part in the Project's design, with a view to achieving 'hydraulic neutrality', i.e. no worsening of the existing flood situation.

As a result of the design process 'hydraulic neutrality' has largely been achieved, and the Project will even reduce some existing flooding effects in populated areas. The limited areas where effects will be marginally greater are mostly in pasture – one exception is a farm storage building which is already susceptible to inundation in severe flood events; another exception relates to properties in a dedicated flood storage basin near the Mangapouri Stream, where flooding risks will be slightly less than currently in more frequent floods (namely 1-in-100-year events), and slightly greater in extremely rare floods (such as a 1-in-200 or 1-in-500-year event).

The crossings of water bodies (through bridges and culverts) and some limited stream realignments incorporated into the Project design will result in changes to how those water bodies flow. By constructing realigned water bodies in a way that mimics their existing form (in terms of slope, channel size, and shape), effects on water velocity and flow paths –and hence water quality and other ecological values – will be minimised.

Stormwater

Erosion and sediment control measures meeting best practice standards will be used during construction. These measures will achieve high levels of performance, minimising the amount of sediment that enters streams. Consequently, water quality effects during construction are predicted to be minor, with suspended sediment in water clearing quickly out of streams and with minimal levels of deposition in sensitive and other locations.

All storm water run-off from finished road surfaces will be treated using natural filtration and treatment methods – unlike the existing SH1, which has no formal stormwater treatment. Because most traffic is predicted to transfer from the existing SH1 to the Expressway, which will treat all run-off, the Project is predicted to lead to a decrease in the level of contaminants entering the local stream and river systems.

Terrestrial Ecology

The Project passes through a landscape that has been highly modified by agriculture and, to a lesser extent, horticulture, viticulture, and urbanisation.

The Project has relatively minor adverse effects on terrestrial ecology. In part this has been achieved through avoidance of effects; for example, the choice of Expressway alignment avoided the most important ecosystems in the vicinity, namely the significant area of indigenous vegetation and an associated wetland at Mary Crest.

Residual adverse effects will be appropriately remedied or mitigated. The Project will affect relatively small areas of indigenous bush, totalling approximately 0.5 hectare, and this will be offset by either reinstating at least 1.5 hectares of indigenous vegetation or protecting an appropriate area of established native bush, subject to agreement with landowners being finalised.

Culverting or bridging of waterways will adversely affect some riparian vegetation (mainly grazed grass or willow), and bring about a loss of stream bed habitat. Those effects will be addressed by ecological offsetting consistent with GWRC policy, namely through stream restoration and indigenous planting in specified areas.

Mitigation is also provided for effects on 0.5 hectares of wetland habitat (which was originally formed by the current alignment of the NIMT). This effect is being offset by 1.1 hectares of wetland restoration.

The Project's adverse effects on the habitat of terrestrial fauna are assessed as minor. Specific construction methods will be used to address effects on one non-threatened species, peripatus (velvet worm), which was observed in an area of bush where Project works will take place.

Aquatic Ecology

Expert assessments have identified five categories of potential adverse effects of the Project on waterways, and detailed mitigation measures are proposed for each.

First, sediment run-off from earthworks during construction has the potential to have adverse effects on freshwater habitats and species. As discussed above, best practice erosion and sediment control measures are to be adopted in constructing the Project, and on this basis the ecological impact of predicted run-off is considered to be less than minor.

Second, the use of culverts in watercourses has the potential to impair fish migration. Appropriate measures to provide for the passage of fish will be incorporated into the design of all culverts where streams have the potential to carry native fish.

Third, run-off from roads can affect water quality; as noted above, the Project will bring about a net improvement in the level of contaminants entering local stream and river systems, because the Expressway design incorporates formal treatment of run-off.

Lastly, the Project will bring about the loss or alteration of two categories of aquatic habitat. As noted above, stream riparian planting will be established to mitigate stream bed effects, and wetland restoration will be carried out to address effects on wetland habitat.

Air Quality

Project earthworks and other construction activities will be managed to minimise the discharge of dust. A range of mitigation measures is proposed in a draft Construction Air Quality Management Plan (CAQMP), including water spraying to dampen and control dust during dry periods.

The effect of vehicle emissions on air quality once the Expressway is operational has been modelled. The assessment concludes that the Expressway will have an insignificant effect on air quality in the Project area as a whole, with small increases in emissions experienced at some locations adjacent to the Expressway (such as in the South Ōtaki to Te Horo section) and improvements in other areas, including the Ōtaki Railway Retail area and Te Horo.

Noise and Vibration

As the Expressway passes through established urban areas, a detailed assessment of noise and vibration effects has been carried out along the entire route using the process set out in the applicable national standard (NZS 6806:2010).

Noise mitigation measures need to meet the 'best practicable option' requirements of the RMA, in that they have to be effective in noise attenuation while being the best fit for the local environment. To identify such measures, a comprehensive multi-disciplinary

assessment process was undertaken, and the proposed mitigation was reviewed further in light of public feedback given in July 2012.

This process determined that specific noise mitigation measures are required in localised areas, namely the use of a low-noise road surface (such as OGPA) for 1km of the Expressway through Ōtaki, and investigation of one of the assessed 'Protected Premises and Facilities' (PPFs) for acoustic treatment.

Rail noise measurements have been undertaken to quantify existing levels and assess the effects of the NIMT realignment. Two additional PPFs will be investigated for acoustic treatment to mitigate rail noise, and KiwiRail and the NZTA are working with the affected property owners to determine appropriate mitigation.

The removal of five of the eight existing level crossings of the NIMT in the Project area (including near the residential area at Rahui Road in Ōtaki) will have a flow-on benefit in terms of noise, as a train's horn is typically sounded when it is approaching a level crossing, and some level crossings incorporate mechanical crossing signals and bells.

Vibration effects from the operation of vehicles on the Expressway are considered to be negligible, and the newly constructed track on the realigned NIMT will significantly reduce the vibration currently generated by trains.

Construction noise will remain within reasonable limits defined by applicable national standard (NZS 6803:1999). Where construction works are proposed in close proximity to sensitive receivers (such as residential dwellings), methods to manage noise and vibration effects will be employed as set out in the draft Construction Noise and Vibration Management Plan (CNVMP) provided with the AEE report.

Contaminated Land

Given that the Project involves designations over private land, not all of which is currently accessible by the NZTA/KiwiRail, any contaminated-land-specific resource consent(s) required under the relevant National Environmental Standard[8] (NES) will be sought prior to site works commencing, when access to all sites is readily available.

Nonetheless, assessments have been carried out in the Project area, in terms of the potential risks around the discovery and handling of contaminated soil and materials during construction of the Project. A small number of potential locations for contaminants have been identified to date, and the management of this risk will involve careful investigation, excavation, and management/disposal methods.

A draft Bulk Earthworks Contaminated Land Management Plan (BECLMP) is submitted with the AEE report, which establishes a framework for the comprehensive management (through well-established processes and techniques) of potential issues arising from contaminated land.

[8] Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011.

Archaeology

The Project will affect two pre-1900 structures (which are 'archaeological sites' for the purposes of the Historic Places Act 1993 (HPA)) and the grounds of a third, and is likely to affect archaeology associated with historical Māori and other occupation of the area.

The two pre-1900 structures are the foundations of an earlier building beneath the Ōtaki Railway Station, which is to be moved slightly to align with the new section of NIMT, and an 1870s cottage known as Clifden, at Bridge Lodge, which is to be moved to a suitable location. Various protection and mitigation measures are proposed, to preserve these structures and their archaeological values. The Project will also affect the grounds of a third pre-1900 building, at 230 Main Road, Ōtaki.

Three Māori archaeological sites (a midden, a midden/oven, and a pit) are recorded[9] as being outside the Project area. These sites could not be re-located and effects on them, while unlikely, are possible given historical mapping inaccuracies.

Given the continual occupation of the Kāpiti district over many years, there is also the potential to encounter unknown, unrecorded archaeological sites during construction. This is particularly so in two dune areas identified as being of high archaeological potential, in the south and north of the Project area.

A process for addressing potential effects on archaeological sites is governed by the HPA, which sets out the requirements for obtaining the appropriate permissions. The NZTA will seek authorities through that separate process in due course.

In addition, detailed further archaeological surveys are an integral part of the pre-construction work programme, and an accidental discovery protocol (ADP) will be agreed with the tangata whenua to manage any unexpected discoveries during construction and ensure that appropriate procedures are followed.

Built Heritage

There are a number of buildings with heritage values located within the footprint of the Project designations or nearby.

As discussed above, the Ōtaki Railway Station building will be moved to align with the new section of NIMT. Those works will be undertaken carefully, in accordance with an updated heritage conservation plan, to ensure that heritage values are preserved. The relocation of Clifden will also be guided by a heritage conservation plan, and undertaken in a manner sensitive to heritage values.

The Project affects part of a site formerly occupied by the potter Mirek Smišek, which includes two 'beehive kilns', a brick flue, and a collection of buildings including the former Te Horo Railway Station building (which was moved to the site in 1971). The site is to be reconfigured to preserve heritage values of the principal structures, and the NZTA is exploring the possibility of providing public access to the site.

The Project will be built near to other listed heritage buildings, namely the former Rahui Milk Treatment Station and the former Rahui Factory Social Hall in Ōtaki. Screen planting

[9] On the register of the New Zealand Historic Places Trust Pouhere Taonga.

is proposed and adverse effects on heritage values associated with these buildings will be negligible.

Tangata Whenua and Cultural Heritage

There is a rich history of Māori settlement in the Kāpiti district, and the Project traverses a landscape containing various sites of importance to tangata whenua.

The NZTA has built strong relationships with the tangata whenua, namely Ngāti Raukawa and Nga Hapū o Ōtaki (a representative group comprising five Ōtaki-resident hapū of Ngāti Raukawa).

These relationships have been fostered through close on-going engagement with the tangata whenua throughout the Project design process. An important consequence of that engagement was the re-alignment of the Expressway to avoid a culturally-significant area near Mary Crest.

A cultural impact assessment has been prepared by Nga Hapū o Ōtaki representatives, which identifies residual issues such as effects on Māori-owned land and possible effects on unknown archaeological sites of cultural significance in other areas, particularly dunes located in the south and north of the Project area. As noted above, an ADP is to be agreed with the tangata whenua to ensure that appropriate procedures are followed in the event of any sites or cultural materials being found during construction. Nga Hapū o Ōtaki representatives will be invited to assist with the further archaeological surveys carried out prior to construction.

Social and Community

The Kāpiti district is a rapidly-growing and changing area, and the Project will add to this change dynamic. The Project has a range of positive and adverse social effects, some of which will be limited to the Project's construction phase.

As noted above, the Project will have significant safety, transportation, and economic benefits, and these will bring social benefits for the Kāpiti district and Wellington region, particularly in terms of the improvements to the existing level of connectivity between communities.

The Project will also give rise to adverse social effects, however, largely borne in areas immediately adjoining the Project. The Project's design has sought to mitigate a number of those effects, including by maintaining or improving local road accessibility, using planted bunds to screen the Project, and providing comprehensive landscape treatment which will contribute to enhanced amenity.

Many of the Project's adverse social effects will occur during construction. It is therefore important that these effects are mitigated through effective construction management and open communication and community liaison. Construction mitigation measures will be implemented through a Construction and Environmental Management Plan (CEMP) and its subsidiary plans for traffic, noise and vibration, and air quality. A community liaison group and various channels for open communication will be established, and will operate as the Project is constructed.

Economic

The Project is anticipated to bring significant net benefits to the Kāpiti district and Wellington Region.

The Project will promote economic development, including through improvements in efficiency for freight movements and reduced travel times, and through increased economic activity and employment opportunities during the Project's four-year construction period.

Because most traffic passing through the Kāpiti district will use the Expressway rather than the existing SH1, some businesses facing onto the existing SH1 may experience adverse 'business redistribution effects'.[10] This is particularly so at Te Horo, where consumers wishing to access Te Horo would need to exit the Expressway at Waikanae or Ōtaki and proceed along local roads.

On the other hand, the reduction of traffic through Te Horo and the Ōtaki Railway Retail area will enhance the general ambience of those areas, potentially encouraging more visitors. Effects on most businesses in the Ōtaki Railway Retail area are therefore considered to be neutral or positive.

Land Acquisition and Property

The land that is required for the Project includes Crown land, Council-owned land (including road reserves), Māori land, and privately-owned property. The majority of land is privately owned. The NZTA has an active purchase programme which seeks to acquire all required land for the Project that is in private ownership along the route. This includes the land required for the rail aspects of the Project, which is to be transferred to KiwiRail.

Property owners whose land is required for the Project have been advised and made aware of the extent required (either full or partial acquisition). Effects on access to properties have been identified and alternative access provided through the Project's design.

Management of Adverse Environmental Effects

The Project's potential adverse effects on the environment have been avoided, remedied, or mitigated through an integrated route selection and design process and a comprehensive set of proposed designation and resource consent conditions.

In the event that the RMA statutory authorities sought are granted, GWRC will oversee the implementation of mitigation and conditions for the regional consents, and KCDC will oversee implementation of the designation conditions.

Development of the Project design and associated conditions has involved a multi-disciplinary team of technical experts and has been informed by public consultation and on-going stakeholder engagement.

Potential effects of constructing and operating the Project were, in the first instance, sought to be avoided by alignment design choices, such as the avoidance of culturally and ecologically significant areas near Mary Crest.

A multi-disciplinary process was also used to identify the comprehensive use of mitigation measures incorporated into the design of the Project. Examples are the provision of a low-noise road surface (such as OGPA) on a section of the Expressway near the Ōtaki urban area, the use of planted bunds, storm water run-off treatment, landscaping and visual

[10] Businesses in other parts of the District or Region may benefit from this redistribution.

screen planting, native re-vegetation or protection of existing habitat, and wetland reinstatement and management.

Prior to, during, and after construction a monitoring programme will provide information to hone and implement the measures to be used to manage effects.

A comprehensive suite of conditions for the designations and resource consents is proposed. The conditions include a detailed environmental monitoring and management programme for construction effects, featuring a three-tiered system of management plans, comprised of:

- The overarching CEMP;[11]
- A series of topic-specific management plans, including an Erosion and Sediment Control Plan (ESCP), an Ecological Management Plan (EMP), a BECLMP, a Landscape Plan (LP), a CNVMP, and a CAQMP; and
- Site-specific Environmental Management Plans (SSEMPs), which will address in detail the specific environmental considerations in each section of the Project area.

Implementing this conditions framework will enable the effects of the Project to be appropriately avoided, remedied, or mitigated in accordance with statutory requirements and the commitment by the NZTA and KiwiRail to best practice.

Statutory Matters

A wide range of objectives and policies in national, regional, and local policy and other planning instruments are relevant to the Project. The Project has been assessed against these provisions, and the main conclusions are as set out below.

- The Project is a key part of government policies relating to transportation; as part of the Wellington Northern Corridor RoNS, the Project will result in significant safety improvements, improve efficiency in freight movements and reduce travel times between Wellington Airport and Levin, improve travel time reliability, reduce congestion (especially through Ōtaki), and improve route security.
- Overall the Project is consistent with the objectives and policies of the relevant national and regional statutory planning documents.
- The Project is consistent with the transport-related policies of the Regional Policy Statement (RPS), the Proposed Regional Policy Statement (PRPS), the Regional Land Transport Strategy (RLTS), the operative Kāpiti Coast District Plan (KCDP), and the proposed KCDP.
- The Project will enable communities at a local, regional, and national level to provide for their social, economic, and cultural wellbeing.
- The Project will meet the growing transportation needs of the Wellington Region, in a manner that does not preclude future opportunities for other land transport development, such as public transport.
- The Project will sustain the potential of natural and physical resources for future generations, and safeguard the life-supporting capacity of air, soils, water, and ecosystems.

[11] The Construction Environmental Management Plan, noted above.

- The adverse effects of the Project on the environment will be sufficiently avoided, remedied, or mitigated to satisfy the requirements of section 5 of the RMA.
- The Project provides for, and has appropriately responded to, the matters in sections 6, 7, and 8 of the RMA.
- To this end it is considered that the sustainable management purpose of the RMA will be achieved by confirming the designations and granting the resource consents sought.

Chapter 1
Part A
VOLUME 2

Introduction

Overview

The NZTA is lodging a Notice of Requirement (NoR) and applications for resource consents for the construction, operation, maintenance and improvement of the Expressway. Re-alignment of approximately 1.2km of the NIMT through Ōtaki is required to accommodate the Expressway, and KiwiRail is lodging a NoR for that purpose. In this AEE report, "the Project" refers to:

- Construction, operation and maintenance of the Expressway between Peka Peka and North Ōtaki;
- Realignment of part of the NIMT; and
- Construction and operation of associated local road connections.

The Project is considered to be a proposal of national significance and the matters have been lodged with the Environmental Protection Authority (EPA). The NZTA requests that the Minister for the Environment directs that the matters be referred to a Board of Inquiry (BoI) for determination. As the KiwiRail NoR is inextricably linked with the NZTA NoR, the KiwiRail NoR is also requested to be referred to a BoI for determination at the same time.

1 Introduction

1.1 The Requiring Authorities / Applicant

1.1.1 NZTA

The NZTA was established on 1 August 2008 through amendments to the Land Transport Management Act 2003 (LTMA). The NZTA is a Crown entity, with functions that are generally equivalent to the combined functions of the former Land Transport New Zealand and Transit New Zealand.

The NZTA's statutory objective is to undertake its functions in a way that "*contributes to an affordable, integrated, safe, responsive and sustainable land transport system*".

One of the NZTA's statutory functions is to manage the State highway network (including planning, funding, design, supervision, construction, maintenance and operations) in accordance with the relevant Acts[12].

A Strategic Priority of the NZTA, as defined in its Statement of Intent 2012 – 2015, is to plan and construct roads identified in the Government Policy Statement on Land Transport Funding 2012/13-2021/22 (GPS) as RoNS.

Under the LTMA, when undertaking its functions the NZTA must, amongst other things:

- Exhibit a sense of social and environmental responsibility (which includes avoiding, to the extent reasonable in the circumstances, adverse effects on the environment);
- Use its revenue in a manner that seeks value for money;
- Give effect to the GPS when performing its functions in respect of land transport planning and funding; and
- Take into account any relevant regional land transport strategies.

12 The LTMA and the Government Roading Powers Act 1989.

The NZTA is the requiring authority in respect of the Expressway NoR, and the applicant for the resource consents associated with the Project.

1.1.2 KiwiRail

The rail industry in New Zealand became a single entity again in October 2008, controlled by New Zealand Railways Corporation / KiwiRail Holdings Limited (trading as KiwiRail). NZRC's powers and functions were contained in the New Zealand Railways Corporation Act 1981 (NZRCA), as well as in other legislation, such as the Railways Act 2005. A recent restructure has seen KiwiRail Holdings Limited, a state-owned enterprise, take over the functions of NZRC as operator of the rail network. A vesting order has been made under section 6 of the New Zealand Railways Corporation Restructuring Act 1990 transferring to KiwiRail Holdings Limited virtually all of NZRC's assets and liabilities, including NZRC's designations and consents. In simple terms, KiwiRail Holdings Limited stands in the shoes of NZRC and continues to trade as KiwiRail.

The statutory functions of KiwiRail, contained in section 12(1) of the NZRCA, include:

(a) to establish, maintain, and operate, or otherwise arrange for, safe and efficient rail freight and passenger transport services within New Zealand.

The realignment of the NIMT through Ōtaki is part of achieving the maintenance of the safe and efficient movement of both rail and road passenger and freight services. While the driver for the realignment is to accommodate the Expressway, the realignment also enables improvements to rail speed, safety and efficiency to be achieved. These improvements are enhanced with the removal of a number of level crossings.

1.2 The Project

1.2.1 Expressway Alignment

The Wellington Northern Corridor RoNS runs from Wellington International Airport to North Ōtaki. The Expressway is one of eight projects developed by the NZTA to address different sections of the Wellington Northern Corridor RoNS. The location of the Project in the overall scheme of the Wellington Northern Corridor RoNS is illustrated in Figure 1-1 below.

The NZTA proposes in this application to designate land and obtain the resource consents to construct, operate and maintain the Peka Peka to North Ōtaki section of the Expressway. This Project extends from Te Kowhai Road in the south to Taylors Road to the north of Ōtaki, an approximate distance of 13km.

The Project will provide an expressway with two lanes of median separated traffic in each direction. Connections to existing local roads, new local roads and access points over the Expressway to maintain safe connectivity between the western and eastern sides of the Expressway are also proposed as part of the Project. The Expressway will provide additional crossings of the Ōtaki River, along with crossings of other watercourses throughout the Project length.

On completion, it is proposed that the Expressway become SH1. Subject to compliance with statutory requirements, including consultation requirements, there would then be the potential for the existing SH1 between Peka Peka and North Ōtaki to become a local road. This would separate local and through traffic. However, the power to declare roads to be State highways or revoke State highway status resides with the Chief Executive of the Ministry of Transport, not with the NZTA.

1.2.2 NIMT

KiwiRail proposes to designate land in the KCDP for the construction, operation and maintenance of a re-aligned section of the NIMT through Ōtaki. While the realignment of

the NIMT is to facilitate the Expressway, it will yield overall safety benefits for operations on the NIMT, including the removal of a number of level crossings. However these are realised without alteration to the existing KiwiRail designation being required.

The realignment involves a length of approximately 1.2km of NIMT being constructed within new designation boundaries, removed from the current NIMT alignment. In order to connect with the new NIMT alignment, short lengths of railway line at each end (approximately 300m long), within the existing NIMT designation boundaries, are also to be altered. The total length of works to the NIMT is therefore approximately 1.8km.

1.2.3 **SH1**

As part of physically constructing the Project and connecting to the adjoining Expressway section, a section of the existing SH1 at Mary Crest is no longer able to be used. In order to ensure that a local road alternative to the Expressway is available, a new section of SH1 will be built in the western side of the Expressway. This new section of SH1 will connect to the existing SH1 to the south of the Project.

Figure 1-1: Location of Peka Peka to North Ōtaki Section of the Kāpiti Expressway.

1.3 Purpose and Scope of this AEE Report

This AEE report and supporting documentation (contained in 5 Volumes) have been prepared in support of the NoRs for the designations and applications for resource consents which would authorise, under the RMA, the construction, operation and maintenance of the Project.

This relates to both the NoR by the NZTA for the designation of land in the KCDP for the construction, operation, and maintenance improvement of the Expressway, and the NoR by KiwiRail for the designation of land for the construction, operation and maintenance of a re-aligned section of the NIMT through Ōtaki.

The NoRs and the regional resource consents application forms are provided in Volume 1.

This AEE report includes a comprehensive and integrated assessment of environmental effects, which addresses all aspects relevant to the consideration and determination of the NoRs and resource consent applications. These matters are being lodged with the EPA as they are considered to be part of a proposal of national significance for the purposes of section 147(2) of the RMA. The NZTA's and KiwiRail's reasons why the Project meets the criteria in section 147(2) of the RMA are set out in a separate letter to the EPA.

Further information on the statutory context for the Project is provided in Part B, Chapter 4 of this AEE report.

1.4 Structure of this Report

The documentation required for the NoRs and resource consent applications is contained in five volumes:

- Volume 1: Resource Management Act 1991 Forms;
- Volume 2: AEE Report;
- Volume 3: Technical Reports and Supporting Documents;
- Volume 4: Management Plans; and
- Volume 5: Plan Set.

This AEE report, in conjunction with the other volumes outlined above, has been prepared in support of the NoRs for the designations and resource consent applications sought for the Project. It provides the following:

- A description of the existing environment in which the Project is located;
- An assessment of the alternatives that have been considered;
- A description of the consultation and engagement undertaken through the development of the Project and the identification of persons affected by the Project;
- A description of both the operation and construction of the Project;
- An assessment of any actual or potential effects on the environment that may result through the construction, operation and maintenance of the Project (including proposed measures to mitigate adverse effects);
- Proposed conditions to be attached to the designations and consents; and
- An assessment of the statutory matters to be considered in respect of the Project.

The structure of this AEE report is outlined in Table 1-1 below.

Table 1-1: Structure of this AEE Report

Part	Chapters	Name	Contents
A	1 and 2	Introduction and Background to the Project	An introduction to the Project, and the context in which it is situated.
B	3 and 4	Statutory Context	Details outlining the statutory matters associated with the Project.
C	5	Description of the Environment	A description of the environment in which the Project is located.
D	6, 7, 8 and 9	Description of the Project	A description of the construction and operation of the Project.
E	10	Consideration of Alternatives	An assessment of the alternatives considered through the development of the Project.
F	11	Consultation and Engagement	Identification of the persons affected by the Project and the consultation and engagement that has been undertaken through the development of the Project.
G	12 to 30	Assessment of Effects on the Environment	An assessment of the actual or potential effects on the environment associated with the Project.
H	32 and 33	The Management of Environmental Effects	Suggested mitigation measures including proposed conditions for designations and consents.
I	34	Statutory Assessment	An assessment of the NoRs and resource consents against all statutory considerations.
J		Appendix	**Appendix One**: Contains the summary of the purpose of a range of statutory and non-statutory documents.

Although some components of the Project relate specifically to the NZTA NoR and others to the KiwiRail NoR, the Project has been developed with a holistic and collaborative approach. A single AEE report has been prepared covering all components of the Project. However, some aspects of the report will only be relevant to:

- Specific geographical areas;
- The NoRs and/or applications for resource consent; or
- Specific components of the Project.

The RMA forms (Volume 1) set out the specific statutory requirements for each aspect of the Project.

Table 1-2 below contains the list of Technical Reports that are submitted in Volume 3 to support this AEE report:

Table 1-2: Technical Reports in Volume 3

Report Number	TECHNICAL REPORT
1	Design Philosophy Statement
2	Rail Basis of Design

3	Assessment of Alternatives
4	Geotechnical Report
5	Construction Methodology Report
6	Assessment of Transport and Traffic Effects
7	Assessment of Urban Planning and Design Effects
8	Assessment of Landscape and Visual Effects
9	Assessment of Hydrology Effects
10	Assessment Stormwater Effects
11	Terrestrial Ecology Assessment
12	Aquatic Ecology Assessment
13	Assessment of Operational and Construction Air Quality Effects
14	Assessment of Traffic Noise and Vibration Effects
15	Assessment of Construction Noise and Vibration Effects
16	Assessment of Land Contamination Effects
17	Assessment of Archaeological Effects
18	Assessment of Built Heritage Effects
19	Cultural Impact Assessment
20	Assessment of Social Effects
21	Assessment of Economic Effects
22A	Consultation Summary Report - 2011
22B	Consultation Summary Report - 2012
23	Urban and Landscape Design Framework

1.5 RMA Requiring Authority Status

A notice of requirement for a designation may only be issued by a requiring authority. Under section 166 of the RMA, a requiring authority is defined as:

(a) A Minister of the Crown; or

(b) A local authority; or

(c) A network utility operator approved as a requiring authority under section 167.

The NZTA is the requiring authority for the proposed designation for the Expressway, and KiwiRail is the requiring authority for the proposed designation for the realignment of a section of the NIMT. Both are approved as requiring authorities under section 167(3) of the RMA.

1.6 Consideration of the Project as a Proposal of National Significance

The Project is part of the Wellington Northern Corridor RoNS. The NZTA and KiwiRail are lodging the NoRs and associated resource consent applications for the Project with the EPA pursuant to section 145 of the RMA, requesting that the Project be directed to and determined by a BoI as a Proposal of National Significance.

The EPA will recommend a course of action to the Minister for the Environment (section 146), who will make a decision pursuant to section 147, guided by the advice of the EPA and taking into account the factors for determining whether proposals are of national significance under section 142. As mentioned above, the NZTA's and KiwiRail's reasons why the Project meets these factors is set out in a letter to the EPA.

1.7 Aspects not Covered in this Report

There are some future authorisations or processes relating to the Project that are not addressed in this AEE report. These are:

- The alteration or removal of existing designations;
- Resource consents that may be required under the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NESCS) or otherwise in respect of contaminated sites (discussed further at para 1.7.3 and in Chapter 24 below);
- Outline plan approval;
- Authorisations required under legislation other than the RMA, such as the Historic Places Act 1991 (HPA);
- The potential revocation of the existing SH1; and
- Works on existing SH1, except where a new section is proposed to be built at Mary Crest and where there is a requirement to tie in to new local roads.

1.7.1 The Future of Existing SH1

The Expressway would allow the existing SH1 between Peka Peka and Ōtaki to become a local arterial road suitable for the safe and efficient use by the local community without having to contend with State highway traffic (including freight traffic) passing through. With appropriate linkages and crossings to enable connectivity either side of the Expressway, the existing SH1 will provide a functional route for local traffic.

Although the Project proposes linkages to the existing SH1 and local roads, and the construction of a new section of SH1 to replace that built over by the Expressway, any redevelopment of the existing SH1 itself does not form part of this application. Any redevelopment of this road will be undertaken in the future and any required approvals sought at that time.

Although the Project does not preclude the construction of parallel walking and cycling facilities along the existing SH1, those facilities are not part of this application. These will be addressed through the SH1 revocation process, whereby the section of SH1 no longer required as State highway is transferred to the relevant local authority, KCDC. Final decisions on the form of the existing SH1 when it is handed over to the local authority and any re-development prior to this, such as the inclusion of pedestrian and/or cycling facilities, are not yet made. High-level principles have however been agreed between the NZTA and KCDC. These principles will be used, in conjunction with ongoing discussions with KCDC, to refine the re-development requirements for the existing SH1.

1.7.2 The Existing NIMT at Ōtaki

As stated, a section of the NIMT at Ōtaki is to be realigned as part of the Project, and KiwiRail is seeking a NoR for the new section to enable that to occur. In respect of the existing NIMT in that location, the Expressway is to be located in that area and, once the realigned section of the NIMT is constructed, KiwiRail will remove its existing designation and rail infrastructure in that location to enable the Expressway to be developed.

1.7.3 Consents under the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health

Any approvals required under the NESCS from KCDC are not sought at this time as the NZTA does not own all the land on which detailed investigations may be required. Any consents necessary under the NESCS and any associated regional consents will be sought closer to construction, when greater certainty can be provided in relation to the effects and mitigation required in relation to contaminated land and the NESCS. Irrespective, however, a preliminary assessment of land contamination has been undertaken and is discussed in Chapter 23.

Chapter 2
Part A
VOLUME 2

Background to the Project

Overview

The Expressway route, between Te Kowhai Road in the south and Taylors Road in the north, is the culmination of extensive historical research and more recent investigations into an alternative route to SH1 through this area.

The Project is a key component of a number of national, regional and local transport strategies, policies and plans and forms part of the Wellington Northern Corridor RoNS.

2 Background to the Project

2.1 Introduction

This chapter provides the following background to the Project:

- History of the Project (Section 2.2);
- Context of the Project (Section 2.3);
- Need for the Project (Section 2.4);
- Benefits of the Project (Section 2.5);
- Project Objectives (Section 2.6); and
- Property Acquisition (Section 2.7).

2.2 History of the Project

The Expressway has arisen from decades of consideration as to the best way for the Kāpiti district to deal with growth and provide a safe and efficient route through the district, leading both south to Wellington and north to Levin and beyond. Over time alternatives to the existing SH1 have been referred to variously as a motorway, expressway and arterial road. At the outset of the current project phase in 2010, a detailed review of previous route alternatives was undertaken. A brief summary of this history is outlined below.

2.2.1 Early Plans for a Motorway

Plans for a motorway through the Kāpiti district began as early as 1956, when the Governor-General issued a mid-line proclamation for a "proposed motorway" between Paekakariki and Ōtaki (as part of the Wellington to Foxton Motorway). This route traversed coastal duneland from south of Paraparaumu to north of Levin and was previously referred to as the "Sandhills Route". However, in the late 1980s the mid-line proclamation from Peka Peka northwards was uplifted within the Kāpiti district.

2.2.2 SH1 Studies Undertaken

As the only south to north route available through the Kāpiti district, SH1 carries all national, regional and local through traffic movements. Given predicted population growth in the district, as well as the general national increase in vehicle and trip numbers, traffic congestion, delays and accidents are expected to worsen. This scenario has been known for many years and there have been multiple studies undertaken to investigate efficient upgrades/alternatives to the existing State highway network throughout the area, including those summarised below.

In 1998, Transit NZ (the predecessor to the NZTA) commissioned Meritec to determine the most appropriate route and development options for SH1 between Himatangi (north of Foxton) and Waikanae. The two key options that were identified and considered were coastal and central routes, the central following the existing transport corridor along SH1. The Strategic Study report was completed in January 2000 and recommended a four-lane

highway utilising the existing transport corridor between Levin and Waikanae. The study also recommended that the proposed strategy was publicised and presented to KCDC, Horowhenua District Council, community boards and other interested parties before confirmation of the strategy.

In 2001 Meritec were commissioned to complete a Scheme Assessment Report (SAR) for the section between Ōtaki and Peka Peka Road. The report was presented as two parts comprising the Ōtaki Bypass and the Te Horo Expressway. Six route options and combinations of sub-options were assessed and presented in the SAR in relation to the central route, including detail around each of the options and their respective merits.

In 2003, following public consultation and further investigation into an alternative western route for the Kāpiti Expressway, referred to as the Te Waka Road route, the Transit NZ Board approved a preferred central route following eastern side of SH1 for both the Ōtaki bypass and the Te Horo Expressway. Transit NZ's Board chose not to designate the route at that time due to the likelihood that this section would not be constructed for some 15 years.

In 2005 Transit NZ, together with the GWRC, commissioned a Western Corridor Study, the purpose of which was to investigate the principal options for all transport modes in the Region's western transport corridor (Ngauranga to Ōtaki). The study confirmed the need to develop a four-lane alignment for SH1 from MacKays Crossing to north of Ōtaki as part of a series of multi-modal transportation improvements along this corridor. Following this, Transit NZ commissioned the State Highway 1 Kāpiti Strategic Study (undertaken by Opus) in 2007, which developed and assessed several options for upgrading SH1 within the Kāpiti district, including four-laning.

Between July 2008 and August 2009, the Study revisited the alignment approved by the Transit NZ Board in 2003 as part of a Strategic Study of the Kāpiti Coast. The importance of having a safe and efficient State highway corridor through the Kāpiti district was confirmed in both of the following the studies undertaken:

- Kāpiti Scoping Report by Opus, July 2008; and
- Kāpiti Technical Report by Opus, August 2009.

The 2009 report endorsed the alignment recommended in the 2003 SAR, and recommended further modifications. Modifications were made to remove the proposed interchange at Te Horo to limit growth pressures and to alter the on/off ramps around Ōtaki to improve access. Public engagement for this section was combined with the consultation on options for the M2PP section, and in December 2009 the NZTA Board restated a preference for the central route that follows the existing transport corridor, subject to further design refinements being undertaken.

The above studies highlighted that the current configuration of SH1 through the Kāpiti district gives rise to a number of significant issues, including:

- Safety concerns;
- Congestion and journey time reliability problems; and
- The need to create more efficient journeys for both local and State highway traffic.

2.2.3 Roads of National Significance

On 1 July 2012, the updated Government Policy Statement on Land Transport Funding (GPS) prepared under the LTMA came into force, replacing the GPS 2009. The GPS seeks to progress the seven roads of national significance, including the Wellington Northern Corridor RoNS. The NZTA is upgrading the Wellington Northern Corridor in geographic sections, with one of these covering the area between Peka Peka and North Ōtaki.

2.2.4 The Expressway Route

The classification of the Expressway as a RoNS highlights its importance not only at a regional scale, but also at a national scale. The main features of the Expressway are summarised below:

- The Expressway is to generally follow the existing transport corridor and follow the western side of the NIMT from Te Kowhai Road to Mary Crest, cross over the railway south of Te Horo and follow the eastern side of the NIMT through to Ōtaki.
- The Expressway includes four lanes from the northern extent of the Peka Peka interchange ramps (proposed to be developed as part of the M2PP Project), through to an interface with the existing SH1 near Taylors Road, a distance of approximately 13km.
- Half-interchanges (with a local road bridge at Ōtaki Gorge Road) will be provided north and south of Ōtaki, together with further local road bridge connections at Rahui Road and Te Horo.
- A new section of local arterial road will be constructed south of Mary Crest (as the Expressway alignment will sit on the existing SH1).
- The Project scope allows for removal of the passing lanes on the existing SH1 near Taylors Road, together with tie-in works to the Expressway.

2.3 Context of the Project

2.3.1 Strategic Context

The GPS highlights that the Wellington Northern Corridor RoNS is one of seven of New Zealand's most essential routes which require significant development to reduce congestion, improve safety and support economic growth.

The Wellington Northern Corridor RoNS is approximately 110km in length and extends from the Wellington International Airport to Levin. Figure 1-1 in Chapter 1 of this AEE report shows the Kāpiti Expressway section of the Wellington Northern Corridor RoNS.

The objectives that the NZTA has for the Wellington Northern Corridor RoNS are:

- To enhance inter-regional and national economic growth and productivity;
- To improve access to Wellington's CBD, key industrial and employment centres, port, airport and hospital;
- To provide relief from severe congestion on the State highway and local road networks;
- To improve the journey time reliability of travel on the section of SH1 between the Wellington International Airport and Levin; and
- To improve the safety of travel on State highways.

Implementation of the Wellington Northern Corridor RoNS programme will be ongoing, with sections of the route being developed at different stages. The Project is part of a bigger roading package that will deliver on the above objectives, i.e. the benefits are dependent on all of the projects being completed.

2.3.2 National Context

At a national level, the Project fits within a number of strategic initiatives including:

- The GPS;
- The National Infrastructure Plan 2011 (NIP); and
- The NZ Transport Strategy 2008 (NZTS).

The GPS contains guidance for the NZTA on what the Crown wishes to achieve from the allocation of funding from the National Land Transport Fund (NLTF) towards activities in the land transport sector. It covers the financial period to 2021/22. The GPS states that the short to medium term impacts expected to be achieved through the use of the NLTF are:

- *Improvements in the provision of infrastructure and services that enhance transport efficiency and lower the cost of transportation through:*
  - *improvements in journey time reliability*
  - *easing of severe congestion*
  - *more efficient freight supply chains*
  - *better use of existing transport capacity.*
- *Better access to markets, employment and areas that contribute to economic growth.*
- *Reductions in deaths and serious injuries as a result of road crashes.*
- *More transport choices, particularly for those with limited access to a car.*
- *A secure and resilient transport network.*
- *Reductions in adverse environmental effects from land transport.*
- *Contributions to positive health outcomes.*

The GPS is also complemented by the NIP, the second version of which was released in June 2011. The NIP outlines the Government's intentions for infrastructure development over a 20-year timeframe. The NIP is discussed further at chapter 34, Volume 2 of this AEE report.

The Project also sits within the context of the NZTS, which was developed in 2002 and updated in 2008. This Strategy applies to both road and rail, and its vision is that by 2040:

> *People and freight in New Zealand have access to an affordable, integrated, safe, responsive and sustainable transport system.*

The objectives of the NZTS are:

- *ensuring environmental sustainability;*
- *assisting economic development;*
- *assisting safety and personal security;*
- *improving access and mobility; and*
- *protecting and promoting public health.*

2.3.3 Regional Context

The Project is proposed within the context of a number of inter-related strategic regional transport initiatives, including the:

- Wellington RLTS 2010–2040;
- Western Corridor Plan 2006 (WCP);
- Wellington Regional Strategy 2007 (WRS); and
- Wellington Regional Land Transport Programme 2009-2012 (WRLTP).

2.3.4 The Wellington Regional Land Transport Strategy 2010-2040

The Wellington Regional Land Transport Strategy 2010-2040 is discussed in chapter 34, Volume 2 of this AEE report.

2.3.5 The Western Corridor Plan 2006

The WCP was adopted by GWRC in April 2006. Although the WCP outlines plans from "Ōtaki to Ngauranga Merge" its focus is on the Transmission Gully Motorway and the WLR. There is limited discussion on the Project section of the Kāpiti Expressway. Since the adoption of the WCP in 2006, the shape of many of the projects involved in the Wellington Northern Corridor RoNS have changed by varying degrees. Given the limited discussion on the Project within the WCP, the applicability of the WCP to the Project is minimal, other than in relation to the high level objectives identified.

2.3.6 The Wellington Regional Strategy 2007

The WRS is discussed in Chapter 33.8.13 of this AEE report.

2.3.7 The Wellington Regional Land Transport Programme 2012-2015

The WRLTP is a three year programme that contains all the land transport activities to be undertaken throughout the region for the three years between 2012 and 2015, as well as indicative activities over the following three financial years, plus a ten-year financial forecast.

As well as maintaining the current transport network, these activities include:

- New public transport infrastructure and services;
- Improved local roads and State highways;
- Walking and cycling projects; and
- Road safety improvements and programmes.

The priorities in the WRLTP respond to the key outcomes sought by the WRLTS and are consistent with the outcomes sought by the GPS. The Expressway is specifically identified in the WRLTP as a significant project.

The WRLTP is further discussed in Chapter 33.8.16 of this AEE report.

2.4 Need for the Project

The importance of improvement of the State highway network throughout the Kāpiti district has been identified by a number of studies. The SH1 network faces a number of transportation issues throughout the district. These include:

- Traffic characteristics;
- Safety;
- Population increases;
- Access, congestion and reliability;
- Route security;
- Freight movement; and
- Amenity and social effects, including effects on walking and cycling.

The focus of the State highway network is on moving people and freight between and within the main centres of New Zealand as safely and efficiently as possible. The local network and community objectives and needs are also important in considering the need for the Project given the dual function that SH1 currently provides. The Project therefore seeks to achieve an integrated network that also facilitates local trips and modal choice, while recognising that the transformation of current SH1 to a local road is the subject of a separate statutory process.

2.4.1 Traffic Characteristics

Key problems with the existing SH1 through the Project area are safety and the severe congestion caused at peak periods, especially at weekends and over public holidays, in particular through Ōtaki. Whilst journey times at other periods are within generally acceptable limits for the speed environment, the route experiences a reduction of levels of service when traffic volumes are high. The congestion at peak times has not allowed efficient access to local roads in the Kāpiti district as an effective, parallel local road network does not exist.

The Project provides an opportunity for traffic congestion relief to improve journey times and the separation of regional and local traffic by providing an effective alternative route.

2.4.2 Safety

The current form of SH1 throughout the Project area is sub-standard in part because it caters for local road and through traffic functions. This creates friction along the highway, slowing traffic flow and increasing the risk of crashes occurring. The existing SH1 has seen a high number of crashes due to the lack of traffic separation and the number of local access points onto the highway.

There were 11 serious and one fatal crashes, 12 in total, on the existing SH1 along the Project area between 1 July 2007 and 30 June 2012. The majority of these are mid-block rather than intersection related. Mid-block accidents include head-on collisions as well as those arising from turning manoeuvres. The fatal crash occurred in the 100km/h section of SH1. The highest concentration of crashes has occurred in the 50kmh zone through Ōtaki, although these have generally been non-injury and low speed as would be expected in a developed area.

Arterial roads that are not separated by a median have a history of accidents occurring, especially where the high traffic volumes using the road means that getting on and off the State highway can be dangerous. The existing SH1 from Peka Peka to North Ōtaki is assessed as medium/medium-high risk under the New Zealand Road Assessment Programme "KiwiRAP". The Expressway provides the opportunity to reduce community severance and improve safety through the provision of safe grade separated connections through which local and regional traffic are divided and traffic (including significant through traffic) in urban areas is reduced. All of these aspects are expected to result in significantly improved safety outcomes.

The NIMT / Expressway alignment will improve rail/road safety with the removal of five of the eight level crossings within the Project area.

2.4.3 Population Growth along the Kāpiti Coast

The population of the Wellington region is expected to increase by approximately 65,000 people over the next 20 years, with a key growth area being the Kāpiti district. The Expressway is needed to provide capacity to meet the growing needs that will be placed on the Wellington Northern Corridor.

The Kāpiti district is experiencing high growth and is one of the fastest growing districts in the Wellington Region and lower North Island. In just five years the population grew nearly 10%, from approximately 46,200 at the 2006 census, to an estimated 49,400 at 30 June 2010.

There are areas of planned development in Ōtaki which, if progressed, would place even greater demand on the use of SH1 as a commuter route. One of these areas is the North Ōtaki Future Urban Development Zone identified in the recently notified proposed KCDP. There is also increasing intensification of rural activity, particularly the horticulture and viticulture industries. The effect of the Project on future activities that are yet to go

through the required statutory processes is considered to the extent known and practicable, and is discussed throughout this AEE report.

2.4.4 Greater Ōtaki Vision

The GOV document is an output of the KCDC Long Term Council Community Plan (LTCCP), also known as 'Choosing Futures'.

The GOV seeks to focus / manage future population and employment growth within the existing Ōtaki urban area in a way that:

- Takes a sustainable development approach;
- Respects the character of the town;
- Consolidates development within existing zoned residential areas;
- Makes efficient use of town services;
- Encourages sustainability through grey water and rain water systems, and pollution minimisation; and
- Clearly creates work opportunities for the community.

The GOV proposes that there is no new urban development at Te Horo Beach and the previously proposed Te Horo future urban growth area is removed. A focus on urban development in Ōtaki is preferred instead. Appropriate consideration of interchange locations for the Project was important in recognising these goals.

2.4.5 Access, Congestion and Reliability

The SH1 network through the Kāpiti district is a key transportation link to and from Wellington City. During peak periods, it is for a large part operating beyond its design capacity. Journey times at other times are within generally acceptable limits. SH1 provides for both local and through traffic and includes uses for commuting, business and recreational purposes. The combined servicing of both local and through traffic further exacerbates congestion issues.

As population levels in the Kāpiti district increase, there will be increased pressure placed on the SH1 network to cater for traffic with different purposes. Local traffic on the SH1 network will increase, placing further stress on the network and increasing existing congestion effects. At present there is already unreliability in travel time throughout the area, which is particularly evident during peak times such as weekends and public holidays.

The lack of a parallel local road to SH1 in the current roading network between Peka Peka and Ōtaki also effects reliability. Any obstruction to the traffic flows on SH1 affects both local and through traffic, as well as emergency vehicles and civil defence. There is also no alternative road network crossing of the Ōtaki River.

The Expressway, with a speed limit of 100kmph and with limited side access, will increase reliability in journey times and minimise congestion, particularly in Ōtaki. This in turn will improve local accessibility for communities using the local road network.

2.4.6 Route Security

In the event of a serious accident or emergency on SH1, there are limited alternative routes that can be utilised. The existing Ōtaki River Bridge is the only public road bridge across the Ōtaki River. A serious earthquake or flood, resulting in the Ōtaki River Bridge being unusable, would close access along SH1. The detour length for vehicles is significant, as motorists would have to travel via SH2 through the Wairarapa. This would add 65km to a journey between Wellington and Palmerston North. The proposed Expressway will improve the route security and resilience.

2.4.7 Freight Implications

One of the goals of the NZTS is environmental sustainability, which supports increases in the proportion of freight moved by both shipping and rail. However, even with increased use of those modes, it is expected that road-based freight movement will grow significantly in the coming years, both as through traffic and within the Kāpiti district.

The Expressway will assist in achieving reliability relating to both freight operating costs and time of freight in transit throughout the region. Speed limits in place in both Ōtaki and Te Horo are limitations on the efficiency of travel times, particularly during peak times. This is of particular relevance and importance for the freight industry, as the operating cost for trucks increases with any stoppage or breaking / accelerating.

The NIMT realignment will also result in freight movement improvements, in terms of removing some level crossings and easing a bend in the NIMT.

2.4.8 Amenity and Social Effects (Including Walking and Cycling)

SH1 has competing demands due to its dual function, catering for both local road and State highway movements. SH1 is the main highway link between Wellington and Auckland, and therefore carries a high volume of through traffic and many trucks. However, within the Project area it is also the only link connecting each of the local communities and plays an important role providing local access.

Within the Ōtaki Railway Retail area there are a variety of shops and cafes located along SH1 with on-street parking and pedestrian crossing facilities. The high turnover rate of the on-street parking, turning movements (to/from intersections and accesses), and high pedestrian crossing demand, results in significant delays to through traffic. The high volume of through traffic and trucks in particular also results in poor amenity for pedestrians and people shopping in the Ōtaki Railway Retail area.

Between Peka Peka and Ōtaki very few facilities for non-motorised users (pedestrians and cyclists) are currently provided along SH1. The lack of facilities, combined with truck and traffic volumes and high vehicle speeds, makes travelling along the existing SH1 undesirable for most non-motorised road users. Additionally, the distances between most destinations are too great for walking or cycling to be a viable mode of transport for many people. However, serious road cyclists are observed riding along SH1, particularly on weekends.

2.5 Benefits of the Project

2.5.1 Project Benefits

The completion of the Project will assist in both regional and national economic growth and have a number of other key benefits, including those set out below.

- The Project will achieve significant safety improvements for users of transport networks, through:
  - the separation of local traffic from State highway traffic travelling through the Kāpiti district;
  - improved road standards, due to the geometric design of the Expressway (including continuous median separation of north- and south-bound traffic); and
  - an enhanced traffic environment on the local road network (which will include the current SH1), with benefits for motorists, cyclists, and rail users due to:
    - fewer vehicles using the current SH1;

    - the provision of grade-separated local road connections (i.e. bridges) across the Expressway and NIMT; and
    - the removal of five of the eight level crossings of the NIMT in the Project area.
- The Project will promote economic development, including through:
    - improvements in efficiency for freight movements and reduced travel times;
    - the reduction of traffic through the Ōtaki Railway Retail area, improving the amenity values[13] of that area as a social, employment, retail, and transport centre; and
    - increased economic activity and employment opportunities during the Project's four-year construction period.
- The Project will enhance connections between communities in the Kāpiti district, through:
    - the provision of the Expressway as an alternative route; and
    - the continued availability of the existing SH1 as part of the local road network, with a safer, improved transport environment (as discussed above).
- The Project will result in reduced and more reliable travel times along key routes, and reduced traffic congestion.
- As part of the Wellington Northern Corridor RoNS, the Project will improve access to Wellington's key facilities such as the port, international airport, hospital, and central business district.
- The Project is "lead infrastructure", in that it will meet the future needs of a growing population, as well as foster economic growth in the ways summarised above.
- The Project will improve route security and resilience of the road network in the event of a significant earthquake, road accidents, or other disruption, by providing a high-quality alternative route between Peka Peka and Ōtaki (including two bridges providing alternative crossings of the Ōtaki River).
- The Project has a high degree of alignment with key strategic planning instruments for the Kāpiti district, including the GOV.

2.6 Project Objectives

2.6.1 NZTA Project Objectives

How the Expressway fits within the overall Wellington Northern Corridor RoNS objectives is shown in Table 2-1 below.

[13] "Amenity values" are those natural and physical qualities and characteristics of an area that contribute to people's appreciation of its pleasantness, aesthetic coherence, and cultural and recreational attributes.

Table 2-1: The Objectives of the Wellington Northern Corridor RoNS and the link to the Project

GPS	Wellington Northern RoNS	Peka Peka to Ōtaki
Support economic growth	To enhance inter-regional and national economic growth and productivity. To improve access to Wellington's CBD, key industrial and employment centres, port, airport and hospital.	By: Providing a significantly improved transport link as an integral part of the Levin to Wellington Airport RoNS. By: Achieving a state highway to expressway standards that connects with the Mackays to Peka Peka and Ōtaki to Levin sections of the Levin to Wellington Airport RoNS; and Efficiently serving the Ōtaki township, its future development and the wider Ōtaki area.
Reduce congestion	To provide relief from severe congestion on the state highway and local road networks. To improve the journey time reliability of travel on the section of SH1 between Levin and the Wellington airport.	By: Aligning traffic types and movements with the most appropriate route by separating through traffic from local traffic.
Improve safety	To improve the safety of travel on state highways.	By: Separating regional and local traffic, limiting access to the expressway and providing local grade separated access across the expressway at Te Horo.

The overall Project objectives for NZTA can be summarised as follows:

> *To provide a modern 4-lane expressway that will support economic development by providing a strategic arterial route to improve trip reliability and efficiency through the Wellington region. The Project will provide legible connections to Ōtaki township, and provide for community connections across the corridor. The expressway is to be integrated with the Greater Ōtaki Vision, and opportunities to enhance urban and landscape outcomes are to be explored.*

The Project-specific objectives for the NZTA components of the Project are:

- To:
  - Enhance inter-regional and national economic growth and productivity;
  - Enhance efficiency and journey time reliability from, to and through the Kāpiti district, Wellington's CBD, key industrial and employment centres, the port, airport and hospital;
  - Enhance safety of travel on SH1; and
  - Appropriately balance the competing functional performance requirements of inter-regional and local traffic movements, and to facilitate others to provide modal choice opportunities, to enable local facilities and amenities in the Kāpiti district to be efficiently accessed;

  by developing and constructing a cost-efficient new State highway to expressway standards between Peka Peka and north of Ōtaki.
- To manage the immediate and long-term social, cultural, land use and other environmental effects of the Project on the Kāpiti district and its communities by, so far as reasonably practicable, avoiding, remedying or mitigating any adverse effects through route and alignment selection, expressway design and conditions.
- To integrate the Expressway into the form of Kāpiti district by taking into account current and planned future land use and development in route and alignment selection, expressway design and conditions.
- To work with NZ Railways Corporation/KiwiRail to achieve an integrated design for both the Expressway and the realigned NIMT.
- To efficiently serve Ōtaki and its future development by providing appropriate vehicle access and signage to and from the Expressway.

2.6.2 KiwiRail Project objectives

The Project objectives are part of KiwiRail's overall direction to operate, maintain, renew and upgrade the rail network, while improving safety on the network and contributing to sustainability through providing an alternative to road transport.

The broader context in which KiwiRail operates is outlined in two key cascading documents. These are the NZTS and the National Rail Strategy 2002-2015 (NRS).

The NZTS sets out the following strategic goals for roads and rail, and identifies targets to achieve them:

- Ensuring environmental sustainability;
- Assisting economic development;
- Assisting safety and personal security;
- Improving access and mobility; and
- Protecting and promoting public health.

KiwiRail's particular objectives for the Project are to:

- Support NZTA's objectives, as stated above, and facilitate the development of the Expressway;
- Continue to establish and maintain safe and efficient rail passenger transport services within the region by providing a functional and connected rail network infrastructure and services;
- Encourage economic development and provide for the development of safe public transport services;
- Allow for stations that are easily accessible and serve the needs for existing and future communities;
- Future proof for potential double tracking and other rail network improvements in the future; and
- Achieve a connected and integrated transport network.

2.7 Property Acquisition

2.7.1 Overview

The properties directly affected by the Project fall into two broad categories:

- Property to be acquired in whole or in part for the Project; and
- Property with an easement or other property right in its favour (including rights-of-way and water rights) that is directly affected by the Project.

The directly affected properties include land owned by the Crown (including Crown land managed by KiwiRail, NZTA, the Office of Treaty Settlements, and Land Information New Zealand (LINZ)), GWRC and KCDC land (including road reserves), as well as privately owned land comprising rural, rural-residential, urban residential and industrial or business landholdings.

Property acquisition is required along the Expressway and realigned NIMT, and also for land required for local road access and linkages. Of the 122 properties required to be either fully or partly purchased for the Project, 25 properties have already been acquired by the Crown.

2.7.2 Public Works Act processes

Land Acquisition

The Crown has the ability to acquire land, either in its entirety or in part, under the Public Works Act 1981 (PWA).

Temporary Land Occupation

Temporary occupation of a number of properties will be required for the construction of the Project, but those properties are unlikely to be purchased as they are not required for the operation of the Expressway in the long term. Construction activities that will require the temporary occupation of land include:

- Construction yards, for storage of heavy machinery and equipment, and Project offices;
- Lay down areas (such as storage areas for pre-cast concrete);
- Fill sites;
- Temporary road diversions; and
- Construction vehicle access tracks, through areas where ground conditions are unfavourable.

The PWA process allows for the temporary occupation of land to carry out construction activities. Through this process, arrangements can be made so that the owners are not unduly disadvantaged by, and are compensated for, the use of their land.

Properties that will be occupied for construction activities are to be designated for roading purposes (should the relevant NoR be confirmed). Once construction of the Project has been completed, the NZTA and KiwiRail will review the designation footprint and uplift the designations from areas of land not required for the operation of the Project.

Access, Easements and other Property Rights

A number of private properties have existing property rights in their favour, such as right-of-ways, water supply arrangements and other easements, which will be potentially affected by the Project. Agents for the Crown have met with property owners and discussed alternatives to the current situation. Some of the methods proposed to address affected property rights include the following:

- Where there is available balance land around the Expressway, the provision of service lanes and realigned private driveways has been considered, in conjunction with KCDC, in order to maintain the local road network (including any new or realigned access roads that will become local roads);
- Where legal frontage onto a public road is severed, methods have been investigated to provide a future road frontage or alternative access;
- Where property access has been severed and a workable solution cannot be found, full acquisition of the property has been considered (for example, where sole right-of-way access has been severed and the property becomes 'landlocked'); and
- Potential effects on groundwater will be monitored, and alternative water supplies will be provided for all those with lawfully established water rights that are affected. The Arcus Road irrigation scheme supply pipeline crosses the Expressway and will be maintained.

Chapter 3
Part B
VOLUME 2

Statutory Approvals Sought under the Resource Management Act 1991

Overview

This chapter outlines the requirements for obtaining the RMA statutory approvals for the Project and assessing the Project as a proposal of national significance. The NoRs and resource consents required for the Project have been lodged with the EPA.

3 Statutory Approvals Sought under the RMA

3.1 Introduction

The RMA outlines a number of relevant considerations for the determination of NoRs and applications for resource consent. NoRs have been put forward by both the NZTA and KiwiRail for their respective aspects of the Project seeking designations in the KCDP.

In this chapter the key statutory matters under the RMA and their relevance to the Project are set out. The focus is on:

- The purpose and principles of the RMA (Part 2);
- Proposals of national significance (Part 6AA);
- Notices of requirement for designations, outline plans, and review of designation (Part 8); and
- Applications for resource consent (Part 6).

This section only seeks to set out the statutory matters. The assessment of the Project in relation to these matters is provided in Part I of this AEE report. This chapter also details the NoRs for designations, and the applications for resource consent, sought for the Project.

3.2 Purpose and Principles of the RMA

The consideration of the environmental effects of the Project is subject to Part 2 of the RMA (Purpose and Principles), which is made up of sections 5 to 8.

Section 5 states that:

> *(1) The purpose of this Act is to promote the sustainable management of natural and physical resources.*
>
> *(2) In this Act, sustainable management means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while-*
>
> *(a) sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
>
> *(b) safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and*
>
> *(c) avoiding, remedying, or mitigating any adverse effects of activities on the environment.*

Matters of national importance are set out in section 6. Of particular relevance to the Project are the matters in section 6(a), (b), (c), (d), (e), and (f).

Section 6 states that:

> *In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall recognise and provide for the following matters of national importance:*
>
> *(a) the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development:*
>
> *(b) the protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development:*
>
> *(c) the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna:*
>
> *(d) the maintenance and enhancement of public access to and along the coastal marine area, lakes, and rivers:*
>
> *(e) the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga:*
>
> *(f) the protection of historic heritage from inappropriate subdivision, use, and development:*
>
> *(g) the protection of recognised customary activities.*

'Other matters' to which particular regard shall be given are set out in section 7. Of particular relevance to the Project are the matters in section 7(a), (aa), (b), (c), (d), (f), and (i).

Section 7 states that:

> *In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall have particular regard to -*
>
> *(a) kaitiakitanga;*
>
> *(aa) the ethic of stewardship;*
>
> *(b) the efficient use and development of natural and physical resources;*
>
> *(ba) the efficiency of the end use of energy;*
>
> *(c) the maintenance and enhancement of amenity values;*
>
> *(d) intrinsic values of ecosystems;*
>
> *(e) [Repealed]*
>
> *(f) maintenance and enhancement of the quality of the environment;*
>
> *(g) any finite characteristics of natural and physical resources;*
>
> *(h) the protection of the habitat of trout and salmon;*
>
> *(i) the effects of climate change;*
>
> *(j) the benefits to be derived from the use and development of renewable energy.*

Section 8 directs that:

> *In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi).*

3.3 Proposals of National Significance

Part 6AA of the RMA provides for the consideration of matters which, singularly or collectively, constitute a proposal of national significance. Section 145 allows certain matters to be lodged directly with the EPA. These include:

- An application for a resource consent (s145(1)(a)); and
- A notice of requirement for a designation or to alter a designation (s145(3)).

As has been outlined in Part A, Chapter 1 of the AEE report, the NZTA and KiwiRail are lodging NoRs and the NZTA is lodging applications for resource consent with the EPA in respect of the Project, in accordance with section 145.

Where the matter lodged with the EPA is a resource consent application, section 145(5) directs that:

> *… section 88 applies, except that -*
>
> *(a) every reference in that section to a consent authority must be read as a reference to the EPA; and*
>
> *(b) the applicant has no right of objection under section 88(5) if the EPA determines that the application is incomplete under section 88(3).*

Where the matter lodged with the EPA is a notice of requirement for a new designation, section 145(7) directs that:

> *… section 168 applies, except that every reference in that section to a territorial authority must be read as a reference to the EPA.*

Concurrent with the lodgement of the NZTA and KiwiRail NoRs and the consent applications with the EPA, the NoRs and consent applications have also been served on KCDC, and provided to GWRC, in accordance with section 145(10) of the RMA.

Where a matter is lodged with the EPA under section 145 of the RMA, the EPA must make a recommendation to the Minister in accordance with section 146. The Minister then makes a direction on how the matter will be heard.

Under section 147(1) the Minister has three options to choose from after receiving the EPA recommendation:

> *(a) refer the matter to a board of inquiry for decision; or*
>
> *(b) refer the matter to the Environment Court for decision; or*
>
> *(c) refer the matter to the local authority.*

Under section 147(6) the Minister may make a direction that differs from the direction recommended by the EPA.

Section 147(2) directs that:

> *The Minister may make a direction under subsection (1)(a) or (b) only if he or she considers that the matter is or is part of a proposal of national significance.*

In accordance with section 147(3), in making a direction the Minister is to apply section 142(3), which provides guidance in determining whether a matter is, or is part of, a proposal of national significance. This section provides a non-exclusive list of the matters to which the Minister may have regard when coming to a decision. These include whether the matter:

> *(a) has aroused widespread public concern or interest regarding its actual or likely effect on the environment (including the global environment); or*
>
> *(b) involves or is likely to involve significant use of natural and physical resources; or*

(c) affects or is likely to affect a structure, feature, place, or area of national significance; or

(d) affects or is likely to affect or is relevant to New Zealand's international obligations to the global environment; or

(e) results or is likely to result in or contribute to significant or irreversible changes to the environment (including the global environment); or

(f) involves or is likely to involve technology, processes, or methods that are new to New Zealand and that may affect its environment; or

(g) is or is likely to be significant in terms of section 8; or

(h) will assist the Crown in fulfilling its public health, welfare, security, or safety obligations or functions; or

(i) affects or is likely to affect more than 1 region or district; or

(j) relates to a network utility operation that extends or is proposed to extend to more than 1 district or region.

In addition to the requirements of section 142(3), section 147(4) states that in deciding whether a proposal is a matter of national significance, the Minister must have regard to:

(a) the views of the applicant and the local authority; and

(b) the capacity of the local authority to process the matter; and

(c) the recommendations of the EPA.

As discussed in Part A, Chapter 1 of this AEE report, the NZTA and KiwiRail consider that the NoRs and resource consent applications for this Project should be determined by a BoI, as the Project fulfils the criteria for a proposal of national significance. These reasons are set out in a letter to the EPA.

If the Minister makes a direction that the Project is a matter of national significance to be considered by a BoI, the process set out in sections 149A to 149L, 149P to 149S and 149V must be followed. In addition, the BoI must release its final decision on the matter within nine months of the Minister's direction being publicly notified by the EPA (section 149R(2)).

If the matters are referred to a BoI, in considering those matters the BoI must have regard to the Minister's reasons for making the direction and consider any information provided to it by the EPA.

The EPA is required to provide the BoI reports prepared by relevant local authorities on the key issues in relation to the matters. Under section 149G(3), those reports would need to include:

(a) any relevant provisions of a national policy statement, a New Zealand coastal policy statement, a regional policy statement or proposed regional policy statement, and a plan or proposed plan; and

(b) a statement on whether all required resource consents in relation to the proposal to which the matter relates have been applied for; and

(c) if applicable, the activity status of all proposed activities in relation to the matter.

Section 149V provides that the decision of a BoI can only be appealed on a question of law.

3.4 Notices of Requirement for Designation

Both NZTA and KiwiRail have requiring authority status and are seeking designations for their relevant aspects of the Project as part of undertaking their legislative functions (as outlined in para 1.1 above). As previously noted, the NZTA is lodging a NoR for the designation of land in the KCDP for the construction, operation and maintenance of the Expressway.

KiwiRail is lodging a NoR for the designation of land in the KCDP for the construction, operation and maintenance of a re-aligned section of the NIMT through Ōtaki.

These notices are being lodged under section 145(3) of the RMA. Section 145(7) directs that where a notice is lodged with the EPA, section 168 applies except that every reference in that section to a territorial authority must be read as a reference to the EPA.

Under section 145(3) when a NoR is lodged with the EPA section 168(2) applies, which stipulates that:

> *A requiring authority for the purposes approved under section 167 may at any time give notice in the prescribed form to a territorial authority [in this case, the EPA] of its requirement for a designation -*
>
> *(a) for a project or work; or*
>
> *(b) in respect of any land, water, subsoil, or airspace where a restriction is reasonably necessary for the safe or efficient functioning or operation of such a project or work.*

The prescribed form for a NoR is set out in Form 18 of the Resource Management (Forms, Fees, and Procedure) Regulations 2003. The NoRs for the Project (contained in Volume 1 of this set of documents) have been prepared in accordance with these regulations.

If the matters are directed to a BoI, the NoRs will be considered under section 149P. Section 149P directs that a BoI considering a notice of requirement:

> *(a) must have regard to the matters set out in section 171(1) and comply with section 171(1A) as if it were a territorial authority; and*
>
> *(b) may -*
>
> *(i) cancel the requirement; or*
>
> *(ii) confirm the requirement; or*
>
> *(iii) confirm the requirement, but modify it or impose conditions on it as the board thinks fit; and*
>
> *(c) may waive the requirement for an outline plan to be submitted under section 176A.*

The BoI must have regard to matters set out in section 171(1A) and 171(1). These provisions state that:

> *(1A) When considering a requirement and any submissions received, a territorial authority must not have regard to trade competition or the effects of trade competition.*
>
> *(1) When considering a requirement and any submissions received, a territorial authority must, subject to Part 2, consider the effects on the environment of allowing the requirement, having particular regard to -*
>
> *(a) any relevant provisions of -*
>
> *(i) a national policy statement:*
>
> *(ii) a New Zealand coastal policy statement:*

(iii) a regional policy statement or proposed regional policy statement:

(iv) a plan or proposed plan; and

(b) whether adequate consideration has been given to alternative sites, routes, or methods of undertaking the work if -

(i) the requiring authority does not have an interest in the land sufficient for undertaking the work; or

(ii) it is likely that the work will have a significant adverse effect on the environment; and

(c) whether the work and designation are reasonably necessary for achieving the objectives of the requiring authority for which the designation is sought; and

(d) any other matter the territorial authority considers reasonably necessary in order to make a recommendation on the requirement.

If the Minister directs the NoRs to be referred to a BoI, the BoI will make the final decisions on the NoRs, rather than the local authority (KCDC in this instance) making recommendations to the requiring authorities.

3.4.1 **Outline Plans**

Section 176A provides that an outline plan must be submitted to a territorial authority before commencing construction of a project or work under a designation unless certain circumstances apply (which are not relevant to the Project). In accordance with section 176A(3):

An outline plan must show -

(a) the height, shape, and bulk of the public work, project, or work; and

(b) the location on the site of the public work, project, or work; and

(c) the likely finished contour of the site; and

(d) the vehicular access, circulation, and the provision for parking; and

(e) the landscaping proposed; and

(f) any other matters to avoid, remedy, or mitigate any adverse effects on the environment.

Upon receiving an outline plan, a territorial authority has 20 working days to request any changes to the outline plan. The requiring authority may accept or reject the requested changes.

Under section 176A(2) the submission of an outline plan is not required if:

(a) the proposed public work, project, or work has been otherwise approved under this Act; or

(b) the details of the proposed public work, project, or work, as referred to in subsection (3), are incorporated into the designation; or

(c) the territorial authority waives the requirement for an outline plan.

The BoI has the ability to waive the requirement for an outline plan under section 149P(4)(c).

In this instance, the NZTA and KiwiRail are not seeking that requirement to be waived. Rather, if the NoRs are approved, the NZTA and KiwiRail will finalise the Project's design and submit outline plans to KCDC prior to the commencement of works onsite, for all

relevant aspects of the Project (in conjunction with addressing various matters via management plans).

3.5 Applications for Resource Consent

Applications by the NZTA for resource consents have been lodged with the EPA under section 145(1)(a) and in accordance with section 88, as provided by section 145(5).

Under section 88(2):

> *An application must -*
>
> *(a) be made in the prescribed form and manner; and*
>
> *(b) include, in accordance with Schedule 4, an assessment of environmental effects in such detail as corresponds with the scale and significance of the effects that the activity may have on the environment.*

Section 145(5) provides that:

> *If the matter is an application for a resource consent, section 88 applies, except that-*
>
> *Every reference in that section to a consent authority must be read as a reference to the EPA; and*
>
> *The applicant has no right of objection under section 88(5) if the EPA determines that the application is incomplete under section 88(3).*

The applications have been prepared in accordance with Form 9 of the Resource Management (Forms, Fees, and Procedure) Regulations 2003.

The matters that should be included in an assessment of effects on the environment are set out in clause 1 of Schedule 4 of the RMA:

> *Subject to the provisions of any policy statement or plan, an assessment of effects on the environment for the purposes of section 88 should include -*
>
> *(a) a description of the proposal:*
>
> *(b) where it is likely that an activity will result in any significant adverse effect on the environment, a description of any possible alternative locations or methods for undertaking the activity:*
>
> *(c) [Repealed]*
>
> *(d) an assessment of the actual or potential effect on the environment of the proposed activity:*
>
> *(e) where the activity includes the use of hazardous substances and installations, an assessment of any risks to the environment which are likely to arise from such use:*
>
> *(f) where the activity includes the discharge of any contaminant, a description of -*
>
> *(i) the nature of the discharge and the sensitivity of the proposed receiving environment to adverse effects; and*
>
> *(ii) any possible alternative methods of discharge, including discharge into any other receiving environment:*
>
> *(g) a description of the mitigation measures (safeguards and contingency plans where relevant) to be undertaken to help prevent or reduce the actual or potential effect:*
>
> *(h) identification of the persons affected by the proposal, the consultation undertaken, if any, and any response to the views of any person consulted:*

(i) where the scale or significance of the activity's effect are such that monitoring is required, a description of how, once the proposal is approved, effects will be monitored and by whom.

Furthermore, clause 1AA of Schedule 4 directs that:

To avoid doubt, clause 1(h) obliges an applicant to report as to the persons identified as being affected by the proposal, but does not -

(a) oblige the applicant to consult with any person; or

(b) create any ground for expecting that the applicant will consult with any person.

Clause 2 of Schedule 4 provides direction on further matters that should be considered when preparing an assessment of effects on the environment:

Subject to the provisions of any policy statement or plan, any person preparing an assessment of the effects on the environment should consider the following matters:

(a) any effect on those in the neighbourhood and, where relevant, the wider community including any socio-economic and cultural effects;

(b) any physical effect on the locality, including any landscape and visual effects:

(c) any effect on ecosystems, including effects on plants or animals and any physical disturbance of habitats in the vicinity;

(d) any effect on natural and physical resources having aesthetic, recreational, scientific, historical, spiritual, or cultural, or other special value for present or future generations;

(e) any discharge of contaminants into the environment, including any unreasonable emission of noise and options for the treatment and disposal of contaminants;

(f) any risk to the neighbourhood, the wider community, or the environment through natural hazards or the use of hazardous substances or hazardous installations.

The AEE process has been undertaken in accordance with Schedule 4 and can be found in Part G, Chapters 11-29 of this AEE report. That assessment also fulfils the requirements of the assessment of effects on the environment required in support of the NoRs.

3.6 Activities Requiring Resource Consents

The Project involves activities which require resource consents under Wellington regional plans and the NESCS. The NZTA is applying for all the Regional resource consents for the construction and operation of the Expressway, and for those required to facilitate the realignment of the NIMT through Ōtaki. There are no resource consents sought in this application by KiwiRail in relation to the Project.

As above at para 1.7.3, consents are not being sought under the NESCS, and any associated regional consents, as the land is not within the NZTA ownership to facilitate access and delays between approval and construction can impact on the validity of assessments undertaken at this time.

The current application seeks all Regional resource consents for the Project (except for those related to contaminated soils). Finalisation of the Project design may identify that other resource consents are required for construction, such as additional culverts. Such activities, if any, will be the subject of future resource consent applications in conjunction with the outline plan approval process, in order to ensure that all necessary approvals are in place to facilitate the Project.

Section 87 of the RMA lists the different types of resource consents, of which the following types of consent are relevant to this Project:

- Land use consent;
- Water permit; and
- Discharge permit.

These are described in further detail below.

3.6.1 **Land Use Consents**

Section 9 imposes the following restrictions of the use of land.

> *No person may use land in a manner that contravenes a national environmental standard unless the use is expressly allowed by a resource consent; or*
>
> *(2) No person may use land in a manner that contravenes a regional rule unless the use -*
>
> *(a) is expressly allowed by a resource consent; or…*

Activities requiring Regional resource consent (land use consent) in relation to the use of land for this Project are:

- Roading and tracking activities, in the form of bulk earthworks;
- Vegetation clearance; and
- The construction of bores.

Section 9(3) also imposes a restriction on the use of land in relation to rules in district plans. Under section 176(1)(a), however *Section 9(3) does not apply to a public work or project or work undertaken by a requiring authority under the designation*, if a designation is included in a Distrct Plan.

Section 13 of the RMA imposes the following restrictions on certain uses of beds of lakes and rivers:

> *(1) No person may, in relation to the bed of any lake or river, -*
>
> *(a) use, erect, reconstruct, place, alter, extend, remove, or demolish any structure or part of any structure in, on, under, or over the bed; or*
>
> *(b) excavate, drill, tunnel, or otherwise disturb the bed; or*
>
> *(c) introduce or plant any plant or any part of any plant (whether exotic or indigenous) in, on, or under the bed; or*
>
> *(d) deposit any substance in, on, or under the bed; or*
>
> *(e) reclaim or drain the bed -*
>
> *unless expressly allowed by a national environmental standard, a rule in a regional plan as well as a rule in a proposed regional plan for the same region (if there is one), or a resource consent.*
>
> *(2) No person may do an activity described in subsection (2A) in a manner that contravenes a national environmental standard or a regional rule unless the activity –*
>
> *(a) is expressly allowed by a resource consent; or…*
>
> *(2A) The activities are –*
>
> *(a) to enter onto or pass across the bed of a lake or river;*
>
> *(b) to damage, destroy, disturb, or remove a plant or a part of a plant, whether exotic or indigenous, in, on, or under the bed of a lake or river;*

(c) to damage, destroy, disturb, or remove the habitats of plants or parts of plants, whether exotic or indigenous, in, on , or under the bed of a lake or river;

(d) to damage, destroy, disturb, or remove the habitats of animals in, on, or under the bed of a lake or river.

Activities requiring Regional resource consent (land use consent) in relation to the use of beds of rivers for this Project are:

- The disturbance of river beds and the bed of a wetland;
- The placement of structures and rip rap in river beds;
- The reclamation of river beds and a wetland;
- Removal of structures (culverts in river beds); and
- Removal of vegetation in river beds and a wetland.

3.6.2 **Water Permits**

Section 14 imposes restrictions in relation to water. Under section 14(2):

No person may take, use, dam, or divert any of the following, unless the taking, using, damming, or diverting is allowed by subsection (3):

(a) water other than open coastal water; or …

Under subsection 14(3):

A person is not prohibited by subsection (2) from taking, using, damming, or diverting any water, heat, or energy if -

(a) the taking, using, damming, or diverting is expressly allowed by a national environmental standard, a rule in a regional plan as well as a rule in a proposed regional plan for the same region (if there is one), or a resource consent; …

Activities forming part of the Project that require Regional resource consent (water permit) in relation to water include:

- Temporary damming and diversion of water during construction works (surface water and groundwater);
- Permanent damming and diversion of water (surface water and groundwater); and
- The take and use of water for construction activities.

3.6.3 **Discharge Permits**

Section 15 of the RMA places restrictions on the discharge of contaminants into the environment. As defined in section 2 "contaminant" includes:

Any substance (including gases, odorous compounds, liquids, solids, and micro-organisms) or energy (excluding noise) or heat, that either by itself or in combination with the same, similar, or other substances, energy, or heat -

(a) when discharged into water, changes or is likely to change the physical, chemical, or biological condition of water; or

(b) when discharged onto or into land or into air, changes or is likely to change the physical, chemical, or biological condition of the land or air onto or into which it is discharged.

Under section 15(1):

No person may discharge any -

(a) contaminant or water into water; or

(b) contaminant onto or into land in circumstances which may result in that contaminant (or any other contaminant emanating as a result of natural processes from that contaminant) entering water; or

(c) contaminant from any industrial or trade premises into air; or

(d) contaminant from any industrial or trade premises onto or into land -

unless the discharge is expressly allowed by a national environmental standard or other regulations, a rule in a regional plan as well as a rule in a proposed regional plan for the same region (if there is one), or a resource consent.

Under section 15(2):

No person may discharge a contaminant into the air, or into or onto land, from a place or any other source, whether moveable or not, in a manner that contravenes a national environmental standard unless the discharge -

(a) is expressly allowed by other regulations; or

(b) is expressly allowed by a resource consent; …

Under section 15(2A):

No person may discharge a contaminant into the air, or into or onto land, from a place or any other source, whether moveable or not, in a manner that contravenes a regional rule unless the discharge -

(a) is expressly allowed by a national environmental standard or other regulations; or

(b) is expressly allowed by a resource consent; or …

Section 105 sets out further matters which are specifically relevant to discharge permits:

(1) If an application is for a discharge permit or coastal permit to do something that would contravene section 15 or section 15B, the consent authority must, in addition to the matters in section 104(1), have regard to -

(a) the nature of the discharge and the sensitivity of the receiving environment to adverse effects; and

(b) the applicant's reasons for the proposed choice; and

(c) any possible alternative methods of discharge, including discharge into any other receiving environment.

Furthermore, under section 107:

(1) Except as provided in subsection (2), a consent authority shall not grant a discharge permit or a coastal permit to do something that would otherwise contravene section 15 or section 15A allowing -

(a) the discharge of a contaminant or water into water; or

(b) a discharge of a contaminant onto or into land in circumstances which may result in that contaminant (or any other contaminant emanating as a result of natural processes from that contaminant) entering water; … if, after reasonable mixing, the contaminant or water discharged (either by itself or in combination with the same, similar, or other contaminants or water), is likely to give rise to all or any of the following effects in the receiving waters:

(c) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials:

(d) any conspicuous change in the colour or visual clarity:

(e) any emission of objectionable odour:

(f) the rendering of freshwater unsuitable for consumption by farm animals:

(g) any significant adverse effects on aquatic life.

(2) A consent authority may grant a discharge permit or a coastal permit to do something that would otherwise contravene section 15 or section 15A that may allow any of the effects described in subsection (1) if it is satisfied -

(a) that exceptional circumstances justify the granting of the permit; or

(b) that the discharge is of a temporary nature; or

(c) that the discharge is associated with necessary maintenance work - and that it is consistent with the purpose of this Act to do so.

Activities forming part of the Project that require Regional resource consent (discharge permit) in relation to the discharge of contaminants include:

- Discharge of sediment and chemical flocculants (during construction) in treated stormwater to water and land where it may enter water; and
- Discharge of treated cement water to water, and to land where it may enter water.

3.7 Classes of Activities

Regional and District Plans set out different classes of activities in accordance with section 87A of the RMA. These classes of activities are:

- Permitted activities;
- Controlled activities;
- Restricted discretionary activities;
- Discretionary activities;
- Non-complying activities; and
- Prohibited activities.

The applications for resource consent for the Project relate to controlled, restricted discretionary, and discretionary activities.

The requirements for the determination of each activity class are set out in sections 104A – 104D as described in the following.

3.7.1 Controlled Activities

Under section 104A:

After considering an application for a resource consent for a controlled activity, a consent authority -

(a) must grant the resource consent, unless it has insufficient information to determine whether or not the activity is a controlled activity; and

(b) may impose conditions on the consent under section 108 only for those matters-

(i) over which control is reserved in national environmental standards or other regulations; or

(ii) over which it has reserved its control in its plan or proposed plan.

3.7.2 Restricted Discretionary Activities

Under section 104C there are particular restrictions for restricted discretionary activities:

(1) When considering an application for a resource consent for a restricted discretionary activity, a consent authority must consider only those matters over which -

(a) a discretion is restricted in national environmental standards or other regulations:

(b) it has restricted the exercise of its discretion in its plan or proposed plan.

(2) The consent authority may grant or refuse the application.

(3) However, if it grants the application, the consent authority may impose conditions under section 108 only for those matters over which -

(a) a discretion is restricted in national environmental standards or other regulations:

(b) it has restricted the exercise of its discretion in its plan or proposed plan.

3.7.3 Discretionary Activities

Under section 104B:

After considering an application for a resource consent for a discretionary activity or non-complying activity, a consent authority -

(a) may grant or refuse the application; and

(b) if it grants the application, may impose conditions under section 108.

3.7.4 Bundling of Activities

The principle of bundling was established by case law under the RMA. According to the "bundling" principle, where there is a group of activities on one site which are closely associated to each other, or are directed towards one dominant use or purpose, they should be assessed holistically as a single bundle, according to the most stringent activity class.

3.8 Resource Consents Sought

The NZTA has also lodged applications for resource consents with the EPA under section 145(1)(a) and in accordance with section 88 of the RMA (as required by section 145(5)). The applications are for regional resource consents under the GWRC regional plans. The approach to consenting has been to group activities on the basis of how they are likely to be undertaken and, consequently, how the potential environmental effects associated with them will be managed.

As such, the NZTA is applying for resource consents as discretionary activities, for the following broad groups of activities:

- Bulk earthworks (associated with the Expressway alignment and the NIMT realignment);
- The discharge of sediment-laden water, and chemically-treated sediment-laden water, from construction;
- Stream crossings (the placement of structures in stream);
- Stream realignment (diversions and reclamations, temporary and permanent); and
- The discharge of cement-laden water.

On this basis, activities have been grouped as set out in Table 3-1. Table 3-1 also lists the forms that the NZTA has completed (in addition to GWRC Form 1). Some forms (such as those relating to culverts and bridges) relate to multiple resource consent applications. The application forms are contained in Volume 1.

The detail of the resource consents sought, in the form of the List of Matters, is contained in Table 3-2.

Conditions are proposed for the approvals sought, as contained in Part H of the AEE report.

The relevant Regional Plans applicable to this Project are:

- The Regional Soil Plan (RSP);
- The Regional Discharges to Land Plan (RDLP); and
- The Regional Freshwater Plan (RFWP).

3.9 Lapse Period

Pursuant to section 125 of the Act, a 15 year lapse period is sought for both the NoR and the Resource consent applications. This will accommodate any uncertainties in funding that may arise. It will also provide the flexibility necessary to ensure that the construction of the Project can efficiently align with the construction of the other stages of the Wellington Northern Corridor (including Transmission Gully and the M2PP Expressway). These stages are all significant construction projects and their development is integrally connected to the Project.

Table 3-1: Groups of Activities for which Consent is being Sought:

Group	General Activity	Application ref #	Relevant form(s)
Resource consents sought by the NZTA for the construction and operation of Project.			
A	Bulk earthworks and construction erosion and sediment control	##	6E (Soil disturbance) 3A (Discharge to land) 4A (Discharge to water) 2A (Damming of water) 2A (Diversion of water) 6B (Bore construction)
B	Crossing, occupation, reclamation and realignment of streams	##	2A (Diversion of water, temporary and permanent) 2A (Damming of water) 3A (Discharge to land) 4A (Discharge to water) 6A (Works in beds of rivers and streams) 6B (Bore construction) 6C (Bridges) 6D (Culverts)
C	Construction of bores and take of groundwater	##	6B (Construct or alter bore) 2C (Take and use groundwater)
D	Reclamation and diversion of wetlands	##	6A (Works in beds of rivers and streams) 6B (Bore construction) 2A (Damming of water) 2A (Diversion of water)

Table 3-2 Resource Consents Sought for the Project:

Application ref #	Consent type	Activity	Regional rule	Activity class	Scope of the application
Group A: Bulk earthworks and construction erosion and sediment control					
1	Land use consent – s9(2)	Roading and tracking activities.	RSP Rules 1 and 4	Restricted Discretionary	Application for bulk earthworks for the formation of the Project.
2	Land use consent – s9(2)	Vegetation clearance and disturbing of soil identified as being erosion prone.	RSP Rules 1 and 4	Restricted Discretionary	Application for vegetation disturbance activities to construct the Project. Application for vegetation clearance over 10,000m^2 in erosion-prone land.
3(a)	Land use consent – s9(2)	Bore construction.	RFWP Rule 15	Discretionary	Application for bores as a result of earthworks that may encounter groundwater.
4	Water permit – s14(2)(a)	Damming and diversion of freshwater.	RFWP Rule 16	Discretionary	Application dam and divert surface water as a result of the embankments and containment bunds.
5	Water permit – s14(2)(a)	Damming and diversion of groundwater.	RFWP Rule 16	Discretionary	Application for the damming and diversion of groundwater as a result of earthworks and from de-watering during earthworks.

Application ref #	Consent type	Activity	Regional rule	Activity class	Scope of the application
6(a)	Discharge permit – s15 (1)(a)	Discharge of sediment-laden (including chemically-treated) water to water.	RFWP Rule 5	Discretionary	Application for the discharge of sediment in treated stormwater (including chemical flocculant) from erosion and sediment control devices to water. Application for the discharge of sediment from de-watering where earthworks may encounter groundwater to water.
6(b)	Discharge permit – s15 (1)(b)	Discharge of sediment-laden (including chemically-treated) water to land that may enter water.	RDLP Rule 2	Discretionary	Application for the discharge of sediment in treated stormwater (including chemical flocculant) from erosion and sediment control devices to land that may enter water. Application for the discharge of sediment in treated stormwater (including chemical flocculant) to land where it may enter water from de-watering where earthworks may encounter groundwater.

The earthworks required as part of the Project includes approximately 800,000m^3 of cut to fill, with 45,000m^3 of fill imported. There is not expected to be any cut to waste as all unsuitable material is to be used in forming the landscaping bunds which occur at specific locations along the length of the Project. There are anticipated to be concentrations of earthworks in some areas, such as in the sand dune area to the north of Ōtaki. In this area the maximum height of the cut is approximately 20m.

While undertaking earthworks it is possible to encounter groundwater. For the construction of this Project, it is anticipated that groundwater will be encountered for a short section south of the Ōtaki River. Groundwater will also be encountered where excavation is undertaken to undercut and remove soft deposits prior to the construction of the embankment. Refer to Technical Report 4 – Geotechnical Report for further details. Where earthworks occur and groundwater is encountered, the GWRC has identified this as technically a bore, irrespective of the earthworks being a cutting and not drilled, and that the purpose is for the construction of the Project and not in relation to geotechnical investigations or water supply/investigations (as is most common when bores are undertaken).

Embankments are proposed along the Project length, and once constructed, these embankments will alter the over-land flows of flood waters, in particular having a damming effect. Consent is required to permit that effect. There will be specific measures constructed, such as containment bunds, along the route where these are required to manage the effects of the altered flood flow patterns.

As large earthworks are proposed along the Project length, consideration of how to manage stormwater and groundwater while the works are being undertaken is required. The Project has conditions requiring the implementation of Erosion Sediment Control Plan (ESCP) measures, with these determined for each site nearer to construction and detailed in the Site Specific Environmental Management Plans (SSEMP). Water will be required to be discharged to either land or water and, without appropriate management, there will be a higher level of sediment in the water than would naturally occur.

Application ref #	Consent type	Activity	Regional Rule	Activity class	Scope of application
Group B: Crossing, occupation and realignment of streams					
Ōtaki River					
3(b)	Land use consent – s9(2)	Construction of boreholes (bores for bridge piles where they intercept groundwater).	RFWP Rule 15	Discretionary	Application for construction of bores for bridge piles.
7	Land use consents – s13(1)(a) & s13(1)(e)	Use, placement and erection of structures (bridges and stormwater outlets), the placement of rip rap, deposition of material, and the	RFWP Rule 49	Discretionary	Application for using, erecting and placing structures in and over the bed of the Ōtaki River. Application for the disturbance and deposition of material on the bed of the Ōtaki River to facilitate

Application ref #	Consent type	Activity	Regional Rule	Activity class	Scope of application
		associated disturbance of a section of the bed of waterways in the Ōtaki River Catchment.			construction of the structures.
8(a)	Land use consents – s13(1)(a) & s13(1)(e)	The reclamation of a section of the bed of waterways in the Ōtaki River Catchment.	RFWP Rule 49	Discretionary	Application for reclamation of an area of river bed to be occupied by piles for the bridges, and the associated rip rap and rock armouring of the embankments.
9(a)	Land use Consent - s13(2A)(b)	Removal of vegetation in the bed of the Ōtaki River, including associated disturbance of the beds.	RFWP Rule 49	Discretionary	Application for vegetation removal in the riverbed including associated disturbance of the bed.
10(a)	Water permit – s14(2)(a)	Diversion of surface water (temporary).	RFWP Rule 16	Discretionary	Application for a temporary diversion of the Ōtaki River to facilitate construction of the bridges in the riverbed.
11(a)	Water Permit – s14(2)(a)	Diversion of surface water (permanent)	RFWP Rules 16 and 49	Discretionary	Application for permanent diversion of the Ōtaki River associated with the area of the bed occupied by the bridge piles.
12	Water permit – s14(2)(a)	Damming and diversion of surface water	RFWP Rules 16 and 49	Discretionary	Application for the damming and diversion of surface water by the Expressway and a new containment bund to the north of the Ōtaki River

Application ref #	Consent type	Activity	Regional Rule	Activity class	Scope of application
					in the event of flooding.
13(a)	Discharge permit – s15 (1)(a)	Discharge of concrete-laden water to water.	RFWP 5	Discretionary	Application for the discharge of concrete-laden water from bridge pile construction to water.
14(a)	Discharge permit – s15 (1)(b)	Discharge of concrete-laden water to land that may enter water.	RDLP Rule 2	Discretionary	Application for the discharge of concrete-laden water from bridge pile construction to land in such a way that it may enter water.

At the Ōtaki River, two parallel bridges proposed to cross the River as part of the Project. These bridges are approximately 332m long, and each one is approximately 11.5m wide. They are to have a gap of approximately 3m between them. Each bridge is to have minimum spans of 30m. There will be 10 sets of piers in the riverbed, with approximately 6 of those located in the wetted channel. During flood events all of all of the piers may be located in the wetted channel.

The bridges will both have concrete piles to support the piers, and installing the piles requires disturbance to the riverbed. This disturbance will be limited in area to where the piles are located and the necessary works to gain access to the area where the piles are to be constructed. A temporary diversion will be installed to ensure that water does not enter the pile area.

Beneath each of the bridge abutments, an approximately 80m long rock rip rap layer will be installed (wrapped around the flanks and face of each abutment).

To the north of the Ōtaki River the existing Chrystall's Bend extended stopbank is located around the outside of the basin containing the concrete factory. This stopbank would overtop in floods larger than a 1 in 100 annual exceedance probability (AEP) flood. Once the stopbank is over topped the natural flood path for these waters is parallel to the Ōtaki River and then back into the Ōtaki River close to the Ōtaki River mouth. The Expressway embankment would run at a right angle to the Ōtaki River and in conjunction with the height of the embankment would create a dam and also divert the waters away from the natural flood path. As such, a new containment bund is to be constructed to contain these flood waters. This is to be approximately 360m long, and at its highest point approximately 1.75m high. The Expressway embankment across the Ōtaki River floodplain on its own will act as a dam in certain flood events, this effect will be exacerbated by the new containment bund. Consent is therefore required for the containment bund and Expressway to dam flood waters in this area.

Stormwater outlet structures will be located on the Otaki River embankments, however exact locations are still to be determined through detailed design.

Application Ref #	Consent type	Activity	Regional rule	Activity class	Scope of the application
Group B: Crossing, occupation and realignment of streams					
Waitohu Stream					
3(c)	Land use consent – s9(2)	Construction of boreholes (bores for bridge piles where they intercept groundwater).	RFWP Rule 15	Discretionary	Application for construction of bores for bridge piles.
15	Land use consents – s13(1)(a) & s13(1)(e)	Use, placement and erection of structures (bridge and stormwater outlets), the placement of rip rap, the associated diversion, disturbance and reclamation of a section of the bed in the Waitohu Stream Catchment.	RFWP Rule 49	Discretionary	Application for using, erecting and placing structures in and over the bed of the Waitohu Stream. Application for the diversion, disturbance and deposition of material on the bed of the Waitohu Stream to facilitate construction of the structures. Application for reclamation of an area of river bed to be occupied by piles for the bridge and the associated rip rap and rock armouring of the embankments.
8(b)	Land use consents – s13(1)(a) &	The reclamation of a section of the bed in the Waitohu Stream	RFWP Rule 49	Discretionary	Application for reclamation of an area of river bed to be occupied by piles for the bridge, and the

Application Ref #	Consent type	Activity	Regional rule	Activity class	Scope of the application
	s13(1)(e)	Catchment.			associated rip rap and rock armouring of the embankments.
9(b)	Land use Consent - s13(2A)(b)	Removal of vegetation in the bed of the Waitohu Stream, including associated disturbance of the bed.	RFWP Rule 49	Discretionary	Application for vegetation removal in the stream bed.
10(b)	Water permit – s14(2)(a)	Diversion of surface water (temporary)	RFWP Rule 16	Discretionary	Application for a temporary diversion of the Waitohu Stream to facilitate construction of the bridge in the stream bed.
11(b)	Water permit – s14(2)(a)	Diversion of surface water (permanent)	RFWP Rules 16 and 49	Discretionary	Application for the permanent diversion of the Stream associated with the area of the bed occupied by the bridge piles.
13(b)	Discharge permit – s15 (1)(a)	Discharge of concrete-laden water to water.	RFWP Rule 5	Discretionary	Application for the discharge of concrete-laden water from bridge pile construction to water.
14(b)	Discharge permit – s15 (1)(b)	Discharge of concrete-laden water to land that may enter water.	RDLP Rule 2	Discretionary	Application for the discharge of concrete-laden water from bridge pile construction to land that may enter water.

The Waitohu Stream will have a single two lane bridge over it. This bridge is approximately 82m long, approximately 17m wide, and will have 2 piers in the stream bed.

There will be the same activities as required for the Ōtaki River bridges undertaken to install the bridge, however as it is only one bridge there will be less disturbance of the riverbed, and less temporary diversion required to facilitate the construction. This disturbance will be limited in area to where the piles are located and the necessary works to gain access to the area where the piles are to be constructed. A temporary diversion will be installed to ensure that water does not enter the pile area.

Stormwater outlet structures will be located on the banks of the Waitohu Stream; exact locations will be determined through detailed design.

Application ref #	Consent type	Activity	Regional rule	Activity class	Scope of the application
Group B: Crossing, occupation and realignment of streams					
Mangapouri Stream					
16	Land use consents – s13(1)(a) & s13(1)(e)	Use, placement and erection of structures (culvert inlet and outlet structures, and stormwater outlets), the placement of rip rap, and associated diversion, disturbance, deposition of material and reclamation of a section of the bed of the Mangapouri Stream.	RFWP Rule 49	Discretionary	Application for using erecting and placing structures in and over the bed of the Mangapouri Stream. Application for the diversion, disturbance and deposition of material on, and the reclamation of a section of the stream bed as a result of the culverts and associated structures being installed.
8(c)	Land use consents – s13(1)(a) & s13(1)(e)	The reclamation of a section of the bed in the Mangapouri Stream.	RFWP Rule 49	Discretionary	Application for reclamation of an area of river bed to be occupied by structures, and the associated rip rap and rock armouring of the

Application ref #	Consent type	Activity	Regional rule	Activity class	Scope of the application
					embankments.
9(c)	Land use Consent - s13(2A)(b)	Removal of vegetation in the bed of the Mangapouri Stream, including associated disturbance of the beds.	RFWP Rule 49	Discretionary	Application for vegetation removal in the streambed.
10(c)	Water permit – s14(2)(a)	Diversion of surface water (temporary).	RFWP Rule 16	Discretionary	Application for the temporary diversion of surface water to facilitate construction of the culverts.
11(c)	Water permit – s14(2)(a)	Diversion of surface water (permanent).	RFWP Rule 16	Discretionary	Application for the permanent diversion of surface water through the culverts once installed.

The Mangapouri Stream is to have new culverts installed under the Expressway and NIMT realignment. The existing culvert under the existing railway embankment in this area will be retained in its current form. The culvert under the Expressway is 60m in length, with a disturbed waterway length of 100m to enable its installation. The culvert under the NIMT is 20m long, and its installation will involve 60m of disturbance to the watercourse.

Application ref #	Consent type	Activity	Regional rule	Activity class	Scope of the application
Group B: Crossing, occupation and realignment of streams					

Mangaone Stream					
17	Land use Consents – s13(1)(a) & s13(1)(e)	Use, placement and erection of structures (culverts, bridge, inlet and outlet structures, and stormwater outlets), the placement of rip rap, associated diversion, disturbance and deposition of material and reclamation of a section of the bed of the Mangaone Stream.	RFWP Rule 49	Discretionary	Application for using, erecting and placing structures in and over the bed of the Mangaone Stream. Application for the diversion, disturbance and deposition of material on, and the reclamation of, a section of the stream bed as a result of the culvert and associated structures being installed.
8(d)	Land use consents – s13(1)(a) & s13(1)(e)	The reclamation of a section of the bed in the Mangaone Stream.	RFWP Rule 49	Discretionary	Application for reclamation of an area of river bed to be occupied by structures, and the associated rip rap and rock armouring of the embankments.
9(d)	Land use Consent - s13(2A)(b)	Removal of vegetation in the bed of the Mangaone Stream, including associated disturbance of the beds.	RFWP Rule 49	Discretionary	Application for vegetation removal in the streambed.
10(d)	Water permit – s14(2)(a)	Diversion of surface water (temporary)	RFWP Rule 16	Discretionary	Application for the temporary diversion of surface water to facilitate construction of the culverts.

11(d)	Water permit – s14(2)(a)	Diversion of surface water (permanent)	RFWP Rule 16	Discretionary	Application for the permanent diversion of surface water through the culverts once installed.
18	Water permit – s14(2)(a)	Damming and diversion of surface water	RFWP Rule 16 and 49	Discretionary	Application for the installation of a bund that will dam and divert the flow of the Mangaone Stream during flood events.

At the Mangaone Stream there will be culverts installed under the Expressway and also under the local roads that cross the watercourse as part of the ramps leading to the bridge over the Expressway at Te Horo. These culverts will be approximately 50m in length under the Expressway and 16m under the Mangaone link road (east). The Mangaone link road (west) bridge will be a single span bridge of 8m span.

New channels are to be formed to control the flow of the Mangaone Stream between the new link roads and the Expressway as a means of managing flood flows. These new channels will require the existing channels to be dammed and the flow diverted into them.

Application ref #	Consent type	Activity	Regional rule	Activity class	Scope of the application
Group B: Crossing, occupation and realignment of streams					
Greenwood, School, Gear, Settlement Heights, Avatar, Jewell, Cavallo, Awatea, Kumototo, Hadfield and Racecourse Catchments					
19	Land use consents – s13(1)(a) & s13(1)(e)	Use, placement and erection of structures (culverts, inlet and outlet structures, and stormwater outlets); the placement of rip rap; the removal of an existing culvert; and associated	RFWP Rule 49	Discretionary	Application for using erecting and placing structures in and over the bed of the unnamed watercourses along the Project length. This includes permanently flowing watercourses, and intermittently flowing watercourses within catchments over 50ha as depicted

Application ref #	Consent type	Activity	Regional rule	Activity class	Scope of the application
		diversion, disturbance, deposition of material and reclamations of sections of the bed of waterways along the Project length.			on Sheet GA07 in Volume 5. The details for the culverts are listed in Table 11 of the Stormwater Report, Technical Report 10 in Volume 2. Application for the diversion, disturbance and deposition of material on and the reclamation of, sections of the stream bed as a result of the culverts and associated structures being installed. Application for the removal of a culvert from the Racecourse Stream.
8(e)	Land use consents – s13(1)(a) & s13(1)(e)	The reclamation of a section of the bed of waterways along the Project length.	RFWP Rule 49	Discretionary	Application for reclamation of an area of river bed to be occupied by structures, and the associated rip rap and rock armouring of the embankments.
9(e)	Land use Consent - s13(2A)(b)	Removal of vegetation in the beds of various watercourses, including associated disturbance of the beds.	RFWP Rule 49	Discretionary	Application for vegetation removal in the beds of the water courses.
10(e)	Water permit – s14(2)(a)	Diversion of surface water (temporary)	RFWP Rule 16	Discretionary	Application for the temporary diversion of surface water to facilitate construction of the

Application ref #	Consent type	Activity	Regional rule	Activity class	Scope of the application
					culverts.
11(e)	Water permit – s14(2)(a)	Diversion of surface water (permanent)	RFWP Rule 16	Discretionary	Application for the permanent diversion of surface water through the culverts once installed.
20	Water permit – s14(2)(a)	Diversion of surface water (permanent)	RFWP Rule 16	Discretionary	Application for the permanent diversion of surface water into new channels.
21	Water permit – s14(2)(a)	Damming and diversion of surface water	RFWP Rule 16 and 49	Discretionary	Application for the installation of an undersized culvert that will dam and divert surface water in times of flood.

There are additional culverts required along the Project route. These culverts do not however all require resource consent. Those that require consent are those in permanently flowing watercourses, and those in ephemeral watercourses where the catchment is over 50ha in area. The culverts that require consent are in the following catchments:

- Greenwood (162.0ha);
- Mangapouri (236.6ha);
- Mangaone (2277.7ha);
- School (175.0ha);
- Gear (176.0ha);
- Settlement Heights (308.0ha);

- Avatar (65.7ha);
- Jewell (360.0ha);
- Awatea (223.0ha);
- Kumototo (64.3ha); and
- Hadfield (111.0ha).

The total length of culverts in these catchments is approximately 690m. The total length of watercourse being diverted in these catchments is approximately 1580m, this being the approximately 690m length of culverts (with an allowance for wingwalls at each end) and the approximately 890m of diversion of the watercourses either into new channels or into the culverts. The total length of the watercourses being disturbed within these catchments is approximately 1735m. The detail for each individual culvert is located within Table 11 of Technical Report 10 – Assessment of Stormwater Effects, as is the length of reclamation within each watercourse. This detail is also outlined on the Plans in Volume 5 of this AEE report.

The culvert through which the Racecourse Stream passes under the current railway embankment will be removed. A new culvert will be placed here which will pass under both the Railway and Expressway embankments. This culvert will control floodwater through being undersized, ensuring that downstream flood effects are managed appropriately. Consent is required as during times of flood this will dam and divert water within the Racecourse Stream catchment. This culvert is 100m long, and there will be a 120m length of channel diversion to connect with the culvert, resulting in 220m of total disturbed channel in the Racecourse Stream

Stormwater outlet structures and temporary crossings will be located where required on these watercourses; however exact locations are still to be determined through detailed design.

Application ref #	Consent type	Activity	Regional rule	Activity class	Scope of the application
Group C: Borehole construction and taking and diversion of groundwater					
22	Land use consent – s9(2)	Construction of boreholes (including bores for the purpose of abstracting groundwater).	RFWP Rule 15	Discretionary	Application for the construction of bores and the abstraction and diversion of groundwater as part of the construction of the Project.
23	Water permit –	The take and use of groundwater for bore testing, dust suppression	RFWP Rule 16	Discretionary	

	s14(2)(a)	and construction purposes.			

As part of the construction of the Project, water will be required. This is generally required to assist with the physical works and for dust suppression purposes. The water that is required is approximately 300m^3 per day.

This water is to be supplied from a number of sources, including groundwater where earthworks encounter groundwater, the water from the sediment ponds built as part of the Project, and water from four bores constructed specifically for that purpose. The four bores are proposed to be located in the vicinity of Mary Crest, the proposed Te Horo overbridge (near Mangaone Stream, opposite Te Horo Beach Road), north of the Ōtaki River and south of the Waitohu Stream. Meters will be installed on these bores to facilitate the recording of the volumes of water taken. All the bores are at least 250m away from the existing groundwater abstraction wells.

Application ref #	Consent type	Activity	Regional rule	Activity class	Scope of application
Group D: Reclamation, diversion of water from wetlands and the construction of new wetlands					
3(d)	Land use consent – s9(2)	Bore construction.	RFWP Rule 15	Discretionary	Application for the undertaking of earthworks in relation to wetlands where groundwater may be encountered.
24	Land use consent – s13(1)(e)	Reclamation of wetlands, including associated disturbance of the beds.	RFWP Rule 49	Discretionary	Application for reclamation of wetlands including the Railway Wetland area in Ōtaki and others throughout the Project extent.
25	Land use consent - s13(2A)(b)	Removal of vegetation in the bed of a wetland, including associated disturbance of the beds.	RFWP Rule 49	Discretionary	Application for the undertaking of earthworks and clearing vegetation in relation to wetlands.

26	Land use consent – s14(2)(a)	To dam groundwater and surface water via a new wetland.	RFWP Rule 49	Discretionary	Application for damming groundwater and surface waters for the creation of new wetland areas at Ōtaki and Mary Crest.
27	Water permit – s14(2)(a)	To permanently divert groundwater and surface water.	RFWP Rule 16	Discretionary	Application for the diversion of groundwater and surface water through a controlled means into and from wetlands at Ōtaki and Mary Crest.

As part of the Project, the existing Railway Wetland to the north of Ōtaki is to be altered in size. This requires that area of the wetland that is to be under the Expressway to be reclaimed. To achieve that, the water has to be diverted away from the wetland area.

New wetland areas are also to be created as part of the Project, one to the south of the Railway Wetland area and one at Mary Crest. These require earthworks, diversion of groundwater into the wetland areas that are created, and the revegetation of these areas. There is the possibility that in undertaking the earthworks to form the new wetlands, that groundwater will be encountered and therefore the earthworks are technically a bore, as with the land use consent element above.

Chapter 4
Part B
VOLUME 2

Other Statutory Matters

Overview

In addition to the matters requiring consideration under the RMA, there are a number of additional statutory requirements that are relevant to the Project. This section outlines other legislation which has informed the development of the Project, and/or under which separate approvals may be required. Some of these are not necessarily matters that need to be taken into consideration by a BoI, but rather provide context for the Project and the NZTA and KiwiRail as the applicants.

4 Other Statutory Matters

4.1 Introduction

In addition to the matters mentioned in the previous chapters, there are some further statutory considerations that the Project either has to be informed by or is legally required to comply with. These may be relevant in regard to section 104(1)(c) or section 171(1)(d) of the RMA. An assessment of these matters is covered in Part I, Chapter 33 of this AEE report.

The additional statutory considerations that are put forward in this section are under the:

- Land Transport Management Act 2003;
- Government Roading Powers Act 2003;
- New Zealand Railways Corporation Act 1981;
- Railways Act 2005;
- Public Works Act 1981;
- Historic Places Act 1993;
- Reserves Act 1977;
- Te Ture Whenua Māori Act 1993; and
- Freshwater Fisheries Regulations 1983 (FFR).

Any authorisations that may be required under other legislation, such as those listed above, are not applied for under this set of documents. They are described briefly below, however, for completeness and to give context.

4.2 Land Transport Management Act 2003

The LTMA provides the statutory framework for the management of New Zealand's land transport network. It is also one of the main statutes under which the NZTA operates (in conjunction with the GRPA). The purpose of the LTMA as set out at section 3 is as follows:

> *(1) The purpose of this Act is to contribute to the aim of achieving an affordable, integrated, safe, responsive, and sustainable land transport system.*
>
> *(2) To contribute to that purpose, this Act -*
>
> *(a) provides an integrated approach to land transport funding and management; and*
>
> *(b) improves social and environmental responsibility in land transport funding, planning, and management; and*
>
> *(c) provides the Agency with a broad land transport focus; and*
>
> *(d) improves long-term planning and investment in land transport, including planning and investment in coastal shipping and rail; and*

(e) ensures that land transport funding is allocated in an efficient and effective manner; and

(f) improves the flexibility of land transport funding by providing for alternative funding mechanisms...

The NZTA's objective is set out in section 94 as being:

To undertake its functions in a way that contributes to an affordable, integrated, safe, responsive, and sustainable land transport system.

There are a number of functions set out in section 95(1), but of specific relevance to the Project are:

(a) to promote an affordable, integrated, safe, responsive, and sustainable land transport system:...and

(c) to manage the State highway system, including planning, funding, design, supervision, construction, and maintenance and operations, in accordance with this Act and the Government Roading Powers Act 1989.

The principles under which the NZTA must operate are set out in section 96. Of specific relevance to the Project are those in subsections (1)(a)(i) and (iii) and (b):

In meeting its objective and undertaking its functions, the Agency must -

(a) exhibit a sense of social and environmental responsibility, which includes -

(i) avoiding, to the extent reasonable in the circumstances, adverse effects on the environment; and ...

(iii) meeting the requirements of section 18H (Māori contribution to decision making);

(b) use its revenue in a manner that seeks value for money...

The LTMA also recognises the importance of the Treaty relationship between councils and Māori and directs those exercising functions under the LTMA to maintain and improve opportunities for Māori to contribute to land transport decision-making processes.

4.3 Government Roading Powers Act 1989

The Government Roading Powers Act (GRPA) provides the statutory framework for the management of New Zealand's land transport system, in conjunction with the LTMA. Part 4 of the GRPA outlines the responsibility of the NZTA in relation to roading, comprising:

- Roads;
- State highways;
- Motorways; and
- Limited access roads.

Section 61 of the GRPA outlines the powers and duties of the NZTA in relation to State highways. Subsection 1 provides that: *Subject to section 62, the Agency shall have the sole powers of control for all purposes, including construction and maintenance, of all State highways under this Act, and any such powers shall be exercisable only pursuant to this Act.* Section 62 outlines that the NZTA can delegate powers and duties to territorial authorities.

Section 88 of the GRPA outlines that the NZTA can declare any State highway, or part of a State highway, to be a limited access road (LAR). The LAR provisions allow the NZTA a higher level of control over where, and the extent to which, access to a State highway can occur. The LAR provisions will apply to the Expressway so the NZTA will control the connections directly onto it.

4.4 New Zealand Railways Corporation Act 1981

The NZRCA is an "Act to establish a corporation to maintain, operate, and develop the services at present carried on by the New Zealand Government Railways Department and to consolidate and amend the law relating thereto". The NZRCA outlines what the New Zealand Railways Corporation (the Corporation) / KiwiRail is and the functions and powers of the Corporation.

Section 12(1) outlines the function of the Corporation:

> *The functions of the Corporation shall be—*
>
> *(a) to establish, maintain, and operate, or otherwise arrange for, safe and efficient rail freight and passenger transport services within New Zealand:*
>
> *(b) to establish, maintain, and operate, or otherwise arrange for, safe and efficient road passenger and freight transport services within New Zealand:*
>
> *(c) to establish, maintain, and operate, or otherwise arrange for, a safe and efficient ferry service for freight, including the carriage of passengers and vehicles between the North and South Islands:*
>
> *(d) to provide or otherwise arrange for those ancillary services which, in the opinion of the Corporation, are necessary for it to efficiently carry out its functions:*
>
> *(e) to endeavour to carry on the operations of the Corporation in such a way that revenue exceeds costs, including interest and depreciation; and to provide for a return on capital that may be specified from time to time by the Minister of Finance.*

The Project, in addition to incorporating a realignment of a section of the NIMT through Ōtaki, has other positive effects such as improved safety, by removing 5 of 8 level crossings of the NIMT (being all the public level crossings in the Project area).

4.5 Railways Act 2005

The Railways Act was enacted in 2005 and its purpose is to:

> *(a) promote the safety of rail operations by:*
>
> *(i) stating the duty of rail participants to ensure safety; and*
>
> *(ii) authorising the Minister to make rules relating to rail activities; and*
>
> *(iii) clarifying the nature of approved safety systems established by rail participants:*
>
> *(b) restate and amend the law relating to the management of the railway corridor:*
>
> *(c) consolidate legislation relating to railways.*

Safety factors are key aspects in the Railways Act and constitute a substantial portion of the Act. The Project delivers improved safety over the stretch of the NIMT applicable to this application.

4.6 Public Works Act 1981

The PWA enables land to be acquired, either by agreement or by compulsion, for the construction of public works including roads and rail. The PWA also contains provisions for disposal of land no longer required for a public work. This AEE report has already noted that the operational land needed for the Project may be less than that required during construction. Therefore, surplus land after construction has been completed may be returned to former owners or uses through the PWA.

Under section 185(1) of the RMA, in certain circumstances, the owner of an estate or interest in land (including a leasehold estate or interest) that is subject to a designation or requirement may apply at any time to the Environment Court for an order obliging the relevant requiring authority to acquire or lease all or part of the owner's estate or interest in the land under the PWA.

The Project requires land to be acquired for both the construction of the Expressway and the realignment of the NIMT at Ōtaki. As set out in Chapter 2.7 above, the land acquisition process is at varying stages, with some land already acquired and further land still to be acquired (either entirely or partially) from a number of properties within the Kāpiti district.

4.7 Historic Places Act 1993[14]

The HPA established the NZ Historic Places Trust (NZHPT) and its role in preserving, marking and recording places of historic interest in New Zealand.

The purpose of the HPA as set out in section 4(1) is:

> *To promote the identification, protection, preservation, and conservation of the historical and cultural heritage of New Zealand, including archaeological sites.*

Under subsection 2 the HPA outlines that all persons exercising functions and powers under it shall recognise:

> *(a) the principle that historic places have lasting value in their own right and provide evidence of the origins of New Zealand's distinct society; and*
>
> *(b) the principle that the identification, protection, preservation, and conservation of New Zealand's historical and cultural heritage should:*
>
> *(i) take account of all relevant cultural values, knowledge, and disciplines; and*
>
> *(ii) take account of material of cultural heritage value and involve the least possible alteration or loss of it; and*
>
> *(iii) safeguard the options of present and future generations; and*
>
> *(iv) be fully researched, documented, and recorded, where culturally appropriate; and*
>
> *(c) the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, wahi tapu, and other taonga.*

Sections 6 to 8 outline heritage covenants under the HPA, the effect of heritage covenants and the register of heritage covenants under a District Plan. Under section 6(1) the NZHPT may negotiate and agree with the owner or lessee or licence of an historic place, historic area, wāhi tapu, or wāhi tapu area for the execution of a heritage covenant to provide for the protection, conservation, and maintenance of that place, area, or wāhi tapu.

The protection of archaeological sites is covered by sections 9 to 19 of the HPA, with section 10 stating that it is unlawful for any person to destroy, damage or modify the whole or any part of an archaeological site without the prior authority of the NZHPT. This applies regardless of whether the land on which the site is located is designated, the activity is permitted under a District or Regional Plan, or a resource or building consent has been granted.

Under section 12 of the HPA, the NZHPT can grant a general authority to destroy, damage, or modify all archaeological sites within a specified area of land. Earthworks and clearing

[14] The HPA is currently being revised, however at this stage the Heritage Bill is still being considered by Parliament. The current legislation is therefore considered here.

work associated with constructing the Project may result in the destruction, damage or modification to two recorded sites, one unrecorded site, and unknown sites along the alignment. These sites are discussed further below in Chapter 24. Consequently, the NZTA will make applications to the NZHPT under section 12 of the HPA. The NZTA is also working with tangata whenua to agree protocols to address any issues arising through the construction of the Project.

4.8 Wildlife Act 1953

The Wildlife Act 1953 deals with the protection and control of wild animals and birds and the management of game. It provides varying levels of protection to different species. All native animals other than those outlined in Schedules 1-5 of the Act are protected. This includes any terrestrial or freshwater invertebrate declared to be an animal under Schedule 7 of the Act, and marine species declared to be animals under Schedule 7A of the Act.

The Project has various effects on watercourses as well as other ecological areas, and as such the implications on wildlife and the applicability of the Wildlife Act 1953, need to be considered. An assessment of the Project in relation to the Wildlife Act 1953 can be found in Part G, Chapter 19.

4.9 Te Ture Whenua Māori Act 1993

The preamble to the Te Ture Whenua Māori Act 1993 notes that it is desirable to facilitate and promote the retention of Māori land in the hands of its owners, their whānau, and their hapū, and to protect wāhi tapu, and to facilitate the occupation, development, and utilisation of that land for the benefit of its owners, their whānau, and their hapū. The Act sets out the provisions governing dealings that alter the ownership status of Māori land, including alienation. Where any Māori land or interest in Māori-owned land is alienated due to it being required for a work under the Public Works Act 1991, an application for confirmation must be lodged with the Māori Land Court for determination.

There are five blocks of Māori owned land affected by the designation for the Expressway. These areas of land are subject to the designation in varying degrees; in some cases complete acquisition of parcels is sought, and in others only part of the land is sought to be acquired.

4.10 Freshwater Fisheries Regulations 1983

The FFR are regulations made under the Fisheries Act 1983. Part 6 of the FFR relates to fish passage and applies to *"every dam or diversion structure in any natural river, stream, or water".*

Under regulation 41(2):

> *No person shall construct any culvert or ford in any natural river, stream, or water in such a way that the passage of fish would be impeded, without the written approval of the Director-General incorporating such conditions as the Director-General thinks appropriate.*

These Regulations require that the approval of the Director-General of Conservation be obtained for culverts where the passage of fish will be impeded. The Director-General can either:

- issue a dispensation from the requirement to provide fish passage; or
- specify that fish passage be provided and maintained.

All river and stream crossings required for the Project, whether by ford, culvert or bridge, will be designed to ensure adequate fish passage is provided. Approval from the Director-General under the FFR is therefore not considered necessary for this Project.

Chapter 5
Part C
VOLUME 2

Description of the Environment

Overview

The Project traverses a range of different land uses along its 13km route, including farming and agricultural land, lifestyle blocks, residential areas, and urban townships and communities:

- At the southern end, the four-lane Expressway is located over the existing SH1, and a replacement section of arterial road is to be built, predominantly through low-lying areas and undulating mounds associated with sand dunes;
- North of Te Hapua Road, the Expressway and new arterial road pass through sand dunes and curve east to avoid a culturally and ecologically significant area at Mary Crest, where the Expressway crosses from the west to the east of the NIMT and the arterial road joins with the existing SH1;
- North of Mary Crest, the Expressway runs adjacent to the existing transport corridor (i.e. the NIMT and the current SH1) until the Ōtaki River, across generally flat topography and properties primarily associated with agriculture or horticulture;
- The Expressway crosses the Ōtaki River and runs across the floodplain, then passes through an urban area to the east of the Ōtaki Railway Retail area; it is in this area that the section of NIMT will be realigned to run parallel to the Expressway;
- The Expressway and realigned NIMT pass under the existing SH1 as it exits the Ōtaki Railway Retail area in a northward direction, where the NIMT rejoins the current rail alignment; and
- The Expressway is located through a sand dune system immediately north of Ōtaki (as is the NIMT), before it reduces to two lanes, crosses the Waitohu Stream, and traverses flat rural land at the northern end of the Project area.

The Project area generally consists of rural pasture land, market gardens, discrete areas of urbanised land, sand dunes, pockets of native and exotic vegetation, and wetlands.

Much of the Kāpiti district has been modified by human activity over hundreds of years, resulting in a variable range of terrestrial (land-based) and aquatic ecological habitat along the route. Design criteria for choosing the Project route included seeking to avoid or minimise the Project's effect on high-value ecological habitats; most notably, the Project successfully avoids existing significant indigenous vegetation at Mary Crest (which is also an area of significance to the tangata whenua).

The Project traverses four main hydrological catchments and numerous smaller catchments, flowing east to west to the Kāpiti coast. The Ōtaki River is the largest water course. The Project area traverses a series of floodplains, where land drainage works predominate – initially these were to enable pastoral farming, and more recently the focus has been on flood control.

Network utilities near the Project area include high voltage overhead transmission lines, which are located to the west of the Project and will not be affected, and local electricity distribution lines, gas and water supply pipelines, and telecommunications cables. The Arcus Road irrigation scheme draws water near the Ōtaki River.

5 Description of the Environment

5.1 Introduction

The first part of the chapter outlines the general built and physical environment. The rest of the chapter details more specific aspects of the environment, focusing on:

- Geology;
- Natural hazards;
- Climate;
- Hydrology;
- Ecology / landscape;
- Air quality;
- Noise;
- Transport networks;
- Network utilities;
- Social environment; and
- Archaeology, culture and heritage.

There are a number of reports that have been drawn on for this section of the AEE report, including the technical reports that can be found in Volume 3.

5.2 Regional Context

The Peka Peka to North Ōtaki section of SH1 and the Expressway is significant on a regional scale given it is part of the main route leading north out of Wellington. This also provides some significance for the Project on a national scale as a result of the connections between regions that the Project will facilitate. As stated earlier, the Project relates to part of the Wellington Northern Corridor RoNS, which stretches from Wellington International Airport to Levin. The location of the Project in the wider regional context can be seen in Figure 5-1.

The Kāpiti district is currently experiencing high growth and is one of the fastest growing districts in the lower North Island. Planned development in the Ōtaki area will place greater demand on the existing road network, and particularly on SH1 as a commuter route to Wellington. Additionally, there is increasing intensification of rural and horticultural activities. All of these changes affect traffic throughout the region and increase the importance of establishing a transport network that not only meets current needs, but also has capacity to meet the needs of future generations.

In the wider regional context the capacity constraints on the existing State highway system throughout the Project area impact on travel times, safety and efficiency.

Figure 5-1: Location of the Peka Peka to North Ōtaki Project Area in Relation to the Wider Wellington Region

5.3 Built and Physical Environment

The Project area is located along the Kāpiti Coast, approximately 70km north of Wellington. The Project stretches for 13km from Te Kowhai Road in the south to Taylors Road in the north.

The route passes through two settlements: Te Horo, which is a small community of approximately 640 in population and Ōtaki, a town of approximately 5,600 in population. Ōtaki is the northernmost urban centre of the Kāpiti district and Wellington region. The Project area comprises a mix of land uses including rural, residential, industrial, commercial and horticultural. The area surrounding Ōtaki township is predominantly rural.

This section provides an overview of the built and physical environment in which the Project is situated.

5.3.1 Proposed Route and Topography

The proposed route for the Expressway largely follows the main transportation corridor, traversing relatively flat terrain, and crossing several waterways, including the Waitohu Stream, Ōtaki River, the Mangapouri Stream and the Mangaone Stream. SH1 and the adjacent NIMT corridor currently bisect Te Horo and Ōtaki. Local roads connect with SH1 at at-grade intersections, and provide east-west connections across SH1.

The Expressway travels between the eastern foothills (which reach up to 510m above sea level), and the coast which is 3-4km to the west. The Project area is defined by a number of strong topographical features including the coastal edge, the coastal plain, the eastern foothills, the local rivers and streams as well as the old coastal escarpment near the southern end of the Project. Different soil types are found throughout the area, ranging

from highly versatile agricultural soils to coastal sands. There are also dune systems at both the southern and northern ends of the Project area where earthworks will be required for the Expressway.

The route goes through a range of land uses including residential, commercial, rural, horticultural, and recreation areas. Much of the route travels through rural land with pockets of intense agriculture which has resulted in an open landscape with scattered mature exotic trees, shelterbelts and hedgerows. Willows are present on many of the stream and river banks. There are pockets of remnant indigenous vegetation and wetlands found along the route. Diagrams showing the Project are located in the ULDF, Technical Report 23 in Volume 3. The topography of the Project is depicted below in Figure 5-2.

Figure 5-2: Oblique Aerial Photograph Showing Topography of the Area (Source: Google Earth 2011)

Through the Project area immediately north of Ōtaki, the existing railway line is located within sand dunes before traversing the flat land at the very northern end of the Project area. The dunes system is located on both the east and west sides of the existing SH1, with the Expressway to be located to the west of the existing highway alignment as it leaves Ōtaki (heading north).

In the area south of Ōtaki through to north of Te Hapua Road, the Project passes through the floodplain at Ōtaki, then crosses the Ōtaki River before travelling through the generally flat topography and dunes heading south. The soils throughout this area are generally fertile, with established farming, market gardening and horticultural development. At Mary Crest the Expressway crosses from the west to the east of the NIMT, and then runs adjacent to the existing transport corridor before crossing the Ōtaki River.

South of Te Hapua Road, the Expressway traverses lower lying areas (associated with interdune deposits) and undulating mounds associated with sand dunes. These undulating sand dunes provide variation in what can be viewed from the existing State highway, and dictate which plant species grow there. In this area the Expressway sits over the existing SH1, and connects to the proposed M2PP section of the Kāpiti Expressway at the Peka Peka interchange. In this area there is also a new section of road to be built that will connect the existing SH1 with the new section of existing arterial road from the M2PP Project to ensure that there is an alternative route between the south and north of the Kāpiti district, other than the Expressway.

5.3.2 Current and Future Land Use

The majority of the Project area is currently zoned rural under the KCDP, with urban activities mainly confined to Ōtaki and, to a much lesser extent, Te Horo. The urban boundaries of Ōtaki are the Ōtaki River to the south and the Waitohu Stream and Waitohu Valley Road to the north. The GOV outlines a desire to grow the urban centre within these containment lines. This document is discussed in Part I, Chapter 33 of the AEE report.

Within the Project area, residential uses are generally confined to the Ōtaki township. There are sections of residential ribbon development on both sides of SH1 immediately north of the northern river terrace and the railway overbridge, and on the west side just north of the Ōtaki River. Dwellings that front SH1 have relatively dense plantings of amenity trees on their highway frontages, providing a buffer between dwellings and the highway traffic flow. There is a settlement area also located at Te Horo, with dwellings primarily being located off adjoining roads rather than fronting SH1.

In the Proposed KCDP there is a new Future Urban Development Zone identified to the north of Ōtaki. This is understood to be land identified for the future urban growth of Ōtaki township, and will be developed subject to a Structure Plan. The Structure Plan will therefore require consideration of the environment that exists at the time that it is developed. The Project will not hinder the development in this area, and to some extent will support it through the removal of through traffic from local roads and the current SH1.

Rural character is pre-dominant throughout the Project area, with the important exception of in Ōtaki township itself. There are also many 'lifestyle' blocks throughout the rural area. These are more intensively subdivided, contain various dwellings and outbuildings and a variety of amenity and production tree and shrub plantings. Their intensity and diversity of development differentiates the character of these lifestyle blocks from their immediate rural surroundings. Following the GOV, the desire is for rural areas to grow with horticultural and agricultural activities, as opposed to there being more residences or lifestyle developments in the rural area.

On the southern edge of Ōtaki, along the northern bank of the Ōtaki River, is an industrial zone, including aggregate extraction and a precast concrete works (Stresscrete). The area around Riverbank Road is the subject of a recent plan change (Plan Change 81) and is now a zoned growth area with a focus on 'clean tech' industries.

Commercial/retail activities are focussed along the Ōtaki Railway Retail area. Ōtaki also has a main township area that is significantly removed from the existing SH1 and the Railway Retail Area. There are a small number of businesses located along SH1 in Te Horo.

Open Space

There is a limited number of open space areas located throughout the Project area, although none have reserve status under the Reserves Act. The first is known as the Pare-o-Matangi reserve, which is an 'island' of land situated between Rahui Road, the existing SH1 and the NIMT. It is administered by the KCDC and although commonly referred to as a "reserve" it is not a reserve under the Reserves Act 1977. The Pare-o-Matangi reserve is of significance to tangata whenua, and holds local importance to the community generally as it provides an area of communal open space and has been subject to extensive planting and development by volunteers within the community. The other open space area within the Project footprint is the 'rest area' on the southern bank of the Ōtaki River between SH1 and the NIMT.

Future Growth

As noted above, KCDC has expressed a desire for future industrial and residential growth to be based around Ōtaki. Development of the existing industrial zone along Riverbank Road is currently underway as a 'Clean Tech' business park.

Although existing severance caused by SH1 is more acute at Te Horo, the settlement is small and is likely to remain so as the KCDP, and the GOV seek to restrict residential development in this area to retain rural character.

There is also a proposed Ōtaki Lake Development, which includes the development of a lake and amenities to the north of the Stresscrete site, on the northern bank of the Ōtaki River. The Expressway traverses along the western side of the Ōtaki Lake area.

5.4 Geology

The Expressway runs through an area predominantly comprising a rolling terrain of recent sand dunes and inter-dunal deposits, a raised alluvial terrace, and the wide alluvial plain of the Ōtaki River. The geological setting and these ground conditions are summarised in Chapter 13 and Technical Report 4 (Volume 3).

5.5 Natural Hazards

Earthquakes and storms, with associated flooding potential, are the two main types of natural hazards that have been identified in the Project area.

There are several faults within the vicinity of the proposed route and the potential for movement on these fault lines creates an earthquake risk. The potential hazards caused by earthquakes are discussed in Technical Report 4. They are also considered in Chapters 13 and 33 of this AEE report.

Storms have also been identified as a natural hazard because they can cause slope instability, debris flows and flooding. Technical Report 10 provides an assessment of stormwater effects, and they are also discussed in Chapter 18 of this AEE report.

5.6 Climate

The climate of the Kāpiti Coast is temperate in nature and does not generally experience extremes in temperature. The most settled weather occurs during the summer months and into autumn. Summers are generally warm with daytime temperatures ranging between 19ºC and 24ºC. However, at times this can peak at over 30ºC. Winters are generally the most unsettled time of the year, with daytime maximum temperatures generally ranging from 10ºC to 14ºC.

Prevailing winds vary across the seasons, with northerly winds dominant during the summer and northwesterlies in the winter. Annual sunshine hours average approximately 2,000 hours and annual rainfall levels average approximately 1,311mm.

5.7 Hydrology

The drainage in the Project area comprises a range of rivers, streams (often within defined channels), wetlands, flood plains, ponding areas, constructed drains and areas of high groundwater. These areas are influenced by the geological conditions previously outlined as well as the catchments that drain throughout the Project area, discharging into the Tasman Sea.

The hydrological effects on the Project area are assessed in Chapter 17 and also in Technical Reports 9 (Hydrology) and 10 (Stormwater) (Volume 3).

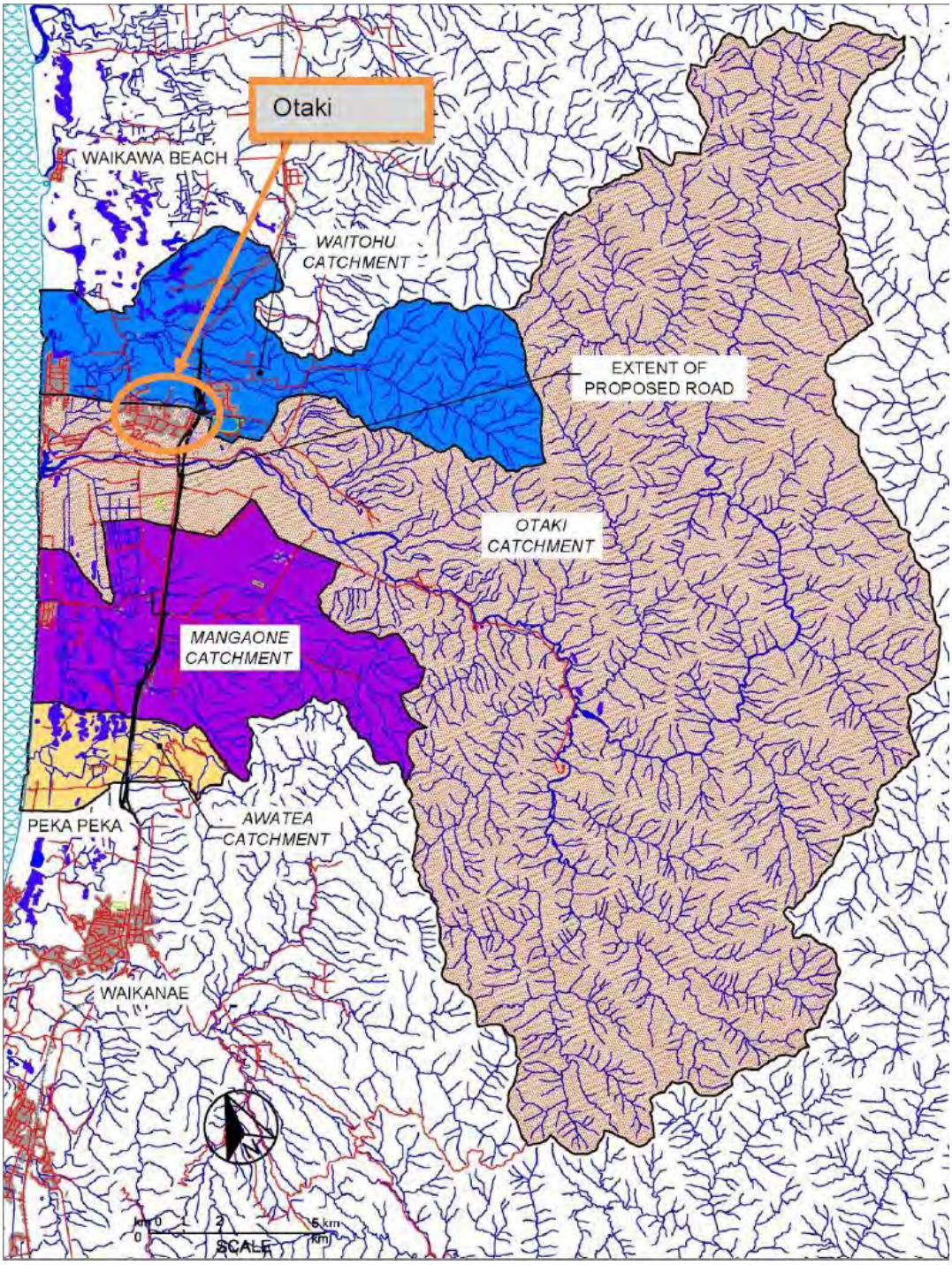

Figure 5-3: The Main Catchments Throughout the Project Area.

5.8 Ecology

Both terrestrial and aquatic ecology assessments have been undertaken throughout the Project area. The terrestrial ecology assessment was based on a review of existing background information relating to the Project and surveys along the Expressway route. The aquatic ecology assessment used existing information on the ecology of rivers and streams in the area extracted from reports written by the GWRC, and from data extracted from the New Zealand Freshwater Fisheries Database. Site visits wereundertaken and fieldwork was conducted to support the aquatic ecology assessment.

The specifics of these assessments are provided in Technical Report 11 (Terrestrial Ecology) and 12 (Aquatic Ecology) (Volume 3). The aquatic and terrestrial ecology environments and assessment of effects are also discussed in Part G, Chapters 19 (Terrestrial Ecology) and 20 (Aquatic Ecology) of this AEE report.

5.9 Air Quality

The Project area falls completely within the Kāpiti Coast Airshed as defined in GWRC's Regional Air Quality Management Plan (RAQMP). Details regarding the air quality assessment can be found in Part G, Chapter 21 of the AEE report and Technical Report 13 (Volume 3).

5.10 Noise

Details regarding the noise assessment can be found in Part G, Chapter 22 of the AEE report and Technical Reports 14 and 15 (Volume 3).

5.11 Transport Networks

The key transport spine through the Project area runs north – south centrally between the coast to the west and the hills to the east. The spine includes SH1 and the NIMT. Local east-west connections join this key transport spine throughout the Project area. Transportation networks that cater for cycling and walking are present in some areas.

This section provides a description of the existing transportation networks in the Project area. These networks are assessed in Part G, Chapter 14 of the AEE report and Technical Report 6 (Volume 3).

5.12 NIMT Network

Opened more than 100 years ago, the NIMT remains a critical part of KiwiRail's freight network, forming the 'backbone' which runs from Auckland to Christchurch. From Peka Peka to Ōtaki, the NIMT generally follows the alignment of SH1. While the NIMT is mainly used to transport freight, a passenger service currently operates on the railway line twice a day. It is possible that this may increase in the future.

In the Ōtaki area, the existing NIMT closely follows the alignment of SH1 to the east of the State Highway south of Ōtaki before crossing the Ōtaki River on a rail only bridge (SH1 crosses the Ōtaki River on its own bridge to the west of the railway). The NIMT then runs parallel with SH1 until Waerenga Road where it curves east away from SH1 to the Ōtaki Rail station, which is on the eastern side of Ōtaki. The NIMT continues to the north, crossing Rahui Road just west of Rahui Road's intersection with County Road. The NIMT then follows the western side of County Road, crossing the Manapouri Stream, before crossing SH1 just south west of the intersection with County Road. The exiting NIMT then tracks northwest out of Ōtaki and across the Waitohu Stream.

5.13 Network Utilities

There are a number of network utilities that are located within the Project area. Chapter 7 of this AEE report assesses the impacts of the Project on these utilities.

5.14 Social Environment

The assessment of social impacts can be found in Part G Chapter 27 of this AEE report. Technical Report 20 (Volume 3) also contains descriptions of the key aspects relating to the social environment in which the Project is located.

5.15 Archaeology, Culture and Heritage

The Kāpiti district has a long and rich cultural and historic heritage with a number of recorded archaeological sites, historic sites and buildings, and areas of significance to iwi and the wider community. The effects of the Project on these aspects of the environment are considered in Chapters 24 (Archaeology), 25 (Built Heritage) and 26 (Tangata Whenua and Cultural Heritage) of this AEE report.

Volume 3 of the AEE also considers these aspects of the environment. In particular Technical Report 17 assesses the potential impact of the project on archaeological sites, Technical Report 18 assesses the impact on heritage buildings and Technical Report 19 provides a Cultural Impact Assessment (CIA).

Chapter 6
Part D
VOLUME 2

Operation of the Project

Overview

This chapter provides an outline of the design, construction and operation of the Project. The roading component of the Project has been designed to an expressway standard comprising four traffic lanes with continuous median separation. The NIMT realignment has been designed to ensure that the NIMT continues to operate to its current standard and provide freight and passenger services by rail along the length of the North Island.

6 Operation of the Project

6.1 Introduction

This Chapter provides a summary of the key aspects of design, construction and operation of the Project, in addition to the detail already provided in other Chapters within Volume 2.

The Expressway is generally parallel to SH1, which is also generally parallel to the NIMT. The Expressway will have two lanes of traffic in each direction, with connections with local roads provided at half-interchanges located to the north of the Ōtaki township and just south of the Ōtaki River. Local connections and the construction of new local roads and access roads are provided to and across the Expressway, so as to maintain local connectivity.

The Project includes the following principal design features:

- A four-lane median-divided expressway (two traffic lanes in each direction);
- Ensuring legible access into and out of Ōtaki from the Expressway to support vitality and the GOV, while limiting direct access elsewhere along the Expressway. This is sought to be achieved by:
  - A half-interchange north of Ōtaki; and
  - A half-interchange south of Ōtaki (southern side of Ōtaki River);
- Two two-lane bridges over the Ōtaki River;
- One two-lane bridge over the Waitohu Stream;
- Grade-separated overbridges to cross some local roads, watercourses, the NIMT and the Expressway;
- A new section of local arterial road near Mary Crest;
- A realignment of approximately 1.2 km of the NIMT through Ōtaki; and
- Stormwater treatment and attenuation facilities, including swales, along the majority of the length of the route.

Further technical information relating to the Project is provided within Part G of this AEE report, the relevant Technical Reports in Volume 3 and the Plan Set within Volume 5. These documents have been cross-referenced throughout this Chapter.

6.2 General Project Description

The Project and the operation of the Project are described in this Chapter with specific reference to:

- The Design Philosophy Statement;
- The ULDF;
- Road design;
- Traffic services;

- Interchanges and local connections;
- Pavements and surfacing;
- Bridges and other key structures;
- Noise attenuation;
- Surface drainage, stormwater treatment and flood management;
- Culverts;
- Cycleway and walkways; and
- Urban design and landscaping.

6.2.1 Design Philosophy Statement

A Design Philosophy Statement (DPS) was produced for the key elements, to capture standards and assumptions relating to the roading component of the Project. The DPS covers the design philosophy for the Expressway, as well as local connections and the creation of new local roads. It identifies the key standards, guidelines and criteria that have been used in the Project design through which the objectives of the Project are sought to be achieved. These objectives relate not only to the construction and operation of the Expressway, but also seek to provide integration of the structures with appropriate local road connectivity across the corridor, and ensure that the Expressway is designed in an environmentally and culturally sensitive way.

The DPS document is provided as Technical Report 1, Volume 3.

6.2.2 Urban and Landscape Design Framework

A ULDF has been used as a touchstone for designing the Project. Its purpose has been to:

- Set out urban and landscape design principles and objectives providing a framework for design of the Project; and
- Inform the finalisation of the design of the Project.

The ULDF was developed by specialists through urban design investigations of the Project area, Project team meetings, multidisciplinary workshops, Wellington Northern Corridor RoNS urban design workshops and liaison with stakeholders.

The ULDF is provided as Technical Report 23, Volume 3.

6.2.3 Road Design

The form of the Expressway, the associated local roads, and the NIMT realignment is shown in the scheme plans in Volume 5: Plan Set, which should be read in conjunction with this section. Bridges and crossings can also be viewed on the plans in Volume 5.

The Expressway has been designed to seek to ensure that the corridor is future-proofed to accommodate changes in population and traffic demands, based on current estimates.

The following sections describe the road design, signage and road markings, lighting and other matters which are proposed to be used in the initial construction of the Expressway, local roads and NIMT realignment. However, over the operational life of the Expressway, local road and NIMT, the relevant road controlling authorities and KiwiRail are proposed to retain the ability to make any changes, including to road design, pavements, signage and road markings, medians, lighting and street furniture, required for the ongoing management, control and upgrading of the roads / rail infrastructure. Depending upon the extent and nature of any such future changes, Outline Plan of Works may need to be submitted, or Outline Plan Waivers may be required, under the RMA.

Expressway

The Expressway will be approximately 13km long and has generally been designed to the following specifications:

- Median width of up to 6m (edge line to edge line), which is reduced to 4m at Peka Peka to align with the M2PP Project and is reduced to 4m on the approach to north Ōtaki;
- A swale, services or planting strip of approximately 10m in width, varying slightly along the route;
- 1.5m verges;
- 2.5m sealed shoulders on each outer edge with widening up to 3m adjacent to structures and barriers;
- 1m median sealed shoulders; and
- Wire rope median barrier with a typically grassed, planted, or sealed median (with a concrete or other form of barrier on river bridges and approaches to structures).

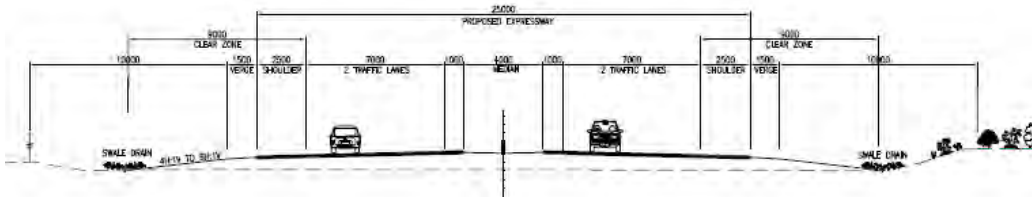

Figure 6-1: General Cross-Section of the Expressway

Local Roads

Sections of new local road or arterial road that are required to be constructed as part of the Project, and are to be located within the Project designation for construction, will have a cross-section and geometry that complies with relevant design standards for local roads, as agreed with KCDC. These standards are:

- New Local Arterial – approximate width of 16.6m with:
  - 3m wide swale, services or planting strip on each side;
  - 1.8m wide shoulder on each side; and
  - 3.5m wide lanes in each direction; and
- New section of local road which is to connect the sections of SH1 north of Mary Crest to Peka Peka:
  - Minimum 1.8m wide shoulder on both sides; and
  - 3.5m wide lanes in each direction.

6.2.4 NIMT

As a consequence of the Expressway project, an approximately 1.2km section of the existing NIMT in Ōtaki needs to be realigned in order to accommodate the preferred Expressway alignment. The 1.2km section of the NIMT that needs to be realigned begins approximately opposite Sue Avenue, runs through the Ōtaki township, and ends where the realigned railway connects with the existing NIMT approximately half way between SH1 and the Waitohu Stream (approximately 320m west of the intersection of Waitohu Valley Road and SH1). The remainder of the existing NIMT alignment is not altered.

The realigned NIMT will continue to run parallel to SH1 from Sue Ave until Waerenga Road although slightly east of the existing NIMT. The existing curve of the NIMT as it approaches County Road will be softened on the realignment, with the realigned NIMT crossing Rahui Road, approximately 120 metres from Rahui Road's intersection with SH1. The realigned NIMT will then curve back down towards SH1, crossing over the Mangapouri

Stream (approximately 120m downstream of where the existing NIMT intersects the stream), before crossing the existing SH1 alignment approximately 140 metres south west of the point at which County Road meets SH1 (and 80 metres south west of the point where the current NIMT crosses SH1). The realigned NIMT will then track north to link into the existing NIMT alignment around 540 metres before it crosses the Waitohu Stream.

It is intended that the realigned NIMT at Ōtaki will be constructed before work on the Expressway begins in that location. This will enable the relevant section of the existing NIMT that is being replaced by the realigned NIMT to be decommissioned and for the Expressway to be built in its place.

The Ōtaki Railway Station

The realigned NIMT results in the Ōtaki Railway Station also needing to be moved slightly on its axis. This will not have an impact on access to the station or its operation. The station is not owned by KiwiRail, but the platform area is. The station needs to be moved slightly to the east to ensure that the realigned NIMT can be accessed safely from the station.

In order to mitigate any effects on heritage values associated with the station, realignment will include the deconstruction and rebuilding of all brick elements. Subject to the brickwork being reconstructed in total and all interior and exterior fabric being relocated with the building (e.g. the platform, verandah and toilet block) and relative to the building as it currently exists, there will be little loss of heritage fabric or significance of the station. The Ōtaki Railway Station has high historical, architectural and rarity values, however assuming the proposed realignment of the station and associated elements is undertaken, it is considered that the heritage effects on this building will be less than minor.

Realigned Design

The section of the realigned NIMT running through Ōtaki, from Waerenga Road will run roughly parallel to the Expressway on its eastern side and does not at any point intersect the Expressway. From just past Waerenga Road until just before connecting with the existing NIMT north of Ōtaki the realigned NIMT has been future proofed to allow double tracking. The other elements of design are recorded in Technical Report 2. In summary the required standards include:

- Provision of a passing loop past Ōtaki Railway Station (on a single line railway a passing loop is a section where trains travelling in opposite directions can pass each other);
- A 820m minimum radius for new sections of NIMT (the minimum radius defines the minimum curvature within the alignment, which affects the maximum safe speed of a curve - the realigned section is designed to enable 100 km/h, except for the curve north of the Ōtaki River, which is designed for 80 km/h);
- A minimum 5.5m vertical clearance (for example where a road bridge passes over the rail corridor) to future proof for electrification; and
- Future proofing for later double-tracking along the corridor.

Noise and Vibration Effects

The realigned NIMT will be closer to properties to the west of the realignment by up to approximately 100 metres at its greatest point (but generally the shift in alignment is much less). The effects of this shift have been considered by the experts in their assessment of this Project. In particular, Technical Report 15 concludes that only two properties will be adversely affected by the move, requiring mitigation measures to be implemented at those locations. Those properties are the Ōtaki Motel and the property at 230 Main Highway. The NZTA and KiwiRail are working with those affected property

owners to determine appropriate mitigation. This is further explained in Technical Report 15.

Stream Crossings and Stormwater

The realigned NIMT will continue to cross Mangapouri Stream and the Waitohu Stream. Culverts will be constructed in respect of both.

Swales are proposed on the eastern side of the realigned NIMT between Rahui Road and Mangapouri Stream. From where the realigned NIMT crosses SH1 until it reconnects with the existing NIMT alignment, swales are proposed on both sides of the railway line. A stormwater management pond is proposed between the realigned NIMT and the Expressway for the section between Rahui Road and SH1.

Bridges

The realigned NIMT will be crossed by two bridges. Bridge 6 will provide access over the realigned NIMT for the realigned Rahui Road. Bridge 8 will allow SH1 to cross over the realigned NIMT. Previously, Rahui Road was a level crossing so the safety of the crossing will improve considerably following completion of the Project.

Realigning the NIMT on this section prevents the need for the Expressway to cross the NIMT over extended periods of track (which it would have to do twice if the NIMT remained on its current alignment). As is shown in the Plan set in Volume 5 of this AEE report, this would be completely impractical.

Level Crossings

As a result of the Expressway, five of the eight existing level crossings within the Project area will be closed. The level crossings to be closed are the crossing at School Road, the crossing opposite Te Waka Road, the crossing enabling access to the Stevens property, and the crossings at Old Hautere Road and Rahui Road. Grade separation or alternative access will be provided at each of those locations.

These changes will significantly reduce the risk of crashes occurring between trains and road traffic, pedestrians or cyclists. The changes remove all the public level rail crossings in the Project area. The removal of the level crossings will result in the warning bells being removed, as well as the train horn not being used (as is generally the case when approaching a level crossing).

6.2.5 Traffic Services

Traffic services include features such as:

- Road markings and permanent road signs (including variable message signs);
- Road lighting; and
- Barrier protection.

Permanent Road Signs and Markings

Design of all road signs and markings will be in accordance with the NZTA's manual of traffic signs and markings (MOTSAM) or any equivalent document which replaces that manual. It will also be in accordance with the Land Transport Rule: Traffic Control Devices.

The Project includes two gantries for signage along the Expressway to identify the entry to Ōtaki, as well as other directional and distance signage on the Expressway, at interchanges and on the local roads. The Expressway also features variable message signs adjacent to the half interchanges and where the Expressway begins at Taylors Road in the north.

Road Lighting

Lighting is to be provided around interchange locations (north and south of Ōtaki) and intersections; lighting is not proposed along the remainder of the Expressway. Local road lighting will be reinstated where it currently exists and new lighting will be required at new intersections on the local road network, e.g. at the junction of Ōtaki Gorge Road and the new local arterial.

All road lighting will be designed to comply with Australian/New Zealand Standard – AS/NZS 1158.0:1997: Road Lighting.

Barrier Protection

All barrier protection will be designed in accordance with the appropriate versions at the time of the following standards:

- The Transit NZ M/23:2000 Guide for Road Safety Barrier Systems;
- AS/NZS 3845:1999 Road Safety Barrier Systems;
- The National Cooperative Highway Research Program (NCHRP) Report 350 - Recommended Procedures for the Safety and Performance Evaluation of Highway Features; and
- The Transit NZ Bridge Manual, September 2004 Revision.

The Expressway will have barriers installed as appropriate for each section of the Expressway. Local roads formed as part of the Project will have wire rope or guardrail type barriers installed where required, with a more substantial concrete and/or steel barrier installed on bridges over the Expressway. The Expressway itself will have wire rope or guardrail type barriers, where these are required, along its length. Across the Ōtaki River Bridge a rigid or semi-rigid bridge barrier will be used to protect vehicles. The remaining bridges that are part of the Expressway will have concrete and/or steel barriers on them.

At locations identified on the scheme plan set, areas of the median will be sealed to enable emergency services to drop the wire rope barrier and access the other carriageway in emergency situations. This will also include an emergency access to Gear Road at Te Horo.

Side barriers have been included in areas where the fill batters are steeper than 2(H):1(V). Where embankments are above 2m they have generally been steepened from 4(H):1(V) to 2(H):1(V) with side protection barriers also included.

A median width of up to 6m has been allowed for along most of the Expressway, except for the northern and southern ends. Generally this includes a grassed or sealed strip between the opposing lanes of the Expressway, and a 1m sealed shoulder either side of the median strip.

6.2.6 Interchanges and Local Connections

The layout of merges, diverges, on-ramps and off-ramps to the Expressway has been developed in accordance with the RoNS Design Standards and Guidelines (October 2009), as well as (in the case of merge and diverge design requirements) the following additional design standards:

- Manual of Traffic Signs and markings (MOTSAM), Part 3, Motorways and Expressways;
- State Highway Geometric Design Manual (SHGDM) (Draft);
- Austroads Guide to Traffic Management – Part 6: Intersections, Interchanges and Crossings; and
- Austroads Guide to Road Design – Part 4c: Interchanges.

There are two half-interchanges incorporated into the Project, north and south of Ōtaki Township. These provide access on and off the Expressway. To the south of Ōtaki access

will be provided for traffic driving to or from the south, and to the north of Ōtaki access will be provided for traffic driving to or from the north. At south Ōtaki, the interchange connects with Ōtaki Gorge Road bridge over the Expressway and NIMT, and leads to a new roundabout on the existing SH1 that enables access north and south along the existing SH1 alignment.

The new connection at Rahui Road is a bridge for vehicles and pedestrians over the Expressway and NIMT, which follows a similar alignment to the current road, and connects with the existing SH1 in Ōtaki.

The overbridge at Te Horo does not provide access on or off the Expressway, however it links School Road with Te Horo Beach Road to facilitate access between the two areas of Te Horo that are bisected by the transport corridor.

6.2.7 Pavements and Surfacing

The pavement design for the Project takes into account the following:

- Subgrade differential settlement issues;
- Rehabilitation of existing pavements;
- Construction methodology and impact on existing traffic;
- Use of locally available materials and recycling of existing pavement materials; and
- Surfacing considerations, including noise mitigation and high vehicle stress areas.

Expressway Pavement

The general pavement design for the Expressway is an unbound granular construction with a stabilised base course. The use of cement modification has been considered as a means of stabilising the pavement, and has currently been recommended by the NZTA's consultants on a "whole of life" risk basis. However, other forms of pavement stabilisation may also be considered to improve the strength and durability of the pavement.

Expressway Surfacing

The Expressway passes through the built up areas of Ōtaki Township and Te Horo settlement. In the Ōtaki urban areas (between the railway station and Waitohu Valley Road) the noise mitigation measures provided as part of the Project will incorporate the use of low traffic noise surfacing such as OGPA.

The use of OGPA as a noise mitigation measure is based on assessments undertaken by specialists using New Zealand Standard (NZS) 6806:2010 Acoustics – Road-traffic Noise – New and Altered Roads. Where OGPA (or similary) is used it will be necessary for the OGPA to be laid up to 12 months after the road is initially opened to ensure that the pavement has cured sufficiently and the OGPA is retained on the surface once vehicles start travelling over it.

The balance of the Expressway will have a chip seal surfacing.

Local Road Surfacing

Local roads will be surfaced with chip seal.

The Project also provides for development of property accesses, typically involving reshaping of entranceways, some additional drainage items and sealing from the road edge to the property boundary.

6.2.8 Bridges and Other Key Structures

The bridges and other key structures proposed for the Project are described below.

Bridges

The Project will involve the construction of a number of bridges. Three of the bridges will form part of the interchanges located north and south of the Ōtaki Township. The remaining bridges are required to take all or part of the carriageway across one or more of the following features:

- Existing SH1;
- Access roads and local roads;
- Rivers, streams and other waterways; or
- The NIMT.

Overall there are 10 key bridges incorporated into the Project, two of which run in parallel across the Ōtaki River (and are numbered as one structure). These are outlined in Table 6-1.

Urban design guidelines for bridge structures have been incorporated in the ULDF. The proposed bridge structures comply with these guidelines.

Table 6-1: PP2O Bridges

Bridge No.	Name	Description	Approx Length (m)	Approx Width (m)
9	Mary Crest	Expressway over NIMT & local access road	152	19.3
8	Te Horo	Local road over Expressway and NIMT	102	11.9
7	South Ōtaki	Local road over Expressway	58	15.4
6	South Ōtaki rail	Local road over NIMT	17.1	15.4
5	Ōtaki River Bridge (two parallel 2-lane bridges)	Expressway over Ōtaki River	332	23 (total)
4	Rahui Road	Rahui Road over Expressway and NIMT	115	13.9
3	Ōtaki North	Local Road over Expressway	36.2	16.9
2	Ōtaki North rail	Local road over NIMT	18.4	16.9
1	Waitohu	Expressway over Waitohu River	82	17

Five different types of bridges are proposed to be used for the Project. Indicative designs of each bridge, the effects of which have been assessed by relevant specialists, are incorporated in the Project design. The types of bridges proposed are:

- Architecturally designed super 'T' bridge;
- Hollow core bridge;
- Concrete Box bridge;
- Precast beam and slab bridge; and
- Super 'T' on circular columns.

Design of Bridges

The length, width and span arrangements of the bridges are generally governed by the roading geometry. Sloped abutment walls have generally been adopted (apart from in limited cases where they are not technically feasible) as these are considered visually superior to vertical abutment walls.

Bridge solutions with specific architectural treatment have been design at the more visible "local road over Expressway" crossings, and this is reflected in the bridge forms being proposed for the Ōtaki North (No. 7), Rahui (No. 6), Ōtaki South (No. 3) and Te Horo (No. 2) crossings.

Retaining Walls and Bridge Abutments

Mechanically Stabilised Earth walls (MSE walls) will generally be used in the areas of fill at bridge abutments. The walls will be formed as either vertical walls (in areas where space is constricted) or as 'spill through' abutments where additional space is available and a more open atmosphere is appropriate.

Retaining walls will generally be used in the following situations:

- At the abutments of some bridges; and
- Around the ramps of some interchanges.

All retaining walls will be designed in accordance with the Transit New Zealand Bridge Manual.

Further design detail on retaining walls can be found within Technical Report 4, Volume 3.

6.2.9 Noise Attenuation

The guiding approach for acoustic design is to address appropriately the adverse effects of road-traffic noise.

Noise attenuation design has been carried out in accordance with:

- NZS 6806:2010 Acoustics – Road Traffic Noise – New and Altered Roads.

Noise attenuation through design is achieved through a variety of measures, some of which are proposed in combination with others:

- Low-noise generating road surfacing (e.g. OGPA);
- Noise barriers (including noise walls), although none are required for the Project;
- Property boundary noise fences; and
- Where it has not proven practicable to reduce external noise to the levels set out in NZS 6806 through other means, acoustic insulation for the internal habitable spaces of buildings where noise sensitive activities (such as sleep) will be affected.

Consideration of noise and vibration from road and rail traffic has included both the Expressway and local road changes and connections, and the realigned section of the NIMT. It is noted that even though the Expressway generally follows or is near to the existing SH1 corridor, in some locations such as through Ōtaki, there will be an increase in road traffic noise experienced at dwellings as a result of a road being closer to that dwelling than the SH1 currently is.

A detailed Acoustics Assessment has been competed for the Project. The assessment of noise effects and the proposed mitigation measures are summarised in Part G, Chapter 22 of this AEE report and detailed within Technical Reports 14 and 15.

6.2.10 Surface Drainage, Stormwater Treatment and Flood Management

Flood Management

Parts of the Project traverse low-lying areas. As highlighted in previous chapters, several of the watercourses that will be crossed by the Project flood from time to time, predominantly the Ōtaki River, and Waitohu, Mangapouri and Mangaone Streams. A key aspect of the Project's design has been to ensure that it will not increase the flood risk for the community from these waterways. In achieving this outcome, the Project has recognised and worked in with existing KCDC/GWRC flood management strategies.

The Project has been designed to accommodate the passing of floodwater. The Expressway has been designed around the 'lifeline' concept where the Expressway is constructed as a raised embankment across the several floodplain areas and is elevated sufficiently so that it can act as a lifeline and remain open in flood conditions. This

concept does, however, counter the philosophy of allowing a flood to break out of its primary watercourse and follow a natural flow path to the sea. The existing NIMT and SH1 already traverse several flood plains which provides good comparable information on the affects of flooding. Currently culvert systems, such as the culvert systems on the Mangapouri Stream associated with the NIMT and County Road crossings, are designed to restrict flood flows to protect downstream properties, and the Project's design would maintain this function.

In some places it has been necessary to provide areas of additional flood water storage. To mitigate against increased peak run-off associated with the Expressway surface, attenuation will be provided to hold back stormwater, avoiding downstream flooding. This will be provided through the construction of swales alongside the Expressway and will require the establishment of stormwater ponds in the form of wetlands or basins. The incorporation of culverts at both wet and dry flow points in the embankments throughout the Expressway allows for drainage of floodwaters over their natural flow paths.

Culverts and Bridges

Existing watercourses will pass under the Expressway either by way of a culvert or beneath a bridge, depending on the size of the watercourse. The locations of the bridges have been described in Table 6-1, and culverts are described more in Chapters 17 and 18. Provision for fish passage is proposed in accordance with GWRC guidelines.

Surface Drainage

The majority of the Expressway is to be drained using a swale system. As such, there are few physical drainage devices such as sumps and manholes proposed. Where these are required, they are generally restricted to local roads and interchanges.

Run-off from the Expressway will generally be allowed to flow down the grassed/planted slopes adjoining the carriageway and collected in a swale at the toe of the slope. In some locations space will be constrained, or barriers/walls will be positioned along the edge of the Expressway. In these locations sumps would collect the run-off and drain it to either pipes or swales.

Bridge deck drainage will generally be achieved by collecting run-off from the bridge deck and discharging into the adjacent drainage system at the ends of the bridge.

For further details on the drainage methodology refer to Technical Report 10.

Stormwater Treatment

Treatment of run-off from the Expressway has been designed in accordance with NZTA's Stormwater Treatment Standard for State Highway Infrastructure.

The scheme design makes significant use of swales and a limited number of ponds for dealing with stormwater and, as such, there is no need for many permanent erosion and sediment control measures. The swale system provides a significant amount of treatment.

A large portion of the permanent stormwater devices will be able to be used for stormwater control as they are constructed, reducing the need for temporary erosion and sediment control measures.

Treatment of stormwater will occur through a combination of swales along the edge of the Expressway and/or wetlands or basins. The swales will either be planted with native wet tolerant species in areas of peat, or grassed in areas of sand. Where it is more topographically or ecologically appropriate, wetlands are proposed to be used. These will treat the run-off for gross debris, suspended sediment, heavy metals and hydrocarbons. All stormwater treatment systems will include safe access for maintenance. Typically, a 5m maintenance margin is provided around wetlands or basins, with excavator access ramps also provided for cleaning out of the sediment.

Wetlands

As stated above, wetlands provide an important measure through which stormwater treatment and attenuation can be created for drainage systems. The Project incorporates the construction of a small number of stormwater wetlands for this purpose.

Some existing wet depressions close to the Expressway which will have once been wetlands would be restored to assist with stormwater management. Natural wetlands with high ecological value that are not affected by the Expressway will not be utilised for stormwater treatment purposes. Where additional wetlands are required, they have been designed to replicate, as far as possible, the hydrological function/regime of a natural wetland.

6.2.11 Culverts

Culverts are considered to be most appropriate for crossing all waterways, with the exception of the Ōtaki River and the Waitohu Stream. Culverts are provided for the smaller streams that are both wet and dry. Culverts are also incorporated into the Expressway embankment where natural flow paths would otherwise have been interrupted.

Fish passage is to be provided for all culverts that will contain surface water flows. Culverts that are installed for stormwater drainage are not required to provide fish passage as these are not in watercourses or environments where fish species are likely to be present.

A schedule of the culverts, including location, approximate length and approximate size, is included within Technical Report 10, Volume 3.

6.2.12 Cycleway and Walkways

Walking and cycling provision on local road bridges crossing the Expressway will vary. On local road bridge connections the kerb side traffic lanes will be 4.2m wide to provide adequate space for cycling in the traffic lane. In conjunction with this, a 2.5m shared use path will be provided on one side of the bridge. In certain locations a 1.5m pedestrian path has been provided on the other side of the bridge. Details of these facilities are indicated on the bridge plan set in Volume 5 of this AEE report.

Based on discussions with KCDC, equestrian use across bridge structures assumes that horse riders will either utilise the road shoulders, or dismount and walk horses along the footpaths.

It is anticipated that once the Project has been constructed the existing SH1 alignment will provide a more attractive route for pedestrians, cyclists and equestrians.

6.2.13 Urban Design and Landscaping

Urban design considerations for the Project include:

- Road alignment;
- Interchange location, type and design;
- Retaining walls;
- Bridges/underpasses placement and design;
- Noise barriers type (bund/wall), height and design;
- Pedestrian/cycle and bridleway links;
- Stormwater wetlands and basins, ponds and swales;
- Culverts;
- "Road furniture" (side and median barriers, lighting, signage); and

- Landscape treatment and planting.

Further details on urban design considerations for the Expressway are provided within the ULDF, Technical Report 23.

Landscaping and visual design objectives for the Project include:

- Enhancing and retaining views of significant landscape features;
- Incorporating ecological mitigation measures;
- Providing for mitigation associated with earthworks;
- Integration of Expressway with surrounding landform;
- Maintaining visual buffers;
- Assisting with stormwater treatments; and
- Reinforcing safety requirements.

Planting constitutes a key aspect of the urban design and landscape aspects of the Expressway.

Further details on landscaping and visual design are provided within Technical Reports 7 and 8, as well as within the plan set in Volume 5 of the AEE report.

Chapter 7
Part D
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Network Utilities

Overview

This chapter sets out the effects of the Project on network utilities. The chapter further outlines how these effects are managed and what mitigation is proposed.

There are a number of networks within the Project area, however in all cases effects are able to be recognised during construction and managed appropriately.

Further information on measures to address effects on network utilities will guide construction in the form of a Network Utilities Management Plan (NUMP). This will include ongoing liaison with the relevant utility owners. Detail on the NUMP and on network utilities is contained in Technical Report 5, Volume 3.

7 Network Utilities

7.1 Introduction

There are a number of existing network utilities within the Project area, namely:

- Electricity distribution;
- Telecommunications facilities;
- Water, wastewater and stormwater;
- The Arcus Road Irrigation Scheme;
- Gas distribution; and
- Railways.

7.2 Existing Environment – Network Utilities

7.2.1 Electricity Distribution

The sole electricity provider for the Project area is Horowhenua Energy Limited (Electra). Electricity distribution infrastructure will be affected in a number of locations and will need to be protected or relocated. The network consists of above and below ground cables, typically 400V, 11kV and 33kV. There are two locations within the Project where Electra's overhead transmission assets will require relocation. These are at Mary Crest (over a distance of 1.1km) and between the North Ōtaki on ramp and Taylors Road (a distance of about 1.4km). None of the Electra substations are located close to the proposed Expressway alignment.

Transpower's Bunnythorpe to Haywards A (BPE-HAY-A) and B (BPE-HAY-B) 220 kV lines are about 2km to the west of the Expressway and are not affected.

7.2.2 Telecommunications Facilities

There are seven locations, listed below, within the Project area where Telecom has underground copper and/or fibre lines, all of which will require relocating.

- Existing SH1 ramp bridge;
- Rahui Road;
- Ōtaki Gorge Road;
- Old Hautere Road;
- From School Road to Gear Road;
- Mary Crest; and
- Te Hapua Road.

7.2.3 Water, Wastewater and Stormwater

KCDC provides water, wastewater and stormwater services for all the urban areas in the Kāpiti district. These services are predominantly located in the road corridors. Several water and stormwater lines will require either protection or relocation within the Project footprint. The only wastewater line that will require relocating or protecting, is along Rahui Road.

7.2.4 Arcus Road Irrigation Scheme

The Arcus Road irrigation scheme draws water from a bore 300m to the east of the Expressway alignment on the south bank of the Ōtaki River and then pipes it along the existing rail corridor south to Te Horo. The bore abstraction will be unaffected, however new sections of pipeline will be provided where the scheme crosses the Expressway near Ōtaki Gorge Road and north of Te Horo to ensure that the scheme is maintained.

7.2.5 Gas Distribution

There are two locations where local gas distribution assets are situated in the vicinity of the Project area. These assets are owned and operated by Vector Gas Limited. The first location is along Rahui Road in the existing carriageway which will require relocation or additional protection installed if they remain under the proposed overbridge embankment. The second location is from Te Horo Beach Road (chainage 7,200m) running south along the existing SH1 to Mary Crest (chainage 10,000m) where the Vector Gas pipeline is located in the western verge and may require local protection, however, no major relocation works are required.

7.2.6 Railway

The Expressway is parallel, and in close proximity, to the NIMT from Peka Peka Road northbound and will deviate away from the NIMT (arching away in a westerly direction) just south of the proposed Ōtaki southern interchange at chainage 4500m. Through Ōtaki the railway must be realigned to provide space for the Expressway. A new line is proposed, including a second track (that includes the replacement of a passing loop at the railway station) from Ōtaki to just south of the Waitohu bridge (chainage 900m).

All associated signals, utilities and controls associated with the realignment section will be relocated, or replaced, as part of the Project.

7.3 Assessment of Effects on Network Utilities

The Project philosophy towards planning for existing network utilities is to avoid disruption to services, where practicable. However, given the large scale of the Project and the presence of network utility infrastructure along the alignment, not all potential disruption effects can be avoided and various utilities will require protection or relocation during construction, which is likely to result in some disruption.

The intensity of network utilities near or within the residential area of Ōtaki is higher than in the rural or rural residential areas of Te Horo and Mary Crest and a greater number of network utilities in Ōtaki will be affected by the construction of the Project.

Concept solutions have been discussed with all affected network utility providers. The following approaches form the basis of the Project design response:

- To maintain full operation of services during construction of the Project;
- To protect existing services from potential damage caused by the Project operation or its construction;
- To protect the proposed Project from future damage and disruption caused by possible service failures (for example, burst water mains);

- To maintain accessibility to the services (for example, for maintenance and repairs);
- To relocate overhead services underground where they cross the Project;

The process for further engaging with network utility operators and exchanging information will be set out protocols in the NUMP. This will include the requirement for NZTA's contractors to work closely with the relevant utility owners' contractors to undertake the necessary protection and/or relocation works. The process will be undertaken in accordance with the NUMP, the preparation of which is proposed as a condition of the designation.

The NUMP will include:

- Protocols for liaison and information exchange between network utility providers and the NZTA;
- A process for network utility operator approval of proposed works on their utilities;
- Protocols for onsite works and responsibilities for both NZTA's contractors and the network utility operator;
- Protocols for utility operator design and supervision services; and
- Protocols for inspections and final approval of works by network utility operators.

7.3.1 Electricity Distribution

Consultation has taken place with Electra to identify where the Project will affect its services and how these services will be maintained during construction and operation.

Where the above-ground network crosses the Project, cables will likely be buried underground (for example, within ducting); existing below-ground services that cross the Project will require relocation or protection. Solutions for maintaining services will be incorporated into the Project and will be implemented during construction. Protocols for managing this process with network utility providers will be set out in the NUMP.

During construction there is potential for dust to settle on insulators, which may interfere with the lines. This will be managed through use of appropriate dust suppression which is outlined in Appendix C, Volume 4: Draft ESCP.

7.3.2 Telecommunications Infrastructure

Telecom has fibre optic cables that will be affected by the Project. Telecom also has copper lines that cross the Project. NZTA has consulted with Telecom to identify the number of cables affected and options for maintaining these utilities during construction and operation of the Project.

The options available are protection of cables where they cross the alignment, and / or realigning the cables so they are not affected. These solutions will be incorporated into the Project and will be undertaken during construction works. Any adverse effects on telecommunications infrastructure will be avoided or appropriately mitigated.

7.3.3 Water, Wastewater and Stormwater Infrastructure

No particular issues are anticipated with re-alignment of these services. A number of pipes cross the Project, and the NUMP will guide how these relocations are to be carried out during the construction period. Any potential adverse effects on local water, wastewater and stormwater systems will be avoided or appropriately mitigated.

7.3.4 Arcus Road Irrigation Scheme

New sections of pipeline will be provided where the scheme crosses the Project near Ōtaki Gorge Road and north of Te Horo to ensure that the scheme is maintained.

7.3.5 Gas Distribution

As outlined above, Vector has a gas pipeline corridor that crosses the alignment at Rahui Road and between Te Horo Beach Road and Mary Crest. Vector has been consulted on the Project design and its implications for its pipelines.

Any required protection or re-alignment of the gas pipelines and/or point where gas is delivered to a property, is intended to be co-ordinated with the construction of the Project. NZTA will work closely with Vector to avoid and mitigate potential adverse effects on their gas pipeline network to an acceptable level.

7.3.6 Rail Infrastructure

The Expressway requires the realignment of the NIMT through the Ōtaki township. The NIMT realignment is expected to be completed before the construction of the Expressway starts and once the Expressway is operational there will be no adverse effects on the operation of the NIMT corridor.

As noted above, the Expressway is parallel, and in close proximity, to the NIMT. Without mitigation, the operation of the NIMT could be adversely affected during the construction period. Potential effects include dust settling on railway infrastructure and interfering with its operation. Dust control will be appropriately managed in accordance with the CEMP (for example, by the use of dust suppressants, or damping down surfaces). Subject to implementation of the CEMP, any adverse effects on the operation of the NIMT will be avoided or mitigated to an acceptable level.

7.4 Measures to Avoid, Remedy or Mitigate Adverse Effects

The adverse effects on network utilities are likely to occur during construction of the Expressway, and will be avoided, remedied or mitigated using the methods discussed in 7.3 above. A number of the utility services that cross the Expressway alignment have not had potential relocation plans finalised, these plans are to be completed in conjunction with the NUMP and further liaison with the utility authorities, prior to construction of the Expressway. Conditions detailing the measures to mitigate construction effects, including in relation to the NUMP, are described in Part H, Chapter 31 of this AEE report.

Chapter 8
Part D
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Construction of the Project

Overview

This chapter provides an overview of the proposed methodologies for the construction of the Project. The information presented in this section is further detailed in the Construction Methodology in Technical Report 5, Volume 3.

Construction of the Project will cause adverse environmental effects. These will be mitigated through a variety of detailed measures, including noise, vibration, dust, water and traffic effects, as summarised in Part G of this report. The draft CEMP (Volume 4) addresses the anticipated construction elements, environmental management, and monitoring procedures for the Project to deliver appropriate environmental outcomes.

The construction of the Project will take approximately 3.5 – 4 years to complete and will be progressed in several stages throughout the approximate 13km length of the Project. The management plans to support construction and the mitigation of construction effects are controlled through conditions outlined in Part H.

8 Construction of the Project

8.1 Introduction

The Project construction methodology described within this Chapter has been developed and refined to identify and assess the potential environmental effects of construction. Final construction methodology will be developed by the contractor once conditions are confirmed and further design has been undertaken. Potential options are identified to avoid, remedy or mitigate these effects as appropriate.

This Chapter provides an overview of the proposed construction methodology across the Project, followed by further information in regard to the nature, scale and duration of construction activities throughout the separate Project areas including:

- Pre-construction considerations;
- Construction programme;
- Construction establishment; and
- Construction activities.

Technical Reports and Plans are referred to where relevant; more detailed information about the Project and specific plans can be found in these reports and plans. Volume 4 contains the draft CEMP, as well as the appended suite of specific Management Plans.

The approach adopted by the NZTA and KiwiRail is to treat construction of the Project – both the Expressway and the NIMT realignment aspects – as an integrated process. This is achieved through largely identical proposed construction conditions (albeit that the final form of the Expressway and NIMT aspects of the Project will be different, and fit for their respective purposes). The NIMT realignment, however, is expected to be completed before the construction of the Expressway starts. This will enable rail services to continue while the Expressway is under construction.

8.2 Pre-Construction Considerations

8.2.1 Construction Environmental Management

During construction, specific mitigation measures and environmental monitoring will be required to ensure that potential adverse effects on the environment are avoided, remedied or mitigated, as appropriate.

A draft CEMP has been prepared for the Project (refer to Volume 4). The CEMP outlines the environmental management and monitoring procedures to be implemented during the Project's construction phase. The CEMP outlines details of the "who, what, where and when" in respect of the environmental management and mitigation measures to be implemented. The CEMP appended to this AEE report is a draft and will be updated and modified as appropriate once a contractor is on board.

The principles and general approach to managing the environmental effects are set out in the main body of the CEMP. The management of specific construction effects (such as discharges to air, noise and vibration) is set out in more particular detail within the suite of environmental management plans (subplans) that form the appendices to the CEMP.

The CEMP, its subplans, and other site-specific environmental management plans for locations along the route, are to be consistent with and complement the AEE report, and have been developed in accordance with the proposed designation/consent conditions.

Once the conditions have been confirmed through the consenting process, the CEMP will be reviewed and updated (if required) in conjunction with the contractor prior to works commencing.

8.2.2 Erosion and Sediment Control

The most significant component for compliance during construction is typically erosion and sediment control measures. The Project design makes significant use of swales and ponds for dealing with stormwater during the operation of the Project, which have a complementary function of controlling any sediment run-off during construction. Designs for temporary basin requirements have been completed, however for construction effects it is expected that a large portion of the permanent stormwater devices will be able to be used as they are built, minimising the need for additional temporary erosion and sediment control measures.

Effects will be managed in accordance with GWRC erosion and sediment control guidelines, namely:

- *Greater Wellington Regional Council's Sediment and Erosion Control Guidelines (2006).*

Erosion and sediment control measures will be installed, monitored and maintained throughout the works to control and mitigate the effects of sediment run-off until the site is stabilised.

The draft ESCP provides an overview of the erosion and sediment management techniques and measures that will be used by the Project. It outlines methodologies and management techniques that will be applied to achieve the environmental management outcomes required by the Conditions. Given the scale of the Project, SSEMPs for all areas along the alignment will be developed to detail the specific erosion and sediment control measures to be utilised.

Specific details of the erosion and sediment control measures that have been developed for the Project works can be found in the ESCP (Appendix C, Volume 4).

Principles for Erosion and Sediment Control

The main philosophy in relation to erosion and sediment control for construction of the Project is to limit sediment run-off beyond the construction site to an acceptable level.

The principles followed to deliver sediment control for the Project include one or more of those set out below:

- Preparatory environmental works:
  - Environmental controls will be established ahead of major works, such as sediment fences, bunds, ponds or other devices.
- Stage construction:
  - The construction will be staged so as to limit the areas of open earthworks.
- Minimise disturbance:
  - The design of the location and detail that has occurred to date has been to minimise the earthworks footprint as far as practicable.
- Protection of water bodies:
  - The Project will require construction in several water bodies (including culverts and bridges) as well as temporary and permanent stream diversions. There are also earthworks proposed throughout the Project length; as the Project crosses a number of watercourses, there will also therefore be earthworks adjacent to water bodies that require special measures to manage environmental effects. The erosion and sediment control measures adopted will consider the site-specific requirements of each structure or diversion. The measures to be implemented are identified in the ESCP, as contained in Appendix C to the CEMP in Volume 4.
  - Careful planning and placement of diversion bunds, rock check dams and erosion control techniques within water bodies, will be implemented to minimise uncontrolled release of sediment during rain events.
- Installation of perimeter controls:
  - Diversion drains, silt fences and earth bunds will be used both downstream and within all earthworks sites, as appropriate.
- Sediment retention devices:
  - Sediment retention devices will be installed prior to the commencement of works. In areas where space is limited, earth decanting bunds, structures or traps may need to be used instead of ponds.

Chemically Treated Ponds

All sediment retention ponds and smaller settlement devices will include a rain gauge and flow activated chemical treatment that will enhance settling performance. Depending on soil type, there may be requirements for dual doses of chemicals, the first to correct high or low pH of the inflow and the second being the addition of a settling agent. The chemical dosing is a means of ensuring the sediment settles out of the water, and thereby improves the visual clarity of the water ultimately discharged.

Performance Monitoring

A set of performance criteria to monitor erosion and sediment control for the Project have been developed as part of the management plan suite submitted with this AEE Report and are included in the ESCP. These will contain clear statements of what is being measured, and what this is being assessed against. This will enable feedback to be given by the statutory monitoring bodies to the contractor and the requiring authority, on the performance of sediment control features.

Temporary Stormwater Management

Works in and around urban areas will need to ensure that run-off from the Project construction site does not contaminate the existing stormwater system. The erosion and

sediment control measures detailed above will be utilised as and where required, however additional bunding and/or water diversions may be required to ensure stormwater systems are not contaminated. Where construction works require the relocation of existing stormwater infrastructure, this will be undertaken in a manner and supported through the use of physical management and mitigation measures, that ensures that uncontrolled run-off is unable to enter the stormwater network. Further details on stormwater management and sedimentation control are contained in the Management Plans submitted with the application, Volume 4.

Site Stabilisation

An essential aspect of the erosion and sediment control measures will be the stabilisation of disturbed land as soon as practicable. The treatment options for site stabilisation include the use of top soil (where necessary), seed and mulch. Detail on this is contained in the Construction Methodology Report, Technical Report 5, and in the Management Plans in Volume 4.

Stabilisation will apply particularly with respect to batter establishment, and will be designed for both erosion control and dust minimisation. Water carts will be used to disperse water to be used for dust suppression.

Stream Works

Given the high risk of sedimentation and the sensitivity of the receiving environment, any works required within streams or rivers will be undertaken in a "dry" environment where this is feasible. This will apply to the diversion of flows around the area of works or when working directly above the stream with no formal stream diversion required. In determining the type of works, consideration will also be given to fish spawning and migration periods, during which time in-stream works will be restricted. These restrictions are identified in the technical reports, and reflected in conditions proposed in Part H, Chapter 32 of this AEE report.

Where there is no ability to work within a dry watercourse environment, appropriate temporary diversions will be installed and managed to minimise the potential for downstream adverse effects on water quality as a result of disturbance of the riverbed.

8.2.3 Temporary Traffic Management and Access

Construction of the Project involves truck movements, lane and intersection closures and periods of lowered speed limits on some roads, all of which have the potential to cause inconvenience to road users and residents. A draft CTMP is included as Appendix G of the CEMP, Volume 4, detailing traffic management methodologies and mitigation measures to be adopted for the Project during construction.

The CTMP details the traffic control activities and the effects on pedestrians, cyclists, residents, businesses, public transport, and general traffic. Typical mitigation measures that will be considered in the development of SSEMPs are presented that will form the basis for management of construction traffic and traffic affected by construction.

8.2.4 Noise and Vibration

Noise and vibration will result from construction activities. To mitigate the effects of this, a draft CNVMP has been prepared, outlining the specific effects of noise and vibration during construction and how these can be mitigated where these are at a level that is of concern (Appendix A of the CEMP, Volume 4). Conditions are proposed to ensure that the CNVMP contains the detail it is required to.

Figure 8-1:
Project Sections

8.3 Construction Programme

An indicative Construction Programme for the Project has been developed and is described in detail in the Construction Methodology Report (Technical Report 5, Volume 3). This was developed for two reasons:

- To understand the duration of the Project to enable a better understanding of cost; and
- To recognise the potential complexities in the construction programme, allowing identification of potential opportunities and to recognise the critical path activities.

The programme has been developed using the Project team's construction knowledge.

8.3.1 Construction Duration

The construction period is 3.5 – 4 years, as determined by the indicative Construction Programme.

Commencement of construction is dependent on securing funding and the contractor being engaged. Specific details such as when road closures might occur will be developed at a later date with the contractor, immediately prior to construction starting. This will form part of the CEMP.

Works will generally be undertaken during daylight hours except where operations are being carried out on or adjacent to an existing road or over roads and rail that will require work to be undertaken during off-peak hours at night.

8.3.2 Construction Sections

Figure 9-1 above shows the Project sections that have been used to develop the Indicative Construction Programme.

The stages (identified as STA) are (from north to south):

- Section 1 – Ōtaki North through to Ōtaki River Bridge STA 0 to STA 3500 including NIMT;
- Section 2 – Ōtaki River Bridge to Old Hautere Road STA 3500 to STA 5250;
- Section 3 – Old Hautere Road to Te Horo STA 5250 to STA 8600; and
- Section 4 – Te Horo to Peka Peka Interchange STA 8600 to STA 12250.

8.3.3 Construction Sequence

The construction sequence has been broken down into several stages over the 3.5 – 4 year construction period, and is depicted in Figure 8-2 below.

Prior to any construction activities commencing on a particular site, a number of site establishment activities will be required, which will include site clearance, service relocations, establishment of erosion and sediment control measures and ground preparations.

The Ōtaki River bridges and the bridge crossings over the railway line north of Ōtaki and at Rahui Road will be commenced early in the programme. This is to facilitate the movement of cut material and to assist works required for the Project in the vicinity of the Ōtaki township.

While commencing works at Section 2 may not immediately seem logical, the construction of the bridges over the railway line at North Ōtaki and Rahui Road are required before any earthworks can occur in Section 1. By undertaking the works in this order the Project can complete the realignment of the NIMT, works relating to Ōtaki Railway Station and service relocations prior to any roading works occurring, giving the space and opportunity for works to be unhindered.

As the road over rail bridge abutments at Mary Crest are founded in an area of peat, preloading of materials is required prior to construction taking place. This preloading imposes a 12 month waiting period prior to any bridge works being able to occur in that area. As such, construction of the Mary Crest Bridge will not be undertaken until later in the construction sequence.

Finishing works such as landscaping and planting will be undertaken at the end of the Project construction.

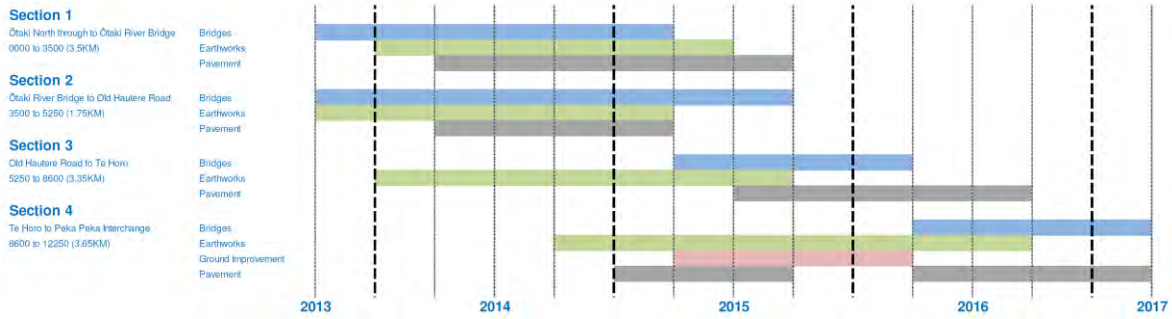


Figure 8-2: Indicative Project construction sequence

8.4 Construction Establishment

8.4.1 Site Access

Local roads will provide the access points to much of the construction site. A CTMP will be implemented along with the stabilisation of entrance ways and areas to be used by construction traffic. The Expressway alignment will be used as a haul road once it has been established. Details on likely local roads and effects, as well as the timing around construction, are contained in Technical Report 5, Volume 3.

8.4.2 Site Security and Fencing

Site fencing and security gates will be installed throughout access points along the extent of the Project and at construction compounds.

8.4.3 Construction Compounds

Due to the lineal extent of the Project, several site construction compounds will be required. All yards will be fully fenced and made secure. Site establishment activities for construction yards will include site clearance, ground preparation, and establishing erosion and sediment control measures prior to any construction activities occurring. Upon completion of the works, the construction yards will be disestablished and the areas reinstated. All construction yard and compounds are located within the designation boundaries.

Main Contractor's Compound

The main contractor's compound is proposed to be located between the existing SH1 and the Expressway north of the Ōtaki River. This location is on the outskirts of Ōtaki and is separated from residential properties by both SH1 and the NIMT. Safe access to this area is provided from both sides of SH1 through access points used currently by Winstone Quarry and Stresscrete Ōtaki.

The functions of the main contractor's compound are as follows:

- Main administrative centre and welfare facility;

- Plant/equipment storage and workshop;
- Local access to alignment;
- Delivery point for materials into site; and
- Management and disposal of site and office waste.

The main contractor's compound will be approximately 1.5ha in size.

Local Construction Compounds

A local construction compound will be set up in each of the four Construction Sections, mainly in conjunction with bridge construction. The locations of these are shown on the plan set within Volume 5.

The services provided through the local construction compounds will be:

- Welfare/small office facility;
- Local plant/equipment storage;
- Local access to alignment;
- Delivery point for construction materials; and
- Collection of site waste.

8.4.4 Water Required for Construction

Water will be required to carry out a number of construction activities, including dust suppression, compaction of granular materials, ground improvements and structural work.

Where practicable, and to minimise the impact on water availability, water from sediment retention devices will be reused in construction operations. Bores are likely to be required and consent for the construction of these and the taking and use of ground water for construction purposes has been sought.

Proposed locations for water take have been identified as follows:

- Mary Crest area by the proposed attenuation pond;
- Te Horo Beach Road area near the local road ;
- North of the Ōtaki River;
- South of the Waitohu Stream; and
- Peka Peka Interchange area (ex-M2PP Project bore).

Peak water demand is likely to occur during drier months and at peak construction periods in each bore location. Even though the required volume would be expected to decrease during periods of wet weather, up to 300m^3 of water will be required per day at peak times during construction.

8.4.5 Materials Required for Construction

The sourcing of material for fill (where there is no excess within the Project length) will be carefully managed during construction to minimise both haul distances to each embankment and truck movements from each site.

There are a number of local options for sourcing the imported fill, which include:

- Kāpiti Quarry;
- Ōtaki Quarry (including Ōtaki River); and
- Waitohu Quarry.

The rate of consumption of specialised materials, e.g. base course of the required standard, may not be manageable from one source, and therefore multiple supply sources may be required.

Other materials that are likely to be manufactured off-site and then transported to site as required include:

- Steel required for structural components;
- Surfacing materials (including bitumen);
- Bridging materials;
- Road furniture such as lights, signage, barriers;
- Stormwater treatment and erosion and sediment control devices; and
- Pipes and drainage materials.

8.4.6 Construction Lighting / Night Work

Typically construction will occur during the day. However, in limited instances where construction operations are on or very near existing roads or rail, and are likely to cause disruption to traffic, work will take place at night. In these areas temporary lighting towers will be utilised. Portable generator driven lighting towers will be brought to the site and used where required.

In some of the construction areas permanent lighting will be required. This will be provided as early as possible and supplemented with portable lighting where necessary.

Each construction yard area will utilise temporary lighting to enable operations to proceed during the hours of darkness during the winter period should this be identified as required by the contractor. In addition, lighting will be provided to guide staff, plant and vehicles at the start and end of each shift during the winter months.

The effects of the lighting will be controlled through placement and orientation of the lights so they direct into the construction area, rather than over adjoining properties and dwellings. Further, the lights will be oriented downward and shielding will be installed where required to manage light spill.

Conditions are proposed in Part H, Chapter 31 to address these issues.

8.5 Construction Activities

8.5.1 Earthworks

The Project involves approximately 800,000m^3 of cut-to-fill and 45,000m^3 of imported fill across the 4 construction sections. Figure 8-3 and Figure 8-4 show the cut/fill comparison and the earthwork ground profiles respectively. It can be seen in both figures that there is a general balance of materials throughout the Project area.

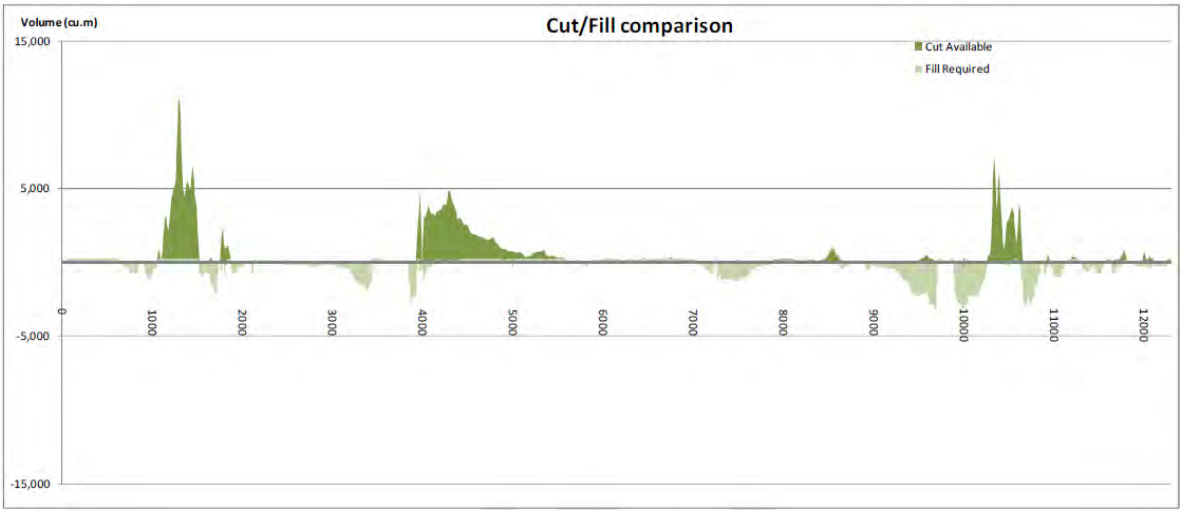


Figure 8-3: Cut/Fill Comparison

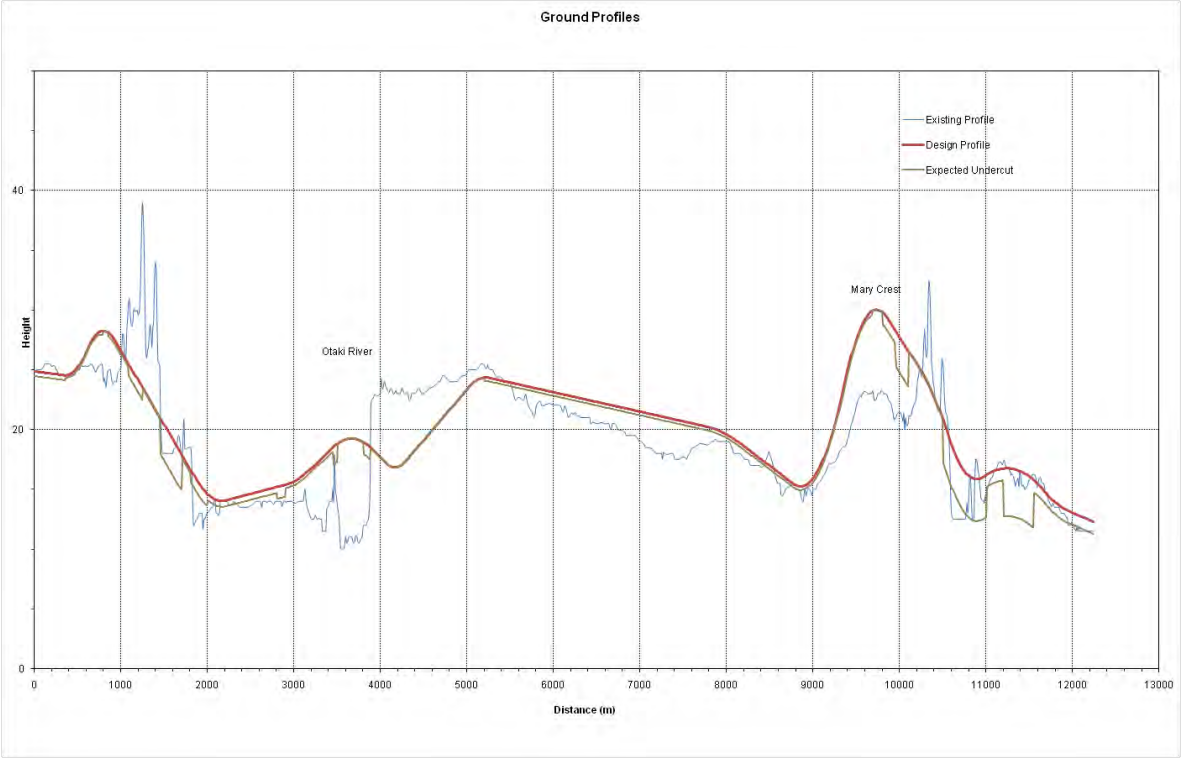


Figure 8-4: Earthworks Ground Profiles

Each section of the Project will be progressed as an individual work package. Erosion and sediment control measures will be implemented to suit earthworks phasing. Initial topsoil stripping will be undertaken by grading topsoil into bunds along the edge of the works. This will serve as temporary storage and as a clear water diversion and rationalise the cartage of topsoil around the site.

The swales at the sides of the Expressway alignment can be progressively excavated from the outset along with the implementation of other drainage elements such as wetlands, basins and flood offset storage areas. These form temporary erosion and sediment control devices. Topsoil can be spread and stabilised through grass seed and straw.

Earthworks Undercutting and Cut-to-Fill

All undercut fill can be disposed of on site. Undercut areas will be backfilled with sand for compaction purposes, reducing the impact on groundwater. Unsuitable undercut material will be used for non-structural fill material and for use in landscape bunds.

Ground Improvements

The Project traverses dune sands, river gravels, and there are known peat deposits south of Mary Crest. Peat deposits present in the low lying inter-dunal depressions are generally soft, with high organic content. Groundwater is typically encountered at a shallow depth in the peat deposits.

Where peat deposits are present below the new road embankments, ground improvements are required to limit post-construction settlement of the Expressway. The treatment approaches will be specifically tailored along the length of the Expressway to the south of Mary Crest depending on the depth and extent of the peat expected to be encountered and the sensitivity of adjacent areas.

Peat deposits will be undercut to a depth of 3m below existing ground or new subgrade level, whichever is lower. Excavated material will be replaced with imported engineered

fill. If unsuitable ground remains at a depth below 3m, preload will be utilised which may be left in place for up to 12 months, allowing consolidation to occur. Due to the potential shortage of suitable earthworks fill material, any suitable materials for preload use may be re-used once the settlement period has been completed. Where possible, preload embankments will utilise material generated from the construction of the Expressway, however in some cases there may be a requirement for imported fill to be utilised.

Other ground improvement methods that may be utilised if unforeseen ground conditions arise, including:

- Soil mixing using lime or other cement materials, to bind the soil particles together and stabilise the soil;
- Vibro-compaction/replacement, to provide a denser soil base; and
- Installing stone columns to reduce slope movement.

Dust Control During Construction

Water carts will spread water to suppress dust. Water will be extracted from bores or sediment ponds, where possible, along the alignment. Where there is material mounded on a construction site, an alternative means of managing dust is to cover it.

8.5.2 Haul Roads

The Project intends to use the Expressway alignment, once possible, as a haul road prior to the commissioning of the Project. This will minimise construction traffic effects, particularly for large loads on the surrounding local roads.

8.5.3 Bridge Construction

The construction of the bridges will be a significant part of the Project. There are 10 bridges to be constructed, three of which are within the existing watercourses of the Waitohu Stream and the Ōtaki River where the crossing consists of two parallel bridges. The management of the construction effects of these structures will be included within the SSEMPs.

Site access, fencing, and erosion and sediment control measures will be developed for each bridge prior to construction, regardless of whether the bridge is a road or rail crossing, or stream/river crossing.

Bridge construction will typically involve piling operations and reinforced concrete column and crosshead construction. Bridge beams will likely be cast off-site and then transported to site and placed in position with the top slab cast in situ. Barriers will also be precast and settlement slabs and wing walls cast in situ. The likely sequence of bridge construction is detailed within the Construction Methodology (Technical Report 5, Volume 3).

Concrete supply will likely be from a supplier local to the Ōtaki / Peka Peka area. Concrete deliveries to all sites will be via SH1 or local roads.

Environmental controls for the various bridges will be designed dependent on the risks and location of the bridge. This will include the design, size, and location of piles, abutments, and the height of the deck of the structure. Road bridges will have differing environmental controls to stream/river crossings and SSEMPs will be required for each.

The Draft CTMP (Appendix G, Volume 4) details methods to manage vehicular, pedestrian, cyclist and equestrian traffic during bridge construction.

8.5.4 Pavement Construction

Upon completion of the earthworks subgrade and stormwater drainage in each section, pavement construction will be undertaken, along with traffic services. One carriageway of

the Expressway will be completed and sealed to enable immediate protection of the sub grade pavement layers while the construction of the opposite carriageway is completed.

Materials for pavement use will be imported to site via SH1 and local roads, with completed sections of the Expressway utilised as a haulage route – reducing the effects of construction on the local roading network.

Final surfacing will be a two-coat chip seal and, where required through Ōtaki township, OGPA surfacing (or similar) for acoustic purposes.

Once all works are complete within each carriageway section, traffic services, roadside furniture and landscaping, including acoustic barriers, will be installed.

8.6 Sector-Specific Construction Activities

The Construction Methodology Report (Technical Report 5, Volume 3) outlines the construction methodology specific for each of the four sections of the Project listed below:

- Section 1 – Ōtaki North through to Ōtaki River Bridge STA 0000 to STA 3500 including NIMT;
- Section 2 – Ōtaki River Bridge to Old Hautere Road STA 3500 to STA 5250;
- Section 3 – Old Hautere Road to Te Horo STA 5250 to STA 8600; and
- Section 4 – Te Horo to Peka Peka Interchange STA 8600 to STA 12250.

The construction methodology specific to each section ensures that the principles discussed above that apply to the whole Project are followed and adopted and that best practice is adhered to.

Chapter 9
Part E
VOLUME 2

Consideration of Alternatives

Overview

The NZTA and its predecessors carried out (or commissioned) numerous historical assessments of alternative State highway routes through the Kāpiti district, including between Peka Peka and Ōtaki.

In developing the Project, that historical work was examined and brought up to date. The updated assessment involved detailed multi-criteria analysis of four alternative routes, a western route, a central route closely following the existing SH1 (which was ultimately preferred for the Expressway), and two routes to the east, the 'eastern plains' and 'eastern foothills' routes.

The NZTA's conclusion (in late 2011) was that the central route, which had previously been presented to and discussed with the local communities as the NZTA's preferred option, was confirmed to achieve the best fit with the NZTA's Project objectives and statutory obligations. In large part this is because the route chosen for the Expressway allows ready access between the Expressway and Ōtaki (including the Ōtaki Railway Retail area), and best integrates the Project with the Kāpiti district's existing infrastructure and land use planning framework.

Parallel processes for defining the Expressway route were conducted during 2010 and 2011. These processes focused on the location of interchanges and cross-corridor local connections, and specific Expressway route choices. The processes were informed by specialist inputs from a multi-disciplinary expert team. Public consultation and meetings with key stakeholders provided valuable feedback that was factored into the NZTA's decisions on options.

As a result of these processes, the Project design incorporates:

- Half-interchanges to the north and south of Ōtaki, providing full access from the Expressway to the Ōtaki Railway Retail area and vice versa;
- The following cross-corridor local connections:
  - At Te Horo, a local road bridge over the Expressway, NIMT, and the existing SH1, connecting residences and businesses to the east and west of the transport corridor – a more northerly location was chosen because of preferences expressed by Te Horo residents during consultation;
  - Just south of Ōtaki River, new local roads and bridges across the Expressway and NIMT, connecting Ōtaki Gorge Road and Old Hautere Road with the existing SH1 to provide access to and from Ōtaki, and linking to the Expressway (heading south); and
  - At Rahui Road in Ōtaki, a local road bridge across the Expressway and realigned NIMT, linking the Ōtaki Railway Retail area with residential areas to the east;
- Specific provision for cyclists and pedestrians on all cross-corridor local connections;
- An alignment at Mary Crest that avoids significant indigenous vegetation remnants and sites/areas of cultural significance; and
- An alignment at Te Horo that facilitates the benefits of the Mary Crest alignment, and enhances safety and urban design outcomes.

Overview (cont)

KiwiRail has also considered alternatives in relation to the realignment of the short section of the NIMT through Ōtaki, necessitated by the route of the Expressway.

The realigned NIMT largely runs parallel and immediately to the west of the Expressway, which minimises the inaccessible land between the two. The chosen alignment also enables the continued use of the historic Ōtaki Railway Station in its current setting, with the Station building and platform adjusted to remain parallel to the realigned railway track.

9 Consideration of Alternatives

9.1 Introduction

This chapter summarises the key aspects of the processes by which the NZTA and KiwiRail have considered alternatives in the development of the Project. The detailed assessment of route alternatives can be found in Technical Report 3 (Route Options Review), in Volume 3 of this AEE report.

The types of alternatives considered include:

- Alternatives relating to the Expressway route;
- Alternative roading alignments within the proposed route;
- Potential alternative interchanges to provide access across the Expressway in its proposed route; and
- Alternatives in respect of the rail aspects of the Project.

The statutory requirement to consider alternatives is outlined in relation to both notices of requirement and resource consents. The process that has led to the development of the Project and the alternatives that have been considered in depth are then covered in more detail in the following sections of this Chapter.

In terms of routes for the Expressway, various alternatives have historically been considered over a long period and across various reports. In developing the Project, the NZTA commissioned an expert in alternatives assessment to review the historical work, update it as necessary, and bring it together in a comprehensive report. A separate Route Options Review was carried out, which documents the range of feasible routes considered. The results of these reviews are appended to this application as Technical Report 3 in Volume 3.

The NZTA's consideration of alternatives has benefited from the consultation process, which has helped identify the factors that the stakeholders and the community consider important in the Project area. Submitters also put forward suggestions for the corridor itself during consultation. These suggestions and values, combined with expert assessment of other aspects such as ecology, transport, noise, geology, and hydrology, have all formed part of the NZTA's overall process for assessing alternatives.

The finalised Expressway route chosen by the NZTA necessitates realignment of a section of the NIMT, which is the subject of a separate NoR. In terms of the alternatives considered in respect of KiwiRail's NoR, the short length of the realigned NIMT and the significant environmental constraints on the design meant that a limited range of alternatives were able to be assessed from a technical feasibility perspective, or acceptable in environmental terms. Alternatives that were identified were assessed as part of the design process.

9.2 Statutory Context for Consideration of Alternatives

Under the RMA, a consideration of alternative sites, routes, and methods is relevant in certain specific respects, including:

- In relation to an NoR, one of the matters to which particular regard must be had is to whether adequate consideration has been given to alternative sites, routes and methods of undertaking the work (where a requiring authority does not have an interest in the land sufficient for undertaking the work, or it is likely that work will have a significant adverse effect on the environment) – section 171(1)(b); and
- In relation to resource consent applications, the Fourth Schedule states that an AEE should include a description of possible alternative locations or methods for undertaking the activity where it is likely that the activity will have a significant adverse effect on the environment, Schedule 4 clause 1(b).

The requirements of those provisions specifically relevant to both NoRs and resource consents are briefly described below.

Moreover, in relation to applications for discharge permits, section 105 requires decision-makers to have regard to various matters including "any possible alternative methods of discharge, including discharge into any other receiving environment". This is addressed in the Stormwater Technical Report, number 10 in Volume 3 and an assessment is provided in Chapter 33.9 of this AEE report.

The RMA also specifies a "best practicable option" regime in relation to noise (section 16) and this is addressed in the Noise Technical Report, numbers 14 and 15, in Volume 3.

9.2.1 Section 171(1)(b) - NoR

Section 171(1) outlines how a territorial authority must consider effects on the environment, with subsection (b) addressing the issue of whether or not adequate consideration has been given by the requiring authority to alternative sites, routes, or methods of undertaking the work if:

> *The requiring authority does not have an interest in the land sufficient for undertaking the work; or*
>
> *It is likely that the work will have a significant adverse effect on the environment.*

The NZTA and KiwiRail do not have an interest in all of the land required for the Project. While in many cases negotiations are well underway, the Crown will continue to seek to acquire the necessary property interests after the NoR has been lodged. Property acquisitions will likely not be completed by the time the NoR has been determined, and therefore a consideration of alternative sites, routes and methods is required under s171(1)(a).

In respect of the Expressway, the alternatives considered by the NZTA are those that are within its powers to undertake and that will assist it to achieve its objectives for the Project. This means that, for example, improvements in public transport between Wellington City and the Kāpiti Coast were not considered as an alternative the Project, as the provision of public transport is outside the scope of NZTA's statutory powers under the LTMA and the GRPA. However, the potential effects that the Project may have on public transport for travelling in to or out of, as well as within, the Project area have been considered.

9.2.2 Resource Consent Applications

Schedule 4 of the RMA requires that alternative locations or methods of undertaking an activity be described where the proposed activity is likely to have any significant adverse effects on the environment. In respect of the Project, this exercise is intertwined with the consideration of alternative route, sites, and methods undertaken for the NoRs.

9.3 Base Information – Constraint Analysis

To adequately identify and refine each of the alternative corridors and alternative alignments within the proposed corridor, a study was undertaken to map specific features within the Project area that could act as a potential constraint to the Project. Constraint information has been considered over time across the various investigations and reports. For the recent (2011) Route Options Review, the constraints information was updated. These included:

- Further site visits and ground photography to examine the existing environment in respect of the possible alternative locations of the route;
- Reviewing previous transport studies, and collecting transport data;
- Preparing relevant desktop studies, including a district plan review; and
- Considering consultation feedback.

There were a number of constraints that were identified through this process and that have relevance in the consideration of alternatives. These constraints generally fell into the following areas:

- Environmental/ecological constraints (for example: indigenous vegetation, wetlands, aquatic wildlife);
- Cultural/heritage constraints (for example: areas of cultural importance to iwi);
- Archaeological constraints (for example: known archaeological sites, and the potential for unknown archaeological sites to be found;
- Land use constraints (for example: existing land uses);
- Social and community constraints (for example: property acquisitions, proximity, displacement costs, community severance);
- Landscape and visual constraints (for example: associated embankments, construction impacts);
- Geology and ground conditions (for example: the presence of peat deposits and sand dunes);
- Hydrology and stormwater constraints (for example: flood levels); and
- Urban design constraints (for example: urban form and connectivity between the eastern and western sides of the alternative corridors).

These constraints were assessed in the analysis of the proposal and fed into the development and overall decision of the preferred route. The scheme plan set in Volume 5 shows some of the constraints identified through the process.

9.4 Option and Evaluation Process

9.4.1 Introduction

A structured process was followed to identify, assess, screen, and develop the various alternatives relating to the Project. This section of the AEE report provides an overview which outlines the broad processes that have been undertaken in assessing alternatives and reaching final decisions regarding the alignment, interchanges, and other aspects of the Project design. These elements are then discussed in further depth and the results given in the following sections.

9.4.2 Overall Process

The process in determining and evaluating the overall corridors and routes that were considered went through the following steps:

- Screening of historical route options considered;

- Identifying any further options requiring consideration;
- Scoping of technical review and feasibility of options;
- Review and preliminary evaluation by specialist experts;
- Multi-Criteria analysis; and
- Reporting.

Potential route, alignment, interchanges and cross-connection alternatives were identified and then assessed, to determine if they were technically feasible from an engineering and transportation perspective. Those identified as feasible were then assessed by the specialists and the appropriate weightings applied to each alternative. In the case of the alternative routes, interchanges and cross-connections, to facilitate an overall assessment a Multi-Criteria Analysis Tool (MCAT) processes were used. The interchanges and cross-connections were also subject to public and stakeholder engagement.

9.4.3 Multi-Criteria Analysis

MCATs were used for options analyses. These methodologies can assist in highlighting the key differences between alternatives in respect of transport, social/community, environmental and economic values. The methodologies are particularly useful when there are several alternatives to choose from and numerous complex considerations involved. The methodologies were adopted for both the route alternatives and the interchange and cross-connection alternatives.

Workshops involving individual technical and specialist experts were undertaken to develop the criteria, scoring and weighting for the MCAT. For the assessment of alternative routes, primary criteria were developed and applied. In relation to the assessment of the interchanges and cross-connections, for each of the primary criteria areas, secondary criteria were identified that were known to provide the key points of differentiation between alternatives. These points of differentiation were also tested and agreed at the relevant MCAT workshops. This focused the assessment on matters critical to comparing and screening the alternatives, rather than matters that are common across the alternatives.

The benefits of carrying out the MCAT in a workshop format included drawing out the detail of the various assessments through discussion and questioning, and the involvement of the Project leaders who were particularly familiar with the Project and the area, as well as examination and testing of the information through the shared scoring process.

The MCAT process for the consideration of alternative routes and interchanges adopted separate processes to ensure the outcomes were robust. The alternative routes assessment was at a macro level, while the alternative interchanges and cross-connections were focused at the micro level.

9.4.4 MCAT Assessment for Alternative Routes:

The assessment criteria developed were:

- *Landscape/Visual* – this took into account topography and existing landscape character (including degree of modification and presence of structures), route length and presence of dwellings nearby, any outstanding landscape or natural character components, and important landscape/natural features.
- *Ecology* – this criterion focused on terrestrial ecology values, particularly those relating to patches of bush and wetlands which are nationally, regionally or locally significant in terms of habitat values and presence of known species.
- *Archaeology/Heritage* – this criterion took into account presence of known archaeological sites and heritage buildings.

- *Cultural Values* – this took into account the range of cultural values including values relating to the natural environment (waterways and wetlands, areas of indigenous vegetation), key areas of settlement (marae, papakainga) and use (food gathering areas), and known wāhi tapu relating to the different hapū and iwi of the area.
- *Social/Community Impacts* – this incorporated a range of considerations including severance effects, accessibility to townships (relating to business activity), support for urban land uses, connectivity to community services and facilities, recreational effects, and construction impacts. Amenity effects were not included. (Note – direct effects on land including dwellings were included under specific land ownership effects.)
- *District Plan* – this criterion included consideration of both zoning and Plan objectives and policies, and the "strategic fit" of a major transport route within the urban and rural context (note – urban growth was included under social and community impacts).
- *Transport Effectiveness/Fit to Objectives* – this criterion covered traffic efficiency, active travel (pedestrian and cycle opportunities), traffic safety and severance and access. The assessment took into account the local network and the various State highway components.
- *Effects on Lifelines* – this criterion provided a preliminary transport-based risk assessment taking into account risks associated with the number, separation, location and configuration of the main transport routes through the area for each of the alternatives. Other lifelines were not addressed as they were not considered to be affected by any of the alternatives.
- *Natural Hazard Effects* – this took into account flood hazard (including ponding areas) and tsunami exposure. This also included potential earthquake resilience.
- *Productive Land Uses* – this criterion took into account the NZ Land Use Capability Classification, in particular classes 1 to 4 (productive land), the presence of land parcels greater than 4 hectares in area, and potential severance effects on productive units.
- *Specific Land Ownership Effects* – this criterion identified types of land ownership which would potentially pose difficulties for the location of an expressway route – specifically Crown Land, designated land, Māori multiple-owned land and QEII Trust covenanted land, as well as estimating numbers of potentially affected parcels and dwellings.
- *Constructability* – constructability was assessed on the basis of physical components such as volume and balance of earthworks (cut and fill suitability of/issues with material), structures, temporary works, access management, risks around "unknowns", and general degree of difficulty in construction.
- *Costs* – costs took into account the actual capital construction costs, including the range of matters identified under constructability, plus contingencies.

There was some potential for double-counting recognised, particularly with constructability and cost, hazards and lifelines, aspects of social assessment (i.e. the community vision) and the KCDP criterion, and archaeology/heritage and culture. It was also noted that in some cases the same aspects could justifiably be assessed under two criteria (such as the separate heritage and cultural values associated with some marae and urupā, and the separate ecological and cultural values of streams, waterways and bush areas). The scoring and weighting resulting after the MCAT process was designed to address these potential issues.

For the assessment of alternative routes, the scoring system outlined in Table 9-1 was applied to the thirteen criteria described above, and then discussed and debated in a workshop process with various specialists in attendance. In all but a few circumstances consensus was reached. Where it was not, dissenting views were noted to be addressed in the sensitivity analysis. The workshop process generally confirmed the initial analysis carried out by the specialists.

Table 9-1: Scoring System (Routes)

Analysis Score	Description
1	The route alternative presents few difficulties on the basis of the attribute being evaluated, taking into account reasonable mitigation proposals. There may be significant benefits in terms of the attribute.
2	The route alternative presents only minor areas of difficulties on the basis of the attribute being evaluated, taking into account reasonable mitigation proposals. There may be some benefits in terms of the attribute.
3	The route alternative presents some areas of reasonable difficulty in terms of the attribute being evaluated. Effects cannot be completely avoided. Mitigation is not readily achievable at reasonable cost, and there are few or no apparent benefits.
4	The route alternative includes extensive areas of difficulty in terms of the attribute being evaluated, which outweigh perceived benefits. Mitigation is not readily achievable.
5	The route alternative includes extreme difficulties in terms of achieving the Project objectives on the basis of the attribute being evaluated.

9.4.5 MCAT Assessment for Alternative Interchanges and Cross-Connections

For the assessment of alternative interchanges and cross-connections, MCAT criteria were developed to ensure the outcomes reflected the intention of the process, and to enable differences between the alternatives to be identified and assessed. The MCAT for interchanges and cross-connections therefore had four Primary Criteria (Transport Outcomes, Social / Community Outcomes, Environmental Outcomes and Economic Value). Each of the Primary Criteria had a number of Secondary Criteria e.g. for Environmental Outcomes these are areas such as Urban Form, Flood Risk, Noise etc.

Table 9-2 below summarises the primary and secondary criteria adopted for the screening process.

Table 9-2: MCAT Primary and Secondary Criteria

Primary Criteria	Secondary Criteria	Criteria explained
Transport Outcomes	Road user safety	Level of safety provided by alternative including consideration of emergency response times (includes SH1 Expressway and local roads).
	Traffic level of service	Significance of effect on congestion, trip reliability, travel times
	Integration with others modes	Significance of effect on public transport users, cyclist and pedestrian trips
	Strategic fit with RoNS	Significance of fit with RoNS objectives and consistency / integration with neighbouring RoNS Projects
	SH / Local Road integration (Ōtaki Inter-regional access)	Significance of ability to achieve the optimal balance between utilisation of the SH infrastructure; and keeping local trips off the SH.

Social/Community Outcomes	Severance	Significance of effect of physical severance and legibility of alternatives on community connectivity and access to community services.
	Economic effects / business activity	Significance of effect on local economy / business activity particularly as related to KCDC plans / strategies including the Greater Ōtaki Vision document.
	Support for current and future land use	Significance of effect on support for current and future land use plans – including consideration of strategic growth management, effect on productive land use, and retention of rural character.
	Improve connectivity to key regional services / facilities	Significance of effect on connectivity to key regional services and facilities for both local community and for those in communities north and south of Project.
	Recreational activity	Significance of effect on amenities and public areas available for recreation, including access.
	Disturbance to community during construction	Significance of effect on the local community and road users during construction.
Environmental Outcomes	Urban form	Significance of effects on the local urban form and on urban design aspects such as connectivity, context and character, with emphasis on Ōtaki township and Te Horo and on the Ōtaki Railway Hub in particular.
	Landscape and visual	Significance of the effects on the local landscape, being landform, land cover and land use and the extent of change the Project/Expressway will bring to these. The extent to which the visual effects of the Expressway, its earthworks construction, road form, structures and noise and landscape mitigation measures will impact upon the local community and the travelling public.
	Flood risk	Significance and extent of the effects on flood plain patterns and pathways.
	Heritage	Significance of effects on identified heritage including buildings, structures and features.
	Archaeology	Significance of the effect on archaeological sites.
	Iwi / cultural	Significance of the effect on matters of importance to iwi including but not limited to cultural sites.
	Ecology (terrestrial and aquatic)	Significance and extent of the effects on wildlife and habitat and natural processes and systems.
	Water quality	Significance and extent of effects on surface water resources, and on ground water and underground aquifers.
	Air quality	Significance and extent of effects on air quality from changes in fuel consumption levels.
	Noise	Significance and extent of effects on noise levels in relation to urban villages, residential and public amenity locations.
Economic Value	Capital investment	Significance of effect on capital required for Project implementation (including constructability considerations and property acquisition).
	Whole of life costs	Significance of effect on the whole of life costs of the infrastructure asset.
	Achieving RMA approval	Significance of effect on ability to achieve RMA approvals i.e. consentability of alternative.

	Timeliness of Project completion	Significance of effect on Project completion and hence timeliness of releasing the economic benefits of the Project to the community.

For the assessment of the interchanges and cross-connections, a different scoring system was developed to provide a result that was specific for that MCAT. As with the alternative route alignments however, this was discussed and debated through the workshop format to address sensitivities. KCDC, as a key stakeholder, was involved in this MCAT process.

The following subjective rating system, shown in Table 9-3 below, was then developed and discussed with specialists to assess the performance of the alternatives. Ratings for each factor in the alternative assessment exercise were assessed with reasonable mitigation applied and with clear justification for the rating identified. Specialists were asked to assess effects on an absolute basis, rather than a relative basis e.g. effects were considered on their own, not relative to any other effects of the Project. Knowledge of other similar projects assisted in rating potential effects.

Table 9-3: Effects Ratings Adopted for MCAT Assessment

Rating	Explanation / Thresholds
+3 Highly Significant Positive	Of *significant* local, regional or national benefit
+2 Moderate Positive	Of local and/or regional benefit
+1 Minor	Of local benefit only
0 Neutral	No or negligible effects
-1 Minor	Of a local impact only – easily mitigated
-2 Moderate Negative	Moderate negative local and/or regional negative effects that can be mitigated
-3 Highly Significant	Of local, regional or national negative *significance*. Very difficult to mitigate.
FATAL FLAW (FF)	Will *stop* the project – of such national/regional/local significance, or technical constraint that it cannot be consented, as it cannot be appropriately avoided, remedied, or mitigated.

9.4.6 Further Analysis

Scores from the MCAT workshop process provided the raw data for further analysis and to support the decision process.

As weighting systems can be developed from a range of different perspectives it was important that this was reflected in the overall process. Seven areas were identified for the alternative route review that form part of the overall analysis and results assessment for the route alternatives arising out of the MCAT process. These placed different importance on various aspects of the alternatives, and combined they provide an overall assessment of alternatives. The eight systems are:

- Workshop Weighting – this weighting was developed in discussion and agreement at the workshop and could be described as the technical view of NZTA's Project advisors.
- RMA Section 6 Emphasis Weighting – this places maximum weight on three of the four section 6 RMA matters potentially at play in respect of the Project (ecology, archaeology and cultural values). Landscape values have not been elevated to the same level in this analysis, as "outstanding" qualities and elements were not identified in the area affected by the route alternatives by the specialist involved, and it would thus be inappropriate to elevate them to a very high weight. This is notwithstanding that part of the Ōtaki River is identified in the KCDP as an Outstanding Landscape, as all alternatives at some point cross this river (although not the part identified as Outstanding, which is the Ōtaki Forks area). Some weight is placed on the KCDP

analysis in this case, as reflective of section 6 matters, but other criteria are left at a very low level.

- RMA Part 2 Balanced Weighting – this provides a more even weighting system (the most even of all the weighting systems applied). This reflects that the criteria are all relevant considerations in a Part 2 RMA analysis, particularly section 5.
- Community Weighting – this system has been developed on the basis of placing the highest weights on the range of issues that are most likely to be of general interest and concern to the wider community in the area, recognising that there will be some diversity of views and that all aspects are important to a range of sections of the community.
- Environment – this places the highest weight on the physical environmental element of ecology, with other criteria which integrate physical environmental considerations with social/community values also given some weighting. Criteria without a physical environment component are omitted.
- Social – all criteria have a social component, so all are given some weight. The highest weighting is given to social and community impacts, followed by lifelines, ownership effects and district plan considerations.
- Cultural – this highly weights cultural values, but also places weight on archaeology/heritage followed by ecological and social/community impacts.
- Economic – this excludes a number of criteria which have little or no economic bearing on the Project or the local economy. It emphasises cost and transportation objectives, but applies some weighting to other criteria with an economic component

9.5 Assessment of Alternative Route Options

9.5.1 Preliminary Review of Route Options

Initially a review of previous route alternatives was undertaken, which identified all the various descriptions and proposals for roads throughout the area. This was important as it identified many of the benefits and drawbacks of the various motorways, expressways or arterials considered in the past that cumulatively provided input into the alternatives considered.

Many of these previous proposals have been outlined in chapter 2.2 in Part A, relating to the history of the Project. Further studies, such as the "Himatangi to Waikanae Study" commissioned in 1998, highlighted many of the issues associated with the proposed routes. Transit NZ (as it was at that time) decided upon a route equivalent to the 'central' route, rejecting a coastal route configuration.

A Scheme Assessment in 2001 and 2002 outlined various possible alternative alignments relating to this 'central route', both to the east and west of the current SH1 alignment. An addendum to this report in 2002 and 2003 identified other routes such as one equivalent to the western / Te Waka route. Both of these routes form part of the alternative route alternatives discussed in this chapter.

Figure 9-1: The Principal Alternative Routes that were Investigated

9.5.2 Route Options Identified and Assessed

Based on the review of initial alternatives, four principal expressway route options were selected for further analysis. These were:

- Option A: Eastern Foothills Route;
- Option B: Eastern Plains Route;
- Option C: Western Route[15]; and
- Option D: 2009 Board Preferred Alignment / Central Route (follows the current SH1 and NIMT corridor)[16].

These alternatives depart from the existing SH1 alignment at different points and comprise different lengths and components of new expressway or modified existing State highway. However to ensure a fair comparison, each alternative had to be considered as having the same starting and completion points – i.e. between the southern take-off point of all options and the point where route Option A joined the existing SH1.

Option A: Eastern Foothills Route

Option A would have extended from Hadfield/Peka Peka Road in the south, to link with the proposed northern interchange of the SH1 M2PP section of the Kāpiti Expressway, through

[15] This follows a western route adopted by the project team to represent a 'best' western route.

[16] In early investigations the central route was referred to as the "Eastern Improved Route" or "Board Preferred Eastern Route" – this is because at this stage there were not any routes further to the east.

to just south of Manakau (in the north), a total distance of approximately 19km. The route is up to 2.7km east of the existing SH1 at Ōtaki and partly follows the transmission line corridor before swinging back to join the State highway at Manakau. This route had the potential to continue north following the transmission line corridor and connecting to SH57 to the east of Levin, with the link to Manakau reverting to a local connection.

Option B: Eastern Plains Route

Option B would have connected in the south with the Option D route in the vicinity of School Road, Te Horo to SH1 (in the north) approximately 3km south of Manakau, a total distance of approximately 12km. This route is up to 2km east of the existing SH1 at Ōtaki.

Option B had two sub-alternatives for the northern end tie-in, B1 and B2. Alternative B1 followed a valley through an outcrop of the Tararua foothills, avoiding the lifestyle blocks further to the west and tied in just to the south of the existing Pukehou Rail Bridge. Alternative B2 passed to the west of the foothills outcrop and through the lifestyle block properties. Option B2 had reduced effects in relation to earthworks compared with B1; however it has far greater effect on property.

Following initial investigations and design of Alternative B it was decided to proceed with Alternative B1 and eliminate Alternative B2 due to the following considerations:

- Alternative B2 created significant severance issues for properties adjacent to it;
- It was considered feasible to construct the Expressway along the valley Alternative B1 follows without incurring significant engineering risk or cut heights; and
- Alternative B2 has significantly greater risk relating to property acquisition issues.

Figure 9-2: Alternatives B1 and B2, the Eastern Foothills and Central Options are also shown

Option C: Western Alternative

The western route alternative would have run parallel with the existing SH1, separated by approximately 600m, to connect in with the Option D just south of Mary Crest, aligned parallel with Te Waka Road, swung to the west of Ōtaki Township crossing the Ōtaki River approximately 2.5km downstream of the existing State highway river bridge and extended to a straight on SH1 approximately 1km north of Taylors Road. The length of the western route alternative is approximately 1.9 km longer than Option D.

Option C is similar to but slightly different from the Te Waka Options investigated as part of the 2002 Scheme Assessment Report prepared by Meritec and also the route suggested by the Te Horo Road Action Committee (THRAC) in a 2009 submission. It differs from earlier western route proposals due to the geometric constraint imposed by the RoNS design criteria and a fresh consideration of the alignment drawing on current knowledge.

Option D: Central Route

The central route generally follows the current SH1 corridor throughout the extent of the area. It follows the western side of the NIMT from Peka Peka north to Mary Crest where north of which it crosses to the eastern side of the NIMT. It then remains on the eastern side of the NIMT and involves the re-alignment of approximately 1.2km of the NIMT through Ōtaki township, before connecting with the current SH1 just north of Taylors Road.

9.5.3 Other Options Discounted

Several routes were discounted during the prior screening process, for various reasons:

- The Historic Sandhills Route or those that followed a similar route; and
  - A range of coastal (or Sandhills) route alternatives had previously been sufficiently investigated and rejected for RMA-based reasons, including a range of section 6 RMA matters.
- The upgrading of the existing SH1 was considered, particularly through Ōtaki. This included measures such as:
  - Creating 2 lanes of southbound traffic on SH1 between the Mill Road roundabout and Waerenga Road, during peak periods and holidays;
  - Restricting parking southbound on SH1 between the Mill Road roundabout and Waerenga Road, during peak periods and holidays;
  - Removing the central median and replacing it with a hatched area for vehicles manoeuvring in and out of parking spaces in a southbound direction;
  - Increased enforcement of parking restrictions; and
  - Increased side road parking provision.

The objectives of the Project are inter-related to the total Wellington Northern Corridor RoNS and as such those alternatives relating to the upgrading of SH1 identified above would not facilitate the provision of a high quality, safe and effective route between Levin and Wellington.

9.5.4 Technical Feasibility of Options

To provide a comparative assessment of technical feasibility and cost, the routes were developed from a 'corridor' stage to that of an 'alignment'. Considerations taken into account in determining the alignment for the four options included ground conditions, gradient, earthworks volumes, river, road and rail crossings, and property impacts including connectivity. The development of these routes to this stage enabled the technical engineering and transportation assessments to be carried out, cost estimates to

be prepared and an economic analysis to be undertaken. Importantly, the options were assessed on the same common basis.

The technical studies found that all alternatives were technically feasible, and all were within a similar cost range. These studies also found that the potential transport benefits of Options A to C were less than those associated with Option D. This was largely because of the continued use of SH1 by vehicles with origins or destinations within Ōtaki. All alternatives were found to be effective in terms of through traffic. There was therefore no technical, cost, or cost-benefit reason to reject any of the alternatives at this stage, and no basis to not subject any of the alternatives to further investigations.

9.5.5 Scoping and Undertaking of Specialist Investigations

The technical assessments of the route options were followed by investigations of their potential environmental impacts through specialist investigations of a range of environmental and social aspects of the routes. The specialist assessments were determined to be best based on a nominal 200 metre wide route, based around the centreline of the routes which had been the subject of technical review. The exception was Option D, where sufficient design work had been undertaken to define the route and flexibility was not required. The 200m wide corridor within which the other routes were based enabled flexibility, and allowed for refinement in detail and opportunity to avoid or mitigate localised constraints and issues. Effects that would occur beyond the 200m corridor were also taken into consideration. The extent of property effects (affected land parcels and dwellings) was however based on a 100 metre wide typical route within the 200 metre wide route.

9.5.6 MCAT Analysis

The MCAT process outlined under 9.4.4 was applied to each of the four routes through a workshop process. The workshop scored each of the criteria for each of the four routes using the scoring schedule in Table 9-1. In all but a few circumstances consensus was reached. Where it was not, dissenting views were noted and were addressed through the sensitivity analysis. Table 9-4 shows the scores awarded at the workshop which provided the raw data for the further analysis.

Table 9-4: Scores for Each of the Alternatives from the Workshops

Route Option	Landscape/Visual	Ecology	Archaeology/Heritage	Cultural Values	Social/Community Impacts	District Plan	Transport Eff/Fit to Objectives	Effect on Lifelines	Natural Hazards Effects	Productive Land Use Effects	Specific Ownership	Constructability	Costs
A Eastern Foothills	4 (5)	5	1	1	2	3	4	2	2	4	3	2	3
B Eastern Plains	4	(3) 4	3	(2) 3	2	3	3	2	2	3	3	1	2
C Western	3	2	5	5	2	2	3	3	5	3	4	3	3 (4)
D Central	2	3	4	4	2	1	2	2	3	(2) 3	4	3	3

Note: numbers in brackets represent minority views on aspects where consensus was not reached. These are later used for sensitivity analysis.

The workshop process generally confirmed the initial analysis carried out by the specialists by awarding similar scores. The main differences that arose were:

- For landscape assessment, Option A (the Eastern Foothills) was scored 4 by consensus, with some considering it should be a 5 due to the degree of change to an existing landscape which is relatively natural and currently entirely rural.
- The ecological criterion was scored for Options B and D (the Eastern Plains and Central alternatives) lower than the initial specialist's assessment. This took into account the ability to avoid or mitigate effects on regionally significant bush remnants at Mary Crest.
- The archaeological and heritage scores reflected the expert evaluation of alternatives, but drew a slightly greater distinction between Option D (the Central option), where built heritage sites are known to be affected but mitigation is possible, and Option C (the Western option) where there are potentially direct and indirect effects on known and potentially numerous unknown sites.
- On cultural values the highest negative score was awarded to Option C (the Western route option) on the basis of knowledge of the past (such as battle sites in this area) and present values, including those values ascertained from previous consultation and engagement, with respectively lower values for Option D (Central Option) next, followed by Option B (Eastern Plains option). Some considered that Option B should be a 2 rather than a 3, as adverse cultural effects would be considered even lower than the 4 scored for Option D.
- The analysis of the social criterion had been undertaken on the basis of five sub-considerations. The specialist advisors informed the workshop that, on three of these (severance, current and future land uses, and disturbance) there were many variations across the four options, to the extent that all routes were roughly equivalent.

- There were no prior scores for the KCDP criterion. The scores awarded mirrored the advice and discussion at the workshop, that the KCDP seeks to retain rural and productive character in the district's rural areas, and roading (such as the proposed expressway) would be characterised as urban infrastructure.
- Productive land use effects had not been subject to prior assessments. On the basis of advice from the relevant specialist, Option A, the Eastern Foothills option, was scored worst at 4, with the remaining alternatives scored at 3. Some felt that Option D, the Central route, should be scored a 2 because of the degree of existing land fragmentation.
- Cost and constructability had been evaluated together, but were discussed as separate criteria at the workshop. In cost terms, Options A, C and D were considered similar (i.e. all alternatives except the Eastern Plain route option) although some considered the additional costs associated with more uncertain ground conditions and flood management design aspects would justify a score of 4 rather than a 3. Option B was most straight-forward and therefore estimated as least cost and a lower score. In terms of constructability, similar conclusions were reached, although the better ground conditions and less closely settled nature of Options A and B (the two Eastern options) led to lower scores than for the other two routes).

To increase the robustness of the analysis the scoring was subjected to a range of weightings and the outcomes reviewed in terms of their consistency and range of differences. A total of 8 weighting systems were utilised, including the workshop weighting. The weightings applied are outlined in Figure 9-3 below.

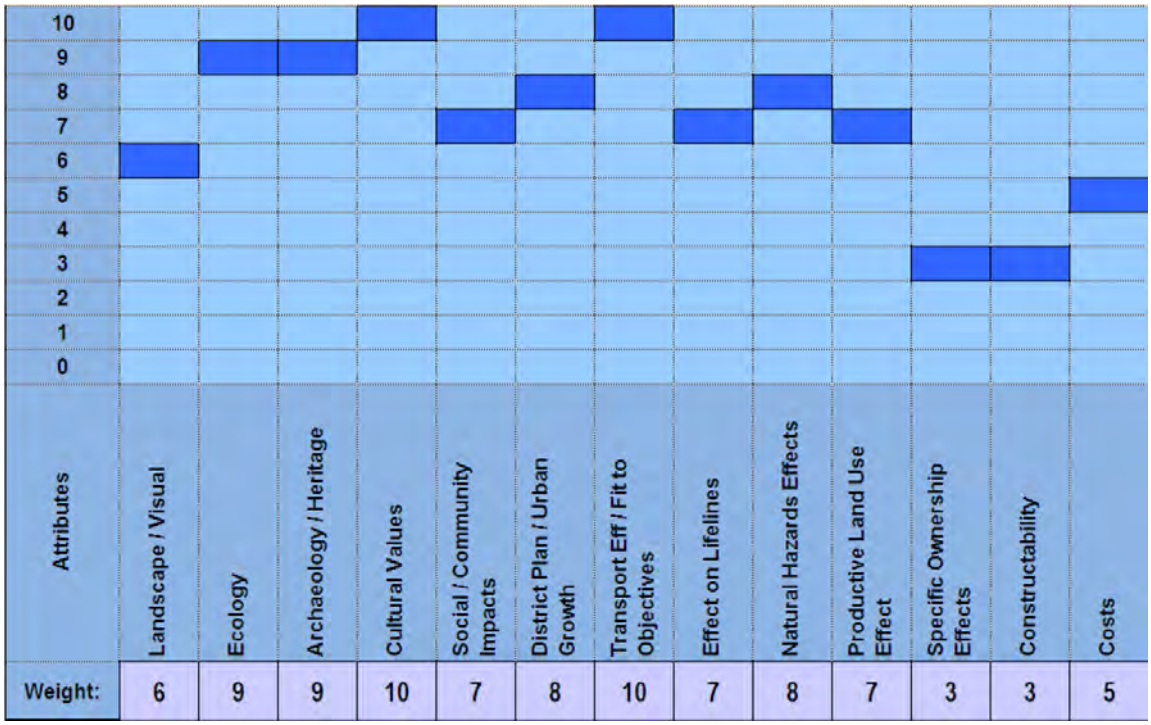


Figure 9-3: The Weighting System Derived through the Workshop Process

9.5.7 Conclusions From the MCAT Process

Once the final weightings had been attributed, an outcome was obtained that ranked each of the four alternatives considered. The outcome for the alternative routes that had been assessed is as follows:

Table 9-5: Analysis of Route Options

Weighting System	A. Eastern Foothills	B. Eastern Plains	C. Western	D. Central
Workshop	2.76*	2.80*	3.36	2.74*
RMA Section 6	2.67	3.05*	3.48	2.98*
RMA Part 2	2.75*	2.69*	3.33	2.79*
Community	2.72*	2.64	3.30	2.73*
Environment	3.00	3.18	3.36	2.90
Social	2.66*	2.64*	3.27	2.72*
Cultural	2.35	3.02*	3.60	3.05*
Economic	2.83	2.24	3.02	2.56

Notes:

- The asterisk (*) denotes where the difference between alternatives is not, or is only marginally, significant.

- Preferred alternative highlighted in blue.

The outcome was not particularly clear-cut in terms of three of the four route alternatives evaluated (Alternatives A, B and D). The full evaluation of the outcomes and the various strengths and weaknesses of each alternative is contained in Technical Report 3 in Volume 3.

9.5.8 Route Decision

The NZTA's conclusion (in late 2011) was that Option D, which had previously been presented to and discussed with the local communities as the NZTA's preferred option, was confirmed to achieve the best fit with the NZTA's Project objectives and statutory obligations. In large part this is because the route chosen for the Expressway allows ready access between the Expressway and Ōtaki (including the Ōtaki Railway Retail area), and best integrates the Project with the Kāpiti district's existing infrastructure and land use planning framework.

9.6 Assessment of Alternative Interchange Options

Separate from the alternative route analysis, a broad range of connectivity and interchange alternatives within the central expressway route were identified, developed, assessed and evaluated using a further MCAT analysis.

A number of expressway connectivity scenarios and interchange/connection alternatives were identified, assessed and screened during the scoping phase of the investigations. Shortlisted alternatives for interchanges and cross-corridor connections were then taken to a public consultation process in February 2011 to obtain feedback and provide input for consideration in the alternative refinement and assessment during the scheme assessment phase.

9.6.1 Connectivity Options

A key focus of the scoping assessment was an in-depth review and assessment of the location and form of interchanges and connections along the Expressway route, with consideration of previous consultation feedback and a focus on improving legibility of access for Ōtaki.

Seven network connectivity scenarios were considered along the route. These scenarios included those resulting from the 2002 and 2009 consultation processes. The scenarios considered are outlined in Table 9-6 below:

Table 9-6: Connectivity Scenarios

Connectivity Scenario	Description
2002 Scheme	Expressway on-ramps on north side of Ōtaki, off-ramps split to the north and south of Ōtaki, no connection at Rahui Road. Full interchange at Te Horo. Full Interchange at Peka Peka.
2009 Scheme	Expressway on-ramps on north side of Ōtaki, off-ramps split to the north and south of Ōtaki, no connection at Rahui Road.
Scenario 1	Half interchanges each side of Ōtaki and pedestrian/cycle link at Rahui Road
Scenario 2A	Half interchanges each side of Ōtaki, southern interchange at Ōtaki Gorge Road and vehicle link at Rahui Road
Scenario 2B	Half interchanges each side of Ōtaki, southern interchange north of Ōtaki River and vehicle link at Rahui Road
Scenario 3	Full interchange south of Ōtaki River (with pedestrian/cycle or road link at Rahui Road)
Scenario 4	Full interchange north of Ōtaki (with pedestrian/cycle or road link at Rahui Road)

Additional options were identified but they were either assessed as not being technically viable, or were not supported by the key stakeholders, and therefore were not included in a connectivity scenario. These additional option concepts included:

- A full interchange on the north side of the Ōtaki River, and
- A north-facing half diamond interchange north of the Ōtaki River that utilised the existing flood prone access under the Ōtaki Bridge to provide for potential heavy commercial vehicle (HCV) access.

All options provide for a full range of movements to and from the expressway to Ōtaki. However, in some cases, these connections are provided in one focused location and in other scenarios they are split between two locations. Traffic volumes and value for money criteria do not justify the provision of two full interchanges either side of Ōtaki.

As an outcome of the scoping phase process the scenarios depicted in Figure 9-4 were recommended and adopted to be taken forward to public consultation and the scheme assessment addendum phase.

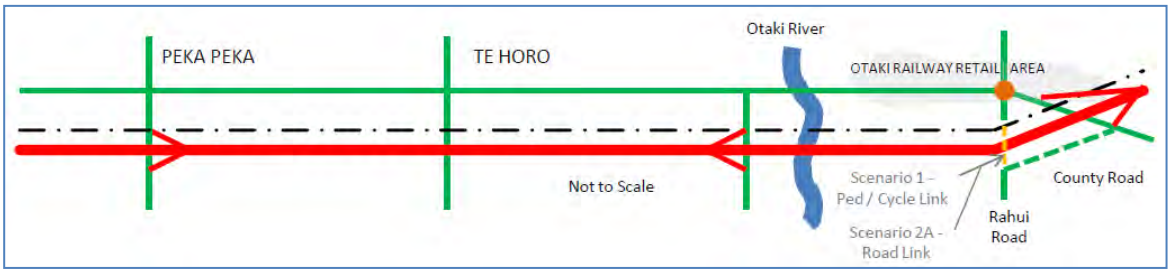


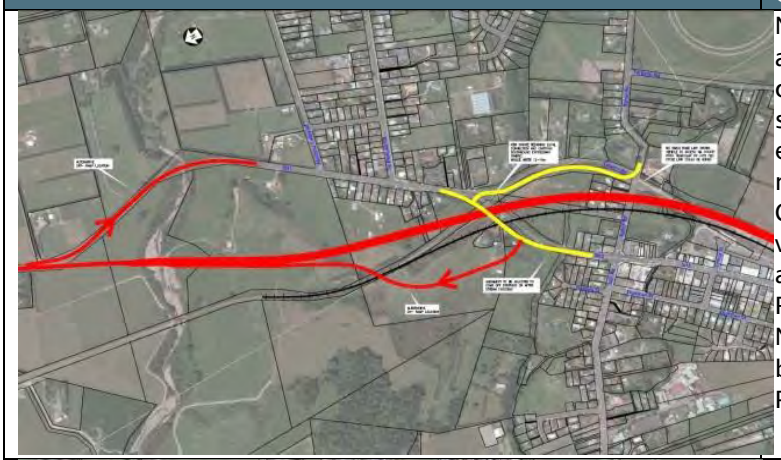
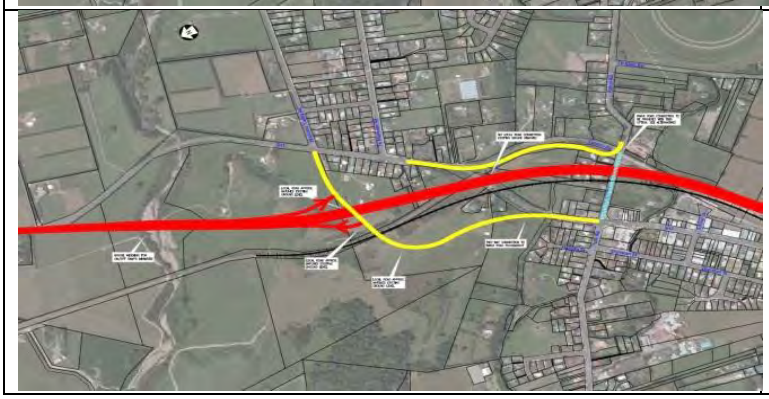
Figure 9-4: Shortlisted Connectivity Scenarios (1 and 2A)

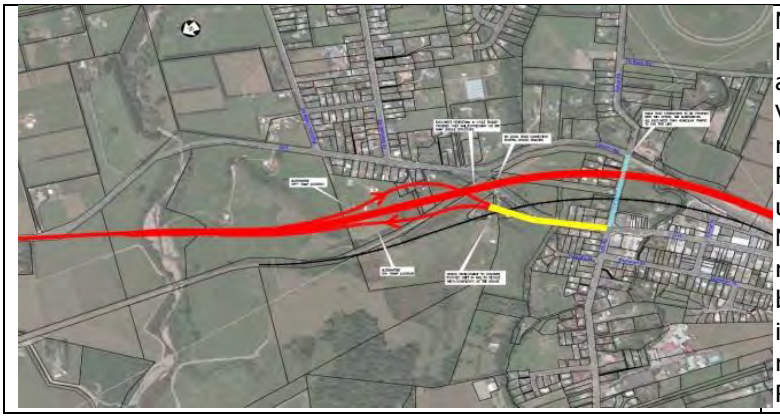
The above scenarios provide a split interchange to the north and south of Ōtaki with either a pedestrian/cycle link (Scenario 1), or road link (Scenario 2A) at Rahui Road. These connectivity scenarios were shortlisted because they were considered to provide the best balance between improved transport outcomes, social, environmental and economic value. The provision of a split interchange on either side of Ōtaki also provides for legible and intuitive access to and from the township, while supporting the GOV for future growth to be focused within the Ōtaki Township.

9.6.2 Interchange Options

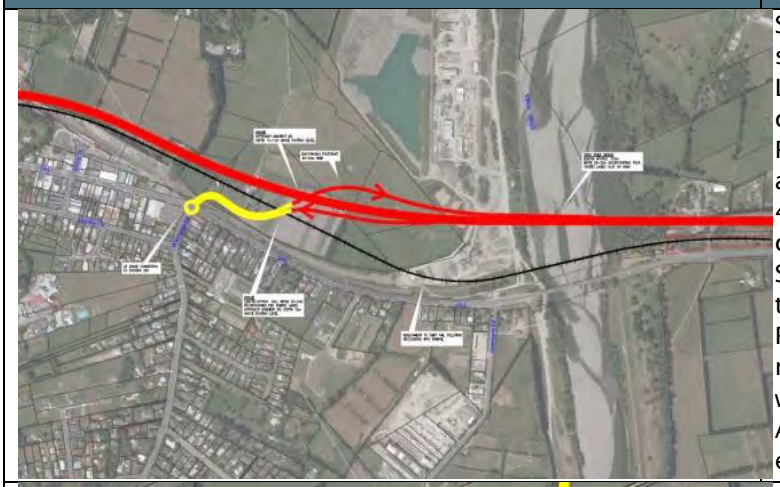
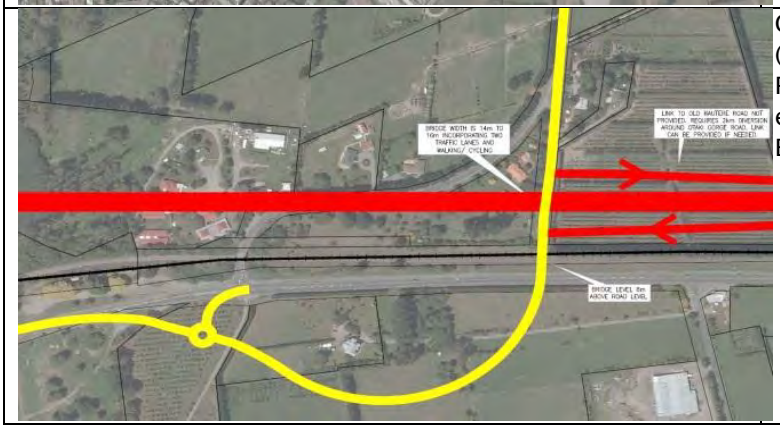
Interchange alternatives were identified for the half diamond accesses on and off the expressway at both North Ōtaki and South Ōtaki. There are three alternatives that were considered technically feasible at each location, as described below. Diagrams relating to the original alternatives scoped are supplied.

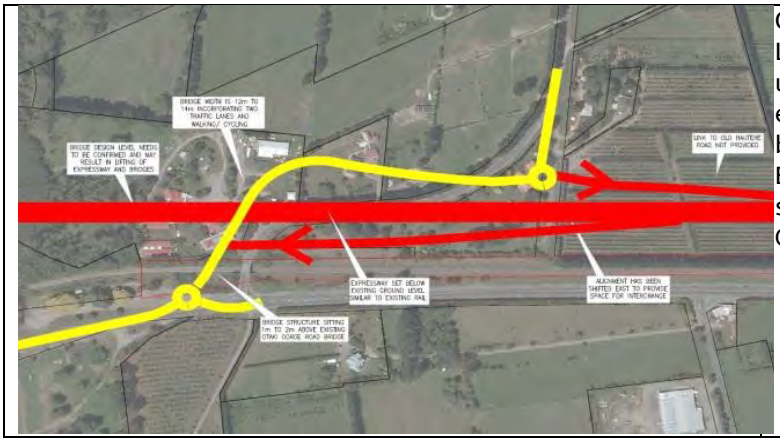
North Ōtaki Interchange

	Option Description and Key Notes
	NO02. 2009 scheme option with alternative ramp locations to eliminate complex rail bridge skew and short stacking length between on-ramps in existing scheme. Southbound on-ramp removed. Closure of Rahui Road results in detour via County Road, for racecourse traffic also. Pedestrian/Cycle link assumed at Rahui Road. New bridge (adjacent to existing rail bridge) constructed over Rail corridor. Provides access to Waitohu Plateau.
	NO09. North facing ramps. Expressway crossing further north than NO02. Vehicle link assumed at Rahui Road. No alteration to County Road function No connection over expressway and rail corridor in location of existing SH1 rail bridge. Access to Waitohu Plateau via new interchange. Existing southbound Ōtaki entrance re-located

	NO11. North facing ramps. North facing ramps provide direct access into Ōtaki. Vehicle link required at Rahui Road as no alternative access to Waitohu Plateau, flood prone. County Road upgraded. No connection over expressway and rail corridor in location of existing rail bridge. Pedestrian access provided on interchange bridge near to existing SH rail bridge. Rail realignment to shift further west.

South Ōtaki Interchange

	Option Description and Key Notes
	SO02. South facing ramps on north side of river. Local bridge over expressway and rail corridor. Requires additional rail realignment and reduction in radius (down to 420m) off the river bridge thereby compromising rail geometry. Steep approach/exit from roundabout to existing SH1. Ramp lengths extend onto bridge requiring widening. More extensive works in flood plain. Additional local connection across expressway at Ōtaki Gorge Road.
	OG03. South facing ramps. Underpass (local bridge over expressway). Ramps raised up to meet bridge over expressway. Bridge aligned with Ōtaki Gorge Road.

	OG07. South facing ramps. Local road bridge over expressway utilises topography by depressing expressway to minimise height of bridge. Bridge for crossing of expressway/rail set approximately 2-4m above existing Ōtaki Gorge Road rail crossing.

9.6.3 Alternative Cross-Corridor Connections

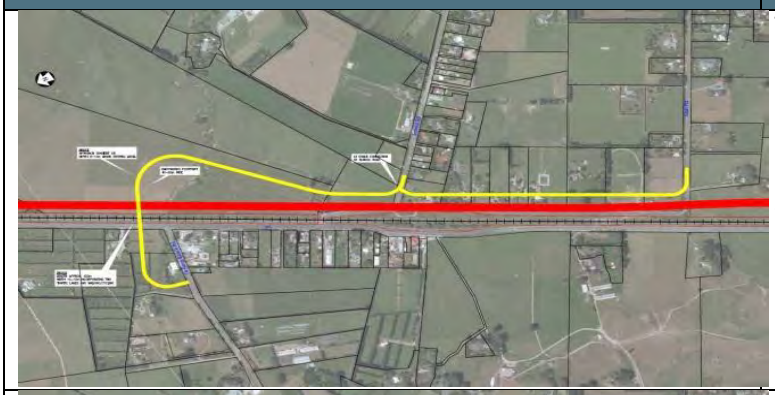
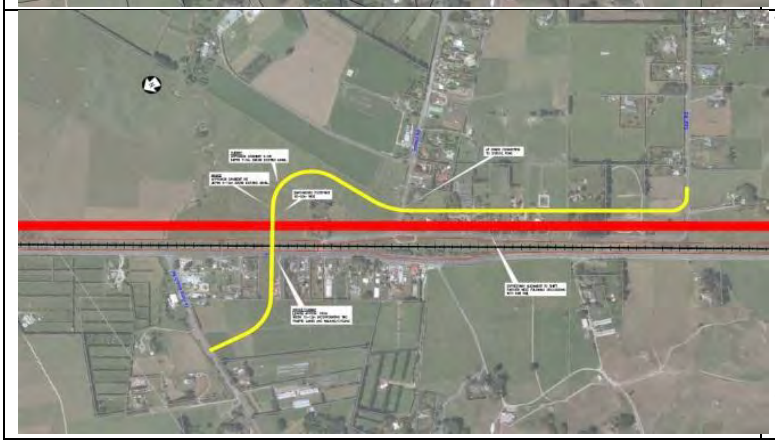
Various scenarios were investigated for providing east-west connections throughout the Project area. The associated assessments incorporated a range of potential effects and input through consultation and specialist and stakeholder workshops.

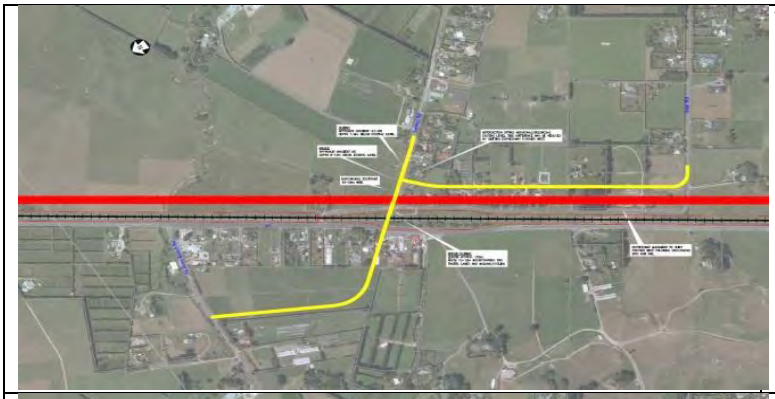
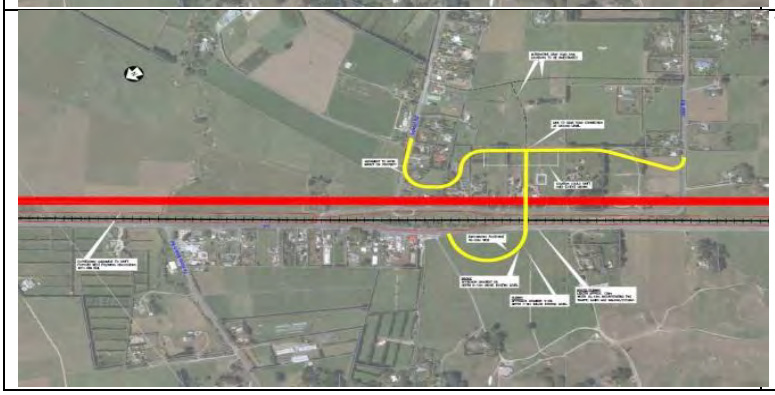
The primary locations where the alternative connections were investigated were:

- Te Horo;
- Ōtaki Gorge Road; and
- Rahui Road.

The alternatives that were considered further and the explanations of these are outlined below, and diagrams are provided of these alternatives where available.

Te Horo

	Option Description and Key Notes
	TH01. Existing 2009 Scheme Option – Underpass, local road bridge over expressway. New Gear Road connection provided to School Road. Local road subway not considered at this location due to location and extent of flood plain.
	TH02. Underpass (Local Bridge over expressway) or potentially Overpass (Local Subway under expressway). New Gear Road connection provided to School Road. Both local road subway and local road bridge considered at this location. Potential for pedestrian/cyclist ramp/stairs from SH1 properties up to bridge. Subway option was considered but eliminated given flood plain issues at this location.

	TH03. Underpass (Local Bridge over expressway – TH03a) or potentially Overpass (Local Subway under Expressway-TH03b). New Gear Road connection provided to School Road. Both local road subway and local road bridge considered at this location. Potential for pedestrian/cyclist ramp/stairs from SH1 properties up to bridge.
	TH08. As per Option TH03, but with the bridge alignment skewed to the south to avoid the Red Cafe and hence reduce impacts on the western settlement. (Note – this alternative was developed following assessment of alternatives TH01 to TH04 as an improvement to Option TH03.)
	TH04. Underpass (Local Bridge over expressway) or potentially Overpass (Local Subway under expressway). New Gear Road connection provided to School Road. Both local road subway and local road bridge considered at this location. Potential for pedestrian/cyclist ramp/stairs from SH1 properties up to bridge.

Rahui Road

This connection has already largely been described in the northern interchange description. In the February 2011 public consultation brochure two alternatives were put forward for Rahui Road, based on earlier scoping assessment work. These were a pedestrian/cycle connection and a vehicular/pedestrian bridge. Vehicular subway alternatives had been discounted on technical grounds due to flood risk in this area.

Ōtaki Gorge Road and Old Hautere Road

Ōtaki Gorge Road connections are provided for in the south Ōtaki Interchange described earlier in this section.

9.6.4 Technical Feasibility Assessment

Issues and alternative development workshops were held during the initial scoping phase of the Project. The focus of these was to identify and develop alternatives that contributed to the Project objectives and responded to the identified issues and outcomes sought. These were then designed to the level necessary to allow an assessment of whether they were technically feasible, before an initial screen/decision process was applied to the

alternatives generated to test that they were indeed feasible and did align with the key objectives.

Further alternative development and staged technical meetings were held with key technical stakeholders as alternatives were developed to ensure a staged involvement prior to a further stakeholder workshops occurring.

9.6.5 Analysis of the Interchange Options

A full-day team MCAT alternative screening workshop was held on 14th September 2010 where the specialists' assessments and ratings were combined and challenged by the core team to inform the decisions as to which alternatives should be short-listed to be taken forward for public engagement and further scheme assessment.

- *North Ōtaki* - through the MCAT analysis Option NO02 was identified as a clear alternative to be taken forward, and was assessed to provide the better overall transportation and social-environmental outcomes while providing the best capital investment outcome.

  While Option NO11 outcomes were similar to Option NO09, Option NO11 relied on utilising a County Road/Rahui Road connection to provide the only local arterial connection between the north and south which would have been prone to closure during flood events. On this basis Option NO11 was dropped from further consideration.
- *South Ōtaki* - through the MCAT analysis it was found that Option OG07 clearly provided better economic, environmental and social outcomes, while transport outcomes were comparable to OG03. This was primarily due to the fact that Option OG07 better utilised the topography to reduce visual and land effects and was assessed to provide a better legibility and gateway for access to and from Ōtaki. On this basis Option OG07 was identified as a preferred alternative.
- *Te Horo* - Options TH01 and TH03A were identified as alternatives to be taken forward as they delivered the best balance between improved transport outcomes, social and environmental factors and economic value.

  Other alternatives were therefore dropped from further consideration as a result of cost comparisons, the lack of transportation improvements, and that they offered similar solutions to the two preferred alternatives.
- *Rahui Road* – prior to the 2011 consultation a pedestrian / cycle link was identified as the preferred option due to issues associated with the scale and grade of a road bridge option. At the scoping stage, the interchange and Rahui assessments were combined by virtue of the close physical proximity of these two elements. Subsequent to these, the MCAT assessment highlighted that the refined Rahui Road bridge alternative (providing for road, pedestrian and cycle linkages) was more favourable than other alternatives across all primary assessment criteria, and the majority of secondary criteria.
- *Old Hautere Road / Ōtaki Gorge Road* – at the scoping stage, a cul-de-sac option was taken to the public for feedback. As a result of the 2011 community feedback and the MCAT analysis, an alternative that provided an at-grade linkage to the south Ōtaki Interchange and Ōtaki Gorge Road was identified as the preferred alternative. It was found that it would deliver slightly less connectivity than a grade separated connection but would deliver significantly better value for money. The localised visual and property effects associated with introducing a grade separated crossing at Old Hautere Road would also be addressed.

9.6.6 Outcomes from Stakeholder and Public Engagement

An Option Development and Screening Workshop was then held with Key Stakeholders (KCDC, GWRC, KiwiRail, NZHPT) on the 23rd September 2010 to workshop the alternatives developed, assessment and screening outcomes and recommendations. The aim was to seek general consensus on the outcomes being looked at for the alternatives as well as confirming which alternatives should be subject to public engagement and identifying which alternatives key stakeholders supported.

Following the identification of alternatives and stakeholder preferences, public engagement was undertaken with the community during February 2011 on two alternatives at North Ōtaki, South Ōtaki, Te Horo and Rahui Road. At this stage there was not total consensus from stakeholders around the Rahui Road options.

Feedback from consultation indicated strong support for the preferred interchange proposals at North Ōtaki (Proposal A/Option NO02) and South Ōtaki (Proposal A/Option OG07), while issues for further consideration, in relation to connectivity, were raised specifically relating to: Ōtaki east-west connectivity (Rahui Road), Old Hautere Road, and a preference for proposal B/Option TH01 at Te Horo, over the promoted preferred alternative.

Specific feedback was not sought on the form of connection at Old Hautere Road in the February 2011 public consultation brochure. However, the proposal to cul-de-sac the existing connection to SH1 was highlighted. Key issues raised in feedback included: concerns around loss of connectivity; emergency accessibility; and concerns around anti-social / boy-racer driver behaviours which provided a mixed response on connectivity desires.

As part of the Scheme Phase, further option development and assessment was completed for Rahui Road, Te Horo and the Old Hautere Road / Ōtaki Gorge Road links. The feedback from the community has been incorporated into the Project with the preferred community interchanges and cross-connections being adopted and changes being made to provide for vehicle access over the Expressway at Rahui Road. The design of Old Hautere Road has also been changed as a result of the feedback to no longer be a cul-de-sac, and the Te Horo local underpass has been provided to ensure connection between the township on both sides of the Expressway.

9.6.7 Interchanges and Cross-Connections Selected

As a result of the MCAT process and the feedback through public engagement, the following alternatives were selected:

- North Ōtaki – Option NO02;
- South Ōtaki – Option OG07;
- Rahui Road – vehicle access over the Expressway (with refined alignment);
- Te Horo – Option TH01; and
- Old Hautere Road – changed from a cul-de-sac to a link road connecting to Ōtaki Gorge Road.

9.6.8 Scheme Phase

Refinement of the alternatives selected then occurred through the scheme assessment phase.

North Ōtaki - Option NO02 was developed further through the scheme assessment phase to further mitigate potential effects. The key changes incorporated into the design after the February 2011 consultation are:

- Adoption of a vehicular and pedestrian bridge at Rahui Road. This allows for County Road to remain as a local access road, rather than being upgraded to take all of the Rahui Road and race day traffic;
- Adoption of the bridge at Rahui Road has enabled the north bound on-ramp intersection to be shifted to between the rail and the Expressway, as opposed to being on the western side of the rail (proximity to County Road is no longer a key concern). This reduced potential effects on the dunes to the west of the route and reduced bridge costs; and
- The northbound Expressway lanes are now reduced to a single lane prior to the merge with the northbound on-ramp, so as to improve safety of the transition back to a 2-lane State highway (an issue that was raised during the interim safety audit process).

South Ōtaki - through the scheme assessment Option OG07 was developed in more detail to further mitigate potential effects. The key changes incorporated into the design since the February 2011 consultation includes:

- Squaring up of the bridges over the Expressway and rail to remove skew and hence improve visibility from the Expressway ramps;
- Improving legibility and safety by creating a more conventional half-diamond interchange. This has been achieved by bringing the southbound on-ramp up to the Ōtaki Gorge Road Bridge, rather than an earlier concept that tied this into the Ōtaki Gorge Road south of the bridge;
- Removal of the roundabout at the intersection with Ōtaki Gorge Road and replacement with a conventional 'T' intersection; and
- Inclusion of an at-grade link to Old Hautere Road and Ōtaki Gorge Road.

Rahui Road - this alternative evolved through the scheme assessment and development phase to deliver significant improvements. There was also a further MCAT process undertaken for options around Rahui Road and Waerenga Road, which included workshops with key stakeholders such as KCDC during the scheme phase. The key improvements are:

- Reduction in bridge height and grades on the approaches due to a rationalisation of the Expressway and rail levels and placement beneath the bridge;
- Retention of County Road as a local access with this crossing beneath the Rahui Road bridge and then linking into Rahui Road; and
- Promotion of a slender segmental or pre-cast structure type with median pier to keep structure depths to a minimum and to assist in reducing the scale of the crossing.

Old Hautere / Ōtaki Gorge Road – a grade separated connection for Old Hautere Road was considered difficult to justify given the low demands, proximity to the south Ōtaki interchange, and the alternative of a lower effects solution that provides good value for money. The alternative developed includes an off-road footpath on the west side of the link road to provide a connection through to Ōtaki from Old Hautere Road. The options for connectivity at Old Hautere Road were also subject to a further MCAT process during the scheme phase to ensure the best outcome for the Project was achieved.

9.7 Assessment of Alternative Alignment Options

Consideration has also been given as to potential alternatives for locating the Expressway in the vicinity of the central route (i.e. Option D known as "Western Alignment 1" for the purposes of this process). Specialists' assessments of alignment alternatives were undertaken in a staged manner following the initial scoping and then consultation phase.

The main alternative alignments centred around (Figure 9-5):

- The Te Horo Alternative alignment; and

- The Mary Crest Alternative alignments.

Figure 9-5: The Alternative Alignments at Te Horo and Mary Crest

9.7.1 Te Horo Alternative Alignment

This incorporated an alternative rail crossing north of Te Horo, which was suggested by the Ōtaki Community Board (OCB) in its 2009 submission. Specialist assessment of this alignment was undertaken in early 2011. The assessment found that the Western Alignment 1 delivered equal or better outcomes in relation to transport, environmental and economic criteria, while social and community outcomes were assessed as marginally better for the Te Horo Alternative due primarily to potential severance effects for the other options.

The key assessed differences between the alternatives were:

- Less favourable urban design outcomes with the Te Horo Alternative due to adverse residual land parcels and a widening of the overall transport corridor;
- Retention of the at-grade rail crossing with the Te Horo Alternative compared with grade separation in the NZTA Board-Preferred Alignment;
- Increased ecological effects on bush remnants with the Te Horo Alternative; and
- A significant difference in capital investment between the alternatives given the need for additional linkages/local bridge crossings.

The Te Horo Alternative could not occur in conjunction with alternatives developed at Mary Crest to avoid significant effects on areas of ecologically significant bush remnant, due to the nature of the alternative alignments and that these two would not connect with each other without compromising the values the alternatives sought to avoid.

On balance the conclusion was that the Western Alignment 1 delivered better overall transport and environmental outcomes while providing similar social and community outcomes. On this basis the central, NZTA Board-Preferred Alignment was confirmed at Te Horo.

9.7.2 Mary Crest Alternative Alignments

Through the scoping and consultation processes, areas of ecological and cultural/heritage significance were identified in the vicinity of Mary Crest. Specialist investigations of the alternative alignments were undertaken in conjunction with the Te Horo investigation in early 2011.

An Eastern Alternative at Mary Crest was identified, which was then subject to further detailed scheme development and assessment. Options for alignments on the western side of the railway were also further investigated, the resulting alignment being referred to as Western Alignment 2. This more in-depth investigation and assessment was subjected to a further MCAT assessment process and shared with key stakeholders at a Stakeholder Workshop held on 11th May 2011.

Through the assessment and MCAT process it was found that the Western Alignment 2 and Mary Crest Eastern Alignment alternatives were likely to deliver improved environmental and economic outcomes while delivering similar social and transport outcomes as the Board-Preferred Alignment (Western Alignment 1).

The key assessment outcomes are summarised as follows:

- Both the Western Alignment 2 and Mary Crest Eastern Alignment alternatives provide significantly improved environmental outcomes compared to the Western Alignment 1 alternative. This is primarily due to the avoidance of significant bush remnants and reduced effect on (or indeed complete avoidance of) sites of cultural significance.
- The Mary Crest Eastern Alignment alternative will affect a lower number of dwellings but a greater number of land parcels. These land parcels may be more productive than those affected in the Western Alignment 1 and this was reflected as a moderate negative effect for the alternative.
- While the MCAT indicated that the Mary Crest Eastern Alignment alternative may provide an improved environmental outcome, it involved a significant height of embankment (approximately 15m) over a reasonable length on the southern approach to the rail crossing. Despite this the landscape specialist assessed this to have a reduced landscape impact relative to Western alternatives as the northern approach was able to utilise the natural topography.

The Mary Crest Eastern Alignment alternative was assessed in the MCAT as potentially providing the best overall outcomes, especially with regard to ecology and cultural issues and value for money. However, when considering all factors a preference was identified for the Western Alignment 2 alternative in that it significantly reduced environmental impacts relative to the Western Alignment 1, avoided the very significant southern fill embankment, and had a more limited effect on properties to the east.

The outcomes from the Mary Crest MCAT and further assessment process were shared with key stakeholders at a workshop and briefing on the 11th May 2011, together with further liaison meetings with KCDC and KiwiRail. The Western Alignment 2 alternative concept was also shared with Ngāti Raukawa and Ngā Hapū o Ōtaki during a site walkover on the 29th July 2011. Feedback on the Western Alignment 2 alternative was supportive. As a result of alternative alignment investigations, the Expressway now avoids the bush and wetland at Mary Crest.

9.8 Identification of Preferred Options

The preferred route for the Expressway is approximately 13km long, stretching from Te Kowhai Road in the south to Taylors Road to the north. The Project will also include a realignment of approximately 1.2km of the NIMT through Ōtaki in order to construct the Expressway (discussed further below).

The alternatives chosen for the alignments within the corridor were:

- The Board-Preferred Alignment was chosen over the Te Horo alternative; and
- The revised Western Alignment 2 Option was chosen out of the Mary Crest alternatives.

The alternatives chosen for alternative interchanges were:

- North Ōtaki Interchange: Option NO02 was chosen with further alterations including shifting of the north-bound ramp to between the NIMT and Expressway and other improvements to improve safety; and
- South Ōtaki Interchange: OG07 was chosen as the preferred alternative with various improvements including; squaring off of the bridges, safety improvements and the removal of the roundabout at the Ōtaki Gorge Road intersection.

The Options chosen for cross-connections were:

- Te Horo: Option TH01 was identified as the preferred alignment incorporating a grade separated crossing and a link to Gear Road;
- Rahui Road: Maintaining vehicular and pedestrian crossings here as an aspect of the north Ōtaki Interchange was identified as the preferred alternative; and
- Ōtaki Gorge Road: A grade separated crossing incorporated into the south Ōtaki Interchange provides access. An at-grade link to Old Hautere Road is also incorporated.

Pedestrian and cyclists are also provided for across all local cross-corridor connections.

The route also includes a new section of existing SH1 located to the west of the proposed Expressway, in the section of the corridor from Mary Crest south to Peka Peka.

9.9 Alternatives – KiwiRail NoR

Alternatives have also been considered in relation to the realignment of the NIMT, necessitated by the route of the Expressway.

The proposed position of the NIMT realignment was preferred over other possible locations to ensure that it retains connectivity with the existing NIMT to the north and south of the realignment, and also retains connectivity with the transport corridor formed by the Expressway and the existing SH1. By retaining the NIMT within the transport corridor, the potential for inaccessible parcels of land is also reduced.

Earlier options investigating into the potential location for the NIMT considered the scale of relocation / realignment that is required for the Ōtaki Railway Station. This has been minimised with the Project to ensure that as much as possible of the existing parking on the site is retained, and the Railway Station retains its relationship with Ōtaki and the NIMT. Previous options considered full relocation of the building onto the car park area whereas now the building can be rotated on its site towards the east, with a re-built platform, retaining the car park.

The cross-connection alternatives that were considered around Rahui Road and Waerenga Road in Ōtaki have also involved consideration of the extent and end location of the NIMT required to facilitate the Expressway.

Where the MCAT process for the Expressway was undertaken, the following specialist areas also considered effects on the KiwiRail interests for the alternatives being considered:

- Alternative Routes: archaeology / heritage; social / community; transport; specific land ownership effects; and
- Alternative Interchanges and Cross-Connections: transport outcomes; social / community; environmental outcomes.

9.10 Mitigation Option Assessment

An assessment of mitigation was undertaken throughout the design and development of the Project, particularly in relation to where potentially adverse effects were identified.

Each of the technical assessments appended in Volume 3, Technical Reports, has identified the mitigation alternatives relevant for each technical area. The applicability of these alternatives have been determined and assessed by the relevant specialists.

Chapter 10
Part F
VOLUME 2

Consultation and Engagement

Overview

Consultation for the Expressway has occurred over an extended period of time, commencing in 2001. The most recent consultation processes began in August 2009 with the final consultation period beginning in June 2012. Throughout these processes there has been input from and consultation with, key stakeholders, affected land owners and the general public.

A range of methods for seeking people's views through consultation have been utilised. This has included direct one-on-one meetings, engagement with specific stakeholders, workshops, letters, newsletters, brochures and open days.

Engagement with iwi, regulatory authorities and several key stakeholders has been on-going over a number of years, in particular since the current phase of the Project commenced.

Consultation has resulted in numerous changes to the Project, as set out in Chapter 10.14.

10 Consultation and Engagement

10.1 Introduction

This chapter outlines the strategy and methodology for carrying out consultation and engagement on the Project and sets out:

- The statutory framework;
- The objectives and purpose of consultation;
- History of consultation;
- Consultation phases;
- Parties consulted with;
- Consultation methods;
- Consultation reporting and feedback 2011-2012; and
- Summary of consultation.

The consultation and methods adopted were developed to provide targeted and effective engagement with iwi and consultation with stakeholders and the public. A consultation strategy was developed to assist in the progressing of the investigation and design development of the Expressway.

Consultation processes are described in more detail in the consultation materials in Volume 3, Technical Report 22A and 22B. Included in the Technical Reports are the brochure and newsletters that were also released as part of the consultation.

10.2 Statutory Framework

10.2.1 Resource Management Act 1991 (RMA)

There are no specific statutory requirements for consultation under the RMA for either NoR or resource consent applications. However, undertaking consultation is considered best practice and it is the NZTA's and KiwiRail's policy to do so. Where consultation has been undertaken the RMA requires this to be identified as part of the application.

10.2.2 **Land Transport Management Act 2003 (LTMA)**

Section 96(1) of the LTMA requires the NZTA to exhibit a sense of 'social and environmental responsibility' in meeting its objectives and undertaking its functions. This is further detailed to include avoiding, to the extent reasonable in the circumstances, adverse effects on the environment. The LTMA also has a statutory obligation under section 18H to establish and maintain opportunities for Māori to contribute to the Agency's decision-making functions. To enable this involvement the NZTA has considered ways in which Māori can contribute to decision-making.

10.2.3 **NZTA Public Engagement Policy 2008**

The NZTA Public Engagement Policy provides guidance for deciding when and how to engage the public. It explains the steps involved and provides a number of engagement resources.

The NZTA Public Engagement Policy identifies four key commitments to public engagement:

- Providing opportunities for public consultation;
- Ensuring people are informed;
- Adopting an inclusive and representative approach to public engagement; and
- Maintaining high professional public engagement standards.

The NZTA's Public Engagement Policy has been adhered to in undertaking consultation in relation to the Project.

10.3 History of Consultation 1998 - 2002

As stated in several previous chapters, an alternative to the current SH1 has long been a topic of discussion and investigation. Consultation has occurred over an extended period throughout the development of the Project. Several key consultation events prior to this are now briefly outlined below.

10.3.1 **1998 Consultation**

A study between Himatangi and Waikanae was undertaken in 1998 and consultation as part of that project also occurred. The two routes within the Project area that arose out of the 1998 investigations, and on which consultation was undertaken, were a coastal route and a central route.

10.3.2 **2001 Consultation**

The objective of the consultation in 2001 was to focus on development of a specific proposal and effects on the environment and properties.

The consultation process started with a presentation to the Ōtaki Community Board in July 2001. This was followed by the general distribution of a newsletter that was also printed in the Kāpiti Observer of 23 July, and a public open day in Ōtaki on 25 July. A second newsletter was distributed in June 2002.

The 2001 consultation raised awareness of Expressway options in the Ōtaki and Te Horo communities. Over 150 people attended the open day. Written submissions were received from about 50 people and groups, while others made telephone enquiries.

10.3.3 **2002 Consultation**

The 2002 consultation process was undertaken to focus on the preferred route of an Ōtaki – Te Horo expressway. This followed on from the 2001 consultation on alternative options. The purpose of the 2002 consultation was to provide widespread public

knowledge of the preferred route and a range of opportunities for potentially affected landowners and interested people to meet with the then Transit representatives to discuss the proposal and its effects.

Key features of the 2002 consultation process included the following:

- Letters were sent to all landowners whose land could possibly be directly affected by the preferred route;
- Follow-up meetings were held with landowners who asked for more detail;
- A newsletter was distributed widely advising people about the preferred route;
- Letters were sent to local authorities, Government agencies, and utility companies advising them of the preferred route;
- A website provided information and plans of the proposal;
- The media were briefed in a tour of the preferred route and a media kit was distributed;
- Two open days were held at the Rotary Hall, Ōtaki, on 4 December 2002 and at Te Horo School on 5 December 2002;
- Graphic displays, along with comment forms, were set up in the New World supermarket, Ōtaki Library, Ōtaki Information Centre and a storefront window in Mill Road; and
- A presentation was made to the Ōtaki Community Board.

10.4 Consultation for the Expressway 2009 - 2012

10.4.1 **2009 Consultation**

As part of investigations into improvements into this section of SH1, it was announced on 20 August 2009 that an expressway would be restarted, and there would be consultation on four-lane expressway options from M2PP and from Peka Peka to North Ōtaki. These two sections formed the Kāpiti Expressway.

The NZTA's objectives for consulting on an expressway proposal at that time, as identified in the consultation report, were to:

- Inform affected communities, key stakeholders, iwi and the general public about the proposal;
- Provide an opportunity for these parties to give feedback to the NZTA on the proposal;
- Provide the NZTA Board with an understanding of the views of the affected community, key stakeholders, iwi and general public regarding the proposal; and
- Provide a method of community, stakeholder and general public engagement on the preferred route for a four-lane expressway from Peka Peka to North Ōtaki, which meets the requirements of the LTMA.

The consultation ran for 10 weeks from 24 August to 30 October 2009. It included sending brochures to over 26,500 postal addresses in the Kāpiti district, open days and meetings with stakeholders. These included potentially affected property owners and key stakeholders such as KCDC and local iwi.

A total of 1,720 submissions were received on the Peka Peka to North Ōtaki section of the Kāpiti Expressway. Of those submissions, 1363 supported the proposal and 231 opposed it.

The 2009 consultation can be considered as the beginning of the current phase of consultation as feedback formed the basis for considering and assessing locations of interchanges and cross-corridor connections for the scoping process leading up to the 2011 consultation. Feedback from the 2009 consultation highlighted substantial support for an expressway throughout the district however there were concerns about the effects it

may have on local communities and those people directly affected. Route options were not consulted on as part of this phase of consultation.

10.4.2 **2011 Consultation**

The primary objective of the consultation undertaken in 2011 on the Peka Peka to North Ōtaki section of the Kāpiti Expressway was to:

- Gain public feedback on the form, function, and location of interchanges and connections.

The secondary objectives were to:

- Provide balanced and objective information on the intent of the Project, the proposed route of the Expressway, and impending Project decisions that key stakeholders and the community could provide input into;
- Gather data to help the Project team understand stakeholder aspirations and concerns about connectivity and safety for all road users and pedestrians, and potential concerns about the social and environmental effects of the Project;
- Gather community input to the decisions about interchanges, land purchases and transport linkages that could be influenced by stakeholders; and
- Build positive relationships between the NZTA, local stakeholders and the community.

Following the formal feedback period, two community newsletters were prepared. One described the outcomes from the consultation and the other the explained the decision that the NZTA had made on the Project (including the details of connections and interchanges) following the consultation undertaken.

An important aspect of 2011 consultation was to re-engage with the communities and affected parties. Prior consultation was undertaken in 2009, meaning that there had been an interlude in providing parties with an update on the Project.

This consultation phase was mainly undertaken between 7 February and 18 March 2011. The focus of this consultation was to gain feedback, obtain information and get assistance in refining the alignment, interchanges and connectivity scenarios. This specifically related to:

- The alignment of the Expressway;
- The location of interchanges north and south of Ōtaki; and
- Cross-corridor connections located at Rahui Road, Old Hautere Road and Te Horo.

The outcomes from the consultation were communicated to the community through a newsletter in September 2011 and the changes to the Project as a result of this consultation are addressed in Part 10.14 below.

10.4.3 **2012 Consultation**

The Project team took the information that had been provided by the community in 2011, and then further refined the Project and the particular details of the route so as to develop indicative mitigation measures. The 2012 consultation sought to relay to the community what sorts of mitigation were being considered, and to give the community the opportunity to provide feedback on the mitigation. The consultation was undertaken before the mitigation was finalised so there was a chance for community input to influence the final mitigation adopted.

The outcomes sought for that consultation were:

- To gain community feedback on the mitigation options proposed along the Expressway; and

- To demonstrate to the community that the NZTA had considered previous feedback comments.

The Project's location and the form of the Expressway and NIMT realignment were confirmed in January 2012 following the Scheme Assessment Report Addendum 2012 (SARA) and communicated to the community through a newsletter soon after that.

The refinements to the design and the preliminary mitigation measures that had been developed to mitigate environmental effects were then taken back to the general public and key stakeholders in June 2012.

Feedback was received from key stakeholders, iwi and the local community. This feedback was used to finalise the mitigation measures for the Project and to ensure a comprehensive consideration of potential issues. The changes to the proposed mitigation resulting from this feedback are set out in Part 10.14 below.

10.5 Parties Consulted

Methods used to engage with stakeholders during the 2011 and 2012 consultation included:

- Open days;
- Consultation brochures and newsletters;
- Workshops;
- Stakeholder letters; and
- Briefings and meetings.

There has been on-going liaison with key stakeholders. The following (Table 10-1) outlines the consultation undertaken with some of these key stakeholders as part of the Project development process.

Table 10-1: Key Stakeholders

Category	Iwi/Stakeholder	Key Interests	Method of engagement
Tangata Whenua	Ngāti Raukawa	Alignment of the Expressway in relation to sites of cultural significance Focus on avoiding or mitigating any effects on significant sites	Project briefings Workshops and hui Open day at Raukawa Marae, Ōtaki Letters informing of consultation and seeking feedback Site walkovers Meetings with specialists and Project team
	Ngā Hapū o Ōtaki	Alignment of the Expressway in relation to sites of cultural significance Focus on avoiding or mitigating any effects on significant sites	Lead role on CIA preparation Project briefings Workshops and hui Letters informing of consultation and seeking feedback Site walkovers Meetings with specialists and Project team

Category	Iwi/Stakeholder	Key Interests	Method of engagement
	Muaupoko	Alignment of the Expressway in relation to sites of cultural significance Focus on avoiding or mitigating any effects on significant sites	Project briefings Workshops and hui Letters informing of consultation and seeking feedback
Community	Directly affected landowners	How the proposal might affect their property or business	Contacted first in 2009 with a letter informing them that their property might be affected Individually notified by letter inviting them to the open days Visited by Project team before consultation and when changes to land effects were determined, to discuss the impact on their properties
	Wider Community	Where the Project will go and how this might affect them	Letters informing of consultation and seeking feedback Open days Brochures and newsletters
Regulatory Authorities/ Organisations	Greater Wellington Regional Council	Implications as a consenting authority in particular erosion and sediment control, ecological / aquatic effects and flooding Relationship to rail and bus public transport	Issues and opportunities workshops Scheme development and evaluation workshops Technical meetings Letters informing of consultation and seeking feedback High level relationship discussions
	Kāpiti Coast District Council	Worked with to develop and achieve common objectives for the Expressway, local connections, and NIMT realignment Develop and maintain a relationship Implications as a consenting authority	Issues and opportunities workshops Scheme development and evaluation workshops Technical meetings Letters informing of consultation and seeking feedback High-level relationship discussions Presentations to full Council on the Project
	Ōtaki Community Board	Effects on the district, and in particular in Ōtaki, as a result of the Project	Briefings and updates on the Project Various meetings

Category	Iwi/Stakeholder	Key Interests	Method of engagement
			Letters informing of consultation and seeking feedback
Transport Industry	Wellington Regional Transport Committee	Implications for transport in the area	Letters informing of consultation and seeking feedback
	Automobile Association	Regionally and nationally safe and efficient road networks	Letters informing of consultation and seeking feedback
	NZ Road Transport Association	Transport effects through the Project	Letters informing of consultation and seeking feedback
	Road Transport Forum NZ	Transport effects through the Project	Letters informing of consultation and seeking feedback
Statutory agencies	Department of Conservation	Ecological effects	Letters informing of consultation and seeking feedback Various meetings
	Ministry for the Environment	Environmental effects as a result of the Project	Letters informing of consultation and seeking feedback
	NZ Historic Places Trust	Sites of cultural or historical significance Archaeological authority approvals	Participation in site walkovers One-on-one sessions with the team and specialists Letters informing of consultation and seeking feedback
Community / Business / Interest Groups	Kāpiti Coast Chamber of Commerce	Economic effects through the district, and in particular in Ōtaki	Letters informing of consultation and seeking feedback
	Wellington Regional Chamber of Commerce	Economic effects through the district, and in particular in Ōtaki	Letters informing of consultation and seeking feedback
	Nature Coast Enterprise	Environmental effects as a result of the Project	Letters informing of consultation and seeking feedback
	NZ Fish and Game	Effects on watercourses and fish habitats as a result of the Project	Letters informing of consultation and seeking feedback
	Keep Ōtaki Beautiful	Effects on Ōtaki from the Project, in particular in relation to the Pare-o-Matangi reserve and the	Letters informing of consultation and seeking feedback

Category	Iwi/Stakeholder	Key Interests	Method of engagement
		Ōtaki River walkway areas	Various meetings Site walkover, in particular in relation to the Pare-o-Matangi reserve
	Ōtaki Māori Racing Club	Effects on access to the Ōtaki Māori Racing Club as a result of the Project	Letters informing of consultation and seeking feedback Meetings
	Friends of the Ōtaki River	Access to the Ōtaki River as a result of the Project	Letters informing of consultation and seeking feedback Meetings Site walkover
Emergency Services	Te Horo Rural Fire Service	Access onto the Expressway to attend callouts	Letters informing of consultation and seeking feedback Meetings
	Wellington Free Ambulance	Access onto the Expressway to attend callouts	Letters informing of consultation and seeking feedback One-on-one discussions and meetings
	St John's Ambulance	Access onto the Expressway to attend callouts	Letters informing of consultation and seeking feedback One-on-one discussions and meetings
	NZ Fire Service	Access onto the Expressway to attend callouts	Letters informing of consultation and seeking feedback One-on-one discussions and meetings Represented on the Emergency Services Group
	NZ Police	East-west connectivity across the Expressway Access on and off the Expressway	Letters informing of consultation and seeking feedback One-on-one discussions and meetings Represented on the Emergency Services Group

10.6 Communication and Engagement with Directly Affected Landowners

10.6.1 **2009 Consultation and Engagement**

Two letters and consultation brochures were mailed to each property owner identified as being potentially affected by the proposal. The first mail out was in August, the second in

October 2009. The landowners were offered the opportunity for further engagement throughout the process.

10.6.2 2011 Consultation and Engagement

Developments in the Project since 2009 meant that by 2011 there were approximately eight newly affected landowners. All landowners received a site visit before the start of consultation to discuss the potential impact on their properties. If the landowners were unable to be contacted, letters were left on site with full contact details of the Project liaison person.

These meetings continued to take place on an as-requested basis and when there have been changes to the Project that have changed the extent of the directly affected land areas.

All directly affected landowners were encouraged to attend the open days to gain an in-depth understanding of the Project and raise any concerns they may have.

10.6.3 2012 Consultation and Engagement

Leading up to the 2012 consultation, each of the directly affected landowners were contacted advising of the consultation on mitigation. Where there had been a change in the land area affected by the Project, the directly affected landowners were met with individually.

Where there was a need for mitigation on a property as a result of the Project, these landowners were also met with individually to discuss the need for the mitigation and what the options for mitigation were.

The meetings were highly beneficial to the NZTA, in terms of understanding landowners' preferences for mitigation and any on-going issues about the Project, and meetings with landowners have continued into 2013.

10.7 Communication and Engagement with Key Stakeholders

10.7.1 2009 Consultation and Engagement

During this engagement, key stakeholders were contacted consistent with directly affected landowners and given the opportunity for further involvement in the Project. Many key stakeholders made submissions, raising issues ranging from connectivity, cultural impacts, improvements to travel times, and economic effects.

10.7.2 2011 Consultation and Engagement

Consultation with key stakeholders such as community groups and environmental groups has taken place on an on-going basis. This has included detailed discussions with emergency services with regard to the effective operation of their roles and functions once the Project is constructed.

While KCDC, GWRC, and NZHPT are key stakeholders, their roles are slightly different from other key stakeholders as a result of them also being regulatory authorities from whom statutory approvals are required to facilitate the Project. These stakeholders have been involved in workshopping issues and opportunities, and the assessment of options to identify suitable solutions for consultation.

All key stakeholders (Table 10-1) received a letter before the start of consultation informing them of the upcoming consultation phases.

10.7.3 **2012 Consultation and Engagement**

Update briefings to key stakeholders occurred on an on-going basis after the 2011 consultation. The Project benefited in particular from specific involvement of KCDC in the development of mitigation options and the consultation material prior to it being published.

10.7.4 **Communications with Regulatory Authorities/Central Government**

Several meetings and workshops were held during the scoping phase of the Project (initial Project design and information gathering phase) with the regulatory authorities and other central government agencies. These meetings were to ensure that firstly the Project team captured the key Project issues and constraints, and secondly to seek the authorities'/agencies' views and feedback in the option identification and development process.

Since that time, update meetings on the Project and the timelines have been held as required.

10.8 Communication and Engagement with the General Public

The methods of communication were generally the same for the 2009, 2011 and 2012 consultation periods. The views of the community were sought by the NZTA sending out information about the Project, holding eight open days in 2009 and then two open days for each of the 2011 and 2012 consultation phases. Feedback was sought in the form of written or verbal submissions. The open days in 2009 and 2011 were supported by the delivery of brochures to all addresses in the Kāpiti district. The brochures also provided links to the website and an 0800 number where further information could be obtained.

Figure 10-1: Project Open Day at Ōtaki, 2011

10.8.1 **Open Days**

Open days were held in both the Ōtaki Town Hall and Te Horo Memorial Hall as part of the 2011 and 2012 engagement phases. There was one open day at each location for both the 2011 and 2012 consultations.

The open day format had a number of display boards featuring information on the Project. In 2011 the information was on the key issues identified, the design process, the options for the interchanges and the process moving forward. In 2012 there were boards on specific geographic locations and individual specialist areas such as noise, landscape and

flooding. Two sets of strip maps showing the entire alignment and interchanges were also provided for easy reference and discussion with the Project team (Figure 10-1).

Each open day had a breakout room where meetings with directly affected landowners could occur in private if required.

In 2012 at both of the open days there was a Project member from the M2PP Project present to answer any questions on the connectivity between the two Projects and the form of that section of the Kāpiti Expressway.

Approximate attendance figures for two open days held in 2011, recorded via a manual door counter, are shown below:

Table 10-2: Attendance Figures for Open Days in 2011

Date	Time	Location	Attendees
Saturday 12 February 2011	10am – 4pm	Ōtaki Town Hall	263
Wednesday 17 February 2011	2pm – 8pm	Te Horo Memorial Hall	194

Table 10-3: Attendance Figures for Open Days in 2012

Date	Time	Location	Attendees
Saturday 16 June 2012	10am – 4pm	Ōtaki Town Hall	109
Wednesday 20 June 2012	2pm – 8pm	Te Horo Memorial Hall	98

10.8.2 Media Releases

Media statements were released to announce the consultation timeline, publicise the start of consultation, and remind people of the closing date for written feedback. Decisions that were made regarding the consultation process and the Project were also subject to media releases.

10.8.3 Project Website

Summary and detailed information about the history of the Project has consistently been available on the NZTA website. Specifically **www.nzta.govt.nz./pp2oproject** is a dedicated site where an array of information is available.

The information available on the website has included the consultation brochures, draft plans, open day panels, the feedback form, background material and resources, and contact details for enquiries and feedback. The website also allows users to lodge feedback online.

10.8.4 Project Phone Line

A free-phone number (0800 7726 4636) was available during working hours since the commencement of engagement in 2011 through to lodgement of the application. All phone calls were recorded in the consultation database.

10.8.5 PP2O Info Email

A Project information email address (info@pp2o.co.nz) was established and staffed by the Project team during normal business hours over the initial consultation periods and the following stages of the Project. Project team members replied to queries, supplied

requested information, and set up further meetings through this email address. All emails were recorded in the consultation database.

10.8.6 **Post**

Queries could also be posted to the Project team at:

Peka Peka to Ōtaki Expressway Project Team
c/- Opus International Consultants Ltd
PO Box 12003
Thorndon
Wellington

As with verbal and email comments and feedback, all written correspondence received was recorded in the consultation database.

10.8.7 **Feedback Forms**

In 2011, feedback forms (included with the consultation brochure) were sent to every Kāpiti district household and postal address, seeking their feedback on the form, function, and location of interchanges and connections for the Project. Copies of the feedback form were also available on the Project website, at the KCDC offices and at local libraries.

In 2012 feedback forms were available at the open days and were also available online at the Project website.

Information sought on the feedback form included contact details, the location of the submitter, and comments on what the different aspects of the proposals meant to the submitter, plus any general comments and feedback.

Feedback forms were able to be lodged online, posted, or handed over personally at the open days. The closing date for lodging feedback forms was 18 March 2011 for the 2011 consultation and 17 July 2012 for the 2012 consultation. Some submitters chose to send in letters and not use the feedback forms; these were accepted and recorded accordingly.

10.9 Consultation Brochures and Newsletters

A 20-page brochure was prepared for the 2011 consultation phase. This brochure contained information to support the objectives of the consultation period and included information on the design process, the options for the interchanges, and the process moving forward. The brochure is contained in the consultation reports in Volume 3 of the application, Technical Report 22.

The brochure was distributed on 4 February 2011 to approximately 23,000 addresses across the Kāpiti district. The brochure was also available from the libraries in Paraparaumu and Ōtaki.

There was a Project newsletter issued in September 2011 advising of the outcome of the consultation undertaken earlier in 2011. In January 2012, after NZTA had reached a decision on the options consulted on in 2011, another newsletter was released to the community advising of these decisions. These newsletters were supplied to all households and postal addresses within the Project area.

10.10 Feedback Methodology and Analysis

As detailed above, feedback forms were received online, by hand at the open days, via email and by post. So far as the NZTA is aware, every piece of feedback received has been recorded in the Project consultation database (Darzin). The use of Darzin allowed the Project team to record and summarise high volumes of public feedback, facilitating the on-going consideration of the public's views as the Project has developed.

From the data collected, issues, concerns, opportunities and preferences were identified. An analysis of the summary of comments was undertaken with a set of common feedback themes being produced as a result (discussed in the consultation feedback sections below).

In recording and summarising the content of the feedback the following protocols were applied.

10.10.1 **Form of Feedback**

Feedback was received via the feedback form, letters and emails. All of these different types were included in the feedback analysis.

10.10.2 **Anonymous Feedback**

Fifteen anonymous feedback forms during the 2011 consultation period and one during the 2012 consultation period were received (names and/or addresses were not stated). This feedback was recorded in the consultation database and included in the feedback analysis.

10.10.3 **Pro-Forma Feedback**

Two pro-forma type feedback forms were received for the 2011 consultation. These are template forms which contain exactly the same content, but which were lodged or signed by individual parties. These forms were treated and summarised as individual feedback comments, recorded under the name of the individual person lodging the feedback.

10.10.4 **Multiple Feedback**

In some cases multiple feedback forms were received from one individual member of the public i.e. different forms lodged on different dates within the same consultation period, but from the same member of the public with the same contact details. These forms were treated and summarised as one feedback entry, with each multiple feedback detail being added into the initial feedback summary entry.

10.10.5 **Late Feedback**

Ten forms were received after the 2011 consultation period closed on 18 March. Three feedback forms were received after the 2012 consultation period closed on 13 July. These forms were summarised in the consultation database and considered in the development of the Project, along with all other feedback received.

10.11 Consultation Feedback 2011

This section of the Chapter provides a summary of the feedback received during the 2011 Peka Peka to North Ōtaki consultation period.

Analysis of the feedback, comments and feedback identified a number of themes, matters and concerns. Overall, there were a total of 473 feedback comments received and the content of the feedback reflected a number of views and interests ranging from support to opposition to the proposals, and a combination of both. The key themes identified from the feedback are now discussed in this section.

10.11.1 **Feedback Analysis**

Figure 10-2 below shows the breakdown of the feedback received by the locality of the parties providing the feedback.

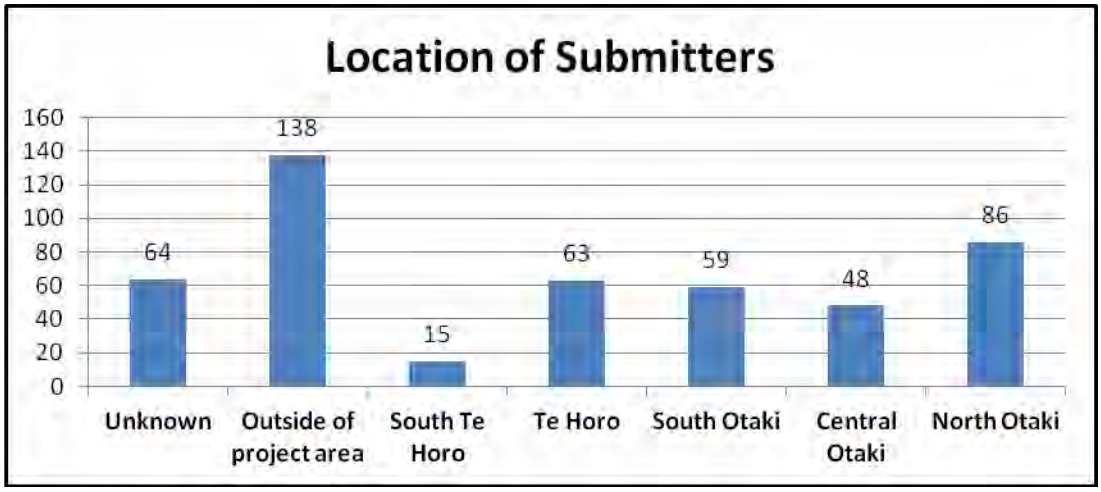


Figure 10-2: Locations of Parties Providing Feedback for the 2011 Consultation

10.11.2 Summary of Feedback (2011 Consultation)

The main themes that were raised during the 2011 consultation were:

- General support;
- General opposition;
- Design;
- Local accessibility and connectivity;
- Property issues;
- Construction issues;
- Environmental effects including;
  - Hydraulics/hydrology/waterways;
  - Social/community/recreation;
  - Business viability;
  - Noise/vibration;
  - Traffic/transportation/safety; and
  - Landscape/visual; and
- Property issues.

A summary of the common themes is provided as follows under each appropriate topic[17].

10.11.3 General Support

Many parties providing feedback highlighted the need for an Expressway through the Project area, citing the congestion issues that they currently experience as the primary reason for their view.

Some sought that the Expressway be constructed as soon as possible. Many reiterated the transport benefits and district/regional importance of the Project.

[17] It is important to note that this is a summary of common themes and does not constitute a summary of every feedback form.

10.11.4 General Opposition

Concern was raised by the parties providing feedback concerning the effects that the proposal would have on the communities, particularly severance of Te Horo settlement and Ōtaki Township. Many also highlighted the effects that the Expressway would have on their property or other properties. The environmental effects of constructing and operating the Expressway were also viewed as areas of concern.

10.11.5 Design Options

Key issues that were addressed in submissions with regard to the proposed design of the Expressway related to the Te Horo options, interchange options north and south of Ōtaki, and the options at Rahui Road.

General issues relating to the design of the Expressway were:

- Gradients of the bridges across the Expressway need to be designed appropriately;
- Speed limits need to be taken into account;
- Upgrading of local roads needs to take into account the people that are going to be using them;
- Bridge design needs to take into account oversize vehicles entering different sites;
- Flooding levels need to be taken into consideration; and
- Maintaining existing connections.

Design Options Relating to Te Horo

The options for the section of road over the Expressway connecting the two areas of Te Horo as presented to the community are outlined in Chapter 9 of the AEE report. The feedback received indicated that there was slightly more support for Proposal B (crossing over railway and Expressway north of Te Horo Beach Road, linking School Road and Te Horo Beach Road). Feedback from just the local Te Horo community, however, indicated a clearer preference for Proposal B.

Common reasons for support for Proposal B from the local Te Horo community included the following themes:

- Less effect on the Red House Cafe if Proposal B is chosen;
- Less effect on the community, St Margaret's Church and that part of the community on SH1 not being 'sandwiched' between two roads; and
- Proposal B is the lower cost option.

Some feedback from the community acknowledged that Proposal B would entail works being undertaken in or adjacent to the Mangaone Stream. Proposal B has been incorporated into the Expressway design.

Design Options Relating to the South Ōtaki Interchange

Public feedback was sought on two options concerning the south Ōtaki interchange. Feedback received indicated that there was large support for Proposal A (local road crossing over the NIMT and Expressway towards Ōtaki Gorge Road at approximately the location of the existing Ōtaki Gorge Road railway bridge, providing for both northbound and southbound ramps). A similar preference was found when only feedback from people located within the Project area were scrutinised. Proposal A has been incorporated into the Expressway design.

North Ōtaki Interchange

Of the two options consulted on concerning the north Ōtaki interchange, feedback indicated that there was substantial support for Proposal A (southbound off ramp which

crosses over the existing SH1 bridge over the Waitohu Stream, and a northbound on ramp that crosses the NIMT slightly north of the town). A similar level of support was noted when only feedback from people located in the Project area were scrutinised. Proposal A has been incorporated into the Expressway design.

Rahui Road

Many feedback comments highlighted the importance of the Rahui Road connection across Ōtaki and that this should be maintained. The brochure had proposed only a pedestrian / cycle bridge with traffic diverted on to an upgraded County Road. The Rahui Road connection has been incorporated into the Expressway design with road and pedestrian access.

10.11.6 Local Access

There were several themes raised through the consultation relating to local access. These issues (broken down by area) include:

Feedback regarding access at Te Horo included issues relating to:

- Local road access to the north to link in with Old Hautere Road;
- Physical effects on School Road and the properties in School Road arising from the options at Te Horo; and
- Access onto the Expressway from Te Horo.

Feedback Regarding Access at South Ōtaki included:

- Issues associated with making Old Hautere Road a cul-de-sac;
- Access to the south linking in with Te Horo;
- Impact of 'boy racers' on the community in relation to the treatment of local roads and any increase in the use of the local roads by 'boy racers';
- Potential impact on emergency services by any alteration of the current local roads; and
- Concerns about a possible reduction in cross Expressway connectivity.

Feedback Regarding Access at Central Ōtaki included:

- The treatment of Rahui Road;
- The loss of community connectivity; and
- Access to/from the Ōtaki Māori Racing Club on race days.

Feedback regarding access at North Ōtaki included:

- The treatment of Taylor's Road; and
- The link into and connections with Rahui Road / County Road area.

10.11.7 Property Issues

A number of submissions commented on a range of property issues along the entire Expressway. The most common themes were general effects, physical effects, and effects on property value. Other themes were access, the purchase process and future land use.

Concerns around general impact on properties focussed on two issues:

- General effects on property from the alignment and environmental effects associated with the Expressway; and
- Effects on the properties at Te Horo that would have arisen from Proposal A (where a number of properties would have needed to be acquired).

Physical effects issues were:

- Effects on the Te Horo community that would have resulted from Proposal A, which would have seen parts of the community sandwiched between two roads; and
- Environmental effects on properties that will be next to the Expressway but where land is not required.

The value issue is:

- The effect on the value of properties that will have the Expressway as a neighbour.

10.11.8 **Construction Issues**

A number of submissions commented on a range of construction issues. The common themes were timing and staging, cost and commercial viability.

Timing and staging:

- 'Get on with it please.'

Cost:

- Options should be chosen on a cost basis.

Commercial viability comments or questions included:

- Can the country afford the Expressway at this point in time?
- Where is the money coming from to construct the Expressway?
- The cost benefit ratio is not sufficient to warrant the Expressway.

Concerns about the effect of noise, vibration and dust during construction were also put forward.

10.11.9 **Environmental Considerations**

A number of submissions commented on a range of environmental considerations. Those for which common themes could be derived are briefly identified in Figure 10-3 and discussed in the sections below.

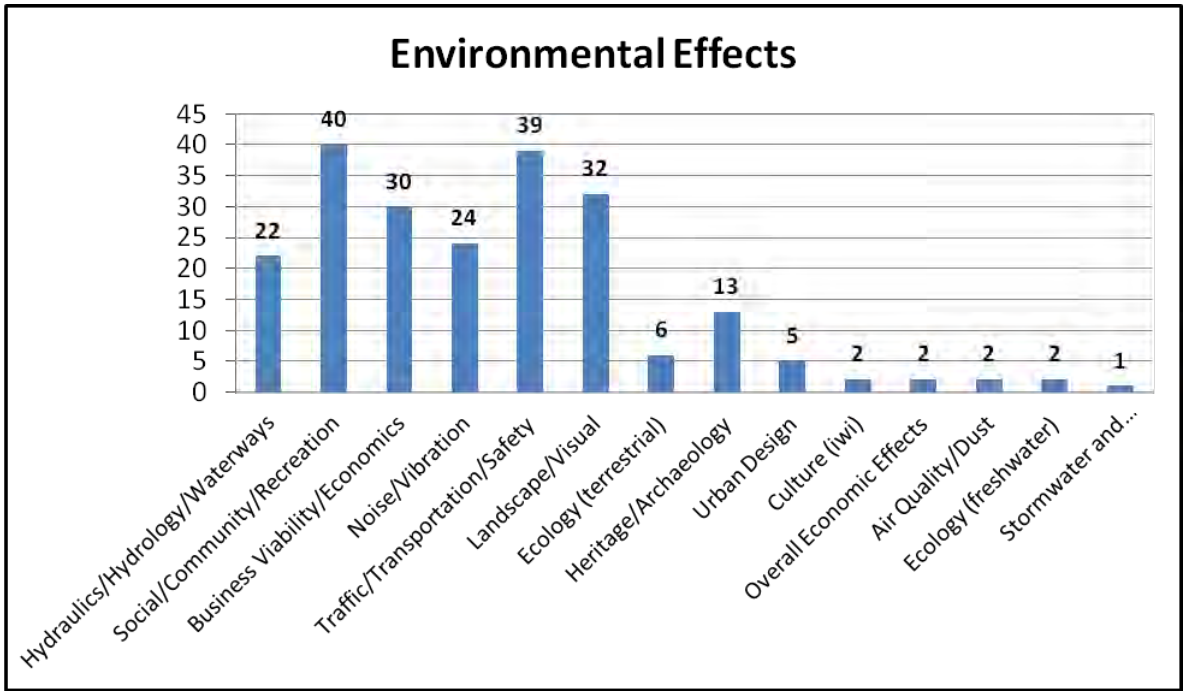


Figure 10-3: Environmental Effects Identified in Submissions

Hydraulics/Hydrology/Waterways

- Some comments highlighted the effects that certain options would have on the Mangaone Stream, and the importance of addressing these effects appropriately; and
- Some people queried the effect that the Project might have on the flooding throughout the area.

Social/Community/Recreation

- The effect that Proposal A at Te Horo would have had on the ambience of St Margaret's Church and the Red House Café as historic sites;
- The effect that an overpass will have on the community café;
- Some people queried whether it would take longer for emergency services to reach certain areas due to the closure of local connections;
- The effect that closures of connections might have for increasing the incidence of 'boy racers' in the area; and
- Fears that any closure of Rahui Road would split the Ōtaki community in two (Ōtaki Village and the Plateau area).

Business Viability

- Effects on local business from the removal of passing trade from the Te Horo straights and Ōtaki areas;
- Consideration of a northbound exit to provide access into Te Horo for passing trade;
- Consideration of signage before Te Horo to promote local businesses;
- The negative impact on the Red House Café by Proposal A;
- Some feedback suggested a "recovery package" be considered for Ōtaki town, focusing on promotion and future development;
- Whether a full interchange north and south of Ōtaki is provided so that people can stop and 'impulse' shop;
- Good signage to Ōtaki and shops; and
- Legible access into Ōtaki town and shops for passing trade (road layout).

Noise/Vibration

- Some expressed concerns about road noise from the existing SH1, and queried whether the Expressway is going to have a greater noise effect.

Traffic/Transportation/Safety

- Some feedback sought the closure of local road level rail crossings along the Expressway route;
- Issues were raised about possible effects on access by emergency services;
- Some queried disaster management of the Expressway and surrounding areas i.e. tsunami threat and the ability for people to clear the area fast with the Expressway in place;
- Some asked whether travel times would be lengthened if local connections are closed off i.e. Old Hautere Road;
- Boy racer issues if local roads and connections are altered;
- Access to the Ōtaki Māori Racing Club on race days; and

- Route security.

Landscape/Visual

- Issues raised included the effects of lighting of the road over rail bridges and potential light spill into the surrounding rural areas;
- Potential effects on the trees at Mary Crest if the Expressway was to go through there.
- Visual impacts of structures; and
- Possible effects of the Project on public areas such as the Pare-o-Matangi reserve and mitigation of those effects.

10.11.10 Process Issues

A number of comments were made on a range of process issues. The common themes were:

- Assertions that the information in the brochure was different from the open day information;
- Queries as to the NZTA's objectives in continuing consultation;
- Suggestions that further changes to the Project design should also be discussed with the community through consultation; and
- Certainty around the processes being undertaken, especially around property purchase.

10.12 Consultation Feedback 2012

In total there were 36 submissions received during the consultation period from 16 June to 13 July 2012, with late submissions additional to that.

10.12.1 Summary of Submissions (2012 Consultation)

The main issues that were raised in submissions included:

- Flooding;
- Geotechnical;
- Stormwater;
- Railway crossing safety issues;
- Noise;
- Landscape and screening;
- Emergency services;
- Heritage and culture; and
- Property access.

Among the issues raised, a number of people attending the open days were concerned about potential visual and noise effects at their properties as a result of the Expressway. Residents were also concerned about an apparent lack of noise mitigation measures in the design, and that they had not had enough prior detail on the potential effect of the alignment on their properties. There were also some concerns about partial or total land loss, and the acquisition process around this.

Residents in the area raised concerns about access to the Expressway, particularly in the Te Horo area and concerns as to the location of access from the Expressway (to and from the south) at the Peka Peka interchange which forms part of the M2PP Project. Residents immediately adjacent to the alignment raised concerns about access to their properties once the Expressway was operational.

Comments were also received in relation to the existing NIMT level crossing at Mary Crest and the safety of this and these have been considered through the design process.

Some members of the Ōtaki and Te Horo communities raised issues related to the preservation of the area's heritage, namely:

- Clifden at Bridge Lodge;
- The property at 230 State Highway 1, Ōtaki; and
- The stockyards at Te Horo.

Each of the comments and feedback topics raised were passed to the Project team to seek to ensure that the final mitigation developed took these comments into consideration. The feedback has been incorporated into the detail that now forms part of the mitigation of the environmental effects that is discussed below in this AEE report.

10.13 Summary of Key Stakeholder Consultation

A summary of the main elements of the feedback and submissions received from the key stakeholders is provided below. This includes feedback received from workshops, Project briefings and the site walkovers. The key stakeholders were:

- Ōtaki Māori Racing Club;
- KCDC;
- NZHPT; and
- Ōtaki Community Board.

Discussions with iwi are specifically addressed in Chapter 26 of Part G, and within the Cultural Impact Assessment, Technical Report 19 in Volume 3.

10.13.1 **Ōtaki Maori Racing Club**

The Ōtaki Māori Racing Club in 2011 asked that:

- The Expressway maintain east to west connectivity through Rahui Road to Main Street for all vehicles;
- Pedestrians and cyclists have safe access across and onto current SH1;
- Access into and out of town and the Ōtaki Māori Racing Club racecourse be of good quality;
- The Expressway cross over the top of Rahui Road; and
- The Expressway provide connectivity with the local road network.

Project Team Response: Consultation continued with the Ōtaki Māori Racing Club to identify and address concerns. The Rahui Road connection has been retained through further investigation and analysis to address the Club's concerns.

10.13.2 **Kāpiti Coast District Council**

A summary of KCDC's 2011 feedback on the key issues surrounding the Project (as it has developed over time) is as follows:

- KCDC highlighted the need for certainty for the communities affected by the Project, especially land owners;
- Other comments on interchanges and alignment – KCDC supported Proposal A at the northern end of Ōtaki as the formation which pulls access into Ōtaki as close as possible to the town;
- KCDC supported Proposal A at the southern end of Ōtaki as the least intrusive option which took up as little land as possible;

- KCDC supported Proposal B at Te Horo as the option which was the least intrusive on the settlement;
- KCDC supported any modification to the alignment which avoided damage to the areas of bush and wetlands in the Mary Crest area;
- Local road connection across the Expressway – KCDC sought that east-west connectivity across the Expressway was maintained, both in the town and in the rural areas. KCDC likewise sought that access to essential and other services was maintained;
- Left-off access to Te Horo – KCDC strongly supported no direct access from the Expressway to Te Horo, as a way of minimising growth pressures. If access was to be included, KCDC prefer a left-off interchange (from the south only) to provide access to the Te Horo businesses;
- The Ōtaki Railway Station – KCDC supported the option of moving the Ōtaki Railway Station slightly on its axis to accommodate a realigned rail line;
- Pare-o-Matangi reserve – The Expressway will affect a significant area of the Pare-o-Matangi reserve, and KCDC was concerned to ensure that effects were appropriately mitigated;
- Design quality – KCDC sought "best practice" level of design, particularly in terms of how design and landscaping can mitigate visual, noise and air quality impacts;
- KCDC raised a concerned in relation to the existing SH1, and sought to ensure that its formation as a local arterial road is appropriate at the time it ceases to be a State highway;
- KCDC was concerned as to economic impacts on Ōtaki, in terms of potentially affected businesses and employment; and
- Cost – KCDC sought that any trade-offs between cost and design were able to be discussed in an open way between Council and the NZTA.

Project Team Response: KCDC continues to be a key stakeholder with whom consultation is frequent and on-going. The concerns of KCDC have been taken into account through the MCAT analysis as well as in the development of the Project design, interchanges, cross-connections, alignment and mitigation measures.

10.13.3 New Zealand Historic Places Trust

The NZHPT 2011 feedback is summarised as:

- Further information was needed in regard to the effects of the Expressway on the archaeological record;
- The historic heritage values of the Ōtaki Railway Station needed to be recognised in the planning process and further consideration needed to be given to options in discussion with NZHPT;
- The heritage values of the former Rahui Milk Treatment Station and Social Hall needed to be further investigated to inform the decision-making process;
- The heritage values of Mary Crest, Mirek Smišek Pottery, 230 Main Road Ōtaki, and the Red House Cafe needed to be investigated to inform the decision-making process; and
- There was a need to consider all Part 2, section 6 matters of the RMA and not to be selective.

Project Team Response: Continued specialist investigations were undertaken to address the NZHPT concerns. These findings have been incorporated in the MCAT decision process as well as the Project design and mitigation development. Further detail on the specific mitigation of heritage issues as a result of the Project in contained in Part H of the AEE report and the technical report on built heritage appended in Volume 3.

10.13.4 Ōtaki Community Board

The OCB 2011 position on a number of aspects of the proposal as expressed during consultation, was as follows:

- Process – OCB expressed concern about a perceived lack of clarity about what aspects of the Expressway were open to consideration and potential change through the consultation processes;
- Local road connection across the Expressway – OCB expressed satisfaction with the general approach to access on and off the Expressway, particularly given its concerns about growth effects, but was concerned about possible loss of connectivity across the Expressway;
- Left-off access to Te Horo – OCB supported the idea of a left-off interchange (from the south only) to provide access to the Te Horo businesses;
- Other comments on interchanges and alignment – OCB supported Proposal A at the northern end of Te Horo;
- OCB supported Proposal A at the southern end of Ōtaki as the least intrusive option which took up as little land as possible;
- OCB supported Proposal B at Te Horo as the option which was less intrusive on the settlement;
- OCB supported any modification to the alignment which avoided damage to the areas of bush and wetlands in the Mary Crest area;
- The Ōtaki Railway Station – OCB supported the option of moving the Ōtaki Railway Station slightly on its axis to accommodate a realigned rail line;
- Pare-o-Matangi reserve – The Expressway will affect a large portion of the Pare-o-Matangi reserve, and OCB was concerned to ensure that effects were appropriately mitigated;
- Design quality – OCB sought "best practice" level of design, particularly in terms of how design and landscaping can mitigate visual, noise and air quality impacts;
- OCB was concerned as to the economic impacts on Ōtaki, in terms of potentially affected businesses and employment; and
- Cost – OCB sought that any trade-offs between cost and design are able to be discussed in an open way between KCDC, OCB and the NZTA.

Project Team Response: OCB is a key stakeholder. Inputs from the Board have been taken into consideration and fed into the MCAT decision process as well as the design of the Expressway and its mitigation measures, as sought in this application. Most matters raised by OCB have been addressed. However, at the date of lodgement of this application, specific points of discussion around marketing and signage for the Ōtaki Railway Retail area adjacent to the current SH1 alignment, are yet to be resolved.

10.14 Summary of Issues

Reports were produced at the completion of each consultation period that summarised the main feedback topics and allowed the design team to provide responses on how these topic themes were being addressed.

The topic areas and issues raised during both the 2011 and 2012 consultation submission periods are set out in Table 10-4, also identifying the design or management response to these topics.

Table 10-4: Feedback and Responses from Consultation

Topic Area	Issues Raised	Design/Management Response	Relevant Section of AEE report
Cross-corridor connectivity and access	More support for Option B at Te Horo as it will have less effect on the community and is cheaper.	Adoption of Proposal B to reflect local community and stakeholder desires.	Chapter 9
	The importance of maintaining two east-west connections in Ōtaki including the Rahui Road connection. Concerns were raised that any closure would split the community in two.	Further investigation concerning this link and alternatives at Waerenga Road. Further design refinement completed to improve the aesthetic outcomes and scale/gradients of the proposed connection at Rahui Road. Vehicular and walking/cycling crossing has been maintained at Rahui Road to address this issue.	Chapter 9
	Provision needs to be made so access for emergency services is not limited through the Expressway.	The Expressway will incorporate access for emergency services – a location for access has been identified.	Chapter 14
	Extended travel times associated with altered local roads.	Travel modelling has been undertaken in relation to cross-connections to seek to ensure optimal design for these where practicable.	Chapter 14
	There needs to be adequate access to the Ōtaki Māori Racing Club on race days.	Rahui Road connection is maintained and addresses this. County Road remains as a local access road.	Chapter 16
Interchanges	General support for the interchange locations.	Alternative interchange locations have been investigated and community inputs have been incorporated in the MCAT processes.	Chapter 9
	South Ōtaki Interchange Option B has greater effect through taking up more land.	Options that utilised less land were considered through the MCAT process. Post the 2011 consultation the interchange footprint has been reduced.	Chapter 9
	North Ōtaki Interchange Option A has general support. Some concerns raised on dune impacts including the new on-ramp.	Enhancements to the north Ōtaki interchange proposed to reduce impacts to dune areas west of the alignment by siting the northbound on ramp between the NIMT and the Expressway.	Chapter 9
	Access to the Expressway for Te Horo. Consideration of a northbound exit from	Two options were identified including a ramp near Te Hapua Road and a	Chapter 9

Topic Area	Issues Raised	Design/Management Response	Relevant Section of AEE report
	the Expressway to provide access to Te Horo.	northbound off-ramp at the Peka Peka interchange, as part of the M2PP Project. A site further to the north near Mary Crest was also identified for a possible northbound off-ramp, which was discounted due to the ecological and dune impacts arising from this option. Transportation benefits were also assessed and did not support an exit here.	
	Need for full interchanges north and south of Ōtaki.	Traffic modelling, combined with the MCAT assessment, has shown that half-interchanges provide the best result for both Expressway and local road users when all factors are considered.	Chapter 9 and Chapter 13
Design	Design of the Expressway needs to occur at best practice levels, particularly concerning how design and landscaping can mitigate visual, noise and air quality impacts.	Design seeks to make the Expressway part of the landscape. This is demonstrated through the multiple visualisations and the ULDF included as part of the application.	Chapter 15 and Chapter 16
	Provision of 6m height clearance for bridges that will have the type of traffic requiring that (e.g. Stresscrete).	Identification and provision of a regular and high vehicle access under the new Ōtaki River Bridge to enable over-dimension loads egress from the Stresscrete site.	Chapter 14
Environmental	Effects of the Expressway on waterways and natural flows.	This has been and will continue to be taken into consideration through the design process of the Expressway and through the provision of appropriate waterway and floodplain culverts and bridges.	Chapter 17 and Chapter 18
	Effect of the Expressway on local streams.	The effect of Expressway on waterways throughout the Project area and means of mitigating these effects have been thoroughly investigated and addressed.	Chapter 17 and Chapter 18
	Effect on the Mary Crest bush if the Expressway was to go through there.	Three main options were explored to avoid this area of significant bush. The Expressway avoids the bush.	Chapter 19 (see also Chapter 10)

Topic Area	Issues Raised	Design/Management Response	Relevant Section of AEE report
Visual/landscape	Concerns over light spill from the Expressway.	Design and location of lighting structures has been considered to address spill issues appropriately. Lighting is limited to interchange areas, intersections and replacement of any existing street lighting.	Chapter 6
	Visual impacts of structures and embankments.	Design seeks to make the Expressway integrate with the landscape. Structures have been lowered where practicable.	Chapters 15 and 16
	The effect of the Expressway on public spaces such as the Pare-o-Matangi reserve and access to Ōtaki River recreational areas.	Mitigation is proposed that provides equivalent alternative reserve space and 'green' connections for the Pare-o-Matangi reserve through to Ōtaki Railway Station. Access on the south side of the Ōtaki River is provided and planting has already been undertaken with support from NZTA. Access on the north side is maintained.	Chapters 15 and 16
	Visual / noise screening at the end of Old Hautere Road	A landscaping bund is to be provided and planting is to be extended south past Old Hautere Road in response to local resident concerns to provide improved visual screening at this location.	Chapter 16
Cultural/heritage	Presence of sites of cultural significance in the vicinity of Mary Crest.	Optimisation of the Expressway alignment to avoid / reduce impacts on the potential cultural sites, including shifting the Expressway eastwards.	Chapter 24, 25 and 26
	Effect of the Expressway on historic heritage associated with the Ōtaki Railway Station.	Refining of the relocation of the Ōtaki Railway Station to reduce effects by enabling the station to be re-oriented on its site.	Chapter 24 and 25
	That there needs to be further investigation into the heritage values associated with the various affected buildings.	Further investigation concerning heritage in the region has been undertaken, for example at Clifden, and appropriate measures adopted.	Chapter 24 and 25
	Proximity of Rahui Road bridge approaches to the	Alignment refinements following stakeholder	Chapter 10

Topic Area	Issues Raised	Design/Management Response	Relevant Section of AEE report
	Former Rahui Treatment Station	feedback on road bridge options have improved the setback to the Former Rahui Treatment Station, and enabled County Road to loop around and under the bridge.	
Archaeological	Further investigation regarding the effects of the Expressway on the archaeological record.	This has been undertaken through specialist investigation, key stakeholder consultation and the agreement of protocols.	Chapter 24 and 25
Transport	That an Expressway is needed to address congestion.	The provision of the Expressway addresses this issue.	Chapter 14
Transport/ safety	Support for the movement of the railway station to allow for the realignment of the NIMT.	Further investigations undertaken.	Chapter 14
	At-grade rail crossings need to be removed to improve safety.	The Expressway will remove the majority of at-grade crossings, improving safety and having positive community impacts.	Chapter 14
	Effects of the Expressway on overall road safety in the area.	Road safety is a key aspect of the Project and its design.	Chapter 14 and 27
	Walking and cycling effects.	Feedback has influenced footpath provision and promotion of wider edge lanes on the bridges.	Chapter 14 and 27
Business viability	Effect on Te Horo businesses if there is no Expressway access. Limited 'impulse shopping'	An economic assessment has been undertaken and advanced guide signage is proposed.	Chapter 27 and 28
	The economic effect of the Expressway on Ōtaki.	An economic assessment has been undertaken with appropriate mitigation identified, including signage. Also the traffic solution of half diamond interchanges north and south of Ōtaki will maximise access to Ōtaki businesses from the Expressway.	Chapter 27 and 28
	Good signage required to indicate Ōtaki and shops and Te Horo.	Advanced guide signage signalling Ōtaki and Te Horo as a destination will form an important part of Expressway signage.	Chapter 29

Topic Area	Issues Raised	Design/Management Response	Relevant Section of AEE report
Noise and vibration	That noise will increase with the Expressway.	The Expressway will meet appropriate noise and vibration standards. The incorporation of low noise surfacing (such as OGPA) on the Expressway through Ōtaki will mitigate effects. A construction noise and vibration management plan will be developed for construction for both the Expressway and the NIMT.	Chapter 22
	Concerns about boy racer issues.	A link to Ōtaki Gorge Road is provided from Old Hautere Road to remove the cul-de-sac concerns.	Chapter 9
Hazards	Expressway will not allow for efficient exiting from the Project area i.e. tsunami threat.	Natural hazards and evacuation routes have been considered and provided for in the design with local cross linkages being retained.	Chapters 10 and 16
	Effect of the Expressway on flooding in the area.	Potential flooding issues have been carefully considered and addressed in the design of the Project.	Chapter 17
	Earthquake risk in the area.	The Expressway will be designed to current best practice and will adopt a lifelines approach to seek to ensure that it can be made operable within a short timeframe following an event. It will also provide an alternative to the current SH1.	Chapter 13
Property values	Concern over the effect that the Expressway will have on property values.	This is considered as part of the amenity effects of the Project on the surrounding community.	Chapter 29

Chapter 11
Part G
VOLUME 2

Summary of Environmental Effects

Overview

The Project will have a number of positive and adverse effects. These will vary in significance, scale (local, regional and national), intensity and duration. These effects are summarised in this Chapter, and are described in more detail in Chapters 14 to 29. The potential adverse effects of the Project are proposed to be mitigated, as described in Chapter 30.

11 Summary of Environmental Effects

11.1 Introduction

The purpose of this Chapter is to provide a summary of the actual and potential effects of both the construction and the operation of the Project. This is a summary of the effects discussed in the rest of the chapters making up Part G of this AEE report. This chapter does not cover proposed mitigation or offsetting, which are addressed in each of the subsequent chapters for the various assessment topics and in Part H of this AEE report.

Section 3 of the RMA 1991 defines 'effect' as including:

(a) any positive or adverse effect; and

(b) any temporary or permanent effect; and

(c) any past, present or future effect; and

(d) any cumulative effect which arises over time or in combination with other effects-

regardless of the scale, intensity, duration or frequency of the effect and also includes –

(e) any potential effect of high probability; and

(f) any potential effect of low probability which has a high potential impact.

11.2 Summary of Potential Effects

The actual and potential effects of the Project, both positive and adverse, are summarised below. Additional detail is provided in the following chapters in Part G and in the associated technical reports contained in Volume 3. Many potential adverse effects have been avoided or reduced through the integrated design process. Table 30-2 (Chapter 30 Part H) sets out the proposed mitigation to address the adverse effects that were not able to be avoided at the preliminary design stage.

11.2.1 Positive Effects of the Project

The Project will have a number of positive effects, especially in relation to traffic and transport benefits, once the Expressway is operational. In summary, the potential positive effects of the Project are:

- The Project will achieve significant safety improvements for users of transport networks, through:
  - the separation of local traffic from State highway traffic travelling through the Kāpiti district;
  - improved road standards, due to the geometric design of the Expressway (including continuous median separation of north- and south-bound traffic);

  - an enhanced traffic environment on the local road network (which will include the current SH1), with benefits for motorists, cyclists, and rail users due to:
    - fewer vehicles (including HCVs) using the current SH1; traffic flows on rural sections of the existing SH1 will be reduced by 80%, and through the Ōtaki Railway Retail area will reduce by 50%, which will significantly increase safety at the existing SH1 intersections with local roads and elsewhere on the network;
    - the provision of grade-separated local road connections (i.e. bridges) across the Expressway and NIMT; and
    - the removal of five of the eight level crossings of the NIMT in the Project area.
- The Project will promote economic development, including through:
  - improvements in efficiency for freight movements and reduced travel times;
  - the reduction of traffic through the Ōtaki Railway Retail area, improving the amenity of that area as a social, employment, retail, and transport centre; and
  - increased economic activity and employment opportunities during the Project's four-year construction period.
- The Project will enhance connections between communities in the Kāpiti district, through:
  - the provision of the Expressway as an alternative route; and
  - the continued availability of existing SH1 as part of the local road network, with a safer, improved transport environment.
- The Project will result in reduced and more reliable travel times along key routes, and reduced traffic congestion, especially that associated with travel on weekends or at peak times.
- As part of the Wellington Northern Corridor RoNS, the Project will improve access to Wellington's key facilities such as the port, international airport, hospital, and central business district.
- The Project is "lead infrastructure", in that it will meet the future needs of a growing population, as well as foster economic growth in the ways summarised above.
- The Project will improve route security and resilience of the road network in the event of a significant earthquake, road accidents, or other disruption, by providing a high-quality alternative route between Peka Peka and Ōtaki (including two bridges providing alternative crossings of the Ōtaki River).
- The Project has a high degree of alignment with key strategic planning instruments for the Kāpiti district, including the GOV.
- The provision of swales along the Expressway will provide significantly greater removal of contaminants from stormwater than exists along the present SH1.

11.2.2 **Temporary Adverse Effects**

Temporary adverse effects will be experienced during construction of the Project. Through careful management and implementation of appropriate controls identified in the conditions and draft management plans, these temporary effects will be minimised or eliminated (see Part H, Chapter 30 of the AEE). Potential temporary adverse effects include:

- Increased construction traffic movements of both light vehicles and HCVs, affecting amenity and safety on local roads.
- Sand dune erosion due to proposed cuttings during construction.

- Ground settlement resulting from preloading at inter-dunal areas (south of Mary Crest and north of Rahui Road) and groundwater drawdown within the Project footprint.
- Reduction in bore water pressure from groundwater drawdown.
- Areas disturbed by construction activities can lead to movement of sediment in waterways adversely affecting downstream receiving environments and fish and invertebrate habitats by reducing water quality in streams.
- Effects on a population of peripatus (velvet worm) at the Steven's property.
- Impeding migratory fish movements during construction.
- Generation of dust nuisance during construction.
- Disturbance of contaminated land during construction.
- Effects of piling works during bridge foundation works, including ground settlement, contaminants entering watercourses and changes to the existing aquifer system.
- Noise and vibration disturbance during construction.
- Visual effects during construction particularly at the various bridges.
- Construction effects on people living or working within close proximity to the route.

11.2.3 **Other Adverse Effects**

Many potential adverse effects have been avoided or reduced through the integrated design process. However, some adverse effects are not able to be avoided and these have been mitigated as set out in Table 30-2 (Chapter 30, Part H). These potential adverse effects are summarised below:

- Loss of areas of the Ōtaki Railway Wetland (approximately 0.5ha).
- Loss of the edges of several remnants of native bush (approximately 0.5ha) and resulting edge effects due to exposure to wind.
- Loss of a significant part of the existing Pare-o-Matangi reserve.
- Habitat loss and alteration caused by the installation of culverts, concrete aprons and rip-rap and by channel diversion.
- Realignment of the NIMT will require the reorientation of the Ōtaki Railway Station building, which has statutory heritage identification.
- Relocation of the 1870's cottage 'Clifden', at Bridge Lodge.
- The Project will occupy part of the site of the former Mirek Smišek pottery property (two beehive kilns and brick flue, preparation shed and house) requiring the relocation of some buildings (including the kilns), a reduction in the size of the site and changes to the setting of the group of structures associated with the pottery.
- Potential adverse effects on unknown archaeological sites, areas and features of significance to tangata whenua, particularly in the dune area between Taylors Road and Rahui Road and on Māori-owned land at Te Horo.
- Noise and visual effects on the amenity of the former Rahui Milk Treatment Station and the former Rahui Factory social hall.
- Effects on natural character, visual, and other amenity values due to proposed new Ōtaki River bridges.
- Removal of a portion of the northern dunescape in northern Ōtaki resulting in loss of existing landform.
- Negative business redistribution effects for businesses located on or near existing SH1 at Te Horo and between Te Horo and South Ōtaki, and for some businesses in the Ōtaki Railway Retail area.

- Loss of existing rural landform between Waerenga Road to Ōtaki River and north of Te Hapua Road to Kowhai Road.
- As an elevated transport structure, the Project has the potential to interfere with the natural drainage function of waterways and catchments, which has the potential to increase flooding effects. Careful design of the Project has sought to avoid or mitigate potential effects by providing for 'hydraulic neutrality', i.e. no worsening of existing flooding risk. Hydraulic neutrality has not been fully achieved in the following cases:
  - A farm storage building upstream of the Gear Road and Settlement Road culverts, which is already susceptible to flooding in severe flood events, will experience increased flooding effects. There are various possible mitigation options, which will be discussed with the relevant landowner.
  - In the Ōtaki River floodplain, there will be a minor increase in flooding risk for areas of pasture to the east of the Expressway.
  - In relation to the Mangapouri Stream in Ōtaki, the Project will reduce flooding risk associated with relatively common flood events, but will lead to minor increases in flooding in extremely rare events.
- Visual severance effects resulting from the elevation of the Expressway at Te Horo.
- Increased volume of rainwater run-off from new impervious surfaces, increasing stream flow.
- Road traffic noise.
- Rail traffic noise, which is predicted to exceed the nominated criteria at two Protected Premises and Facilities.
- Effects on access to some properties, easements and other property rights.

Chapter 12
Part G
VOLUME 2

Assessment Methodology

Overview

The environmental assessment undertaken for the Project has involved extensive collaborative input of a broad range of engineering, environmental, social and cultural specialists.

The Project team collaborated to identify potential adverse environmental effects of the Project along with associated measures to ensure that any such effects were appropriately avoided, remedied or mitigated and relevant Part 2 considerations addressed at the preliminary design stage.

12 Assessment Methodology

12.1 Introduction

The purpose of this Chapter is to outline how the AEE was undertaken for the Project. The structure for the remainder of Part G is also set out.

12.2 Purpose of the Assessment

Under the RMA an assessment of the environmental effects of the Project is required.

In addition to the requirements under the RMA, it is also part of the NZTA's environmental policy, and its operating principles under section 96(1)(a) of the LTMA, to:

> *Exhibit a sense of social and environmental responsibility, which includes -*
>
> *(i) avoiding, to the extent reasonable in the circumstances, adverse effects on the environment; …*

The requirements of the RMA and the LTMA formed the basis for the AEE undertaken for the Project.

12.3 Environmental Assessments Undertaken

12.3.1 Previous Environmental Assessments

Two environmental assessments have been undertaken previously for the Project:

- A SAR prepared in 2001/2002 by Meritec for the section of SH1 between Ōtaki and Peka Peka Road. The report was presented in two parts comprising the 'Ōtaki Bypass' and 'Te Horo Expressway'. Six route options and combinations of sub-options were assessed and presented in the SAR in relation to a central route.
- A SARA prepared in May 2003, which reviewed an alternative western route.

The above reports included preliminary assessments of environmental effects related to traffic, noise and vibration, landscape, land use, social severance, and local businesses.

In preparing this AEE and the technical reports, some information from these previous assessments was considered and utilised but only where it remained relevant.

Studies undertaken in 2008 and 2009 reviewed options relating to the central corridor (referred to as the "Eastern Route' in the SAR) and endorsed it as the preferred route. This was adopted as a preference by the NZTA Board in December 2009, subject to a range of further reviews and detailed investigations. Throughout the development of the current Project, including as a result of public consultation, there have been a range of route options put forward for further consideration and assessment. These are detailed in Chapter 9 above.

12.3.2 Environmental Assessment Undertaken for the Project

A social and environmental screen process was completed as a preliminary assessment of the Project against a checklist of potential effects commonly associated with major road projects. This checklist formed a framework for the assessment.

A further series of reports (comprising a further SARA) was then completed in January 2012 to identify options to refine the alignment of the preferred central corridor. Those experts presented the results of the following environmental assessments:

- The identification and mapping of constraints;
- A multi-criteria assessment of alternative alignment and associated interchange options; and
- Expert technical analysis across a range of disciplines.

The constraints analysis included a detailed examination of the existing environment in the wider Project area that highlighted a number of environmental factors relevant to the development and consideration of route options.

The multi-criteria assessment involved the application of non-cost and cost-related criteria[18] to the Project options identified in order to assess their relative environmental and other effects. The outcome of this process was the confirmation of a preferred alignment along with a preliminary indication of its potential environmental effects. These potential effects, in turn, were subsequently assessed in more detail by various experts through the AEE process, the results of which are reported in various Technical Reports (refer Volume 3: Technical Reports and Supporting Documents) and summarised in this Part G, Chapters 14 to 29 of the AEE report.

12.3.3 Assessment Methodology

The close working relationship between the Project designers (i.e. the engineering teams) and the environmental assessment teams for the Project has resulted in a high level of integration between the design and mitigation processes.

In general terms, the approach has been:

- To modify the design of the Project to avoid or reduce potential adverse effects;
- Where avoidance of adverse effects was not considered feasible (due to other Project objectives), to develop measures to appropriately remedy and/or mitigate potential adverse effects; and
- Where mitigation and/or remediation is required, to co-ordinate development of measures between specialists to promote optimal environmental outcomes.

Specific details about how particular potential adverse environmental effects are proposed to be managed are provided in Part H, Chapters 30 to 32 of the AEE.

12.3.4 KCDC Involvement

KCDC has been involved during the Project design process and has provided input on options and mitigation measures identified. This has been particularly important because the KCDC acts in the following capacities:

- It is the relevant territorial regulatory authority; and

[18] Non-cost criteria included transport outcomes, social/community outcomes and environmental outcomes.

- It is the owner and controlling authority for the local roads that will connect to the Project, including the existing SH1 once the revocation process is completed.

KCDC has been involved in the identification and mapping of constraints, in the multi-criteria assessment and at various other stages of the alternatives assessment process, as well as throughout the various consultation processes and, as necessary, as the experts have assessed the effects of the Project and developed mitigation measures.

12.3.5 Stakeholder Involvement

A range of stakeholders has been involved in the AEE development process. In addition to KCDC, key stakeholders for this Project are KiwiRail (as well as being a joint applicant), GWRC, NZHPT and Nga Hapū o Ōtaki.

Part F of the AEE contains a description of the methods used to engage stakeholders. In general terms, stakeholders and individuals provided feedback to the Project team on how they believed the Project would affect their interests. The engagement undertaken with the various stakeholders is discussed throughout the topic Chapters in Part G as relevant.

12.3.6 Structure of the Assessment

Chapters in Part G describe the assessments undertaken for each potential environmental effect, addressed by topic. For convenience, each assessment topic is described in a separate Chapter, although interactions between topic areas are recognised and discussed where relevant. The topic chapters and the relevant technical reports are shown in Table 12-1.

Each Chapter provides a summary of the key potential effects and the mitigation proposed. The Project incorporates measures that will create positive benefits. The Project will also give rise to significant benefits which are discussed in the various Chapters as relevant.

Further information about each assessment, including the methodology used, is contained in the relevant technical report in Volume 3.

The basic structure for each Chapter is:

- A description of the existing environment (in greater detail than that provided in Chapter 5, as relevant to the assessment matter);
- A description of the potential effects (both positive and adverse) resulting from the Project; and
- A description of what measures have been undertaken, or are proposed to be undertaken, to avoid, remedy or mitigate potential adverse effects.

Table 12-1: Environmental Effects Assessment Topics

AEE report chapter	Topic	Relevant Technical Report No.
13	Geotechnical engineering and resilience	4
14	Traffic and transport	6
15	Urban form and function	7
16	Landscape and visual	8
17	Hydrology	9
18	Stormwater	10
19	Terrestrial ecology	11
20	Aquatic ecology	12
21	Air quality	13
22	Noise and vibration	14 and 15
23	Land contamination	16
24	Archaeology	17
25	Built heritage	18
26	Tangata whenua and cultural heritage	19
27	Social	20
28	Economic	21
29	Land acquisition and property	N/A

Part H, Chapters 31 to 33, sets out the framework by which effects (as identified throughout Part G) will be managed and mitigated, including through conditions of the designation and resource consents. It also outlines the relationships between the recommended mitigation and proposed management plans.

Chapter 13
Part G
VOLUME 2

Geotechnical Engineering and Resilience

Overview

Key geotechnical aspects of the Project include:

- Cut slopes in dune sand, including erodibility and erosion protection;
- Cut slopes in terrace alluvium;
- Embankment fills including undercut of peat and other compressive swamp deposits;
- Ground improvement and instrumentation;
- Earthworks and construction materials; and

The proposed cuttings for the Project will involve lowering the groundwater levels by up to 2m locally (across the road width) due to the installation of sub-horizontal drains at the cut slopes and sub-soil drains below the pavement. Excavations to undercut and remove peat will require lowering of the groundwater levels locally by about 3m over a period of a few days. These cuttings will have a negligible effect on the groundwater regime in the area, including on groundwater takes.

Construction and preloading of the embankments on soft ground will cause some ground settlement of the area immediately surrounding the preload areas. However, this work will be in rural areas and will be carefully managed.

The Expressway will have a good level of resilience to major earthquakes. In the event of a major earthquake, some limited subsidence of the Expressway embankments could occur due to liquefaction of isolated limited layers in the underlying ground, but the Expressway is likely to provide continued access, though with some uneven road surface which is likely to be reinstated within a few days to two weeks.

In the event of rupture of the Northern Ohariu Fault (located approximately 100m east of the Expressway), it is possible that the Expressway will be closed due to road deformation or rupture of the fault. It is possible that a fault rupture where the Expressway crosses the fault may have a distributed deformation rather than a concentrated rupture. The Northern Ohariu Fault crosses the earth ramp leading to the Te Horo overbridge over the Expressway. Any fault rupture displacement of the earth embankment is likely to disrupt access to the bridge. However, access can be quickly reinstated by earth moving machinery in the event of fault displacement.

13 Geotechnical Engineering and Resilience

13.1 Introduction

This Chapter summarises the geotechnical aspects of the Project. This includes identification and assessment of actual and potential effects relating to geotechnical engineering, including effects on groundwater, aquifers and existing abstraction bores, rivers and ground settlement, along with an assessment of significant hazards which include earthquake ground shaking, liquefaction and active fault rupture.

The report that contributes to this overall assessment is:

- Peka Peka to Ōtaki Expressway: Assessment of Environmental Effects Geotechnical Engineering and Geology (Technical Report 4).

This technical report is included in Volume 3 of this AEE report.

13.2 Existing Environment

13.2.1 General

The Expressway crosses the Ōtaki alluvial plain over a distance of approximately 13 km, from Taylors Road, just north of Ōtaki, to Te Kowhai Road, Peka Peka, in the south. The alluvial plain influences the topography significantly. Land either side of the route is generally flat or with low gradients. The foothills of the Tararua Ranges lie to the east, with waterways flowing from east to west towards the sea.

13.2.2 Geology

Field engineering geological mapping was carried out in November 2010 to confirm and map the geology and geomorphic features and the fault traces identified in the geological maps and aerial photographs. An engineering geological map was produced after the mapping and was refined after more information was gathered during the site investigations. A programme of geotechnical site investigations was developed, implemented and assessed.

Ground conditions in the Project area are summarised as follows:

- Alluvial floodplain deposits are found in the Ōtaki River floodplain and along other watercourses including the Mangaone Stream and the Waitohu Stream.
- Dune sand is located at the southern part of the proposed route (south of Mary Crest) and at the northern end (between Waitohu Stream and Rahui Road). The Expressway route crosses the old beach / dune deposits at the northern end of the alignment and to the west of the existing state highway south of Mary Crest.
- Swamp deposits (inter-dunal areas) comprising organic silt, clay, peat and sand are found north of County Road and at two locations south of Mary Crest.
- A significant length of the proposed route (from south of Ōtaki River to north of Mary Crest) is underlain by terrace alluvium.

13.2.3 Surface Water

The Expressway crosses a number of watercourses including the Mangaone Stream (at Te Horo), Ōtaki River (south of the Ōtaki township), Mangapouri Stream (near County Road, Ōtaki) and Waitohu Stream (north of Ōtaki).

13.2.4 Hydrogeology

The hydrogeology present in the Project area can be described in terms of the three groups of deposits as classified by Jones and Baker (2005) as follows:

- Glacial and inter-glacial deposits – a thick layered semi-confined to confined aquifer system of poorly sorted and stratified clay-bound gravels and sand overlying bedrock;
- Post-glacial beach and dune sand deposits – a low-yielding, unconfined aquifer which becomes semi-confined with depth towards the coast (up to 50 m depth). The aquifer system encompasses a coastal dune belt, which has resulted in the formation of a number of inter-dunal wetlands where drainage has been impeded; and
- Recent river gravel deposits – relatively high-yielding unconfined aquifers in the alluvial flood plain around the rivers. The gravels were reworked by rivers during the interglacial and postglacial period and have a direct hydraulic connection with surface water.

13.2.5 **Groundwater**

Groundwater levels were monitored in the shallow unconfined aquifers in the Project area and are summarised as follows:

- Groundwater at shallow depths of 0m to 2m in inter-dunal areas. Groundwater seepage was commonly observed at 1m to 2m depths in dry summer conditions. Some low-lying inter-dunal areas are commonly water-logged with standing water during the wet winter periods.
- Groundwater levels in the sand dune areas are generally dictated by the groundwater conditions at the inter-dunal depressions; thus the sand dunes are generally dry with reduced groundwater levels similar to that in the adjacent inter-dunal areas.
- Groundwater levels within the alluvial floodplain deposits are generally determined by the level of the adjacent watercourses such as rivers and streams, and are typically at 2m to 5m depth below ground level.
- Groundwater levels were found to be fluctuating between 5m to 10m below surface in the alluvial terrace deposits. The groundwater at the terrace south of the Ōtaki River is likely influenced by the fluctuation of the river levels.

13.2.6 **Natural Hazards**

The proposed Project is located in an area of high seismicity. Primary geo-hazards identified along the route include active faults, fault rupture, ground shaking, earthquake induced slope failure and liquefaction. The Northern Ohariu Fault and Ohariu Fault are the two active faults closest to the site. The Northern Ohariu Fault is mapped to be about 100m east of the Expressway at Te Horo. The Ohariu Fault is indicated to be about 1km away from the alignment to the southeast of Peka Peka Road. A rupture of either fault could result in between 3m and 5m of right lateral displacement at the ground surface with varied vertical displacement. It is also expected that an individual surface rupture along the Northern Ohariu Fault could generate 3m to 4m of right-lateral displacement at the ground surface, with a lesser and variable amount of vertical displacement.

There is potential for significant ground shaking during large earthquakes. The ground shaking is expected to be modified and exacerbated by the presence of deep soil deposits and soft ground in the area. The design horizontal peak ground accelerations to be used in assessing the stability of slopes and structures such as fill embankments and bridge structures have been derived according to the New Zealand Earthquake Loading Standard, NZS 1170.5: 2004 (Standards NZ, 2004) and the Bridge Manual (Transit NZ, 2003) and its Provisional Amendment in December 2004.

An importance level of 3 and a 100 year design life is assumed for bridge structures, resulting in an annual probability of exceedance of 1/2,500. For other structures (e.g. free standing walls, cuttings) which do not form an integral part of bridge structures, a return period factor of 1.5 is adopted. This is equivalent to an annual probability of exceedance of 1/1,500.

The Regional Slope Failure Hazard Map (Wellington Regional Council, 1995) indicates a generally low susceptibility to earthquake-induced slope failure along the Project route. Localised narrow bands of high susceptibility to slope failure in earthquakes exist along the abandoned sea cliff to the south of Mary Crest to Peka Peka Road and along Te Waka Road and the river terraces south of Ōtaki River, just north of Ōtaki township and along the stream opposite Te Hapua Road. There is also a high susceptibility locally at a steep portion of the railway cutting just south of the Ōtaki River crossing.

Liquefaction as a consequence of earthquakes could lead to subsidence and lateral spreading, which could affect any surface development. According to the Regional Liquefaction Hazard Map (GWRC, 1993) the majority of the proposed Expressway is situated in areas which are not susceptible to liquefaction. In areas to the north of Ōtaki River, variable potential for liquefaction from low to high may be present. There is very low or no potential for liquefaction between Ōtaki River and Mary Crest. A moderate potential for liquefaction is indicated in the areas underlain by sand dunes and inter-dunal deposits, south of Mary Crest. Results of the site investigations show that there are localised sand and silt layers within the site that could potentially liquefy.

13.3 Assessment of Environmental Effects

An engineering assessment of geotechnical aspects for the Project has been completed and is presented in Technical Report 4, Volume 3. This includes a geotechnical engineering assessment of:

- Cut slopes in dune sand, including erodibility and erosion protection;
- Cut slopes in terrace alluvium;
- Embankment fills including undercut of peat and other compressive swamp deposits;
- Ground improvement and instrumentation;
- Earthworks and construction materials; and
- Effects on groundwater regime and on groundwater takes in the area.

The report includes consequential design requirements that are incorporated into the Project design.

An AEE related to geotechnical engineering and a study of route security for the Project is also included in the report. A summary of key findings is listed below.

13.3.1 Potential Groundwater Drawdown

Groundwater drawdown would cause a reduction in bore water pressure, which might result in ground settlement and changes to groundwater flow.

Permanent Drawdown due to Cuttings

The potential of groundwater drawdown due to formation of cuttings has been reviewed. It is assessed that the excavations in dune sand areas will generally be formed above the measured groundwater level and thus would have negligible effects on the groundwater table. For excavations within terrace alluvium to the south of Ōtaki River, the measured highest groundwater level in the area is about 1m above the excavation level. In order to construct the Expressway in this location, the groundwater table would need to be drawn down about 2m locally across the road width, which can be achieved through the installation of sub-horizontal drains at the cut slopes and sub-soil drains below the pavement.

Temporary Drawdown due to Undercutting

Undercutting in the order of 3m depth is expected at some of the wet inter-dunal areas. These areas will be backfilled with well-compacted materials. During excavation, groundwater in the excavation will be drained temporarily by sumps or drains. This will lead to localised draw-down of groundwater in the surrounding area, up to about 3m depth below ground surface.

The effects of the both permanent and temporary groundwater drawdown are considered to be negligible.

13.3.2 **Effects on Groundwater Flow and Direction**

Groundwater in the area generally flows from the east towards the sea coast. Since the permanent groundwater drawdown is local and of a relatively small order, its effects on groundwater flow and direction are considered to be insignificant. Temporary groundwater drawdown would have negligible influence on the long-term groundwater flow and direction.

13.3.3 **Effects on Groundwater Use**

The long term effects of the Project on consented water takes are considered to be negligible.

There may be some minor, temporary, localised effects on existing ground water abstractions during construction, so groundwater levels and pressures will be monitored during construction, and conditions are proposed to ensure that any such effects will be remedied through provisions of an alternative water source and that there will be no effects on water abstraction in the vicinity.

13.3.4 **Ground Settlement**

Ground settlements can be caused by consolidation of ground due to groundwater drawdown and construction of fill embankments on compressible ground.

Consolidation of Ground due to Groundwater Drawdown

Since the permanent groundwater drawdown at the cutting areas is local and of small order (about 1m to 2m), and the ground at these areas (dense terrace alluvium) has low compressibility, the resultant ground settlement is likely to be negligible.

Temporary excavation and dewatering at some of the inter-dunal areas could potentially cause groundwater drawdown up to about 3m deep. As the groundwater drawdown is temporary, and for no more than a few days at a time, the ground settlement during this period will be small. Also these areas are generally farming areas and there will be no buildings near the Project works at risk of damage from settlement of that size. Therefore such ground settlements will have a negligible, if any, adverse effect on the environment.

Consolidation of Ground due to Fill Embankments

Soft and compressible materials such as peat in inter-dunal areas will be removed / undercut before placing of fill. There are some areas along the route, e.g. south of Mary Crest, where soft materials of more than 3m thickness are present and it becomes costly to completely undercut. In such instances partial undercutting to 3m depth followed by preloading is proposed, with extra surcharge to accelerate consolidation during construction. However, secondary consolidation is expected to continue even after construction. This will result in ground settlement within the road footprint and a short distance in the surrounding area.

The adjacent existing SH1 and railway in the area south of Mary Crest could potentially be affected. The settlement of the embankments as well as the State highway and railway will be monitored during construction. The State highway will be reinstated and the railway line re-levelled using ballast if necessary.

Interdunal deposits are found north of Rahui Road. Current investigations show that the soft materials are up to 3m thickness and thus can be removed completely before the placing of fill. However, should the soft materials be deeper and some soft materials remain below a nominal 3m depth of undercut, ground settlement due to construction of embankment on soft ground will occur.

There are no buildings in the surrounding area that may be affected by such settlements and therefore any effects will be low. However, settlement will be monitored post-

construction to ensure that any effects on adjacent facilities, such as SH1 and the NIMT south of Mary Crest, are carefully managed and remedied. Conditions are proposed to achieve this.

Minor road repair to existing roads, such as sealing of cracks, may be required during construction and the pavement may need to be reinstated on completion of the preloading and construction.

13.3.5 **Wetlands**

The temporary groundwater drawdown will not have a significant effect on the long term viability of the proposed Ōtaki Railway wetland, the Mary Crest wetland or the wetland to the west of County Road. A low embankment will be required with a weir to ensure that water is retained in the wetland and surplus water can overflow through the weir during wet weather conditions.

13.3.6 **Effects of Bridge Foundation Works**

The bridge scheme design shows that bridges will generally be founded on bored piled foundations and abutments on either reinforced soil walls or spill through embankments.

Some potential effects due to piling works are:

- Ground settlement when piles / casings are driven through loose materials (such as loose sand), which causes vibration and consolidation of the ground surrounding the piles. There are no buildings directly adjacent to the proposed bridges, and therefore any effect on adjacent structures is highly unlikely. However, where there are buildings in close proximity to new bridge structures (e.g. the former Milk Treatment Station at Rahui Road) ground settlement will be monitored.
- Spilling of concrete and grout leading to pollution of watercourses. Best practice measures will be taken when constructing piles, particularly adjacent to waterways, to prevent any spillage that could contaminate waterways.
- Change of aquifer system – such as piling into a confined aquifer and resulting in the pressurised artesian water flowing through the aquifer. The site investigations have not shown the presence of confined or artesian aquifers that may be affected within the depth of the proposed piles. Therefore any risk to the groundwater systems is considered to be low.

13.3.7 **Erosion Control at New Cuts Slopes**

The newly-formed cuttings sand dune areas will be susceptible to erosion. Adequate measures are required to protect the cuttings from erosion. Appropriate measures include:

- Re-vegetation as soon as possible after formation of cut, and maintenance of the vegetation during the early stages after construction. The type of vegetation should be carefully selected to suit the local coastal dune sand environment;
- Installing erosion protection geotextile mats; and
- Placing topsoil or peat on the slope surface.

With appropriate management and measures, the effects of proposed excavations on sand dune erosion can be kept to a minimum and adverse effects are unlikely.

13.3.8 **Route Security**

The Expressway will have good resilience against earthquakes and other natural hazards. The Expressway is likely to remain open for access in the event of a large magnitude 7.5

local earthquake in the Region, perhaps at some reduced level of service due to damage to the road associated with localised liquefaction and subsidence. These areas are generally likely to be able to be reinstated quickly (e.g. within 3 days to 2 weeks).

An objective of the Project has been to avoid crossing the Northern Ohariu Fault with structures which may be severely damaged and will take a long time to reinstate. The Project does cross the fault, namely where an earth ramp leads to the Te Horo overbridge, a location where the topography enables quick restoration of access. That aside, the Northern Ohariu Fault trace becomes indistinct in the lidar-based topography[19], and it is possible that an apparent fault rupture near to where the Expressway passes the fault is a distributed deformation rather than concentrated rupture. This will reduce the extent of any damage and disruption, and in the event of damage the Expressway is likely to be able to be opened for limited access by earthmoving machinery.

13.4 Measures to Avoid, Remedy or Mitigate Actual and Potential Adverse Effects

13.4.1 Consolidation of Ground due to Fill Embankments

Ground settlement will be closely monitored during and after the preloading period to assess the effect to settlement of the adjacent ground, especially at the current SH1 and NIMT. Any development of cracks on the seal should be recorded and monitored.

Minor road repair such as sealing of cracks may be required during construction and the pavement may need to be reinstated on completion of the preloading and construction. Short, localised sections of the NIMT may also need to be re-levelled during or soon after construction.

13.4.2 Wetlands

Installation of low embankments with a weir to ensure water is retained within the wetland and surplus water can overflow through the weir during wet weather conditions.

13.4.3 Effect of Bridge Foundation Works on the Environment

Site investigation results did not show significant thick layers of loose soil that could result in settlement due to vibration. Care will be taken during pile construction particularly adjacent to waterways to prevent spillage and contamination and ground settlement will be monitored when piling takes place adjacent to the existing railway and State highway, or in close proximity to buildings. This work will be the subject of a construction management plan which will include measures to avoid possible spillage.

In the unlikely event that any artesian water is encountered, this can be managed through raised casing above ground level.

13.4.4 Erosion Control at New Cut Slopes

Re-vegetation should occur as soon as possible after formation of cut areas, and vegetation should be maintained during the early stages after construction. The type of vegetation should be carefully selected to suit the local coastal dune sand environment. Erosion protection geotextile mats should be installed. Topsoil or peat should be placed on slope surfaces. With appropriate management and these measures, the effects of excavation on sand dune erosion can be minimised and adverse effects are unlikely.

[19] Lidar (Light Detection And Ranging) based topography is an optical remote sensing technology that can measure the distance to, or other properties of, a target by illuminating the target with light, often using pulses from a laser.

Chapter 14

Part G

VOLUME 2

Traffic and Transportation

Overview

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

- Improved safety and reduced road accident risk, due to:
  - the separation of local traffic from State highway traffic travelling through the Kāpiti district, which will address the very poor current performance of the intersections of local roads with SH1;
  - improved road standards, due to the geometric design of the Expressway (including continuous median separation of north- and south-bound traffic); and
  - an enhanced traffic environment on the local road network (which will include the current SH1), with benefits for motorists, cyclists, and rail users due to:
    - fewer vehicles using the current SH1;
    - the provision of grade-separated local road connections across the Expressway and NIMT; and
    - the removal of five of the eight level crossings of the NIMT in the Project area;
- Enhanced connections between communities in the Kāpiti district, through:
  - the provision of the Expressway as an alternative route; and
  - the continued availability of the existing SH1 as part of the local road network, with a safer, improved transport environment (as discussed above);
- Reduced and more reliable travel times along key routes and reduced traffic congestion, which in turn will improve efficiencies in freight movement;
- Improved access to Wellington's key facilities such as the port, international airport, hospital, and central business district; and
- Improved route security and resilience of the road network in the event of a significant earthquake, road accidents, or other disruption; and
- Grade separated connections instead of level crossings at five of the eight existing NIMT road crossings (this removes all the public level rail crossings in the Project area); and
- Safeguard the future ability to extend rail double tracking through the Project area.

During construction, there will be localised, short-term, adverse traffic effects, including delays or inconvenience arising from increased HCV construction traffic and the need to do work on some local roads adjacent to the Expressway. These effects will be managed through a comprehensive Construction Traffic Management Plan, a draft of which is provided with the AEE report.

Overview (cont.)

There will be additional HCV and light vehicle traffic during construction and it is necessary to take measures to ensure the safe operation of the existing SH1 during this period. Measures that will mitigate the effects of construction traffic, have been identified through the development of a CTMP and include:

- advanced warning of turning traffic;
- temporary speed limits;
- controls on the routing of construction traffic;
- temporary access changes;
- measures to address any temporary effects on public transport users;
- measures to address any temporary effects on local traffic; and
- early construction of overbridges associated with the Project.

14 Traffic and Transport

14.1 Introduction

This Chapter summarises the key findings of the assessment of traffic and transport effects undertaken for the Project. This assessment is based on demographic and transport data collected for the Project and traffic modelling as described in Section 14.5. The key traffic and transport effects from the operation and construction of the Project are described in the Sections 14.7 to 14.12.

The full report detailing the effects of the Project on traffic and transportation is:

- Integrated Transport Assessment (Technical Report 6).

This technical report is included in Volume 3 of this AEE.

14.2 The Expressway Alignment

The Project extends from Te Kowhai Road in the south to Taylors Road just north of Ōtaki, an approximate distance of 13km. The Project is one of eight sections of the Wellington Northern Corridor which has been identified by the Government as a RoNS.

The Expressway will provide two lanes of median separated traffic in each direction. Connections to existing local roads, new local roads and access points over the Expressway to maintain safe connectivity between the western and eastern sides of the Expressway are also proposed as part of the Project. There is an additional crossing of the Ōtaki River proposed as part of the Project, along with crossings of other watercourses throughout the Project length.

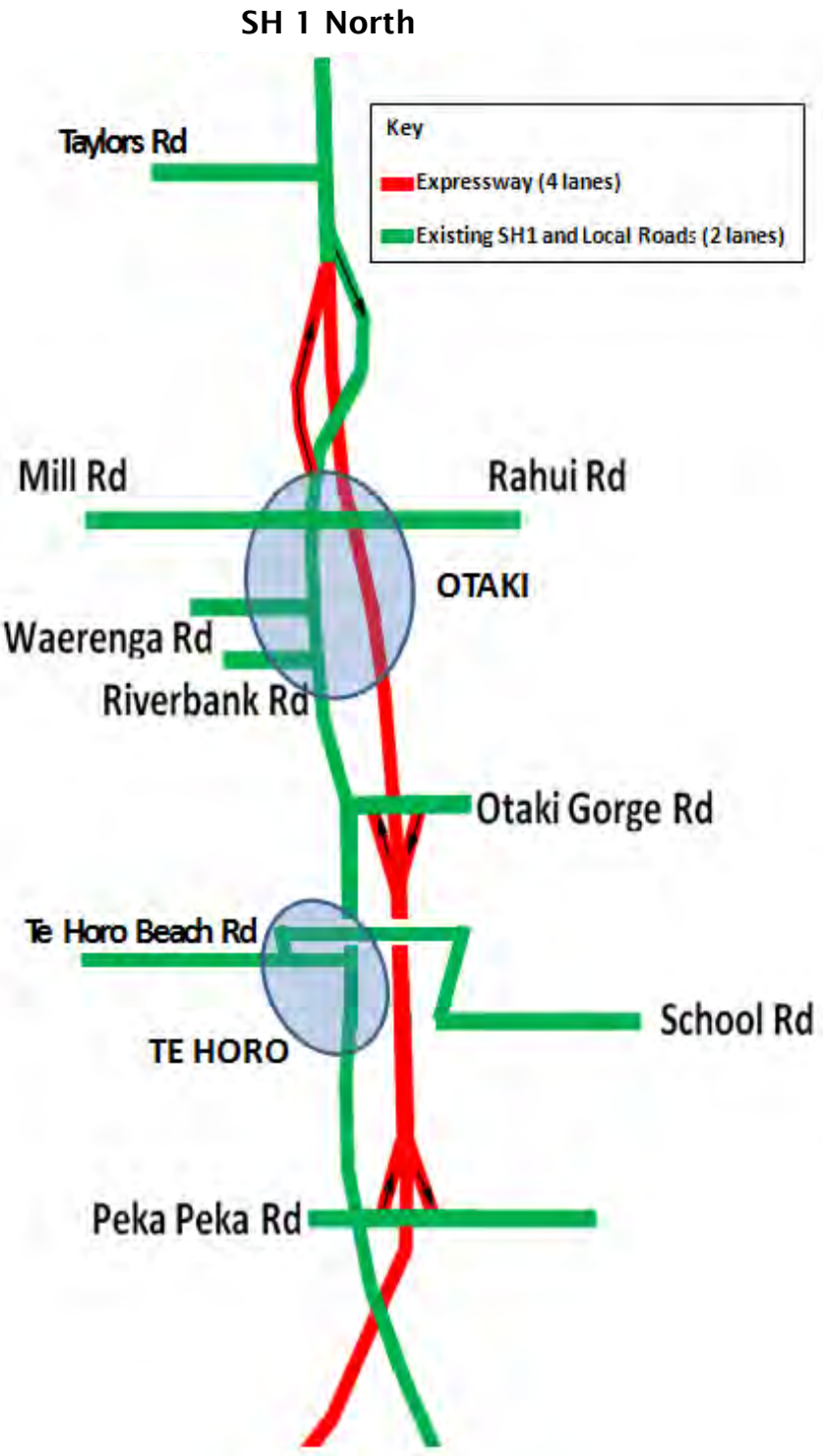
On completion, it is proposed that the Expressway become SH1 and that the existing SH1 between Peka Peka and Ōtaki will become a local road, allowing for the separation of local and through traffic.

To facilitate the Expressway alignment, approximately 1.2km of the NIMT will be realigned.

As part of the Project, a section of the existing SH1 at Mary Crest is required to the relocated. In effect, a new section of the existing SH1 will be built on the western side of the Expressway, connecting to the existing SH1 south of the Project area. The old section of the existing SH1 will be either removed or will have the Expressway built on top of it.

The Project is shown schematically in Figure 14-1, below.

Figure 14-1: Schematic of the Expressway and Interchanges



14.3 The existing Transportation and Traffic Environment

The Project area includes two main townships of Te Horo and Ōtaki. Ōtaki is the northernmost urban centre of the Kāpiti district and the Wellington region. The existing transportation network comprises the SH1, rail, local road, bus, walking and cycling networks.

14.3.1 State Highway 1 and North Island Main Trunk Line

SH1 and the NIMT are part of the national transport network. They pass north-south through the Kāpiti district approximately midway between the coast to the west and the hills to the east. Other than these strategic connections there is limited opportunity for north-south travel within the Kāpiti district.

SH1 through the Kāpiti district is the major route in and out of Wellington and for the lower North Island, linking the centres of Palmerston North, Whanganui and Levin with Wellington. Key parts of the route are (from north to south):

- Taylors Road to Ōtaki Township (100km/h speed limit);
- Ōtaki Railway Retail area (50km/h speed limit);
- South Ōtaki Railway Retail area to Ōtaki Bridge (70km/h); and
- Ōtaki Bridge to Peka Peka (100km/h speed limit – except for a section through Te Horo 80km/h).

The existing SH1 and NIMT rail bridges across the Ōtaki River provide the only transport network connections across the river between the north and the south of the Project area.

The lack of local roads providing north-south connectivity and the reliance on one primary river crossing means that SH1 effectively functions as a local road for travel within the district as well serving regional and national strategic traffic, including freight.

The Ōtaki Railway Station is located to the east of the Ōtaki Railway Retail area, behind and to the east of the shops that front the existing SH1. Currently the station is served by the Capital Connection, which operates a commuter service with limited stops between Palmerston North and Wellington in the morning, with a return service in the evening. Rail freight services also pass through the Project area.

Currently SH1 passes directly through the Ōtaki Railway Retail area. Delays caused by pedestrians crossing and motorists manoeuvring into on-street car parks or side roads slow traffic and make travel times unreliable and create safety effects.

14.3.2 Local Road Network

Local roads in this part of the Kāpiti district branch out from the east and the west sides of SH1. Key local roads (from north to south) include:

- Taylors Road;
- Mill Road (Ōtaki);
- Rahui Road (Ōtaki);
- Waerenga Road (Ōtaki);
- Riverbank Road (Ōtaki);
- Ōtaki Gorge Road;
- Te Horo Beach Road (Te Horo);
- School Road (Te Horo); and
- Peka Peka Road.

Except at the Ōtaki Roundabout intersection with Mill Road and Rahui Road, the existing SH1 has priority over traffic (including cyclists) joining from side roads. Travel between

the east and west of the district involves crossing both SH1 and the NIMT at-grade. Road bridges across the NIMT are provided at Ōtaki Gorge Road and for SH1 immediately north of the Ōtaki Railway Retail area. At other locations railway level crossings are provided. Although at-grade connections across the strategic transport corridor are provided, SH1 and the adjacent NIMT create physical and perceived severance between the east and west sides of the Kāpiti district.

14.3.3 Bus Network

Bus route 290 runs between Ōtaki Beach and Waikanae Railway Station via Mill Road and the Ōtaki Railway Retail area. The service allows passengers to transfer to/from rail services at Waikanae Railway Station. Bus route 290 provides five services a day in each direction. Two of the southbound services extend to Paraparaumu. Two of the northbound services start in Paraparaumu, allowing residents of Ōtaki to access Paraparaumu facilities including the Coastlands shopping centre.

There are also a number of longer-distance bus services to other centres in the North Island that stop at Ōtaki. There is one school bus route servicing Te Horo Primary School.

14.3.4 Walking and Cycling Network

Pedestrian footways are provided within the road corridor in Ōtaki. Pedestrian build-outs, central refuges and a signalised pedestrian crossing are provided within the Ōtaki Railway Retail area to cross the existing SH1. Cycle lanes are provided in each direction along Mill Road between Ōtaki Town and the Ōtaki Railway Retail area.

Outside Ōtaki, in the rural area, there is little or no provision for non-motorised road users. A footway is provided on the southern side of School Road in Te Horo.

14.4 Existing Traffic and Transport Issues Within the Project Area

14.4.1 Increased Vehicle Movements

Daily traffic volumes on SH1 have increased over the past 35 years from close to 8,000 Average Annual Daily Traffic (AADT) volume in 1975 to over 14,000 AADT in 2011. A small decline in traffic volume has been observed since 2009, likely due to fuel price increases and a slow-down of economic activity following the financial crisis. However, in the medium growth scenario a 26 percent growth in the vehicle kilometres travelled in the region is forecast over the next 30 years.

Traffic volumes can be expected to vary by about 1,000 vehicles per day in each direction and increase significantly during weekends and holidays. Within Ōtaki significant delays and queuing are commonly experienced in southbound traffic following long weekend public holidays. SH1 is susceptible to significant fluctuations in traffic flow (i.e. holiday weekends).

14.4.2 Pedestrian and Cycle Movements

Current pedestrian and cyclist demand is low, especially within the rural sections of the study area. This is most likely related to the large distances between potential origins and destinations, lack of formal pedestrian and cyclist facilities outside Ōtaki and traffic volumes and speeds on the existing SH1.

14.4.3 **Poor Road Safety and Crash History**

In the Project area SH1 has a poor crash history, with 164 crashes including 14 serious injury or fatal crashes occurring over the past 5 years[20]. Approximately 30% of the crashes in the 100km/h speed zone occurred at intersections and another 10% occurred at property access points. Approximately 14% of the 100km/h crashes were head-on. The KiwiRap[21] assessment undertaken for the section of SH1 from Paraparaumu to Levin has a collective risk (or crash density) rating of high and personal risk rating of medium. The risk ratings are based on fatal and serious injury crashes for the five-year period 2002-2006. Collective risk is a measure of the total number of fatal and serious injury crashes per kilometre over a section of road. Personal risk is a measure of the danger to each individual using the State highway. The high collective risk rating and medium personal risk rating shows that there are a high number of crashes currently occurring on the existing SH1 within the Project area.

14.5 Methodology for Assessing Effects

The modelling approach taken for the AEE incorporates the use of a multi-modal strategic transport model as well as a Project-specific traffic model, in accordance with the approach taken for the assessment of other major projects in the Wellington region. Intersections have also been individually modelled for concept design purposes. The models used are listed below:

- Multi-modal strategic model: Wellington Transport Strategy Model (WTSM)[22], 2011 and forecast years for 2021, 2031 and 2041;
- Project-specific model: Kāpiti Traffic Model (KTM) SATURN model[23] for the 2011 base year, and 2021 and 2031 forecast years; and
- Key intersection Sidra models[24].

Traffic modelling compares:

- The baseline in 2011;
- The 'Do Minimum' scenario in 2031; and
- The Expressway scenario option in 2031.

[20] 5 year period between 1st of January 2007 and 31st December 2011.

[21] The KiwiRap rating tool is an assessment program to assess risk and identify safety shortcomings on New Zealand's state highways. There are two components to KiwiRap: the star rating and risk mapping. The star rating is an assessment of the level of 'built-in' safety provided on State Highways through engineering features such as lane and shoulder widths or safety barriers. 1-star is the least safe roads while 5-star roads are the safest roads. The southern part of the project area has a 3-star rating, while the northern portion has a 2-star rating.

[22] Multi-modal strategic model: Wellington Transport Strategy Model (WTSM) is used to forecast the change in travel demand both in terms of number of trips that are made and also the form of transport taken (i.e.. car or public transport)

[23] Project-specific model: KTM SATURN model is used to forecast future traffic performance and how motorists will re-route in response to the Project.

[24] Key intersection Sidra models allow a more detailed assessment of traffic performance of individual intersections.

14.5.1 **Do Minimum Transport Network**

Development of other Wellington RoNS results in increased capacity on wider network which can influence people's travel decision and result in changes to demands within the Project area. Therefore when assessing the effects of the Expressway, comparison of the Expressway Scenario to a scenario with the same assumptions but with no Expressway needs to be made. The scenario used for the comparison is known as the "Do Minimum" since it represents what would happen on the network in the future if the Project was not constructed.

Table 14-1 shows which projects are assumed to be completed on the wider network in 2021, 2031 and 2041 in the Do Minimum scenario. A check (✓) indicates where a project is complete while an "X" indicates that the project has not been constructed.

Table 14-1: Wellington Region RoNS Projects in the "Do Minimum"

RoNS Traffic Scheme	2021	2031	2041
Ōtaki to north of Levin	×	✓	✓
Peka Peka to Ōtaki (PP2O)	×	×	×
MacKays to Peka Peka (M2PP)	✓	✓	✓
Linden to MacKays (Transmission Gully)	×	✓	✓
Ngauranga to Aotea Quay (NtAQ)	✓	✓	✓
Terrace Tunnel Duplication	×	✓	✓
Basin Reserve	✓	✓	✓
Airport to Mt Victoria Tunnel	×	✓	✓
Other	**2021**	**2031**	**2041**
Petone to Grenada Link Road	×	✓	✓

The inclusion of the RoNS projects in the do minimum removes pinch points on the wider network which will result in more traffic being able to reach the Project area.

14.5.2 **WTSM Model Assumptions**

The land use matrices used for this assessment have used what is known as the composite growth scenario, which includes medium growth from the WTSM model and the inclusion of the Riverbank Road development and those trips associated with additional development in Paraparaumu town centre, Waikanae North and the Kāpiti Coast Airport development. This will ensure the design has sufficient capacity to accommodate the forecast demand as development occurs.

Other assumptions used for modelling the trip matrices in WTSM are consistent with those identified in the "Do Minimum" scenario.

14.5.3 KTM[25] Model Assumptions

When developing a traffic model and using it to test the effects of future changes there are two key inputs:

- Assumptions about land use changes and population growth which influence the number of trips on the road network and where they are travelling to or from (known as the trip matrices); and
- Assumptions about what changes will occur on the network i.e. which roads will be built.

When assessing the effects of changes to the road network generally two network models are needed for each forecast year. These are called the Do Minimum scenario and option scenario. In this case the option scenario is known as the Expressway Scenario since it contains the Expressway. For these two scenarios consistent land use and population growth assumptions have been used. In terms of networks, the difference between the scenarios is that the Expressway is not included in the 'Do Minimum' scenario but included in the Expressway scenario. This enables the effects of the Expressway on traffic patterns to be evaluated.

The assumptions used for the modelling are consistent with the changes to the network as described in the "Do Minimum" scenario, plus the Expressway. The influence of the other Wellington Northern Corridor RoNS projects on the traffic demands are included in the trip matrices since the matrices are derived from WTSM, which covers a larger geographic area.

14.6 Traffic Demands

14.6.1 Future Motor Vehicle Trip Origins and Destinations

By 2031, approximately 34,000 vehicle-trips to or from Kāpiti district each day are forecast. Most, if not all of these trips would use some part of the Kāpiti Expressway:

- 10,000 trips per day between SH1 north of the model area (north of Taylors Road) and Kāpiti district.
- 24,000 trips per day between SH1 south of the model area (at Paekakariki) and Kāpiti district.

By 2031, about 4,000 trips per day (of the 10,000 trips per day above) are forecast between SH1 north of the model area and SH1 south of the model area all the way through Kāpiti district. All these trips would be made using the Expressway. It is also expected that there will be around 6,000 vehicle-trips per day between Ōtaki (Main Street and Retail Area) and southern parts of the district (in and around Waikanae or Paraparaumu), many of which would use the Expressway. Therefore, about 90% of vehicle-trips made using the Kāpiti Expressway would have a beginning or an end in Kāpiti district.

Around 13,600 vehicle-trips each day are forecast to have either an origin or destination in the Ōtaki Retail Area or Main Street. In comparison, 4,900 are forecast to begin or end in Te Horo and the rural part of the Project area.

[25] An updated version of the KTM has been used. The updated model is called KTM2.1. This is an updated version of the model which was used to assess the traffic effects of the M2PP Expressway proposal. The traffic modelling was undertaken by the M2PP team. This was intended as a way to provide consistency between the two assessments.

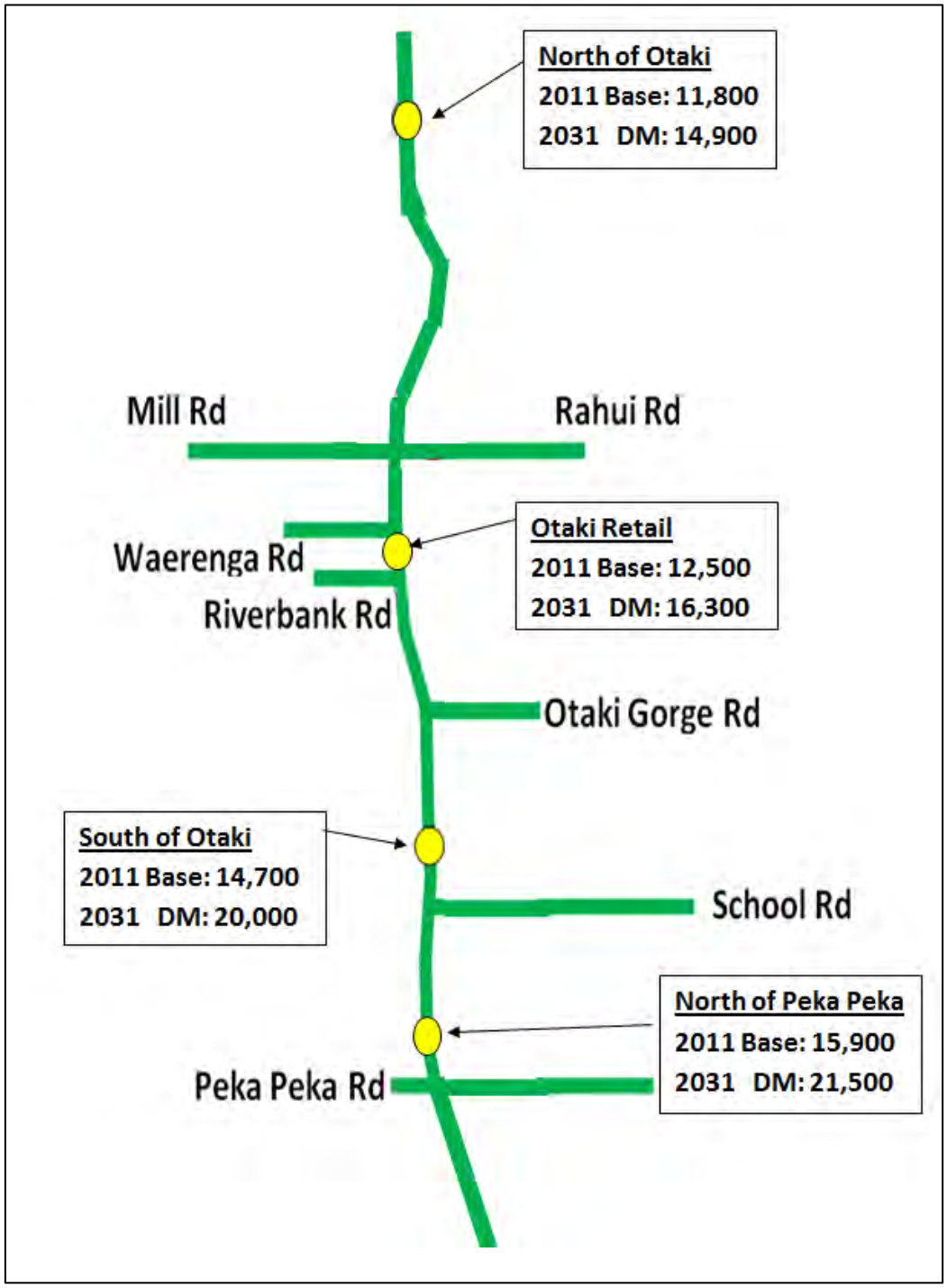
14.6.2 **Existing and Future Traffic Flows**

Figure 14-2, below, summarises the two-way Annual Average Daily Traffic (AADT) for 2011 base and 2031 Do Minimum on SH1. Traffic volumes are lowest at the northern end of the Project area and increase as you head south along SH1. By 2031, traffic volumes on SH1 are expected to increase by between 3000 and 5600 vehicles per day. This corresponds to a growth rate of 1.3 to 1.8 percent per year.

In 2031, if the Expressway is not constructed, motorists trying to turn onto existing SH1 from the side roads would experience extensive delays. The delays would be of a magnitude which could result in motorists changing their trip making patterns or taking increased risks when turning.

The Project provides a superior route for motorists that do not have trip origins or destinations in Te Horo or rural parts of the Project area, with shorter and safer trips with more reliable travel times. The introduction of the Expressway is forecast to reduce the numbers of vehicles on the existing SH1, providing a significant safety improvement for local access to, and safety along, the existing SH1. Motorists leaving or passing through the Project area would instead use the Expressway.

Figure 14-2: Existing and Future Traffic Volumes on SH1 (Two-way AADT)



Note: *2011 Base* = Existing Average Annual Daily Traffic Volume

2031 DM = Do Minimum. This scenario represents what would happen on the network in the future (2031) if the Expressway was not constructed.

(Modelled in the Kapiti Traffic Model (KTM2.1))

14.7 Forecast Traffic Reassignment and Travel Time Effects

Traffic flow re-routing (reassignment) resulting from the introduction of the Expressway was forecast using the KTM 2.1. The effect on journey times for travel by motor vehicle has also been assessed.

14.7.1 Annual Average Daily Traffic

Comparing the 2011 base with the 2031 Do Minimum shows the forecast growth of traffic on the existing SH1 at the following locations:

- 26% increase in AADT on SH1 North of Ōtaki;
- 30% increase in AADT on SH1 in Ōtaki Railway Retail area; and
- 36% increase in AADT on SH1 in Te Horo.

14.7.2 Heavy Commercial Vehicle Traffic

Currently the daily proportion of HCVs on SH1 at Ohau (north of the Project area) is 8%. There is a strong correlation between economic activity and vehicle-kilometres travelled by HCVs. Since 1989 HCV traffic in New Zealand has doubled. The number of HCVs using this part of SH1 is forecast to grow more quickly than the number of light vehicles. This means that by 2031, HCVs will make up a higher proportion of the daily traffic flow than at present.

HCV proportions are forecast to increase from between 12% and 14% in 2011 to between 17% and 22% in 2031. This suggests that daily HCV flows will double again in the coming 20 year period.

The Project allows HCV drivers making inter-regional or inter-district trips to use the Expressway rather than the existing SH1. Overall, the Project relieves the existing SH1 of HCV traffic. The reduction is most noticeable in Te Horo where the Project results in lower HCV flows using the existing SH1 in 2031, than were experienced in 2011. In 2011 the two-way HCV AADT passing Te Horo on the existing SH1 is 2,200. In 2031 there are 4,700 HCV forecast to pass Te Horo per day with 3,900 of these HCVs using the Expressway and 800 using the existing SH1. This means despite a total increase of 2,500 HCVs per day, there are 1,400 fewer HCVs on existing SH1.

On the existing SH1 south of the Ōtaki Railway Retail area, HCV flows in 2031 are forecast to be similar to 2011 levels as HCV drivers leave the Expressway to access destinations in Ōtaki or the Riverside Development.

14.7.3 State Highway Performance – Level of Service

The Level of Service (LOS) experienced by motorists using rural highways is affected by the capacity of the road, the traffic flows on the road and ratio of flow (volume) to capacity. As the traffic flow approaches the capacity of the road, the LOS deteriorates. As traffic flow increases, motorists using the road experience slower vehicle speeds. When the road capacity is reached, flow breakdown occurs and queuing forms.

The Highway Capacity Manual (HCM) provides guidance for assessing the LOS of highway links.

The LOS definitions used for this assessment are presented in Table 14-2.

Table 14-2: HCM LOS Definitions

Volume / Capacity %	LOS	Description
< 25%	A	Free flow operations. Vehicles are almost completely unimpeded in their ability to manoeuvre within the traffic stream.
< 40%	B	Reasonably free flow operations. The ability to manoeuvre within the traffic stream is only slightly restricted.
< 60%	C	Flow with speeds near the free flow speed of the freeway. The ability to manoeuvre within the traffic stream is noticeably restricted.
< 80%	D	Speeds begin to decline with increasing flows. Ability to manoeuvre within the traffic stream is seriously limited.
< 100%	E	Operation is at capacity. Operations are highly volatile with little room to manoeuvre within the traffic stream.
> 100%	F	Flow breakdown or unstable flow.

The level of service assessment for weekday traffic indicates that the existing rural sections of SH1 currently perform at Level of Service (LOS) B ("reasonably free flow operations") and are expected to degrade to LOS C ("the ability to manoeuvre within the traffic stream is noticeably restricted") in the "Do Minimum" scenario, while the reduction in traffic on the existing SH1 resulting from the construction of the Expressway will result in level of service A ("free flow operations, unimpeded manoeuvres") for both the 2031 medium and high growth scenarios.

The 2011 holiday peak hour flows on rural sections of the existing SH1 are forecast to perform at LOS C, which is slightly worse than the morning peak hour for either the medium or high growth scenarios (LOS B). By 2031, the roads are approaching capacity and operating at LOS D ("speeds decline and the ability to manoeuvre is seriously limited").

The Project provides substantial relief to the existing SH1 which will continue to perform at LOS A ("Free flow operations". Vehicles are almost completely unimpeded in their ability to manoeuvre within the traffic stream") or B ("reasonably free flow operations the ability to manoeuvre within the traffic stream is only slightly restricted"). Holiday traffic travelling through the Project area is expected to use the Expressway. The Expressway is forecast to operate at LOS A at peak hours on an average weekend day. With the construction of the RoNS on the wider network, there is the potential for holiday traffic profiles to change. However, there is still limited capacity north of the Project area as SH1 remains a two lane highway. As is currently the case, people will adjust when they travel to minimise the congestion they experience to the north of the Project. Therefore this will have the effect of minimising the potential for extreme peaks in holiday traffic flows.

14.7.4 Travel Time Forecast

Journey times for seven key origin and destination pairs have been extracted from the model. The forecast travel times for these journeys in the PM peak hour for the 2011 base, 2031 Do Minimum and Project are shown in Table 14-3.

From the 2011 base to 2031 Do Minimum the travel times for some journeys are reduced. This is due to the M2PP section of expressway not being constructed in 2011, but included in the 2031 Do Minimum.

Table 14-3: 2031 PM Peak Travel Time Comparison

Travel Time Route		Northbound				Southbound			
		2011 Base	2031 Do Min	2031 Expressway	Difference: 2031 Expressway – 2031 Do Min	2011 Base	2031 Do Min	2031 Expressway	Difference: 2031 Expressway – 2031 Do Min
(a) Between SH1 at MacKays Crossing and SH1 north of Ōtaki	Time (m:s)	26:27	20:32	18:44	*-01:48*	23:17	20:25	18:41	*-01:44*
	Dist (km)	31.2	30.7	31.1	*0.4*	31.2	31.0	31.1	*0.1*
(b) Between SH1 at MacKays Crossing and Arthur St in Ōtaki Retail	Time (m:s)	24:20	18:24	18:19	*-00:05*	21:11	18:19	18:22	*00:03*
	Dist (km)	29.0	28.6	29.0	*0.4*	29.0	28.8	29.1	*0.2*
(c) Between SH1 north of Ōtaki and Arthur St in Ōtaki Retail	Time (m:s)	02:06	02:08	02:03	*-00:05*	02:06	02:06	02:03	*-00:03*
	Dist (km)	2.1	2.1	2.4	*0.3*	2.1	2.1	2.4	*0.3*
(d) Between Te Horo at School Road and SH1 at MacKays Crossing	Time (m:s)	20:18	14:27	18:23	*03:56*	17:07	14:13	17:28	*03:15*
	Dist (km)	23.5	23.5	23.9	*0.4*	23.5	23.5	23.8	*0.3*
(e) Between Te Horo at School Road and Paraparaumu Town Centre	Time (m:s)	14:05	13:32	12:52	*-00:40*	13:01	13:37	13:18	*-00:19*
	Dist (km)	17.0	17.2	17.3	*0.1*	16.99	17.14	17.32	*0.2*
(f) Te Horo at School Road and Waikanae at Elizabeth Street	Time (m:s)	06:42	07:25	07:01	-00:24	06:53	07:25	07:19	-00:06
	Dist (km)	9.9	10.2	10.2	0.0	9.9	10.2	10.2	0.0
(g) Te Horo at School Road and Arthur Street in Ōtaki	Time (m:s)	04:03	03:58	04:07	+00:09	04:04	04:06	04:05	-00:01
	Dist (km)	5.5	5.5	5.5	0	5.5	5.5	5.5	0

Overall, motorists driving through the Project area are expected to experience shorter travel times with the Expressway constructed compared to the "Do Minimum" with savings of up to 1 minute and 48 seconds. Local trip travel time between Te Horo and Paraparaumu and Waikanae are also improved.

Journeys between Te Horo and MacKays Crossing will take longer after the Expressway is constructed when compared to the "Do Minimum" for the same year. However, in the "Do Minimum", motorists making these journeys have relatively direct access to the M2PP Expressway. This is a temporary benefit resulting from unimpeded access to the M2PP Expressway. When the Peka Peka to Ōtaki section is complete, this access will be removed and the fastest route to the Expressway will be via the South Ōtaki Interchange (north of Te Horo). For most journeys, it will be quicker to drive south using the existing SH1 whereas in the "Do Minimum" these journeys could be been made using the M2PP Expressway.

14.7.5 **Travel Time Reliability**

Motorists currently experience variable travel times when travelling through the Project area, particularly on weekends and holidays. This variability is generally caused by delays which occur as a motorists travel through the Ōtaki Railway Retail area.

With the Expressway constructed, motorists will be able to bypass this area. Motorists who choose to stop in Ōtaki will also experience improved performance of the existing SH1 due to the reduction in traffic. These improvements in journey time reliability will also benefit Heavy Commercial Vehicles. The Ōtaki bypass also means HCVs do not need to accelerate or decelerate for intersections or when travelling through the Ōtaki urban area which will improve their operating efficiency.

There is the potential for some journey time variability to occur on holiday weekends as a result of constraints to the north of the Project area where the Expressway and SH1 becomes a single lane in each direction.

14.7.6 **Summary of Forecast Traffic Reassignment and Travel Time Effects**

In 2031 with the construction of the Expressway the volume of traffic using the existing SH1 is significantly reduced. For example on existing SH1 through Te Horo the volume of traffic in 2031 is forecast to drop from nearly 21,500 vehicles per day in the Do Minimum scenario to nearly 3,000 vehicles per day with the Expressway. The volume of traffic passing through Ōtaki with the Expressway is higher (around 7,000 vehicles per day) but this is still a significant reduction compared to the Do Minimum flow which is forecast to be 16,300 vehicles per day. These reductions in the traffic volume result in improvement in the link LOS on the existing SH1. The Expressway will also operate with a link LOS of A.

The Expressway is forecast to result in an approximate 2 minute travel time saving for motorists travelling through the Project area. This is largely due to the bypass of Ōtaki. Journey time reliability will also improve since motorists will not be subject to delays within Ōtaki as currently occurs on weekends and holidays.

North of Ōtaki the merge with the existing SH1 is expected to perform well with a LOS of C or better. However, if there are significant changes to holiday travel patterns as a result of the elimination of other downstream constraints due to the wider RoNS package delays could be experienced. As is currently the case, motorists will most likely adapt to this by adjusting their travel patterns.

14.8 Expressway and Local Road Traffic Connectivity

The performance of the local roads and interchanges has been assessed using Sidra.

Sidra is a software package used for modelling intersection capacity, level of service and performance analysis. The Sidra models have been built on the traffic volumes extracted from the KTM SATURN model. Since the Sidra models are for concept design of new intersections they are not calibrated and use default Sidra settings.

The Sidra analysis focused on the AM and PM peak 2031 medium growth "Do Minimum" and Expressway option scenarios. The average delays presented here incorporate both

the intersection delay (time waiting for a gap in traffic) and geometric delay (time associated with completing turning manoeuvres). Sensitivity tests were also performed to take in to account the impact of higher than typical traffic flows such as those which may be experienced on holiday weekends. For the analysis of the local road and interchange performance the Project area has been divided into three general areas: Ōtaki, Ōtaki Gorge and Te Horo.

14.8.1 Ōtaki

The Rahui Road, Mill Road, and SH1 roundabout (at the northern end of the Ōtaki Railway Retail area) performs well in both the "Do Minimum" and Expressway scenarios with each movement having an average delay of 13 seconds or less, which corresponds to LOS of A or B. The intersection of the existing SH1 and the new northbound on-ramp also performs well with a LOS of A for all movements in both the AM and PM peak periods.

In 2031 traffic turning out of Riverbank Road, immediately north of the Ōtaki River, experiences extensive delays without the Expressway. With the Expressway constructed the volume of traffic on the existing SH1 is significantly reduced, which results in a considerable improvement for traffic exiting Riverbank Road.

14.8.2 Ōtaki Gorge

Traffic exiting either Ōtaki Gorge Road or Old Hautere Road (to the south side of the Ōtaki River) in the 2031 "Do Minimum" scenario experiences extensive delays while waiting for a gap in the through traffic on SH1. With the Expressway built, the road network layout in the vicinity is completely different. North facing ramps to the Expressway are provided along with a bridge across the Expressway for local traffic. In the Expressway scenario all intersections operate well with average delays of 20 seconds or less.

14.8.3 Te Horo

Similar to the other locations, traffic will experience long delays when accessing SH1 from School Road in the "Do Minimum" scenario. The construction of the Expressway results in significantly less traffic on the existing SH1 which means there is less delay for motorists turning to or from the existing SH1.

14.8.4 Summary of Expressway and Local Road Traffic Connectivity

With the construction of the Expressway the volume of traffic on existing SH1 is significantly reduced which results in the intersections of the local roads and existing SH1 performing much better. In locations where the Expressway severs the link between a local road and existing SH1 an underpass is provided to maintain the connection. All of the Expressway on and off ramps also perform well with a good level of service.

Sensitivity tests regarding the effects of peak holiday traffic show that with the Expressway constructed all intersections will have a good level of service.

The provision of the Expressway in addition to the existing SH1 means there is an alternative, higher standard route should there be an incident on either corridor. This improves the resilience of the transportation network.

14.9 Effect on Other Transport Modes

14.9.1 Passenger Transport Services

Generally, the Expressway has minimal effect on passenger transport users. The bus route can continue to use the existing SH1 or switch to using the Expressway. The Expressway will have minimal effect on the roads currently used by school bus services, as most of the existing local road to State highway connections will be maintained.

The Ōtaki Railway Station will be shifted slightly but this will not affect access to the station or its operation. The design of the NIMT realignment allows for double tracking of the railway should there be a desire to do this in the future.

14.9.2 Effect on Pedestrians, Cyclists and Equestrians

Very few people currently cycle or walk within the Project area, except within Ōtaki. The existing SH1 is a high-volume, high-speed road with no dedicated facilities for pedestrians or cyclists. The Project will significantly reduce the traffic flow on the existing SH1 south of Ōtaki Gorge Road. This will:

- Reduce the exposure of pedestrians, cyclists and equestrians to motorised traffic, reducing the risk they are involved in a crashes;
- Create gaps in the traffic noise, reducing the sense of a car-dominated environment; and
- Make it easier to cross the existing SH1.

Construction of the Project will mean that a pedestrian or cyclist travelling alongside SH1 through Te Horo in 2021 would see 5 vehicles each minute rather than 26 per minute. This is fewer vehicles than one would expect to see on Mill Road today.

The bicycle level of service (BLOS) was assessed using The Highways Capacity Manual method. The resulting BLOS for the 2021 Do Minimum were predominantly D and E[26]. The results for this assessment appeared to be most affected by the shoulder widths. In the Expressway 2031 Do Minimum scenario the traffic reduction on the existing SH1 changes the BLOS from D/E to B. The reduction of speed below 80kmph would further lift the BLOS to A.

14.9.3 Across the Transport Corridor

The existing SH1 and NIMT railway create an impediment to movement between the east and west sides of the transport corridor. The factors contributing to this severance are the:

- Physical barrier formed by the NIMT railway;
- Time needed to wait for adequate gap in traffic flow to cross the existing SH1;
- The distance people would walk or cycle to cross the existing SH1;
- Risk of involvement in a road traffic accident; and
- The perception of danger.

The Project provides connections across the NIMT railway and traffic flows on the existing SH1 and Expressway. At some locations it also introduces additional deviation and increased travel distances for some journeys.

For the Do Minimum scenario, the severance caused by traffic volumes on the existing SH1 is severe. This means people are deterred from making trips which require crossing SH1. In the rural parts of the Project area, traffic flow on the existing SH1 is reduced by between 60% and 80% once the Expressway is constructed. The ability for pedestrians to cross the existing SH1 at-grade is greatly improved due to the substantial reduction in traffic flow.

Table 14-4 shows that overall there is a reduction in severance for pedestrians crossing the transport corridor. Cyclists and equestrians are likely to perceive relief from severance

[26] BLOS uses the same ranking system as vehicular LOS with BLOS A representing the best conditions and BLOS F representing the worst conditions

(i.e. reduced traffic flows) in much the same way as pedestrians in terms of gaps in the traffic. The assessment of journeys to and from School and Old Hautere Roads would therefore be more positive overall for these users.

Table 14-4 summarises the assessment of pedestrian severance.

Table 14-4: Pedestrian Severance Assessment

Route	Comments	Relief from Existing Severance	New Severance	Result
School Road	• Grade-separated crossing of the transport corridor • additional 1.7km for some trips	Substantial Positive	Substantial Negative	Neutral
Old Hautere Road	• grade separated crossing of the transport corridor via South Ōtaki Interchange • minimal increase in length for trips to/from Ōtaki	Substantial Positive	Slight Negative[27]	Moderate Positive
Ōtaki Gorge Road	• 60% reduction in traffic flows on existing SH1 • negligible change in trip length	Substantial Positive	Negligible	Substantial Positive
Rahui Road	• 50% reduction in traffic flows on existing SH1 • negligible change in trip length	Moderate Positive [28]	Negligible	Moderate Positive
The Ōtaki "Ramp"	• 50% reduction in traffic flows on existing SH1 • negligible change in trip length	Moderate Positive [29]	Negligible	Moderate Positive

14.9.4 **Amenity in Ōtaki Retail/Railway Precinct Area**

The Expressway will greatly reduce the traffic flow through the Ōtaki Railway Retail area. This will have a positive effect for the retail area.

New Zealand Standard 4404:2010 (Land Development and Subdivision Infrastructure) advises the traffic volumes appropriate for different types of road. It suggests that a road providing for urban retail activity should have an AADT volume of less than 8000 vpd.

The 2011 base model predicts an AADT of 12,500 vpd and the 2031 Do Minimum model an AADT of 16,300 vpd.

[27] Assumes most trips are to/from Ōtaki.

[28] Assumes built-up areas are less sensitive to traffic reduction.

[29] Assumes built-up areas are less sensitive to traffic reduction.

With the Expressway in place, AADT volumes through the Ōtaki Railway Retail precinct in 2031 are predicted to reduce to 6,900 vpd, which is less than the flows suggested in NZS 4404:2010 for a road providing for urban retail activity and therefore better than the vehicles per day suggested by NZS 4404:2010.

14.10 Road Safety Effects

Due to the reduction in traffic on the existing SH1 the crash costs for existing SH1 are expected to reduce by 75 percent. However, there is a risk of some, generally low severity, crashes occurring on the Expressway or the new intersections associated with the on and off ramps. Therefore, the construction of the Expressway is expected to result in an overall 60 percent savings per year in crash costs compared to the existing situation.

The Project also means that five of the eight existing rail level crossings within the Project area will be closed. They are:

- School Road; grade separation provided;
- Property access opposite Te Waka Road; alternative access provided;
- Stevens property access; alternative access provided;
- Old Hautere Road; alternative access provided; and
- Rahui Road; grade separation provided.

Three existing level crossings will be retained. They are Sampson property access, Mary Crest and the Winstone's crossing. As at present, the Winstone's crossing will only be used for oversized loads.

All of the level crossings on public roads will be closed as part of the Project. The remaining level crossings are private access and therefore carry lower traffic flows. The changes will therefore significantly reduce the risk of crashes occurring between trains and road traffic, pedestrians or cyclists.

14.11 Property Access Effects

After the Expressway is constructed, there will be no physical change to many residents' access to the existing SH1, although access will be easier and safer due to reduced traffic volumes. However, there are some locations where residents' access to existing SH1 will be severed by the Expressway. In these situations alternative access arrangements have been developed, resulting in an increase in travel distance for some journeys. However, the traffic volumes on the existing SH1 in the future will be much lower which will make this manoeuvre safer and easier.

New local roads planned for provision of alternative access include:

- From Gear Road to School Road – no distance change for northward trips; southward trips - increases the travel distance by 1.5km;
- Ōtaki Gorge Road and Old Hautere Road – access is provided by new local road parallel to the Expressway – no distance change for northward trips; southward trips - increases the travel distance by 2.5km;
- Between Te Horo and Old Hautere Road - provide access to properties via a new local road which otherwise become landlocked; and
- From Mary Crest to a point opposite Te Hapua Road – Access to SH1 will be via an underpass beneath the Expressway at Mary Crest.

Although there are a number of locations in which access distances will increase, this will be offset by the significant improvement in safety and reduced delay for vehicles turning in or out of these locations.

The effect of the Expressway on emergency services access is dependent upon the specific location from which they are responding. For access to properties within the study area

the effects are generally similar to those noted above. Special access, for emergency services only, from the Expressway to Gear Road in Te Horo has been provided for. This enables emergency vehicles travelling in either direction to access Ōtaki.

14.12 Construction Traffic Effects

Given the stage of Project development (i.e. a Contractor has not yet been appointed), the approach has been to assume the worst case scenario with regards to the number of vehicles.

14.12.1 Assumptions

The types of construction activity that could affect transport activities are:

- Arrival and departure of construction workers in light vehicles or buses;
- Delivery of plant or materials using HCV movements;
- Movement of overweight and / or over-dimension loads; and
- Construction activities close to a live highway.

This Project will predominantly be constructed off-line, that is without the need for temporary road closures, although some traffic diversions will be experienced. For the purposes of this assessment, the main assumptions are that:

- Construction activity is 6 days a week;
- Construction occurs across an 8 hour day (this may vary slightly across the year);
- Construction workers arrive at site in the hour starting 07:00;
- Construction workers leave site in the hour starting 16:00;
- All trucks importing pavement material or water will leave the site empty; and
- All trucks exporting earthworks material will arrive at the site empty.

In addition to access along internal haul routes, each construction section may be accessed from the public road network. The following routes are assumed between:

- SH1 and Section 1 via Rahui Road;
- SH1 and Section 2 via Ōtaki Gorge Road;
- SH1 and Section 3 via Old Hautere Road; and
- SH1 and Section 4 via School Road.

14.12.2 Worker Arrival and Departures – Light Vehicles

Additional trips will be generated by construction staff travelling to and from the site. There will be approximately 150 workers on site each day. The movements identified are small compared to the flow on the existing SH1, and analysis has shown that the effect of the additional worker light vehicles on the operation of the intersections will be negligible. The assessment has shown that the additional worker vehicles did not noticeably increase delays for motorists travelling from side roads onto SH1, as significant delays are already experienced by motorists making these movements.

The most significant delays are forecast for motorists turning right out of side roads on to SH1 in the evening peak hour where delays of more than 3.5 minutes per vehicle are forecast. The queues of motorists waiting to turn right onto the northbound direction for SH1 will also create delays for those wishing to turn left.

14.12.3 Movement of Construction Materials – Heavy Commercial Vehicles

HCVs will be used to move materials and large loads such as bridge beams. The majority of truck and trailer movements will be associated with:

- Earthworks (cut and fill);

- Import of materials for pavement construction; and
- Water cartage for dust management.

Most of the pavement materials will be needed following completion of earthworks. These materials will need to be imported. Until there is more certainty regarding the construction programme, it has been assumed that the movement of cut and fill, pavement materials and water will occur at the same time.

By 2021 it is forecast that SH1 will be carrying just under 1500 vehicles per hour in the morning peak period through its intersection with Ōtaki Gorge Road.

Approximately 16% or around 240 are forecast to be HCVs. Construction of the Project will add 26 HCVs per hour at Ōtaki Gorge Road, which would increase the HCV proportion to 18%.

The additional HCV traffic will affect the operation of the at-grade intersections between the existing SH1 with Ōtaki Gorge Road, Old Hautere Road and School Road. The additional HCV traffic will result in increased average delay, particularly for turns from the side roads onto the existing SH1. The intersection turning delay will affect construction traffic using these site accesses as well as motorists travelling to and from properties to the east of the transport corridor. The increased delay and the associated safety hazard is the main issue that needs to be addressed in the construction traffic management plan (refer Volume 4 AEE).

The current separation between the existing SH1 and the NIMT railway at Old Hautere Road and School Road does not allow much room for truck and trailer units to wait to cross the railway or join the existing SH1 when undertaking turning manoeuvres. Minor changes to the road layout Old Hautere Road, as provided for in the Project design, will avoid this issue. More substantial measures are provided for in the design at School Road.

Options for minimising the risk of truck and trailers blocking back include:

- Temporarily re-locate the School Road level crossing further to the south where the required storage space can be provided;
- Limit the movement of truck and trailer units to left in a left out only from this intersection - this would allow for deliveries from the north with trucks using the Peka Peka interchange (4km to the south) to turn back towards the north;
- Using trucks without trailers - this would double the numbers of HCV movements at the intersection; or
- Staging of bridge construction to minimise traffic effects.

14.12.4 Construction Traffic Mitigation

There are numerous options for mitigating the intersection efficiency and road safety effects during construction, including:

- Limiting truck and trailer units to left in a left out only (substantially increase the length of the haul routes);
- Using trucks without trailers (doubling the number of HCV movements at the intersections);
- Temporary warning signs on the SH1 approaches to intersections;
- Temporary speed restrictions on the SH1 approaches to intersections; and
- Staging of bridge construction to minimise traffic effects.

Of these, the following mitigation for construction traffic effects are proposed:

- A construction traffic management plan will be developed for all construction activities, including the movement of over-dimension components (e.g. bridge spans);

- To minimise journey distances and reduce transport costs, every effort will be made to source bulk materials from locations / settlements within the Kāpiti district or adjoining districts;
- Transportation of over-dimension components shall be undertaken in accordance with the appropriate operational approvals;
- The use of internal haul routes will be maximised (e.g. earthworks will be moved within the site rather than via public roads);
- A self-contained drive-through wheel wash will be provided for each site access;
- Workers and bulk goods suppliers will be briefed about the poor crash record of at-grade intersections on the existing SH1 before their first visit to the site;
- Advance warning signs will be provided for SH1 approaches to site access roads used for construction site access;
- Temporary speed restrictions will apply on the SH1 approaches to Ōtaki Gorge Road, Old Hautere Road and School Road;
- Temporary traffic signal control will be introduced during the construction of the Rahui Road bridge;
- Measures will be introduced, such as diverting pedestrians and cyclists along a safe route past the construction area using temporary directional signage, to ensure the safety of non-motorised road users of side roads, particularly at School Road and Rahui Road; and
- In order to minimise the risk to child pedestrians using the School Road site access/HCV drivers will be warned of school bus arrival and departure times SH1 and instructed to take additional care when using the route. Other measures such as temporary speed limits, signage and regular communication with the School will also be implemented. All mitigation measures will be documented in the CTMP.

With the adoption and implementation of these recommendations, it is considered that construction will have minimal and acceptable effects upon the safe and efficient operation of the road network. The detail of the above options will be detailed in the CTMP and certified in accordance with the processes outlined in the CEMP.

14.13 Mitigation

The Project, by its nature, avoids the significant adverse road safety effects that are forecast in future if no changes to the road hierarchy are introduced. This will benefit not only people travelling through the study area, but also people that make trips within as well as to and from the Project area.

Particular care has been taken in the urban design and landscaping at Gear Road and School Road in Te Horo. This has been necessary to minimise the (already small) risk of pedestrians attempting to cross the Expressway and NIMT at grade.

The transport effects of construction activities will be appropriately mitigated. The successful contractor will work with the road controlling authorities to develop the most appropriate mitigations measures in the development and agreement of a construction traffic management plan, which will adopt a range of well-established, proven measures such as those documented in Section 14.12.4 above.

Chapter 15

Part G

VOLUME 2

Urban Form and Function

Overview

Potential urban design effects of the Project have been assessed, including in terms of amenity, community severance, connectivity (with and across the Expressway), urban form, land use patterns and the impact on the existing SH1.

The ULDF contains a full description of the urban and landscape design context of the Project (refer Volume 3 – Technical Reports, of AEE). It identifies urban design decisions made to date and recommends further methods for achieving optimal urban design outcomes as the design details of the Project are finalised.

The Project's overall urban design outcome is rated as "low (positive)". The existing urban form and land use patterns are not significantly disrupted as the Expressway alignment broadly follows the existing rail corridor on what is predominantly rural land. Retention of the underlying urban form within the Ōtaki Township is a good urban design result. Current cross-corridor connections are retained, with one exception at Old Hautere Road.

The form and ease of use of the new North Ōtaki and South Ōtaki interchanges at either end of the township will be important for the business viability of the current Ōtaki Railway Retail area. The interchanges provide excellent connectivity to and from the Expressway for the industrial / 'Clean Tech' area around Riverbank Road at the southern end of Ōtaki, and other future land use development and growth for Ōtaki Township and the wider region.

Important future urban design issues, outside the scope of the Project, will be the integration of the network of walking and cycling routes and the interfaces with key public realm spaces including the Pare-o-Matangi reserve and the Ōtaki Railway Retail area.

15 Urban Form and Function

15.1 Introduction

This Chapter summarises the findings of the urban design assessment of the Project.

The reports that detail the effects of the Project on urban form are:

- The Peka Peka to Ōtaki Expressway Urban Design Assessment (Technical Report 7); and
- ULDF (Technical Report 23).

These technical reports are included in Volume 3 of this AEE report.

The NZTA requires that the urban and landscape design considerations for its projects are addressed within an ULDF. A ULDF has been prepared for the Project. It is a technical document, rather than an assessment of effects, and contains recommended methods for achieving good urban design. The relevant content of the ULDF is summarised in the AEE report.

15.2 Methodology

The process for determining urban design effects is based on the draft NZTA Guideline on the Assessment of Urban Design Effects, which requires the key areas for assessment of urban design effects to include:

- Urban form and land use effects;
- Amenity effects; and
- Connectivity effects.

The existing urban design environment was then assessed to provide a baseline. Assessment of urban design against the baseline environment was then completed, using the ULDF and other recognised urban design principles, policies and objectives.

15.3 Existing Environment – Urban Design

The overall landform of the Kāpiti region is characterised by the Tararua ranges to the east and the coastal edge to the west. SH1 and the rail corridor affect connectivity for both Te Horo and Ōtaki. The majority of the Project area is zoned rural, with urban activities mainly limited to Ōtaki. The urban boundaries of Ōtaki are the Ōtaki River to the south and the Waitohu Stream to the north.

The existing SH1 and NIMT corridor bisect the Ōtaki township and (to a lesser extent) Te Horo, and typically defines the urban form and land use boundaries through "built edges" where buildings or structures define streets or public places.

15.3.1 **North Ōtaki**

North Ōtaki is characterised as an elevated eastern block of suburban residential land use on the Waitohu Plateau, surrounded by lifestyle and rural farms. The amenity values of this area are predominately its rural residential character, but the current SH1 runs through the western edge of the residential area. The Pare-o-Matangi reserve is a key recreational and amenity feature in this area.

Taylors Road currently connects directly into SH1. SH1 runs through this section of Ōtaki to the Ōtaki Railway Retail area. Te Manuao Road is the key residential feeder road to the east, perpendicular to SH1. County Road acts as a secondary connector road and runs down to Rahui Road.

15.3.2 **Ōtaki Township**

The Ōtaki Township contains two commercial areas, the Ōtaki Railway Retail area and the Ōtaki Main Street. The Ōtaki Railway Retail area is a retail area along the existing SH1 between Waerenga Road and Mill Road/Rahui Road roundabout. The centre of the Ōtaki Railway Retail area is the Arthur Street intersection, which acts as a minor axis to the major axis of SH1 and defines the 'heart' of an increasingly pedestrian-oriented precinct. The historic Ōtaki Railway Station is located at the eastern end of this minor axis.

The amenity values of the Ōtaki Railway Retail area are characteristic of a retail high street. The length of this stretch of retail shops creates a walkable streetscape of approximately 400m end to end. A small park space is located around the Information Centre. Existing traffic volumes and resulting congestion on SH1 through this area have a negative impact as they impede vehicular, pedestrian and cyclist access to SH1 from local roads and movements that traverse across Ōtaki township.

The Ōtaki Main Street is located approximately 1.5km to the west of the Ōtaki Railway Retail area, down Mill Road. The Ōtaki Main Street town centre predominantly serves the local community.

15.3.3 **South Ōtaki**

South Ōtaki is dominated by an industrial zone including aggregate extraction and precast concrete works. KCDC has also identified the area around Riverbank Road as a growth area, with a focus on clean technology industries.

The Ōtaki Lake Development area to the east of the existing SH1 is proposed to include a lake and amenities on the northern bank of the Ōtaki River. Within the south Ōtaki area, the Ōtaki River is the key amenity function with recreational access provided at the Chrystalls Bend Reserve on the northern banks of the Ōtaki River and its associated riverbank walkway.

15.3.4 **Te Horo**

Te Horo is a small settlement within the Project area and is divided by the current SH1 and the NIMT corridor. The urban form of Te Horo is linear with the main community

functions along School Road and market garden shops on SH1. These areas are severed by the existing SH1 and the NIMT corridor. Te Horo's community facilities are located on the eastern side of SH1 while the main residential areas are on the west. Connectivity is, therefore, important for this area to function well.

15.3.5 Mary Crest to Peka Peka

The Mary Crest to Peka Peka section of the Expressway is predominantly rural with a mixture of pasture and horticultural land on the eastern side and pasture and remnant native bush on the western side. The largest group of buildings is Mary Crest, a former Catholic school which sits prominently at the top of a small sand dune hill to the west of the existing SH1.

15.4 Design Process and Alternatives

The design process itself is an important consideration, as good urban design is key to delivering successful urban outcomes. Through the design, alternatives were considered and either adopted, refined or rejected. The current urban form and land use patterns along the Project route are described in the ULDF.

15.4.1 Assessment of Interchange and Connectivity Options

For the Expressway the primary connectivity is the north / south SH1 and access to and from Ōtaki Township. In terms of urban design, the access to the wider road network to and from the Project was assessed, as was how the Project would affect current and future land use patterns. Different forms of interchange were evaluated using a MCAT process.

Ōtaki Township was the key consideration of the wider road network connectivity to the Expressway. Particular consideration was given to access from the north and south to facilitate the existing Ōtaki Railway Retail area and the anticipated 'Clean Tech' growth in the existing Riverbank Road industrial area.

A range of interchange forms, including a single full-diamond, were considered in the Project design process. This provided full connectivity at a single location and is efficient from a transportation perspective but on balance did not support the broader access objectives for the Ōtaki Township outlined in the Project objectives and was therefore rated below the final outcome. It was considered that half-diamond interchanges at both the north and south ends of Ōtaki facilitated both the physical and perception of connectivity to the Ōtaki Township.

The final location and arrangement of the interchanges was then considered. From an urban design perspective the key criteria were integration with the wider urban form, particularly the existing urban circulation network / street pattern, respect for or enhancement of amenity values and the ability to support current and future land use.

There were also critical topographical constraints with Waitohu stream to the north and the Ōtaki River to the south, both dictating the location of interchanges. At the north there are connections to Taylors Road, and the Waitohu Plateau residential area to be maintained. Connectivity to and from the plateau is important as the majority of the community and retail functions are located in the township on Main Street. The vertical elevation of the plateau and the separation of the urban form at this point is also an important consideration as it allows the Project route and realigned NIMT rail corridor to pass through Ōtaki with minimal disruption to the overall urban form.

The KCDC Vision for Ōtaki Township (the GOV) is for medium-density development within the existing urban area. Half-diamond interchanges at the north and south ends of Ōtaki encourage development to occur between the two interchanges as easy access is available for both northbound and southbound transportation, creating a good regional destination.

15.4.2 **East-west Connectivity**

The retention and enhancement of connectivity across the north-south Expressway and rail corridor (i.e. east-west) was a key urban design consideration throughout the Project's development. Corridor severance effects exist in the current SH1 and rail corridor and could be further increased by the Project. The Project design team identified where these severance effects currently occur, and obtained information about the community's desires in terms of which east-west connectivity locations were critical to maintain.

In this context the existing Rahui Road link was of particular significance, as it provides a second link to the north-eastern residential area of Ōtaki, is the direct access to the Ōtaki Māori Racing Club (a key local amenity and economic asset) and it is part of a historic interchange with Main Road linking to the local retail centre (further to the west) and the existing SH1.

Rahui Road currently connects to the Ōtaki roundabout and has an at-grade rail crossing where it straddles the NIMT rail line. Any new connectivity at Rahui Road would need to cross over both the Expressway and realigned NIMT rail corridor now running parallel to each other. Options considered included:

- not recreating a link and relying solely on the new northern interchange;
- a pedestrian-only footbridge or underpass; and
- a grade-separated structure allowing full vehicle movement.

The first round of public consultation feedback clearly highlighted a strong need for a full vehicle connection at Rahui Road.

A key consideration in the form and geometry of the new connection at Rahui Road was the flood plain of the Ōtaki River and the local Mangapouri Stream. This meant that at-grade or depressed underpass options were quickly discounted as this could potentially increase flooding to the west. To gain sufficient clearance for a local underpass (local road at-grade) the Expressway would have to be raised about 8m above the existing ground level over a significant length and would therefore have a significant visual and noise impact on the adjacent township. The NIMT rail corridor could not be raised in vertical alignment with the Expressway due to the current location of the Ōtaki Railway Station. A new at-grade rail crossing would therefore be created, which was considered to be a poor safety outcome.

Through further evaluation, a local bridge spanning 150m over the Expressway and rail corridor was considered the best solution and preferred over other options. This option has good walking and cycling provision, ties into the existing street pattern and allows for the full range of vehicle connectivity, including specifically to the Ōtaki Racecourse for larger trucks and horse floats. It does have localised property effects requiring removal of some residential houses on both the eastern and western sides of Rahui Road / County Road, and these were considered in the overall MCAT evaluation.

A similar exercise was also carried out for an east-west connection at Riverbank Road. Any connection at this point was primarily for recreational access as it was located south of the Chrystalls Bend stopbank and was not clearly earmarked for residential or other core community facilities. This potential link was quickly discounted due to a vertical alignment under the existing rail bridge that was susceptible to flooding.

The overall evaluation of the alternatives for east-west routes concluded that to maintain a second east-west link at Rahui Road provided the most benefit in terms of connectivity across the corridors, with the least negative effects. This option was therefore carried through into the Project design.

Old Hautere Road

At Old Hautere Road on the straight section of SH1 from Te Horo to the Ōtaki River there is currently an existing at-grade crossing of the NIMT rail corridor at the intersection. This

connection serves the rural and lifestyle properties along Old Hautere Road to the east of the corridor. Old Hautere Road also currently connects into Ōtaki Gorge Road further to the east.

With the Expressway running on the eastern side of the rail corridor the original proposal for Old Hautere Road was to close the intersection and leave it as a dead end. There were mixed views from public consultation regarding this change with some concerned about 'boy racers' using Old Hautere Road for racing and others seeking that connectivity to SH1 be retained. The design team undertook to develop and evaluate options to reconnect to Old Hautere Road to SH1. KCDC were keen in principle to reinstate like-for-like connectivity along the length of the corridor.

In this context two options were developed:

- The first was a grade-separated local bridge structure across the Expressway, existing rail corridor and the existing SH1 with a span of around 150m.
- The second option was an at-grade local road running parallel with the new Expressway to the southern interchange at Ōtaki Gorge Road.

Both were evaluated as part of the MCAT process. On balance the at-grade connection to the interchange was preferred and adopted as it had visual benefits over the larger grade-separated structure, which was assessed to be out of context in the wider flat rural topography.

Te Horo

East-west access at Te Horo needed to be recreated to support community connectivity and link into the local arterial road proposed for the former SH1. There was a strong desire by KCDC to restrict urban growth pressures at Te Horo to maintain both the rural character and viable agricultural land use practices in this fertile area. An Expressway interchange was therefore discounted for this location.

A series of options for a new grade-separated local connection were developed and evaluated. Three connection options considered were located north of School Road, at School Road, and to the south. At-grade connections proved impractical as it would require elevating both the Expressway and rail corridor for a considerable distance to provide clearances, with associated additional visual effects and cost.

A direct connection across the corridor at School Road would have had benefits in terms of a logical street pattern, but this option would have had considerable effects on a number of properties on the western side of the current SH1, and the elevated, grade-separated structures would have had considerable visual effects on an otherwise low rise, flat rural context.

A northern location for the connection was therefore preferred, due to reduced individual property impacts and visual effects.

15.4.3 **Preferred Alignment**

The overall preferred proposal alignment led to the overall urban design outcome to be rated as low (positive). This was because:

- The existing cross-corridor connections are retained, with one exception at Old Hautere Road. In the case of North Ōtaki the cross-corridor connections are actually enhanced with improved pedestrian and cycleway provision. This has a positive outcome on the potential for community severance caused by the Project and also maintains the current underlying urban form and street pattern;

- With the exception of the localised area around Rahui Road, existing land use patterns are not materially disrupted, as the Expressway alignment broadly follows the existing rail corridor on what is predominantly rural land; and
- The form of the new North Ōtaki and South Ōtaki interchanges that bookend the township, and their legibility by Expressway users, will be important for the business viability of the current Ōtaki Railway Retail area, as discussed further in Chapter 28 (in Volume 2 of this AEE report), but equally provide excellent connectivity to the Expressway for the industrial / 'Clean Tech' area around Riverbank Road at the southern end of Ōtaki, and other future land use development and growth for Ōtaki Township and the wider region.

15.5 Assessment of Effects

Most adverse effects from an urban design perspective were avoided, remedied or mitigated through the process outlined above, through which stakeholder and community consultation and feedback was integrated into the overall Project design.

The assessment of effects has been divided into Project sectors and their effects on:

- Urban form and land use – how the Project may affect the existing and future urban form, including town centres and residential communities;
- Connectivity – how the Project may affect local road connections and other forms of connectivity, despite the measures adopted during the design process to avoid or mitigate such effects (discussed above); and
- Amenity values – how the Project may affect amenity values including people's direct experiences and perception of recreational amenity.

15.5.1 **North Ōtaki**

The urban form of Ōtaki is largely unchanged from its current state due to the existing dislocation caused by the rail corridor and the vertical elevation of the Waitohu Plateau. The new northern interchange recreates the existing connections, bridging both Expressway and NIMT corridors.

The effects on current and future land use are largely limited to the removal of a portion of the northern dunescape and Pare-o-Matangi reserve. Connectivity is maintained (with potential for future enhancements) enabling potential future growth or development in the northwest of the Ōtaki township on the Waitohu plateau area.

The access proposed to Taylors Road does not support growth nodes to the north of Waitohu stream. KCDC's growth vision is to the north of the Ōtaki township, densification around the railway station/transport hub and along Riverbank road. If the Taylors Road area is to be developed this may, in time, require a different local access strategy towards Ōtaki township. The North Ōtaki and South Ōtaki interchanges are in close proximity to a natural urban containment line, which reinforces the GOV's aim of encouraging urban growth within the existing urban structure.

In terms of amenity values, reducing through traffic along the existing SH1 will improve the amenity of properties adjacent to this road. This will lead to a better environment for walking and cycling along the road. High traffic volumes from through traffic will be significantly reduced, even with a southbound off-ramp and a north bound on-ramp.

The character of the Pare-o-Matangi reserve after reinstatement will be different due to its closer proximity to the adjacent transport corridors. However, with the proposed mitigation (which incorporates adjoining vacant land into the reconfigured reserve, and emphasises community / iwi involvement in finalising design) it will provide improved public amenity that is more accessible from the Ōtaki Railway Retail area. There is also

opportunity for it to be connected into the wider 'green' corridor of walking and cycling networks along the route of the existing SH1 and local arterial road.

The new alignment has the potential for a significant increase in severance. However several mitigating factors will create a net positive outcome for the local community. The current two local cross connections at 'The Ramp', which is the current SH1 bridge over the NIMT at the north of Ōtaki, and Rahui Road will be maintained. The new 'Ramp' underpass will provide improved walking and cycling facilities which are important for local journeys from residential areas to destinations within the township.

As discussed above, the Rahui Road underpass, a local road over the Expressway and NIMT, reconnects Rahui Road and the Ōtaki Racing Club to the Mill Road roundabout with a vehicle bridge and walkways on both sides. Pedestrian pathways across and under the bridge, to connect with the Ōtaki Railway station to the south and the reconfigured Pare-o-Matangi reserve to the northwest, have been incorporated in the Project and are important for maintaining access to these amenities.

Overall connectivity will be maintained or enhanced.

15.5.2 **Ōtaki Railway Retail area**

The overall urban structure of the Ōtaki Railway Retail area from the roundabout at Mill Road/Rahui Road south to Waerenga Road will not be affected by the Expressway. The reduction of traffic on the existing SH1 is likely to have a positive effect on the quality and amenity of the public realm for the Ōtaki Railway Retail area as a high quality, well designed space, that supports the attraction of a proportion of passing trade.

Rahui Road will change from a rural road connecting into the town to a grade-separated, curved local bridge spanning across the Expressway and the NIMT corridor. The interaction with the existing frontages will be removed (apart from at the ends of the bridge), and elevates the connection above the surrounding townscape, similar to the Ramp. The planted embankments will add to the new Pare-o-Matangi reserve landscape treatment.

The reduction in through traffic will have a positive effect on other local connections and cross-town movement. The existing SH1 will become the main north-south spine for the local community.

15.5.3 **South Ōtaki**

The land used for the Expressway corridor for this section is parallel with the existing SH1 and railway corridors and is rural land. The South Ōtaki interchange minimises land take and minimises impact through use of the underlying topography and a depressed Expressway alignment.

The proposed Ōtaki River Bridge (actually two side-by-side bridges) is designed with sufficient clearance underneath to allow access to a new potential recreational area, the Ōtaki Lakes development to the north of the Winstone Aggregates yard. On the south side of Ōtaki River, access to the recreational area along Ōtaki Gorge Road will be maintained and enhanced, with a safer grade separated interchange and alternative access provided to a reconfigured river walkway car park.

In terms of connectivity the Expressway will be depressed into the underlying topography north of Old Hautere Road, which reduces the perception of severance. Connection to Old Hautere Road is reduced but, given the low population density and low traffic movements, is considered preferable to construction of an additional grade-separated Expressway underpass in close proximity to the new South Ōtaki interchange.

15.5.4 **Te Horo**

The existing SH1 and NIMT corridor already creates severance effects for the Te Horo community in terms of connectivity. The Project does not provide direct access to or from the Expressway at Te Horo. East-west connectivity will be provided by the Te Horo Underpass to the northern edge of the settlement. This new link will provide a safer, grade-separated interchange. This results in some residual land areas, which are proposed to be planted for landscape mitigation. The east-west local bridge will provide improved safer access between the two parts of the Te Horo community.

Within this section the Expressway is elevated by approximately 2.0m over the surrounding topography**.** This will emphasise the visual severance effect.

Careful consideration has been given to the landscape planting through this area to mitigate that effect.

There are some residual severance effects of the Expressway at Te Horo, in that some walking and cycling users may be discouraged from using the crossing point to the north due to the 1.9km detour required.

15.5.5 **Mary Crest to Peka Peka**

The urban form and land use within this section will remain unchanged. Amenity values are also unaffected and the significant remnant vegetation at Mary Crest will be unaffected.

Connectivity will be maintained on the eastern site of the new Expressway and access to individual properties on the western side of the new corridor will be reinstated off a new local arterial road, including connectivity at Te Hapua Road.

15.6 Measures to Avoid, Remedy or Mitigate Actual or Potential Adverse Effects

In summary, the Project design incorporates design features that have reduced or eliminated potential negative effects, as follows:

- The selection and fine tuning of the geometry for the interchange at the northern end of Ōtaki township, which utilises the existing urban grid and avoids significant property impacts;
- The provision for a Rahui Road link which maintains a secondary connection to the east of the Project;
- The geometry and vertical alignment of the southern interchange to Ōtaki Township which uses the existing landform to reduce the overall impact of the structures;
- The severance of the direct connection of Old Hautere Road to the new local arterial and re-routing to Ōtaki Gorge Road avoids another underpass structure;
- The realignment of the Te Horo link to the north which avoids property impacts on the western side of Te Horo, and specifically on the Red House Café;
- The design of the structures along the entire route has been developed to integrate into the surrounding landforms where possible and complement existing structures; and
- The alignment of the Expressway in the Mary Crest section avoids important areas of native vegetation.

Overall, the degree of effects for urban form, and land use, and connectivity are considered to be "low (positive)", which means there will be minimal overall effect, with positive effects outweighing the negative. In terms of amenity the degree of effect is considered positive, particularly with the reduction of traffic through the Ōtaki township and the improved public amenity of the Pare-o-Matangi reserve.

Many of the potential adverse effects on urban design have been addressed through the design process.

A key aspect of the Project is a proposal to provide off-set mitigation within the enhanced Pare-o-Matangi reserve. As proposed, this reconfigured green space will provide valuable amenity values directly adjacent to the Ōtaki Railway Retail area. Local community involvement in this process has been (and will continue to be) important to the successful redevelopment of the area.

Chapter 16

Part G

VOLUME 2

Landscape and Visual

Overview

The Project is a large roading infrastructure project with a rail element, and will result in changes to the landscape. Potential effects include the physical effects of the Project on the landscape, including effects on landscape character and landscape values, visual effects, cumulative effects of the Project when considered with other infrastructure elements, and temporary landscape and visual effects during construction.

Landscape and visual experts have provided advice and input throughout the design process on measures to avoid or reduce adverse landscape and visual effects through good design. Numerous mitigation measures have been proposed and included in the design. These measures have been informed by the urban and landscape design principles developed for the Project and documented in the ULDF.

In terms of landscape effects, the overall magnitude of adverse effect is high for two short sections of the Project, being Ōtaki North to Rahui Road (approx. 1km in length) and Ōtaki River to Addington Road (approx. 800m in length). With the landscape mitigation proposed, as shown on the landscape plans in Volume 5 of this AEE report, the degree of actual adverse effect is reduced from high to moderate-high. Effects on the North Ōtaki to Rahui Road section are reduced to moderate with the specific mitigation proposed at Pare-o-Matangi reserve.

For the majority of the landscape 'sections', the overall magnitude of adverse effect is moderate. Landscape mitigation is proposed to ameliorate the generally moderate effects and any localised higher effects. The overall landscape effects for Waerenga Road to Ōtaki River and north of Te Hapua Road to Kowhai Road are ranked as moderate to low and low.

In terms of natural character, there will be a cumulative adverse effect of placing a closely spaced part of parallel bridges (that will appear as one bridge) across the Ōtaki River, parallel to and immediately upstream of the existing NIMT and SH1 bridges. This effect is considered to be low due to the highly modified nature of this section of the river.

There will be moderate to high adverse visual construction effects at the various bridge sites and along the length of the Project as it is built. Progressive mitigation is proposed to reduce the effects of the construction phase.

Overall the adverse landscape and visual effects are considered to be acceptable in light of the extensive mitigation measures proposed. Landscape mitigation will be delivered through the Project being built in general accordance with the Landscape Plans (see Volume 5 of this AEE report), and other measures implemented through conditions.

16 Landscape and Visual

16.1 Introduction

This chapter summarises the landscape and visual effects of the Project, including temporary effects during construction.

The assessment extends over a range of different landscapes along the approximately 13km route and describes the mitigation measures NZTA is proposing to undertake.

The NZTA requires the urban and landscape design considerations for its RoNS projects to be guided by a ULDF. A ULDF has been prepared for the Project (see Technical Report 23, Volume 3 of this AEE report). It is a technical document rather than an assessment of effects[30].

[30] The ULDF describes and sets out urban and landscape design principles, objectives and high level concepts of the Project. The ULDF is a 'live' document and continues to evolve during the scheme

The reports that detail the effects of the Project in terms of landscape and visual effects are:

- Peka Peka to Ōtaki Expressway: Landscape and Visual Assessment (Technical Report 8, Volume 3); and
- Peka Peka to Ōtaki Expressway: Urban and Landscape Design Framework (Technical Report 23, Volume 3).

16.2 Existing Landscape

The Expressway passes through two townships, being Ōtaki and Te Horo. The landform of the Project area is defined by a number of strong natural features including the coastal edge, the coastal plain, the western foothills and the local rivers and streams. The Expressway is located between the western foothills of the Tararua Ranges and the coast. The northern two thirds of the Project area is generally flat. To the south of Waitohu Stream there is a localised sand dune formation and further south is the northern terrace of the Ōtaki River floodplain.

The existing SH1 crosses Waitohu Stream, Mangapouri Stream, Ōtaki River and Mangaone Stream. Indigenous vegetation is largely confined to a few small remnants with scattered stands of native vegetation more common and distinctive in the Ōtaki Gorge Road/Old Hautere Road/Te Horo area. The Expressway passes through the edge of several of these stands and through a small number of wetland areas in discrete localities. Two areas of significant swamp forest have been identified and the Project has been designed to avoid these areas.

In terms of land use, the majority of the area is zoned rural. Urban activities are confined to Ōtaki and to a small extent at Te Horo. Within Ōtaki, there are two areas zoned retail/commercial being the Ōtaki Main Street and the Ōtaki Railway Retail area. At Te Horo the community facilities are located on the eastern side of the SH1 while the residential area is to the west.

Pare-o-Matangi reserve does not have legal reserve status but is a green space of importance to iwi and the broader community.

16.3 Actual and Potential Visual and Landscape Effects

16.3.1 **Methodology**

The methodology to assess visual and landscape effects is modelled on the draft NZTA Landscape and Visual Assessment (LVA) Guidelines[31] and framed in response to RMA Part 2 matters, being:

- Assessment of the effects on physical landscape, referred to subsequently as 'landscape effects' (s7(c) and s7(f) matters);
- Assessment of effects on landscape amenity, referred to subsequently as 'visual effects' (s7(c) and s7(f) matters), taking into account:
  - 'fit' with existing landscape character and patterns;
  - effects on land use;
  - appearance of structures such as bridges;
  - visual effects from dwellings and private property; and

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and NOR phases and will also inform the finalisation of the design for the Project through to the Outline Plan process.

[31] *NZTA Landscape and Visual Assessment Guidelines*; prepared for NZTA by Isthmus Group (Gavin Lister), undated (March 2012)

- photo simulations from representative viewpoints;

- Assessment of effects on natural character of rivers, streams and their margins (s6(a) matters); and
- An appraisal of potential Outstanding Natural Features (ONFs)/Outstanding Natural Landscapes (ONLs) in the corridor, and effects on the values of such landscapes (s6(b) matters).

The following section from the draft LVA provides direction on defining the actual landscape and visual effects of the Project:

Analysing Actual Effects

Nature of Effect	+	Magnitude	-	Mitigation	=	Actual Effect

Based on the environmental and design information available, the precise nature of the potential effect is described. It is noted that change is not an effect per se. By way of example, it is not the quantity of the earthworks that is relevant, rather the effect of the earthworks on visual amenity values or natural character of a stream.

An evaluation of the magnitude of the effect is then provided. Magnitude is influenced by variables, for example, the dimensions of a cut batter, distance from a viewpoint and the extent of screening. A relative scale is used to rank magnitude and reasons provided to justify the ranking. The following 5-point scale suggested in the draft LVA is utilised. The scale is symmetrical around a 'moderate' middle score and uses neutral ('objective') descriptors.

low	*moderate-low*	*moderate*	*moderate-high*	*high*

16.3.2 Landscape and Visual Effects

Landscape Effects

Landscape effects arise from changes to the landform, land cover and land use components of the local landscape. These physical changes to the landscape from the construction and operation of the Project typically occur due to:

- the removal of existing structures and vegetation;
- the excavation of cut batters;
- the placement of fill formations;
- the construction/placement of Project components such as the Expressway surface, bridges, lighting and other structures;
- the realignment of 1.2km of NIMT, in this case;
- implementation of stormwater, noise and visual mitigation measures; and
- traffic on the completed Expressway and realigned NIMT.

These physical changes then equate to varying degrees of change to the landscape character along the route of the Project.

Visual Effects

The visual effects of the Project will result from changes to the local landscape and their degree of visibility. The extent of these effects and their acceptability (or otherwise) will depend on the degree of change to the local landscape character in relation to the amount of change that is currently happening in the area. For instance, in the North Ōtaki to

Rahui Road section, the context and extent of change is quite contained and is consistent with other changes happening in the local landscape, where there is the commercial and retail development to the south, residential development to the east and west and open space or pastoral land that runs parallel to the NIMT. Elsewhere, the landscape is more open and rural and there are no other large built elements other than the existing SH1 and the NIMT.

The actual change to the landscape due to the construction of the Project results in landscape effects that, in turn, will have effects on the visual amenity and character of the area. There are also broader amenity aspects considered within this part of the assessment such as changes to traffic volumes on SH1 resulting in improved residential amenity.

The following assessment of effects is based upon observation of the existing landscape and existing sections of the four lane expressway (SH1) within the NZTA highway network, and an understanding of the likely visual effects of constructing the Expressway and realigning NIMT.

16.3.3 Section-by-Section Analysis

The ULDF provides a broad overview of the urban and rural landscape context of the Project. The landscape character of the Project area can be considered in relation to the three landscape units. These units are:

- Ōtaki (including Taylors Road to Ōtaki South);
- Te Horo (including Ōtaki South to Mary Crest); and
- Mary Crest to Peka Peka.

Representative photographs of various aspects of the landscape units and their sections are contained in Appendix 1 to Technical Report 8 (in Volume 3 of the AEE) along with the 'before' photographs that form part of the visualisations in Appendix 4 to Technical Report 8.

The Ōtaki Landscape Unit consists of six different landscape sub-sections.

Each landscape unit is broken down into sections to aid in describing more detailed landscape character, the potential landscape, visual and amenity effects of the Project, and the mitigation measures proposed. All mitigation proposed is shown in the plan set (Volume 5 of the AEE).

Taylors Road to Waitohu Valley Road Section

Description

From Taylors Road at the northern end of the Project through to Waitohu Valley Road, the landscape contains areas of orchard but is predominantly pastoral, with dairy production being the main land use. Views from the existing SH1 open to the west towards the north side of Waitohu Stream and towards the NIMT. Immediately south of the Waitohu Stream and west of the existing SH1 there is rolling farmland that has the appearance of a dunal landscape. These dunes create a rolling platform towards the northern aspect of Ōtaki and form a backdrop to housing on the west as the existing SH1 enters Ōtaki.

Landscape Effects

There will be a moderate to high degree of change to the landform, a moderate to low change to the land cover and moderate change to the land use through this section of the local landscape. The existing character of the area south of Waitohu Stream as a quiet rural open pastoral landscape will change to one containing a further section of transport corridor. There will also be a distinct effect on the dune ridge south of the stream with the Expressway cutting through and along the half of the ridge closest to the NIMT.

Visual Effects

The Project will result in the roading becoming more visible within this area with the Expressway bridging the Waitohu Stream and entering a large cut through a sand dune ridge. The first section of the Expressway through to the bridge will be at-grade and have a low visual effect. From the bridge to the cutting the visual effect will be very obvious from the Expressway due to the scale and extent of the cutting and its contrast with the surrounding landform.

The Expressway can be accommodated visually within the landscape with moderate adverse effects on adjacent landowners and for road users due to the open nature of the surrounding land. The open nature of the surrounding land prevents the route dominating the local setting and, due to the moderate scale of the setting, is also sufficiently expansive to accommodate the Project without being dominated by it. The sand dune ridge south of the Waitohu Stream provides screening and will only allow a portion of this length of Expressway to be seen from houses adjoining the existing SH1.

Mitigation of Effects

In order to mitigate landscape effects bold formal planting will be used to signal the Project's Northern Gateway Zone, just south of Taylors Road. The cuts through the sand dune ridge south of the Waitohu Stream will be formed to reflect the natural contour, to mitigate the effect on this feature. Cut faces on the western side of the Expressway will be planted and the eastern batters will be grassed.

The visual effect of bridging the Waitohu Stream will be mitigated through the implementation of a clean and simple bridge design, which allows open views of the area of the stream and surrounding land. Rock armouring and riparian planting will be undertaken to protect the bridge abutments and stream banks.

Waitohu Valley Road to Ōtaki North Section

Description

South from Waitohu Valley Road to the existing SH1 railway over-bridge, which currently forms the northern 'entrance' or 'gateway' to the Ōtaki Railway Retail area, is the most intensively developed area of housing along the entire route of the proposed Expressway. There is also a variation in topography, with the housing on the east of the existing SH1 being on the higher flat ground of an old river terrace, locally known as Waitohu Plateau. The land on the west of SH1 undulates and includes the varied landform created by a number of old sand dunes. The NIMT passes through a local valley between the dunes and at a lower level than the flat terrace to the east. The houses to the east provide an urban character, while the open space around the NIMT and the land to the west provides a rural character.

Landscape Effects

Within this section there will be a moderate to high degree of adverse effect on the rural open space character of the northern end of this section with the introduction of the Expressway and associated landform changes. The landform change entails a continuation of a cutting by a further 400m approximately for the Expressway, paralleled in part by approximately 300m of open cut for the realignment of the NIMT, with a combined width of approximately 120m across the two designations between the top of the opposing cut batters. The Project works in this area will affect a sand dune 'ridge' and partially infill a small valley that contains a spring-fed wetland (known as the "Railway Wetland") and the existing section of the NIMT. The land cover change involves replacing pasture, sections of shelterbelt and unkempt, woody weed vegetation with road surface and grassed and planted cut batters and Expressway margins. The land use change involves the conversion of various 'rear sections' of smallholdings, a section of NIMT and a wetland area to Expressway and realigned NIMT. A local road on-ramp will also be created on the dividing 'ridge' between the pair of cuttings.

The change of character will have an adverse effect on the landscape amenity values for houses on the west side of the existing SH1, causing them to be located between roading to the east and west. These effects will be localised due to the enclosing topography and small scale of the area. The houses to the immediate east at the south end of this section will be those most affected due to the close proximity of the Expressway and the significant changes in character that will occur. The character of the localised setting will therefore change markedly through the introduction of the Expressway, northbound on-ramp and realigned NIMT.

Visual Effects

The change in visual aspect from that of rural open space to that of parallel road and rail will be distinct. The change in visual character will have an adverse effect on the landscape amenity values for houses on the west side of the existing SH1, given that they will be located between roading to both the east and west.

There will also be a high degree of effect on visual amenity values of the immediate area. These will be localised due to the topography and small scale of the area. The houses to the east of the Project will be most affected due to the close proximity of the proposed Expressway and the significant change in character that will occur. The removal of two houses and their mature trees and other planting on the western edge of the designation corridor due to the realigned NIMT will also result in visual changes.

Mitigation of Effects

Landscape effects of Expressway and NIMT cut batters will be mitigated through planting, as will the northbound feeder road fill batters. Amenity improvements will also occur from landscape and ecological mitigation planting around the Railway Wetland. This wetland will become more visible to southbound vehicles on the Expressway.

Screen planting of native trees and shrubs will also be placed along the top of the eastern Expressway cut batter. This will provide a visual buffer to the adjoining properties facing onto the new arterial road and back onto the Expressway.

Ōtaki North to Rahui Road Section

Description

The existing 'Ōtaki North' SH1 railway over-bridge – County Road intersection area through to Rahui Road traverses the change in topography between the higher river terrace of the Waitohu Plateau and the lower Ōtaki River flood plain. The terrace edge is highlighted by vegetation growing along the escarpment, which borders the eastern edge of County Road for a short distance.

The NIMT parallels the western edge of County Road as it descends from under the existing SH1 to the at-grade crossing at Rahui Road. Immediately west of this section of the railway are a number of open paddocks and then the local community passive recreational space of the Pare-o-Matangi reserve, which has significance to the tangata whenua as well as the community as a whole.

The Pare-o-Matangi reserve is an open space that covers approximately the northwest third of the triangular shaped area that is bounded by SH1 and the Ōtaki North railway over-bridge to the west and north, the NIMT and County Road to the east and Rahui Road to the south. The north-eastern 'third' of the area is open space that is subdivided into horse paddocks. The southern third to half of the area includes the Ōtaki Motel and associated vacant land, a real estate office and 9-10 residences, associated outbuildings and gardens.

The Mangapouri Stream flows east to west bisecting the triangular area between the highway and railway and is contained within an incised channel. The stream drains from the Ōtaki Racecourse area, which is approximately 1.5km upstream; it runs through a culvert under the railway into the area and out through another culvert under SH1.

Landscape Effects

Within this section there will be fundamental changes to all three of the landscape components – landform, land cover and land use. The overall magnitude of landscape effects is high. There will be three new bridges (an existing bridge will be replaced, giving a net gain of two new bridges) and associated approach embankments created in this localised section of the landscape, although two of the bridges will be incorporated within the one earthworks structure.

The footprint of the Project will also occupy a considerable portion of the triangular area of the Pare-o-Matangi reserve, open space and residential housing, altering approximately half of the total area. In placing the new formations and their associated drainage and stormwater features, almost all of the existing vegetation east of the midpoint of the area and the adjoining vacant motel land will be removed. Creating the Rahui Road underpass approach embankments will require the removal of vegetation on the Rahui Road margins on both sides of the existing railway crossing. Established vegetation on the downstream extent of the stream bank within the area and on the adjacent SH1 embankment will be able to be retained.

A distinct landscape effect will be that of land use change with localised areas of housing, pasture and open space being developed as transportation corridor; that is Expressway, NIMT and local road.

Visual Effects

The visual effects on the Ōtaki North – Rahui Road section have been considered from four public viewpoints. The four viewpoints are:

- **View South to Rahui Road**

  After construction of the Project, all of the central portion of the view from this viewpoint will be altered. This would result from the removal of the entire upper portion of the Pare-o-Matangi reserve and much of its adjoining open paddock, much of the horse paddocks and part of the Pare-o-Matangi reserve below the terrace and all of the houses and their section plantings that front onto Rahui Road. The Expressway, NIMT, and the strip of land between the two will become the foreground of this view. These will be crossed by the Rahui Road underpass and the support spans of this bridge will become the central focus of the view.

- **View North from County Road**

  Much of the existing view from this viewpoint on County Road will be altered with the removal of the existing SH1 railway over-bridge, its southern approach embankment and the associated vegetation on the Pare-o-Matangi reserve and the private property beyond, including the residence on that property. The NIMT will pass through the underpass; there will be an embankment between the NIMT and the Expressway that will have the on-ramp for north-bound local traffic accessing the Expressway on its northern aspect. The two spans of the Expressway section of the underpass will occupy the central part of the view. The existing vegetated, eastern bank above County Road will be untouched.

- **View East from the Pare-o-Matangi Reserve**

  Much of the existing view from within the Pare-o-Matangi reserve will be altered with the removal of all the terrace face and eastern boundary planting. The railway embankment will become the immediate eastern edge of the Pare-o-Matangi reserve. This will have the effect of significantly 'shrinking' the area of usable reserve land and foreshortening the vista that reserve users previously had to the east.

  The existing SH1 railway over-bridge will be removed and the part of the upper superstructure and eastern abutment of the Ōtaki North underpass, along with larger vehicles crossing the bridge structure, will be visible, though setback more from the

Pare-o-Matangi reserve than the existing highway rail over-bridge. From this viewpoint, the actual Expressway formation will be obscured by the railway embankment, as will the majority of the traffic on the Expressway.

While not directly visible from this viewpoint, all of the open space land between the Pare-o-Matangi reserve and County Road, along with the upper terrace of the Pare-o-Matangi reserve, will be 'converted' to railway and Expressway formation and their associated margins and stormwater treatment areas. The actual area of the Pare-o-Matangi reserve that will be 'under' the footprint of the two formations and their margins will be in the order of 9,900 m^2, leaving a residual of 6,300 m^2; that is approximately 60% of the current area will be built over.

- **View East to Rahui Road**

  Relatively little of the existing view from this viewpoint on the north side of the roundabout will be altered. The main change will be the placement of the western approach embankment for the proposed Rahui Road underpass; being 'slotted' into the existing local road reserve. The western extent of the bridge itself will also be visible. In turn, the bridge will obscure the former Rahui Milk Treatment Station building.

Mitigation of Effects

There will be a substantial reduction in the usable area of the Pare-o-Matangi reserve, which will have a significant landscape effect.

A 'like-with-like' mitigation for the Pare-o-Matangi reserve land 'lost' to the Project is to incorporate the L-shaped block of unoccupied Ōtaki Motel land into the area. This creates an area of Pare-o-Matangi reserve that is approximately 17,700m^2. While this will do little to compensate for the loss of the 'horse paddock' open space, or the established house sections that front onto Rahui Road, it will create a connected passive space that focuses on Mangapouri Stream and also 'connects' more directly to Ōtaki Railway Retail area than is the current situation. In turn, it will create a buffer between the Ōtaki Motel and the NIMT, along with the opportunity to improve access to the Pare-o-Matangi reserve direct from Main North Road.

Given the significance of the area to iwi and the local community as a whole, it will be very important for those interests to be brought to bear on the final design of the planting and other landscape mitigation measures carried out in the Pare-o-Matangi reserve.

Adverse visual effects, particularly from the four public viewpoints, will be mitigated through the implementation of extensive planting on the various Expressway and NIMT batters, along with the remnant railway embankment. The species choice will include a mix of trees and shrubs that will grow to completely obscure the Expressway from particular viewpoints. The planting layout will be such that tree species are placed back from County Road so as to not overshadow or excessively shade the road.

Rahui Road to Waerenga Road Section

Description

This section includes the Ōtaki Railway Station and the Rahui Milk Treatment Station. The width of Rahui Road, which is wider than many urban streets, plus the lack of buildings and the views to the open space, contribute to the character of the street as being a quiet, semi-developed area. The area immediate south of Rahui Road west of the NIMT is vegetated, with an area of orchard and an area of larger trees forming a grove adjacent to the NIMT. An old home is located on the western side of the orchard, in a quiet small-scale setting with rural characteristics which belies its location between the retail area and the NIMT. A cycle/walkway parallels the NIMT and connects through to the Ōtaki Railway Station.

Landscape Effects

The Project creates a moderate change to landform, land cover and land use. The landform change relates to the continuation of the Expressway and the realigned NIMT formations 'descending' down to close to grade from under the Rahui Road Underpass to just before the Ōtaki Railway Station. The land cover change involves replacing an area of mature trees with the NIMT on the west side of the Project to the south of Rahui Road and the replacement of screen and shelter planting and some pasture with road surface on the east side of the Expressway. A structural change will be the shift along its axis of the Ōtaki Railway Station and platform relative to the southern 'tying-in' of the realigned section of the NIMT. Two houses and two outbuildings on the Expressway route at the very south end of this landscape section will be removed.

Construction of the Expressway will require relocation of the NIMT to the west and will also require removal of much of the grove of vegetation in this area. This will change the existing character from one of vegetated and undeveloped urban to one of constructed Expressway. This will have a high adverse effect on the landscape character and amenity values within the immediate area.

The setting for the former Rahui Milk Treatment Station building and the former Rahui Factory Social Hall will be altered with the construction of the Project. This will have an enclosing effect on these two heritage buildings, though access and physical separation from the Expressway will be maintained and provided for.

The character of its setting will change from small-scale quiet rural or undeveloped urban, to a busy and constructed transport corridor. The effects on landscape character and amenity values are considered to be moderate to high.

The effect on the rural land on the eastern side of the existing NIMT, where the current character is market garden and open rural pasture, will change the local area to one dominated by a busy transport corridor. Beyond here the landscape effects of the Project are readily mitigated by the scale and open character of the rural setting. The adverse effect on the underlying rural character of the area is assessed as moderate.

Visual Effects

The northern part of this section will have a moderate to high degree of visual effect where the Expressway and the realigned NIMT are constrained by heritage buildings. Beyond this the visual effects of the Project are mitigated by the scale and open character of the rural setting. The adverse effect on the underlying rural character of the area is assessed as moderate.

Mitigation of Effects

Screen planting and a screen fence will mitigate the visual effect of the Project on the former Rahui Milk Treatment Station building and the adjoining former social hall. Block planting along the eastern Expressway margin will integrate the Project with its surroundings and allow views towards the Ōtaki Racecourse. Dense, mass planting will also provide a buffer between the Expressway and NIMT and screen the Expressway from the Ōtaki Railway Station and Ōtaki Railway Retail area.

Tree planting will enhance the setting and amenity of the reinstated cycle/walkway from Rahui Road to Ōtaki Railway Station.

Waerenga Road to Ōtaki River Section

Description

Open pasture extends from opposite Waerenga Road to the Ōtaki River on the eastern side of the NIMT. The area is low lying and flat, and forms part of the Ōtaki River flood plain. The open views to the east and the Tararua Ranges and the flat topography contribute to the large-scale open rural character of the area. The NIMT embankment forms a barrier

along the western edge of the paddocks and the Winstone Aggregate shingle plant and an associated flooded gravel pit separates the paddocks from the Ōtaki River.

Landscape Effects

The overall landscape effect for this section is moderate to low for landform, land cover and land use. The landform change relates to the continuation of the Expressway as an elevated four lane formation, rising up to 1.5 m above grade at the existing Chrystall's Stopbank and up to 5 m above grade between the stopbank and the proposed Ōtaki River Bridge (Bridge 5). This elevation also serves a flood management purpose as the formation links into the existing stopbank and then grades into the northern approach to the Expressway bridge. The land cover change involves replacing a strip of pasture and some market gardening with the road surface of the Expressway, which also equates to the land use change. There are no built structures of particular note proposed for this landscape section.

Visual Effects

The Expressway will fit within the scale of the rural setting, which will remain the dominant character of the area. By placing the Expressway on a raised level, it will have increased prominence and also a long 'wedge' of farmland will become isolated between the Expressway formation and the NIMT embankment. The landscape character of the surrounding area will be adversely affected to a moderate to low degree due to the prominence of the Expressway.

The road user will have a positive visual experience of the landscape when driving along the Expressway as extensive views eastward will be available from the raised embankment, allowing an appreciation of the surrounding farmland and hills beyond.

Mitigation of Effects

The Expressway is to be elevated through this section to prevent inundation during flooding and will have a clear view to its surroundings. The side batters will be grassed and lower slopes fenced so they can be grazed and reduce maintenance requirements and reducing the visual impact of this elevated structure.

Ōtaki River Section

Description

The Ōtaki River forms the southern edge to Ōtaki township with the existing SH1 bridge across the river being the current southern 'entrance' or 'gateway' to the Ōtaki Railway Retail area. The NIMT bridge, located approximately 50m away from the SH1 bridge, crosses the river in parallel. Together, they contribute to the modified character of this section of the river and constitute a large-scale built element that dominates the local setting. The modified character is reinforced by the exotic vegetation planted in rows along the banks, and the gabions placed along the edges for river protection work. A haul road that is part of the shingle plant operation runs under the northern abutments of both bridges, along with a riverbank walkway.

Landscape Effects

The main feature within this section will be the new Ōtaki River Expressway bridges and their embankments[32]. The addition of these bridges approximately 100m upstream from

[32] Ōtaki River Expressway bridge is proposed to consist of an immediately parallel pair of two lane bridges which will be approximately 320 m long. The bridges will have a common, pier and beam-type built form, there will be 11 spans and 10 sets of piers and end abutments will be vertical mechanically stabilitised earth walls.

the existing rail bridge will increase the degree of modification in place for this portion of the river. The Expressway bridges will add to the overall degree of modification, but placing them in proximity to the existing bridges means modifying elements will be concentrated into one area. Although the extent of modification will be confined there will be a cumulative effect in this area. The additional bridges are unlikely to dominate the local landscape. The adverse effect on landform, land cover and land use is likely to be moderate.

Visual Effects

The proposed Ōtaki River Expressway bridges, due to their length of approximately 130m, will be a large combined built feature relative to the Ōtaki River viewpoint and an additional modifying element in the local landscape. There will also be a cumulative effect given that two bridges are being added to a short section of the Ōtaki River where there are two existing bridges. Given the distance across the river and the southern river bank to the Ōtaki South Underpass, the underpass structure will have a minimal effect on Ōtaki River view.

Mitigation of Effects

The proposed Ōtaki River Expressway bridges have an indicative form and design that will act to limit the overall visual effect of both parallel structures; that is, integration of the structure with its surroundings and therefore mitigation of its visual effects is part of the design of the bridges. The use of modern, efficient design means that a greater span length than the two existing bridges can be utilised to limit the physical and visual extent of the bridge. This is coupled with a relatively slim superstructure which has a simple form with few shadow lines and a shallow deck, so the combined structure has a visually 'light' form relative to its long length. This simple form also hides the fact there are two parallel bridges, which is reinforced by having both bridges located as a close, parallel, pair of bridges which means that they 'read' as one bridge.

Both of the proposed Ōtaki South Interchange bridges (Bridge 6 and Bridge 7) have a design that will act to integrate these smaller bridges with the larger Ōtaki River Expressway bridges and make them a unified element within the local landscape. Their slim superstructure also limits their visibility when seen from a distance.

Existing vegetation on the southern river bank will be re-vegetated with native species and integrate the proposed Ōtaki River Expressway Bridge site with its surroundings, which will also assist to mitigate the visual effect.

Te Horo Landscape Unit

The Te Horo landscape unit consists of the following three landscape sub-sections.

Ōtaki River to Addington Road Section

Description

The land on the southern side of the Ōtaki River rises sharply from the river bed to become level at Ōtaki Gorge Road, which heads inland to provide access to Ōtaki Gorge. The Ōtaki River forms the northern boundary to the Hautere Plains, which are an extensive flat delta that runs south past Te Horo.

The current landscape in this area is characterised by intensive rural land uses, lifestyle blocks and an accommodation facility. There are limited views due to shelter belts, intensive activities such as orchards and market gardens, and a frequency of houses and buildings associated with a number of the small lots close to Addington Road and Ōtaki Gorge Road.

Landscape Effects

The overall landscape effect for this section is high for changes to landform, land cover and land use. The landform change entails the excavation of a cutting that extends 600m to Addington Road and beyond. The landform change also includes the approximately 400m long pair of elevated, south-facing feeder road embankments for the Expressway underpass that connect to Ōtaki Gorge Road, along with the curving, local road, eastern approach embankment to the underpass. The small scale rural residential character of the surrounding area will be significantly affected with the removal of the entire Bridge Lodge facility and four adjoining lifestyle blocks. The orchards to the south of Ōtaki Gorge Road will also be adversely affected by the new roading which will consist of a combination of Expressway and local access road connecting through to Old Hautere Road.

Visual Effects

The likely visual effects have been considered from the viewpoint looking north from Ōtaki Gorge Road. From this viewpoint the proposed Ōtaki River Expressway bridges, will be a large combined built feature and an additional modifying element in the local landscape. There will also be a cumulative effect with the two existing bridges.

Mitigation of Effects

The proposed Ōtaki River Expressway bridges and their southern approaches 'sit low' in the landscape as the latter emerge from under the Ōtaki South Underpass and the broad cutting that the underpass crosses. The road surface of the pair of Expressway bridges will appear as an extension of the Expressway sweeping across the river and on towards the Ōtaki Railway Retail area. Given that the bridges are large built elements within this local landscape, their indicative form and design will act to limit the overall visual effect of both parallel structures. This, in turn, will act to limit the cumulative effect with the two existing river bridges.

Both of the proposed Ōtaki South Underpass bridges (Bridge 6 and Bridge 7) have a design that will act to integrate these smaller bridges with the larger Ōtaki River Expressway bridges and make them a unified element within the local landscape.

Landscape planting will occur on the approach batters to the Ōtaki South Interchange and the adjoining Expressway feeder road batters, mitigating the visual effect of the interchange. The Southern Gateway zone will be planted with bold formal planting to signal the Southern Gateway between Ōtaki River and the northern end of Hautere Plains.

Addington Road to Te Waka Road Section

Description

Progressing south from Addington Road to Te Waka Road the Project crosses the Hautere Plains, following a straight path parallel to and immediately east of the NIMT. Along the 'Te Horo straight' the land use is generally pastoral. Stands of second growth native trees are scattered across the plains, with totara appearing to be the dominant species, along with some titoki and matai.

The flat open pastoral land and the scattered stands of native trees are a strong characteristic of this area, and extend well beyond the existing SH1 and across the Hautere Plain. The open land, in places, allows extended views from SH1 but shelterbelts, which line SH1 in places, limit these views and confine the SH1 views to much more of a linear experience. Those open views that are available to the inland ranges and towards the coast, along with the areas of remnant forest, add to the amenity and landscape character of this area, particularly as seen by passing motorists and railway passengers.

Landscape Effects

Within the northern half of the Te Horo Straight section of the Te Horo landscape unit, the Project creates a moderate change to landform, land cover and land use relative to the

2.5km section of the local landscape that is traversed. The landform change relates to the continuation of the Expressway in a cutting that rises to grade, and running south on the eastern margin will be a 2m high and 2km long landscape bund.

The land cover change involves replacing pasture, orchard and market garden crops, lengths of shelterbelt and hedge and parts of two stands and one scattered stand of remnant native vegetation with road surface and landscape bund planting. In the wider context, the landscape effect of removing these areas of trees is assessed as moderate, as the underlying character remains unchanged.

Visual Effects

The proposed Expressway will pass through the northern section of the Te Horo straight which will be most obvious in the doubling in width of the overall transport corridor. This will have a major visual effect and also a cumulative effect. To a degree this will be moderated by the visual lines of roading being depressed into a flat landscape that currently contains two obvious sets of transport 'lines'.

The removal of shelterbelts along the eastern side of the NIMT will remove the eastern enclosing visual edge to the Te Horo straight. Removing these shelterbelts will cause the land and houses to be more exposed, and may affect productivity and the landscape amenity values for houses.

Mitigation of Effects

Planting of replacement shelterbelts will provide a degree of mitigation. The 2m high landscape bund will be planted to increase its buffering effect over time and to integrate it with its surroundings. Landscape planting will be undertaken to reinstate the exposed western edges of the various stands of native vegetation.

Te Waka Road to South of Gear Road Section

Description

Te Horo Township is located a short distance to the south of Te Waka Road through to Gear Road. The township is divided into two, with part being located east of the NIMT and part west of the existing SH1. The western side has a mix of houses plus facilities including commercial activities. Away from SH1 along Te Horo Beach Road, this dominance decreases and the smaller scale character of the localised retail area becomes apparent and the amenity values increase accordingly.

By contrast, the township on the eastern side of the NIMT is primarily residential. It has a small-scale character, and relative quietness in comparison to the SH1 portion of the township. There is a school and a hall, and features such as the grassed berms along School Road and the low fences on many properties all contribute to the high amenity values of area.

The land surrounding both aspects of the Te Horo Township is generally flat and pastoral and used for grazing or more intensive horticultural purposes. There is, however, more varied topography to the west, which has developed as a result of dune processes over time.

Landscape Effects

Within the southern half of the Te Horo straight section of the Te Horo landscape unit there will be a moderate to high degree of change to landform and a moderate change to land cover and land use.

The land cover change involves replacing pasture and the gardens and amenity and shelter plantings of 6-7 rural-residential properties and sections of farm shelterbelt with road surface and landscape planting on the west face of the structural bund. In the wider context, the landscape effect of removing these areas of trees is assessed as moderate, as the underlying character remains unchanged.

The land use change involves the further conversion of the west 'ends' of numerous grazed paddocks and also all, or a large portion of up to 7 rural-residential properties, along with a section of local road, to Expressway and its margin. A new structure, the Te Horo underpass (Bridge 8) across the Expressway and the new local arterial road, will also be created.

Visual Effects

The likely visual effects have been considered from two viewpoints, the view north from the proposed Te Horo underpass and the view north from Te Horo village. From the view north from the proposed Te Horo underpass, the visual extent of the Expressway formation and the underpass structure will be reduced due to a redesign of local flood protection measures that means both the Expressway formation and the Te Horo underpass bridge can be lower. The proposed new local road alignment will have minimal visual effects.

When viewed looking north from the western part of Te Horo village, the proposed Expressway and underpass will be obvious features. The addition of the Expressway will have no more than a moderate effect when seen from the Te Horo straight. The Te Horo underpass, due to its elevated and singular nature will have a moderate to high visual effect, but this will be localised. The degree of setback and/or distance will limit the effect on the viewer.

Mitigation of Effects

For the view north from the proposed Te Horo underpass, the flood protection bund and the swale at its base will be grassed. Appropriate landscape treatment for the private accessway between extended School Road and Old Hautere Road is proposed.

For the view north from Te Horo village the proposed Expressway formation has a grassed batter slope facing the adjoining NIMT. The use of occasionally mown grass on the Expressway batters will be consistent with the landscape treatment of the margins of the NIMT and the new local arterial road.

The form and design of the proposed Te Horo underpass bridge will limit the overall visual effect of the structure and will integrate the structure with its surroundings. The batters on both sets of the underpass approach embankments will be planted. There will also be planting south of the eastern approach embankment that will form a buffer between School Road and the extended Gear Road south to the 'railway corner' on Gear Road. Riparian planting is also proposed associated with the stream diversion near the 'railway corner'.

Mary Crest to Peka Peka Landscape Unit

The Mary Crest to Peka Peka landscape unit consists of the following two landscape sub-sections.

South of Gear Road to North of Te Hapua Road Section

Description

At the south end of the Te Horo straight, the landform becomes more distinctly rolling due to the prevalence of dune formations, limiting extensive views from the inter-dunal areas and giving the area a smaller scale setting and more complex landscape than Hautere Plain to the north. Pasture is the predominant land cover and dairy production is the main land use in the surrounding area.

The buildings of the defunct convent and school at Mary Crest are a distinctive built feature to the immediate west of the existing SH1 at the very southern end of the Te Horo straight. Two stands of native vegetation lie just to the east and south of the buildings and contain a mix of species, with large trees forming the canopy.

Landscape Effects

This section of the Mary Crest to Peka Peka landscape unit contains Project-related changes to landform that are moderate to high and changes to land cover and land use that are moderate to low. From just south of Gear Road, the Expressway formation will start to rise up for a length of approximately 800 m on fill to an over-bridge that crosses the NIMT. It will remain on fill for a further 600 m and then continue at grade (similar level to existing SH1) to Te Hapua Road and beyond. From just north of Mary Crest, a new local arterial road alignment will be created that parallels the western margin of the Expressway. This new section of local road will be placed on alternate sections of cut and fill. On the east to south side of the Expressway approximately 1.5km of the existing SH1 alignment will be retained as local road serving properties to the east and above the NIMT.

The land cover change involves replacing pasture, lengths of shelterbelt and hedge and stands of mature exotic trees with Expressway and local road surface.

The land use change involves the further conversion of parts of numerous farms and smallholdings from grazed paddock to Expressway and Expressway margin. A new structure - Mary Crest Rail Bridge (Bridge 9) - across the NIMT and a section of new local road, will also be created.

Visual Effects

The likely visual effects on the south of Gear Road to north of Te Hapua Road section, has been considered from a viewpoint looking south to Mary Crest. The rail bridge will be a new and obvious built feature in this local landscape, as will the Expressway approach embankments to the north and south.

The Mary Crest rail bridge and the associated elevated sections of the Expressway will have a moderate to high visual effect but this will be localised.

Mitigation of Effects

The open aspect of the Mary Crest rail bridge will be a mitigating factor in limiting the visual bulk of the bridge as seen from the adjoining local roads and to a lesser degree from the Expressway.

The proposed Expressway formation has grassed batter slopes. The use of occasionally mown grass on the Expressway batters will be consistent with the landscape treatment of the margins of the NIMT and the new local arterial road. This will reinforce the clean, simple, linear lines of the Expressway formation, allow for clear outward views from the Expressway and allow for ease of maintenance.

Sections of shelterbelt will be reinstated between the eastern edge of the Expressway formation and adjoining farmland from south of Gear Road through to the Mary Crest rail bridge. Shelterbelts and amenity tree planting will be reinstated along the tops of the new local arterial road cut batters on the west side of the southern Mary Crest curve.

North of Te Hapua Road to Te Kowhai Road Section

Description

South of the Mary Crest curves, the Peka Peka straight is bound by the NIMT and the rising ancient sea cliff escarpment to the east, and the rolling dunes of the undulating pastoral land to the west. The existing SH1 follows the low-lying land between the two, which comprises peat lands that have developed as a result of poor drainage in inter-dunal depressions.

The broader area is now pastoral and farmed, with groups of trees breaking the view along the length of the low lying area on the western margin of the existing SH1. A band of native and exotic trees cover the escarpment, giving a heavily vegetated appearance to the eastern margin of the NIMT. The straight alignment of the underlying escarpment

landform contributes to the simple linear landscape character of the eastern aspect of this section of the Project.

From Te Hapua Road through to Te Kowhai Road, there are a number of houses set back from the existing SH1 on the crest of the various dunes that have westerly outward views and are also sheltered and screened by established tree plantings.

Landscape Effects

Within the 'Peka Peka Straight' section of the Mary Crest to Peka Peka landscape unit, Project-related changes to landform, land cover and land use are moderate to low. From Te Hapua Road south, the Expressway formation will be at grade with and utilise the existing SH1 formation as the southbound lanes for the Expressway. The new local arterial road alignment created to parallel the western margin of the Expressway will be on fill past and south of Te Hapua Road and then in a shallow, sidling cut as it approaches Te Kowhai Road.

The land cover change involves replacing pasture, lengths of highway edge plantings with Expressway and local road surface. In the wider context, the landscape effect of removing these various trees and plantings is assessed as minor, as the underlying character remains unchanged.

The land use change involves the further conversion of the east 'ends' of numerous grazed paddocks to Expressway and Expressway margin. There are no other built structures of particular note proposed for this landscape section.

Visual Effects

From Te Hapua Road south, the visual effects of the proposed Expressway formation will be limited as the southbound lanes for the Expressway will utilise the existing SH1 formation. The creation of the northbound lanes and the parallel new local arterial road alignment along the western margin of the Expressway on fill will have a visual effect that results from vegetation removal and earthworks, along with the removal of a farm building.

Mitigation of Effects

Minimal landscape mitigation is required for this section, given that the few dwellings in the area are enclosed by existing, established plantings. However, native shrub planting will be established on the western fill batters of the new local aerial road realignment. This planting will provide a long term cover to the batters and a degree of screening between the Expressway and the land to the west.

16.4 Natural Character

The nature and degree of effects relative to natural character as a section 6(a) matter has been outlined in respect of vegetation, wetlands and watercourses, and is summarised in this section.

16.4.1 **Vegetation**

The construction of the Expressway alignment will remove the western edge of a number of stands of native mature trees within the Ōtaki Gorge Road/Old Hautere Road/Te Horo area. In several cases the majority of the remnant stands will remain and the visual aspect of the natural character associated with the trees will remain. Proposed landscape and ecological mitigation will provide edge shelter to those stands of trees directly affected.

There are two stands of swamp forest within the dune hollows on the southern aspect of Mary Crest. These stands will not be affected by the proposed Expressway.

16.4.2 **Wetlands**

There are several small wet areas in the Ōtaki North/Pare-o-Matangi reserve area that will be directly affected by the Project. These wetlands contain little naturally occurring native vegetation. Stormwater attenuation measures (Railway Wetland, Taylor Basin and Kennedy Wetland) and landscape and ecological mitigation planting will result in a noticeable degree of natural character enhancement. An opportunity also exists for natural character enhancement for stormwater features associated with existing 'grass' wetlands south of Mary Crest, adjacent to the two areas of swamp forest.

16.4.3 **Watercourses**

The Waitohu Stream has limited natural character within the Project area. Riparian planting associated with the Waitohu Stream Bridge will provide some natural character enhancement to the immediate area of the Waitohu Stream.

The Mangapouri Stream also has minimal natural character within the Project area. Whilst more of the stream will be culverted, the landscape and ecological mitigation planting associated with stormwater attenuation measures will improve the natural character for some short sections of the stream.

The Ōtaki River is the largest waterway in the Project area and contains various flood protection mechanisms. Whilst these measures may have a semi-natural appearance they provide little in the way of natural character. Two long bridges are proposed although they will have the appearance of one. This will result in further decreasing the already reduced natural character of the immediate Ōtaki township section of the river. The new bridges will have little effect on the natural flow of the river.

The Project will not affect the Mangaone Stream's natural character, and landscape mitigation planting is likely to enhance the stream.

16.5 Outstanding Natural Features and Landscapes

The Project's Statutory Assessment notes, with respect to KCDP and outstanding landscapes, that:

The Landscape objective is:

> *Objective C.10.1 - That the District's outstanding landscapes are identified and protected from adverse environmental effects of subdivision, use and development.*

The four related policies include:

> *Policy 1: Ensure new buildings, structures, services and earthworks within outstanding landscapes are located so that they will not be visually dominant (e.g. below the dominant ridgeline where practicable).*
>
> *Policy 2: Encourage landowners to design and clad their buildings to blend in with the rural landscape.*
>
> *Policy 3: Ensure no dune or landform modification takes place within outstanding landscapes of the open space, rural and residential zones, except to the minimum necessary for roading, access, provision of services, building site and farming purposes.*
>
> *Policy 4: Ensure the following outstanding landscapes are protected from inappropriate subdivision, use and development through controls on subdivision and land uses.*
>
> *- The foredune and consolidated sand dunes.*
>
> *- The foothills of the Tararua Ranges including Pukehou hill.*
>
> *- The wavecut escarpments behind Paraparaumu and Paekakariki.*

- *Kāpiti Island and associated Islands.*

- *The river landscapes of the Ōtaki and Waikanae Rivers.*

The one 'outstanding landscape' potentially affected by the Project is the landscape of the Ōtaki River (Policy 4). However, the identification applies to the upper reaches of the river (refer Planning Map 22) and not the section that the Expressway bridge crosses. However, notwithstanding that the section of the Ōtaki River at the point of the bridge crossing is not an outstanding landscape area, the design approach has been to locate and design the structure so that it sits as low as practicable in the landscape thus reducing its visual impact.

No identified 'outstanding natural feature' is affected by the Project.

As part of KCDC's current Plan Review process, the district was recently re-assessed by Isthmus Group[33], and no ONF/ONLs were identified in the Expressway's designation corridor. The current district-wide landscape study has defined that part of the Ōtaki River within the Project area is a 'significant amenity landscape'[34]. The 'Te Hapua sea cliff' north of Peka Peka Road is a geological feature that has been identified as a 'significant amenity feature', but this feature is to the east of the NIMT at the south end of the Project area and well beyond any landscape influence the Project may have.

As it stands, the operative KCDP remains a relevant reference point. As noted in previous sections there will be effects on the landscape, visual and natural character aspects of the Ōtaki River in the area of the Expressway bridges. It is acknowledged that there will be a cumulative effect of having a further pair of long bridges within the current 'river crossing' section of the river. However, given the degree of modification that is already in place in this section of the river, the magnitude of the effect is expected to be no more than moderate. The expected change through the Plan Review from the status of a poorly defined outstanding landscape area to that of a clearly documented 'significant amenity landscape' is more in keeping with the quality and the use of the landscape at the 'river crossing' section of the Ōtaki River.

16.6 Construction Effects

It will take approximately 3.5 – 4 years to construct the Expressway. During this time there will be visual effects associated with vegetation clearance, earthworks and construction activity. There will be moderate to high visual construction effects at the various sites of the Expressway bridge structures and along the length of the Project. Mitigation of exposed cut and fill batters and installation of landscape mitigation plantings (as discussed in this chapter) will reduce the relatively short-term effect of the construction phase.

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[33] *Kāpiti Coast Landscape Assessment*, prepared for KCDC by Isthmus Group, Wellington, October 2012

[34] Significant amenity landscapes are:

(a) important but not clearly exceptional landscape value under one or more of the criteria in an area where natural components dominate; or

(b) important (including exceptional) landscape value under one or more of the criteria in an area where the influence of human activity on landscape character dominates natural components. GWRC RPS definition.

Chapter 17

Part G

VOLUME 2

Hydrology

Overview

The Project crosses five significant waterways and floodplains within the Ōtaki Coastal Plain: the Waitohu stream and floodplain, the Mangapouri Stream, the Ōtaki River, the Ōtaki River floodplain and the Mangaone Stream and floodplain. As an elevated transport link, the Expressway interferes with the natural drainage function of these waterways and adequate provision must therefore be made for water to pass, including in flood events.

This chapter describes the potential flood effects associated with these major waterways and floodplains. Chapter 19 describes the Project's approach to stormwater generally.

The design approach of the Project has sought to achieve hydraulic neutrality (i.e. no exacerbation of the existing flooding situation), taking into account both the barrier posed by the Expressway to overland flow paths across floodplains and the loss of floodplain storage under the footprint of the Expressway. For these waterways, the increased run-off from the Expressway is negligible in comparison to the volume of flood flows. Detailed hydrological and hydraulic modelling has been undertaken to inform the design and environmental assessment process. As a result of this closely integrated process, the majority of potential adverse hydrological effects have been avoided through design solutions.

In summary, with the proposed design and mitigation, the effects of the proposed Expressway crossing of the Waitohu, Mangapouri and Mangaone Streams and floodplains are minimal and acceptable. In the case of the Mangaone Stream, proposed modifications in School Road, in partnership with KCDC, will reduce an existing flood nuisance to a number of residential properties. The effects of the proposed crossing of the Ōtaki River will be minimal and limited in extent. The effects on the Ōtaki River floodplain will be greater in areas to the east of the Expressway that are used for pasture, but the effects on populated areas to the west of the Expressway will be no worse than in the existing situation. The proposed design and flood mitigation measures to address potential effects of the Expressway crossing the Ōtaki River floodplain include:

- a 350m long, approximately 1.75m high secondary flood containment bund located approximately 250m north of Chrystall's Stopbank;
- a 40m wide dry culvert through the Expressway embankment; and
- a road overflow weir section along the Expressway embankment measuring approximately 300m long with a minimum crest level of 15.3m (Mean Sea Level (MSL) Wellington datum) and rising up to about 15.8m (MSL Wellington datum) to the north of the line of the secondary flood containment bund and then falling again beyond this high point.

17 Hydrology

17.1 Introduction

This Chapter summarises the potential for flood effects (hydraulic effects) on the significant waterways and floodplains that the Project crosses. These are:

- the Waitohu Stream and floodplain;
- the Mangapouri Stream;
- the Ōtaki River and the Ōtaki floodplain; and
- the Mangaone Stream and floodplain.

Figure 17-1 below shows the location of Major Watercourses in relation to the Project.

Figure 17-1: Location of Major Watercourses in relation to the Peka Peka to North Ōtaki Expressway

The information contained in this Chapter is based on the following Technical Report:

- Peka Peka to Ōtaki Expressway Assessment of Hydraulic Effects for Major Watercourse Crossings, Technical Report 9.

Other, related reports and their relevant chapters in this AEE report are:

- Peka Peka to Ōtaki Expressway: Geotechnical Report, Technical Report 4;
- Peka Peka to Ōtaki Expressway: Construction Methodology Report, Technical Report 5;
- Peka Peka to Ōtaki Expressway: Assessment of Stormwater Effects, Technical Report 10 (which describes the flood effects in smaller watercourses, summarised in Chapter 18); and
- Peka Peka to Ōtaki Expressway: Aquatic Ecology Assessment, Technical Report 12.

These reports are included in Volume 3 of this AEE report.

17.2 Existing Environment

The Project crosses the Ōtaki coastal plain over a distance of approximately 13km, from Taylors Road, just north of Ōtaki, to Te Kowhai Road, Peka Peka, in the south. The coastal plain, an alluvial fan, is the defining feature of the environmental setting.

Land either side of the route is generally flat or with low gradients. Geology varies from river gravel deposits directly north of Ōtaki River and alluvium north of Te Horo, to underlying dune sand and inter-dune deposits (which have a high peat content) in the south, between Peka Peka and Te Horo.

The foothills of the Tararua Ranges lie to the east, with waterways flowing from east to west, towards the sea. The Project crosses four significant waterways (Waitohu and Mangapouri Streams, Ōtaki River and Mangaone Stream) and four major catchments (three

associated with the major waterways (the Waitohu, Ōtaki and Mangaone) plus the Awatea catchment at the southern end of the Project area).

Historically, the drainage systems across the coastal plain will have continually evolved over time. However development has interfered with existing drainage paths, with many waterways re-routed or severed from the main stream channel. The existing SH1 and NIMT embankments that traverse the alluvial fan surface further alter the natural drainage patterns of the area, as does a stopbank on the northern bank of the Ōtaki River which protects Ōtaki Township from being flooded.

Rainfall in the area is heavily influenced by the prevailing westerly winds and their interaction with the Tararua Ranges, with the intensity of rainfall being greater to the east.

17.3 Design

An elevated transport link constructed across a floodplain or alluvial fan interferes with the natural drainage functions of these topographic features. Adequate provision must therefore be made to allow the safe passage of flood waters through the transport link or over it.

A fundamental principle that has been applied consistently with respect to the treatment of individual watercourse crossings on the Project is that of hydraulic neutrality. This means that the impact of flood hazards from the proposed Project should in general be no worse than in the current situation in specific locations. In specific locations where it has not been possible to achieve this desired objective, while still maintaining the required level of service for the Expressway, a fall-back position has been adopted whereby flood hazards that have been made worse are kept away from residential dwellings and instead redirected towards uninhabited rural areas.

To assess the hydraulic effects, calibrated hydraulic models of the waterways sourced from GWRC were used, with the proposed Expressway alignment and geometry superimposed into the models. River and stream flow data used in the modelling incorporates the effects of potential increases in projected rainfall as a result of climate change effects to 2090, based on guidelines established by the Ministry for the Environment. In general, the design guidelines contained in the NZTA's Bridge Manual were followed, with a design standard for the minimum level of service adopted being that of the 1% annual exceedence probability (AEP) flood adjusted for possible future climate change effects to 2090[35] (that is, the flood with a 1% AEP). This design standard is referred to as the Serviceability Limit State flood.

Each of the significant waterway/floodplain crossings along the route of the proposed Expressway has unique features requiring individual treatment and design. These are described in the following sections.

17.4 Waitohu Stream and Floodplain

17.4.1 Catchment Description

The Waitohu Stream lies to the north of Ōtaki Township and the Ōtaki River. The Waitohu Stream and its tributaries drain a 53 km^2 catchment on the steeply-sloping western side of the Tararua Ranges. After the stream flows out of the foothills, it meanders across the coastal plain for a distance of about 7 km before exiting into the sea north of Ōtaki Beach Village.

[35] In this Chapter, this is referred to as 1% AEP (2090), where the bracket indicates that the flood flow has been adjusted for possible future climate change effects to the year contained in the brackets.

The average channel slope of 13.3% makes the stream extremely steep hydraulically, however the slope reduces significantly at about the location of the existing SH1 bridge causing this location and downstream to be a zone of lateral channel instability and sediment deposition. For river management purposes, GWRC has established a 75m fairway width for the stream downstream of the existing SH1 bridge to allow for possible changes during extreme flood events.

The Expressway crosses the Waitohu Stream about 260m downstream of the existing SH1 bridge, within this zone of instability and deposition. The Expressway bridge has been designed with a span length of 75m to accommodate this zone and GWRC's design alignment for the stream. The piers of the Expressway bridge will be located outside of the existing main flow channel of the stream so as not to interfere with normal flows in the stream. This means the bridge will require three spans of about 25m each.

Extensive flood inundation occurs on both the north and south sides of the stream crossing. This is primarily due to flood breakout from the main stream channel upstream of the existing SH1 bridge (a result of the limited flood capacity of that bridge) and, to a lesser degree, the surface run-off from the adjacent Greenwood sub-catchment to the north.

17.4.2 **Design**

The 1% AEP (2090) flood was adopted as the Serviceability Limit State flood for the proposed bridge crossing of Waitohu Stream. A minimum design freeboard of 600mm (from the design flood level to the underside of the proposed bridge) was adopted.

This flood standard is also appropriate for the Expressway crossing of Waitohu Stream.

Culverts through the proposed Expressway and bridge approach embankments providing continuity for existing secondary overland flow paths across the floodplain require a minimum design freeboard allowance of 500mm in accordance with design guidelines.

17.4.3 **Assessment of Effects**

The proposed Expressway bridge at the Waitohu Stream has been designed with a minimum 75m span, comprised of three spans each of 25m. This span length has been determined to provide for future channel migration. This span length allows the two piers for the bridge to be located on either side of the existing active channel for the stream, the area of known channel instability and sediment deposition during extreme flood events. Pier head losses[36] will be minimal under design and super-design flood conditions. Upstream and downstream flood discharges are no worse than the existing situation.

In the case of the Waitohu Stream floodplain crossing, the Expressway must be constructed as a raised embankment across the 0.9km wide floodplain. Dry culverts will be incorporated into the embankment to accommodate existing overland flow paths. The construction of the embankment will have the effect of elevating flood levels in the main stream channel immediately upstream of the bridge compared to the existing situation but this backwater effect will diminish to nothing over a very short distance upstream. The relative effect on nearby residential properties on the floodplain is negligible. Downstream flood discharges are no worse than in the existing situation.

[36] Head losses are energy losses in a water flow induced by some structural element or some feature of the channel geometry. In the case of a structural element such as a bridge pier, they are manifested by a sharp difference in average water levels upstream and downstream of the element.

17.5 Mangapouri Stream and Floodplain

17.5.1 **Catchment Description**

The Mangapouri Stream is a tributary of the Waitohu Stream. It drains a small catchment of 2.37km^2 (at the Expressway) along the northern side of the Ōtaki River floodplain. The catchment upstream is mixed rural and urban, and includes part of the Ōtaki Racecourse for which the track has been built up and contoured to direct surface run-off into the stream. This landscaping has completely altered natural drainage patterns in the area.

The flood capacity of the Mangapouri Stream downstream of the existing SH1 culvert through Ōtaki Township is severely restricted. Consequently the culvert under the existing NIMT has been deliberately restricted in size in order to throttle downstream flood flows. This forces storm run-off to pond upstream of the railway culvert in a flood storage basin that contains a number of houses that would have their floor levels inundated by flood waters in the existing situation. Although not recognised as such, the downstream area between the NIMT, SH1 and Rahui Road (including the Pare-o-Matangi reserve) also functions as a flood storage basin in extreme floods, with the SH1 culvert restricting downstream flood flows.

The Project will pass through the area of the secondary flood storage basin within the Pare-o-Matangi reserve and incorporates the relocation of the NIMT westwards to accommodate the Expressway to the east.

Two additional aspects further complicate this catchment. Rahui Road acts as a very wide overflow flood relief path for catchment run-off stored in the primary flood storage basin upstream of County Road. In the proposed situation, the eastern approach embankment to the Rahui Road over bridge will block off this flood relief path.

To the north, a relatively small (0.316km^2) urban catchment, the Te Manuao Catchment on a remnant river terrace, drains into the Mangapouri Stream via a wetland area to the west of SH1. The stormwater network in this catchment is quite limited and when capacity is exceeded, stormwater flows overland towards SH1. The Expressway cuts through the existing wetland area to the west of SH1, resulting in the loss of about half of the wetland area.

17.5.2 **Design**

It is proposed to retain the existing NIMT culvert so that the culvert continues to perform its flood throttling function and thereby provide flood relief to downstream properties through Ōtaki Township. The existing railway embankment which forms the flood detention barrier for the primary flood storage basin on the Mangapouri Stream will also be retained except in the vicinity of the existing railway crossing of Rahui Road, where County Road will be realigned to loop around and connect to a new Rahui Road overbridge. Here, the Expressway embankment would take over the flood containment function from the removed section of railway embankment.

In this situation, the 1% AEP (2090) flood is an appropriate design standard for the primary flood storage basin upstream of the existing railway embankment. The railway embankment is sufficiently elevated above peak flood levels to meet this criterion and the standard design freeboard of 500mm. In the area directly underneath the new Rahui Road overbridge it would be acceptable to adopt a lower design freeboard standard of 300mm as floodwaters stored in the primary flood storage basin will be relatively calm and undisturbed.

Blockage of the Rahui Road flood relief path by the Rahui Road overbridge approach embankment will require a range of mitigation measures that are detailed in Technical Report 9 (Volume 3). These will result in the flood flows being collected by the unnamed watercourse to the south where it will be directed towards the Racecourse Culvert under

the Expressway. This particular culvert will be limited in size to match the discharge capacity of the existing railway culvert so that there is no increase in flow downstream.

The reduced area of the Pare-o-Matangi reserve would still be required as a secondary flood storage basin for floodwaters conveyed through the new Expressway and NIMT culverts. The available spaces between the dual lanes of the Expressway and between the Expressway and the relocated NIMT are required for road run-off treatment purposes and are not available for flood storage. The new culverts (downstream of the existing railway culvert) will be constructed from standard precast concrete box culvert units, nearly as wide as the existing stream channel, and deep enough to allow free surface flow under the most extreme flood conditions considered. This construction will also allow better light penetration under normal flow conditions, which will facilitate fish passage.

These practical design considerations negate the need for a design freeboard standard for the new Expressway and railway culverts on the Mangapouri Stream. In summary, both culverts will be designed to mimic as closely as possible the existing flow regime under flood conditions along the reach of the Mangapouri Stream between the existing railway and SH1 culverts.

The existing Ōtaki Railway Wetland area will be significantly reduced in area with the construction of the Project. To compensate for this loss of wetland storage area, it is proposed to construct a second wetland area in series utilising the vacant space between the existing (to be abandoned) railway embankment and the Expressway embankment to the north of the Mangapouri Stream. This second wetland area would be impounded at the downstream end by a watertight bund and the two wetlands connected by a long pipe. The primary outlet to the Mangapouri Stream would be piped, but an emergency spill weir would also be required over the crest of the bund to discharge floodwaters in excess of the design flood standard.

A minimum design freeboard standard of 300mm will be applied to the wetland storage ponds on this system for the design 1% AEP (2090) flood. This is based on analysis that the water surface in the wetlands would remain fairly calm even under flood conditions due to the shallow flow depths, high flow resistance from aquatic vegetation and very slow flow velocities.

17.5.3 **Assessment of Effects**

Under flood conditions, the behaviour of the Mangapouri Stream and its associated system of interconnected flood detention ponds or storage basins will be the same as the current situation because of the retention of the existing NIMT embankment and culvert. However, construction of the Project will have a number of effects on the hydraulic behaviour of this flood storage system including:

- Blockage of the present Rahui Road overflow path by the eastern approach embankment to the new Rahui Road overbridge;
- Loss of storage volume in the secondary flood storage basin upstream of the SH1 culvert through the Pare-o-Matangi reserve; and
- Loss of storage volume in the Ōtaki Railway Wetland area draining the Te Manuao Catchment.

A number of mitigation measures are proposed to preserve as closely as possible the delicate balance of the hydraulic response in the modified storage basin system along the stream under flood conditions. These are detailed in Technical Report 9, and include retaining the existing railway embankment, providing a culvert for flood storage pond outflow through the eastern approach embankment to the Rahui Road overbridge, providing a storage pond outflow culvert under Rahui Road, lowering the level of high point along Rahui Road, and incorporating a low bund around the perimeter of the remaining buildings on the corner of SH1 and Rahui Road adjacent to the Pare-o-Matangi reserve. Refer to Figure 17-2 below.

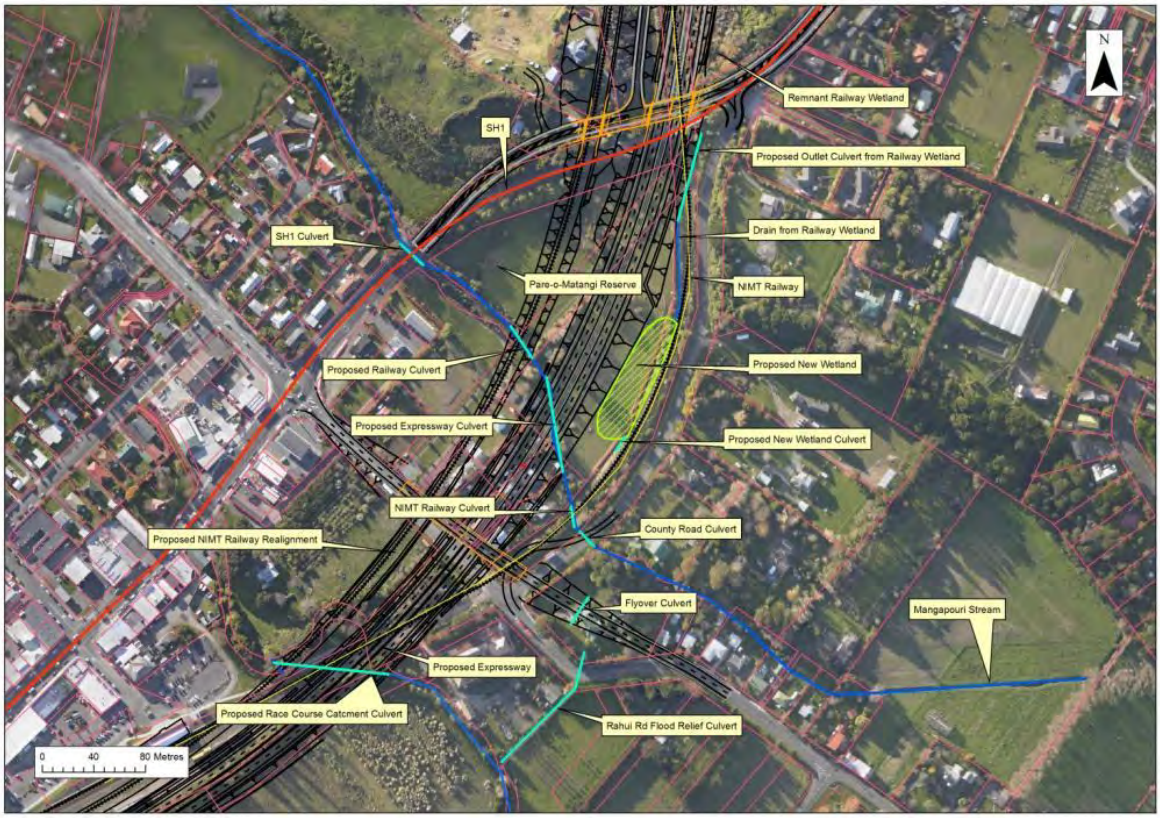


Figure 17-2: Aerial Photograph of Mangapouri Stream in SH1 / Rahui Road / NIMT Railway Line Triangle with Layout of Proposed Expressway and Realigned Railway Line Superimposed

The slightly elevated road formation will allow floodwaters transferred from the primary flood storage basin on the Mangapouri Stream to head up in front of the new Racecourse Culvert, utilising the rough land area upstream along the margins of the unnamed watercourse to the south of Rahui Road for flood storage purposes.

The loss of flood storage in the Railway Wetland will be rectified by making use of the unused space between the old railway embankment and the new Expressway embankment to form a second wetland area in series with the remnant Railway Wetland. The outlet from this wetland has been sized to maximise the attenuation efficiency of the system, and thereby reduce outflows to the Mangapouri Stream.

With the proposed mitigation measures in place, the effects of the proposed Expressway crossing of the Mangapouri Stream would be as follows:

- Flood levels in the primary storage basin on the Mangapouri Stream would be marginally lower than those in the existing situation for all except the 0.5% AEP and 0.2% AEP floods adjusted for possible climate change effects to 2090.
  - In the case of the former flood, the increased flood level would be only marginally higher (0.04m).
  - In the case of the latter flood, the increase in flood level relative to the existing situation would be up to 0.12m.
- However, it is important to note that in an extremely rare flood of this magnitude (0.2% AEP) and even lesser floods, there would be widespread flood inundation through Ōtaki Township due to flood breakout from natural stream channels and surface runoff exceeding the capacity of the piped stormwater drainage system.

- The flood levels in the primary flood storage basin currently affect a number of houses within the area of the basin either by exceeding floor levels or being within 0.5m of floor levels. The number of affected houses with the Expressway would be slightly lower than in the existing situation for the smaller floods considered (six in the case of the 1% AEP flood adjusted for possible future climate changes effects in the proposed situation compared to eight in the existing situation). However the number of affected houses would be the same (eight) for the 0.5% AEP flood and increased by one (ten) for the 0.2% AEP flood (both floods also adjusted for possible future climate change effects).
- Flood levels within the Pare-o-Matangi reserve storage basin area (upstream of the SH1 culvert) would be marginally higher (0.03-0.07m) for some of the intermediate sized floods considered (2% AEP flood up to the 1% AEP floods adjusted for possible climate change effects to 2090). However this would only impact on the same number of buildings as at present (excluding those houses that which need to be acquired for the Expressway). The existing flood inundation risk for these floods will be mitigated by landscaping the Pare-o-Matangi reserve to form a low bund around the perimeter of the affected properties on the corner of the existing SH1 and Rahui Road. Flood levels within the Pare-o-Matangi reserve storage basin area would be only 0.01-0.02m higher for the 5% AEP flood and the two largest floods considered (0.5% and 0.2% AEP floods adjusted for possible climate change effects to 2090).

Overall, the effects of the Expressway crossing of the Mangapouri Stream and its ancillary features are minimal and acceptable. In very rare floods such as the 0.5% AEP and 0.2% AEP floods the effects would be slightly greater than in the existing situation (but with the same number of properties affected). However, in those situations there would be widespread flood inundation elsewhere through Ōtaki Township.

17.6 Ōtaki River and Floodplain

17.6.1 Catchment Description

The Ōtaki River drains a 335km^2 catchment (at the existing SH1 bridge) extending back to the main divide of the Tararua Ranges. It is a major river that responds very rapidly to weather systems impacting on the mountain range. The catchment includes extensive forest cover so that there is a high likelihood of large volumes of woody debris being flushed out of the catchment under extreme flood conditions. After exiting from the foothills of the Tararua Ranges, the river flows westwards to the sea over a distance of about 9 km.

A stopbank system along the true right (north) bank provides flood protection to the township of Ōtaki, which lies north of the river. The stopbank upstream of the NIMT railway bridge (known as the Chrystall's Bend extended stopbank) skirts around the landward perimeter of an off-channel storage basin occupied by the Stresscrete concrete facility. The stopbank system continues along the right bank downstream of the existing SH1 bridge.

The northern (right bank) approach embankment to the NIMT railway bridge across the river ties into the Chrystall's Bend stopbank and has been strengthened to form part of the primary flood defence system. The floodplain incorporates known secondary flow paths for residual flows from the river, those either overtopping the stopbank system or flowing through a stopbank breach. Super-design floods (floods larger than the design standard) would overtop the stopbank along the right bank upstream of the existing NIMT and SH1 bridge crossings after first backfilling the off-channel storage basin from the main river channel.

Natural high ground (in the form of a river terrace) confines flood flows in the river along the true left (south) bank.

17.6.2 **Design**

The proposed Expressway crosses the River (on twin bridges) to the north of the existing road and rail crossings.

The existing SH1 bridge partially constricts the river channel and causes a slight backwater effect (elevated upstream water levels) upstream. The NIMT bridge does not appear to contribute to this backwater effect. To ensure adequate hydraulic performance, the 330m total span of the Expressway bridges has therefore been designed to approximately match that of the railway bridge, although the pier spacing will be much larger. The pier to pier span length has been set at 30m, giving a total of 11 spans.

The wide spacing of the bridge piers will limit the size of any debris raft accumulating on a pier during flood conditions. The piers of the two bridges will be aligned so that those on the upstream bridge will shelter those of the downstream bridge. The design freeboard allowance for the two Expressway bridges needs to allow for the effects of gradually occurring bed aggradation in addition to the effects of potential debris raft formation on the bridge piers. Based on the minimum freeboard requirements of the NZ Transport Agency's Bridge Manual (Transit NZ, 2003) for the latter factor and the recent aggradational history of the Ōtaki River with an increasing bed level trend, it would be appropriate to adopt a slightly higher freeboard standard for the two Expressway bridges than the Bridge Manual value. A minimum freeboard standard of 1.7m is recommended, derived from the 1.2m allowance from the Bridge Manual and the maximum mean bed level increase between 1991 and 2011 of 0.5m.

The proposed Expressway will need to be elevated above the floodplain and tied into the existing stopbank system. The design standard for the existing Chrystall's Bend stopbank is the 1% AEP flood with freeboard based on current climate conditions. The stopbank would therefore be overtopped by any super-design flood with an AEP of less than 1%. Overtopping floodwaters could also induce a breach in the stopbank. In this scenario, floodwaters will predominantly follow existing secondary flow paths across the floodplain with lateral spread of floodwaters into residential parts of Ōtaki township.

The effect of elevating the Expressway above the floodplain will be, in the event of stopbank overtopping by a flood larger than the stopbank design flood, to block off the secondary flow paths along the landward side of the Chrystall's Bend stopbank and to cause extensive ponding upstream of the Expressway embankment. A key design objective for the Expressway was, therefore, to incorporate some means of providing continuity for this main secondary flow path. Other additional design principles were to reduce the impact of stopbank overtopping flows on Ōtaki township, particularly residential areas, and contain the spread of stopbank overtopping flows into the Mangapouri Stream.

It is not possible to pre-define a suitable design flood standard or design freeboard value for the Expressway embankment. These parameters can only be determined by carrying out a range of flow simulation trials exploring the effects of different embankment geometries and complementary mitigation measures for a stopbank overtopping event. A series of computational hydraulic model simulations were, therefore, undertaken to gauge the effects of stopbank overtopping by the 0.2% AEP (2090) flood with various mitigation measures in place to safely pass ponded floodwaters through the Expressway embankment.

17.6.3 **Assessment of Effects**

The Expressway crossing of the Ōtaki River will comprise two parallel bridges with a total span similar to that of the downstream railway bridge, although the pier spacing will be much larger. This geometry means that the Expressway bridges will not constrict flood flows in the main river. Pier head losses will also be minimal and the bridges will be

located sufficiently far upstream to not cause any significant hydraulic interference or additional scour effects on the downstream rail bridge.

The northern approach embankment to the twin bridges across the Ōtaki River bisects the off-channel flood storage in which the Stresscrete concrete factory is located. The effect of this approach embankment is to shift the critical location for stopbank overtopping from immediately upstream of the NIMT bridge in the existing situation, to immediately upstream of the Expressway bridges in the proposed situation. The maximum depth of stopbank overtopping will be unchanged.

The following mitigation measures are required to reduce the blocking effects of the Expressway embankment on stopbank overtopping flows flowing across the Ōtaki River floodplain (see Figure 17-3):

- a secondary flood containment bund projecting upstream of the Expressway embankment roughly parallel with the main river channel (secondary containment bund);
- a dry culvert through the Expressway embankment immediately to the north of the Chrystall's Bend stopbank; and
- re-shaping the vertical alignment of the Expressway embankment between the Chrystall's Bend stopbank and the secondary flood containment bund to form a preferential weir overflow path across the roadway for stopbank overtopping flows.

Figure 17-3: Aerial View of Ōtaki River and Floodplain in Vicinity of Existing and Proposed River Crossings

In terms of peak flow depths and velocities, these mitigation measures mean that the effects of stopbank over-topping sourced floodwaters on populated areas will be less than those that occur in the current situation.

Upstream of the Expressway embankment, peak flood inundation depths would be increased due to the partial damming effect of the embankment while peak flow velocities

would be reduced except in the localised area approaching and through the dry culvert. These latter effects would only impact on land currently used for pastoral purposes.

The occurrence of these effects would be extremely rare given the very low AEP of Ōtaki River floods (0.2% AEP and larger) which would overtop the stopbank system protecting Ōtaki Township.

On balance the effects of the Expressway crossing of the Ōtaki River floodplain will be minimal and acceptable with the proposed mitigation measures implemented.

17.7 Mangaone Stream and Floodplain

17.7.1 Catchment Description

The Mangaone Stream drains a 38.6km^2 catchment extending from the foothills of the Tararua Ranges to the sea at Te Horo Beach. After exiting from the foothills, the stream crosses the coastal plain over a distance of about 7km before reaching the sea. SH1 and the NIMT cross the stream at Te Horo, about 3.5km to the south of the Ōtaki River, with the NIMT on the inland side.

The NIMT sits slightly elevated above the coastal plain on a ballasted embankment which acts as a flood detention barrier. Two culverts under the railway embankment provide passage for flood flows – one on the main stream and another approximately 250m to the south acting as an overflow facility. The culverts under SH1 are aligned in series with those under the NIMT.

The SH1 crossing of the Mangaone Stream and Mangaone overflow are known flooding hotspots with the road having been overtopped by floodwaters on a number of occasions in recent years. This is due to the limited capacity of the NIMT and SH1 culverts. Other local flood inundation problems also exist. These include flooding along Te Horo Beach Road downstream of the SH1 culvert on the main stream channel, caused by the limited flow capacity of that channel, and flooding around the School Road / Gear Road intersection caused by the limited flow capacity of the School Road Drain (this is linked to the Mangaone Overflow).

The proposed Expressway crosses the Mangaone Stream and its left bank overflow path on the upstream side of the existing transport links. The Expressway will therefore need to be elevated on an embankment where it crosses the Mangaone Stream and overflow path in order to achieve the required level of service and remain flood-free up to that level. The ponding that currently occurs upstream of the NIMT will be transferred to upstream of the new Expressway embankment.

The proposed Expressway is complicated by the presence of a local link road providing east / west connectivity between School Road and Te Horo Beach Road via an overbridge. This local link road will also cut through the overland flow path leading to the Mangaone Overflow, cross the main channel of the Mangaone Stream east of the Expressway, cut through the existing Lucinsky Overflow (along the right bank of the main stream channel downstream of the SH1 culvert) and then cross over the Mangaone Stream again west of the Expressway (see Figure 17-4 below).

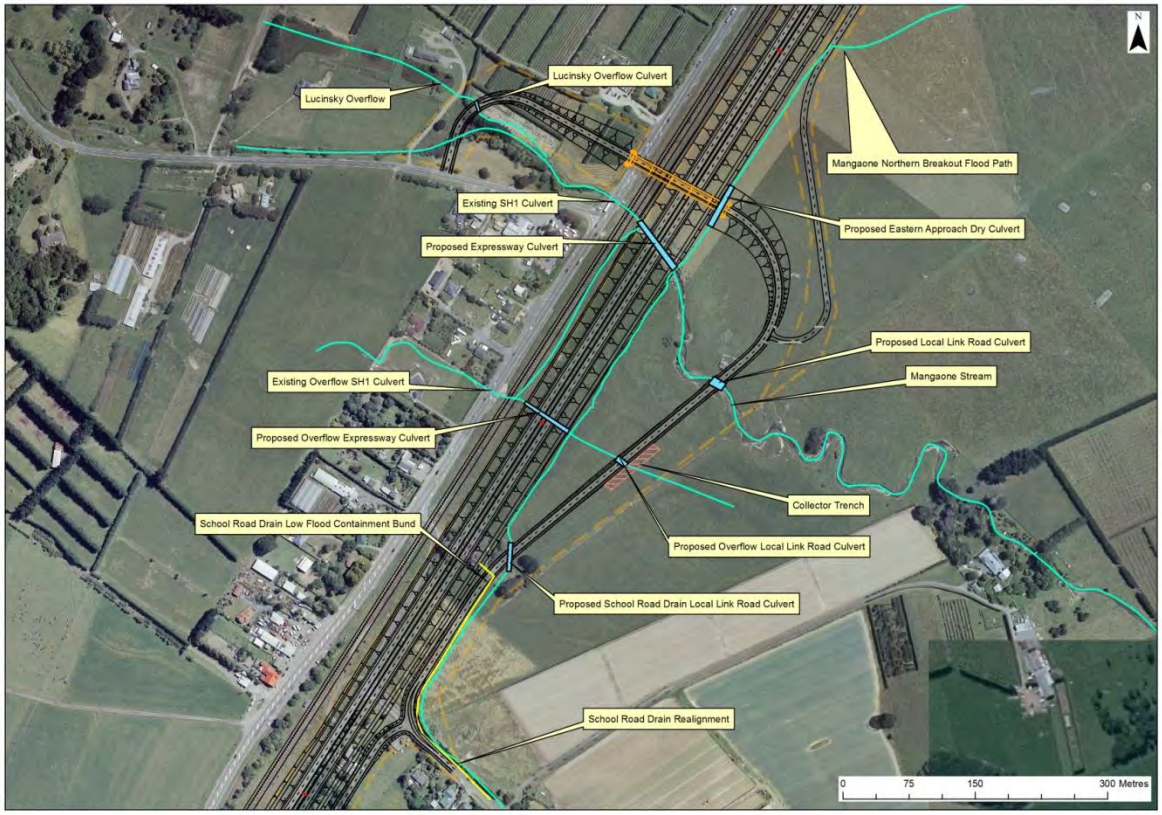


Figure 17-4: Proposed Expressway and Local East / West Local Link Road Crossings of Mangaone Stream Alluvial Fan and Floodplain System with Main Drainage Paths Marked

17.7.2 **Design**

Construction of the Project represents an opportunity to rectify some of the existing localised flooding issues, although the real issue remains the volume of storm run-off (over which there is no control) that must safely pass through all three parallel transport links. As with the crossing of the Ōtaki River floodplain, if the crossing of the Mangaone Stream floodplain is constructed as an elevated embankment, it will function as a flood detention barrier.

The 1% AEP (2090) flood was adopted as the Serviceability Limit State flood for the proposed crossing. Culverts through the proposed embankment will provide continuity for existing secondary flow paths across the floodplain and require a minimum design freeboard allowance of 500mm.

The local link road providing east-west connectivity across the Expressway between School Road and Te Horo Beach Road will also cross the Mangaone Stream floodplain within the flood ponding area upstream of the Expressway. The level of service will be between a 4% and a 2% AEP flood, reflecting the lower use level of the road.

17.7.3 **Assessment of Effects**

The Expressway crossing of the Mangaone Stream at Te Horo on a raised embankment acts as a flood detention barrier, impounding floodwater upstream of the existing transport links to the west and downstream residential properties.

To minimise the effects of flood ponding upstream of the Expressway, new culverts will be required in the Expressway embankment (aligned with existing culverts), new culverts will be required on local link roads, to convey overland flows, and works would be required in

the vicinity of the School Road drain to remove constrictions and provide flood containment in this area. These works are described in detail in Technical Report 9.

With these improvements in place, the effects of flood ponding upstream of the Expressway would not impact on any residential properties on the floodplain. The culvert system would not make flood discharges (and hence flood levels) on the western (downstream) side of SH1 any worse than in the existing situation. The culvert under the western approach embankment to the east-west local link road overbridge will not impede flood flows along the Lucinsky Overflow.

Chapter 18

Part G

VOLUME 2

Stormwater

Overview

Construction of the Project involves approximately 800,000m³ of cut-to-fill and 45,000m³ of imported fill across four construction sections. During earthwork activities, soil particles become detached from the ground surface making them easier to transport via stormwater to the downstream receiving environment. During construction of the Project, best practice Erosion and Sediment Control measures and principles, outlined in the GWRC and NZTA draft standard, will be adopted to minimise sediment yields and achieve compliance with effective measurable standards enshrined in conditions. These measures are outlined in the draft ESCP included in Volume 4 of the AEE.

The potential operational stormwater-related effects arising from the Project include increased run-off containing contaminants and effects arising from the disruption to small and medium-sized waterways from new culverts, bridges and crossings.

Potential stormwater effects of the Project have been identified through assessment and consultation. Site conditions and constraints have been identified and considered through site visits, geo-technical investigations, hydrological assessments, and topographical assessments. The potential stormwater effects of the Project have largely been mitigated through careful design.

Through the use of treatment and/or attenuation swales and attenuation basins, the potential effects of run-off will be appropriately mitigated to achieve appropriate measurable standards. This is in compliance with industry best practice. The Project will have a net positive effect on contaminant levels entering the environment, due to the transfer of most traffic from the existing SH1, which has no formal stormwater treatment, to the Expressway, which will treat all run-off.

The culverts proposed as part of the Project have been designed using methods developed and accepted by GWRC and NZTA. Culverts have been designed so that they have minimal impact on flood levels (both upstream and downstream) and allow for fish passage, where applicable.

The residual stormwater effects of the Expressway, after application of the mitigation measures described, will be less than minor. The sole exception to this relates to increased flood risk to a farm storage building at Gear Road, for which the residual effects are likely to be minor-moderate. This matter is proposed to be resolved through direct negotiation with the property owner.

18 Stormwater

18.1 Introduction

Stormwater is water that originates during rain and storm events and runs off impervious surfaces such as roads, drives, footpaths and rooftops. Stormwater either flows directly into surface waterways or is channelled into stormwater drains that then discharge into surface water or to ground.

This Chapter describes and summarises the actual and potential effects of stormwater arising from the construction and the operation of the Project, and the actions that are proposed to be taken to mitigate these effects.

The potential effects of erosion and transportation of sediment from areas disturbed by earthworks can have a significant adverse effect on downstream receiving environments. Adverse effects arising from the Project will be mitigated by applying best practice erosion and sediment control principles and practices.

The possible stormwater-related environmental effects of building a new road, re-aligned railway, and connecting roads can be considered in three groups:

- The first group includes effects arising during the course of construction activities.
- The second group are associated with the impermeable nature of the road pavement and the pollutants that are generated on it.
- The final group of effects are due to the road/railway crossings of waterways, which can disrupt natural flow patterns and habitat.

The potential for flood effects in the major waterways that the Expressway crosses is described in Chapter 17 (Hydrology) of this AEE report.

The information contained in this Chapter is based on the following Technical Reports:

- Peka Peka to Ōtaki Expressway: Assessment of Stormwater Effects, Technical Report 10.

Other, related reports are:

- Peka Peka to Ōtaki Expressway: Geotechnical Report, Technical Report 4;
- Peka Peka to Ōtaki Expressway: Construction Methodology Report, Technical Report 5;
- Peka Peka to Ōtaki Expressway: Assessment of Hydrology Effects, Technical Report 9;
- Peka Peka to Ōtaki Expressway: Aquatic Ecology Assessment, Technical Report 12; and
- Draft Erosion and Sediment Control Plan.

These reports are included in Volume 3 of this AEE report and the Draft Erosion and Sediment Control Plan is included in Volume 4.

18.2 Existing Environment

The existing environment as it relates to stormwater is as set out in Chapter 17, in relation to Hydrology effects of the Project.

18.3 Stormwater Design

The stormwater design for the Project was developed through consideration of key design documents (detailed in Technical Report 10 – Volume 3) and in consultation with KCDC and GWRC to develop an appropriate design philosophy, and stormwater standards. A set of proposed levels of service for the Project were agreed with KCDC and GWRC.

18.4 Construction Related Effects

During construction large areas of earth will be exposed as part of earthworks activities. This raises the potential for erosion of bare soil and contamination of water bodies with sediment. This is a particular risk during the course of bridge/culvert construction, stream diversions, and any other work in close proximity to streams. Similarly dust can be mobilised by earthworks and spread by wind where it creates both human nuisance and potential environmental effects.

If best practice erosion and sediment controls (E&SCs) are not established to mitigate the increase in sediment runoff, a range of adverse environmental effects may occur to the downstream receiving environment, such as smothering of aquatic life by build-up of sediment in the stream bed, increased turbidity, accumulation of contaminants transported by sediments and effects on consumable water for irrigation and stock (e.g. clogging of pumps).

The implementation of the ESCP will limit the effects of erosion and suspended solids on the downstream receiving environment.

Four key principles have been adopted in relation to the provision of E&SCs during the construction of the Project. These are:

- Minimise disturbance (both time and extent);
- Protect land surface from erosion;

- Prevent sediment from leaving the construction site; and
- Engage appropriate personnel.

Site-specific environmental factors such as topography, geology, soil composition, particle sizes and permeability have also been considered in the development of the draft ESCP (Volume 4 of this AEE report).

The soil composition throughout the Project length is predominantly composed of sands and gravels and so soil particle sizes are generally large and heavy when compared to that of silt and clay soils. On this basis retention practices such as decanting earth bunds and sediment retention ponds are expected to perform well.

To gain a rough indication of the proposed scale of environmental effects, the estimated sediment yield within each catchment due to construction, calculated using the Universal Soil Loss Equation (USLE), has been compared to the estimated sediment yield from the entire catchment (estimated using Water Resources Explorer New Zealand (WRENZ) model). When the percentage increase of sediment due to construction is assessed against that of the whole catchment, the percentage increase for the three waterways of significance is in the order of:

- 0.2% for the Waitohu catchment;
- 0.003% for the Ōtaki River catchment; and
- 0.1% for the Mangaone catchment.

Based on these findings, and providing that best practice is followed, the short term effects of land disturbance due to construction on the three waterways of significance is expected to be minor.

The USLE evaluation does, however, identify catchments that are much more sensitive to the effects of construction. In such locations particular attention will be required to limit sediment reaching the watercourses. The catchment areas sensitive to the effects of construction are summarised below:

- Te Manuao: Estimated 46% above baseline
- Andrews 1: Estimated 22% above baseline
- Andrews 2: Estimated 37% above baseline
- Cavallo: Estimated 80% above baseline

There are three main cuts on the Project and the Te Manuao and Cavallo catchments are both sensitive to construction because they each contain one of these large cuts. The Andrews catchments are sensitive to the effects of construction because the upstream catchment is very small and the disturbed areas account for 73% of the total catchment.

Of these, the Cavallo catchment in the Mary Crest area has been identified as being the most sensitive area to the effects of construction. For this reason this site has been selected as the subject of one of the SSEMPs (in Volume 4 of the AEE report). The SSEMP documents demonstrate the application of the methodologies and principles outlined in the ESCP, and provide confidence that the works can be constructed to ensure that environmental matters are appropriately managed.

The proposed Expressway will increase the volume of rainwater run-off from the new impervious surfaces. The potential effects, if not mitigated effectively, are an increase in stream erosion due to a permanent small percentage increase in stream flow and increases in downstream flood levels in large rainfall events.

These effects will be mitigated through the design of swales or attenuation ponds which will provide detention of the stormwater where appropriate.

The two locations where attenuation is not currently proposed are on the north and south banks of the Ōtaki River, where the discharge is to ground soakage and direct to the River

respectively. The effect is considered to be insignificant as the increase in flow and volume of water to the Ōtaki River is negligible compared to the flow in the river.

18.5 Road Surface Generated Effects

18.5.1 Contaminants from Road Surface

Pollutants generated by vehicles will accumulate on the road surface and then get washed off by rain. With no intervention, the pollutants will be washed into the surrounding environment, which could be the surrounding land but is often streams. The effect of these contaminants on a stream is small but cumulative.

The commonly-accepted mitigation for this is to remove the majority of the contaminants from the rainwater before it discharges to streams or reaches ground water (the receiving environment).

The proposed Expressway increases the area of trafficked surface and will, long-term, convey increased traffic volume. All run-off from the Expressway and new roads will pass through treatment devices that will filter out contaminants. Although swales meeting the NZTA design standards should remove 70 to 80% of suspended solids and a proportion of other associated contaminants on a long term average basis, they are not able to remove 100% of the contaminants. Nonetheless, swales are considered the best practicable option (BPO) for mitigation.

The BPO E&SCs will be implemented, maintained and monitored throughout the Project. Site soil conditions suggest that best practical option for mitigation ESC practices are likely to be highly effective, however (as normally occurs on any earthworks site) there will still be some small residual release of sediment. This residual effect is likely to be less than minor, but will be further assured by consent conditions requiring device inspection and ecological monitoring.

There is currently no formal treatment of run-off from the existing SH1 over the Project length. As the Project will transfer the majority of traffic from the existing SH1 to the proposed Expressway, where all of the run-off is treated, the overall levels of contaminants discharged to the receiving environment from the two roads combined is expected to reduce.

It is therefore considered likely that the Project will have a net positive effect on the environment, in terms of contaminants from vehicles entering the environment, although this is difficult to quantify with any certainty.

18.5.2 Increased Road Surface Runoff During Rainfall Events

On a green-field development (as the Project is) the existing ground is often pasture. When it rains, some of the water soaks into the ground and some is lost through evapotranspiration (by plants), leaving only a portion to run off the land into streams. The natural form of the stream reflects the amount of runoff from the land that naturally occurs.

When a road is built, the rain that falls on the pavement is unable to soak into the ground or be lost through evapotranspiration and virtually all the rain turns into runoff. This means that more water reaches the streams that the road crosses, often faster as a result of efficient drainage systems. This in turn increases stream erosion and changes the stream characteristics.

The effects of this are small but incremental. If the total catchment of a stream has less than 3% impervious surface then the stream is likely to be able to absorb the increase in flow without significant negative effects. However once this 3% threshold is exceeded, mitigation is required.

The usual mitigation for this is to provide storage areas that, during small rainfall events, can hold back water and release it slowly once the rain has passed.

In large storm events there is likely to be flooding in the natural system. The increased road runoff is likely to make this flooding worse (i.e. increased downstream flood levels), depending on timing effects.

Once again the effects of this are small but incremental. The usual mitigation for this is to provide storage areas that, during large storm events, can hold back water and release it slowly once the peak of the storm has passed.

18.6 Effects Associated with Waterway Crossings

18.6.1 **Increases in Upstream Culvert Ponding Levels (at Stream Crossings)**

The Project has more than 25 crossing points over waterways ranging in size from the Ōtaki River to minor land drains.

When a road crosses a drain, stream or river the waterway can be diverted, culverted, or bridged. When the waterway is bridged there is relatively little stormwater environmental effect (assuming the bridge is sufficiently wide and the bed is not unduly disturbed during construction). Diverting a waterway is typically only done to low ecological value land drains or where the alignment unavoidably runs near / parallel with a watercourse (which is not the case for the Project except over short lengths). The most common way for a road to cross a waterway is to culvert the stream.

A feature of culverts is that there needs to be a difference in water level between the upstream end and the downstream end for any water to flow through them. In large storm events this means that the level of the water in the stream has to build up to push water through the culvert. This increase in water level (and wetted area) can cause a negative effect on the adjacent upstream land or buildings. Ideally the culvert should be sized so that the increase in upstream water level will be kept within the road designation or within the natural banks of the stream. Sometimes this is not practicable and the increased water level is allowed to spread to rural land if the effect is deemed sufficiently minor.

18.6.2 **Removal of Existing Constrictions (at Stream Crossings)**

Existing roads and railways have existing culverts. When these roads are upgraded the culverts are often upgraded also. Typically the new culverts are bigger than the existing culverts (as levels of service rise and climate change is considered). This can mean that during large storm events water that was held back by the previously small culvert (acting as a constriction) is not held back by the new larger culvert.

This can mean that the peak flow in the waterway downstream of the upgraded culvert can be higher than it was previously. Depending on the magnitude of water that was previously impounded and the scale of the increase in peak flow, this can make existing downstream flooding worse.

One potential mitigation option is to keep the existing constriction in place. Alternatively, minor increases in flow may be tolerated if they are considered to have a minor effect.

Constrictions have been kept in place around the Ōtaki township, but not at the southern end of the Project area.

18.6.3 **Creating Barriers to Fish Migration (at Stream Crossings)**

If culverts are designed and constructed only considering the flood flow hydraulics, then barriers to fish passage can be inadvertently created. The potential effect of this is that fish will be cut off from their habitat, which leads to a decline in fish numbers.

The appropriate mitigation for this is to consider low flows and design the culvert such that native fish are able to swim into and through the culvert.

For all culverts, these effects have been fully mitigated by design. These culverts will feature rocky substrates in the culvert inverts, rock ramps or inverts depressed below stream bed levels so that native fish are able to swim into and through them.

18.6.4 Reduction of Existing Flood Storage (at Stream Crossings)

Where new roads (particularly roads on embankments) are built through existing flood areas, the embankment takes up volume that would previously be available for ponding of flood water. The effect is that the flood levels rise slightly. The amount the flood level rises by depends on the extent of the flood area and the volume that the road takes up below the water level. Generally speaking, the larger the flood area the smaller the effect.

One mitigation option is to excavate additional land within the flood area to offset the flood volume removed by the new road. Alternatively the effect on flood level may be shown to be insignificant by analysis (e.g. hydraulic modelling).

18.6.5 Summary of Effects Associated with Waterway Crossings

In summary the potential effects associated with waterway crossings are:

- Changes to the upstream flood levels outside of the designation;
- Changes to the peak flow that is discharged downstream;
- Changes in the waterway affecting the ability of fish to migrate; and
- Changes to overland flow paths in extreme events.

The 1% AEP (2090) flood flows (which include anticipated climate change effects) were established for all the small to medium-sized waterways, in accordance with KCDC requirements. Once characterised, the hydraulics of the existing situation were established using modelling software, and this data was used as constraints when modelling the future situation, to identify any upstream or downstream effects. Extreme 'super design' event flows (1.5 times the 1% AEP (2090) flood flow) were also modelled, to assess whether the road overtops and determine where the secondary overflow path would be. Provision for fish passage has been made at streams where there is a defined channel and a tributary network (consistent with the guidance in Technical Report 12 (Aquatic Ecology Assessment)). This has been achieved by embedding the culvert inverts below the stream bed level (to ensure the culvert contains water even at low flows) and providing for rock ramps or rocky substrate to be placed in the base of the culvert.

Detailed and summary schedules of culvert design (for a total of 34 culverts, including some associated with the major waterways) are contained in Technical Report 10, section 7.2.1. In the majority of cases, potentially adverse effects have been eliminated through culvert design. The following have merited special consideration:

- Gear and Settlement Heights Culverts (near Gear Road, approximately two kilometres south of Mangaone Stream). The Gear and Settlement Heights streams are within 300m of each other and, in flood conditions, create a shared pond inland of the NIMT embankment. The proposed Expressway embankment goes through this ponded area, and will result in a 300mm increase in the 1% AEP (2090) headwater pond level. This is potentially significant for a farm building that is already in this flood zone, which will be subject to a greater depth and frequency of flooding. The effects on this farm storage building will be resolved through negotiations with the land-owner and may include raising or relocation of the building, bunding or compensation. If agreement cannot be reached the effect of the Expressway on this property is considered minor-moderate.

- Jewell and Cavallo Culverts (close to and south of Mary Crest). The Jewell culvert is significant as it will be downstream of existing SH1 and NIMT culverts. The proposed culvert needs to have sufficient capacity so as not to affect the flows through the existing upstream culverts (which could cause an increase in flood level). This has been achieved by limiting the water level on the upstream side of the culvert by design. In a super design event (1.5 times the 1% AEP (2090) flood flow) the height of the water will increase, encroaching onto the shoulder and first lane of the Expressway, as it flows overland into the adjacent Cavallo catchment. The flow rate is expected to be in the order of 1 to 4 m^3/s and last only in the order of 15-30 minutes.
- Kumutoto Culvert (at chainage 11600m). This culvert will replace an existing culvert under SH1. The culvert is being made larger, which will result in a reduction in the upstream flood level (of approximately 1m) and increased flows downstream (in the order of half a percent during the early part of a flood event.

18.7 Attenuation of Road Run-Off

The proposed Expressway will replace existing pervious surfaces. During rainfall events, the rain that falls on the pavement is unable to soak into the ground or be lost through evapotranspiration from plants, and virtually all the rain turns into run-off. This means that, in the absence of suitable mitigation measures, more water reaches the waterways that the road crosses, and the flows often arrives faster as a result of efficient drainage systems. This has the potential to increase stream erosion and change the character of the smaller waterways; in large storm events there is likely to be flooding in the natural system and increased road run-off may make this flooding worse.

Both NZTA and KCDC design standards require attenuation of peak stormwater flows prior to discharge in order to avoid downstream effects on flooding and channel morphology. KCDC refers to this as "hydraulic neutrality", meaning that areas outside the site of works should not experience any increased flood risk. The usual approach is to provide storage areas that can hold back water and release it slowly once the rain has passed. As the majority of the Project passes through a rural landscape, there is room to provide wide swales that serve as collection, conveyance, treatment and attenuation devices. Swales are vegetated areas designed to remove contaminants from stormwater run-off, with attenuation provided through the use of internal bunds.

Attenuation swales are proposed to be used along approximately 55% of the Project route to collect, convey, treat and attenuate the rain water that runs off the road surface. These swales are wider than conventional treatment swales, and contain plant species appropriate to a wet environment.

Attenuation swales have been designed to hold up to the full run-off arising over a 24 hour period from a Q_{100} storm event (including climate change). That is, the peak flow for a storm event with an average return interval of 100 years (also referred to as an event with 1% AEP (2090)).

There are three exceptions to this:

- Discharges to the Mangapouri Stream, immediately north of Ōtaki. At this location, there are a number of sources of stormwater in addition to the proposed Expressway, and there is insufficient space for attenuation swales. Therefore two attenuation areas are proposed being: the Railway and Kennedy Wetlands (operating together) and the Taylor Basin. The level of attenuation at this location has been designed to attenuate the resulting stream flows to their pre-existing levels. This system has been modelled to show that existing flooding is not made worse by the Project.
- Discharges in the vicinity of the Ōtaki River Bridge. Stormwater arising north of the Ōtaki River Bridge (behind the stopbank) will be discharged to ground soakage at an existing area between the rail embankment and the proposed Expressway. This

soakage area is relatively large and soakage conditions are considered to be favourable, but there is also the option to construct a shallow trench through the topsoil layer to improve the discharge of water to the extensive sand and gravel layers below if required. Stormwater arising south of the Ōtaki River Bridge will discharge directly to the River. No peak flow attenuation is required for either of these discharges. Stormwater arising from the road bridge will be conveyed by pipes either to the north or south banks, for treatment and discharge as described above.

- Discharges around Mary Crest. At this location there is insufficient space for attenuation swales, therefore an attenuation basin (Valentine Basin) is proposed to attenuate the discharge to the Jewell Stream.

18.8 Treatment of Contaminants in Road Run-Off

Contaminants generated by vehicles, such as brake pad dust, rust, oil and coolant leaks, and exhaust discharges, will accumulate on the road surface and then get washed off by rain. With no intervention, the pollutants will be washed into the surrounding environment including surrounding land and streams. The effect of these contaminants on a stream is small but cumulative.

The BPO approach to managing road-derived contaminants in stormwater is to remove the majority of the contaminants from the rainwater before it discharges to streams or reaches groundwater. The water quality volume adopted (upon which devices are designed and sized) was the 90th percentile storm, i.e. the storm for which 90% of all rainfall events will be smaller. This value varies along the length of the Project from 17.5mm to 20mm over 24 hours; a value of 19mm was adopted throughout the length of the Project, which was then increased to allow for climate change effects.

Swales were chosen as the appropriate devices to provide both treatment and attenuation as described previously. Treatment occurs as stormwater moves through the vegetation, where contaminants are removed by filtration, infiltration, absorption and biological uptake. The swales were designed to meet the design criteria (such as residence time, maximum flow velocity and maximum depth) that is expected to remove at least 70% of suspended solids (and the other contaminants bound to the solids) from the discharge.

As the majority of the swales designed for this Project are also attenuation swales, the water is likely to be in the swale for longer than the minimum required, and thus the percentage of solids (and contaminants) removed is likely to be higher.

18.9 Overall Summary of Effects

The Project will have a net positive effect on contaminant levels entering the environment, has minimal effects on flood levels and includes proposed culvert details that allow for fish passage.

The potential stormwater effects of the Project have been identified using a range of information sources including site conditions and constraints through site visits, geo-technical investigations, hydrological assessments, and topographical assessments.

Through the use of swales and attenuation basins the Project successfully minimises the potential adverse stormwater effects. This is in compliance with industry best practice. Where effects are not fully mitigated the residual effects have been assessed. All new roads will be treated, using principally swales or wetlands, however attenuation is proposed for only about 55% of the route length.

The following table gives a brief summary of effects, mitigation and residual effects.

Table 18-1: Summary of Effects, Mitigation and Residual Effects

Item	Potential effect	Mitigation through design	Residual effect
Contaminants	Contaminants (brake pad dust, tyres, paint, lubricating oils, exhaust fumes, coolant and oil leaks etc) collecting on the road and washing into the environment.	The proposed new roads are all designed to drain to swales[37] or other treatment devices. The swales filter out the majority of pollutants that the rainwater collects as it runs off the road.	Although the swales can meet the NZTA design standards, they will not remove 100% of the pollutants. This is not practically or economically achievable with current technology. If the Expressway and the existing SH1 are considered together, then this Project has a net positive effect on the amount of pollutants reaching the receiving environment. This is because the majority of existing traffic (associated with the contaminants' generation) will stop using the existing SH1, which has no formal road runoff treatment, and will use the Expressway, all of which will have formal road runoff treatment.
Increased runoff – stream bank erosion (in small frequent rainfall events)	An increased volume of rainwater runs off the new impervious surfaces, as none is lost via soakage or evapotranspiration. Potential increase in stream erosion due to a permanent small percentage increase in stream flow.	International research shows that this effect is only significant if the catchment imperviousness is over 3% (which is not the case for the majority of this Project[38]) However, because it is easy to achieve, the current design proposal provides for extended detention to be provided at all locations (except where discharging to the Ōtaki River or to ground)	None, fully mitigated. The relevant standard is exceeded.

[37] "Swales" are shallow channels (usually grass-lined) through which road runoff receives treatment as it percolates through foliage. "Attenuation swales" provide storage and peak-flow attenuation in addition to treatment.

[38] Refer to Appendix 3 for an assessment of catchment imperviousness.

Item	Potential effect	Mitigation through design	Residual effect
Increased runoff – flood mitigation (in large storm events)	As above, increased runoff due to increased impervious surfaces. Potential increase in downstream flood levels in large rainfall events.	The swales we have designed to provide treatment also provide attenuation for over half the Project length. For the rest of the Project: – the road catchments that discharge to the Ōtaki River or to ground are not attenuated, and – for the remainder, attenuation basins have been included.	No residual impact for all storms up to the Q_{100} event. Whilst no attenuation of storm flows is proposed for areas discharging to the Ōtaki River, the effect on the river is deemed to be insignificant.
Constrictions introduced	By culverting streams, constrictions to flows are introduced. The effect is that water can pond upstream of the culvert. This increase in water level can have a negative effect on adjacent land or buildings	The culverts are designed so that the upstream ponding does not affect upstream flooding levels outside of the designation. We have been able to do this in all cases with the exception of the Gear/Settlement Heights culverts.	Due to downstream constraints, we have not been able to eliminate the effects of increased ponding depth at the Gear/Settlement Heights culverts. The residual effect at those culverts is that the Q_{100} flooding level in the area will increase by approximately 300mm and potentially a farm building would be adversely affected to a greater level than currently.
Constrictions removed	By replacing existing culverts with larger new culverts. The potential effect of this is to allow a greater flow of water downstream in a storm event. This may make existing flood problems worse.	This is difficult to mitigate through design. The only thing that can be done is to keep the existing constriction in place. This might compromise levels of service. Constrictions have been kept in place around the Ōtaki township, but not at the southern end of the Project.	Of the two constrictions that have been removed: one has an additional existing constriction (which is not being removed) just upstream so there is no increase in flow; the other has been assessed to have only impounded a very small amount of water, so the increase in flow is deemed to have a negligible effect, if any, on downstream flood levels.
Extreme (i.e. super-design) event flows	In a storm event greater than the 100 year ARI design event, available Expressway culvert freeboard may be "used up" and the Expressway may overtop. Culvert headwater pond depth and extent may increase, and overland flowpaths may be diverted.	An extreme event (defined as 1.5 times the 100 year ARI storm flow plus climate change) was modelled for each culvert to ascertain whether the Expressway overtops, and the likely location of the overflow path.	Some short-term inundation of the Expressway; some increased depth and extent of culvert headwater ponding (depth increase generally limited to "consumption" of the 500mm culvert freeboard before overtopping occurs); and some diversion of overland flows. Note that this low-probability event lies outside the Project design brief, and therefore some level of effects must be expected. It has been evaluated to ensure that the potential effects are not catastrophic.

Item	Potential effect	Mitigation through design	Residual effect
Fish passage	Introducing culverts into streams can create barriers to fish migrating. The potential effect of this is that fish will be cut off from their habitat which leads to a decline in fish numbers.	We have designed the culverts such that native fish are able to swim into and through them. Fish passage features includes: introducing rocky substrate to culvert inverts, rock ramps, and very importantly, setting downstream inverts below low flow ponding levels.	None. Fully mitigated pending attention to detail during construction.
Loss of flood plain storage	By road embankment occupying volume in an existing flood plain. The potential effect is increased flood levels.	This can be designed out by altering the route of the road, or offset by creating new flood storage areas where there is land available in the appropriate location.	Altering the proposed road alignment or providing new flood areas has been deemed impracticable in this case. Instead at several locations the effect has been modelled and found to be minor (see Technical Report Nº 9)

Chapter 19

Part G

VOLUME 2

Terrestrial Ecology

Overview

The Project passes through a landscape that has been highly modified by agriculture, and to a lesser extent horticulture, viticulture and urbanisation. The choice of Expressway alignment has avoided the most significant ecosystems, in particular a significant area of native bush and associated wetland at Mary Crest.

The majority of the Project footprint impacts upon a highly modified landscape supporting little or no indigenous vegetation and no significant habitat of indigenous fauna. The areas of indigenous vegetation and habitats of indigenous fauna impacted by the Project's alignment is the Ōtaki Railway Wetland, that is largely lost to the Project footprint and the edges of several remnants of native bush, with a total area of approximately 0.5ha lost. These are considered to be moderate effects and will require mitigation to compensate for the loss.

The loss of 0.5ha of the Ōtaki Railway Wetland will be offset by the creation of two new areas of indigenous vegetation (total area approximately 1.5ha). The loss of bush habitat will be compensated either by planting new areas of bush or protecting an existing area of bush that is threatened by on-going degradation. Mitigation will achieve the "no-net-loss" in biodiversity objectives contained within the Proposed National Policy Statement on indigenous biodiversity and the NZTA's Environmental Plan.

No threatened or at-risk terrestrial or wetland species of flora or fauna were identified along or immediately adjacent to the Project footprint (whose populations could be materially affected by the Project).

No species-specific mitigation is necessary for threatened or at-risk species. Recommendations have been made concerning minimising impacts on one non-threatened species, peripatus (velvet worm). This has been proposed as a precaution due to the taxonomy of the species being under review, which could result in new species being identified. The risk of material adverse effects on these animals is considered to be negligible.

Overall it is considered that with proposed mitigation measures and offsets undertaken, the effects of the Project on terrestrial ecology will be minimal and acceptable and that "no-net-loss" in ecological values will be achieved.

19 Terrestrial Ecology

19.1 Introduction

This chapter summarises the effects of the Project on terrestrial, wetland and riparian ecosystems.

This chapter covers the following:

- a description of the terrestrial, wetland and riparian habitats, and their associated flora and fauna;
- an assessment of the ecological values of the habitats and species potentially affected by the Project;
- details of the nature and scale of the Project's actual or potential adverse effects, and the likely significance of those effects; and
- details of such measures that are necessary to avoid, remedy, mitigate or offset effects.

The following methods and sources were used to identify the existing environment and the potential effects of the Project:

- review of existing background information relating to the Project and Project Corridor including: project plans, existing ecological reports and databases, aerial photographs, the operative and proposed KCDPs and the PRPS;
- vegetation survey;
- wetland condition assessment;
- bird survey;
- bat survey;
- reptile survey; and
- invertebrate survey.

A survey for native frog was not undertaken as the Project passes through an area that is located outside the known range of all native frog species.

The summary is based on the following report:

- Peka Peka to Ōtaki Expressway: Terrestrial Ecology (Technical Report 11).

This technical report is included in Volume 3 of this AEE report.

19.2 Existing Environment

The Project passes through a landscape that has been highly modified by agriculture, and to a lesser extent horticulture, viticulture and urbanisation. The birdlife found in the Project area is typical of a farmland with fragments of native bush and wetland supporting diverse communities of common native and introduced species. Most of the Project affects areas that support no indigenous vegetation and are likely to be of limited value as habitat for indigenous fauna. There are however a small number of features of ecological significance impacted by the Project, as outlined below.

19.2.1 Habitat Features of Recognised Ecological Significance

Part I of the operative KCDP contains the Heritage Register. Table E of the Heritage Register lists ecological sites (areas of significant indigenous vegetation and significant habitat of indigenous fauna). Many of these sites were taken from ecological site surveys and assessments undertaken by Wildland Consultants Limited[39]. The sites are ranked as being of international, national, regional or district significance. Table 19-1 below details the sites listed in the Heritage Register that are affected by the Project and their level of significance.

Table 19-1: Ecological Sites Listed in the KCDC Heritage Register

Site Name	Description	Ranking
K134 – Ōtaki Railway Wetland (see Map 1)	Small wetland. Grazed in part. *Raupo Typha orientalis* abundant. Threatened by plant pests.	District significance
K038 – Hautere Bush F (see Map 2)	Totara-matai forest. Grazed beneath and lacking an understorey.	District significance

[39] Wildland Consultants Ltd., 2003. Kāpiti Coast District Council: 2002-2003 Ecological Site Surveys. Contract Report No. 662.

Site Name	Description	Ranking
K037 – Cottle's Bush (see Map 2)	Totara-titoki-matai forest. Recovering from grazing.	District significance

19.2.2 Proposed Kāpiti Cost District Plan

The proposed KCDP was notified in November 2012.

In addition to sites listed in the operative KCDP Heritage Register, areas supporting native flora and fauna present along the alignment have been added to the Heritage Register of the proposed KCDP, being:

- An area of indigenous forest on the Steven's Property (48 Old Hautere Road) - a significant and relatively species-rich under-represented habitat. The bush covers a small area but is fenced and supports a well developed sub-canopy.
- An area of indigenous forest and wetland at Mary Crest has also been included in the proposed KCDP. This would have been significantly impacted by the alignment as it was originally proposed in the early stages of the Project, however the road was subsequently re-aligned to avoid this area.

19.2.3 Unregistered Sites Supporting Indigenous Vegetation

Additional areas supporting native flora and fauna present along the alignment have also been identified that are not listed under the operative or proposed KCDPs, as described below:

- An area of damp pasture to the south of the Mary Crest bush-blocks supports some native plant species; however, given the high degree of modification and the general dominance of exotic species these pastures are not considered to be of ecological significance.
- Native trees in the paddocks immediately to the south of Ōtaki Gorge Road and immediately to the north of Te Kowhai Road will be directly affected. The trees are of some interest in the context of the local landscape given the general low incidence of mature native trees. However, these trees are not part of functioning ecosystems and cannot be considered to represent significant indigenous vegetation or significant habitat of indigenous fauna.

Table 19-2 below contains an assessment of the significance of these unregistered sites. Their significance has been assessed using the criteria set out in the PRPS and section 8.3(c) of the operative KCDP.

Table 19-2: Assessment of Unregistered Ecological Sites

Site	Significance	Reasons
Mature native trees within pasture situated between Hautere Bush F and Cottle's Bush	Not significant	Significantly degraded ecosystem that will continue to decline without protection. No sub-canopy and pasture beneath canopy. Not a functioning or sustainable ecosystem. However, mature native trees take generations to replace and therefore they still have modest ecological value in the context of the local landscape.
Mature native trees dispersed through pasture adjacent to Cottle's Bush	Not significant	As above.

The locations of the registered and non-registered sites within the Project area are included in Technical Report 11 and shown on the plan set in Volume 5.

The inclusion of sites in the Heritage Register does not change the assessment of values, effects or the proposals for mitigation.

Ōtaki Railway Wetland, Hautere Bush F and Cottle's Bush are all examples of under-represented habitats i.e. <30% of their original extent remains, and are sufficiently intact to be considered examples of significant indigenous vegetation. This assessment therefore concurs with the original assessment made by Wildland Consultants Ltd that these sites are significant. However, while they meet the test of significance, the values of all these habitats have been impacted by human activity. In particular, the integrity of Hautere Bush F has been historically impacted and continues to be impacted by grazing. Cottle's Bush, while having a more developed sub-canopy, also shows signs of historic grazing pressure i.e. discontinuous age structure. In the case of the Ōtaki Railway Wetland, while it is dominated by native wetland plants, its current state has been substantially influenced by the interventions of man.

19.2.4 Riparian Vegetation

Riparian vegetation consists predominantly of grazed grass and willows. There is almost no naturally occurring native vegetation along any of the waterways where they are crossed by the Expressway, apart from the native species that have been planted along the edge of the Mangapouri Stream where it passes through the Pare-o-Matangi reserve in Ōtaki. None of the riparian vegetation encountered along the alignment is considered to be significant indigenous vegetation or significant habitat of indigenous fauna.

19.2.5 Ōtaki Railway Wetland

Native wetland plant species dominate the vegetation in the Ōtaki Railway Wetland. The wetland also supports a variety of introduced plant species and weed species.

A wetland condition assessment for the Railway Wetland scored 13.3/25 which reflects a high degree of modification. The pressure rating for the wetland scored 25/30 representing a high degree of pressure from sources such as weed invasion, nitrogen inputs and predators. These pressures are highly likely to lead to future degradation in the absence of management.

Wetlands are nationally and regionally under-represented and most remaining wetlands supporting a high proportion of native vegetation still constitute significant indigenous vegetation and indigenous fauna, as does this wetland. However, when considering the effects of the loss of this wetland it must be acknowledged that it has been highly modified and its current state and condition have largely been determined by significant interventions by man, i.e. impeded drainage caused by the NIMT and SH1 embankment. It should also be recognised that it will suffer significant on-going pressure that may lead to further degradation due to the highly modified nature of the catchment and its small size.

19.2.6 Species of Ecological Significance

The following is a summary of the habitat and species survey results within the Project area:

- No threatened plant species were recorded in areas affected by the Project. The effects on populations of individual plant species as a result of the Project are expected to be less than minor.
- No threatened bird species were recorded during the walkover survey, or are likely to be significantly affected by the Project given its location and the paucity of suitable habitats present. Effects on bird populations resulting from the Project are expected to be less than minor.

- No bats were recorded at any of the survey locations along the alignment. While a nil result does not necessarily prove that bats are not present, it is considered that the effects of the Project on bats, if any, will be less than minor.
- No threatened reptile species were recorded during the survey. This result supports the assessment of the habitat potential of the land affected by the Project as being low for threatened reptile species. The effects of the Project on individual reptile species are therefore expected to be less than minor.
- No threatened invertebrate species were recorded by the invertebrate survey. This is not surprising given the modified nature of the habitats affected by the Project. The effect of the Project on the populations of individual species of invertebrates is therefore expected to be less than minor.

19.2.7 **Māori Perspective on Ecological Values**

At a meeting and site visit held on Friday 29th July 2011 ecological issues of importance to iwi were discussed. The Railway Wetland in Ōtaki was of significant interest being of importance from an archaeological and cultural perspective, as well as ecological. The possibility of recreating the wetland as mitigation was discussed, as was the possibility of 'capturing' the source of the spring located in the northern part of the wetland.

One solution discussed was to preserve the source of the spring in its current location, creating a wetland or riparian zone alongside the Expressway following the existing "natural" flow path. Rehabilitation and planting this area with wetland plants would then be undertaken along this flow path creating a narrow wetland strip/riparian zone. This treatment is essentially the treatment envisaged for the remnant of the Railway Wetland (Map 5).

To offset the residual loss of the Railway Wetland in Ōtaki one of the options discussed was the incorporation of ecological values into stormwater wetland ponds. This is essentially what is now being proposed in creating the Kennedy Wetland in Ōtaki (Map 5) where a stormwater attenuation pond will be designed to incorporate biodiversity values. An additional area of wetland is to be created adjacent the Mary Crest Bush (Map 6). The primary function of this wetland is biodiversity offset. The design principles to be followed in developing biodiversity values of these wetlands have been included in the draft Ecological Management Plan submitted to the EPA. However, further inputs from iwi will be sought before completion of the final detailed designs.

Bush to the west of the Railway Wetland (beyond the Expressway) was considered very significant and it is understood that iwi are working with Tim Park at GWRC to look at enhancement/fencing opportunities. This area is not impacted by the Project.

Avoiding the bush and wetland at Mary Crest was viewed as a very positive step for the Project to have taken. There was also recognition that the Project has brought the area to the attention of iwi and other stakeholders. Iwi are keen to pursue protection and enhancement of the area with the land owner and other stakeholders. The proposed creation of offset wetland in this area will further enhance the ecological values of this area.

The treatment and water quality enhancement opportunities provided by stormwater wetland ponds are of significant interest to iwi and seen as a positive potential enhancement that the Project can provide.

Iwi also generally support efforts to minimise loss of bush from other sites along the alignment. Where native trees are unavoidably lost, recovery of timber for carving or other traditional uses is advocated.

19.2.8 **Summary of Existing Environment**

Most of the Project footprint affects a highly modified landscape supporting little or no indigenous vegetation and no significant habitat of indigenous fauna. There are however a few areas of indigenous vegetation and habitats of indigenous fauna impacted by the alignment. There is one significant area of wetland located in Ōtaki (the Railway Wetland) that is largely lost to the Project footprint. In addition, the edges of several remnants of native bush will also be impacted by the footprint with a total area of approximately 0.5ha lost. One significant area of bush (and a nearby wetland) at Mary Crest would have been significantly impacted by the alignment as it was originally proposed in the early stages of the Project, however the road was subsequently re-aligned to avoid this area of bush and wetland.

19.3 Assessment of Effects on Terrestrial Ecology

19.3.1 **Positive Effects**

While it is often possible to avoid sites of ecological significance by designing alignments to bypass certain habitats, net positive gains that are a direct consequence of building a road are rare. It is, however, possible to achieve "no-net-loss" of habitat and associated ecological values by avoiding, remedying and mitigating adverse effects.

The Expressway was initially designed to pass through the Mary Crest bush and wetland, however the route has been refined and this significant area has been avoided. While the avoidance of Mary Crest is not in itself a positive benefit of building the Project, the need to consider the effects of the Project on this site has highlighted the ecological importance of an area that was previously not recognised in the District Plan Heritage Register and was largely unknown by local people. The increased knowledge of the ecological characteristics and values of Mary Crest is a positive benefit that has occurred as a result of the studies undertaken to support the designation of the Expressway.

19.3.2 **Habitat Loss**

Table 19-3 below specifies the habitat losses to the Project footprint from ecological features along the alignment and also describes the significance of the effect. As there is no significant indigenous vegetation along the riparian margins of rivers and streams, and no "at risk" or "threatened" terrestrial species that have significant associations with the affected riparian margins, the effects on riparian habitat are considered to be negligible.

Table 19-3: Summary of Habitat Losses and Significance of Effect

Site	Habitat Loss	Significance of Effect
K134 – Railway wetland (adj. railway Ōtaki)	Most of wetland (0.5ha ot 0.8ha in total) lost to the footprint.	Habitat has been determined as significant in terms of section 6(c) of the RMA and Policy 22 of the PRPS. More than minor effect due to large scale of loss. An effect of moderate rather than major significance given the modified condition of the wetland.
Mature native trees in paddock adjacent to south of Ōtaki Gorge Road.	Small number of mature native trees lost.	Less than minor effect. Not significant indigenous vegetation or habitat of indigenous fauna and small number of trees involved.
K038 – Hautere Bush F	Between 40 and 60 mature native trees lost from the	Vegetation has been determined as significant in terms of section 6(c) of the

Site	Habitat Loss	Significance of Effect
	western edge of the bush.	RMA and Policy 22 of the PRPS. More than minor effect due to number of trees lost. An effect of moderate significance due to the modified condition of the habitat and the fact only a small proportion of the site is impacted.
Mature native trees situated between Hautere Bush F and Cottle's Bush	Approximately 20 mature trees lost from the edge.	Minor effect due to relatively low value of the stand of trees and scale of effect.
Mature native trees adjacent to Cottle's Bush.	Approximately 12 native mature trees lost to footprint.	Minor due to relatively low value of the stand of trees.
K037 - Cottle's Bush	A few mature trees lost from extreme western edge.	Vegetation has been determined as significant in terms of section 6(c) of the RMA and Policy 22 of the PRPS. Minor due to very small scale of effect.
Indigenous forest and wetland at Mary Crest	Road realigned to avoid. No habitat loss.	Effects avoided.
Indigenous forest on the Steven's Property (48 Old Hautere Road)	Approximately 15% of the bush lost from the eastern edge	Vegetation has been determined as significant in terms of section 6(c) of the RMA and Policy 22 of the PRPS. Alignment modification has reduced loss of habitat. More than minor effect due to relatively high value of site. Effect of moderate significance.
Mature kahikatea in paddock to north of Te Kowhai Road.	Four mature kahikatea trees lost.	Less than minor effect. Not significant indigenous vegetation or habitat of indigenous fauna and small number of trees involved.

The cumulative area of native forest that will be lost from sites determined to be significant in terms of section 6(c) of the RMA and Policy 22 of the PRPS (Hautere Bush F, Cottle's Bush and bush on the Steven's Property) is approximately 0.5ha.

More than half (c.0.5ha) of the Ōtaki Railway Wetland (total area c.0.8ha) will be permanently lost to the footprint. The remaining area of wetland (c.0.3ha) is at risk of significant disturbance during the construction period. However, the modified nature and pressures from weed species that already exist along the remaining edge mean that intervention would be required to create a higher quality habitat than already exists regardless of how much impact the road construction has.

Outside of the areas determined to be significant in terms of section 6(c) of the RMA and Policy 22 of the PRPS mature native trees will be lost from a number of locations along the Expressway. The cumulative total number of mature trees lost from these areas will be about 40.

19.3.3 **Hydrological Effects on Mary Crest Bush and Wetland**

Wet pasture occurs to the south of the Mary Crest bush and wetland. There is also a drain that flows from east to west along the southern edge of the bush/wetland. This drain then converges with a stream that flows west through the wet pasture. Observations of

the surface drainage within the pasture indicate that there is no surface connection between the pasture and the bush/wetland. There are likely to be ground water connections between the wet pasture, surface drainage within the pasture and wet areas within the Mary Crest bush area. While the Expressway construction will involve a diversion of the Edwin Stream the surface water flow volumes into the wet pasture area are expected to be similar post-construction to those that exist at the present time. With regard to the impact of the Expressway on ground water levels to the west of the new road, it is not expected that there will be any significant long-term effects that may be detrimental to the Mary Crest wetland and swamp forest i.e. permanent lowering of ground water levels.

19.3.4 **Habitat Fragmentation**

It is considered that very little habitat fragmentation, i.e. the effects of breaking areas of habitat into smaller areas principally by severance, will result from the proposed alignment.

19.3.5 **Edge Effects Resulting from Tree Removal from the Edges of Bush Habitat**

Where trees and shrubs are cleared from the edge of areas of bush, the exposed trees can be more prone to wind-throw. Further, where a sub-canopy or ground cover is present this is likely to be more prone to desiccation. This is particularly the case in exposed coastal areas. The magnitude of edge effects is difficult to predict given the variability in the resilience of vegetation in a given location to wind effects and the variable nature of weather patterns.

A number of locations along the Expressway will require removal of mature vegetation from the edge of stands of bush assessed as being significant (Hautere Bush F, Cottle's Bush and bush on the Steven's Property) thus exposing trees that may be more susceptible to wind damage. Trees will be removed from the western edges of Hautere Bush F and Cottle's exposing them to prevailing winds. In the case of Hautere Bush F the main concern is wind-throw of remaining mature trees. Effects on the sub-canopy and ground cover are not a significant concern as grazing by cattle has largely removed these layers. It is important to note that in the context of this location edge effects are much less of a threat to the remaining habitat than the on-going grazing pressure.

In the case of Cottle’s Bush, although the sub-canopy and ground cover layers are sparsely vegetated there is some regeneration occurring in this habitat. Desiccation effects on sub-canopy and ground cover species could therefore be an issue in addition to the risk of wind-throw of mature trees. However, the length of exposed edge in this location will be a maximum of 40m, which is a small proportion of the total edge seaward facing edge of the bush.

The exposed edge of bush on the Steven's Property will be facing east, away from the prevailing winds and therefore edge effects should be less than those associated with a west facing edges. However, there are still risks of wind-throw and desiccation which could compound the habitat loss effects in these locations. Furthermore, species such as peripatus are highly susceptible to desiccation.

Overall, edge effects at these locations are unlikely to be major issues but there are risks of some additional damage to the remaining habitat. Measures to minimise these effects will be incorporated into the design, e.g. planting a wind break of fast growing, wind-tolerant species.

19.3.6 **Effects on Individual Plant Species**

No populations of individual species of plants are expected to be significantly impacted by the Project. No avoidance, remediation or mitigation is therefore necessary for individual plant species.

19.3.7 **Effects on Individual Fauna Species**

No populations of individual species of fauna are not expected to be impacted in a major way by the Project. However, there could be some minor effects on the population of peripatus that inhabits the native bush on the Steven's property (Map 4). Peripatus inhabit rotting timber in cool, damp shady environments. Some of the rotting logs where peripatus were found at the Steven's Property are close to the Project footprint where there will be loss of native trees and shrubs along the edge of the bush. As well as loss of shade trees, which could result in desiccation of the logs, it is also possible that the logs may be directly affected.

While individuals of the *Peripatoides novaezealandiae* complex are not classified as threatened or at risk, the taxonomy of peripatus in New Zealand is currently under review.

Currently, five peripatus species from two genera are recognised, however it is possible that there may be as many as 25 separate species amongst those currently classified as five species (Gleeson & Ruhberg, 2010). Given the isolated nature of such remnant populations and the likelihood that a more extensive complex of species may exist than is currently recognised, it is recommended that populations such as at the Steven's property remain in situ (in this case within the remaining area of bush), to maintain genetic integrity until more is known of their taxonomy.

Measures are proposed in section 19.4.2 of this AEE report to minimise the impact on the peripatus in this location. These are the only mitigation measures that are considered necessary for individual species of fauna likely to be affected by the Project.

19.3.8 **Direct Effects on Wildlife Resulting from Construction Activities and the Provisions of the Wildlife Act 1953**

The nature of site clearance activities prior to construction (i.e. vegetation removal and soil stripping) means that there is a risk that some animals to which protections in the Wildlife Act apply could be killed in the process. The groups of animals at risk along the alignment are common non-threatened young native birds (in the nest during the breeding season) and non-threatened reptile species. Even if the construction of the road results in the loss of some individuals from populations, this is likely to be an insignificant proportion of the total populations of species given their population size. Consequently, the effects on the populations of the species potentially impacted are expected to be less than minor.

Given that effects on the populations of these species are insignificant there is no necessity to avoid, remedy or mitigate effects under the provisions of the RMA. However, the provisions of the Wildlife Act still apply to any killing of protected wildlife, even non-threatened species. A permit is therefore likely to be required from the Director-General of Conservation to undertake site clearance works in advance of construction which may kill individuals of a native bird or reptile species. The requirements that will need to be met for the granting of the permit will need to be ascertained from the Director-General of Conservation prior to the start of construction when permits are applied for. It is however expected that Director-General of Conservation will take into account the expected insignificant effects on the populations of the species that could be affected in determining the conditions which may accompany the granting of the permit.

19.3.9 Effects of the NIMT Realignment

Since the re-alignment of the NIMT will affect only highly modified habitats i.e. pasture, rush pasture and patches of blackberry with no associated flora and fauna species of conservation significance, it is not expected that it will have any significant ecological effect on terrestrial or wetland ecosystems. Overall, the effect of the NIMT on terrestrial ecology is expected to be insignificant.

19.4 Measures to Avoid, Remedy or Mitigate Actual and Potential Adverse Effects

19.4.1 Avoidance of Effects

The Expressway design has taken account of the need to minimise effects on features of ecological value along the alignment. In the case of Mary Crest the route has been realigned to avoid the bush thereby avoiding both habitat loss and habitat fragmentation effects. This measure has significantly reduced the overall effect of the alignment on terrestrial ecosystems.

In other locations along the Expressway where the edges of native bush have been impacted, every effort has been made to minimise the intrusion of the footprint into these areas, although some residual loss could not be completely avoided. In the case of the Ōtaki Railway Wetland, this habitat could not be avoided and more than half of the area will be permanently lost. Where loss of habitat could not be avoided offset mitigation has been proposed to compensate for this loss (refer to Section 19.4.2 of the AEE report).

19.4.2 Mitigation Measures

Protection of Bush Edges from Wind-thrown and Desiccation

Where mature native trees are removed from the existing edges of bush wind breaks should be planted along the edge to provide protection. These should be dense plantings of early succession, wind tolerant species e.g. ngaio, kanuka, wineberry, *Pittosporum tenuifolium* and *Coprosma repens*. It is important that these are locally sourced from the coastal zone to ensure that they are genetically adapted to salt and wind tolerance. Ideally the wind break should be at least 10m wide. Where there is limited room within the designation to plant on the flat the embankments of the road should be planted.

Peripatus

If the footprint is likely to directly affect logs inhabited by peripatus at the Steven's property, or if the logs are likely to be exposed to desiccation due to the removal of tree cover, these should, with the land owner's permission, be moved further into the bush. In addition, placement of a few sections of wood from trees felled along the Expressway within the remaining bush adjacent to existing rotting timber currently inhabited by peripatus would provide future habitat for the species as they start to decay.

Wetland Rehabilitation and Creation

Approximately 0.3ha of the existing Ōtaki Railway Wetland will remain once the Expressway has been constructed (see Map 5). This residual area of wetland will continue to receive water from the catchment during rain events and ground water seepage in the north eastern corner of the wetland which will not be covered by the Project footprint. This remaining wetland is expected to be permanently wet, with water draining out via culvert from its southern extremity. The wetland remnant will be rehabilitated following construction. This rehabilitation will include re-contouring as necessary, removal of weed species and replanting with the species currently found in the wetland.

To offset the loss of wetland habitat it is proposed to create two new areas of wetland. The Kennedy Wetland (c.0.4ha – see Map 5) and a new area of wetland adjacent to the Mary Crest bush (c.0.7ha – see Map 6). The cumulative area of these two wetlands is c.1.1ha. The Kennedy Wetland will receive water from outflow of the remnant of the Ōtaki Railway Wetland. This is expected to provide permanent flow through the Kennedy Wetland and keep this wetland permanently wet.

It is proposed to create the new area of wetland adjacent to the Mary Crest bush in an area that is currently damp pasture. The area is low-lying and the plant species present indicate high water content in the soil. It is proposed to increase the wetness of the area by digging down into the water table. By doing this it is expected that conditions will be created where native wetland plant species can be introduced and wetland habitat created. The area where it is proposed to create the wetland does slope gently from east to west. Consequently a low bund with impermeable lining may be required around the western edge of the wetland to assist in water retention. A weir is likely to be required to control water outflow from the wetland.

Exact replication of the existing vegetation communities within the Ōtaki Railway Wetland within the new wetlands is not a realistic objective due the high degree of variability of composition within the wetland. Nor is it necessarily a desirable objective given substantial influence of human activities in determining the present species and composition of the vegetation within the wetland. A more realistic objective is to create wetland conditions suitable for the key species present in the existing wetland e.g. raupo, *Isolepis prolifera*, spiked rush, *Carex secta, Carex virgata* and cabbage tree, and plant these into the new wetland areas. Over a period of time these species will find their own compositional equilibrium. Plant material would be salvaged from the existing wetland prior to construction or obtained from nursery plant stock grown from locally sourced seeds. Inclusion of deeper water zones (1.5m) in the Kennedy Wetland and the wetland proposed at Mary Crest would provide open water areas that would create habitat diversity wetland that would be more attractive to waterfowl.

Given the modified nature of the wetland lost it is expected that the new wetlands will quickly (within 2-3 years) achieve values although not necessarily identical, at least comparable to those lost. On this basis it could be reasonably argued that a compensation ratio of 1:1 could achieve "no-net-loss" within a relatively short timeframe. However, the amount of wetland it is proposed to create for this Project will exceed this ratio i.e. c1.1ha will be created against c0.5ha lost. This is a compensation ratio of over 2:1. The Project should therefore comfortably meet the "no net loss" objectives contained within the Proposed National Policy Statement on Indigenous Biodiversity and NZTA's Environmental Plan with regard to wetland habitat, and is likely to achieve a net gain.

Native Bush

There are two options by which the loss of native bush could be mitigated:

- Protection and enhancement of an existing area of native bush; and/or
- Planting new areas of bush.

Protection and Enhancement of an Existing Area of Native Bush

There are a number of existing areas of native bush in the vicinity of the proposed Expressway that are under threat from grazing and/or plant and animal pests. In some cases the remaining areas of bush are unlikely to survive in the long-term without intervention. This is especially true where regular grazing by domestic animals takes place. In these stands of bush, no natural regeneration takes place and as mature trees die they are not replaced. Over time, that bush disappears. By fencing and covenanting such areas to ensure long-term protection, the long-term viability of such areas can be significantly enhanced, particularly when supported by plant pest removal. However,

protecting existing areas of bush will require agreements to be made with landowners and this cannot be guaranteed.

When considering the amount of bush (compensation ratio) that should be protected to compensate for that lost in this case, consideration has been given to the condition of the bush being lost and long-term prognosis for its survival. The greater part of the bush being lost (c.0.35ha out of 0.5ha) has been, and continues to be grazed beneath the canopy, to the extent that there is no forest ground dwelling species, minimal sub-canopy and no regeneration of canopy species. The long-term prognosis for this area in the absence of intervention (protection from grazing as a minimum) is that it will continue to diminish and eventually disappear. Under the circumstances, the loss of this area of bush to the Expressway footprint is accelerating a process that is already occurring, although this process may take many decades to run its course. There is no easily developed formula that can determine what an appropriate compensation ratio is in this case. However, a ratio of 2:1, as a minimum, has been chosen in this case to reflect the compromised condition of the bush and the likelihood of on-going degradation in the absence of intervention. It could be argued that a 1:1 would be appropriate. However a 2:1 ratio takes account of some of the uncertainties concerning the future of the existing bush e.g. it is possible that in the future intervention could occur, and also risks to protected areas of bush in the future such as fires, drought or breaches of fences by stock.

An area of bush, with the potential for long-term protection, has been identified close to the Project corridor that supports habitat very similar in character and condition to much of the area of bush that is being lost to the Project footprint. Negotiations are on-going to try to secure this area of bush for protection. If agreement is secured with the land owner it is proposed to covenant the bush to provide long-term protection. This will ensure that it remains fenced from stock. It is also proposed to undertake planting of suitable edge and sub-canopy tree and shrub species around the edge of the bush and in gaps in the canopy within the bush interior to provide a "kick-start" to the regeneration process. This will be supported by a 3 year weed control programme.

The protection of an existing area of bush is the preferred option to compensate for bush lost due to the fact that mature canopy trees (the element of a forest that takes the longest to develop) are already in place. Furthermore, given the length of time it takes for trees to mature, it makes little sense planting new areas of bush, when an existing bush in the area is in need of protection to prevent its disappearance. The area of bush currently being investigated is c.2.4ha in area. If protection of this area of bush was secured the area protected would be well in excess of the recommended 2:1 compensation ratio. This would be a substantial offset to compensate for the bush lost and would achieve greater than the "no net loss" objectives contained within the Proposed National Policy Statement on Indigenous Biodiversity and NZTA's Environmental Plan.

Landscape Planting

If the protection of an existing area of bush cannot be achieved, an area has been identified adjacent to the existing Mary Crest bush, and within the designation, where new bush habitat can be established by planting (Map 6). In this case a minimum compensation ratio of 3:1 has been chosen. This takes account of the extended timeframe which is required for the new bush habitat to develop significant ecological values (50 to 100 years), comparable to those being lost. However, the ratio also recognises the fact that areas of bush impacted are not pristine habitat and much of that lost is severely threatened by on-going grazing. The new area of bush by contrast will be within the designation, which will provide long-term protection from adverse effects such as grazing.

Most of the bush lost (>80%) is from Hautere Bush F and Cottle's Bush which are located on lowland river terrace where the soils are free draining, and prone to summer drought. Totara and titoki which tolerate dry summer conditions are dominant species in this zone.

The bush on the Stevens Property is located seaward of the edge of the river terraces in the lee of the stable coastal dunes.

The compensation ratio of 3:1 requires the creation of a minimum of 1.5ha of new bush adjacent to Mary Crest. The area available within the designation for planting at Mary Crest is c.3.0ha. If 1.5ha. of this area is planted with bush, and other recommended measures are implemented to ensure successful establishment and introduction of late successional species, it is expected that the "no-net-loss" in biodiversity objectives contained within the Proposed National Policy Statement on Indigenous Biodiversity and NZTA's Environmental Plan will be achieved.

Chapter 20

Part G

VOLUME 2

Aquatic Ecology

Overview

The Expressway will cross numerous catchments in the Project area. Three bridges and numerous culverts are to be constructed at waterway crossings (streams, drains and rivers). In addition, a depression containing the "Railway Wetland" near Ōtaki is to be mostly filled to accommodate the Expressway.

Expert assessments have identified the following five categories of potential adverse effects of the Project on waterways, and developed the following detailed mitigation measures to address each of those categories of effect.

First, construction activities may cause temporary adverse effects on freshwater quality and habitat. Best practice erosion and sediment control measures will be adopted in constructing the Project as specified in the draft CEMP and, in particular, in the ESCP and the Ecological Management Plan (EMP). On this basis the ecological effect of the Project from sediment run-off from earthworks on fresh water quality and habitat is considered to be less than minor.

Second, the use of culverts in watercourses may impair fish and invertebrate migration. Appropriate measure to provide for fish passage will be incorporated into the design of all culverts where streams have the potential to carry migratory native fish. On this basis, the affect of the Project on fish and invertebrate migration from the use of culverts is considered to be less than minor.

Third, road runoff has the potential to affect water quality and cause channel erosion. The existing SH1 lacks an attenuation system to intercept runoff. Attenuation swales and basins designed to retain and remove contaminants will intercept most runoff from the Expressway. Therefore, the Project will have a net-positive effect on road runoff contamination.

Fourth, the use of culverts may result in a loss of, or alteration to, habitat in waterways (streams, drains and rivers). In addition to the culvert design to provide for fish passage, a minimum of 2601 metres of enhanced waterway length (in the form of riparian buffers) will be established to off-set any residual effects on waterways. The overall effect of the Project on waterways is less than minor.

Fifth, 0.5 hectares of the Railway Wetland (0.8 hectares in total) will be lost to the Project. That loss will be off-set by the construction of two wetlands (1.1 hectares in total), as detailed in Technical Report 11 (Terrestrial Ecology). Aquatic ecological conditions will be monitored at these sites for 3 years following completion of construction of the Expressway. On the basis of the proposed riparian planting mitigation and culvert design, and establishment of the 1.1 hectares of new wetlands and monitoring, the effect of the Project on wetland habitat is considered to be less than minor.

20 Aquatic Ecology

20.1 Introduction

This Chapter summarises the potential effects of the Project on aquatic ecology.

The report that describes the effects that the Expressway construction and operation will have on freshwater ecosystems in the Project area, and provides recommendations for mitigating adverse effects, is:

- Peka Peka to Ōtaki Expressway: Aquatic Ecology (Technical Report 12).

This technical report is included in Volume 3 of this AEE report.

The following methods and sources were used to identify the existing environment and the potential effects of the Project on freshwater ecosystems in the Project area:

- Biological surveys of streams and rivers in the Project area were carried out in March 2011, July 2012 and February 2013;
- A biological survey of the railway wetland was carried out in July 2012;
- Extraction of records of fish from the New Zealand Freshwater Fish Database (NZFFDB); and
- Additional records of fish occurrence and invertebrate communities were compiled from technical reports (Boffa Miskell 2001, Perrie and Cockeram 2010).

20.2 The Existing Aquatic Environment

The existing aquatic environments in the Project area were characterised using data from field surveys, regional council monitoring programmes and publically available databases. Stream flow is monitored at flow recorders on the Ōtaki River and Waitohu and Mangaone Streams. Water quality, aquatic invertebrates and periphyton (attached algae) are monitored by GWRC at two sites each on the Ōtaki River and Waitohu Stream and one site each on Mangaone and Mangapouri Streams. No GWRC monitoring is carried out at other waterways in the Project area, most of which are intermittent. No GWRC monitoring is carried at wetlands in the Project area.

Fish, aquatic invertebrates, riparian plants and physical habitat in waterways in the Project area were surveyed in March 2011, July 2012 and February 2013. Fish, invertebrates and macrophytes were surveyed in the lentic (pool) portion of the Railway Wetland in July 2012. The aims of the surveys were to compile the most complete taxonomic lists possible (within a defined period), identify any fish or invertebrates in the Project area with threatened or declining conservation status, and identify streams inhabited by migratory native fish, as these streams will require fish passage at road crossings.

There are 23 natural streams and artificial drains in the Project area, including several ephemeral swales and the secondary channels of larger streams. The largest waterway is the perennial Ōtaki River. The second and third largest, Waitohu and Mangaone Streams, are near-perennial (rarely dry), and the fourth largest, Mangapouri Stream, is spring-fed and perennial. All smaller waterways in the Project area are intermittent, and many of these are highly ephemeral (i.e. they only flow for brief periods after heavy rainfall). Most of the waterways that will cross the Expressway have intermittent reaches.

20.2.1 **Water Quality**

Water quality in the Ōtaki River at Pukehinau, the Ōtaki River at Mouth, and Waitohu Stream at Forest Park was classed as excellent in 2009-10 and 2010-11 by GWRC. The Pukehinau and Forest Park sites are in indigenous forest-dominated catchments upstream of the Project area, and water quality may decline downstream, as agricultural and urban land-use increases. Water quality in Waitohu Stream at Norfolk Crescent (near the mouth), Mangaone Stream at Sims Road (near the mouth), and Mangapouri Stream at Bennett's Road was classed as poor in 2009-10 and 2010-11 by GWRC. These three sites are downstream of the Project area, and water quality may be higher in the Project area upstream, which is less influenced by upwelling, nutrient-rich groundwater.

20.2.2 **Physical Habitat**

Physical habitat assessments were made at waterways in the Project area using the New Zealand stream habitat assessment protocols. Physical habitat scores were generally low; the median score was 2.3 (47% of the maximum possible). The low scores reflect the fact

that most waterways in the Project area are in intensively grazed farmland, with minimal or no riparian setback, minimal riparian shading, frequent access to livestock, and a predominance of silt and clay substrate. The highest physical habitat scores were for Waitohu and Mangapouri Streams; these high scores are primarily due to the dense and continuous riparian zones at both sites.

20.2.3 **Biological Environment**

At least one native, migratory fish was caught in nine out of 10 waterways surveyed in the Project area. A total of nine native fish species were caught during the field surveys, of which eight are migratory. A total of 16 native fish species, of which 13 are migratory and three are naturalised non-native species, have been reported from the Project area in the New Zealand Freshwater Fish Database. The Ōtaki River and Waitohu and Mangaone Streams are each inhabited by several species of native fish with poor climbing abilities (e.g. giant kokopu). Longfin eels were the only fish species observed in Mangapouri Stream.

A total of 83 invertebrate taxa were found in the nine waterways surveyed in the Project area. The numerically dominant invertebrate taxa in the largest waterways, Ōtaki River and Mangaone and Waitohu Streams, were aquatic insects. The dominant taxa in the other, smaller streams were amphipods and snails. Stream health indicators calculated from the invertebrate survey data indicated that Mangapouri Stream and an intermittent stream draining the Settlement Heights catchment were low, indicating poor ecological conditions. Higher scores for Mangaone and Waitohu Streams and the stream at Mary Crest indicated good ecological conditions, and the Ōtaki River score indicated excellent ecological conditions.

With the exception of Mangapouri Stream and the stream near Mary Crest, riparian-zone vegetation bordering streams in the Project area is composed entirely of non-native species. Riparian vegetation at the Mangapouri Stream site in the Pare-o-Matangi reserve is dominated by native trees and shrubs that were planted in a restoration programme. The stream at Mary Crest flows through a native-bush fragment and has a native species-dominated riparian zone for approximately half of its 300m length. The riparian vegetation at all other sites is composed of mixtures of non-native grasses, forbs, shrubs and trees.

Shortfin eels were the only fish caught in the Railway Wetland pool survey. A total of 26 invertebrate taxa were collected in the Railway Wetland pool. The numerically dominant taxa were midges, oligochaete worms and copepods. None of the invertebrate taxa in the wetland are rare in New Zealand, and the community was similar to those of other low-elevation wetlands of the Kāpiti Coast and elsewhere in the North Island. The submerged, floating and emergent macrophytes in the wetland pool were dominated by non-native species and a few widespread native species; no rare macrophytes were observed. The physical and biological condition of the Railway Wetland was assessed in Technical Report 11 (Terrestrial Ecology), Volume 3. The condition score was low, which reflects substantial modification of wetland hydrology and vegetation. Wetland drainage is impeded by railroad and road embankments; parts of the wetland are used for grazing livestock, and the wetland is vegetated with a mixture of native and invasive non-native vegetation. The wetland pool sampled for the current assessment appears to have been excavated, possibly to drain the surrounding wetland.

20.2.4 **Ecological Value**

The ecological values (i.e. ecological significance and naturalness) of waterways in the Project area were assessed using a range of attributes, including the prevalence of at-risk fish species, condition classes for fish and invertebrate communities and water quality, the prevalence of native forest in the catchment, and connectivity for migration between the headwaters and coast. Waterways for which most or all attributes were ranked highly were classed as high. Waterways for which most or all attributes had low rankings were classed as low. Waterways with approximately half high and half low rankings were classed as moderate. Four waterways were classed as having high ecological value (Waitohu, Mangaone and Mary Crest Streams and the Ōtaki River), and four waterways were classed as having moderate ecological value (Mangapouri, Settlement Heights, Jewell and Kumototo Streams). The remaining 15 waterways were classed as having low ecological value. These ecological values were used to evaluate mitigation requirements for potential adverse effects of the Project on habitat loss and alteration, as set out in the following section.

20.3 Effects Assessment and Mitigation

The Expressway will cross 12 large catchments (> 1km^2) and several smaller catchments in the Project area. Three bridges and numerous culverts are to be constructed at waterway (streams, drains and rivers) crossings. In addition, a depression containing the "Railway Wetland" near Ōtaki is to be mostly filled to accommodate the Expressway.

There are five potential adverse effects associated with the Project on aquatic ecosystems in the Project area:

- temporary effects of construction activities on water quality and habitat;
- impaired fish and invertebrate migration due to culverts;
- effects of road runoff on water quality and channel erosion;
- loss and alteration of habitat in waterways (streams, drains and rivers); and
- loss and alteration of habitat in the Railway Wetland.

The effects, mitigation and residual effects of the Project on aquatic ecology are summarised in Table 20-1.

Table 20-1: Summary of Potential Environmental Effects of the Project on Aquatic Ecosystems, Proposed Mitigation, and Evaluation of Residual Effects after Mitigation

Potential effects	Proposed mitigation	Residual effects	Evaluation of residual effects
Construction effects	Best-management practices as specified in the CEMP, and in particular, the ESCP and the EMP.	Moderately increased risk of spills and bank erosion affecting waterways. Brief periods of mobilised fine sediment, brief periods of flow blockage, minor effects of construction equipment on in-stream habitat.	Less than minor
Impaired fish migration	Provision of fish passage at every crossing that may be used by	Minimal impairment due to the presence of culverts and consequent alterations in	Less than minor

Potential effects	Proposed mitigation	Residual effects	Evaluation of residual effects
	migratory native fish.	hydrodynamic and substrate conditions.	
Road runoff and contamination of waterways	Runoff drainage to treatment swales and basins.	Reduced contaminant input to waterways compared with SH1 alone.	Positive
Habitat loss - waterways	Riparian planting, bank stabilisation and fencing at all crossing sites. Offset mitigation consisting of ≥ 2601 metres of new riparian buffers.	Very small reduction in total stream habitat, very small alterations in habitat quality. Improvements in ecological condition at sites with new riparian buffers.	Less than minor
Habitat loss – Railway Wetland	Constructed wetlands of equal or greater area.	Short (2-3 year) delay before constructed wetlands mature and provide the same habitat quality and biodiversity as established wetlands.	Less than minor

20.3.1 **Construction Effects**

Sediment input to waterways is a primary environmental concern for Expressway construction because earthworks create a risk of increased sediment yield over natural rates, and because elevated sediment input can have numerous adverse ecological effects. To assess the risk of elevated sediment input to waterways during construction, sediment yield was estimated for each catchment in the Project area during the construction period and the current (background) period. The estimated increases in sediment yield due to construction are low for most catchments, including the catchments of waterways with high ecological value. However, sediment yields in four catchments are predicted to be significantly higher than background sediment yields. These catchments are very small, have no defined channels and terminate in soakage areas or drains. Therefore, the risk of construction sediment input to waterways with high ecological value is low. Despite this low risk, the ESCP lists sediment management actions targeted at each of the four catchments.

To minimise risks of adverse effects and to ensure construction effects are acceptably managed, all construction activities will comply with the construction methods, preventative measures (e.g. sediment detention devices) and monitoring protocols in the CEMP, EMP and ESCP.

Pre-construction and construction-phase monitoring in construction areas and at control sites upstream will be used to determine whether construction is affecting water quality and aquatic biota. Turbidity trigger levels will be developed with data from continuous turbidity monitoring in the pre-construction period at four sites. If trigger levels are exceeded during construction, and the exceedance is attributed to construction activities, a series of responses are required as set out in the conditions and EMP. These responses include audits of erosion and sediment control measures, and remedial and mitigation measures.

Construction activities in waterways can also impede fish passage. In intermittent waterways, construction activities will be concentrated into dry and drying periods when possible, to minimise effects on fish. In perennial and near-perennial streams, fish passage will be provided around in-stream works that partially impede flow. In-stream works that fully divert flow will be concentrated into periods outside of the peak migration times when possible. Periods of complete flow diversion and dewatering will be preceded by fish collection and relocation to unaffected reaches. A fish rescue plan specifying collection and relocation procedures will be in the EMP.

Based on the combination of erosion and sediment control measures, construction and post-construction monitoring, fish rescue, and the low risk of elevated sediment input to waterways with high ecological values, the effects of Expressway construction on waterways are expected to be less than minor.

20.3.2 **Fish Passage**

The perennial streams, and at least some of the intermittent streams that will cross the Expressway that have well-defined channels, are inhabited by native fish that migrate between the coast and the Tararua foothills. In the absence of fish passage structures, or if these structures are not designed appropriately, the Expressway embankment could block or impair fish migration. To minimise or eliminate adverse effects on migration, the construction plan for the Expressway includes fish passage designed for the local fish assemblage, and in particular for non-climbing or poor-climbing species, under a wide range of flow levels. All fish-passage culverts will be inspected to ensure proper operation one and four years after installation as set out in the conditions and EMP. With the provision of effective passage under the Expressway at all streams used for migration, the effects of the Project on migration are expected to be less than minor.

20.3.3 **Road Runoff**

Contaminants from vehicles can enter waterways via runoff from the Expressway. However, most runoff will be intercepted by attenuation swales and basins designed to retain and remove contaminants. The attenuation system will be maintained to ensure that its retention capacity is not depleted. Furthermore, a large proportion of the traffic will shift from SH1 to the Expressway. SH1 lacks an attenuation system or other structures designed to intercept runoff. Therefore, the net effect of the Expressway is to increase the retention of contaminants from vehicles at current traffic levels. This is a positive effect.

20.3.4 **Waterway Habitat Loss and Alteration**

Some open-channel habitat will be lost to culverts. The proportion of total channel length that will be culverted is very small. Culverts will be designed to minimise migration barriers as noted above. Components of these culverts will also ensure that they provide reasonable habitat for the biota that inhabit them. Those components include spoilers for flow reduction and rough low-flow channels. Additional portions of channels will be modified (e.g. rip-rap and concrete-cobble apron installation). These modifications may improve habitat conditions in reaches that were previously dominated by soft sediments and eroding banks. All channel lengths within the Project designation will be fenced and the channel banks planted with stabilising, native vegetation. Due to the short lengths of culverted and altered channel, the minor changes in habitat conditions, and the riparian-zone planting and fencing planned for waterway crossings, the overall effect of waterway habitat loss and alteration is expected to be minor.

A mitigation proposal to offset the loss and alteration of waterway habitat provides for at least 2601 metres of enhanced waterway length, in the form of riparian buffers on both

banks composed of native trees and shrubs. The majority of waterways in the Project area are grazed or cultivated to the banks, and lack setbacks or riparian buffers. Mitigation activities would focus on creating relatively large, long riparian buffers on a small number of waterways that currently have moderate to high ecological values, but lack riparian vegetation. Extensive riparian buffers composed on native plants should substantially improve ecological conditions in these waterways. These measures are expected to shift the overall effect of the Project on waterway habitat from minor to less than minor.

20.3.5 **Wetland Habitat Loss**

The Project will have an adverse effect on the Railway Wetland near Ōtaki. Approximately 0.5 ha of the 0.8-ha Railway Wetland will be filled to accommodate the Expressway. Based on a field survey, the wetland appears to contain few fish (by species and abundance), and no rare aquatic invertebrate taxa. A wetland condition assessment indicated that the wetland is highly modified and vulnerable to future degradation, independent of Project effects (see Technical Report 11 (Terrestrial Ecology)). Offset mitigation for the loss of the Railway Wetland will take the form of two constructed wetlands of greater area (1.1 ha) as set out in Technical Report 11. Aquatic ecological conditions will be monitored at the constructed wetlands for three years after their completion to ensure that they achieve a level of aquatic ecological value equal to that of established wetlands. The construction of wetlands of greater area than the wetland area lost indicates that the residual negative effect of habitat loss will be less than minor.

Chapter 21

Part G

VOLUME 2

Air Quality

Overview

The primary potential air discharge from the construction of the Project will be dust. This will require mitigation in some areas to reduce the potential for nuisance effects. Generally properties located within 100m of construction activities could be affected, and mitigation will be required to address those effects.

The primary mitigation measures proposed are speed restrictions on construction vehicles operating near sensitive receptors, defining an area around construction activities where there is the potential to create dust and putting in place mitigation to minimise dust effects in that area, the use of water tankers to dampen surfaces that have the potential to create dust and hydroseeding/mulch cover over finished cut batters. The management of air quality during construction is set out in the draft CAQMP.

The potential effects from vehicle exhaust pollutants once the Project is operational have also been assessed. The ambient concentration of nitrogen dioxide (NO_2), carbon monoxide (CO) and particulate (PM_{10}) were assessed for the nominal opening year (2021) and the design year (2031). The assessment indicates there will generally be an improvement in air quality in the Project area as a result of improved vehicle technologies, and improved traffic flows which corresponds to reduced travel emissions.

21 Air Quality

21.1 Introduction

This Chapter summarises the construction and operation effects of the Project on air quality.

The full report detailing the effects of the Project on air quality is:

- Peka Peka to Ōtaki Expressway: Assessment of Air Quality Effects (Technical Report 13).

This technical report is included in Volume 3 of this AEE report.

Technical Report 13 has been prepared in accordance with the following:

- Tier 3 detailed assessment methodology contained in the draft NZTA Standard for Producing Air Quality Assessments for State Highway Projects; and
- Ministry for the Environment's Good Practice Guide for Assessing Discharges to Air from Land Transport.

21.2 Existing Environment

The Project primarily runs parallel to the existing SH1 through land which is zoned rural and residential. The main township of Ōtaki and the settlement of Te Horo are located between the coast, approximately 4 km to the west, and the Tararua Ranges which are 3km to the east. The rural land is mainly used for beef and sheep farming as well as market gardening activities.

The NIMT follows the alignment of SH1 from Peka Peka to North Ōtaki. The railway line is mainly used to transport freight, with a passenger service currently using the railway line twice a day.

21.3 Sensitive Receptors

A 'sensitive receptor' is defined as a location where people or surroundings may be particularly sensitive to the effects of air pollution. This type of receptor includes residential houses, hospitals, schools, early childhood education centres, childcare facilities, rest homes, residential properties, temporary accommodation, open space used for recreation, the conservation estate, marae and other similar cultural facilities. Orchards and market gardens can be considered sensitive to construction dust as it has the potential to reduce produce quality.

There are a number of residential properties, churches and schools located near to the Project at Ōtaki, Ōtaki South and Te Horo that have the potential to be sensitive to air pollution effects.

During preliminary stages of the assessment, areas were identified where there was the potential for air quality effects and a number of representative worst-case sensitive receptors selected in each of those areas. Effects on other sensitive receptors are likely to be less than at the selected locations. The modelling results also considered all other residential properties within 200m of the proposed alignment.

21.4 Meteorology

A meteorological station was installed at Te Horo, approximately halfway between Peka Peka and Ōtaki. In addition to the data collected from the Te Horo weather station, meteorological data collected at Levin and Paraparaumu was reviewed and assessed. The predominant wind direction measured at Te Horo for the monitoring period was from the easterly quadrant, with the strongest winds being from the northwest.

21.5 Ambient Air Quality Monitoring

The NZTA commenced measurement of short-term NO_2 concentrations in Ōtaki at the corner of SH1 and Mill Road in 2010. Based on the results of the monitoring data to date, negligible adverse effects are expected from NO_2 concentrations arising from the Project at this location as the annual average of 20 µg/m³ is considerably below the WHO annual average guideline of 40µg/m³.[40]

A further air quality monitoring study was undertaken between July 2011 and January 2012 to assist with determining background concentrations. Monitoring of NO_2 was completed at three locations, Rahui Road in Ōtaki (to give an approximation of emissions in Ōtaki), Gear Road in Te Horo (to give an approximation of emissions in Te Horo) and at the M2PP Project monitoring station on Raumati Road in Paraparaumu.

Continuous PM_{10} and CO monitors were also installed at Rahui Road to provide additional information on the other air pollutants of concern.

The Rahui Road and Te Horo monitoring locations produced very similar results. Given the correlation in concentrations between the locations, the value of 8µg/m³ has been conservatively used as the annual background concentration of NO_2 for both Ōtaki and Te Horo.

The average measured CO concentration at Rahui Road was 0.4mg/m³, which compares with the average concentration measured at the Paraparaumu monitoring station for the same period of 0.2 mg/m³.

The average 24-hr PM_{10} concentration for the period was 14µg/m³, which compares with the average concentration measured at the Paraparaumu monitoring station for the same period of 12µg/m³.

[40] World Health Organisation Air Quality Guidelines Global Update, 2005.

The results of monitoring at Ōtaki, Te Horo and Paraparaumu were used to estimate typical background concentrations within the broader Project area. Results of monitoring indicate that background concentrations are typical of a semi-rural environment.

21.6 Assessment of Effects on Air Quality

21.6.1 Construction of the Project

Construction Dust

Construction activities required as part of the Project have the potential to result in the generation of dust if not appropriately controlled. Receptors more than 300m away are unlikely to experience any nuisance effects from construction dust, and are only considered where there is potential for dust to travel further than normal. Receptors within 100 m of construction activities have a greater potential to experience nuisance effects and mitigation measures will be required for these receptors.

In the North Ōtaki to Ōtaki River Bridge section of the Project, the activities likely to generate dust requiring mitigation are the earthworks through the sand dunes, the haul road and placement of fill for the Rahui Road over-bridge. Most receptors are more than 100 m from construction activities, but fine dust might reach these without mitigation.

Construction activities will occur within 20m of the former Rahui Milk Treatment Station and Social Hall. Specific measures will be contained in a CAQMP[41] to ensure that these properties are not adversely affected by dust during the construction process.

In the Ōtaki River Bridge to Old Hautere Road section of the Project, the activities that might generate dust include the large cut at the southern approach to the Ōtaki River Bridge and use of the haul road. Most receptors are more than 100m from construction activities. Areas to the west of the existing SH1 are unlikely to be affected due to their distance. Some areas of crops particularly close to Old Gorge Road and in the general area between Old Gorge Road and Old Hautere Road, to the east of the existing SH1, may be more sensitive to dust at some times of the year. It is unlikely with the mitigation measures proposed, that dust will result in significant or noticeable reductions in crop yields but some crops may be down graded where they are grown close to the construction activities. Mitigation measures to deal with these localised effects will be developed in consultation with affected landowners and incorporated into the CAQMP.

From Old Hautere Road to Te Horo there are no receptors that are considered especially sensitive to dust, close to the alignment, which require specific mitigation over and above the standard mitigation measures being used throughout the Project.

From Te Horo to Peka Peka the main sources of dust will be the significant areas of fill required. There are a number of residences around Te Horo, primarily along School Road and between Mary Crest and Te Hapua Road that will be relatively close to the construction process. The use of standard mitigation measures will address any potential nuisance effects.

Emissions from Construction Vehicles

The construction of the Expressway will require a number of vehicles to operate along the length of the Project for the duration of the works. Based on the information provided in the Construction Methodology report, construction vehicles will make a contribution equivalent to between 32 and 131 additional vehicles per day, travelling in the area. Given

[41] The draft CAQMP will be finalised prior to construction commencing as outlined in chapter 8, Part D, Volume 2 of this AEE report.

that the annual traffic volumes are in the order of 16,000 AADT, this increase, while resulting in a small increase in the level of combustion emissions in areas adjacent to where the works are occurring, will not give rise to ambient concentrations of pollutants that exceed the values set in the National Environmental Standards for Air Quality (NESAQ).

Odour

No specific odour sources have been identified in the Project area to date. However, potential does exist for localised odour effects associated with sources such as septic tanks or offal pits encountered during the construction process. Therefore, the CAQMP contains mitigation measures in the event that those odour sources are encountered.

Construction Yards

There will be a number of construction yards associated with the Project, with the main yard proposed to be located near the Ōtaki River. These yards will be in the order of a hectare in size, and are likely to be metalled. Depending on the activity being undertaken in them, there is potential for dust to be generated. When the main construction yard is used for activities, such as aggregate processing or construction of pre-cast concrete components, additional mitigation measures will be implemented. These measures are described in the CAQMP (see section 4.1.4 of the CAQMP).

21.7 Operation of the Project

21.7.1 Modelling

Road traffic dispersion modelling has been completed for four sections of the Project:

- Section 1: North Ōtaki to South Ōtaki;
- Section 2: South Ōtaki to Te Horo;
- Section 3: Te Horo; and
- Section 4: Te Horo to Peka Peka.

The model predicts future levels of air pollutants in the Project area for the following future scenarios:

- 2010 base year;
- 2021 with Project – representative of the nominal year of opening of the Project;
- 2021 without Project – for comparison with the 2021 with Project scenario;
- 2031 with Project – representative of the opening year plus ten; and
- 2031 without Project – for comparison with the 2031 with Project scenario.

Modelling input data included existing traffic counts and future projected traffic flows, fleet profile, vehicle speeds, fuel properties, locomotive traffic and existing air quality and meteorology.

Further information about the dispersion modelling completed for this assessment including the input data, assumptions and limitations is contained in the Air Quality Technical Report 13 in Volume 3 of this AEE report.

21.7.2 Results

The detailed results of the dispersion modelling completed for this assessment are contained in Technical Report 13. A summary is provided below.

Overall, years modelled show a slight improvement in air quality in Ōtaki township and Te Horo and an "insignificant"[42] increase in concentrations in the South Ōtaki to Te Horo section compared with the 2021 and 2031 "without project" results.

The results of road traffic pollution dispersion modelling for the township of Ōtaki show that reductions in the concentration of vehicle air pollutants can be expected along the existing SH1 and around the existing SH1/Mill Road intersection. An increase in concentrations can generally be expected in areas located within 200m of the Project. However, due to location of the Project, which takes vehicle traffic to the east and away from the township of Ōtaki, this is expected to be negligible and likely to only be experienced by a small number of receptors. The modelling shows that these increases will not result in exceedances of relevant air quality assessment criteria or NESAQ.

The results of dispersion modelling of the South Ōtaki interchange demonstrate that there are negligible changes in NO_2 concentrations, and no exceedances of relevant air quality assessment criteria or NESAQ, "with Project" scenarios in this area.

The results of dispersion modelling for the settlement of Te Horo predict improvements in air quality, especially at locations on the western side of the main arterial road. A small increase in concentrations is expected in areas adjacent to the eastern side of the Project. However, when compared to the overall improvements associated with the construction of the Project, this increase is expected to be minor.

The predictions of NO_2 concentrations at the section between Te Horo and Peka Peka indicate that NO_2 concentrations in areas close to the Project will be well below the levels set by the NESAQ (200 µg/m³).

Overall, the Expressway will improve air quality in the Project area as a result of improved vehicle technologies, and improved traffic flows which correspond to reduced travel emissions.

21.8 Measures to Mitigate Actual and Potential Adverse Effects from Construction

21.8.1 General Activities

A draft CAQMP (a sub-plan of the CEMP) has been prepared, and describes the air quality mitigation measures proposed during construction activities. These measures are detailed in Technical Report 13 in Volume 3 of this AEE report. A summary of the main mitigation measures is provided below.

Mitigation measures to be used on the entire Project include:

- Where practical, defining an area around construction activities where there is the potential to create dust effects and putting in place appropriate mitigation to minimise dust effects in that area;
- Locating specific speed limits on haul roads to minimise dust emissions close to sensitive locations;
- Having a community liaison person who is available to deal with any concerns or complaints;
- Having a comprehensive complaints and response procedure;
- House cleaning service available for properties that are affected by dust;

[42] As defined by Ministry for the Environment, Good Practice Guide for Assessing Discharges to Air from Land Transport, May 2008.

- In the unlikely event that this occurs (given the other measures proposed) temporary relocation of the residents of any severely affected properties; and
- Having a team dedicated to monitoring environmental effects.

21.8.2 **Earthworks**

Measures to be used on earthworks to control dust emissions include:

- The removal and stockpiling of topsoil during windy conditions in areas away from sensitive receptors;
- Guidelines to guide the operation of construction vehicles (with specially reduced speed limits applying) in areas close to sensitive receptors;
- Strict protocols around the removal of potentially dusty cut or placement of fill material, such as sand and silts at locations close to sensitive receptors;
- All finished cut batters will be quickly vegetated or covered with hydro seed or mulch; and
- Water carts will be used to control dust, with water supply available along the length of the construction.

Chapter 22

Part G

VOLUME 2

Noise and Vibration

Overview

The Project route closely follows the existing SH1 and NIMT through both rural and urban areas. A number of PPFs affected by this Project are already subject to high levels of road-traffic noise, and a noise survey has been performed to assist in quantifying this existing exposure. Road-traffic noise computer modelling has been conducted, and an extensive road-traffic noise mitigation options assessment has been undertaken in accordance with the method set by NZS 6806. For each area of the Project, a number of options have been developed and assessed by all relevant members of the Project team to determine the best practicable option best practical option for mitigation for noise mitigation. The mitigation was also reviewed following public open days and feedback in July 2012.

Proposed noise mitigation includes one kilometre of low-noise road surface (open-graded porous asphalt / PA-10 or equivalent) on the Expressway through Ōtaki, and investigation of one PPF for acoustic treatment.

Rail noise and vibration measurements have been undertaken to quantify existing exposure and typical source levels. Rail vibration from the realigned NIMT is predicted to comply with the adopted criteria without the need for specific mitigation. Two additional PPFs will be investigated for acoustic treatment to mitigate rail noise.

With the proposed mitigation, operational noise and vibration from the Project will be restricted to within reasonable levels and effects are considered acceptable.

Construction noise will generally remain within reasonable limits defined by NZS 6803, using standard noise management controls. There are a small number of specific locations where neighbours are closer to the works, and enhanced controls (particularly effective communication) are proposed to manage noise disturbance. The NZTA has well-established processes to manage construction noise and vibration, which comply with the philosophy of NZS 6803. A critical part of these processes is the use of a CNVMP for the Project as a whole, and construction noise and vibration management schedules for individual activities and locations. While no significant night works are anticipated, night works may be required where activities interact with live roads and rail for safety or operational reasons. Continuous pours of concrete may also be required. These night works are to be of limited duration. Effects from construction noise and vibration for this Project will be temporary. There will be some disturbance, but with appropriate management measures the adverse noise and vibration effects are considered reasonable.

22 Noise and Vibration

22.1 Introduction

This chapter summarises the noise and vibration effects of the Project during construction and operation.

The reports detailing the effects of the Project on noise and vibration are:

- Peka Peka to Ōtaki Expressway: Operational noise and vibration assessment (Technical Report 14); and
- Peka Peka to Ōtaki Expressway: Construction noise and vibration assessment (Technical Report 15).

These technical noise and vibration reports are included in Volume 3 of this AEE report.

22.2 Existing Environment

The Project closely follows the existing SH1 and NIMT, with the environments ranging from rural to urban.

For SH1, computer modelling has been used to predict existing road-traffic noise levels. A noise survey has been performed to validate this modelling and to assist in a qualitative assessment of the noise environment. Measurements were taken at two locations over a week to capture temporal variations, and spot measurements at six other locations to capture spatial variations. This modelling also forms the basis for comparisons with modelling of the Project.

The NIMT runs parallel to the existing SH1 from Peka Peka through to Ōtaki, before diverging. A noise survey has included measurements of rail noise and vibration from freight and passenger trains.

Most PPFs are currently exposed to road-traffic noise from the existing SH1 and rail noise and vibration from the NIMT.

If the Project is not built, traffic growth is still anticipated with an increase in 2031 of approximately 30% of total vehicles, with a greater proportion of HCVs. Road-traffic noise from the existing SH1 is expected to increase by 2-3 dB in most locations, which generally would not be noticed as the slight increase is gradual over two decades.

22.3 Operational Noise Effects

NZS 6806: 2010 Accoustics - Road-traffic noise - new and altered road (NZS 6806) sets the criteria for reasonable road-traffic noise levels, taking into account health issues associated with noise and other matters (see below). Therefore, road-traffic noise levels in compliance with NZS 6806 Category A should generally result in acceptable noise effects.

NZS 6806 noise criteria

Category	Criterion	Altered roads	New road
A	Primary	64 dB $L_{Aeq(24h)}$	57 dB $L_{Aeq(24h)}$
B	Secondary	67 dB $L_{Aeq(24h)}$	64 dB $L_{Aeq(24h)}$
C	Internal	40 dB $L_{Aeq(24h)}$	40 dB $L_{Aeq(24h)}$

As the existing environment is heavily influenced by road-traffic noise, compliance with Category B may also represent acceptable noise levels. This is particularly so for the new road criteria where Category B is the same road-traffic noise level as Category A for altered roads.

The assessment of operational noise effects is described in full in Technical Report 14, but broadly involved:

- Identifying PPFs within the vicinity of the proposed roads;
- Modelling predicted noise levels without any specific form of mitigation at each PPF;
- Investigating potential noise mitigation options, where appropriate; and
- Evaluating the mitigation options with the assistance for the Project team to determine the best practicable option (best practical option for mitigation).

In addition to compliance with the NZS 6806 criteria, actual and potential noise effects have been explicitly considered in developing the proposed mitigation, and a further qualitative assessment made before the proposed mitigation recommendation is then finalised.

Comparison with existing and do-nothing noise levels formed the operational noise assessment, the cumulative effect of the Project and the existing SH1.

22.3.1 Protected Premises and Facilities

This assessment has considered all noise sensitive locations within set distances from the Project. PPFs include existing houses, schools, marae and various other land uses defined

in the NZS 6806. The distance from the road within which PPFs are considered is defined as 100 metres from the edge of the nearside traffic lane for urban areas and 200 metres from the edge of the nearside traffic lane for rural areas.

NZS 6806 has been applied to evaluate noise effects.

NZS 6806 also states that, for any PPFs that are significantly affected by noise from another existing road in the vicinity, it may be appropriate to apply different criteria. These altered road criteria have been applied to a sub-group of PPFs within 100 metres of the existing SH1 in Ōtaki, which is being altered as part of the Project, and where the existing road-traffic noise level is assessed to be 64 dB or greater.

Therefore, Technical Report 14 considered two groups:

(a) PPFs where the new road criteria were applied; and

(b) PPFs where the altered road criteria were applied.

However, this distinction is not critical as the criteria from NZS 6806 only guides the selection of the best practical option for mitigation.

The predicted noise level at each PPF for the best practical option for mitigation and other scenarios are listed in Table 4-5 of Technical Report 14.

22.3.2 **Modelling**

Modelling of road-traffic noise was completed to predict operational noise effects.

The noise model took into account predicted traffic volumes, topography, existing buildings, road alignments, road surfaces, safety barriers and bridges. Noise levels were evaluated for:

- the existing environment; and
- the do-nothing scenario - the existing roads with 2031 traffic without the Project constructed; and
- the do-minimum scenario - the existing roads with 2031 traffic with the Project constructed, but with no specific noise mitigation.

Comparison of do-nothing and do-minimum noise levels showed that the Project meets the threshold criteria to be considered as both a new and altered road depending on the assessment area.

Initial modelling was completed to determine in which areas noise mitigation should be considered. All PPFs in NZS 6806 categories B and C in the do-minimum scenario were identified and split into seven assessment areas as follows:

A: North of Ōtaki Ramp;

B: Main Highway, Ōtaki;

C: 230 Main Highway, Ōtaki;

D: East Ōtaki;

E: Ōtaki Gorge to Te Horo (West);

F: Ōtaki Gorge to Te Horo (East); and

G: South of Mary Crest.

Noise mitigation options were modelled for each of these areas, and the road-traffic noise at each PPF predicted.

22.3.3 Operational Rail Noise and Vibration Effects

To accommodate the Project, the NIMT alignment will move west in Ōtaki.

The increase in curve radius in Ōtaki will result in potential increase in speed, which has been considered in the assessment. Rail noise is predicted to exceed the nominated criteria at two PPFs (Ōtaki Motel and 230 Main Highway) and mitigation has been considered and is proposed for these locations.

It should be noted that the Project will result in the level crossing at Rahui Road being removed, therefore trains will no longer need to use their horn at the approach to Rahui Road. The measurements of vibration from the railway on its existing alignment and in its current condition indicate that the design criterion might be exceeded at PPFs 60 metres or less from the track. There are a number of PPFs closer than this distance to the current SH1. With the re-alignment of the track, a new track will be constructed and the vertical alignment and ballast condition improved compared to the current SH1. This will result in a significant reduction in vibration levels generated by trains, which will offset the reduction in distance between the track and nearest PPFs.

Vibration levels are predicted to comply with the nominated criterion without specific mitigation.

22.3.4 Measures to Avoid, Remedy or Mitigate Operational Noise and Vibration Effects

Road-traffic noise was modelled and, for all areas where NZS 6808 Category A was exceeded, a number of mitigation options were tested. Each mitigation option was assessed against the following acoustics factors:

- Compliance with NZS 6806 categories, attenuation provided by structural mitigation, requirements for building modifications, effect of changes to the noise environment and value for money.
- A graded assessment was also provided by specialists including urban design, heritage, ecology, social impacts; need to acquire land, safety and visual amenity.
- Each option was then assessed at a noise mitigation workshop with other relevant disciplines. For each area the workshop participants selected an option that represented the best practical option for mitigation. Further evaluation was completed where necessary to determine the best practical option for mitigation. The mitigation was also reviewed following public open days and feedback in July 2012.

A summary of the currently proposed noise mitigation resulting from Technical Report 14 is provided in each of the seven assessment areas below in Table 22-1.

Table 22-1: Selected Options - Road Surfaces

Location	Currently proposed noise mitigation
A: North of Ōtaki Ramp	Open graded porous asphalt (PA-10)*
B: Main Highway, Ōtaki	No mitigation proposed – Maintain existing asphaltic concrete (AC) surface
C: 230 Main Highway, Ōtaki	Open graded porous asphalt (PA-10)*
D: East Ōtaki	Open graded porous asphalt (PA-10)*
E: Ōtaki Gorge to Te Horo (West)	No mitigation proposed
F: Ōtaki Gorge to Te Horo (East)	Building modification for one Category C PPF (14 Old Hautere Road)
G: South of Mary Crest	No mitigation proposed

With the structural mitigation detailed in Table 22-1, the total numbers of PPFs in the Project area each of the NZS 6806 categories are shown in Table 22-2.

Table 22-2: Number of PPFs in NZS 6806 Categories

Category A	Category B	Category C
132 PPFs	15 PPFs	1 PPFs

A set of plans with building references and noise contours are presented in drawings N-001 to N 008 (refer Volume 5: Plan Set). Buildings are colour-coded according to their NZS 6806 category.

Building modification is to be investigated at two PPFs (Ōtaki Motel and 230 Main Highway), to mitigate rail noise (e.g. mechanical ventilation, updated glazing). Building modification mitigation is subject to detailed design and agreement with the landowner.

No specific mitigation is required for rail vibration. Vibration will decrease due to the new rail track and ballast. This will however be partly counteracted by the railway being closer to the two PPFs.

22.4 Construction Noise

22.4.1 Methodology

NZS 6803 provides a framework for managing construction noise. NZS 6803 provides different guideline noise limits for different activity durations.

Due to the proximity of the existing SH1, ambient noise levels are already elevated and intermittent exposure to daytime noise resulting from multiple construction activities is not expected to have a significant effect.

For this reason the short term criteria (less than 20 weeks) provided in NZS 6803 is considered to be appropriate.

Construction noise has been assessed for all residential and commercial receivers within 100 metres of any earthworks, which represents the extent to which heavy machinery will be operating.

22.4.2 Construction Activities

Construction activities predicted to generate noise have been assessed. The most significant activity in terms of timeframe and extent are the actual road works including bulk earthworks, transporting fill, grading, levelling and compaction.

- Nine bridges will be built along the route. Bored piles will be used in preference to vibratory or driven piles.
- The existing SH1 bridge in Ōtaki (known as 'the Ramp') will be demolished (and replaced nearby).
- The NIMT will be diverted west of the existing alignment in Ōtaki to allow for the Project.
- The rail works will consist of earthworks which are similar in nature to those required for the roads, in addition to the laying of the ballast, sleepers and rail delivery and fixing.
- Vehicle movements will be required to transport soil around the Project or imported from elsewhere; the vast majority resulting from internal movements.
- Vehicle movements will mostly take place on the existing SH1 or the Expressway, while vehicle movements on local roads are expected to be largely avoided.

22.4.3 **Construction Noise Effects**

From the types of equipment and duration of works envisaged, a conservative assessment has been made for typical activities using the construction noise calculator on the NZTA's Transport Noise website[43]. From these calculations, buffer distances required from construction activities to comply with guideline noise limits in NZS 6803 have been determined.

The majority of the construction is separated from neighbours and while it will be audible at many places, construction noise will remain within reasonable limits determined by NZS 6803, using standard noise management controls.

- The receivers on Main Highway north of the new ramp and along County Road are in close proximity to the alignment, and noise from earthworks and surfacing will be in the order of 70–80 dB, although this would vary during the day.
- Several receivers are within 50 metres of both the Project and the Old Hautere Road extension, and may experience noise levels in the order of 70–80 dB. At these levels, some disturbance to daytime activities is expected.
- For the remainder of the Project north of Mary Crest, the Expressway and the new local arterial road run parallel to the existing SH1. The PPFs to the east of the Project are in general at least 50–100 metres from the Expressway. Construction noise will be audible and there may be some annoyance.

There are a small number of specific locations where neighbours are closer to the works and these are listed below. For these locations, enhanced controls and particularly effective communication with neighbours are proposed to manage noise disturbance. With appropriate mitigation (discussed further in Section 22.5), works are not expected to unduly interfere with normal domestic activities.

The Expressway is also 20-40 metres away from the former Rahui Milk Treatment Station and Social Hall and, without mitigation, construction noise levels could be up to 85 dB at times, which would interfere with activities occurring at the time. In addition to effective communication with occupants, a schedule to the CNVMP will be required for all works adjacent to this property, with activities programmed to reduce any disturbance.

Night works will only be required where the Project interacts with the existing SH1, railway and local roads. Their extent and duration will be limited. In these locations, the receivers are likely to already have elevated ambient noise levels due to the proximity to the existing SH1 and NIMT. With appropriate communication with residents, and scheduling to minimise disturbances, construction noise effects from any night works will be acceptable.

22.4.4 **Construction Vibration Effects**

The Expressway is 20 – 40 metres away from the former Rahui Milk Treatment Station and Social Hall. As these two buildings are close to vibration sources (vibratory compaction on the alignment) there is the potential for cosmetic damage to buildings (such as cracking) and annoyance from vibration.

A building condition survey will be required before and after construction works to determine if any cosmetic damage has been caused, so that it can then be repaired. Annoyance will be addressed by accurately communicating the time and duration of vibration in advance, which will generally be during the daytime.

[43] www.acoustics.nzta.govt.nz

With these controls the adverse effects of construction vibration will be acceptable. There are no adverse vibration effects predicted for the remainder of the Expressway route.

22.5 Measures to Avoid, Remedy or Mitigate Construction Noise and Vibration Effects

When the NZTA and KiwiRail submit an outline plan of works to the KCDC for approval, the plan will contain a detailed construction methodology, including a detailed CNVMP. The process for finalising management plans is discussed in Chapter 8, Part D, Volume 7 of this AEE report. The NZTA has a standardised template for this purpose, which is included in Volume 5 of this AEE report. The plan includes:

- Noise targets;
- Summary of assessments/predictions;
- General construction practices, management and mitigation;
- Noise management and mitigation measures specific to activities and/or receiving environments;
- Monitoring and reporting requirements;
- Procedures for handling complaints;
- Procedures for review of the CNVMP throughout the Project; and
- Management schedules to the CNVMP for specific activities and locations where further assessment and control is required.

Indicative mitigation is documented below to illustrate the approximate extent and types of measures likely to be required.

- Roads:
  - noise from bulk earthworks can be reduced by limiting the number of items of equipment operating in parallel, and/or by equipment selection.
  - Potential annoyance can be reduced by avoiding long periods of consecutive activity; the use of alarms rather than standard tonal alarms; and performing routine maintenance such as greasing tracked equipment.
- Bridges:
  - most of the bridges are remote from receivers, and bored piles are being used in preference to driven or vibratory piling.
  - No mitigation will be required for daytime activities greater than 50m from the receivers.
  - If a continuous pour of concrete or beam lifts are required during the bridge formation, then night works may be required.
  - Consideration of noise will be required when selecting equipment and procedures for any night works, and direct consultation with affected properties will be necessary.
- Tie-ins: the tie-ins to the existing SH1 to the north and the M2PP Expressway to the south are likely to be built during the day using standard traffic control techniques, therefore night works will generally not be required.
- Rail: the majority of the rail work can be performed during the day, however some night works may be required when connecting to the existing rail tracks, to minimise disruption. It is anticipated that it would take a weekend to tie in the new alignment with the current alignment, where intensive works will be required.
- Site compound: the Main Contractor's site compound, including any batching required, should be located remote of any receivers. The potential location for this is in the vicinity of the existing concrete plant by the Ōtaki River (between chainages 3200 and

3400). Any site should have direct access to the Project, and vehicles movements on local roads should be discouraged.

For significant activities, CNVMPs will be prepared once details of construction equipment and locations have been confirmed. The CNVMPs will set out specific conditions relating to a defined activity in a pre-determined location. Generally, CNVMPs are developed for activities that have been identified as likely to exceed the Project noise criteria. For example, any activity which will require night works is likely to require a schedule to be prepared.

Chapter 23

Part G

VOLUME 2

Contaminated Land

Overview

The NZTA is taking a staged approach to contaminated land management in accordance with current practice, as set out below;

1. Conduct a high-level overview assessment of the Project corridor to identify potentially contaminated sites.

2. For those sites that may have (or may have had) potential sources of ground contamination and/or sites where contaminated land issues may have a significant impact on construction, conduct a Phase 1 Contaminated Land Assessment (CLA).

3. Based on the high-level overview assessment and Phase 1 CLAs, prepare a BECLMP which provides a framework and general procedures for management of contaminated soil during construction of the Project. The BECLMP would be updated with site and Project specific details once additional information becomes available.

4. Conduct Phase 2 CLAs (detailed site investigations including intrusive works), as and if required, at selected sites to characterise the nature and extent of contaminants present in soil and groundwater (if applicable).

5. Review the findings of the Phase 2 CLAs and, where applicable, obtain consent from KCDC for fuel system removal and soil disturbance at contaminated sites under the NESCS. Consents would be obtained prior to construction commencing.

6. Update the BECLMP, as required, based on the findings of the Phase 2 CLA and align with any NESCS consents required to complete the works.

As part of NZTA's staged approach, the first three items described above were prepared in support of the designation and resource consent application process. The detailed Phase 2 CLAs (item 4 above) are proposed to occur after the resource consent and designation applications are lodged. Phase 2 CLAs will be undertaken after the application has been determined, for the following reasons:

- There are practical barriers to completing the investigations at this time including land ownership, site access agreements and continued use of the sites.

- Project design details relevant to the Phase 2 investigations have not yet been confirmed.

The Overview Phase contaminated land assessment identified 21 sites with the potential for ground contamination within the Project corridor. Of these, 12 sites were considered to be potentially contaminated.

Site-specific CLAs were conducted at the following properties:

- Ōtaki Station, off Arthur Street, Ōtaki

- Ōtaki Sidings, off Arthur Street, Ōtaki

- Winstone Aggregates, SH1 South, Ōtaki

- Bridge Lodge, 3 Ōtaki Gorge Road, Ōtaki

-Mary Crest, 701 SH1, Te Horo

These properties were selected for site-specific Phase 1 CLAs because it is considered that the nature and location of potential ground contamination at these sites could be refined and associated risks identified through such an assessment. The findings from the site-specific Phase 1 CLAs are presented in Technical Report 16, Volume 3 of the AEE.

Site-specific Phase 1 CLAs were not completed for the KiwiRail Corridor or the market garden/orchard sites because site-specific Phase 1 CLAs would not significantly refine the nature or extent/location of potential ground contamination. Such refinement and assessment would be completed through a Phase 2 CLA, as and if required.

Other sites identified as being of potential concern, but that are not assessed as requiring a Phase 1 or 2 CLA, will be managed via the draft BECLMP.

Potential effects on human health and the environment may occur if contaminated land is disturbed and/or used during construction of the Project. Those effects can be avoided through application of appropriate procedures to manage contaminated soils and materials, which may include retaining soil and materials *in situ* where appropriate to be capped by the Expressway. Soils and materials not suitable to remain on site will be excavated, removed offsite and disposed of in accordance with procedures outlined in the draft BECLMP and New Zealand guidelines[44], NESCS, and consent conditions.

23 Contaminated Land

23.1 Introduction

This chapter summarises the potential effects resulting from the construction of the Project on areas of potentially contaminated land.

This chapter is informed by an assessment of potentially contaminated sites within the Project area and identification of procedures for management of contaminated soils and materials during construction and operation.

The reports detailing the effects of the Project on contaminated land and proposed mitigation are:

- Peka Peka to Ōtaki – Phase 1 Contaminated Land Assessment (Technical Report 16); and
- BECLMP – Peka Peka to Ōtaki Expressway Project.

Technical Report 16 is included in Volume 3 of this AEE report and the BECLMP is included in Volume 4.

23.2 Staged Approach to Contaminated Land Management

NZTA has taken a staged approach to contaminated land management.

Phase 1 CLA involved:

- a high level assessment of the project corridor to identify potentially contaminated sites,
- preparation of a Phase 1 CLA; and
- preparation of the BECLMP which provides a framework and general procedures for management of contaminated soil during construction of the Project.

Phase 1 has been completed as part of this application.

Phase 2 CLA (detailed site investigations, including intrusive works) will be undertaken (if required) at selected sites to characterise the nature and extent of contaminants present in soil or ground water. These findings will be reviewed and, where applicable, resource consents for fuel system removal, soil sampling, ground disturbance, soil removal/remediation activities will be applied for from KCDC under the NESCS (as well as any necessary regional consents from GWRC).

Phase 2 CLAs will be undertaken after this application has been determined, for the following reasons:

[44] Ministry for the Environment Contaminated Land Management Guidelines.

- Continued land use between lodgement and consultation may result in changes to the nature and extent of contamination in soil.
- There are practical barriers to completing the investigations at this time including land ownership, site access agreements and continued use of the sites.
- Project design details relevant to the Phase 2 investigations have not yet been confirmed.

23.3 Existing Environment – Contaminated Land

The following five sites within or adjacent to the Project corridor (i.e. the area to be designated for the Project) have been identified as having the highest potential for contaminated soil.

- **Ōtaki Station**: historic railway station where current and historic railway maintenance and operational activities have taken place.
- **Ōtaki sidings**: railway sidings where current and historic railway maintenance and operational activities have taken place.
- **Winstone Aggregates**: Site of current aggregate processing company, and where current and historical maintenance, operational and fuel storage activities have taken place.
- **Bridge Lodge**: Historic agricultural and holiday camp land where current and historic fuel storage activities take place and potential for septic tanks.
- **Mary Crest**: former farm and convent, where historic fuel storage activities have taken place and potential for septic tanks. Potential sources of contamination within the Project corridor.

Works are proposed within the existing NIMT corridor. Based on the nature of activities that typically occur within rail corridors, it is inferred that potential for land contamination also exists within this corridor.

In addition, the assessment identified other sites within the Project corridor of potential concern for contaminated land. These sites are inferred to have lower risk for land contamination than those identified above.

Previously unidentified contaminated soils or other materials may be discovered during the works. Given the nature of the Project corridor it is anticipated that such discoveries would most likely be associated with farm tips and offal pits, storage and handling of agricultural chemicals, septic tanks, fuel storage, sheep dips and market gardens and orchards.

23.4 Assessment of Contaminated Land Effects

The disturbance of contaminated land may result in the discharge of contaminants to air, groundwater and surface water. Such discharges may have adverse effects on human health and the environment. There are well-established mechanisms to avoid such effects (or mitigate them to an acceptable level). The discharges, and the potential for the resulting adverse effects, are assessed to be minimal and acceptable assuming the mitigation proposed (described below) is implemented.

Over the long term, the proposed mitigation would result in a reduction in the potential for adverse effects to the environment resulting from isolation (capping) and removal of contaminated soil and structures not suitable to remain within the Project corridor.

23.5 Measures to Avoid, Remedy or Mitigate Actual and Potential Adverse Contaminated Land Effects

The BECLMP is in Volume 4 of this AEE report. The BECLMP contains procedures on the identification and mitigation of effects associated with the disturbance of potentially contaminated materials (in ground) or soil. Below is a summary of the key procedures detailed in the BECLMP.

- Specific procedures have been developed for mitigation of effects associated with works at the sites with the highest potential for ground contamination and works within the rail corridor. These procedures include confirmation/assessment of soil contamination and subsurface structures (tanks and sumps) that may have contained contaminants, and removal of soil and structures assessed to be unsuitable to remain on site.
- Sites with potential for ground contamination identified in technical reports shall be reviewed in the field and assessed as required prior to initiating physical works in those areas.
- Potentially contaminated soils and materials not previously identified may also be encountered during Project works. Guidance is provided in the BECLMP on the identification of these materials, and the following preliminary measures have been developed:
    - Assess potential immediate hazards, if unsafe move away, and upwind from area.
    - Notification of potential discovery in accordance with the Project/contract communication plan as soon as practical.

If the conditions are assessed to be safe, the following actions shall be undertaken:

- Make area and works in progress safe.
- Stop works in and adjacent to the inferred area of contaminated soil or material.
- Secure/isolate area.
- Implement temporary measures to minimise transport of potential contaminants offsite.

The following general procedures for management of contaminated soil have been developed, and these are set out in the BECLMP:

- Assessment of potentially contaminated soil or other materials shall be undertaken by a suitably qualified and experienced practitioner.
- Assessment may conclude that contaminated soils and other materials may be left in place. It is anticipated that covering/capping of ground contamination as a result of the Project construction may be the most practical and suitable solution for mitigating effects of ground contamination.
- Soils or other materials assessed as not suitable to remain in situ shall be removed offsite for treatment and disposal.
- Consents shall be obtained from KCDC for fuel system removal, soil sampling, ground disturbance and/or soil removal/remediation activities as required under the NESCS.
- Notification, assessment, validation sampling and reporting shall be conducted in accordance with the NESCS.
- Health, safety and environmental management measures shall be put in place for works that may result in direct or indirect exposure to ground contamination to avoid impacts on human health, or the environment, including appropriate management of excavation and stockpiling.
- Measures shall be implemented for excavation and temporary stock piling of contaminated or potentially contaminated soil.

- Sumps or septic tanks conflicting with proposed works shall be abandoned in place or excavated and removed for offsite disposal by an appropriately qualified contractor. Underground storage tanks shall be removed in accordance with relevant codes of practice.
- Transportation of contaminated soil, material or liquids for offsite disposal shall be in accordance with specified rules, regulations, guidelines, standards and licensing requirements. Classification shall be completed by a suitably qualified and experienced practitioner.
- Contaminated soil and other material shall be disposed of at a facility licensed to accept such materials.
- Liquid wastes shall be treated and disposed of by discharge under permit to a trade waste system or removal off site for disposal and treatment at a facility consented to receive such wastes.
- Removed petroleum storage tanks shall be disposed of in accordance with the relevant code of practice.

Chapter 24

Part G

VOLUME 2

Archaeology

Overview

There are six recorded archaeological sites either within the Project area or within close proximity. Three of those sites that will be physically affected by the Project are pre-1900 structures:

- the Ōtaki Railway Station (S25/122);
- the 1870s cottage 'Clifden' at Bridge Lodge (S25/125); and
- the grounds at 230 Main Road, Ōtaki (S25/124).

A draft Accidental Discovery Protocol (ADP) has been discussed between the NZTA and Nga Hapu o Ōtaki (see Volume 4 of this AEE report) and is to be agreed..

The Ōtaki Railway Station, which has pre-1900 building foundation remains beneath it, is to be moved slightly to align with the realigned NIMT.

Clifden cottage is considered one of the oldest remaining buildings in the Kāpiti district and, while the building has been considerably modified, the cottage and the grounds are considered to be an archaeological site. The building will be relocated to a suitable location and archaeological investigations will take place before relocation in accordance with accepted best practice.

The grounds of the third building, at 230 Main Road Ōtaki, will also be affected.

In addition, three more archaeological sites (two shell middens/ovens and pits) are recorded as being outside the Project area, but effects on these sites are possible given historical mapping inaccuracies.

There is also the potential for effects on unknown, unrecorded archaeological sites during construction. Two areas in particular have been identified as being of high archaeological potential, namely:

- a southern dune area which is close to recorded archaeological sites (R25/5; R25/7 and R25/14) and broadly corresponds with the location of a settlement marked on an historic survey plan as Te Horo Pa.
- a northern area of remnant sand dune between Waitohu Stream and the Mangapouri Stream.

Overall, the potential impact on the archaeological resource is considered to be low to medium.

Adverse effects arising from the Project will also be mitigated by the potential to recover and record detailed archaeological information. A positive outcome associated with any archaeological investigations of the area is the potential to increase awareness of the history of the area to the public and scientific forums.

Earthworks associated with the Project will require a general authority to destroy, damage, or modify an archaeological site from the NZHPT under the HPA. Site-specific authorities (s11 HPA) to modify any archaeological site (e.g. Ōtaki Railway Station, Clifden at Bridge Lodge) will also be required. NZTA will seek authorities through the separate process in due course.

24 Archaeology

24.1 Introduction

This chapter summarises the Project's potential effect on archaeological sites. Technical Report 17 in Volume 3 of this AEE report details the effects of the Project on Archaeology.

Technical Report 17 is linked with the Assessment of Built Heritage Effects (Technical Report 18) and the Cultural Impact Assessment prepared by Ngā Hapū o Ōtaki (Technical Report 19). Technical report 17 draws on information from those reports, but does not make statements on the significance or values of heritage buildings, nor on the significance or values of cultural sites identified by tangata whenua within the Project area (or elsewhere).

24.1.1 **Existing Environment**

The Kāpiti district has a long and rich cultural and historic heritage. Within the district there are a number of recorded archaeological sites, historic sites and buildings, and areas of significance to iwi and the European community.

24.1.2 **Physical Environment**

The Kāpiti district is located on the southwest coast of the North Island and is the southern extent of a system of coastal dunes that extend from Paekakariki in the south to Taranaki in the north. The landscape of the Kāpiti district is characterised by a flat and narrow coastal shelf dominated by sand dunes and wetlands. The dunes within the Kāpiti district have formed during successive dune building phases. The formation of dunes has had a major impact on the landscape and influenced settlement patterns. Earlier sites were closer to the sea and later sites were based along waterways further inland. Near to the wetlands and lakes were good places to establish pā sites. Water level changes and tide levels resulted in Māori moving their settlements.

24.1.3 **Historic Background**

The Kāpiti district has been inhabited since the mid to late 13th century AD, not long after the initial colonisation of New Zealand Māori (Davidson, 1988). In the 1800s the Māori population of the area changed as several groups from the north moved to the district. A detailed account of Māori history of the area is provided in the Cultural Impact Report prepared by Ngā Hapū o Ōtaki (Technical Report 19 in Volume 3 of this AEE report).

The 1830s saw the spread of missionary teachings through the Kāpiti district. The first Europeans to settle in the region were the missionaries of the Church Missionary Society and the Catholic Church. The missionaries also introduced the growing and processing of flax and wheat to the Māori of the district, and a number of mills were constructed in the area to support this.

The original transport route from Ōtaki to Wellington through this area was primarily along the coast, with the route shifting inland around the Ōtaki River in order to avoid crossing at the mouth of the river and to avoid large areas of wetland to the north of the river. The Wellington-Manawatu rail line was opened through Ōtaki by 1886 and the first railway station was built at this time. Stations were constructed every ten miles along the route of the railway and settlements, roads and farms developed around them. The original Ōtaki Railway Station, described as a "Public Works 4th class station", was replaced in 1902. In 1908 the line and buildings were purchased by the NZ government however in July 1910 the Ōtaki Railway Station was destroyed by a fire. A new station, a "Troup B type station", was operational by 1911. This new station was built on the location of the previous station for proximity to the rail line, and remains at the site.

The development of the Te Horo district, south of Ōtaki, was further impacted by the establishment of work camps in the area during the 1930s. During this period unemployed men were paid to clear land of the greywacke boulders washed from the Tararua Ranges by the Ōtaki River. Evidence of the work camps remains in the area, visible in the vicinity of Old Hautere Road and Arcus Road in the form of stone cairns.

Archaeological evidence for the early settlement of the Kāpiti district is relatively sparse compared with evidence from other regions in New Zealand, and to date only a small number of archaeological sites in the region have been systematically excavated.

Compared with the coastal area around Waikanae, to the south of the Project area, the Peka Peka to North Ōtaki area does not appear to have as dense a distribution of recorded archaeological sites.

24.2 Archaeological Assessment

A number of site walkovers of the Project area have been undertaken as part of the archaeological assessment in order to identify recorded and previously unrecorded archaeological sites along the route that may be physically affected by works. Site visits were also made to areas along the route where consultation with iwi and the NZHPT had identified that people had lived or utilised the area in the past.

Six recorded archaeological sites have the potential to be directly impacted by the Project, these are outlined in Table 24-1 below.

Table 24-1: Recorded Archaeological Sites Potentially Directly Impacted

Site No.	Location	Description
R25/5	Te Hapua Road to Derham Road	Midden and oven site
R25/7	West of SH1	Shell Midden and oven site
R25/14	North of Te Hapua Road	Māori pit
S25/122	Ōtaki township	Site of the Ōtaki Railway Station
S25/124	Ōtaki township	Pre-1900 home / grounds at 230 Main Road
S25/125	Bridge Lodge	Clifden cottage and grounds

Using the previously reported location points and the written description of site locations, the above locations were examined, along with an extensive area surrounding each point in order to identify any evidence of the archaeological site. No physical evidence was identified associated with the recorded sites R25/5 and R25/7 and it is possible that in the 50 years since the midden sites were initially recorded evidence of these has been destroyed as a result of farming operations and land development.

Another recorded midden site, R25/6, is located approximately 360m to the west of the current State Highway alignment and therefore well outside the Project area. A further site, site R25/20, is located approximately 640m away from the current SH1 and is outside the designation boundary and as such will not be impacted by the proposed earthworks.

Examination of the Ōtaki Railway Station site (S25/122) has identified that there is evidence of archaeological deposits associated with the earlier stations at the site remaining. Underneath the building, the piles associated with the station building that was destroyed by fire in 1910 are clearly visible and further archaeological evidence, both structural and artefactual, will remain at this location.

As a result of the archaeological field inspections two new archaeological sites have been entered into the NZAA database, being:

- A pā site, identified as Haowhenua, located on a hill to the west of Mary Crest (NZAA site R25/36. The pā is located to the west of the Project area and will not be affected by the Project.
- The site of a pre-1900 occupation at 230 Main Road (NZAA site S25/124).

This location would have provided an ideal site for occupation in pre-European times because of the natural stream feature, and it is considered possible that sub-surface archaeological evidence of this may remain on the property. In addition, given that there was a house on the property in the late 1800s, it is possible that archaeological deposits associated with its occupation will remain in the grounds of the property.

In addition, Clifden cottage (NZAA site S25/125) on the Bridge Lodge property has now been formally recorded as an archaeological site.

This site was identified as part of the built heritage report completed as part of the Project (see Technical report 18 in Volume 3 of this AEE report). This work identified that an 1870s cottage built by William Small is located on the Bridge Lodge property. The house is known as 'Clifden' and is considered to be one of the oldest remaining buildings in the Ōtaki area. There have been a number of modifications to the original cottage building, with several extensions, the removal of chimneys and changes to the verandah. It is possible, however, that many original construction and design features remain, particularly inside the original part of the structure. Associated with the cottage, there is potential for subsurface archaeological deposits linked with the occupation of the block by the Small family to remain.

24.2.1 Potential Archaeological Sites

In addition to the above, two areas of high archaeological potential have been identified within the Project area.

- The first is associated with the general area of Te Horo pā, a site identified on an 1870s historic survey plan, and containing the recorded archaeological sites R25/5; R25/7 and R25/14. This area encompasses the dune area to the south of Mary Crest, south to Te Hapua Road.
- The second area is in the northern portion of the Project, between the Waitohu Stream and the Mangapouri Stream. This area contains remnant sand dune and a small spring, and includes an area identified as Te Manuao, a former clearing and kainga.

24.3 Assessment of Effects on Archaeology

The following rating system (Table 24-2) has been used to rate the effects of the Project on the archaeological resource.

Archaeological sites are a non-renewable resource and any physical work that will result in disturbing archaeological features or deposits is a negative effect of the Project, including archaeological investigations.

In considering the level of effect in relation to archaeology, medium adverse effects would include a situation where part of a site or site type will be impacted by the proposed works.

However, similar archaeological features of a comparable nature in the general vicinity will remain unaffected by the Project.

Table 24-2: Impact of Potential Effect Rating

Degree of Potential Effect	Effect
High	Permanent, serious and widespread adverse effects and/or opportunities for social and environmental improvement. Adverse effects to be avoided; opportunities to be actively pursued.
Medium	Major, medium-term adverse effects and/or opportunities for social and environmental improvement. Where cost-effective, adverse

	effects to be avoided and opportunities to be pursued (significant mitigation may be required).
Low	Limited, short-term adverse effects.

In considering the level of effect, the potential to avoid or mitigate that effect is also considered. The opportunity to recover information from a site, record and present this to the archaeological and wider community is considered to be a form of mitigation. Significant mitigation would include detailed recording and investigation of sites to be affected, rather than lower level archaeological monitoring of earthworks alone. In the case of the Project, the relocation of buildings and a combination of archaeological investigation and monitoring of earthworks is considered to be significant mitigation.

24.3.1 **Mary Crest to Te Hapua Road**

Three recorded archaeological sites (R25/5, R25/7, R25/14) are in the vicinity of the southern extent of the Project between Mary Crest and Te Hapua and may be potentially affected by the Project. The construction of the Expressway in this area will require extensive earthworks. The three archaeological sites recorded appear to be avoided by the Project, but this is based solely on the identification of the sites as single data points, and the information on which this data point is based is considered accurate to within 100m. This then raises the potential for these sites to be located within the Project area (or indeed further away from it). No physical evidence of these three sites has been identified by an archaeologist since they were first recorded over 50 years ago. This is the general location of Te Horo pā, as identified on the historic survey plans, and is one of the two areas of high archaeological potential identified during the assessment.

Overall impact rating of the Project on the site is considered to be medium.

24.3.2 **'Clifden'**

The original portion of Clifden cottage is reported to have been built in 1870, and is therefore one of the oldest buildings remaining in the Kāpiti district. The style and design of the original cottage are considered to have moderate architectural values.

Clifden cottage is associated with one of the earliest European settlers in the Ōtaki district, William Small. Clifden cottage has significance not only as one of the oldest buildings remaining in the district, but in its association with one of the early prominent European families in the district. While Clifden cottage has been significantly modified there is potential for archaeological information to be gathered from the building, and potentially the surrounding grounds.

Both the cottage and the grounds are considered to be archaeological sites under the provisions of the HPA, and both will be impacted by the construction of the Expressway, with the structure affected by both the new Expressway and the new Ōtaki Gorge Road over-bridge. Clifden cottage will be relocated and all other (non-archaeological) buildings associated with Bridge Lodge will be removed as a result of the Project.

Overall impact rating of the Project on the site is considered to be medium.

24.3.3 **Ōtaki**

There are two recorded archaeological sites associated with the Project within Ōtaki township – the Ōtaki Railway Station and the property at 230 Main Road. The existing Ōtaki Railway station building was built in 1910 and does not therefore meet the definition of an archaeological site. However the ground underneath and surrounding the station building does contain intact archaeological deposits associated with earlier structures.

The Ōtaki Railway Station (S26/122) will be directly affected by the Project, in that the existing station will be moved slightly to align with the realigned NIMT. Visible evidence exists under the building of piles and features associated with earlier structures at the railway station.

The property at 230 Main Road was occupied in the late 1800s, and may also contain evidence of earlier pre-European occupation. The property contains a pre-1900 villa, however this has been modified over the years. The grounds surrounding the building are considered to be of high archaeological potential. There has been some modification as a result of land development and gardening, however it is likely that intact sub-surface archaeological deposit remains. The house will not be affected by construction works for the Project; however the eastern part of the grounds of the property, including the old bed of the stream will be affected by the new NIMT alignment and Expressway road crossing.

Overall impact rating of the Project on these sites is considered to be medium.

24.3.4 Taylors Road to Rahui Road

There are no recorded archaeological sites within this section of the Project. However, the area has been identified as having high archaeological potential based on the fact that there are known sites nearby (unrecorded) and intact dunes. Sites within this area are expected to be shell middens and ovens associated with pre-European and early contact period occupation.

Construction of the Expressway will involve earthworks through the dunes, particularly through the Pare-o-Matangi reserve through to the Waitohu Stream, and there is potential for there to be subsurface archaeological resource that will be revealed during the course of earthworks.

Overall impact rating of the Project in this area is considered to be medium.

In all other areas the effect of the Project on the archaeological resource is considered to be low.

24.3.5 Overall Assessment of Impact

Overall, the impacts of the Project on the archaeological resource are considered to be low to medium. In all areas of identified or known archaeological risk, as discussed above, the impact is considered to be medium, while in all remaining areas, the impact is considered to be low.

24.4 Measures to Avoid, Remedy or Mitigate Potential Adverse Effects on Archaeology

To address the effects of the Project on archaeology identified in Section 24.3, a range of mitigation measures are proposed. Specific mitigation measures are proposed for the recorded archaeological sites that will be affected by the Project, as well as more general measures for the overall Project.

A total of six recorded archaeological sites have been identified within or close to the Project footprint. In addition there are two areas that have been identified as being of archaeological potential, one of which overlaps with the location of three recorded archaeological sites in the southern end of the Project.

Archaeological authorities under Part 1 of the HPA will be sought for the Project prior to construction, and an archaeological management plan (AMP) will be developed in that context. This plan will outline archaeological investigation and monitoring requirements, identify areas where work is to be carried out in accordance with an ADP, and outline the steps and responsibilities that form any protocol developed for the Project. These will be linked with the NZTA's Accidental Discovery Procedures (NZTA Standard Z/22) as well as protocols to be developed for the Project in conjunction with the tangata whenua. A draft

ADP has been prepared and accepted as a draft by the relevant parties (see Volume 4 of this AEE Report).

In addition to this legal requirement, mitigation measures are proposed below to manage the adverse effects of the Project on the archaeological resource.

24.4.1 Mary Crest to Te Hapua Road

Earthworks undertaken in this area will need to be subject to an archaeological authority from the NZHPT under Section 12 of the HPA. As much as is possible, archaeological investigations through this area will be carried out in advance of construction to ensure archaeological material can be recorded, sampled and investigated in an appropriate manner without construction phase time pressures.

24.4.2 Bridge Lodge – 'Clifden'

Clifden cottage is to be relocated and, archaeological work associated with Clifden and the land under and surrounding the cottage, is likely to be a condition of any section 11 authority granted under Part 1 of the HPA. In association with any sub-surface archaeological investigations, the features of the cottage will also be investigated and recorded in accordance with archaeological best practice. Depending on the material recovered, interpretation panels of this may be provided both along the route of the Expressway and either in the relocated cottage or the Ōtaki Museum.

24.4.3 Ōtaki

Interpretation panels of archaeological information associated with the land at 230 Main Road may be appropriate to be provided at the adjacent Ōtaki Railway Station, depending on the nature of information found.

Interpretation panels of archaeological investigation results associated with the Ōtaki Railway Station could also be provided on the station platform and within part of the station building.

24.4.4 Taylors Road to Rahui Road

Archaeological work through this area will be a combination of investigation and monitoring. Interpretation panels could be provided within this area of the results of the investigations.

24.4.5 General Mitigation

Archaeology

To mitigate any additional effects of the Project on archaeology, the following is proposed:

- Interpretation panels and viewing areas will be incorporated to assist in providing information on the history of the area and the results of any archaeological work carried out as part of the Project.
- Opportunities are sought during archaeological work to provide information to the public on the work, through press releases, talks to local schools or public open days.
- On completion of the Project and any associated archaeological work, a pamphlet or small booklet will be prepared specifically for distribution in the Kāpiti district/Ōtaki, summarising the results of the archaeological work.
- Depending on the nature of archaeological material located and, in accordance with consultation with Ngā Hapū o Ōtaki and the management committee of the Ōtaki Museum, if considered appropriate, an exhibition associated with the archaeological work could be developed for display at the Ōtaki Museum.

Archaeological Management Plan

Linked with any archaeological authority that may be granted by the NZHPT and, in accordance with accepted archaeological best practice, a Project specific AMP will be developed. This plan will outline archaeological investigation and monitoring requirements, identify areas where work is to be carried out in accordance with the ADP, and outline the steps and responsibilities that form any protocol developed for the Project in conjunction with Ngā Hāpu o Ōtaki and the CEMP developed for the Project.

Research Strategy

The development of a research strategy to assist in guiding any archaeological investigations undertaken is also required by the NZHPT. Research questions or themes should have local, regional and national focus.

Key research questions associated with this Project will include the following:

- How does archaeological evidence within the Project area link or compare with information recovered elsewhere on the Kāpiti Coast and other coastal districts in New Zealand (e.g. Coromandel; Bay of Plenty; Northland)?
- Is there evidence of specialist use or activity areas within the midden sites?
- Is there evidence of environmental change within the area that is reflected in the midden sites?
- In addition to shell middens, is there evidence for gardening or other activities within the area?
- Is there evidence of economic and social change reflected in the archaeological record, associated with population change, particularly population movements in the early 19th century?

Chapter 25

Part G

VOLUME 2

Built Heritage

Overview

There are nine heritage buildings that are statutorily recognised (either by NZHPT and/or KCDC) and three sites that are considered to contain structures with built heritage values but are not listed or registered, located within or near the proposed designations. Of those, four NZHPT and/or KCDC registered sites and the three non-listed buildings have the potential to be adversely affected by the Project's construction and/or operation.

To address the effects on built heritage arising from the Project, various mitigation measures are proposed, including rotating the Ōtaki Railway Station (shifting it slightly to the east) to align it with the realigned NIMT, relocating the beehive kilns at the former Mirek Smišek pottery site, screening buildings from the proposed Expressway and relocating 'Clifden' house at Bridge Lodge to an appropriate site. With these mitigation measures, the overall effects of the Project on heritage values will be less than minor and acceptable.

25 Built Heritage

25.1 Introduction

Assessments have been undertaken to profile the existing environment in relation to built historic heritage, and assess the Project's potential impacts on these sites and structures.

The report detailing the effects of the Project on built heritage is:

- The Assessment of Built Historic Heritage Effects (Technical Report 18).

This technical report is included in Volume 3 of this AEE report.

25.2 Existing Environment – Built Heritage

There are nine statutorily recognised heritage buildings, either registered by the NZHPT and/or scheduled in the Operative and Proposed KCDPs, which are within the boundaries of the proposed designation or within close proximity (i.e. within a distance of approximately one kilometre from the centre line of the proposed Expressway alignment).

The four NZHPT/KCDC registered sites are:

- *Ōtaki Railway Station* - The Ōtaki Railway Station has been a pivotal structure in the life of Ōtaki and the wider districts since the first station was built in 1886. The present railway station dates from 1910 and is an example of a type B Troup station. This is an NZHPT Category II building[45].
- *Former Rahui Milk Treatment Station* - built in 1924 by the Wellington City Corporation Milk Department as a branch of the main depot. The building is currently undergoing adaptation as a hotel and conference centre. The building has been considerably adapted and its heritage values significantly compromised. This is an NZHPT Category II building.
- *Former Rahui Factory Social Hall* - this was one of the first church buildings constructed in the parish of Ōtaki and was built in 1893. The building is now used as rental accommodation. This is an NZHPT Category II building.
- *Former Te Horo Railway Station* - The history of the former Te Horo Railway station is uncertain, but the existing building is likely to have been constructed in 1896. The building was relocated in 1971 from its original site in Te Horo by potter Mirek Smišek

[45] Category II status is given to places of historical or cultural heritage significance or value

for use as bed and breakfast accommodation. This building is listed on the KCDC Heritage Register.

The five KCDC registered properties are:

- 3 Main Highway, Ōtaki – Brown Sugar Café;
- 91 Main Highway, Ōtaki – old house built 1880;
- 290 Main Road, Ōtaki – old house built 1889;
- Centennial reserve, Main Road, Ōtaki; and
- 266 Main Road, Ōtaki – 1888 cottage.

Other sites which are not listed or registered, but which may have potential heritage values, were also identified, either visually or from research using oral history or secondary sources. These sites are:

- *Former Mirek Smišek pottery site.*
    - A group of buildings and structures exists on the site, associated with Mirek Smišek and includes:
    - The former Te Horo Railway Station building discussed above (listed on KCDC Heritage Register);
    - Two beehive kilns and a brick flue with shelter - these were built by Mirek Smišek (one of New Zealand's most significant potters) and were used by Smišek to fire his signature salt glazed pottery. There are no other examples of kilns built and used by Mirek Smišek. The kilns are considered to have physical, historical and cultural heritage values;
    - A shed next to the beehive kilns – an ad hoc structure with earth floor built from 'found' materials and used by Mirek Smišek to prepare clay and throw pots;
    - A hut (possibly a former railway workers' hut) – used as a show room by Mirek Smišek; and
    - A house – a large Edwardian villa and used by Mirek Smišek as his home while he ran his pottery on the site. It has some minor historical value in its association with the potter and as one of a group of buildings used by Smišek. It is the only building on site that was not constructed by Smišek or transported onto the site by him.
- *230 Main Highway, Ōtaki* – a bay villa constructed prior to 1890 and former home of Hema Te Ao, a significant kaumātua and local politician.
- *'Clifden' at Bridge Lodge* – constructed approx. 1870. The site was purchased from Tamihana Te Rauparaha by William Small, believed to be one of the earliest settlers in the district. While the house has been modified, the main elements of the north elevation have been retained.

25.3 Assessment of Effects on Built Heritage

25.3.1 Potential Effects on Statutorily Identified Built Heritage

Of the nine NZHPT registered or KCDC listed buildings identified, four of these structures are potentially affected by the Project. The other five are considered to be either too distant from the proposed alignment to experience any physical or visual effects on heritage values or there were no assessed changes in circumstances from the existing situation.

The four registered/listed buildings/structures that are considered to be affected by the Project are:

- *Ōtaki Railway Station:* The realigned NIMT will occupy part of the existing location of the Station, and the realignment of the railway tracks by the Station changes the existing geometric relationship of the building with the line. The resulting realignment of the Station building, to replicate gometric relationships (i.e. the building and the

platform being parallel to the line), will require the reorientation of the Station including the deconstruction and rebuilding of all brick elements.

- *Former Te Horo Railway Station building* (located on the former Mirek Smišek pottery site): The Expressway will be within 20 metres of the former Railway Station building, changing the existing setting. This building was relocated on to the pottery site (so is not on its original setting) but will remain in-situ on its current site.
- *Former Rahui Milk Treatment Station:* The Project will be in close proximity to the north elevation of the building, changing the existing setting, with a potentially visible bridge to the north.
- *Former Rahui Factory Social Hall:* The Project will be in very close proximity to the building, changing the existing setting.

The Ōtaki Railway Station has high historical, architectural and rarity values. As part of the proposal, the Ōtaki Railway Station will be reoriented with the realigned NIMT. Subject to the brickwork being completely reconstructed, and all interior and exterior fabric being relocated with the building (e.g. the platform, verandah and toilet block) to remain relative to the building as it currently exists, there will be little loss of heritage fabric or significance of the Station. It is therefore considered that, with these mitigation measures implemented, the heritage effects on this building will be less than minor.

The integrity and setting of the former Te Horo Railway station will also be affected as the Expressway will be located approximately 20 metres from the building. However there will be no physical effects on the former station or loss of building fabric. The associations of the building to its original site were lost when it was relocated to Mirek Smišek's site in 1971, and for the last 42 years it has been associated with a number of buildings on the site created by Mr Smišek. It is considered that the former Te Horo Railway Station has moderate to high architectural and historical values, but the effects of the Expressway on these heritage values are assessed to be less than minor.

The immediate setting of the former Rahui Milk Treatment Station and the former Rahui Factory Social Hall will be modified to an insignificant degree, however the wider setting will be significantly modified as the Project will be in close proximity. There will be no physical change to the buildings resulting from the Project. Planting is proposed to mitigate the visual effects on these buildings. Any noise and vibration effects or settlement that might arise during construction will be avoided or mitigated through implementation of the CEMP, discussed further in Part H, Chapter 30 of this AEE report. The former Rahui Milk Treatment Station and the former Rahui Factory Social Hall have both been assessed as having moderate architectural and historic values, however the effects of the Project on these values are assessed to be less than minor.

25.3.2 Potential Effects on Non-Statutorily Identified Built Heritage

The following non-statutorily identified buildings/structures are considered to be affected by the Project:

- *Former Mirek Smišek pottery site* (two beehive kilns and brick flue, preparation shed and house): The site of the kilns, brick flue, preparation shed and house will be occupied by the Expressway, resulting in a reduction in the size of the site by approximately half, as well as changes to the setting of the group of structures associated with the Smišek pottery.
- *'Clifden' at Bridge Lodge:* The site of the house will be occupied by an over-bridge access road.

Although not registered with the NZHPT or listed by KCDC, it is considered that the kilns and flue have sufficient heritage values to be considered under the RMA as being historic heritage. As they have significant heritage values, their demolition would not be consistent with the protection of historic heritage. The alternative of relocation would

better provide for their protection, with the optimum location being as close as possible to their existing site and maintaining a physical relationship with the preparation shed. Such a location would enable a visual appreciation of the process of pottery production and firing followed by Mirek Smišek on the site.

The beehive kilns and flue can be carefully be relocated in a sympathetic manner on site. As the original location of the kilns would no longer exist, documentary recording of the kilns as they exist and interpretation of their original location would further assist an appreciation of the workings of the pottery manufacturing.

There is no public access to the site currently and therefore little or no public understanding and appreciation of the place and structures where Smišek developed his 'signature' salt-glazed pottery. If possible, public access to the site should be provided, along with appropriate recording and interpretation of the kilns. This would increase awareness and understanding of the significance of the site and structures.

The Expressway will have no physical impact on the hut, but will modify its setting.

Other than the kilns and preparation shed, the only other structure physically affected by the Project is the house, the site of which will be occupied by the Expressway, bunding and drainage. The removal or demolition of the house will be required as there will not be sufficient space for it to remain on site. The house is the structure least associated with the production of the pottery for which Smišek is highly regarded, however Smišek occupied it for many years and it is at the centre of the site. Its recording prior to demolition or removal is recommended and this information could be added to the interpretation of the site as recommended for the kilns.

The assessment of the collection of buildings including the house, preparation shed, and hut has established that, based on current knowledge, these structures have low to moderate heritage value through their historic association with Mirek Smíšek.

With the recommended relocation of the kilns and associated mitigation measures proposed above, namely the retention of the remaining structures (excluding the house) associated with Smišek and the recording and interpretation of the kilns, the effect on the heritage values of the group will be negligible and the historic heritage of the site will be maintained. As noted above, if possible, public access would increase awareness of the site.

The approach to the proposed Expressway bridge no.6 will occupy the approximate location of 'Clifden'. The assessment of 'Clifden' has established that, although not registered with the NZHPT or listed with the KCDC, it has sufficient heritage values to be considered under the RMA as being historic heritage of local significance. As it has locally significant heritage values its destruction would not be consistent with the protection of historic heritage. The alternative of relocation of the house without its later additions (which have reduced architectural heritage values) would provide for its protection. An optimal location would have been to a site associated with William Small, who was the original builder and owner of the house, but investigations have not located any such sites. Clifden will therefore be relocated to a suitable site owned by the NZTA in the district, 91 Gear Road, Te Horo. This would reduce adverse effects of the Project to an acceptable level and, given the modified nature of this house its historic heritage will be protected.

25.4 Measures to Avoid, Remedy or Mitigate Potential Adverse Effects on Built Heritage

To minimise the effects on built heritage and protect the historic heritage identified in Section 25.3 of this AEE report, a range of measures are proposed.

25.4.1 Ōtaki Railway Station

The Station and railway track are currently parallel to each other. The Project realigns the railway track so that the two will no longer be parallel. Realignment of the Station building to maintain its historic orientation with respect to the railway line will mitigate this adverse effect. To ensure that effects are acceptable and historic heritage is protected, the following mitigation measures are recommended:

- all brickwork, including chimneys and the central brick fire-wall, is completely reconstructed in the realigned Station building.
- all other interior and exterior fabric associated with the building, including the verandah, is relocated with the building.
- all external elements associated with the building, including the full extent, design and fabric of the platform, the toilets, steps, loading dock and ramps are relocated/reconstructed in the new alignment.
- a revision of the existing conservation plan is recommended to take account of any changes since it was first written and to recommend policies for the relocation and care of fabric.

25.4.2 The Former Rahui Milk Treatment Station

The effects of the Project on the heritage values of the building are likely to be negligible and historic heritage will not be compromised. Further planting between the building and over bridge to screen the Project is proposed to mitigate any adverse visual effects.

25.4.3 The Former Rahui Factory Social Hall

The effects of the Project on the heritage values of the building are likely to be negligible and historic heritage will not be compromised. Further planting near the building to screen the Project is proposed to mitigate any adverse visual effects.

25.4.4 The Former Te Horo Railway Station

The effects of the Project on the heritage values of the building are likely to be negligible and historic heritage will not be compromised. To mitigate any adverse effects on the setting of the building, planting and a new access road is proposed.

25.4.5 The Beehive Kilns

The effects of the Project on the kilns, flue and protective shelter are likely to be more significant. Relocation of the structures is the only option to protect historic heritage and it has been determined that this is feasible and will occur as part of the Project. The optimal location for the structures would be to the eastern end of the clay preparation shed as this would retain physical, visual and historical associations with the site. Relocation to this area is feasible and therefore is provided in the Project design. The relocation of the kilns along with their recording and interpretation, and screening of the Expressway will reduce the effects of the Project on the kilns to an acceptable degree and historic heritage will be protected. A conservation plan will be prepared for the relocation and appropriate conservation of the kilns. Public access to the site, if possible, would also increase public awareness of the site and its heritage values.

25.4.6 Group of Former Smišek Buildings

The most significant effects of the Project on the grouping of structures in the former Smišek pottery, relate to the kilns, discussed above, and, to a lesser extent, the house. Mitigation of effects described for the kiln also relate to the group of buildings. With respect to the house, which has the least heritage significance of the group, its recording prior to removal or demolition and this information being added to interpretation of the

site will mitigate effects to an acceptable degree. Implementation of all recommended mitigation measures concerning the site will result in the appropriate protection of historic heritage.

25.4.7 **'Clifden'**

The effects of the Project on 'Clifden' are likely to be significant, but adverse effects will be appropriately mitigated through the relocation of the original house, without its modern additions, to an identified site owned by the NZTA in the district. A conservation plan will be prepared for the relocation and appropriate conservation of the house.

25.4.8 **Overall**

With the recommended mitigation proposed, the overall effects of the Project on built heritage will be less than minor.

Chapter 26

Part G

VOLUME 2

Tangata Whenua and Cultural Heritage

Overview

The Kāpiti Coast has a long history of Māori settlement. The Project traverses a landscape containing various sites of cultural importance to tangata whenua, particularly between Taylors Road and Rahui Road. Māori-owned land is affected at Te Horo and other locations.

The NZTA has built strong relationships with the tangata whenua, namely Ngāti Raukawa and Nga Hapū o Ōtaki (a representative group comprising five Ōtaki resident hapū of Ngāti Raukawa).

These relationships have been fostered through close on-going engagement with the tangata whenua throughout the Project design process. An important consequence of that engagement was the re-alignment of the Expressway to avoid a culturally-significant area near Mary Crest.

A cultural impact assessment has been prepared by Nga Hapū o Ōtaki representatives, which identified residual issues such as effects on Māori-owned land and possible effects on unknown archaeological sites of cultural significant in other areas, particularly dunes located in the south and north of the Project area. As noted above, an ADP has been discussed with the tangata whenua and will be finalised to ensure that appropriate procedures are followed in the event of any sites or cultural materials being found during construction. Nga Hapū o Ōtaki representatives will be invited to assist with the further archaeological survey carried out prior to construction.

26 Tangata Whenua Values and Cultural Heritage

26.1 Introduction

Assessments have been undertaken that profile the existing environment in relation to cultural heritage, and assesses the Project's potential impacts on these sites.

The tangata whenua of the Project area are Ngāti Raukawa and Nga Hapū o Ōtaki (a representative group comprising five Ōtaki resident hapū of Ngāti Raukawa). In order to assess the cultural effects of the Project, a CIA was undertaken by Nga Hapū o Ōtaki. The full CIA report detailing the effects of the Project on cultural values and heritage is:

- Peka Peka to Ōtaki Expressway Option: Cultural Impact Assessment (Technical Report 19)

This technical report is included in Volume 3 of this AEE report.

The NZTA has developed strong working relationships with the iwi representative groups in the area and has developed mitigation proposals to address the potential effects of the Project on culturally sensitive sites and places. This relationship will continue through the subsequent construction and other phases of the Project.

26.2 Existing Environment

26.2.1 **Māori Settlement History**

Ngāti Toa first arrived in Rangitīkei, Manawatū and Horowhenua circa 1818. After defeating Rangitāne, Muaūpoko and Ngāti Apa the mana of Ngāti Toa extended from the Whangaehu River in the north to Te Koko a Kupe (Cloudy Bay, South island) in the south. Muaūpoko, Ngāti Apa and Rangitāne tried to regain their mana in the Rangitīkei, Manawatū and Horowhenua districts and defeat Te Rauparaha and Ngāti Toa, however they were unsuccessful and Te Rauparaha and Ngāti Toa held mana whenua over the area.

Ngāti Raukawa who had close links with Te Rauparaha, came to the Horowhenua coast from Waikato and in 1831 Ngati Raukawa gained the mana of the land. At Te Horo and

the surrounding locality Ngāti Tama and their leader Te Puoho along with Ngāti Raukawa sub-tribes of Ngāti Whakatere, Ngāti Kauwhata and Ngāti Pare lived peacefully together until 1834. At that time tribes in the Taranaki district migrated south seeking safety and a new home for their people as a result of hostile Waikato tribes raiding their homelands. This resulted in pressure on the availability of resources, which culminated in tensions and warfare between the tribal groups on lands between Ōtaki and Te Horo. These tensions erupted into a battle and a combined war party arrived in front of the Ngāti Raukawa pā at the mouth of the Ōtaki River. The battle (referred to as Haowhenua) created a rift between Ngāti Toa, Ngāti Raukawa and Taranaki. Although the outcome of the battle was inconclusive, it signalled the end of the coalition of inter iwi co-operation but for Ngāti Raukawa and the Taranaki coalition it fixed the boundary lines between each other.

26.2.2 **European Settlement**

The *Tory* was a New Zealand Company vessel dispatched to New Zealand for the express purpose of purchasing land from Māori and facilitating settlement of British settlers. On 16 October 1839 the *Tory* landed off Kāpiti Island and on 25 October the New Zealand Company transacted a land deed which was signed by nine Ngāti Toa chiefs including Te Rauparaha.

On 14 May 1840 the Treaty of Waitangi was signed at Kāpiti by Te Rauparaha, his son, grand nephew and niece and was witnessed by Henry Williams and Octavius Hadfield. On 19 May 1840 Nga Hapū o Ōtaki/Ngāti Raukawa signed the Treaty of Waitangi at Rangiuru Pā Ōtaki which was situated near the mouth of the Ōtaki River. It was also signed at Tawhirihoe, Manawatū and on 19 June at Mana Island by Te Rauparaha. Ngāti Raukawa therefore has direct claims under the Treaty.

Between 1839-1845, various land transactions within the Kāpiti, Horowhenua, Manawatū and Rangitīkei were undertaken between the New Zealand Company and Ngāti Raukawa through various Native Land Court hearings.

Ngāti Raukawa subdivided their Ngāti Raukawa whānau/hapū/iwi entitlements into various blocks of land, including blocks within Taylors Road to Rahui Road, Rahui Road to Ōtaki River, Ōtaki River to Te Horo and Te Horo to Peka Peka. Within these blocks some parcels are still Māori-owned land held by whānau.

26.3 Assessment of Effects on Tangata Whenua

A field visit involving both tangata whenua and the Project team in mid-2011 enabled discussion and confirmation of cultural, ecology and heritage sites identified in the Project area. Key areas that were identified for their cultural values were:

- Taylors Road hosts pā sites and a burial ground (urupā) west of the far west railway corridor (i.e. avoided by the Project);
- Sand dunes at the southern and northern ends of the Project area, as they may contain archaeological sites;
- Rahui Road in Ōtaki is the location of a significant site which iwi have identified as a wāhi tapu, as well as a spring (puna) and a wetland (also avoided by the Project); and
- The Waitohu stream, which flows from the Tararua Range to the Tasman Sea north of Ōtaki. Tangata whenua value the resource for catching eels and swimming.

An assessment of effects on those areas was subsequently undertaken and reported in Technical Report 19 (Volume 3). A summary of that assessment is set out below.

26.3.1 **Taylors Road to Rahui Road**

Within this area parts of the land near or affected by the Project are still under Māori ownership, including the Pukehou 5K Block. The use of part of this land for the Project will have an adverse effect on the cultural value of the block as a whole. Further

discussions will be undertaken with landowners as part of NZTA's property acquisition process.

The Project earthworks will modify a dune landscape in this area, where middens or more significant cultural sites may be located.

The Pare-o-Matangi Block is of special significance to Ngāti Raukawa as its name is derived from the tikanga of 'taunaha whenua', where a chief reserved the land by naming it after a portion of his body. Parts of this block are still under Māori ownership. Whilst a small area of this block is required by the Project (although not the part that is Māori-owned; the Pare-o-Matangi reserve area is currently owned by KCDC) it is not possible to distinguish the cultural significance of this area from the entire block, therefore effects on cultural values may result. Refer Volume 5 of the AEE, Land Information Plans, sheet 3 of 16.

Within this area culvert works will also be required on the Mangapouri. However these works will not interfere with kaitiakitanga[46] as addressed in Technical Report 19 in Volume 3 of this AEE report.

Te Manuao was a former clearing and kainga of Ngāti Raukawa. While the kainga is avoided, the Project crosses part of what was once identified as a clearing. This area may contain sites of cultural and spiritual significance.

26.3.2 Rahui Road to Ōtaki River

Between these roads there is a low probability of the Project impacting on any sites of significance, however damage of discreet archaeological sites is possible. Within this area parts of the Moutere Hanganoaiho block are still under Māori ownership. Archaeological effects of the Project are summarised in Chapter 24 and in Technical Report 17 (Volume 3 of this AEE report).

26.3.3 Ōtaki River to Te Horo

Within this area there is a low probability of wāhi tapu or sites of significance being affected by the Project.

26.3.4 Te Horo to Peka Peka

Within this area there is a low probability of wāhi tapu or sites of significance being affected by the Project, however care will need to be taken with unknown sites. The ADP see Volume 4 of this AEE report) that has been agreed with tangata whenua addresses this.

The Te Horo pā is situated within the Ngakaroro No2F Reserve located above the Mary Crest complex, however it is not affected by the Project.

There are various other sites within this area however they are not affected by the Project.

26.3.5 Te Horo Underpass

There is some Māori land in the vicinity of this underpass between School Road and Te Horo Beach Road, but Nga Hapū o Ōtaki consider that the cultural impacts of the Expressway are significantly less than previous connectivity options which explored a bridge crossing further to the south.

[46] The Resource Management Act 1991 defines Kaitiakitanga as *"the exercise of guardianship by the tangata whenua of an area in accordance with tikanga Maori in relation to natural and physical resources; and includes the ethic of stewardship."*

26.4 Cultural Mitigation Proposals

The NZTA has sought to avoid affecting sites of significance to tangata whenua in developing the alignment of the Project and in large part this has been achieved. However there are locations along the extent of the Project where effects on unknown sites may occur. The NZTA has directly engaged with tangata whenua to determine appropriate mitigation measures to address these impacts.

There is a high risk of discovery of sites between Taylors Road and Rahui Road. The existence of sites in these areas cannot be confirmed until construction earthworks takes place. A number of measures will be in place to ensure correct protocol is followed, in the event of an accidental discovery of potential archaeological material.

Relationship agreements between the NZTA and Nga-Hapū o Ōtaki and Ngāti Raukawa are being progressed. The parties have decided to formalise their discussions by way of a Memorandum of Understanding (MoU) to recognise and enhance the positive and effective relationship which has been achieved between the parties through an open and frank dialogue. The intent of the MoU is to record the agreements to date between the NZTA and Nga Hapū o Ōtaki and Ngāti Raukawa in relation to the Project and to assist the NZTA to proceed with the successful completion of the Project's design and construction.

The MoU also outlines the protocols for collaborative actions and works agreed between the parties. The MoU is intended to be signed with Nga Hapū o Ōtaki and Ngāti Raukawa prior to construction commencing.

Chapter 27

Part G

VOLUME 2

Social and Community

Overview

At a regional level the Project delivers clear benefits in terms of the improved movement of people, goods and services between the Kāpiti district and the Greater Wellington region. At a local level, the Project will result in some localised negative impacts but also some localised benefits through safer east-west access and reversion of SH1 to a local arterial road.

Key positive effects are expected to be:

- improvements to regional safety and connectivity through improved trip times, reduced congestion on SH1;
- improved pedestrian and cyclist safety through grade-separated crossings;
- the removal of level crossings at Te Horo and Old Hautere Road to improve social connectivity;
- a reduction in traffic on the existing SH1; and
- improvement to the pedestrian and shopping amenity of the Ōtaki Railway Retail area due to the reduction in through traffic.

Key negative effects are expected to be impacts on a small number of Te Horo businesses that are reliant on bypassing traffic, impacts on landowners from land requirements, construction impacts on houses and businesses within close proximity to the route and the use of part of the Pare-o-Matangi reserve for the Project.

In addition to the mitigation measures supported by other technical assessments, specific mitigation recommendations are made from a social perspective, for example:

- establishment of a community liaison group;
- establishment of a feedback/complaints database for the construction phase;
- maintaining a usable open space and undertaking specific engagement with the community regarding the Pare-o-Matangi reserve re-design options; and
- a clear communications protocol in the CEMP.

27 Social and Community

27.1 Introduction

This chapter summarises the potential social effects of the Project.

The potential effects of the Project have been assessed against the following social elements:

- *Way of Life* including impacts on accessibility, connectivity, patterns of living and mobility, changes to way of walking and cycling and changes to public transport;
- *Well Being* including changes to wellbeing, health and safety;
- *Environment and Amenity* including changes to the environment such as noise, dust, amenity and landscape;
- *Community* including impacts on people's property and neighbourhoods, schools, community areas and sites, accessibility to commercial areas and impacts on community plans and aspirations.

Effects and mitigation that are dealt with in other technical assessments (built heritage, archaeological, cultural, landscape and visual, noise, air quality, transport and economic assessments) are acknowledged in this assessment and, where appropriate, additional social mitigation is suggested.

The following methods and sources were used to identify the existing environment and the potential effects of the Project:

- a literature review and development of a Social Impact Assessment (SIA) framework based on national and international best practice;
- an assessment of the relevant statutory and non-statutory framework to ensure that the Project aligns with legal and other local authority requirements;
- identification of a social study area and demographic profile to understand the existing social environment (social baseline);
- a review of other specialist inputs to the Project though a 'social lens';
- a review of feedback from the consultation process, including consultation with directly affected parties such as educational facilities, businesses and the elderly to ensure that the relevant social concerns of the community have been considered;
- an assessment of the identified social effects against the SIA framework; and
- identification of appropriate mitigation, avoidance or remedial strategies.

The report that contributes to this overall assessment is:

- Peka Peka to Ōtaki Expressway: Social impact assessment (Technical Report 20).

This technical report is included in Volume 3 of this AEE report.

27.2 Existing Environment

27.2.1 Population

The Project area is mainly rural with some scattered areas of larger settlement. The largest is Ōtaki which has a population of approximately 5,466 with around 2,361 dwellings. Te Horo has a population of 675, with approximately 294 dwellings.[47] Ōtaki's residential areas fall on both sides of the proposed Project. To the east of SH1 the residential area lies between Waitohu Valley Road to the north, Rahui Road to the south, and the cul-de-sacs of Ludlam Way, Speranza Avenue, and Brandon Street to the east. To the west of SH1 the residential area is mostly densely settled around Ōtaki. There is also an area extending westward to the coast and then along Ōtaki Beach. At Te Horo, the main residential area is along School Road and there are also numerous lifestyle and larger rural blocks in the area.

Approximately 122 properties will be acquired as part of the Project, either in part, or outright. Many but not all acquisitions will include residential buildings.

The majority of the Project runs through areas of low population density. Towards its northern end, the Project dissects a portion of Ōtaki to its eastern edge, comprising an area of more dense settlement. Ōtaki has experienced a decline in the usually resident population in the five year inter census period from 2001 to 2006. However, the population is projected[48] to increase by over 1,000 residents in the next twenty years. Within the project area, Peka Peka has the highest proportion of residents of working age (15-64 year age group) and Ōtaki has the highest proportion of residents over 65 years of age.

27.2.2 Other Social Characteristics

The overall character of the study area is rural and has a very low population density, with Ōtaki township and the Ōtaki Forks area being the notable exceptions to this. These two

[47] Statistics New Zealand 2006.

[48] Based on Statistics New Zealand's medium population projection.

areas show the highest rates of walking and cycling as a main means of transport to work, although it is worth noting that Ōtaki itself has a higher percentage of people not in the labour force than the total for other Census Area Units (CAUs) in the study area, and for the Kāpiti district. This reflects both the higher rate of unemployment in Ōtaki, and the older demographic of Ōtaki (over 22% aged 65 and older). There are also higher numbers of residents in Ōtaki who have no access to a private motor vehicle than in other parts of the study area, or in the Kāpiti district in general.

Other social characteristics of the Project area are:

- The largest ethnic group in 2006 was European (68.9%), with the largest proportions residing in Peka Peka and Te Horo. The second largest group was Māori (25%) and the largest percentages of residents who identified themselves in this ethnic group, were resident in Ōtaki.
- Private vehicles are the predominant method of transport in all areas.
- Ōtaki has the highest percentage (10%) of residents who do not own a motor vehicle and has the highest rates of walking and cycling as a main means of transport to work.
- The number of people who participate in the labour force is variable across the area. Percentages of those who are unemployed and those who are not in the labour force are highest in the Ōtaki area unit, which together, comprises over 46% of the working age population. Consequently, employment rates for Ōtaki are low.

27.2.3 **Community Facilities**

There are numerous community facilities within the wider area surrounding the Project, which are typical of a rural community. The majority of facilities are located within the Ōtaki township and will not be directly affected by the Project. However, accessibility, connectivity and safety to community facilities are all factors that need to be considered for the Project. Facilities within the wider area include three cemeteries, a library, a swimming pool, a racecourse, parks including the Ōtaki Domain, Haruatai Park and the Pare-o-Matangi reserve, numerous churches, Ōtaki and Te Horo community halls, Ōtaki medical centre, Ōtaki and Hyde Park Museum, Ōtaki Police Station, Ōtaki and Te Horo Volunteer Fire Stations and Ōtaki Ambulance Station. There are eight primary and secondary schools that are near the Project, with approximately 1300 students in total. In addition to the eight schools, Te Wānanga-O-Raukawa (a Māori University) is also located at Ōtaki Township. Approximate distances from educational facilities to the Project range from 0.3km (Waitohu Primary) to 3.9km (Ōtaki Health Camp School).

27.2.4 **Economic Activity**

Within Ōtaki there are two main retail areas – the area along the existing SH1 alignment (the Ōtaki Railway Retail area) and the area on Main Street, approximately 1.8km north-west of the existing SH1 (the Ōtaki Main Township). There are approximately 265 workers (MECs or Modified Employment Count, from Statistics NZ's Business Frame) employed in Ōtaki's Railway Retail Area working in 43 businesses. The largest employer is the New World supermarket in the Ōtaki Railway Retail area (nearly 100 MECs), while other businesses in the Railway Retail Area are smaller, averaging less than 5 MECs each, spread across a range of core retail, hospitality and household and health service businesses. There are a further 327 workers in the Town Centre, in 75 businesses.

A comparison between Ōtaki Main Street and the Ōtaki Railway Retail area (ORR) showed that a higher percentage of pedestrians surveyed were Ōtaki residents in the main street shopping area (57%), than at the ORR (35.7%). A higher percentage of those surveyed in the ORR indicated that the Expressway may change their travel behaviour, 13.8% (ORR), compared with 4.6% (Ōtaki main street).

A survey of pedestrians[49] around Ōtaki was carried out to assess the main purpose of shoppers in Ōtaki and to determine how their behaviour might change once the Expressway is operational. Over half (56.6%) of surveyed pedestrians reported that they were passing through Ōtaki, and the most common types of purchases made were for takeaway food and drink, groceries, petrol and clothes. The report concludes that these business types are the most likely to be affected by the Project. Fewer than half the surveyed respondents (42.2%) lived in the area, and their shopping behaviour was not expected to change as a result of the Project. A similar percentage of respondents (42.6%) reported that they would continue to shop in Ōtaki regardless of the change in travel time. Of the remaining respondents, 6.6% indicated that they would still be willing to stop in Ōtaki, but this depended on how much longer this would make their trip, and 8.6% indicated that if the Expressway was in place they would no longer stop in Ōtaki.

27.3 Project Consultation and Engagement

Consultation with the community in relation to the Project was undertaken in February-March 2011[50] and in June-July 2012. Engagement methods included:

- One-on-one meetings;
- Open days;
- Website, free phone number and email;
- Brochure;
- Feedback forms; and
- Media statements.

Open days held in June and July 2012 presented the Project's design. Feedback at these open days covered a range of issues.

Among the issues raised, a number of attendees were concerned about potential visual and noise effects to their properties. Residents were also concerned that there was a lack of noise mitigation measures in the design, and that they had not had enough prior detail on the potential effects of the alignment on their properties. There were also some concerns about partial or total land loss, and the acquisition process around this. Residents in the area raised concerns about access to the Expressway, particularly in the Te Horo area. Residents immediately adjacent to the alignment raised concerns about access to their properties once the Expressway is operational. Some members of the Ōtaki and Te Horo communities raised issues related to preservation of the area's heritage, and including the Clifden building at Bridge Lodge.

Thirty-six consultation forms were received following the June-July 2012 consultation round. Community reactions were largely positive and many forms provided general positive feedback on the Project. Other feedback included concerns about severance around Te Horo, pedestrian / cycling access across the Expressway, general concerns and uncertainty about what the extent of effects would be, frustration with the consultation process, loss of individual property / effects to property (mainly noise), importance of continued visitors to Ōtaki, and concern that there may be fewer people / less custom passing through as a result of the Project.

[49] *Ōtaki Customer Survey: Draft Report of Pedestrian Intercept Surveys conducted in March 2011,* Opus International Consultants.

[50] Phase 1 Peka Peka to North Ōtaki Expressway Public Engagement Report, August 2011.

27.4 Targeted Consultation

During the 2011 general consultation a number of Te Horo businesses expressed concern about the potential economic impact of the Project. The SIA team contacted Te Horo businesses directly to understand these issues better. Some businesses draw their trade from locals or are 'destination based' and are less affected by the Expressway. Other businesses, particularly those in the food and beverage industry, expect to experience the greatest impact as they are more reliant on passing traffic. For some this will be counter balanced in part by safer access for customers.

Meetings were arranged with six educational institutions covering all age groups from kindergarten, through to primary, secondary and tertiary facilities. All educational institutions held the view that the Project had substantial benefits in that the Expressway would improve travel times to and from the facility by vehicle and would improve facilities for those students that walk or cycle.

The Project was presented to a Grey Power Meeting in Ōtaki. Although there were a few individual members whose properties were directly impacted (and whom had already engaged in one-on-one consultation) the vast majority felt that the Project was positive as it made local travel easier, and with less traffic.

27.5 Assessment of Social Effects

27.5.1 Social Implications of other Technical Reports

The social assessment of the Project takes into consideration elements which are covered in greater detail in other technical reports. Where there is an overlap of issues, the relevant technical report has been considered and the issues outlined in terms of the social perspective of the SIA report, Technical Report 20. Technical recommendations and mitigations presented in the technical assessments are relied on and in most cases cover off social impacts also. Any additional mitigation recommended from a social perspective is listed below.

Heritage

From a social perspective it is important that where heritage sites provide a service or facility to the community (such as the Ōtaki Railway Station), the community can continue to use and enjoy them in the same way. Heritage sites also function as a community touchstone, providing a connection for the current community with the past. As the functionality of the buildings will not be affected by the Project, it is not expected that there would be any substantial social issues regarding their amenity to the community, although access to the Rahui Social Hall will be changed as a result of the Project. In terms of the potential negative effects on heritage, the findings of the Heritage Assessment and the proposed mitigations are relied on.

Archaeological

From a social perspective maintaining links with the history of the area and continuity of the area is important to community aspirations, and feedback from local submitters indicated that care should be taken around historical sites. The amenity and on-going access to existing buildings is important, and should not be affected by the Project. There is a potential benefit to the community that raising awareness about archaeological sites in the area as a result of investigations could strengthen historical links with the area.

Cultural

The findings of the CIA are accepted, and from a social perspective the cultural significance of Pare-o-Matangi reserve strengthens the importance of this area to the

current residents and community at Ōtaki, and reinforces the care that should be taken in addressing future use of this site.

Landscape and Visual

The findings of the LVA are accepted, noting that the proposed mitigation for Pare-o-Matangi reserve would also address the social effect of loss of recreational amenity as a result of the Project. In addition to this, involvement of the Ōtaki community and local iwi in the future design for this space would positively address community aspirations for this area.

Economic

From a social perspective, conclusions regarding the positive economic effects to Ōtaki Main Street support the on-going viability of this community hub, and the overall vision for Ōtaki as a growth area. The potential adverse effects on some Te Horo businesses may result in wider negative social effects to this community. Proposed mitigations such as signage to alert passing traffic to services and facilities at Te Horo have been used in other projects, such as the East Taupo Arterial, and their effectiveness has yet to be quantified.

Air Quality

Maintained or improved air quality at community focal points such as schools and halls is a positive effect of the Project on the amenity of these facilities. However potential negative effects to some specific sites within 200m of the Expressway may have a localised negative effect on those sites. Effective communication and management will be necessary to ensure that any potential effects during construction do not impact on the health and wellbeing of residents in close proximity to the works.

Construction Noise & Vibration

From a social perspective, the overall findings regarding Te Horo and Ōtaki township suggest that there would be no adverse effects on the amenity of open spaces as a result of noise and vibration effects. Potential negative effects in specific locations on the amenity and environment can be managed through communication during the construction stage of the Project. In the case of night works, it is recommended that affected residents are given the option for temporary relocation.

Operational Noise & Vibration

Overall the estimates and modelling in this assessment deem these increases to be within the acceptable threshold within the NZS (with only a few exceptions). The main social effect as a result of operational noise will be to the specific properties which experience a noticeable increase in traffic noise. This is particularly the case along Old Hautere Road, where residents have already expressed their concern at a lack of information about, and a lack of noise mitigating treatment, to this section of the Expressway. On-going communication with affected residents will be necessary to manage the impact of this on residents and it is recommended that this is managed via a Communication Plan.

Traffic and Transport

From a social perspective cross Expressway linkages improve safety and accessibility for neighbouring communities for both local motorised traffic and active transport modes. Greater perceived and actual safety may encourage uptake of active transport and have beneficial effects on the recreational amenity and use of local roads.

Improvements to the connectivity of local roads may also lead to improved amenity of local centres for retail and recreational purposes, which are currently high traffic areas.

27.5.2 **Other Social Effects**

Potential and actual effects were assessed against the SIA framework adopted for this review. Effects were assessed in terms of way of life, well-being, environment and amenity and community.

Way of Life

"Way of life" positive effects include improved journey times and journey reliability to main centres outside of the Project area and improved access to regional facilities. The Expressway will result in a substantial reduction in traffic utilising the existing SH1 and in particular a reduction in through-traffic, including freight. Overall, there will be minor changes to people's localised travel patterns in the east/west directions across the Expressway due to the location and functions of the interchanges and over-bridges connecting local roads. With the removal of SH1 traffic, the high numbers of people who drive to work would have potential benefits of reduced traffic along the route.

Positive effects include improved pedestrian and cycling amenity, improved safety on the existing SH1 and for local communities and potential for greater use of active transport modes such as walking and cycling.

Provision of footpaths and cycleways will improve facilities for pedestrians and cyclists which may also encourage more of the community to use the facilities. These changes are expected to have a positive impact on the walking and cycling environment within Ōtaki and to some extent within in Te Horo.

Minor negative way of life effects on local residents are severance between Old Hautere Road to the existing SH1, removal of access from some properties directly onto SH1 and increased travel time for some residents at Te Horo.

Wellbeing

There will be improved safety on the existing SH1, including as a result of the reduction in through traffic (especially freight) and removal of 5 out of 8 level rail crossings.

Minor negative effects for wellbeing are uncertainty about land acquisition and the degree of effects to private property and what mitigation would be used to address them. In addition there are potential negative effects of emissions to air (dust) and noise or vibration during construction and potential operational noise impacts to a limited number of residences in specific locations in Te Horo and Mary Crest.

The CNVMP will contain measures to mitigate any effects on air quality from construction activities and reduce the potential to harm the health of residents and workers in the Project area. Communication with potentially affected residents will help to mitigate any temporary loss of amenity by enabling residents to alter plans.

Mitigation of any construction related effects on the safety of local and regional traffic, both motorised and active will be managed through the CTMP

Environment and Amenity

A moderate negative effect is the loss of amenity at the Pare-o-Matangi reserve. This is recommended (and proposed) to be mitigated through the purchase of vacant land currently owned by the Ōtaki Motel, therefore no net loss of the Pare-o-Matangi reserve land will result. Minor negative effects are reduced visual amenity at Te Horo and Ōtaki urban area as a result of road widening and over-bridges.

A low noise road surface (OGPA or similar) is proposed through Ōtaki which will reduce noise levels without any visual impact. Investigation of acoustic treatment at one property is also proposed. The mitigation of construction effects are expected to be managed through construction management plans.

Community

A positive community effect is the increased accessibility to educational facilities in the area with improved travel times. Potential improvements to the safety of school bus users are a result of reduced traffic on the existing SH1. There is also a potential negative effect during the construction period, these effects are to be managed via the preparation and implementation of the CTMP.

A minor negative effect is the loss of neighbouring properties and residential cohesion as a result of property acquisition and a moderate negative effect (considering the compensation payable under statutory processes) is the loss of private property where land is to be acquired.

A moderate negative effect on community is the loss of land at the Pare-o-Matangi reserve resulting in a negative effect on community association with the Pare-o-Matangi reserve, (particularly given the cultural significance of the land to tangata whenua).

Impacts on accessibility to commercial areas are positive and negative. Changes at Te Horo will maintain local access and improve safety. Potential negative effects to business owners at Ōtaki Railway Retail area and Te Horo will depend on the nature of the business.

Effects on community development are expected to be moderately positive and include preservation of Te Horo's predominant rural land use and improved access to Ōtaki supporting future growth in this area.

27.6 Measures to Avoid, Remedy or Mitigate Actual and Potential Adverse Effects

The key mitigation measures proposed to address the social effects of the Project are listed below. These are in addition to the mitigation measures already proposed by other technical assessments.

- For those vulnerable residents such as the elderly or disabled, a community liaison person will be provided for to facilitate the process.
- The option for residents temporarily affected by construction noise and vibration to be temporarily relocated (for the duration of the construction period) is provided, if the impacts on them are too great to maintain normal daily functioning. This should be considered in the preparation of the relevant management schedule if monitoring results indicate that this may be a suitable mitigation measure, though in the main this is not anticipated. This should be reviewed once the detailed design and final construction management plan are complete.
- A CEMP will be prepared and implemented to address any adverse effects of construction activities. This will include management of any pedestrian or cycling traffic that may be affected. A communications strategy will accompany the CEMP and will detail how and when this information will be communicated to the public, stakeholders and directly affected landowners.
- On-going communication with neighbouring schools and educational facilities, regarding time and duration of activities in this area is recommended as part of the communications strategy.
- A community liaison group will be established for key sectors such as education and business (Te Horo and Ōtaki). Specific provisions should be set up in association with Te Wānanga-O-Raukawa to ensure the large student base the Wānanga represents is kept informed as well as ensuring that the collective of Māori educational interests of which the Wānanga are a part are also fully advised. All other schools could fall within a second collective.

- It is important that other potentially vulnerable groups are also kept informed. The elderly are potentially one of the positively affected groups by reducing traffic volumes on local roads. During the construction period and during the early stages of operation organisations such as Grey Power should be specifically informed.
- KCDC staff responsible for travel demand management plans should be kept informed so as to enable their plans to be prepared and/or updated.
- If during the construction phase any substantial delays (particularly over holiday periods and long weekends) are anticipated, publicity should be given to this on a regional or national basis e.g. use of national press or national and regional radio.
- Maintain the iwi consultation protocol that has been established as a forum to communicate information particularly during the construction stage.
- Establishment of a feedback/complaints database to established for the construction phase to ensure that community, stakeholder and individual issues are addressed and that appropriate responses are provided for all queries.
- Crime Prevention through Environmental Design Principles (CPTED) has been taken into account when designing the route, particularly the over-bridge sections and those areas including pedestrian and cycleways.
- The SIA supports the mitigation proposed to incorporate Ōtaki Motel land to offset loss of land at the Pare-o-Matangi reserve, and further recommends local iwi and the wider Ōtaki community involvement in the re-design of Pare-o-Matangi reserve.
- Establishment of a dedicated community liaison person who will be the conduit between the Project team and the community during construction.

Chapter 28

Part G

VOLUME 2

Economic

Overview

The Project will have significant net economic benefits for the Wellington Region and especially the Kāpiti district.

During the construction of the Project, there will be increased expenditure, employment and incomes, with associated economic benefits for local and regional businesses and residents.

Once operational, the Project will also contribute economic benefits to local and regional businesses as a consequence of:

- Savings in vehicle operating costs, travel time costs and accident costs;
- Improvements in travel time reliability; and
- Increased business development and population growth.

For most residents within the Ōtaki Railway Retail area, the Project will have neutral or positive effects. There will be negative business redistribution effects for a small minority of businesses within this area. Negative business redistribution effects of the Project are likely to be greatest for a small minority of businesses on or near SH1 at Te Horo and on SH1 between Te Horo and South Ōtaki. Whilst important from the perspective of the residents of Te Horo, these businesses do not constitute a significant commercial centre in terms of the hierarchy of centres within the Kāpiti district. Appropriate signage at exit points on the Expressway will provide some protection against negative business redistribution effects.

Some property values will be affected by the Project. However such effects are a reflection of, and not in addition to, the intangible impacts of the Project identified in other Technical Reports of the AEE.

28 Economic

28.1 Introduction

This chapter summarises the economic effects of the Project as they relate to the RMA's focus on enabling economic wellbeing, including local, district and regional economic effects and effects resulting from both construction and operation. The cost benefit analysis for the Project is discussed in Technical Report 21. This chapter also contains recommendations for mitigation.

The assessment in this chapter is consistent with the requirements of the RMA and aims to measure the ability of the Project to enable economic wellbeing.

The report that contributes to this overall assessment is:

- Peka Peka to Ōtaki Expressway Project Assessment of Economic Effects (Technical Report 21)

This technical report is included in Volume 3 of this AEE report.

28.2 Existing Economic Environment[51]

Economically, Kāpiti district is strongly intertwined with the wider Wellington Region, and the district has a relatively high dependence on the wider region for employment.

The 70% local employment retention rate for the Kāpiti district is third lowest in the Wellington Region after Upper Hutt with 62% and Porirua with 67%. This means that a sizeable proportion of residents rely on employment opportunities outside district boundaries (in that about 30% of the labour force travel outside the district for employment). Ōtaki town centre and the business and industrial areas in Paraparaumu are the principal sources of employment and economic activity in the district.

Forecasts for the Kāpiti district's economic environment are for on-going population increase, and associated demand for housing and business development. Some key indicators in this regard are estimates for the period 2010 to 2031 of:

- Population growth of circa 10,000 persons or 20% (Statistics New Zealand medium growth assumptions). This is Statistics New Zealand medium forecast (fertility, mortality and net migration) for the Kāpiti district. The actual forecast for 2011-2031 is 10,300 for the Kāpiti district with 2,300 for Peka Peka, Ōtaki Forks, Te Horo and Ōtaki.
- Total employment counts growing between 3,400 to more than 6,000.
- Increases of over 50,000 m^2 in sustainable retail gross floor area.

There are three retail areas potentially affected by the Project, the Ōtaki Railway Retail area, Ōtaki Main Street and Te Horo.

28.2.1 Ōtaki Railway Retail Area

The Ōtaki Railway Retail area contains a mixture of shops and businesses which serve local Ōtaki residents, visitors to Ōtaki and passing traffic. An inventory[52] of the businesses in the Ōtaki Railway Retail area shows that out of a total of 85 businesses, 63 were involved in retail. Of these 30 (48%) were classified as clothing and footwear, 13 (21%) were cafes, bakeries and takeaways, 3 (5%) sold food, groceries and/or liquor, 3 (5%) were petrol stations and 14 (22%) were classified as miscellaneous retail stores. Of the 22 other businesses in this area, 8 provided professional and business services, 4 provided auto repair services, 2 were motels, 1 was a hotel providing accommodation and bar services, 2 were healthcare businesses and 5 provided other services.

The high number of clothing and footwear stores reflects the concentration of "factory outlet" stores in the Ōtaki Railway Retail area. This has attracted other clothing and footwear stores and other retail outlets to also locate in the area and has made the Ōtaki Railway Retail area an attractive shopping destination for visitors.

28.2.2 Ōtaki Main Street

The Ōtaki Main Street centre contains a number of shops and other commercial activities, which principally serve the local community rather than visitors to Ōtaki or passing through traffic who stop at Ōtaki. Because of the particular mix of activities and its distance from SH1, it is not a "destination" centre attracting visitors to Ōtaki and is less

[51] Information regarding the existing economic environment has been obtained from MacKays to Peka Peka project, Assessment of Environmental Effects report: Chapter 29: Economic effects, dated March 2012, pgs 588-589.

[52] Undertaken in March 2011 (see Table 1 in *Ōtaki Customer Survey: Report of Pedestrian Intercept Surveys Conducted in March 2011*; Opus International Consultants Limited; 2011). The business inventory was updated in October 2012.

reliant on the passing motorised trade than is the Ōtaki Railway Retail area, which is on or adjacent to the existing SH1.

An inventory[53] of the businesses in the Ōtaki Main Street centre shows that out of a total of 59 businesses, 28 were involved in retail. Of these only 4 were classified as clothing and footwear, 11 were cafes, bakeries and takeaways, 6 sold food, groceries and/or liquor, and 7 were classified as miscellaneous retail stores. Of the 31 other businesses in this area, 3 provided professional and business services, 2 were hotels (of which only 1 provides accommodation as well as bar services), 4 were healthcare businesses and 22 provided other services.

28.2.3 Te Horo

At Te Horo there is a small cluster of businesses on SH1 and down Te Horo Beach Road, near to SH1. These include 2 cafes, an art gallery, a jewellery shop, an auto repairer, a building products yard, a museum, a plant, fruit and vegetables store, a hairdresser, a second-hand furniture store, a second-hand clothing store, and a caravan sales yard. Whilst these businesses form something of a commercial "centre" from the perspective of the local Te Horo residents, they do not constitute a significant commercial centre in terms of the hierarchy of centres for the wider Kāpiti district.

28.3 Assessing Economic Effects

For the Project the economic effects at a Kāpiti district level are relevant, because the economic effects of the Project will largely (but not solely) affect residents and businesses in the district. At a regional level, Wellington (and Kāpiti) viewpoints are relevant as the residents and businesses of these locations will also experience economic effects of the Project.

The effects at the national level are also relevant particularly as the Project forms part of the Wellington Northern Corridor RoNS. For this Project the national economic effects are also relevant because of the size of the Project and because the Project will be funded through the NZTA.

The assessment in this chapter considers:

- Efficient use and development of resources;
- Increased economic activity during the Project's construction;
- Operational effects for local and regional residents and businesses;
- Business redistribution effects on Ōtaki and Te Horo; and
- Property value effects.

28.4 Investigation and Assessment Process

The Assessment was informed by:

- Ōtaki Customer Survey: Report of Pedestrian Intercept Surveys Conducted in March 2011; Opus International Consultants 2011;
- An update of the business inventory undertaken in October 2012;
- Results of consultation;
- The traffic assessment for the Project (refer Technical Report 6 titled 'Integrated Transport Assessment', Volume 3); and

[53] Undertaken in March 2011 (see Table 1 in *Ōtaki Customer Survey: Report of Pedestrian Intercept Surveys Conducted in March 2011*; Opus International Consultants Limited; 2011). The business inventory was updated in October 2012.

- Analysis of regional and district-level demographics and business statistics.

28.5 Assessment of Economic Effects

The summary findings of the economic effects assessment are set out below.

28.5.1 Increased Economic Activity During the Expressway's Construction

During the construction of the Project (anticipated to be over a four-year period) there is likely to be increased expenditure, employment and incomes, with associated economic benefits for local and regional businesses and residents.

28.5.2 Operational Effects for Local and Regional Residents and Businesses

Once operational the Project will also contribute economic benefits to local and regional businesses and residents as a consequence of (i) savings in vehicle operating costs, travel time costs and accident 'costs', (ii) improvements in trip travel time reliability; and (iii) increased business development and population growth.

28.5.3 Business Redistribution Effects on Ōtaki and Te Horo

A consequence of the Project is that through-traffic on the Expressway will no longer pass through Ōtaki and Te Horo, and passing traffic wishing to visit these centres will be required to exit and re-join the Expressway. For Ōtaki this will be relatively straightforward as traffic can exit and enter at the North and South Ōtaki on and off ramps. For Te Horo this will be more difficult. Through traffic from the south will need to exit at the Waikanae (Te Moana Road) off-ramp and re-enter at the North Ōtaki on-ramp. Through-traffic from the north will need to exit at the North Ōtaki off-ramp and re-enter at the Waikanae on-ramp. The distance to be travelled along a local road for through traffic wishing to visit Te Horo will be 15km.[54]

Leaving the Expressway to visit either centre will result in longer travelling times compared to remaining on the Expressway. This will create a disincentive for passing motorists to visit Ōtaki and Te Horo with potentially negative implications for local businesses. On the other hand, removing through traffic from the existing SH1 provides the opportunity to improve access, parking and the general ambience of these centres, potentially encouraging more visitors to them.

For most businesses within the Ōtaki Railway Retail area, the Project will have neutral or positive effects. There will be negative business redistribution effects for a small minority of businesses within this area. However competing businesses at other centres between Wellington and North Ōtaki will be similarly affected by the proposed Transmission Gully Project and another expressway Project (M2PP). Also by the time the Project is operational, growth in population and expenditure is likely to more than offset any negative business redistribution effects of the Expressway and the Project will not result in any reduction in public amenity values for the Ōtaki Railway Retail area commercial centre.

The Project will have minimal business redistribution effects on businesses located within the Ōtaki Main Street centre, given their predominant servicing of local residents and businesses.

Negative business redistribution effects of the Project are likely to be greatest for businesses on or near the new local arterial road (existing SH1) at Te Horo and on the new local arterial road between Te Horo and South Ōtaki. Whilst important from the perspective of the residents of Te Horo, these businesses do not constitute a significant commercial centre in terms of the hierarchy of centres within the Kāpiti district.

[54] 10 km between Waikanae and Te Horo and 5 km between Te Horo and North Ōtaki.

28.5.4 **Property Value Effects**

Some property values will possibly be negatively affected by the Project. However such effects are a reflection of, and not in addition to, the intangible impacts of the Project identified in other chapters of this AEE report.

The increase in attractiveness of the Kāpiti district for business and residential development is likely to mean increases in property values. However this is likely to largely be a transfer effect from a broader regional or national perspective. To the extent that the Project increases the demand (and price) of properties for development within the Kāpiti district, there will be lesser demand (and price) for properties elsewhere in the region.

Also, whilst the accessibility benefits for the occupiers of existing commercial and residential properties will exert upward pressure on these properties' values, these are a reflection of, not in addition to, the traffic-related benefits already discussed above.

28.6 Measures to Avoid, Remedy or Mitigate Actual and Potential Adverse Economic Effects

The economic assessment identifies some possible business redistribution effects for a limited number of businesses at Te Horo, between Te Horo and Ōtaki and at Ōtaki. Appropriate signage at exit points on the new Expressway will provide some protection against such effects.

Chapter 29

Part G

VOLUME 2

Land Acquisition and Property

Overview

The main property effects of the Project can be separated into three broad categories of property:

- Property with land that is directly required (either in whole or in part) for the Project;
- Land with an easement or other property right (including rights of way and water rights) that is directly affected by the Project; and
- Properties within close proximity to the Project.

The land holdings range from Crown land, KCDC-owned land (including road, rail and reserves, private land) Māori land and private land. The largest land requirement is for land held in private ownership which must be acquired for the Project for road purposes. There are some properties where part acquisition will be required.

There are some examples of properties that will be required for construction of the Project, but that will not be purchased. Examples include properties that are required for temporary occupation during construction work, but are not required in the long term for occupation of the road. The effects on these properties can also be managed through the PWA process. In some cases alternative arrangements can be made with landowners (such as land entry agreements or license to occupy).

There are a number of instances where the Project will affect other property rights such as physical access to a property or a water supply arrangement. It is considered that effects on other property rights have been well identified through the design and investigation phase and the various mitigation measures will be adopted in consultation with the affected parties.

Properties within close proximity to the route that have been identified as being subject to or particularly sensitive to effects have been identified through the Technical Reports (Volume 3 of the AEE report). Actual and potential effects on these properties have been identified in relation to specific technical areas and appropriate mitigation has been devised.

Actual and potential (including perceived) effects on property values is not considered to be a relevant consideration under the RMA. Effects on amenity values are a relevant consideration, and those that are affected by the Project are considered through assessment of other actual and potential effects including noise, landscape and access.

29 Land Acquisition and Property

29.1 Introduction

The main property effects of the Project can be separated into three broad categories:

- Properties with land that is directly required (either in whole or in part) for the Project;
- Land with an easement or other property right (including rights of way and water rights, for example) that is directly affected by the Project; and
- Properties within close proximity to the Project.

Land parcels that will be directly affected to a greater or lesser degree by 'land take' requirements to accommodate the Project are shown in the Land Requirement Plans (LR01-18) contained in Volume 5 of the AEE report, and in the accompanying schedule. 117 land interests have been identified as being directly affected.

The land holdings range from Crown land, KCDC-owned land (including road and reserves) land in Māori general or freehold title (which will be subject to the Māori Land Court's decision to approve any alienation) and private land which is primarily large rural holdings,

but also includes some rural-residential lifestyle blocks, and urban rural land and business land.

Most of the land required for the Project is in private ownership. At this time, only a relatively small amount of land has been acquired for the Project, but all property owners whose land is directly affected have been contacted and consulted. All land is within the Wellington Region, and the land required is within the jurisdiction of KCDC.

29.2 Land Acquisition and Occupation

As the NZTA and KiwiRail are requiring authorities under the RMA, they are also classified as network utility operators for the purposes of the PWA, so may apply to the Minister of Lands to acquire lands on their behalf.

The PWA acquisition process is usefully described in a guide produced by LINZ where as background[55]:

> *"Public works often cannot be carried out without affecting private landowners and their interests in land. For these reasons many governments throughout the world, including New Zealand, provide themselves with legislative powers to compulsorily acquire land for public works so that public works proposals are not unreasonably delayed. A basic principle of our system of government is that no person shall be deprived of land by the Crown without receiving fair compensation. In New Zealand the Public Works Act 1981 provides the power to acquire land for public works and to pay compensation. LINZ, on behalf of the Crown, is responsible for administering this Act.*
>
> *A large number of decisions made by the courts in both the United Kingdom and in New Zealand aid interpretation of the compensation provisions of the Public Works Act. Entitlements to compensation are therefore well settled."*

The following describes landowners' rights[56].

> *"The Public Works Act provides the Crown with the statutory authority to acquire land for a public work. The Crown has the power to acquire or take land for a wide variety of purposes and may negotiate for the land in the same way as a private purchaser. While the Crown's powers are wide, it can only acquire land, whether by negotiation or compulsorily, in accordance with the Act. The acquisition process generally takes place after all required consents for the use of the land have been granted, or a designation has been provided for by the territorial authority."*

The LINZ guide also outlines guidance on compensation and other landowner rights under the PWA.

As mentioned in the guide, property acquisition generally takes place later on in the process. To date, however, the NZTA's property accredited suppliers, through LINZ have completed property agreements with landowners to purchase land in advance of the designation process, where owners were in exceptional circumstances (including hardship cases).

There are some properties where part-acquisition will be required. This could result in severance of land, or a reduction in the area of land remaining that means that the previous potential of the property can no longer be realised. For example, a property may be reduced in size so that it no longer meets district plan rules for subdivision. The property valuation and acquisition process under the PWA will take into account any

[55] http://www.linz.govt.nz/crown-property/public-works/guide/background

[56] http://www.linz.govt.nz/crown-property/public-works/guide/public-works-acquisition

adverse effects on the value of properties arising from part-purchase, and appropriate compensation will be arranged with the land owner.

There are some examples of properties that will be required for construction of the Project, but that will not be purchased. Examples include properties that are required for construction purposes, but which are not required in the long-term for occupation by the Project. Construction land requirements that may not be required in the long-term include:

- Construction yards containing, for example, Project offices, workers' conveniences, and machinery and equipment storage;
- Laydown areas such as for the storage of precast concrete components;
- Mitigation measures such as noise barriers;
- Fill sites; and
- Construction access routes alongside the alignment, which are required in many locations where there is difficult topography, or there are existing tracks.

An example of a property within the proposed designation that will be affected is the Ōtaki Railway Station and the adjacent operative NIMT alignment. As discussed in previous chapters of this AEE report, the Ōtaki Railway Station will be retained and reoriented to accommodate the realignment of the rail line.

All affected properties are shown in the Land Information Plans (refer Volume 5 of the AEE) (and eventually in the relevant district plans should the NoRs be confirmed) as required for roading or rail purposes (as the case may be) in the same way as the land that will be purchased. Upon confirmation of the NoRs, land will be identified for temporary occupation, lease or land necessary to be acquired. On completion of the construction of the Project, the NZTA and KiwiRail will review the designation boundaries, and uplift those parts that are no longer required for roading or rail purposes.

Where a property lease/rental arrangement through the PWA process is undertaken, the NZTA/KiwiRail will undertake to return the land as near as practicable to its original state or as otherwise agreed with the landowner.

It is considered that the effects on property have been well acknowledged through consultation, and will be properly compensated for through the PWA processes.

29.3 Access, Easements and Other Property Rights

There are a number of instances where the Project will affect other property rights such as physical access to a property, or farm management or a water supply arrangement. To address this:

- Where such rights are affected, alternative arrangements for movement or replacement are proposed, and either have been or will be developed in close consultation with the landowner.

It is considered that effects on other property rights have been well identified through the consultation processes.

29.4 Properties Within Close Proximity

Properties within close proximity to the Project that have been identified as being subject to or particularly sensitive to effects have been identified through the Technical Reports summarised in this AEE report. Actual and potential effects on these properties have been identified in relation to specific technical areas and appropriate mitigation has been devised.

While discussed during consultation, actual and potential (including perceived) effects on property values are not considered to be relevant considerations under the RMA. Effects

on amenity values are relevant considerations, and those that are affected by the Project are considered through assessment of other actual and potential effects including examples such as noise, landscape, and access.

Chapter 30
Part H
VOLUME 2

Environmental Management and Monitoring

Overview

Many of the potential adverse effects of the Project have been avoided or reduced through an integrated design process. Residual adverse effects are to be mitigated through careful management throughout the construction and operation of the Project.

The Project delivery framework sets out the overall framework in which the Project will be delivered through to commissioning. This identifies where management plans and other key processes (such as the submission of outline plans to KCDC) will occur.

The practices and management controls to be adopted by the Project will be set out in a series of management plans. The management plan framework adopted for the Project implements the controls (i.e. standards and limits) as set by conditions. The purpose of the management plans is to clearly show the means by which these controls will be implemented.

The overall management plan framework provides for three proposed tiers of management plans:

- An overarching CEMP. The CEMP is a high level plan intended as an 'umbrella' document containing overarching principles and an overall staging programme;
- The second tier of management plans consists of a series of topic-specific management plans, including an ESCP, an EMP, a BECLMP, a CTMP, a LP, CNVMP, and a CAQMP. These plans provide principles that are applied site-wide, setting out how design criteria and performance standards are met;
- The third tier is a series of SSEMPs. The SSEMPs provide detailed design, details of appropriate monitoring positions/locations, and environmental management measures (such as the type of sediment management device for specific areas).

The above management plans are provided as draft versions. The draft CEMP and the topic-specific draft management plans have been prepared and are contained in Volume 4. Management plans will be finalised by the contractor and provided as required by consent conditions.

Draft SSEMPs have been developed for Central Ōtaki and Mary Crest, two sensitive areas in which the Project will be constructed. SSEMPs will eventually be developed for all areas of the Project in sequence with the staging of construction.

The management plans and conditions also cover proposed environmental monitoring which will be undertaken prior to, during and following construction to monitor potential effects, and provide a mechanism through which additional measures can be implemented during construction and operation if necessary.

As a result of the extensive suite of mitigation measures put forward as part of the Project (which have already been integrated into the Project's design elements and/or are proposed to be implemented as conditions of the designations and resource consents) the potential adverse effects of the Expressway will be appropriately avoided, remedied or mitigated.

30 Environmental Management and Monitoring

30.1 Introduction

The AEE in Part G, chapters 14 to 29 and summarised in chapter 11, identifies a wide range of positive and adverse actual and potential environmental effects predicted to result from the construction and operation of the Project.

These effects require remediation and/or mitigation to ensure that they are appropriately managed. This chapter provides a discussion of the environmental management

measures proposed to be implemented before, during and after construction, in order to ensure that potential environmental effects of the Project are adequately and appropriately avoided, remedied or mitigated.

The remainder of this chapter provides the following information:

- The Project delivery framework identifying how conditions and management plans will be implemented through the further detailed design and construction phases of the Project (Section 30.2);
- The proposed management plan framework (Section 30.3); and
- A summary of the measures proposed to adequately avoid, remedy or mitigate potential adverse effects (Section 30.6).

The suite of proposed mitigation, remediation and monitoring measures summarised in Section 30.6 is formalised through the conditions of the designations and resource consents. The summary of measures provides a reference to the relevant proposed condition(s).

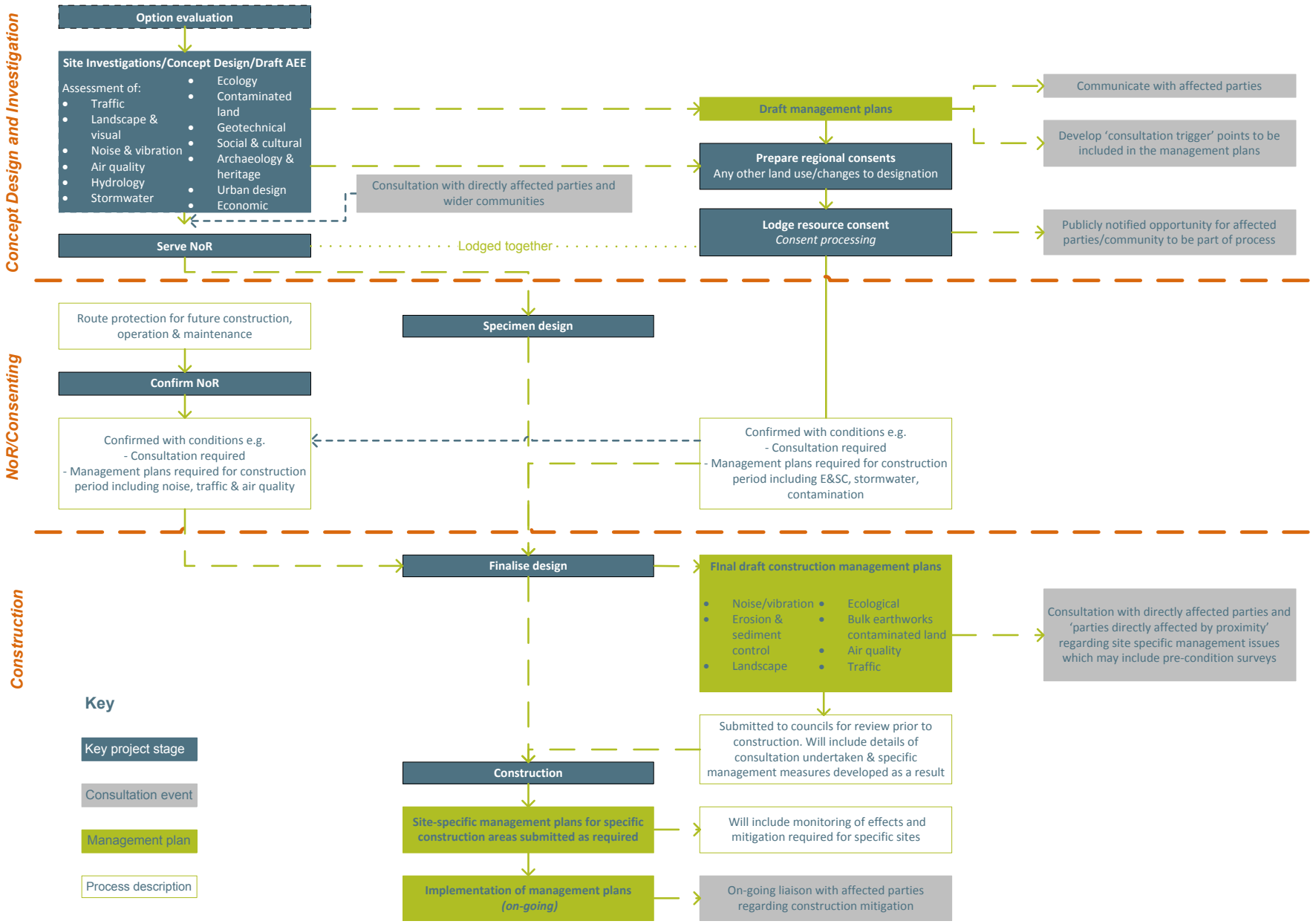
The proposed conditions of the designations are set out in Chapter 31 and the proposed conditions of the resource consents, including specific conditions for earthworks, discharges to land, wetland reclamation, and vegetation clearance, are set out in chapter 32.

30.2 Project Delivery Framework

Key to the management of effects is the development and implementation of a suite of measures that include conditions, management plans and monitoring. This is referred to as the Project delivery framework. This includes the need to provide consistency with the NZTA's and KiwiRail's environmental objectives, to manage areas of environmental sensitivity, recognise environmental risk issues, and to identify the mechanisms to avoid, remedy or mitigate actual and potential effects of the Project.

This chapter identifies the principles, methods and plans to be developed by the NZTA and KiwiRail (and its nominated contractors/consultants) at the time detailed design is finalised and construction occurs, and the associated monitoring and processes for verification. Figure 30-1 illustrates the overall process for delivery of the Project.

Figure 30-1: Overall Project Delivery Process



30.2.1 Principles for Project Delivery

The following principles form the basis for the development of the management plans and conditions for the delivery, operation and maintenance of the Project:

- All works are to be undertaken in compliance with applicable current New Zealand standards and legislation;
- The construction and operation of the Project will avoid, remedy or mitigate adverse effects to an appropriate level;
- An integrated team approach has been and will continue to be used to develop the design and the methods to avoid, remedy or mitigate actual and potential effects so that no one discipline is more important than others; and
- Each technical specialist, consultant, or contractor involved in the Project has equal responsibility to avoid, remedy or mitigate adverse effects.

In addition to these principles, the NZTA and KiwiRail will maintain on-going communication with:

- the local authorities (GWRC and KCDC) responsible for monitoring and enforcing conditions placed on the designations and resource consents;
- directly affected landowners;
- tangata whenua;
- the community; and
- other key stakeholders.

30.2.2 Methods to Avoid, Remedy or Mitigate

The following methods to avoid, remedy and mitigate actual and potential adverse effects have been employed or are proposed:

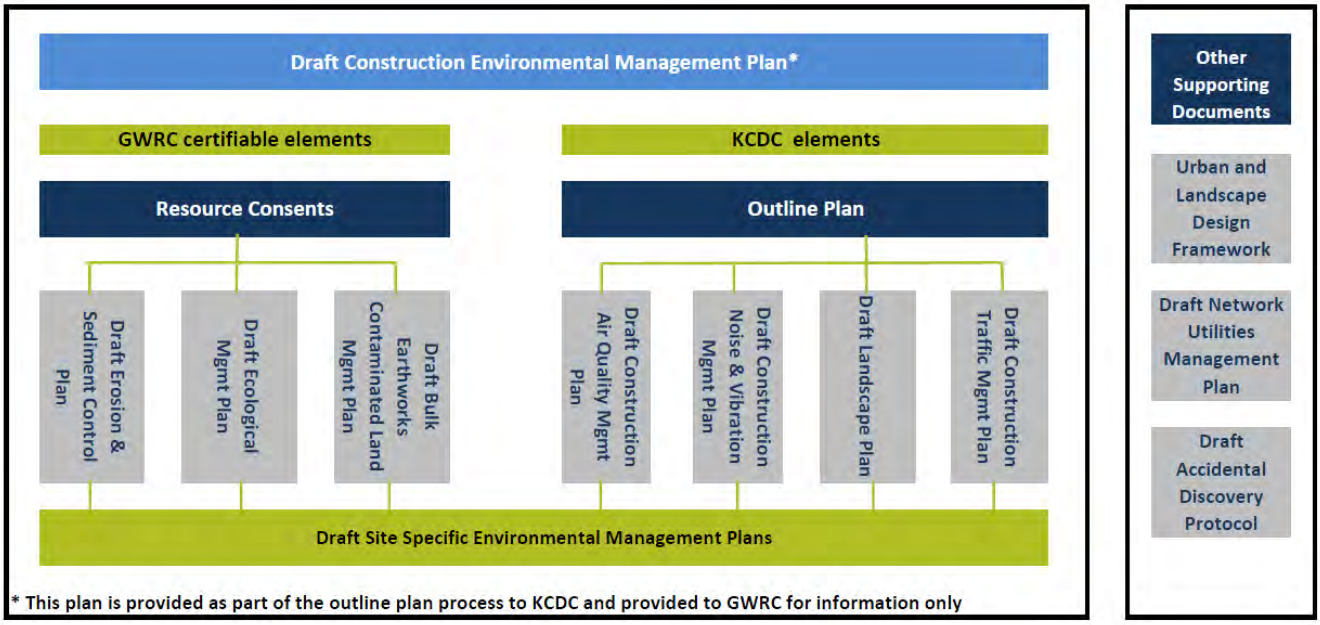
- The Project has been carefully designed to respond appropriately to the receiving environment, including the consideration of alternatives (discussed in Chapter 9 of Part E, AEE report), which involved an integrated team approach and led to significant improvements in the design, and the avoidance of various adverse effects.
- The Project's design and other mitigation measures will be implemented through proposed:
    - Designation conditions;
    - Resource consent conditions; and
    - Management plans.

Table 30-2 sets out actual and potential adverse environmental effects and the proposed methods to be used to mitigate and manage them.

30.3 Management Plan Framework

The proposed framework of management plans required to avoid, remedy and mitigate effects is shown in Figure 30-2.

Figure 30-2: Proposed Management Plan Framework



The practices and management controls to be adopted by the Project will be set out in a series of management plans. The management plan framework adopted for the Project implements the controls (i.e. standards and limits) as set by conditions. The purpose of the management plans is to clearly show the means by which these controls will be implemented.

- The first tier in the framework is the CEMP. The CEMP is a high level plan intended as an 'umbrella' document containing overarching principles and an overall staging programme, as detailed below.
- The second tier of management plans (discussed in detail below) provide principles that are applied site wide, setting out how design criteria and performance standards are met.
- The third tier, being the SSEMPs, provide detailed design, details of appropriate monitoring positions/locations, and environmental management measures (such as the type of sediment management device for specific areas). They describe how the Project will be built as discussed in detail below.

Draft management plans are in Volume 4 of this AEE report.

30.3.1 Construction Environmental Management Plan

A draft CEMP has been prepared for the Project (Volume 4). The CEMP will be finalised in conjunction with the Project contractor and provided to KCDC and GWRC prior to construction of the Project.

The contractor(s) will be required to undertake all construction activities on the site in accordance with the provisions of the CEMP and relevant management plans (and the designation / resource consent conditions as a whole) as part of their contractual arrangements.

The CEMP is an overarching strategy document. It covers all anticipated construction elements and presents a framework of principles, environmental policy, objectives and performance standards for the project execution. The other management plans generally fall under, and are Appendices to, this main plan. The CEMP sets out the methods and tools (for example; monitoring and review requirements, auditing procedures and

corrective actions) to be implemented by the construction contractors to manage, avoid, remedy and mitigate potential adverse environmental effects in order to meet the proposed resource consent and designation conditions, relevant legislation and the NZTA's environmental objectives.

The CEMP also establishes the relationship between the related topic specific environmental management plans that address specific effects, for example construction traffic and contaminated soil. It also sets out the methodology for delivering more detailed site-specific management plans immediately prior to construction.

The proposed designation and consent conditions that require preparation of a CEMP also need to provide flexibility to review and modify practices according to changing circumstances. Making sure the CEMP is current and relevant is critical to its successful implementation.

The CEMP, and the environmental topic-specific plans, may require review and amendment during the life of the Project to reflect changes to activities, risks, mitigation measures, responsibilities and management processes (known as adaptive management). The ability to make changes to the CEMP is an important aspect of continually improving the effectiveness of the CEMP.

The NZTA/KiwiRail will work with the selected contractors to develop further and finalise the CEMP once the consents and designations are obtained, as part of the process of finalising detailed design and construction methods. The process for modifications is set out in the CEMP and includes methods to involve inputs from Councils and key stakeholders.

The CEMP, and the topic-specific environmental management plans, are to be consistent with, and complement, the Project's AEE report. The many technical assessment reports contained in the AEE report inform the specific environmental management, monitoring and mitigation measures described within the second-tier plans. The contractor will implement these to manage actual and potential environmental effects during construction.

30.3.2 Site-Specific Environmental Management Plans

The SSEMPs describe in detail how the Project will be built within site-specific areas. They provide detailed design, details of appropriate monitoring positions/locations, and environmental management measures (such as the type of sediment management device) for specific areas.

Two draft SSEMPs have been prepared as part of this AEE report. These are for Central Ōtaki and Mary Crest. These focus areas were chosen as they contain potentially sensitive areas, and between them have the full range of environmental management issues likely to be encountered during the construction of the route. In total there will be at least 9 SSEMPs, but the final number will be developed in conjunction with the contractor, GWRC and KCDC.

The SSEMPs aim to:

- Provide confidence to stakeholders in the Project's design and environmental controls to be implemented during construction;
- Assist in assessing effects;
- Assist in developing mitigation strategies; and
- Assist in consultation with stakeholders regarding construction management issues.

The purposes of the SSEMPs are to:

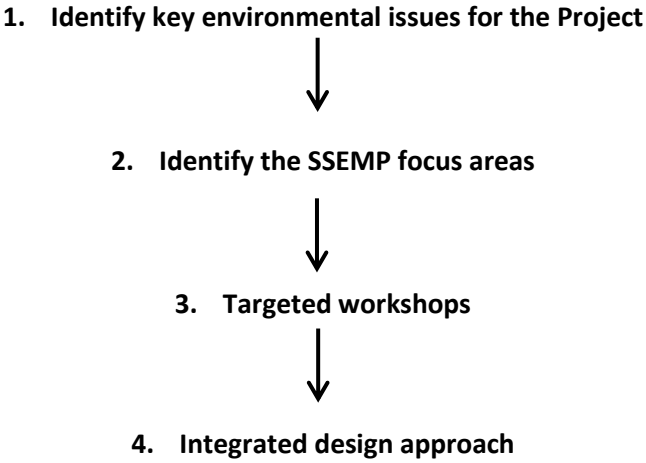
- Develop and demonstrate the environmental controls that will be applied to a specific area of the site or activity, i.e. how the CEMP and topic specific environmental management plans will be applied in practice;

- Provide more detailed design information about specific key areas along the route where there are a number of interacting discipline areas, technical challenges or particularly sensitive receiving environments;
- Prepare targeted environmental management measures to demonstrate how generic performance-based construction techniques could be applied to a specific section of the Project route; and
- Demonstrate a method for fine-tuning the design to reduce adverse environmental effects further at a later date in other areas along the Project route.

Preparing two draft SSEMPs at this stage of the process has had the added benefit of informing the development of performance-based consent and designation conditions using the technical inputs of all the relevant technical specialists. The SSEMPs, once finalised, will provide an integrated consideration of the key performance standards relevant to controlling actual and potential effects on the environment and will clearly document proposed control measures, e.g. temporary sediment controls.

Finalising/Developing the SSEMPs

The following four-step approach will be used to finalise the draft SSEMPs, and to develop SSEMPs for the balance of the Project:



Step 1 – Identify key environmental issues

The SSEMP areas (which together will cover the entire Project area) will be identified in a workshop by technical specialists through a process using the following criteria:

- **High profile (public)** – Sites that are clearly visible from public areas and that are known to be of particular interest to the public.
- **Visual and landscape** – Areas that have particular natural landscape value or which are clearly visible from public areas.
- **Social and community and urban design** – Areas where there is a significant amount of interaction with the public and where appropriate design is critical to achieve a better and more liveable outcome for people and communities.
- **Traffic management** – Areas where particular traffic management issues arise, such as at tie-ins with the existing SH1 where construction will need to occur, whilst still providing for the through movement of traffic.
- **Hydrology and flood risk** – Areas where the construction of the Project has the potential to cause particular damming and/or flooding issues.
- **Railway integration** – Areas where the NIMT railway corridor requires realignment.

Step 2 – Identify the SSEMP focus areas

In light of the above criteria, SSEMP focus areas will be selected. Together the SSEMPs will cover the entire Project area, and the boundaries between each SSEMP will be chosen taking into account the site conditions and issues arising along the Project length.

Step 3 – Targeted workshops

Workshops with KCDC / GWRC, stakeholders, and NZTA / KiwiRail personnel and consultant experts will be held in order to discuss the purpose and selection of the SSEMPs. Key construction issues for each SSEMP will be discussed in order to develop principles for managing construction activities given known environmental and construction issues.

Step 4 – Integrated approach to development

The outputs from the workshops will be integrated into the SSEMP through further sessions involving key technical experts. Contractor input in to the final SSEMP development will also be required to ensure that control measures are integrated with the proposed construction methodologies.

The final SSEMPs will be submitted to GWRC and KCDC for certification, prior to the commencement of any sector, stage or location of construction works.

SSEMP Relationship to the AEE Report and Conditions

The two draft SSEMPs (for Central Ōtaki and Mary Crest) form part of the application documentation and demonstrate a higher level of detail for two key areas of the Project, including environmental management principles that have been developed specifically for the unique issues present at the chosen sites and how these can be applied into physical controls.

Final SSEMPs developed for the Project prior to construction in a specific area will comply with the 'umbrella' CEMP, topic specific environmental management plans and the final designation and resource consent conditions.

30.3.3 Summary of Environmental Effects and Corresponding Management Plans

Table 30-1 identifies which actual and potential effects on the environment are managed in each management plan.

Table 30-1: Proposed Management of Environmental Effects via Management Plans

Environmental Effect (Construction)	Relevant Management Plan*
Designations	
Noise	CNVMP
Vibration	CNVMP
Air quality	CAQMP
Social and community effects	CEMP*, CTMP, CAQMP, Communications Strategy
Culture and heritage	Conservation Plan for Ōtaki Railway Station Conservation Plan for Clifden Conservation Plan for the relocation and conservation of the Mirek Smišek Beehive Kilns ADP
Site operation	CEMP*
Traffic	CTMP
Visual and landscape effects	LP EMP
Resource Consents	

Environmental Effect (Construction)	Relevant Management Plan*
Land	CEMP* ESCP
Water resources	
Ecology (aquatic and terrestrial)	EMP
Spill response and land contamination	BECLMP CEMP*

Note: *The CEMP applies to entire Project and is the overarching strategy document under which all of the topic specific environmental management plans sit.

30.4 Certification Process for Management Plans

The management plans are provided in draft as a number of amendments to the design are likely during design refinement for the Expressway. The appointed contractor commonly redesigns environmental management methods within the parameters guidelines set by conditions. For example, these may include reductions in exposed areas of earthworks in a particular section of the works; changing the staging of works depending on soil types and physical conditions; and amendments to erosion and sediment controls.

Each sub-management plan (topic specific environmental management plans) developed under the CEMP will be submitted to the GWRC, which has RMA functional and consenting responsibilities. The sub-plans contain Project-specific methodology for avoiding, remedying or mitigating the actual and potential adverse effects arising from the construction of the Project within the parameters set in the conditions.

GWRC will be responsible for certifying the following Management Plans:

- Erosion and Sediment Control Plan;
- Ecological Management Plan;
- Construction Air Quality Management Plan; and
- Bulk Earthworks Contaminated Land Management Plan.

As part of the Outline Plan process, the following management plans will be submitted to KCDC:

- Construction Noise & Vibration Management Plan;
- Network Utilities Management Plan;
- Landscape Plan; and
- Construction Traffic Management Plan.

It is acknowledged that aspects of some management plans will have a secondary purpose or benefit, and will be of interest to both GWRC and KCDC. Therefore it is intended that both KCDC and GWRC will be consulted during the preparation of the relevant management plan, prior to the lodgement of the management plan.

It is proposed that the final draft management plans will be lodged together to the relevant certifying authority before the commencement of work on the Project. The purpose of lodging all certifiable elements (apart from the SSEMPs) at the same time is to ensure the local authority is able to consider all plans on an integrated basis.

The SSEMPs will be lodged and certified as construction progresses, prior to commencement of the next stage of work. The methodology to be used at each construction sector will need to be consistent with the general methodology certified with the relevant sub-management plan contained within the CEMP. However, they will also need to be revised if required as construction proceeds (for example, due to weather conditions or unexpected site conditions).

30.5 Non-Certifiable Management Plans and Other Documents

In addition to the management plans that require certification as part of the CEMP, there are a number of other plans and supporting documents that form part of the overall framework for managing the final design and construction of the Project which will be provided to KCDC but will not require certification:

- Urban and Landscape Design Framework; and
- Accidental Discovery Protocol.

30.6 Summary of Mitigation, Monitoring and Other Measures to Manage Adverse Effects

The mitigation, remediation, management and monitoring measures are summarised in Table 30-2. Where relevant, a reference is provided to proposed condition(s).

Table 30-2: Proposed Mitigation and Assessment Reference for the Management of Environmental Effects

Actual or potential environmental effect identified	Mitigation recommended	Monitoring recommended	Condition proposed	Report name(s)/reference(s)
Traffic and Transport				
Additional Heavy Commercial Vehicle and light vehicle traffic during construction is likely to affect the safe operation of the existing SH1.	Use CTMP to control construction vehicle movements and routes and ensure safety, including: • advanced warning of turning traffic; • temporary speed limits; • controls on the routing of construction traffic; • temporary access changes; • measures to address any temporary effects on public transport users; • temporary speed limits; • measures to address any temporary effects on local traffic; and • early construction of overbridges associated with the Project	Monitoring as set out in the CTMP.	Designation • Subject to requirements of the CTMP. • Future SSEMPs required to set out detailed requirements	Assessment of Traffic & Transportation Effects Technical Report 6, Volume 3 CTMP CEMP
Geotechnical Engineering and Resilience				
Ground settlement resulting from preloading at inter-dunal areas within the Project footprint and a short distance further. Areas of potential settlement are south of Mary Crest, and north of Rahui Road.	Minor road repair to existing roads such as sealing of cracks may be required during construction and the pavement may need to be reinstated on completion of the preloading and construction. The railway line may also need to be re-	Ground settlement will be closely monitored during and after the preloading period to assess the effect to settlement of the adjacent ground, especially at SH1 and the NIMT. Any development of cracks on the seal should be recorded and monitored, to	Designation: • Monitoring of ground settlement during and immediately after construction • Settlement conditions	Geotechnical AEE Technical Report 4, Volume 3 CEMP

Actual or potential environmental effect identified	Mitigation recommended	Monitoring recommended	Condition proposed	Report name(s)/reference(s)
No risk to buildings.	levelled during or soon after construction.	trigger repairs as necessary.		
Consolidation of ground due to fill embankments.	Appropriate management measures.	Ground settlement monitoring as described above.	Designation: • CEMP • Settlement conditions	Geotechnical AEE Technical Report 4, Volume 3 CEMP
Consolidation of ground due to groundwater drawdown.	If this effect does occur beyond the Project extent, change the construction methodology, for example: • Lining (temporary and/or permanent) of cuts below the groundwater level; • Limit the length and drained duration of temporary excavation.	Groundwater level and pressure will be monitored during excavation and dewatering to ensure there is no unexpected water drawdown that will affect water abstraction in the vicinity.	Designation: • CEMP • Settlement conditions	Geotechnical AEE Technical Report 4, Volume 3 CEMP
Sand dune erosion due to proposed cuttings during construction.	Re-vegetation should occur as soon as practicable after formation of cut areas, and vegetation should be maintained during the early stages after construction. The type of vegetation should be carefully selected to suit the local coastal dune sand environment. Erosion protection geotextile mats should be installed on new cut slopes. Topsoil or peat should be placed on slope surfaces.	Monitoring as set out in the ESCP	Resource Consent (General Conditions): • ESCP • EMP • SSEMPs Resource Consents (Land Use Consent for Bulk Earthworks) • ESCP	Geotechnical AEE Technical Report 4, Volume 3 Erosion and Sediment Control Plan Ecological Management Plan CEMP
Geological effects of piling works during bridge foundation works	Implementation of erosion and sediment management controls during pile	Monitoring of ground settlement and implementation of ESC	Designation: • Settlement conditions	Geotechnical AEE Technical Report 4, Volume 3

Actual or potential environmental effect identified	Mitigation recommended	Monitoring recommended	Condition proposed	Report name(s)/reference(s)
including ground settlement, contaminants entering watercourses, changes to the existing aquifer system.	construction particularly adjacent to waterways to prevent spillage and contamination.	measures and SSEMP	Resource Consent (Land Use Consent for Works in Watercourse) • ESCP • EMP • SSEMP	Erosion and Sediment Control Management Plan Ecological Management Plan CEMP
Reduction in pore pressure from groundwater drawdown resulting in ground settlement and groundwater flow changes.	Any artesian water encountered should be managed through raised casing above ground level.	Groundwater monitoring	Resource Consent (Water Permit for taking and using groundwater)	Geotechnical AEE Technical Report 4, Volume 3 CEMP
Loss of water from newly created wetlands	A low embankment with weir to ensure water is retained in the newly created wetlands and surplus water can overflow through the weir during wet weather conditions.	N/A	Resource Consent (General conditions) • EMP • SSEMP	Geotechnical AEE Technical Report 4, Volume 3 CEMP
Urban Form and Function				
Effects on part of the existing Pare-o-Matangi reserve.	Provide off-set mitigation by adding land to and planting within the enhanced Pare-o-Matangi reserve, in conjunction with tangata whenua and other community input.	N/A	Designation: • Landscape Plan	Urban Design Assessment Technical Report 7. Volume 3 CEMP
Landscape and Visual				
Removal of a portion of the Northern dunescape in Northern Ōtaki	The cuts through sand dune to reflect the natural contour to mitigate the effect on this	N/A	Designation: • Landscape Plan	Landscape and Visual Assessment of Effects Technical Report 8,

Actual or potential environmental effect identified	Mitigation recommended	Monitoring recommended	Condition proposed	Report name(s)/reference(s)
resulting in loss of existing landform.	feature. Cut faces will be planted or grassed. Screen planting of native trees and shrubs will also be placed along the top of the eastern Expressway cut batter. Wetland riparian planting will also occur around the reconfigured Railway Wetland.			Volume 3
Moderate to high degree of change to landform from Taylors Road to Waitohu Valley Road section (Northern Gateway), from rural open pastoral landscape to a landscape containing a section of transport corridor and changes to landform south of Ōtaki Gorge Road (southern Gateway).	Bold formal planting to signal the Project's Northern Gateway zone, just south of Taylors Road and the southern Gateway zone south of Ōtaki Gorge Road.	N/A	Designation: • Landscape Plan	Landscape and Visual Assessment of Effects Technical Report 8, Volume 3.
Landscape effects resulting from three new bridges and associated approach embankments in the Ōtaki North to Rahui Road section of the Project.	Planting is proposed to mitigate effects.	N/A	Designation: • Landscape Plan	Landscape and Visual Assessment of Effects Technical Report 8, Volume 3
A reduction in the usable area of the Pare-o-Matangi reserve which will have a significant	Additional land will be added to the Pare-o-Matangi reserve, and extensive landscaping is proposed for the area, to be	N/A	Designation: • Landscape Plan	Landscape and Visual Assessment of Effects Technical Report 8, Volume 3

Actual or potential environmental effect identified	Mitigation recommended	Monitoring recommended	Condition proposed	Report name(s)/reference(s)
landscape effect.	finalised in conjunction with tangata whenua and other community input.			
Visual effect around Rahui Road where the Expressway and the realigned NIMT are constrained by heritage buildings.	Screen planting and a screen fence to mitigate visual effect on the former Rahui Milk Treatment Station building and the adjoining former social hall. Block planting along the eastern Expressway margin to integrate the Project with its surroundings and allow views towards the Ōtaki Racecourse. Dense, mass planting will also provide a buffer between road and rail and screen the Expressway from the Ōtaki Railway Station and Ōtaki Railway Retail area. Specialist tree planting will enhance the setting and amenity of the reinstated cycle/walkway from Rahui road to Ōtaki Railway Station.	N/A	Designation: • Landscape Plan	Built Heritage Assessment of Effects Technical Report 18, Volume 3 Landscape and Visual Assessment of Effects Technical Report 8, Volume 3
Loss of existing rural landform between Waerenga Road to Ōtaki Gorge Road and north of Te Hapua Road to Te Kowhai Road resulting in loss of existing rural landform.	Project earthworks areas will be rehabilitated through (in this case) grassing the side batters of the Expressway.	N/A	Designation: • Landscape Plan	Landscape and Visual Assessment of Effects Technical Report 8, Volume 3
Ōtaki River Bridge creates a cumulative	Existing vegetation on the southern river bank will be re-	N/A	Designation: • Landscape Plan	Landscape and Visual Assessment of Effects

Actual or potential environmental effect identified	Mitigation recommended	Monitoring recommended	Condition proposed	Report name(s)/reference(s)
effect with existing SH1 bridge and NIMT bridge.	vegetated with native species. Fill batters of the embankments will be planted with native species. Similar landscape planting will occur on the approach batters to the Ōtaki South Underpass and the adjoining Expressway ramp batters.			Technical Report 8, Volume 3
Hydrology				
The proposed crossing of the Ōtaki River will not alter the hydrology of the river. The crossing of the Ōtaki River floodplain will increase the potential for properties in areas to the east that are used for pasture to be flooded, however potential flooding of populated areas to the west of the Expressway will be no worse than in the existing situation. In extremely rare flood events the effects will be slightly greater than in the existing situation (adjusted for possible climate change effects to 2090).	Ōtaki River floodplain mitigation: • construction of a secondary flood containment bund located approximately 250m north of Chrystall's Stopbank; • installation of a 40m wide dry culvert through the Expressway embankment; and • installation of a road overflow weir section along the Expressway embankment.	N/A	Resource Consent (Land Use Consent for Works in Watercourse and Damming and Diverting Surface Water)	Hydrological AEE Technical Report 9, Volume 3
Flood levels within the	Landscaping is proposed at	N/A	N/A	Hydrological AEE

Actual or potential environmental effect identified	Mitigation recommended	Monitoring recommended	Condition proposed	Report name(s)/reference(s)
Pare-o-Matangi reserve will be marginally higher for some floods.	the Pare-o-Matangi reserve to form a low bund around the perimeter of the affected properties on the corner of the existing SH1 and Rahui Road			Technical Report 9, Volume 3
Effects on flood levels in the primary flood storage basin of the Mangapouri Stream due to the Expressway crossing	• Incorporate a long relief culvert under Rahui Road to the Racecourse Catchment to carry flood waters out of the Mangapouri holding basin; • Installation of an 'undersized' culvert at the Racecourse Stream under the Expressway and NIMT which will act as a 'throttle' holding floodwaters on the eastern side of the Expressway embankment; • Keeping the existing culvert at the railway embankment, maintaining the existing 'throttle' function at this location; • locally lower the level of the link road (County Road) connection that loops around under the Rahui Road overbridge adjacent to the eastern abutment; and • To compensate for the loss of storage volume in the remnant Railway Wetland,	N/A	Resource Consent (Land Use Consent for Works in Watercourse and Damming and Diverting Surface Water)	Hydrological AEE Technical Report 9, Volume 3

Actual or potential environmental effect identified	Mitigation recommended	Monitoring recommended	Condition proposed	Report name(s)/reference(s)
	make use of the "dead space" between the old NIMT railway embankment and the Expressway embankment to the south of the new local link road overbridges to form a second wetland area in series with the remnant Railway Wetland.			
Effects on flood levels in the Waitohu Stream and floodplain due to the Expressway and bridge crossing.	• Expressway constructed as a raised embankment across the 0.9 km wide floodplain. Dry culverts will be incorporated into the embankment to accommodate existing overland flow paths.	N/A	Resource Consent (Land Use Consent for Works in Watercourse and Damming and Diverting Surface Water)	Hydrological AEE Technical Report 9, Volume 3.
Effects on flood levels in the Mangaone Stream and floodplain due to the Expressway and bridge crossing.	• Construct an elevated bund upstream of the Expressway functioning as a flood detention barrier; • Installation of culverts aligned with the downstream NIMT railway and SH1 culverts on each primary watercourse; and • Installation of culverts and bridges on the local link road to convey overland floods.	N/A	Resource Consent (Land Use Consent for Works in Watercourse and Damming and Diverting Surface Water)	Hydrological AEE Technical Report 9, Volume 3.
Stormwater				
The effects of erosion and transportation of	Implement appropriate E&SC practices to limit the effects of	• Erosion and sediment control measures	Resource Consent (General conditions):	Stormwater AEE Technical Report 10,

Actual or potential environmental effect identified	Mitigation recommended	Monitoring recommended	Condition proposed	Report name(s)/reference(s)
sediment (including silt and sediment tracked onto roads from construction vehicles) from areas disturbed by construction can have adverse effects on downstream receiving environments.	erosion, suspended solids and potential adverse effects on the downstream receiving environment.	• Visual assessments of receiving watercourses • Weather forecasts	• CEMP • ESCP • SSEMP	Volume 3 ESCP SSEMP's
New culverts introducing or removing constrictions to surface water flow creating potential flood hazards.	Culverts have been designed so that they have minimal impact on flood levels (both upstream and downstream) and allow for fish passage.	N/A	N/A	Stormwater AEE Technical Report 10, Volume 3
Increased volume of rainwater run-off from new impervious surfaces increasing stream flow potentially increasing stream erosion and downstream flood levels in large rainfall events.	The design includes swales and basins to attenuate flood flows to reduce the need for offset storage.	Monitoring of swale/ wetland/ basin attenuation functioning as part of implementing the CEMP and SSEMP's.	Resource Consent (General conditions): • CEMP • SSEMP	Stormwater AEE Technical Report 10, Volume 3
Increased flood risk to an existing farm storage building upstream of the Gear/Settlement Heights culvert	Negotiations with the landowner may include raising or relocating the building, bunding or compensation	N/A	Resource Consent (Stormwater Discharge conditions)	Stormwater AEE Technical Report 10, Volume 3
Terrestrial Ecology				
Loss of mature trees from between Hautere Bush and Cottle's Bush, at Cottle's Bush, adjacent to Cottle's Bush.	QEII covenanting existing bush remnants or planting of indigenous habitat.	Monitoring and maintenance of newly planted vegetation as outlined in the Ecological Management Plan.	Resource Consent (General conditions): • Ecological Management Plan (EMP)	Terrestrial Ecology AEE Technical Report 11, Volume 3

Actual or potential environmental effect identified	Mitigation recommended	Monitoring recommended	Condition proposed	Report name(s)/reference(s)
Loss of approximately 0.5ha of the Ōtaki Railway Wetland.	It is proposed to create two areas of new wetland within the designation to compensate for the loss of most of the Railway Wetland. One will be the Kennedy Wetland adjacent to the existing Ōtaki Railway wetland (approximately 0.4ha) and a new area of wetland adjacent to the Mary Crest bush (approximately 0.7ha) and provision of a bund around the western edge of the Mary Crest wetland to assist in water retention. The new areas to be created will provide greater ecological value than the area that will be lost.	Monitoring and maintenance of newly planted vegetation as outlined in the Ecological Management Plan.	Resource Consent (General conditions) • EMP	Terrestrial Ecology AEE Technical Report 11, Volume 3
Loss of approximately 40 mature trees/other vegetation from various locations along the Expressway	Native trees and shrubs will be used in landscape planting for the Expressway alignment including riparian planting.	N/A	Resource Consent (General conditions) • EMP	Terrestrial Ecology AEE Technical Report 11, Volume 3
Potential for existing bush remnants to be exposed to wind throw where trees and shrubs are cleared from the edge of areas of bush.	Where mature trees are removed from the existing edges of bush, wind breaks will be planted along the edge to provide protection.	Monitoring and maintenance of newly planted vegetation as outlined in the Ecological Management Plan	Resource Consent (General conditions): • EMP	Terrestrial Ecology AEE Technical Report 11, Volume 3 Ecological Management Plan
Potential effects on population of peripatus (velvet worm) at the	The logs where peripatus were found at the Steven's Property are close to the Project	N/A	Resource Consent (General conditions): • EMP	Terrestrial Ecology AEE Technical Report 11, Volume 3

Actual or potential environmental effect identified	Mitigation recommended	Monitoring recommended	Condition proposed	Report name(s)/reference(s)
Steven's property (48 Old Hautere Road).	footprint. If the footprint is likely to directly affect these or if the logs are likely to be exposed to desiccation due to the removal of tree cover these should, with the land owner's permission, be moved further into the bush. Placement of a few logs from felled trees along the alignment to provide future habitats for peripatus.			Ecological Management Plan
Potential hydraulic effects on the existing Mary Crest bush and wetland during construction of the Expressway	The CEMP and SSEMP will specify the practices used to minimise the effects of construction activities on the existing bush and wetland area at Mary Crest	Groundwater monitoring in vicinity of Mary Crest bush and wetland	Resource Consent (Water Permit for taking and using groundwater)	Terrestrial Ecology AEE Technical Report 11, Volume 3 Ecological Management Plan CEMP & SSEMP

Actual or potential environmental effect identified	Mitigation recommended	Monitoring recommended	Condition proposed	Report name(s)/reference(s)
Aquatic Ecology				
Temporary effects from construction due to reduction in water quality in streams and effects on fish and invertebrate habitats due to increased sedimentation and road run-off.	The Construction Environmental Management Plan, ESCP and EMP will specify the practices and structures (e.g. silt barriers) used to minimise the effects of construction activities on water quality, habitat and biota in waterways in the Project area.	Monitoring to establish a baseline of pre-construction ecological conditions against which effects are measured (and adaptive management techniques applied as necessary). Turbidity monitoring during construction. Monitoring and maintaining ESC devices during construction. Post construction monitoring of waterways, new wetland areas and new bush habitat.	Resource Consent (General conditions): • EMP • CEMP • ESCP	Aquatic Ecology AEE Technical Report 12, Volume 3 CEMP E&SCP EMP
Impaired fish and invertebrate migration due to culverts	At each location where a native fish-bearing stream crosses the Project, fish passage will be provided. Fish passage will also be provided to streams that drain small catchments on the inland plains where these streams cross the Expressway.	Immediately following formation of diversions and livening of the new channel, an appropriately qualified ecologist will inspect and confirm that any structures within the diversion will provide fish passage for all native species currently known to occur or reasonably likely to occur within the stream. On-going monitoring and maintenance of culverts will	Resource Consent (General conditions): • EMP	Aquatic Ecology AEE Technical Report 12, Volume 3 EMP CEMP

Actual or potential environmental effect identified	Mitigation recommended	Monitoring recommended	Condition proposed	Report name(s)/reference(s)
		occur during the operation of the Expressway.		
Effects on road run-off on water quality and channel erosion.	Treatment of road run-off in vegetated attenuation swales and basins.	On-going monitoring and maintenance of swales and ponds will occur during the operation of the Project.	Resource Consent (General conditions): • EMP	Aquatic Ecology AEE Technical Report 12, Volume 3, CEMP
Loss and alteration of streambed and riparian habitat due to culvert construction and operation of the Project.	The loss of open-channel stream habitat is mitigated by habitat improvement and rehabilitation by implementing the following: • Installation of rip rap to reinforce banks upstream and downstream of culverts. • Riparian planting in and along streams in the Project area. • Fencing of stream channels within the Project designation to exclude stock.	On-going monitoring and maintenance of planting and fencing will occur during the operation of the Expressway.	Resource Consent (General conditions): • EMP	Aquatic Ecology AEE Technical Report 12, Volume 3
Loss of 0.5 hectares of the Railway Wetland to the Project	Construction of two new wetlands (1.1 hectares in total)	Post construction monitoring of constructed wetlands	Resource consent (General conditions): • EMP	Aquatic Ecology AEE Technical Report 12, Volume 3 EMP
Air Quality				
Construction activities including earthworks required as part of the Project have the potential to result in the generation of dust if not	A Construction Air Quality Management Plan will contain the mitigation measures required for construction activities, to include the use of water carts to suppress dust,	A dust monitoring programme is proposed, based on regular visual monitoring in all areas, monitoring of total suspended particulate matter (TSP) and monitoring of meteorological	Resource Consent (Discharge Permit to discharge dust to air): • CAQMP	Air Quality AEE Technical Report 13, Volume 3 CAQMP

Actual or potential environmental effect identified	Mitigation recommended	Monitoring recommended	Condition proposed	Report name(s)/reference(s)
appropriately controlled.	and low speed limits for construction traffic near sensitive receiving environments etc.	conditions.		
Noise and Vibration				
Temporary noise and vibration disturbance during construction.	The outline plans submitted to KCDC for approval will contain a detailed construction methodology. A Construction Noise and Vibration Management Plan (CNVMP) will be finalised by the Project team, and implemented by the appointed contractors.	As required by the Construction Noise and Vibration Management Plan (CNVMP), including monitoring: • Noise limits; • At locations considered to be sensitive receivers, or otherwise in response to a complaint; • Effective communication with neighbours in close proximity to the works to manage noise disturbance; • Pre and post construction building condition survey of the former Rahui Milk Treatment Station and Social Hall.	Designation: • CNVMP	Noise and Vibration AEE Technical Reports 14 and 15, Volume 3 CNVMP
Once operational the Project will create road traffic noise.	Road traffic noise was modelled and mitigation options tested. A low-noise surface, open-graded porous asphalt (or similar), will be used on the Expressway surface through Ōtaki. More specifically, proposed noise mitigation is as follows:	No monitoring required except as set out in the CNVMP.	Designation: • CNVMP • Requirement for low noise surfaces in specified locations	Noise and Vibration AEE Technical Reports 14 and 15, Volume 3 CNVMP

<table>
<tr><th>Actual or potential environmental effect identified</th><th>Mitigation recommended</th><th>Monitoring recommended</th><th>Condition proposed</th><th>Report name(s)/reference(s)</th></tr>
<tr><td></td><td><table><tr><th>Location</th><th>Currently proposed noise mitigation</th></tr><tr><td>A: North of Ōtaki Ramp</td><td>Open-graded □porous asphalt (PA-10)</td></tr><tr><td>B: 230 Main Highway, Ōtaki</td><td>Open-graded porous asphalt (PA-10)</td></tr><tr><td>C: East Ōtaki</td><td>Open□graded porous asphalt (PA-10)</td></tr><tr><td>D: Ōtaki Gorge to Te Horo (West)</td><td>Building modification for 14 Old Hautere Road</td></tr></table>
Road Noise: One PPF will be investigated for acoustic treatment to mitigate road noise.</td><td></td><td></td><td></td></tr>
<tr><td>As a result of a change to the rail alignment through Ōtaki, rail noise is predicted to exceed the nominated criteria at two Protected Premises and Facilities.</td><td>The two PPFs will be investigated for acoustic treatment to mitigate rail noise.</td><td>Monitoring as required by the Construction Noise and Vibration Management Plan</td><td>Designation:
• Monitoring as required by CNVMP</td><td>Noise and Vibration AEE Technical Reports 14 and 15, Volume 3

CNVMP</td></tr>
<tr><td colspan="5">Land Contamination</td></tr>
<tr><td>Presence of contaminants in soil and</td><td>Potential effects can be avoided through application of</td><td>A contaminated land specialist will be engaged by the Project</td><td>Resource Consents (General conditions)</td><td>Contaminated Land Assessment of Effects</td></tr>
</table>

Actual or potential environmental effect identified	Mitigation recommended	Monitoring recommended	Condition proposed	Report name(s)/reference(s)
their disturbance during construction may have adverse effects on human health if above human health risk based guidelines, or if above ecological risk based guideline values, adverse effects on terrestrial/aquatic life.	appropriate procedures to manage contaminated soils and materials. The BECLMP contains procedures on the identification and mitigation of contaminated materials or soil. Findings of the Phase 2 CLAs will be reviewed, and where applicable, obtain consent from KCDC for fuel system removal and soil disturbance at contaminated sites under the NES. Consents would be obtained prior to construction commencing.	team to monitor, supervise and report on works that may disturb contaminated land. Monitoring as required within the BECLMP.	• BECLMP	Technical Report 16, Volume 3 BECLMP
Archaeology				
Effects on two heritage buildings (Ōtaki Railway Station and 'Clifden) and the grounds of a third heritage building at 230 Main Road Ōtaki. Three archaeological sites that are outside the Project but effects on these sites are possible.	Clifden and the Ōtaki Railway Station will be relocated, as discussed further below. Interpretation panels and viewing areas could be incorporated to assist in providing information on the history of the area and the results of any archaeological work carried out as part of the Project. Opportunities are sought during archaeological work to provide information to the public on the work, through	Systematic investigations of discrete sections of the proposed Expressway that have high archaeological probability. The investigative work would be undertaken by a team of archaeologists and take place prior to construction.	Resource Consent (General condition) • ADP Designation: • Follow standards and guidelines of ICOMOS New Zealand Charter, Archaeological Authorities granted under the HPA 1993 and research strategy.	Archaeology Assessment of Effects Technical Report 17, Volume 3 ADP

Actual or potential environmental effect identified	Mitigation recommended	Monitoring recommended	Condition proposed	Report name(s)/reference(s)
	press releases, talks to local schools or public open days. On completion of the Project and any associated archaeological work, a pamphlet or small booklet will be prepared specifically for distribution in the Ōtaki district of the results of the archaeological work. Depending on the nature of archaeological material located, and in accordance with consultation with Nga Hapū o Ōtaki and the management committee of the Ōtaki Museum, if considered appropriate, an exhibition associated with the archaeological work could be developed for display at the Ōtaki Museum. Develop a Research Strategy. Archaeological authorities will be sought under Historic Places Act and an AMP developed.			
Potential for discovery of potential archaeological material during	Archaeological investigations undertaken in conjunction with monitoring during the	Systematic investigations of discrete sections of the proposed Expressway that	Resource Consent (general conditions): • ADP	Archaeology Assessment of Effects Technical Report 17,

Actual or potential environmental effect identified	Mitigation recommended	Monitoring recommended	Condition proposed	Report name(s)/reference(s)
construction	course of construction. Discoveries of archaeological material will be treated in accordance with the ADP to be agreed with tangata whenua.	have high archaeological probability. The investigative work would be undertaken by a team of archaeologists and take place prior to construction. Monitoring during the course of construction for the sections of the proposed Expressway that have low to moderate archaeological probability.		Volume 3
Built Heritage				
Those sites with heritage values within the Projects earthworks footprint are: • The Ōtaki Railway Station, which is to be moved to re-align it with the NIMT. • The site of the former Mirek Smišek pottery, containing two beehive kilns, a brick flue, a preparation shed and a house. • Clifden Cottage at Bridge Lodge.	Ōtaki Railway Station: movement of the building, which will include the deconstruction and rebuilding of all brick elements, will be undertaken carefully, so as to preserve heritage values, in accordance with an updated conservation management plan. Mirek Smišek pottery site: the beehive kilns and flue will carefully be relocated on the existing site, in accordance with a conservation management plan. Clifden Cottage: the cottage will be relocated to an	Implementation of the conservation management plan for Ōtaki Railway Station, and the criteria set out in the conservation plans for 'Clifden' and the beehive kilns.	Resource Consent (General condition) • ADP Designation: • Follow standards and guidelines of ICOMOS New Zealand Charter, Archaeological Authorities granted under the HPA 1993 and research strategy	Built Heritage AEE Technical Report 18, Volume 3 Conservation management plan/reports

Actual or potential environmental effect identified	Mitigation recommended	Monitoring recommended	Condition proposed	Report name(s)/reference(s)
	appropriate site within the district, in accordance with a conservation management plan.			
Noise/vibration, settlement and visual effects that may affect the amenity of the former Rahui Milk Treatment Station, the former Rahui Factory Social Hall and the setting of the former Te Horo Railway Station.	Planting is proposed to mitigate the effects of the Project on the amenity values of these buildings. Any noise and vibration effects that may arise during construction will be avoided or mitigated through implementation of the Construction and Environmental Management Plan.	Monitoring of planting as per landscape plan. Mitigation as recommended in the Noise and Vibration chapter 22 and as set out in the CNVMP.	Designation: • CNVMP • Settlement conditions	Built Heritage AEE Technical Report 18, Volume 3 CNVMP
Tangata Whenua and Cultural Heritage				
Adverse effects on sites, areas and features of potential significance to tangata whenua, particularly between Taylors Road. Māori-owned land at Te Horo is also affected.	An ADP is to be finalised by the NZTA in consultation with Nga Hapū o Ōtaki, which will guide the Project earthworks and dictate proper cultural protocols to be followed in the event of an archaeological site being discovered. Relationship agreements between the NZTA and Nga Hapū o Ōtaki are being progressed and it is expected that a Memorandum of Understanding will be signed with Nga Hapū o Ōtaki. Tangata whenua advice and	Active supervision by iwi representative during earthworks in sensitive areas and cultural training for contractors	Resource Consent (general conditions): • ADP	Cultural Heritage Assessment of Effects Technical Report 19, Volume 3 ADP

Actual or potential environmental effect identified	Mitigation recommended	Monitoring recommended	Condition proposed	Report name(s)/reference(s)
	input will be sought in a number of areas, including in relation to mitigation measures at the Pare-o-Matangi reserve.			
Social				
Economic impacts on a small number of Te Horo businesses that are reliant on bypassing traffic.	Installation of appropriate signage at exit points on the new Expressway to alert passing traffic to services and facilities at Te Horo.	N/A	Designation: • Network Integration Plan (NIP) prepared for the Project	Social Impact Assessment Technical Report 20, Volume 3
Impacts on landowners from land requirements.	Residents permanently affected by the works will be compensated in line with market valuations and assisted with the process under the PWA. For those vulnerable residents such as the elderly or disabled, NZTA will appoint a community liaison person to facilitate the process.	N/A	Designation: • Community liaison person appointed • Stakeholder Communications and Management Plan • Community Liaison Group established	Social Impact Assessment Technical Report 20, Volume 3

Actual or potential environmental effect identified	Mitigation recommended	Monitoring recommended	Condition proposed	Report name(s)/reference(s)
Construction impacts on houses and businesses within close proximity to the Project.	A community liaison group will be established for key sectors such as education and business (Te Horo and Ōtaki). Specific provisions should be set up in association with Te Wānanga-O-Raukawa. If during the construction phase any substantial traffic delays particularly over holiday periods and long weekends are anticipated publicity should be given to this on a regional or national basis e.g. use of national Press or national and regional radio. During the construction period and during the early stages of operation organisations such as Grey Power should be specifically informed. Residents affected by construction will be temporarily relocated in the highly unlikely event that construction activities preclude normal daily functioning. Maintain the iwi consultation protocol that has been	Establishment of a dedicated community liaison person who will be the conduit between the Project team and the community during construction. Establishment of a feedback/complaints database to established for the construction phase to ensure that community, stakeholder and individual issues are addressed and that appropriate responses are provided for all queries.	Designation: • Community Liaison person appointed • Community Liaison Group established Designation and Resource consent (General conditions) • Complaints register maintained at all times during construction works	Social Impact Assessment Technical Report 20, Volume 3 CEMP Memorandum of Understanding with iwi

Actual or potential environmental effect identified	Mitigation recommended	Monitoring recommended	Condition proposed	Report name(s)/reference(s)
	established as a forum to communicate information particularly during the construction phase. Establishment of a dedicated community liaison person who will be the conduit person between the project team and the community during construction.			
Social effects from the loss of part of the Pare-o-Matangi reserve.	Incorporate Ōtaki Motel land to offset loss of land at the Pare-o-Matangi reserve, and involve local iwi and the wider Ōtaki community in the re-design of the Pare-o-Matangi reserve.	N/A	Designation: • Landscape Plan	Social Impact Assessment Technical Report 20, Volume 3 Landscape Management Plan
Economic				
Potential adverse effects for a limited number of businesses at Te Horo, between Te Horo and South Ōtaki and at Ōtaki.	Appropriate signage at exit points on the new Expressway to minimise business redistribution effects.	N/A	Designation: • Prepare a Network Integration Plan	Assessment of Economic Effects Technical Report 21, volume 3
Land Acquisition and Property				
Some properties will be temporarily occupied because they are required for temporary construction purposes.	Following the consenting process the NZTA / KiwiRail will confirm which land will be required for temporary occupation, lease or land to be acquired. The designation boundaries will be reviewed and those	N/A	Designation: • Consider uplift of parts of new designation not required for the on-going operation or maintenance to the State Highway	Assessment of Land Acquisition and Property Effects Social Impact Assessment

Actual or potential environmental effect identified	Mitigation recommended	Monitoring recommended	Condition proposed	Report name(s)/reference(s)
	parts will be uplifted that are no longer required for roading/rail purposes.		or for on-going mitigation measures.	
Access to some properties, easements and other property rights will be adversely affected by the Project.	Where property rights are affected alternative arrangements for movement or replacement are proposed and developed in consultation with the landowner.	N/A	No condition (the NZTA is required under Government Roading Powers Act to provide an alternative access). Mitigation has been provided through design of the Project.	Assessment of Land Acquisition and Property Effects
Some properties within close proximity to the route have been identified as being subject to or particularly sensitive to effects including noise and landscape and visual effects.	Where noise standards are breached appropriate methods are proposed to manage noise, including the low-noise road surface on the Expressway proposed through Ōtaki. Where required adverse visual effects will be mitigated (as discussed above in relation to landscape and visual effects).	Monitoring as set out in the CNVMP and CAQMP	Designation: • CNVMP Resource Consent (Discharge Permit to discharge dust to air): • CAQMP	CNVMP CAQMP

30.7 Overview of Proposed Conditions

Based on the mitigation and monitoring measures summarised in Table 30-2, a suite of conditions is proposed to manage the effects of construction.

Some conditions will appear in both the designation and regional resource consent conditions, but for the most part the design and nuisance effects are dealt with under the designation conditions, and the other environmental, ecological, and water effects are dealt with in the regional consent conditions.

A suite of conditions is also proposed for the designation to manage the effects of operation. These mainly relate to maintenance, including maintenance of the road and associated structures, surface water run-off and maintenance of vegetation planting. The NZTA has an existing network maintenance contract and has a number of measures in place for the on-going operation and maintenance of its assets.

Chapter 31
Part H
VOLUME 2

Proposed Designation Conditions

31 Proposed Designation Conditions

31.1 Guide to Reading the Conditions

The table below provides explanation to a number of the abbreviations, acronyms and terms used in the conditions.

Table 31-1: Abbreviations, Acronyms and Terms Used in the Conditions

Definitions	
Active Construction	Means the commencement of earthworks in a particular location and ending when pavement construction is complete at that location
AEE	Means the Peka Peka to North Ōtaki Project Assessment of Effects on the Environment Volumes 1 to 5 dated 18 March 2013
CAQMP	Means the Construction Air Quality Management Plan
CEMP	Means the Construction Environmental Management Plan
CLG	Means the Community Liaison Group
CNVMP	Means the Construction Noise and Vibration Management Plan
Commencement of Work	Means the time when the work that are the subject of these designations commence
CTMP	Means the Construction Traffic Management Plan
District	Means the Kāpiti Coast District
District Plan	Means the Kāpiti Coast District Plan
EMP	Means the Ecological Management Plan
Existing Network Utilities	Means all network utilities existing at the date of notification of this Notice of Requirement. Network utility has the same meaning as in section 166 of the Resource Management Act 1991
GWRC	Means the Greater Wellington Regional Council, including any officer of Greater Wellington Regional Council
KCDC	Means the Kāpiti Coast District Council, including any officer of Kāpiti Coast District Council
LP	Means the Landscape Plan

Manager	Means the Regulatory Manager of the Kāpiti Coast District Council
NIP	Means the Network Integration Plan
NUMP	Means the Network Utilities Management Plan
NZHPT	Means the New Zealand Historic Places Trust Pouhere Taonga
Operational	Means when construction of the Project is complete and the Project is open to traffic (be it road traffic on the Expressway or associated local roads, or rail traffic in relation to the realigned NIMT)
Outline Plan	Means an Outline Plan prepared in accordance with section 176A of the RMA
Project	Means the construction, maintenance and operation of the Peka Peka to North Ōtaki Project, comprising an Expressway, local road connections, a realigned section of the NIMT, and all associated works
Requiring Authority	Means the NZ Transport Agency or the New Zealand Railways Corporation / KiwiRail Holdings Limited (trading as KiwiRail), as relevant to each designation
RMA or 'the Act'	Means the Resource Management Act 1991
Road Asset Manager	Means the Kāpiti Coast District Council's Road Asset Manager
SCMP	Means the Stakeholder and Communications Management Plan
Sector	Means a sector of the Project as nominated by the Requiring Authority and shown in the Sector plans required by this designation (a Sector may include several Stages).
SSEMP	Means a Site Specific Environmental Management Plan
SSTMP	Means a Site Specific Traffic Management Plan
Stage	Means a stage of the Project as identified by the Requiring Authority in the staging programme submitted to KCDC in accordance with condition [9].
Work	Means any activity or activities undertaken in relation to the Project
Working Day	Has the same meaning as under section 2 of the Resource Management Act 1991

31.2 Table of Contents

Table 31-2: Table of Contents for the Designation Conditions

31.3 Proposed Designation Conditions – applying to both NZTA and KiwiRail

Table 31-3: Proposed Designation Conditions- - both NZTA and KiwiRail

***Advice Note**: The implementation of the construction conditions (conditions 1 to [54]) is proposed to be achieved through a combined approach, with the same construction conditions applying to both the NZTA and KiwiRail designations*

Cond no.	Proposed Conditions – applying to both NZTA and KiwiRail
	General Conditions and Administration
1.	a) Except as modified by the conditions below, and subject to final design, the Project shall be undertaken in general accordance with the information

	provided by the Requiring Authority in the Notice of Requirement dated 18 March 2013 and supporting documents being: i) Assessment of Environmental Effects report, dated 18 March 2013; ii) Plan sets: [to insert] b) For the avoidance of doubt, none of the conditions of this designation prevent or apply to work required for the on-going operation or maintenance of the Project following construction such as changes to street furniture or signage over time. Depending upon the nature of such work, outline plans or outline plan waivers may be required. c) Where there is conflict between the documents listed above and conditions of this designation, these conditions shall prevail. d) The Project website shall provide online access to these conditions and the plans and reports referred to in these conditions throughout the construction of the Project, and a hard copy shall be available at the Project site office.
2.	As soon as reasonably practicable following completion of construction of the Project, the Requiring Authority shall: a) Review the width of the area designated for the Project; b) Identify any areas of designated land that are no longer necessary for the on-going operation or maintenance of the Project or for on-going mitigation measures; and c) Give notice to KCDC in accordance with section 182 of the RMA seeking the removal of those parts of the designation identified in b) above.
3.	The designation shall lapse if not given effect to within 15 years from the date on which it is included in the District Plan under section 175 of the RMA.
4.	The Requiring Authority shall reimburse KCDC for its actual and reasonable costs incurred in carrying out its functions pursuant to section 36(1)(d) of the RMA in respect of the Project.
5.	Conditions 1 to [54 and 74 to 80] relate to construction of the Project and only apply to construction activities. Once construction is complete (including any post-construction mitigation and monitoring) these conditions no longer apply and are able to be removed (for example, at the time of the next plan review / designation roll over).
Community Communication and Impact Monitoring – Construction	
6.	a) A Community Liaison person shall be appointed by the Requiring Authority for the duration of the construction phase of the Project, and for 12 months following completion of the Project, to be the main and readily accessible point of contact at all times for persons affected by the construction and operation of the Project. b) The Requiring Authority shall take appropriate steps to seek to advise all affected parties of the Community Liaison person's name and contact details. c) If the Community Liaison person will not be available for any reason, an alternative contact person shall be nominated, to seek to ensure that a Project contact person is reasonably available by telephone during the construction phase of the Project and for 12 months following completion of the Project.
7.	a) Prior to the commencement of construction and/or enabling Work, the Requiring Authority shall prepare and implement a Stakeholder and Communications Management Plan (SCMP) that sets out procedures detailing how the public and stakeholders will be communicated with throughout the construction period. The stakeholders comprise the following, to the extent that they are affected by construction activities:

	i) Kāpiti Coast communities; ii) road users; and iii) residents. b) The purpose of the SCMP is to provide a framework to: i) Inform the community of construction progress; ii) Engage with the community in order to foster good relationships and to provide opportunities for learning about the Project; iii) Provide early information on key Project milestones; and iv) Respond to queries and complaints. c) As a minimum, the SCMP shall include: i) Details of a contact person available on site at all times during work. Contact details shall be prominently displayed at the entrance to the site(s) so that they are clearly visible to the public at all times. ii) Methods to consult on and to communicate the proposed hours of construction activities outside of normal working hours and on weekends and public holidays, to surrounding residential communities, and methods to deal with concerns raised about such hours. iii) Methods to record concerns raised about hours of construction activities and, where practicable, methods that avoid particular times of day which have been identified as being particularly sensitive for neighbours. iv) Any stakeholder specific communication plans required. v) Monitoring and review procedures for the SCMP. vi) Details of communications activities proposed including: a. Publication of a newsletter, or similar, and its proposed delivery area. b. Newspaper advertising. c. Notification and consultation with individual property owners and occupiers with dwellings within 20 metres of construction activities. d. The use of the Project website for public information. d) The SCMP shall include linkages and cross-references to methods set out in other management plans where relevant.
8.	a) The Requiring Authority shall establish a Community Liaison Group (CLG) at least 30 working days prior to construction commencing. b) The Requiring Authority will ensure that the CLG is resourced with at least one person in the CLG appropriately qualified in community development and social assessment. c) The purpose of the CLG shall be to provide a means for monitoring the effects of constructing the Project on the community by providing a regular forum through which information about the Project can be provided to the community. The CLG will also enable opportunities for concerns and issues to be reported to and responded by the Requiring Authority. d) Membership of the CLG shall be open to all interested organisations within the Project area including, but not limited to the following groups: i) Nga Hapū o Ōtaki; ii) Educational facilities within the project area (including schools, kindergartens, and childcare facilities); iii) Community / environmental groups; iv) Business groups; and v) Community Boards.

	e) The CLG hold meetings at least once every 3 months throughout the construction period so that on-going information can continue to be disseminated. f) The CLG shall continue for the duration of the construction phase of the Project and for 12 months following completion of the Project. g) Matters to be addressed by the CLG may include, but not are limited to, the following matters: i) Effects of construction on schools and other educational and community facilities, including effects on traffic; ii) Effects of construction on housing supply and accommodation costs; and iii) Extent of opportunities for local training and employment. h) The Requiring Authority shall arrange for the Project's Community Liaison person to attend meetings of the CLG. The role of the Community Liaison person at these meetings shall be to hear and convey information received from the CLG to the Requiring Authority and the construction contractors, and to provide the Groups with updates on construction, including any remedial responses to issues raised by the Groups. i) The Requiring Authority shall arrange for the Chairperson of the CLG (or other person appointed by the Group) to write a report summarising the main points arising from each meeting of the CLG, reporting on any social impacts of the Project, along with recommendations on the measures to mitigate those effects. The Requiring Authority shall ensure that a copy of the report is provided to KCDC and to meeting attendees within 5-10 working days of the meeting. The Requiring Authority shall be responsible for all reasonable costs associated with the resourcing of the CLG. j) The Requiring Authority shall consider the recommendations and take reasonable steps, where practicable, to implement any recommendations that are within its statutory powers to execute under this designation.
9.	a) The Requiring Authority shall provide the attendees of the CLG at least 5 working days before their first meetings the construction programme, which shall include the staging of construction, the anticipated number of construction staff, and other facets that may impact on residents and community facilities. b) The Requiring Authority shall ensure it provides further meetings of the CLG with updates about the Project construction so the attendees can understand changes in the nature and scale of the works, including the numbers of construction staff, their accommodation, and other facets that may impact on residents and community facilities. c) The Requiring Authority shall ensure that appropriate personnel attend meetings of the CLG to explain how the effects of construction are proposed to be managed and to respond to any questions.
Complaints	
10.	a) At all times during construction work, the Requiring Authority shall maintain a permanent register of any complaints received alleging adverse effects from, or related to, the exercise of this designation. The register shall include: i) the name and address (where this has been provided) of the complainant; ii) identification of the nature of the complaint; iii) location, date and time of the complaint and of the alleged event; iv) weather conditions at the time of the complaint (as far as practicable), and including wind direction and approximate wind speed if the complaint relates to air quality; v) the outcome of the Requiring Authority's investigation into the complaint; vi) measures taken to respond to the complaint; and vii) any other activities in the area, unrelated to the Project, which may have contributed to the complaint (such as non-Project construction, fires,

	traffic accidents or unusually dusty conditions generally). b) The Requiring Authority shall respond to any complaint within 10 working days of receiving the complaint. c) The Requiring Authority shall also maintain a record of its responses and any remedial actions undertaken. d) This record shall be maintained on site and shall be made available to the Manager and GWRC upon request. A copy of the Complaints Register shall be provided to the Manager every month.
11.	The complaints process outlined in condition [10] shall continue for 6 months following the Project becoming Operational. Any complaints received after this period shall be managed by the Requiring Authority in accordance with its standard complaints procedures.
Management Plans – General	
12.	The Requiring Authority shall submit an Outline Plan (or Plans) to KCDC for the Project or for each Project Stage, in accordance with section 176A of the RMA. Various management plans shall accompany the Outline Plan, as required by these conditions.
13.	a) All Work and the operation of the Project shall be carried out in general accordance with the management plans and other documents and plans required by these conditions. b) The management plans provide the overarching principles, methodologies and procedures for managing the effects of construction of the Project to achieve the environmental outcomes and performance standards required by these conditions. c) The management plans apply to the entire Project and, for some matters, are sufficient to address construction management without the need for more specific plans. For other matters, there is a need for Site Specific Environmental Management Plans (SSEMPs) to provide the necessary level of detail to address requirements within each of the construction Stages. d) The management plans provide the basis for which SSEMPs will be prepared. The SSEMPs shall, collectively, set out the detailed design and construction responses to address the specific context and circumstances of all aspects of the Project. Each SSEMP must be consistent with, and be implemented in accordance with, any relevant management plan.
14.	Where a management plan is required to be prepared in consultation with any third party, the management plan shall demonstrate how the views of that party have been incorporated and, where they have not, the reasons why.
15.	The Requiring Authority shall submit draft copies of all management plans (as required by conditions [28, 35, 55, and 74]) to the Manager for comment at least 10 Working Days prior to lodging the Outline Plan.
16.	a) A Construction Environmental Management Plan (CEMP) will be submitted for information (at the same time as the Outline Plan, but outside the Outline Plan statutory process) in accordance with condition [20a)] below. b) Management plans that will be appended to the CEMP, and submitted as part of the Outline Plan statutory process, are: i) Construction Noise and Vibration Management Plan (CNVMP); ii) Construction Traffic Management Plan (CTMP); iii) Construction Air Quality Management Plan (CAQMP); and iv) Landscape Plan (LP). c) These management plans shall be prepared in general accordance with the draft management plans included with the documents and information

	provided in support of the application, except as modified by the conditions and information provided during the hearing and approved by the Board of Inquiry. d) SSEMPs will be submitted for certification in accordance with condition [23b)]. e) A copy of the management plans (including the SSEMPs) will be made publicly accessible on the Project website.
17.	a) In order to assist KCDC with planning for staff resourcing, at least 2 months prior to the submission of the first Outline Plan for the Project, the Requiring Authority shall provide the Manager with a programme. The programme shall set out: i) The estimated timing for provision of the CEMP for comments; ii) The date proposed for the submission of the Outline Plan (or Plans); and iii) Expected timing for provision to KCDC, and response from KCDC officers, in respect of management plans (including SSEMPs); and b) The Requiring Authority shall give reasonable consideration to accommodating any concerns raised by KCDC over the proposed timing and, if requested by KCDC, the Requiring Authority shall give reasonable consideration to extending the timeframes for processing the Outline Plan (or Plans) beyond that set out in section 176A of the Act.
18.	Once construction has commenced, the Requiring Authority shall provide the Manager with an updated schedule of construction activities and timing of any further management plans and/or Outline Plans that are required to be prepared for the Project at monthly intervals throughout the construction phase of the Project.
Construction Environmental Management Plan	
19.	The Requiring Authority shall, at least 10 working days prior to submitting the Construction Environmental Management Plan (CEMP) to KCDC, submit a draft to KCDC for comment.
20.	a) The Requiring Authority shall submit a CEMP to the Manager for information at the same time as the Outline Plan, but outside the Outline Plan statutory process. b) The CEMP shall be in general accordance with the draft CEMP submitted with the application. The CEMP shall include, as appendices, the management plans required under conditions [28, 35, 55 and 74]. c) The CEMP (and its appendices) shall include details of: i) Staff and contractors' responsibilities; ii) Training requirements for employees, sub-contractors and visitors; iii) Environmental incident and emergency management (including the procedures required under regional consent condition [G.10]); iv) Communication and interface procedures; v) Environmental complaints management (required under condition [10]); vi) Compliance monitoring; vii) Environmental reporting; viii) Corrective action; ix) Environmental auditing; x) CEMP review; and

	xi) Stakeholder and Communication Management Plan. d) The CEMP shall also confirm construction methodologies and construction timeframes, including staging.
21.	The CEMP shall be implemented and maintained throughout the construction period, and updated if further design information is provided.
22.	A copy of the CEMP shall be held at one or more of the construction site offices at all times and be available for inspection by KCDC.
Site Specific Environmental Management Plans	
	Advice Note: *The SSEMPs are not part of the CEMP as they will be lodged in a staged manner throughout the course of the Project. The SSEMPs are required to be certified by KCDC (under the Project designations) and GWRC (under the relevant regional consents) in respect of their statutory functions.*
23.	a) The objective of each SSEMP is to integrate design elements with environmental management and monitoring methods, and reflect this in a set of plans for each Stage or location, in order to define how the Project will be practically implemented on site. b) Not less than 20 working days prior to the commencement of any Stage or location of construction works, the Requiring Authority shall prepare and submit an SSEMP to the Manager for certification that: i) The SSEMP has been prepared with inputs from suitably qualified specialists; ii) The SSEMP has been prepared in accordance with the management plans appended to the CEMP; iii) As a minimum, the SSEMP meets the information requirements set out in condition [25] unless alternative arrangements have been agreed in writing with the Manager and GWRC (in respect of their statutory functions). c) Work shall not commence until the Requiring Authority has received the Manager's written certification of the SSEMP.
24.	a) The SSEMP shall confirm final details, staging of work, and sufficient engineering design information to ensure that the Project remains within the limits and standards approved under this designation, and that the construction activities appropriately avoid, remedy, or mitigate adverse effects on the environment in accordance with the conditions of this designation. b) The Requiring Authority shall adhere to the requirements of each SSEMP at all times during the relevant construction stage of the Project.
25.	Each SSEMP shall include, but need not be limited to: a) A detailed design and construction methodology for all works within the area covered by the SSEMP; b) A detailed schedule of construction activities including the expected commencement date and duration of works in each location within the area covered by the SSEMP, and demonstrating that the area of disturbance will be kept to the minimum practicable; c) Detailed design specifications of all earthworks within the SSEMP area including disposal sites; d) Detailed design specifications for all erosion and sediment control measures, including supporting calculations (where appropriate, such as contributing catchment area and retention volume of structure), position of inlets/outlets, stabilisation measures proposed for structures, and any maintenance requirements; e) Detailed design of chemical treatment (if any) for each of the proposed sediment retention devices; f) Identification of the location of all discharge points to watercourses; g) Confirmation that temporary stockpiles of excavated material will be located at least 50 metres away from any flowing watercourse unless there is appropriate treatment of stormwater (which may include discharging to vegetated land);

	h) In respect of vegetation clearance and rehabilitation activities: i) Identification of valued habitats identified under regional consent condition [G.34a)i)] which are to be protected and retained; ii) Management of measures to minimise effects of vegetation clearance; iii) Identification of soil resource to be used for rehabilitation within the SSEMP area; and iv) The plan for implementing any relevant revegetation or restoration included within the Ecological Management Plan (EMP, to be certified by GWRC under the resource consent conditions) or the Landscape Plan (LP); i) In respect of stream realignment and culverting: i) Measures/methods to maintain fish passage during and following completion of construction works along the stretches of stream affected by the exercise of this consent; ii) Specific consideration of seasonal migration of native fish; iii) Details of culvert inlet/outlet protection structures e.g. pre-cast wing walls or rock rip-rap; iv) Confirmation of appropriate sizing of culverts and allowances for secondary flow paths during high flows; v) Detailed diversion plans and any other measures or details as appropriate to achieve compliance with all conditions of this consent and the objectives of the relevant management plans; vi) Confirmation that placement of excavated material in the wetted channel will be avoided, and the time spent by machinery in the wetted channel, including the number of vehicle crossings, will be minimised; and vii) Confirmation that any excess material from the bed and banks of the stream will be removed immediately on completion of the work; j) A drawing that clearly shows the location of key areas or features that are required to be avoided or otherwise protected during construction, including (but not be limited to) notable areas of bush or vegetation and heritage features; k) The identification of appropriately qualified and experienced staff to manage environmental issues onsite; l) The identification of staff who have clearly defined roles and responsibilities to monitor compliance with the SSEMP; m) Details of a chain of responsibility for managing environmental issues and details of responsible personnel; n) Details of the site access for all Work associated with construction of the Project; o) Measures to be adopted to maintain the site in a tidy condition in terms of disposal/storage of rubbish, storage and unloading of building materials and similar construction activities; p) Location of workers' conveniences (e.g. portaloos); q) Details of the storage of fuels and lubricants (which shall require that storage be bunded or contained in such a manner so as to prevent the discharge of contaminants from spillages); r) Details of the proposed maintenance of machinery and plant to minimise the potential for leakage of fuels and lubricants; s) Location of vehicle and construction machinery access and storage during the period of site works; t) Procedures for thoroughly cleaning all machinery of unwanted vegetation (e.g. weeds), seeds or contaminants prior to entering the site and any other methods to avoid the introduction or spread of unwanted weeds or pests; u) Methods for the clear identification and marking of the construction zones including those which extend into watercourses; v) A methodology that prescribes the extent to which machinery can operate in the vicinity of watercourses so as to minimise disruption and damage to the watercourses and associated vegetation; w) Methods to manage public health and safety during the construction works, and notification to the public of temporary access restrictions to the

	immediate works area during the staged construction; x) Confirmation that no equipment or machinery will be cleaned, or refuelled in any part of any watercourses/streams, except as otherwise specifically provided for in the CEMP or an SSEMP; y) Procedures for removing all contaminants (e.g. fuel, hydraulic oils, lubricants etc) from the site at the end of the construction period, except for those required for on-going maintenance of the network and operational activities; and z) As a schedule to the SSEMP, a Site Specific Traffic Management Plan (SSTMP) as provided by condition [34], which shall describe the measures that will be undertaken to manage the traffic effects associated with the construction of specific parts of the Project.
26.	a) The Requiring Authority may request amendments to any of the SSEMPs by submitting the amendments in writing to the Manager at least 5 working days prior to those amendments being intended to be implemented. b) Any changes to the SSEMPs shall remain consistent with the overall intent of the relevant management plan and shall be consistent with the requirements of the relevant conditions attached to this designation. c) The changes sought shall not be implemented until the Requiring Authority has received the Manager's written certification.
27.	a) In the event of any dispute, disagreement or inaction arising as to any certification required by condition [26], matters shall be referred in the first instance to the Manager and to the Requiring Authority to determine a process of resolution. b) If a resolution cannot be agreed within: i) 3 months of lodging the particular SSEMP; or ii) 1 month of submitting a request for an amendment to an SSEMP; the matter may be referred to an independent appropriately qualified expert, acceptable to both parties, setting out the details of the matter to be referred for determination and the reasons the parties do not agree. c) The expert shall be appointed within 10 working days of the NZTA or KCDC giving notice of their intention to seek expert determination. The expert shall, as soon as possible, issue a decision on the matter. d) The decision of the expert is binding and shall be implemented by the Requiring Authority. e) The dispute resolution process above will be applied before any formal enforcement action is taken by KCDC, except in urgent situations.
Construction Traffic Management Plan and Site Specific Traffic Management Plans	
28.	An Outline Plan (or Plans) for the construction of any part or Stage of the Project shall include a CTMP as an appendix to the CEMP. The CTMP shall address the matters in condition [29].
29.	a) In managing construction traffic, the Requiring Authority shall achieve the following outcomes: i) Minimise the disruption to road users using the local road network and footpaths; and ii) Maintain a safe passage for all road and footpath users affected by construction. b) The Requiring Authority shall: i) Identify local road delay triggers on local travel routes; ii) Monitor the travel times on local travel route to determine if the delay triggers have been exceeded; and

	iii) Investigate additional mitigation measures to remedy any adverse effects on local traffic arising from the delay triggers being exceeded. c) In achieving the outcomes in a), the Requiring Authority shall adopt the following standards and guidelines insofar as they are relevant: i) NZTA Traffic Control Devices Manual; and ii) NZTA Code of Practice for Temporary Traffic Management. d) In managing construction activities, the Requiring Authority shall comply with the following standards: i) Local traffic shall not be held up by construction activities in any one location by longer than 2 minutes, except in regard to bridge construction when the structural components are being put in place, when the maximum delay shall not exceed 5 minutes; and ii) Emergency services shall be provided with unimpeded access along all local roads 24 hours per day, unless bridge or wall construction requires the temporary closure of a road, in which case an Emergency Action Plan must be developed and agreed with emergency services prior to any temporary closure so that an alternative access via a detour route is available for the duration of that temporary closure.
30.	The CTMP shall be consistent with the version of the NZ Transport Agency Code of Practice for Temporary Traffic Management (COPTTM) which applies at the time the CTMP is prepared. Where it is not possible to adhere to this standard, the COPTTM's prescribed Engineering Exception Decision (EED) process will be followed, which will include appropriate mitigation measures agreed with the Road Asset Manager.
31.	The Requiring Authority shall appoint an independent party to carry out random auditing of temporary road closure/s in accordance with COPTTM at regular intervals throughout the construction of the Project. The intervals shall be stated in the CTMP. A copy of the findings of each audit shall be provided to the Manager.
32.	a) Prior to the commencement of construction of the Project, or any enabling Work, the Requiring Authority shall undertake a pre-construction condition survey of the carriageway/s along those local roads affected by the Project for which KCDC is the road controlling authority and submit it to the Manager and the Roading Asset Manager. The condition survey shall consist of a photographic or video record of the carriageway, and shall include roughness, rutting defects and surface condition. b) As soon as practicable following completion of construction of the Project the Requiring Authority shall, at its expense, conduct a post-construction condition survey of the road network affected by the Project. c) The results of the pre- and post-construction surveys will be compared and, where necessary, the Requiring Authority shall at its expense arrange for repair of any damage to the carriageways and footpaths (and associated road components), for which KCDC is the road controlling authority, where that damage has resulted from the impacts of construction of the Project.
33.	a) The Requiring Authority shall carry out regular inspections of the road network affected by the Project during construction to ensure that all potholes and other damage resulting from the construction of the Project are identified as soon as practicable. b) The Requiring Authority shall contribute fair and reasonable costs towards repair and maintenance of potholes and other damage resulting from the construction of the Project. c) Prior to construction commencing the Requiring Authority will agree with KCDC's Road Asset Manager the nature, extent and frequency of the inspections referred to in a).
34.	Site Specific Traffic Management Plans (SSTMPs) shall describe the measures that will be undertaken to manage the traffic effects associated with the construction of specific parts of the Project prior to construction of the relevant part(s) of the Project commencing. Each SSTMP must be consistent with, and

	be implemented in accordance with, the CTMP. In particular, SSTMPs shall describe, where appropriate: a) Temporary traffic management measures required to manage impacts on road users during proposed working hours; b) Assessment of delays associated with the proposed closure/s and detour routes; c) The capacity of any proposed detour route(s) and their ability to carry the additional traffic volumes likely to be generated as a result of the construction of the Project and any known safety issues associated with the detour route, including any mitigation measures the Requiring Authority proposes to put in place to address any identified safety issues; d) Measures to maintain existing vehicle access to adjacent properties and businesses; e) Measures to maintain safe and clearly identified pedestrian and cyclist access on roads and footpaths adjacent to the construction work. Where detours are necessary to provide such access the Requiring Authority shall provide for the shortest and most convenient detours which it is reasonably practicable to provide, having regard to safety; f) Measures to maintain passenger transport services and facilities; g) Any proposed temporary changes in speed limit; h) Provision for safe and efficient access of construction vehicles to and from construction site(s); and i) Measures that will be undertaken by the Requiring Authority to communicate traffic management measures to affected road users and stakeholders. The SSTMP(s) shall be appended to the relevant SSEMP when submitted to KCDC for certification.
Construction Noise and Vibration Management Plan	
35.	An Outline Plan (or Plans) for the construction of any part or Stage of the Project shall include a Construction Noise and Vibration Management Plan (CNVMP) as an appendix to the CEMP. The CNVMP shall address the matters in conditions [36 and 37].
36.	The purpose of the CNVMP shall be to provide a framework to manage construction noise/vibration appropriately for the variety of circumstances within the Project area by outlining the measures, procedures and standards for mitigating the effects of noise and vibration during construction of the Project to meet: a) The noise criteria set out in condition [38], where practicable. Where it is not practicable to achieve those criteria, alternative strategies should be described to address the effects of noise on neighbours; and b) The Category A vibration criteria set out in condition [39], where practicable. Where it is not practicable to achieve those criteria, a suitably qualified expert shall be engaged to assess and manage construction vibration during the activity that exceed the Category A criteria. If predicted construction vibration exceeds the Category B criteria, then construction activity should, where practicable, only proceed if approved by the Manager and if there is appropriate monitoring of vibration levels and effects on those buildings identified as being at risk of exceeding the Category B criteria, by suitably qualified experts.
37.	The CNVMP shall, as a minimum, address the following: a) Description of the Work, anticipated equipment/processes and their scheduled durations; b) Hours of operation, including times and days when construction activities causing noise and/or vibration would occur; c) The construction noise and vibration criteria for the Project; d) Identification of affected houses and other sensitive locations where noise and vibration criteria apply;

e) Requirements for building conditions surveys at locations close to activities generating significant vibration, prior to and after completion of the Works (including all buildings predicted to exceed Category A vibration criteria in condition [39]);
f) Procedures for preparation of management schedules containing site specific information;
g) Mitigation options, including alternative strategies where full compliance with the relevant noise and/or vibration criteria cannot be achieved;
h) Methods and frequency for monitoring and reporting on construction noise and vibration;
i) Stakeholder communications as per the Stakeholder and Communications Management Plan required by condition [7];
j) Complaints processes as required by condition [10]; and
k) Operator training procedures and expected construction behaviours under the CEMP as required by condition [20].

38. Construction noise shall be measured and assessed in accordance with NZS 6803:1999 'Acoustics – Construction Noise'. The construction noise criteria for the purposes of the CNVMP are:

Time of week	**Time period**	**dB $L_{Aeq(15\ min)}$**	**dB L_{AFmax}**
Residential			
Weekdays	0630-0730	60	75
	0730-1800	75	90
	1800-2000	70	85
	2000-0630	45	75
Saturdays	0630-0730	45	75
	0730-1800	75	90
	1800-2000	45	75
	2000-0630	45	75
Sundays and Public Holidays	0630-0730	45	75
	0730-1800	55	85
	1800-2000	45	75
	2000-0630	45	75

	Industrial and Commercial			
	All days	0730-1800	75	
		1800-0730	80	

39. Construction vibration shall be measured in accordance with ISO 4866:2010 '*Mechanical vibration and shock – Vibration of fixed structures- Guidelines for the measurement of vibrations and evaluation of their effects on structures'.* The construction vibration criteria for the purposes of the CNVMP are:

Receiver	**Details**	**Category A**	**Category B**
Occupied Dwellings	Night time 2000h-0630h	0.3 mm/s PPV	1 mm/s PPV
	Daytime 0630h-2000h	1 mm/s PPV	5 mm/s PPV
Other occupied buildings*	Daytime 0630h-2000h	2 mm/s PPV	5 mm/s PPV
All other buildings	Vibration – transient	5 mm/s PPV	BS5228-2:2009* Table B.2
	Vibration – continuous	5 mm/s PPV	50% of BS5228-2:2009* Table B.2

* BS5228-2:2009 '*Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 2: Vibration*'

Network Utilities Management Plan

40. The Requiring Authority shall prepare and implement a Network Utilities Management Plan (NUMP), the purpose of which shall be to outline the methodologies that will be adopted to ensure enabling work, design, and construction of the Project adequately takes account of (and includes measures to address) the safety, integrity, protection, and (where necessary) relocation of Existing Network Utilities.

41. a) The NUMP shall be prepared in consultation with the relevant infrastructure providers who have Existing Network Utilities that are directly affected by the Project and shall be implemented during the construction of the Project. The NUMP shall include:
   i) Contact details for the utility owners and a protocol for liaison with them;
   ii) Measures to be used to accurately identify the location of Existing Network Utilities;
   iii) Measures for the protection, relocation and/or reinstatement of Existing Network Utilities;
   iv) Measures to seek to ensure the continued operation and supply of infrastructure services which may include, but not be limited to, any new or relocated gas pipes being made operational prior to the termination of existing gas lines;
   v) Measures to provide for the safe operation of plant and equipment, and the safety of workers, in proximity to live Existing Network Utilities;
   vi) Measures to manage potential induction hazards to Existing Network Utilities;

	vii) Earthwork management (including depth and extent of earthwork), for earthworks in close proximity to Existing Network Utilities; viii) Vibration management for Work in close proximity to existing network utilities; and ix) Emergency management procedures in the event of any emergency involving Existing Network Utilities. b) The Requiring Authority shall ensure that the construction Work does not adversely impact on the safe and efficient operation and planned upgrade of network utilities.
Construction Lighting	
42.	The Requiring Authority shall implement procedures at all times during construction to manage lightspill (if any) to residential properties from any night lighting that is required on the site.
Settlement Management	
43.	In managing the construction of the Project and its potential effects on ground settlement south of Mary Crest and north of Rahui Road, the Requiring Authority shall achieve the following outcomes: a) Minor road repair to existing roads such as sealing of cracks may be required during construction and the pavement may need to be reinstated on completion of the preloading and construction; the railway line may also need to be re-levelled during or soon after construction; and b) Ground settlement will be closely monitored by settlement plates / stations during and after the preloading period to assess the settlement of the adjacent ground, especially at SH1 and the NIMT. Any development of cracks of the road seal should be recorded and monitored, to trigger repairs as necessary.
44.	The Requiring Authority shall establish a series of ground settlement monitoring marks to monitor potential settlement that might occur as a result of construction of embankments and drawdown of the groundwater table. The survey marks will be generally located as follows: a) At 20 m intervals along sections identified as prone to settlement due to construction of compressible ground / and preloading (namely south of Mary Crest and north of Rahui Road); and b) Adjacent to stormwater features where settlement of more than 0.1 m due to groundwater drawdown has been predicted. The exact locations of each type of settlement monitoring marks shall be confirmed in the relevant SSEMP.
45.	The Requiring Authority shall survey the settlement monitoring marks at the following frequency: a) Pre-construction – settlement at monthly intervals starting at least 1 month prior to Active Construction commencing within 500 metres of the monitoring mark; b) During construction: i) settlement at weekly intervals during active construction earthworks in the area; ii) settlement at monthly intervals after construction earthworks in the area until settlement is less than 5mm per month; and iii) settlement at 3 monthly intervals during the balance of the construction period; c) Post-construction: i) settlement at 3 monthly intervals for 12 months.

46.	Immediately following each monitoring round, the Requiring Authority shall use the settlement monitoring results (together with the results of visual observation and groundwater monitoring where they may provide additional information) to reassess whether any damage has occurred or is likely to occur as a result of settlement arising from any Project Work. If the reassessment indicates that any damage has occurred or is likely to occur: a) the owner and occupier of the site shall be notified within 72 hours; b) the Requiring Authority shall undertake appropriate remedial or preventative action; and c) the Requiring Authority shall advise the owner and occupier of the site and the Manager of any remedial or preventative action undertaken.
47.	The Requiring Authority may reduce the frequency of settlement monitoring required by condition [45] when: a) The Active Construction Stage has passed; and b) 3-monthly monitoring has been carried out for a minimum of 6 months; and c) The monitoring indicates that no damage has occurred or is likely to occur.
48.	The Requiring Authority shall collate the results of the settlement monitoring (undertaken pursuant to condition [45]) and prepare a report that shall be made available to KCDC at the completion of construction Work for the Project.
Archaeology and Built Heritage	
49.	The Outline Plan(s) for the construction of the Project shall include the following: a) Any heritage monitoring requirements; b) Procedures, stand down periods and dispute resolution processes to be applied in the event of an archaeological discovery; c) Methods for transferring any relevant information to KCDC upon completion of Works; d) The methodology for relocating the following structures: i) the Ōtaki Railway Station (within the existing site); ii) Clifden cottage at Bridge Lodge (to 91 Gear Road, Te Horo); and iii) the 'Beehive Kilns' at the former Mirek Smisek pottery site, 990 State Highway 1, Te Horo (within the existing site).
50.	a) In managing the construction of the Project and its effects on archaeology and built heritage, the Requiring Authority shall achieve the following outcomes: i) The use of appropriate training, methods, protocols, and procedures in relation to the possible presence of cultural or archaeological sites or material that may be discovered during construction; ii) The investigation and recording of any archaeological resources discovered during the construction of the Project and the use of that information gained to facilitate a greater general understanding of the history and cultural heritage of the Kāpiti Coast; iii) The protection of the built heritage values of the following sites or heritage structures from significant adverse effects: a) the Ōtaki Railway Station; b) Clifden cottage; c) the former Mirek Smisek pottery site (including the former Te Horo Railway Station); d) the property at 230 Main Road, Ōtaki;

	e) the former Rahui Factory Social Hall; and f) the former Rahui Milk Treatment Station. b) In achieving these outcomes, the Requiring Authority shall comply or be consistent with the following standards and guidelines: i) ICOMOS New Zealand Charter for the Conservation of Places of Cultural Heritage Value 2010; and ii) Conditions contained in any archaeological authorities granted by the NZHPT under the Historic Places Act 1993. ***Advice Note**: The Requiring Authority will be seeking separate archaeological authorities from the NZHPT under section 12 of the Historic Places Act 1993, prior to the commencement of construction. The authorities are likely to include requirements for detailed investigations and monitoring effects and are also likely to require the preparation of an Heritage Management Plan (or an Archaeological Management Plan). The Requiring Authority shall actively promote the inclusion of conditions on the archaeological authorities to secure these requirements at the time of making application for these authorities.*
51.	Relocation of the Ōtaki Railway Station, Clifden cottage at Bridge Lodge, and the 'Beehive Kilns' will be in accordance with a heritage conservation plan prepared (or, in the case of the Ōtaki Railway Station, updated) by a suitably qualified and experienced conservation architect.
52.	The Requiring Authority shall, in consultation with Nga Hapū o Ōtaki, finalise an accidental discovery protocol and provide a copy to KCDC and GWRC for information at the time the CEMP is submitted. The protocol shall be implemented in the event of accidental discovery of cultural or archaeological artefacts or features during the construction of the Project. The protocol shall include, but not be limited to: a) Training procedures for all contractors regarding the possible presence of cultural or archaeological sites or material, what these sites or material may look like, and the relevant provisions of the Historic Places Act 1993 if any sites or material are discovered; b) Parties to be notified in the event of an accidental discovery, who shall include, but need not be limited to, Nga Hapū o Ōtaki, the NZHPT, GWRC, KCDC and, if koiwi are discovered, the New Zealand Police; c) Procedures to be undertaken in the event of an accidental discovery (these shall include immediate ceasing of all physical Works in the vicinity of the discovery); and d) Procedures to be undertaken before Work under this designation may recommence in the vicinity of the discovery. These shall include allowance for appropriate tikanga (protocols), recording of sites and material, recovery of any artefacts, and consulting with Nga Hapū o Ōtaki and the NZHPT.
53.	a) The Requiring Authority will undertake pre-construction monitoring where any Works are proposed within the following areas identified as being of high archaeological potential: i) The dune area between the Waitohu Stream and the Mangapouri Stream; ii) The dune area south of Mary Crest; and iii) The grounds of the property at 230 Main Road, Ōtaki. b) The accidental discovery protocol referred to in condition [52] will apply in the event of the accidental discovery of cultural or archaeological artefacts or features during that monitoring. c) The Requiring Authority shall invite a representative or representatives of Nga Hapū o Ōtaki to be present during the pre-construction monitoring.
54.	a) During archaeological field investigations, the Requiring Authority shall hold a series of open days associated with those investigations. b) Following completion of the construction of the Project, the Requiring Authority shall, in consultation with Nga Hapū o Ōtaki, KCDC, and the New Zealand Historic Places Trust, and for the purpose of public information and education:

	i) Prepare a series of fixed interpretive signs and place those signs at culturally and/or archaeologically significant or strategic locations; ii) Prepare a complementary set of portable interpretive panels to be supplied to KCDC for use and distribution, based on information obtained as part of any investigations undertaken in accordance with any archaeological authorities granted under the Historic Places Act 1993; and iii) Prepare and publish material (for example a booklet or series of booklets, or publication in an academic journal) suitable for a general audience that provides a summary of the archaeological findings and cultural heritage relating to the Project.
Construction Air Quality Management Plan	
55.	a) An Outline Plan (or Plans) for the construction of any part or Stage of the Project shall include a CAQMP. The CAQMP shall be generally consistent with the draft CAQMP submitted with the application. The CAQMP shall be submitted as an appendix to the CEMP. b) The purpose of the CAQMP shall be to establish methods to be used to limit dust and odour nuisance, and procedures for responding to any complaints and events in order to comply with the outcomes and standards required under condition [59]. c) The CAQMP shall include the following details: i) Identification of the sensitive locations where specific dust mitigation measures may be required; ii) Identification of contingency measures to address identified and verified adverse effects on sensitive receptors. Contingency measures may include options such as: a) Cleaning of water tanks and replenishment of water supplies; b) Cleaning of houses; c) Cleaning of other buildings and infrastructure; and d) Cleaning of local roads in agreement with KCDC's Road Asset Manager. iii) Visual monitoring of dust emissions; iv) Methods to be used to limit dust and odour nuisance; v) Procedures for responding to process malfunctions and accidental dust discharges; vi) Criteria, including consideration of weather conditions and procedures for use of water sprays on stockpiles and operational areas of the site; vii) Implementation of Continuous Monitoring of Total Suspended Particulate (TSP) concentrations; viii) Monitoring of the times of offensive odour emissions from the ground; ix) Procedures for responding to discharges of odour (including in the event of excavation of contaminated sites); x) Monitoring of construction vehicle maintenance; and xi) The identification of staff and contractors' responsibilities.
56.	In managing dust arising from construction activities, the consent holder shall achieve the following outcome: a) Earthworks are managed to minimise the amount of dust received offsite.
57.	Monitoring of wind speed, wind direction, air temperature and rainfall shall be undertaken: a) In general accordance with the Good Practice Guide for Air Quality Monitoring and Data Management, Ministry for Environment, 2009; and b) Continuously for the duration of the construction phase of the Project, at a point that is representative of the local weather conditions across the construction site.

58.	The consent holder shall review the CAQMP at least annually and as a result of any material change to the Project.
59.	There shall be no odour, dust or fumes beyond the site boundary caused by discharges from the site which, in the opinion of an enforcement officer, is noxious, offensive or objectionable.
60.	Beyond the site boundary, there shall be no hazardous air pollutant caused by discharges from the site that causes, or is likely to cause, adverse effects on human health, environment or property.

31.4 Proposed Designation Conditions – applying to only NZTA

Table 31-4: Proposed Designation Conditions- - only NZTA

Cond no.	Proposed Conditions – applying to only NZTA
	Noise and Vibration Management – Operation
61.	For the purposes of conditions [61 to 73], the following terms will have the following meanings: a) BPO – means Best Practicable Option; b) Building-Modification Mitigation – has the same meaning as in NZS6806:2010; c) Habitable Space – has the same meaning as in NZS6806:2010; d) Noise Assessment – means the Operational Noise and Vibration Assessment submitted with the NoR; e) Noise Criteria Categories – means groups of preference for time-averaged sound levels established in accordance with NZS6806:2010 when determining the selected mitigation option considered to be the BPO; i.e. Category A – primary noise criterion, Category B – secondary noise criterion, Category C – internal noise criterion; f) NZS6806:2010 – means NZS 6806:2010 Acoustics – Road-traffic noise – New and altered roads; g) PPFs – has the same meaning as in NZS6806:2010, and are generally identified in green, yellow or red on drawings N-001 to N-008; and h) Structural Mitigation – has the same meaning as in NZS6806:2010.
62.	The Requiring Authority shall implement the noise mitigation measures identified in the 'Selected Options' in section 7 of the Noise Assessment as part of the Project, in order to achieve the Noise Criteria categories indicated in drawings N-001 to N-008, where practicable and subject to conditions [61 to 73].
63.	The detailed design of the Structural Mitigation measures in the Selected Options (the 'Detailed Mitigation Options') shall be undertaken by a suitably qualified acoustics specialist prior to construction of the Project, subject to condition [68], as a minimum shall include low-noise road surfaces in general accordance with the Noise Assessment.
64.	Where the design of the Detailed Mitigation Options identifies that it is not practicable to implement a particular Structural Mitigation measure in the

	location or of the length included in the "Selected Options" either: a) If the design of the Structural Mitigation measure could be changed and would still achieve the same Identified Category or Category B at all relevant PPFs, and a suitably qualified person certifies to KCDC that the changed Structural Mitigation would be consistent with adopting the BPO in accordance with NZS6806:2010, the Detailed Mitigation Options may include the changed mitigation measure, or b) If the changed design of the Structural Mitigation measure would change the Noise Criteria Category at any PPF from Category A or B to Category C, and the Manager confirms that the changed Structural Mitigation measure would be consistent with adopting the BPO in accordance with NZS6806:2010, the Detailed Mitigation Options may include the changed mitigation measure.
65.	The Detailed Mitigation Options shall be implemented prior to completion of construction of the Project, with the exception of any low-noise road surfaces, which shall be implemented within 12 months of completion of construction.
66.	Prior to construction of the Project, a suitably qualified acoustic specialist shall identify those PPFs which, following implementation of all the Structural Mitigation measures included in the Detailed Mitigation Options, are not in Noise Criteria Categories A or B and where Building Modification Mitigation in accordance with NZS 6806:2010 may be required to achieve 40 dB $L_{Aeq(24h)}$ inside Habitable Spaces ("Category C Buildings").
67.	a) Prior to commencement of construction of the Project in the vicinity of a Category C Building, the Requiring Authority shall write to the owner of each Category C Building seeking access to such building for the purpose of measuring internal noise levels and assessing the existing building envelope in relation to noise reduction performance. b) If the owner(s) of the Category C Building approve the Requiring Authority's access to the property within 12 months of the date of the Requiring Authority's letter (sent pursuant to a)), then no more than 12 months prior to commencement of construction of the Project in any Sector, the Requiring Authority shall instruct a suitably qualified acoustic specialist to visit the building to measure internal noise levels and assess the existing building envelope in relation to noise reduction performance.
68.	Where a Category C Building is identified, the Requiring Authority shall be deemed to have complied with condition [67] above where: a) The Requiring Authority (through its acoustics specialist) has visited and assessed the building; or b) The owner of the Category C Building approved the Requiring Authority's request for access, but the Requiring Authority could not gain entry for some reason (such as entry being denied by a tenant); or c) The owner of the Category C Building did not approve the Requiring Authority's access to the property within the time period set out in condition [67b)] (including where the owner(s) did not respond to the Requiring Authority's letter within that period); or d) The owner of the Category C Building cannot, after reasonable enquiry, be found prior to completion of construction of the Project. If any of (a) to (d) above apply to a particular Category C Building, the Requiring Authority shall not be required to implement any Building-Modification Mitigation at that Category C Building.
69.	Subject to condition [70], within six months of the assessment required under condition [67b)], the Requiring Authority shall give notice to the owner of each Category C Building: a) Advising of the options available for Building-Modification Mitigation to the building; and b) Advising that the owner has three months within which to decide and advise the Requiring Authority whether to accept Building- Modification Mitigation for the building, and if the Requiring Authority has advised the owner that more than one option for Building-Modification Mitigation is available, to advise the Requiring Authority which of those options the owner prefers.

70.	Once an agreement on Building-Modification Mitigation is reached between the Requiring Authority and the owner of an affected building, the mitigation shall be implemented in a reasonable and practical timeframe agreed between the Requiring Authority and the owner.
71.	Subject to condition [70], where Building-Modification Mitigation is required, the Requiring Authority shall be deemed to have complied with condition [67b)] above where: a) The Requiring Authority has completed Building-Modification Mitigation to the Category C Building; or b) The owner(s) of the Category C Building did not accept the Requiring Authority's offer to implement Building-Modification Mitigation prior to the expiry of the timeframe stated in condition [69b)]) above (including where the owner(s) did not respond to the Requiring Authority within that period); or c) The owner of the Category C Building cannot, after reasonable enquiry, be found prior to completion of construction of the Project.
72.	The Requiring Authority shall manage and maintain the Detailed Mitigation Options to ensure that, to the extent practicable, those mitigation measures retain their noise reduction performance.
73.	A Noise Mitigation Plan shall be prepared by a suitably qualified acoustics specialist prior to commencement of construction including details of: a) Detailed Mitigation Options; b) Predicted noise levels, including identification of any PPFs which have changed NZS 6806:2010 noise categories; and c) Methods for post-construction validation of the Noise Assessment.
Landscape and Urban Design	
74.	An Outline Plan(s) for the Project shall include a Landscape Plan (LP) as an appendix to the CEMP. The LP shall address the matters in conditions [74 to 78].
75.	The purpose of the LP is to outline the methods and measures to be implemented prior to construction, during the construction phase, and for a defined period thereafter to avoid, remedy and mitigate adverse effects of the permanent Works on landscape amenity. The LP shall document the permanent mitigation measures, as well as the necessary monitoring and management required to successfully implement those measures during the construction phase and the transition to the Operational phase of the Expressway. a) The LP shall be prepared in consultation with: i) Keep Ōtaki Beautiful and Ngā Hapū-o-Ōtaki, where the Works are within or directly affect the Pare-o-Matangi reserve; and ii) KCDC. b) Consultation under a) shall commence at least 60 Working Days prior to submission of the finalised LP to KCDC. Any comments and inputs received from the parties listed above shall be clearly documented, along with an explanation of where any comments have not been incorporated and the reasons why. c) The LP shall provide information how the following outcomes will be achieved: i) The integration of the Expressway's permanent Works, including earthworked areas, structures and noise attenuation measures, into the surrounding landscape and topography (including the contouring of dune landforms), including but not limited to the restoration of areas used for temporary Work and construction yards, and the reinstatement with appropriate vegetation types; ii) The mitigation of the visual effects of the Expressway on properties in the immediate vicinity through landscape Work, generally within land acquired for the Expressway (but also on private properties, where appropriate, and where the relevant owner consents); iii) The retention or relocation of significant existing trees, or their replacement if their retention or relocation is not practicable; iv) The retention of areas of regenerating indigenous vegetation;

	v) The proposed maintenance of plantings, including the replacement of unsuccessful plantings; and vi) Coordination of landscape Works with ecology Works, including those required for stream diversion and permanent stormwater control ponds.
76.	The LP shall be prepared by suitably qualified and experienced landscape architect, and shall: a) implement the principles and outcome sought by the Urban and Landscape Design Framework (technical report 23); and b) be consistent with the Ecological Management Plan (EMP), which is required to be certified under the regional consent conditions; and c) be prepared in accordance with: i) Transit New Zealand's Guidelines for Highway Landscaping (dated December 2006) – or any subsequent updated version; and ii) Transit New Zealand's "Urban Design Implementation Principles (2006)" – or any subsequent updated version.
77.	In order to confirm that the LP is consistent with the ecological management measures in the EMP, a copy of the EMP shall be provided to KCDC at the same time it is submitted to GWRC under the regional resource consent conditions.
78.	The LP shall include details of landscape design, including the following matters: a) Identification of vegetation to be retained, including retention of as many as practicable significant trees and areas of regenerating indigenous vegetation; b) Protection measures for vegetation to be retained, and make good planting along cleared edges; c) Proposed planting including plant species, plant/grass mixes, spacing/densities, sizes (at the time of planting) and layout and planting methods including trials; d) Planting programme – the staging of planting in relation to the construction programme which shall, as far as practicable, include provision for planting within each planting season following completion of Works in each stage of the Expressway; e) Detailed specifications relating to (but not limited to) the following: i) Vegetation protection (for desirable vegetation to be retained); ii) Weed control and clearance; iii) Pest animal management; iv) Ground preparation; v) Mulching; and vi) Plant supply and planting, including hydroseeding and grassing, which shall require: a) Any planting to reflect the natural plant associations of the area; b) Where practicable, the use of mixes of plant which are of a suitable richness and diversity to encourage self-sustainability once established; and c) Any native plants to, so far as practicable, be genetically sourced from the relevant Ecological District; f) Consideration of: i) The landscape character of the area; ii) The integration of the Works into the natural environment, including streams; and iii) Crime Prevention Through Environmental Design (CPTED) principles in urban areas.
Operational Lighting	
79.	Lighting shall be designed and screened to minimise the amount of lighting overspill and illumination of residential areas, and shall demonstrate that: a) All motorway lighting shall be designed in accordance with "Road lighting Standard AS/NZS1158"; and b) All other lighting shall be designed in accordance with the relevant rules of the District Plan.

Transport – Operational	
80.	a) The Requiring Authority shall prepare, in collaboration with KCDC and GWRC (the latter in respect of the public transport elements), a Network Integration Plan (NIP) for the Expressway, or relevant Expressway stages, to demonstrate how the Expressway integrates with the existing local road network and with future improvements planned by KCDC and GWRC. b) The NIP shall include details of proposed physical Work at the interface between the State highway and the local road and public transport network, and shall address such matters as lane configuration, traffic signal co-ordination and operational strategies, signage and provision for bus stops. c) The Requiring Authority shall submit the NIP to the Manager at least 20 working days prior to commencement of construction of the Expressway. d) Works identified in the NIP which are the responsibility of the NZTA, including any Work associated with the relocation of bus stops, will be undertaken at the time the Project is constructed.

Chapter 32

Part H

VOLUME 2

Proposed Resource Consent Conditions

32 Proposed Resource Consent Conditions

32.1 Guide to Reading the Conditions

The proposed suite of conditions to manage effects of the Project has been numbered as idetifned in Table 32-1 below:

Table 32-1: Resource Consent Reference Used in Conditions

NZTA regional resource consents	
G	General conditions applying to all relevant consents and permits
WS	Conditions applying to consents and permits for work in watercourses
E	Conditions applying to consents and permits for earthwork and erosion and sediment control activities
BC	Conditions applying to consents and permits for the construction of boreholes
GT	Conditions applying to consents and permits for the taking of groundwater
VC	Conditions applying to consents for the removal of vegetation in the beds of watercourses and a wetland, including the associated disturbance of their beds
WR	Conditions applying to consents for the partial reclamation of the wetland relating to the Peka Peka to North Ōtaki Project alignment (the 'Railway wetland'), including the associated disturbance of its bed.
SW	Conditions applying to operational stormwater discharge.

The table below provides explanation to a number of the abbreviations, acronyms and terms used in the conditions.

Table 32-2: Abbreviations, Acronyms and Terms Used in the Conditions

Definitions	
AEE	Means the Peka Peka to North Ōtaki Project Assessment of Effects on the Environment Volumes 1 to 5 dated 18 March 2013
BECLMP	Means the Bulk Earthworks Contaminated Land Management Plan
CEMP	Means the Construction Environmental Management Plan
Commencement of Work	Means the time when the work that is the subject of these resource consents commences
EMP	Means the Ecological Management Plan

ESCP	Means the Erosion and Sediment Control Plan
GWRC	Means the Greater Wellington Regional Council, including any officer of Greater Wellington Regional Council
KCDC	Means the Kāpiti Coast District Council, including any officer of Kāpiti Coast District Council
Manager	Means the Manager, Environmental Regulation, Greater Wellington Regional Council
Operational	Means when construction is complete and the Project is open to traffic (be it road traffic on the Expressway or associated local roads, or rail traffic in relation to the realigned NIMT)
Project	Means the construction, maintenance and operation of the Peka Peka to North Ōtaki Project, comprising an Expressway, local road connections, a realigned section of the NIMT, and all associated works
Project Environmental Manager	Means the person responsible for environmental management during construction, as nominated in the Construction Environmental Management Plan
Project Footprint	Means the extent of the earthworks required for the Project construction and associated cuts and fills
Section	Means a section of the Project as nominated by the consent holder and shown in technical report 5 (a Section may include several Stages).
SSEMP	Means a Site Specific Environmental Management Plan
Stage	Means a stage of the Project as identified by the consent holder in the staging programme submitted to GWRC in accordance with condition [G.13].
Stabilisation	Means making an area resistant to erosion. This may be achieved by using indurated rock or through the application of base course, grassing, or other method to the satisfaction of the Manager, on a surface that is not otherwise resistant to erosion. Where seeding or grassing is used on a surface that is not otherwise resistant to erosion, the surface is considered stabilised once 80% vegetative ground cover has been established over the entire area. "Non-stabilised" areas are those which do not meet the definition of "stabilised".
Water Body	Means fresh water or geothermal water in a river, lake, stream, pond, wetland or aquifer, or any part thereof, that is not located within the coastal marine area.
Work	Means any activity or activities undertaken in relation to the Project
Working Day	Has the same meaning as under section 2 of the Resource Management Act 1991

32.2 Table of Contents

Table 32-3: Table of Contents for the Resource Consent Conditions

Page No.	Proposed Condition No.	Proposed Condition Content
Proposed application of conditions * Except as specified otherwise, the General Conditions shall apply to all resource consents as relevant. In addition, a number of resource consents are proposed to have specific conditions apply.		
	G.1-G.2	General
	G.3-G.4	Pre-construction Administration
	G.5-G.6	Consent Lapse and Expiry
	G.7	Review of Consents
	G.8-G.9	Complaints
	G.10-G.11	Incidents
	G.12	Staff Training
	G.13-G.14	Staging and Programme Conditions
	G.15	Annual Monitoring
	G.16-G.22	Management Plans - General
	G.23-G.27	Construction Environmental Management Plan
	G.28-G.30	Site Specific Environmental Management Plans
	G.31-G.37	Ecological Management Plan
	G.38-G.45	Ecological Monitoring
	G.46	Ecological Mitigation
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Proposed consent conditions for works in watercourses		
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	WS.10-WS.11	Conditions During Construction
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Proposed consent conditions for earthworks and erosion and sediment control		
	E.1-E.2	Erosion and Sediment Control Plan
	E.3-E.5	Erosion and Sediment Control Monitoring
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	E.10	Bulk Earthworks Contaminated Land Management Plan

Page No.	Proposed Condition No.	Proposed Condition Content
Proposed consent conditions for borehole construction		
	BC.1-BC.4	General Conditions
Proposed consent conditions for taking and using groundwater		
	GT.1-GT.3	Groundwater Monitoring
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Proposed consent conditions for stormwater discharges		
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32.3 Proposed Resource Consent Conditions

Table 32-4: Proposed Resource Consent Conditions

Except as specified otherwise, the General Conditions shall apply to all resource consents as relevant.

Cond no.	Proposed Condition – NZTA
General Conditions Applying to All Consents	
General Conditions and Administration	
G.1	a) The Project shall be undertaken in general accordance with the plans and information submitted with the application as documented as consent numbers [to insert], subject to such amendments as may be required by the following conditions of consent. The plans and information include: i) Assessment of Environmental Effects report, dated 18 March 2013 ii) Plan sets: [to insert] b) Where there is conflict between the documents lodged and the conditions, the conditions shall prevail.
G.2	Subject to the consent holder holding or obtaining appropriate property rights to enable it to do so, the consent holder shall permit the agents of the GWRC

	to have access to relevant parts of the respective properties at all reasonable times for the purpose of carrying out inspections, surveys, investigations, tests, measurements and/or to take samples to enable GWRC to undertake its monitoring functions in relation to the Project.
Pre-construction Administration	
G.3	a) The consent holder shall arrange a pre-construction site meeting between GWRC and any other relevant party nominated by GWRC, including the primary contractor, at least 10 working days prior to Commencement of Work in any Stage (as identified in the staging programme plan submitted under condition [G.13]). b) In the case that any of the invited parties, other than the representative of the consent holder, does not attend this meeting, the consent holder will have been deemed to have complied with this condition, provided the invitation requirement is met. c) The consent holder shall ensure that additional site meetings are arranged between the consent holder, the Manager and any other relevant party nominated by the Manager, at appropriate intervals, and not less than every 6 months following Commencement of Work.
G.4	The consent holder shall ensure that a copy of this consent, and all documents and plans referred to in this consent, are kept on site at all times and presented to any GWRC officer on request.
Consent Lapse and Expiry	
G.5	Pursuant to section 125(1) of the Act, the consents referenced [to insert – GWRC reference numbers] shall lapse 15 years from the date of commencement of this consent in accordance with section 116 of the Act, unless they have been given effect, surrendered or cancelled at an earlier date.
G.6	Pursuant to section 123(c) of the Act, the consents referenced [to insert – GWRC references for discharge and water permits] shall expire 35 years from the date of commencement in accordance with section 116(5) of the Act.
Review of Consents	
G.7	The Manager may review any or all conditions of this consent by giving notice of their intention to do so pursuant to section 128 of the Act, at any time within six months of the first, third, fifth and seventh anniversaries of the date of commencement of the works authorised by this consent for any of the following purposes: a) To address any adverse effects on the environment, which may arise from the exercise of this consent, and which it is appropriate to address at that time; and b) To review the adequacy of the construction, operational, maintenance, and monitoring requirements for this consent, and incorporate any modifications necessary to address any adverse effects on the environment arising from the exercise of this consent.
Complaints	
G.8	a) At all times during construction Work, the consent holder shall maintain a permanent register of any complaints received alleging adverse effects from, or related to, the exercise of this consent. The record shall include: i) The name and address (where this has been provided) of the complainant; ii) Identification of the nature of the complaint; iii) Location, date and time of the complaint and of the alleged event;

	iv) Weather conditions at the time of the complaint (as far as practicable), including wind direction and approximate wind speed if the complaint relates to air discharges; v) The outcome of the consent holder's investigation into the complaint; vi) Measures taken to respond to the complaint; and vii) Any other activities in the area, unrelated to the Project, which may have contributed to the complaint (such as non-Project construction, fires, or unusually dusty conditions generally). b) The consent holder shall respond to any complaint within 10 working days of receiving the complaint. c) The consent holder shall also maintain a record of its responses and any remedial actions undertaken. d) This record shall be maintained on site and shall be made available to the Manager and KCDC upon request. The consent holder shall provide the Manager with a copy of the complaints register every month.
G.9	The complaints process under condition [G.8] shall continue for 6 months following the Project becoming Operational. Any complaints received after this period shall be managed by the consent holder in accordance with its standard complaints procedures.
Incidents	
G.10	a) The consent holder shall follow the relevant incident requirements as specified in this condition. b) The consent holder shall notify the Manager and KCDC within 1 working day after identifying that any contaminants (including sediment) have been released in the undertaking of the Work and enter any Water Body due to any of the following: i) Discharges from non-stabilised areas that are not treated by erosion and sediment control measures required under this consent; ii) Failure of any erosion and sediment control measures; iii) Discharge of a hazardous substances, including cement, to a Water Body; iv) Failure of any temporary stream diversion; v) Unconsented removal, loss, or damage to vegetation or other habitats; vi) Any other incident which either directly or indirectly causes, or is likely to cause, adverse ecological effects in any Water Body that are not authorised by a resource consent held by the consent holder; or vii) Any other incident which either directly or indirectly causes, or is likely to cause, adverse ecological effects in any Water Body that are not authorised by a resource consent held by the consent holder. c) If any of the incidents specified in b) occur, the consent holder shall: i) Establish control measures, where these have failed or have not been implemented in accordance with the relevant management plan, as soon as practicable; ii) Liaise with the Manager to establish what remediation or rehabilitation is required and whether such remediation or rehabilitation is practical to implement; iii) Carry out any remedial action as required by and to the satisfaction of the Manager; and iv) Maintain a permanent record of the incident at the site, which shall include the date and time of the incident, the nature, manner and cause of the release of the contaminants, weather conditions at the time of the incident, the steps taken to contain any further release, and the steps to remedy any adverse ecological effects on the Water Body.

	d) The notification in c) shall be either by telephone or email, or via an alternative method as agreed with the Manager.
G.11	The consent holder shall, if requested by the Manager in response to a complaint or incident or other reasonable request that relates to managing an adverse effect that is directly related to the construction of the Project, carry out a review of any management plan required by these conditions. The consent holder shall submit the revised management plan to the Manager for certification that: a) The reason(s) for requiring the review have been appropriately addressed; and b) Appropriate actions and a programme for implementation are provided for if required.
Staff Training	
G.12	a) The consent holder shall ensure that personnel responsible for supervising earthwork site staff (i.e. foremen, supervisors and managers) shall undergo environmental awareness training, required by the CEMP. This training shall occur prior to the commencement of any earthworks or earthworks Stage and shall be given by a suitably qualified and experienced person certified by the Manager to deliver practical on-site training. b) Specifically, training may include (as relevant): i) Design details for the erosion and sediment control measures and associated methodologies; ii) Details of any stream diversions or other in-stream work and works in wetlands, briefing on the values of the streams and wetlands, the objectives for stream and culvert design and construction erosion and sediment control measures, the requirements of native fish for fish passage, and the sensitivity of the receiving environment to sediment discharges; iii) For supervisory and management personnel likely to be involved in any Work involving vegetation clearance, briefing on the values of any significant areas of vegetation that are to be retained, and the methods that shall be used to identify and protect them during construction; and iv) Briefing on the requirements for cultural ceremonies to occur before the Commencement of Work. c) The environmental awareness training shall include a process and programme for training of new staff members joining the Project team, and for any staff moving to a new Site Specific Environmental Management Plan (SSEMP) area within the Project. This obligation to provide environmental awareness training shall continue for the duration of the earthworks.
Staging and Programme Conditions	
G.13	The consent holder shall submit to the Manager 2 months prior to the commencement of the anticipated construction Work a detailed programme outlining: a) The proposed staging of the construction Work; b) The anticipated submission dates of the CEMP and management plans as required by conditions [G.18 and G.23] and any other plans; c) The anticipated submission dates of SSEMPs, which will be submitted for certification in accordance with the conditions [G.28] prior to the Commencement of Work at each applicable Stage of construction.
G.14	The consent holder shall provide the Manager with an updated schedule of construction activities and timing of management plans for the Project at monthly intervals throughout the construction phase of the Project. Each monthly update schedule shall demonstrate how it fits into the overall staging plan programme required by condition [G.13].
Annual Report	

G.15	The consent holder shall provide an annual monitoring report to the Manager by the [to insert day] of [to insert month] each year (or on an alternative date as agreed to by the Manager), an annual monitoring report. The purpose of this report is to provide an overview of the monitoring and reporting work undertaken, and any environmental issues that have arisen during the construction of the Project. As a minimum, this report shall include: a) All monitoring data required in accordance with the conditions of these resource consents and a summarised interpretation of this data; b) Any reasons for non-compliance or difficulties in achieving compliance with the conditions; c) Any work that has been undertaken to improve the environmental performance of the site or that is proposed to be undertaken in the up-coming year; d) Recommendations on alterations to the monitoring required and how and when these will be implemented through changes to the relevant management plans; and e) Any other issues considered important by the consent holder.
Management Plans – General	
G.16	a) All Work and the operation of the Project shall be carried out in general accordance with the management plans and other documents and plans required by these conditions. b) The management plans provide the overarching principles, methodologies and procedures for managing the effects of construction of the Project to achieve the environmental outcomes and performance standards required by these conditions. c) The management plans apply to the entire Project and, for some matters, are sufficient to address construction management without the need for more specific plans. For other matters, there is a need for Site Specific Environmental Management Plans (SSEMPs) to provide the necessary level of detail to address requirements within each of the construction Stages. d) The management plans provide the basis for which SSEMPs will be prepared. The SSEMPs shall, collectively, set out the detailed design and construction responses to address the specific context and circumstances of all aspects of the Project. Each SSEMP must be consistent with, and be implemented in accordance with, any relevant management plan.
G.17	Where a management plan is required to be prepared in consultation with any third party, the management plan shall demonstrate how the views of that party have been incorporated and, where they have not, the reasons why.
G.18	The consent holder shall submit draft copies of all management plans (as required by conditions [G.23, G.31, E.1, and E.10]) to the Manager for comment at least 30 Working Days prior to Commencement of Work.
G.19	a) A Construction Environmental Management Plan (CEMP) will be submitted for information in accordance with condition [G.23] below. b) Management plans that will be appended to the CEMP, and submitted for certification by GWRC, are: i) Erosion and Sediment Control Plan (ESCP); ii) Bulk Earthworks Contaminated Land Management Plan (BECLMP); and iii) Ecological Management Plan (EMP). c) These management plans shall be prepared in general accordance with the draft management plans included with the documents and information provided in support of the application, except as modified by the conditions and information provided during the hearing and approved by the Board of Inquiry. The management plans listed in b) shall be submitted to the Manager for certification at least 20 working days before the Commencement of Work. Work shall not commence until the consent holder has received the Manager's written certification for the management plans.

	d) SSEMPs will be submitted for certification in accordance with condition [G.28]. e) A copy of the certified management plans (including the SSEMPs) will be made publicly accessible on the Project website.
G.20	The management plans are not required to include all details for every Stage of Work at the time the plan is submitted for certification to the Manager. If further details are to be provided for later Stages of construction, the management plan shall specify which Stages require further certification at a later date. Further details shall be submitted to the Manager prior to Work commencing in the relevant construction Stage.
G.21	The consent holder may request amendments to any of the management plans required to be certified by these conditions, including SSEMPs, by submitting the amendments in writing to the Manager for certification at least 5 working days prior to those amendments being intended to be implemented. Any changes to management plans shall remain consistent with the overall intent of the management plan and relevant conditions in achieving the outcomes required by these conditions. The changes sought shall not be implemented until the consent holder has received the Manager's written certification for the relevant management plan(s).
G.22	a) In the event of any dispute, disagreement or inaction arising as to any certification, implementation, or monitoring required by the conditions, matters shall be referred in the first instance to the Manager and to the consent holder to determine a process of resolution. b) If a resolution cannot be agreed within: i) 3 months of lodging the particular management plan (including an SSEMP); or ii) 1 month of submitting a request for an amendment to a management plan (including an SSEMP); the matter may be referred to an independent appropriately qualified expert, acceptable to both parties, setting out the details of the matter to be referred for determination and the reasons the parties do not agree. c) The expert shall be appointed within 10 working days of the consent holder or GWRC giving notice of their intention to seek expert determination. The expert shall, as soon as possible, issue a decision on the matter. d) The decision of the expert is binding and shall be implemented by the consent holder. e) The dispute resolution process above will be applied before any formal enforcement action is taken by GWRC, except in urgent situations.
Construction Environmental Management Plan	
G.23	The consent holder shall submit a CEMP to the Manager for information at least 20 working days prior to Commencement of Work. The CEMP shall be in general accordance with the draft CEMP submitted with the application. The CEMP shall include, as appendices, the management plans required under conditions [G.31, E.1, and E.10], which must be certified prior to Commencement of Work.
G.24	The CEMP (and its appendices) shall include details of: a) Staff and contractors' responsibilities; b) Training requirements for employees, sub-contractors and visitors; c) Environmental incident and emergency management (including the procedures required under condition [G.10]); d) Communication and interface procedures; e) Environmental complaints management (required under condition [G.8]); f) Compliance monitoring; g) Environmental reporting;

	h) Corrective action; i) Environmental auditing; j) CEMP review; and k) Stakeholder and Communication Management Plan. The CEMP shall also confirm construction methodologies and construction timeframes, including staging.
G.25	The CEMP shall be implemented and maintained throughout the entire construction period, and updated if further design information is provided.
G.26	A copy of the CEMP shall be held at one or more of the construction site offices at all times and be available for inspection by GWRC.
G.27	If the CEMP (excluding any certifiable management plans) is required to be revised as a result of any updated or new design information, the revisions shall be submitted to the Manager for information.
Site Specific Environmental Management Plans	
	Advice Note: *The SSEMPs are not part of the CEMP as they will be lodged in a staged manner throughout the course of the Project. The SSEMPs are required to be certified by GWRC (under these consents) and KCDC (under the Project designations) in respect of their statutory functions.*
G.28	a) The objective of each SSEMP is to integrate design elements with environmental management and monitoring methods, and reflect this in a set of plans for each Stage or location, in order to define how the Project will be practically implemented on site. Not less than 20 working days prior to the commencement of any Stage or location of construction works, the consent holder shall prepare and submit an SSEMP to the Manager for certification that: i) The SSEMP has been prepared with inputs from suitably qualified specialists; ii) The SSEMP has been prepared in accordance with the certified management plans appended to the CEMP; and iii) As a minimum, the SSEMP meets the information requirements set out in condition [G.30] unless alternative arrangements have been agreed in writing with the Manager and KCDC (in respect of their statutory functions). b) Work shall not commence until the consent holder has received the Manager's written certification of the SSEMP. c) The management plans required to be certified under these conditions must have been certified prior to the consent holder submitting the first SSEMP, unless otherwise agreed in writing with the Manager.
G.29	a) The SSEMP shall confirm final details, staging of work, and sufficient engineering design information to ensure that the Project remains within the limits and standards approved under this consent, and that the construction activities appropriately avoid, remedy, or mitigate adverse effects on the environment in accordance with the conditions of this consent. b) The consent holder shall adhere to the requirements of each SSEMP at all times during the relevant construction stage of the Project.
G.30	Each SSEMP shall include, but need not be limited to: a) A detailed design and construction methodology for all works within the area covered by the SSEMP; b) A detailed schedule of construction activities including the expected commencement date and duration of works in each location within the area covered

	by the SSEMP, and demonstrating that the area of disturbance will be kept to the minimum practicable; c) Detailed design specifications of all earthworks within the SSEMP area including disposal sites; d) Detailed design specifications for all erosion and sediment control measures, including supporting calculations (where appropriate, such as contributing catchment area and retention volume of structure); position of inlets/outlets; Stabilisation measures proposed for structures, and any maintenance requirements; e) Detailed design of chemical treatment (if any) for each of the proposed sediment retention devices; f) Identification of the location of all discharge points to watercourses; g) Confirmation that temporary stockpiles of excavated material will be located at least 50 metres away from any flowing watercourse unless there is appropriate treatment of stormwater (which may include discharging to vegetated land); h) In respect of vegetation clearance and rehabilitation activities: i) Identification of valued habitats identified under condition [G.33a)i)] which are to be protected and retained; ii) Management of measures to minimise effects of vegetation clearance; iii) Identification of soil resource to be used for rehabilitation within the SSEMP area; and iv) The plan for implementing any relevant revegetation or restoration included within the EMP or the Landscape Plan (LP) to be lodged under the designation conditions; i) In respect of stream realignment and culverting: i) Measures/methods to maintain fish passage during and following completion of construction works along the stretches of stream affected by the exercise of this consent; ii) Specific consideration of seasonal migration of native fish; iii) Details of culvert inlet/outlet protection structures e.g. pre-cast wing walls or rock rip-rap; iv) Confirmation of appropriate sizing of culverts and allowances for secondary flow paths during high flows; v) Detailed diversion plans and any other measures or details as appropriate to achieve compliance with all conditions of this consent and the objectives of the relevant management plans; vi) Confirmation that placement of excavated material in the wetted channel will be avoided, and the time spent by machinery in the wetted channel, including the number of vehicle crossings, will be minimised; and vii) Confirmation that any excess material from the bed and banks of the stream will be removed immediately on completion of the work; j) A drawing that clearly shows the location of key areas or features that are required to be avoided or otherwise protected during construction, including (but not be limited to) notable areas of bush or vegetation and heritage features; k) The identification of appropriately qualified and experienced staff to manage environmental issues onsite; l) The identification of staff who have clearly defined roles and responsibilities to monitor compliance with the SSEMP; m) Details of a chain of responsibility for managing environmental issues and details of responsible personnel; n) Details of the site access for all Work associated with construction of the Project; o) Measures to be adopted to maintain the site in a tidy condition in terms of disposal/storage of rubbish, storage and unloading of building materials and similar construction activities; p) Location of workers' conveniences (e.g. portaloos); q) Details of the storage of fuels and lubricants (which shall require that storage be bunded or contained in such a manner so as to prevent the discharge of

	contaminants from spillages); r) Details of the proposed maintenance of machinery and plant to minimise the potential for leakage of fuels and lubricants; s) Location of vehicle and construction machinery access and storage during the period of site works; t) Procedures for thoroughly cleaning all machinery of unwanted vegetation (e.g. weeds), seeds or contaminants prior to entering the site and any other methods to avoid the introduction or spread of unwanted weeds or pests; u) Methods for the clear identification and marking of the construction zones including those which extend into watercourses; v) A methodology that prescribes the extent to which machinery can operate in the vicinity of watercourses so as to minimise disruption and damage to the watercourses and associated vegetation; w) Methods to manage public health and safety during the construction works, and notification to the public of temporary access restrictions to the immediate works area during the staged construction; x) Confirmation that no equipment or machinery will be cleaned, or refuelled in any part of any watercourses/streams, except as otherwise specifically provided for in the CEMP or an SSEMP; and y) Procedures for removing all contaminants (e.g. fuel, hydraulic oils, lubricants etc) from the site at the end of the construction period, except for those required for on-going maintenance of the network and operational activities.
Ecological Management Plan	
G.31	The consent holder shall submit the EMP to the Manager for certification at least 20 working days prior to Work commencing. The EMP shall be in general accordance with the draft EMP submitted with the application. The EMP shall be submitted as an appendix to the CEMP.
G.32	a) The purpose of the EMP is to: i) Detail the ecological management programme that will be implemented to appropriately manage effects of the Project on the environment during the construction phase and once the Project is operational; ii) Document the permanent mitigation measures, including the restoration, management and maintenance of ecological mitigation, as well as the mechanisms for developing relevant mitigation and restoration plans for terrestrial and freshwater habitat; iii) Ensure that mitigation has been successful by establishing post-construction monitoring and response procedures; and iv) Ensure that any long-term effects are appropriately managed through monitoring, adaptive management and implementation of appropriate responses. b) The EMP shall be prepared by a suitably qualified ecologist and finalised in consultation with Nga Hapū o Ōtaki. Work shall not commence until the consent holder has received the Manager's written certification of the EMP.
G.33	The EMP shall include, but not be limited to, the following: a) Information on how the following outcomes will be achieved: i) Minimise loss of valued vegetation and habitats; ii) Minimise construction effects on freshwater bodies; iii) Minimise effects on identified wetlands resulting from hydrological changes to water tables; and iv) Minimise effects on fish and fish habitat during stream work;

	b) Details of habitat offset mitigation proposed; c) A Fish Rescue and Relocation Plan; d) Details of the monitoring to be undertaken pre-construction, during construction, and post-construction as required by condition [G.38] below; e) Details of the remedial/response actions proposed; f) A Revegetation and Mitigation Strategy; g) The salvage of elements of any valued habitat of indigenous flora and fauna (including felled logs) identified in [a)i)] that has been lost as a result of the Project, where practicable, including provision for transfer of elements of the affected habitat to ecological mitigation sites; and h) Details of each new waterway diversion channel. If full details are not available at the time the EMP is submitted, full details shall be provided in the relevant SSEMPs.
G.34	a) The EMP shall include a Revegetation and Mitigation Strategy (which shall be included as part of the relevant SSEMP (as required by condition [G.28])). The Revegetation and Mitigation Strategy shall cover all revegetation, other proposed mitigation, maintenance and monitoring requirements as set out in the EMP for the following areas: i) the exposed edges of Hautere Bush F, Cottle's Bush and bush to south of Te Hapua Road; ii) the restored remnant of the Ōtaki Railway Wetland; iii) the two new wetland areas – the Kennedy Wetland and the wetland at Mary Crest; iv) the area of bush identified for protection and enhancement if this offset option is adopted; v) the area identified for bush habitat creation at Mary Crest if this option is adopted; and vi) riparian planting along the Mangaone, Settlement Heights, Jewell and Mary Crest streams, b) All revegetation mitigation as set out in the EMP (including fencing and pest/weed control) shall be subject to a minimum 3-year maintenance period (except for the area of bush created at Mary Crest (if that option is chosen) which shall be maintained for a period of 5 years) which shall commence from the time planting is undertaken in each area. c) At the completion of the maintenance period for each revegetation area, the consent holder shall engage a suitably qualified ecologist to carry out a full review of the success of the revegetation in that area. The results of the review shall be provided to the Manager for certification: i) that the revegetation has met the requirements of the EMP; and/or ii) to identify any remedial actions that need to be carried out. d) Where any remedial actions are required, the consent holder shall provide a programme and description of remedial actions to the Manager for certification. These actions shall be carried out as soon as practicable having regard to weather and appropriate planting seasons.
G.35	Areas to be specifically identified within the EMP include: a) Any area to be subject to a QEII covenant, including reasons why and any specific measures required to protect and enhance that area; and b) Specific techniques to manage effects on peripatus in the area of bush on Steven's property.
G.36	The EMP shall be consistent with the Landscape Plan (LP) that is required to be submitted to KCDC under the designation conditions.
G.37	At least 10 working days before submitting the EMP to GWRC for certification, the consent holder shall submit a copy of the draft EMP to KCDC for comment. Any comments received shall be supplied to the Manager when the EMP is submitted, along with a clear indication of any comments that have not been incorporated and an explanation of the reasons why.

Ecological Monitoring	
G.38	Monitoring shall be carried out in accordance with the EMP as required by condition [G.33d)] in order to: a) Collect baseline information for 6 months prior to Commencement of Work on freshwater turbidity to enable management triggers to be developed; b) Monitor freshwater ecology during construction Work to identify changes in condition arising from the Project; c) Monitor vegetation and freshwater ecology following completion of construction of the Project to confirm mitigation requirements outlined in condition [G.46] are successfully achieved; and d) Undertake monitoring of fish passage as required by condition [WS.9].
G.39	The consent holder shall undertake pre-construction monitoring of water turbidity for 6 months at the Ōtaki River and Waitohu, Mangapouri and Mangaone Streams. This monitoring shall include the following: a) Telemetered turbidity sensors and loggers shall be installed, operated and maintained upstream and downstream of the proposed Construction Works; b) The locations of the monitoring sites shall be identified in the EMP. The locations of these sites shall be chosen to avoid other potential sources of sediment interfering with the results of monitoring; and c) The purpose of the continuous turbidity monitoring is to monitor turbidity levels at the upstream and downstream monitoring locations on a continuous basis for a duration of at least 6 months prior to the Commencement of Work to establish correlations between turbidity levels at the upstream and downstream monitoring sites.
G.40	a) Prior to the commencement of any stream diversion work in the waterways affected by the Project, surveys of brown mudfish within those areas directly affected by the Project will be carried out by a suitably qualified ecologist (who has prior experience with mudfish surveys): i) These surveys will include (subject to the length of affected waterway being long enough to contain the stated number of traps), at a minimum, the setting in appropriate mudfish habitat of 20 fine meshed (4mm) gee-minnow traps and six fine meshed (4 mm) fyke nets over 2 consecutive nights at each stream site to be surveyed. Fyke nets will contain a "large fish exclusion" compartment. ii) Where site conditions preclude carrying out the method detailed above, suitable alternatives will be discussed with the Manager. iii) Mudfish that are located in the surveys shall be transferred to safe locations in the same waterway prior to commencement of work following the procedures set out in the Fish Rescue and Relocation Plan. iv) Results of the mudfish survey will be provided to the Manager within 10 working days following completion of the data collection and will inform the fish transfer requirements (as set out in the Fish Rescue Relocation Plan) for the diversion. v) Full details of the proposed mudfish survey methodology shall be submitted to the Manager for certification prior to undertaking the survey. The survey shall be carried out in accordance with the certified methodology. b) Results of mudfish surveys will be included in the EMP prior to the EMP being supplied to the Manager for certification.
G.41	The consent holder shall undertake the following monitoring during construction (in accordance with the methods, locations, frequency, reporting and all operation and maintenance procedures as outlined in the EMP): a) Turbidity monitoring in the Ōtaki River and Waitohu, Mangapouri and Mangaone Streams at the locations in condition [G.39] and at one of either Jewell, Kumutoto or Settlement Heights and at one of either Te Manuao or Cavallo waterways (during periods when flowing water is present). This monitoring shall be as set out in the EMP and include the following:

	i) The chosen waterway for additional monitoring (either Jewell, Kumutoto or Settlement Heights) will be identified in the EMP; ii) Continuous telemetered turbidity loggers shall be installed, operated and maintained at the sites used for pre-construction monitoring on the Ōtaki River and Waitohu, Mangapouri and Mangaone Streams, and at the chosen sites at either the Jewell, Kumutoto or Settlement Heights and either Te Manuao or Cavallo waterways (during periods when flowing water is present), upstream and downstream of the proposed Construction Works; and iii) The purpose of the continuous telemetered turbidity monitoring is to monitor discharges on a continuous basis (or for the intermittent waterway during periods when flowing water is present) until the relevant earthwork areas discharging to those waterways are stabilised; and b) Monitoring of the effects of the construction works on waterways, until all construction works affecting that waterway have been completed, by measuring fine sediment deposits, oil and grease, aquatic invertebrates and fish: i) As set out in the EMP; and ii) In the same 5 waterways as identified for turbidity construction monitoring. *Advice Note: The inclusion of turbidity monitoring at either Te Manuao or Cavallo waterways is not for ecological reasons but rather due to the sediment levels predicted in those catchments.*
G.42	The construction turbidity monitoring shall have a trigger level that is a 50% or greater increase in turbidity (as nephelometric turbidity units (NTU)) between upstream and downstream monitoring sites, when the downstream turbidity exceeds 5 NTU. During construction, until the relevant earthwork areas discharging to the monitored waterways are stabilised, should the turbidity monitoring trigger be exceeded the following responses will be implemented by the consent holder: a) Within 24 hours of the 50% threshold breach carry out and record in writing a full audit of the condition of all erosion and sediment control measures within the earthworks area discharging to the monitored waterway; b) Remedy any causes on site that may have contributed to the 50% threshold breach as soon as practicable, and record what remedial measures were undertaken; c) Notify the Manager by email within 1 working day of the 50% threshold breach, including providing details of the percentage change in turbidity and any remedial measures taken; d) If the NTU threshold remains generally elevated above 50% for more than 48hrs, then macro-invertebrate sampling (all laboratory analysis of these samples shall include a full macro-invertebrate count) shall be undertaken following Protocols C1 or C2, as set out in Protocols for Sampling Macro-invertebrates in Wadeable Streams, MfE 2001 (for hard and soft-bottomed streams, respectively) within 2 working days at upstream and downstream sites agreed to by the Manager (known discharge points shall be specified in the EMP); e) Within 10 working days of the collection of the macro-invertebrate samples, a report shall be provided to the Manager which has been prepared by a suitably qualified and experienced aquatic ecologist, and which includes the following: i) The results of the macro-invertebrate sampling; ii) The causes of the discharge, the response to remedy the cause and measures proposed to avoid a recurrence of this cause; and iii) An assessment undertaken by a suitably qualified and experienced aquatic ecologist which details whether the following thresholds have been exceeded: a. A decline in the Quantitative Macro-invertebrate Community Index (QMCI) score of 1.5 or greater from the corresponding upstream monitoring site or baseline monitoring scores; or

	b. A decline of greater than 20% in sensitive invertebrate taxa (in this case taxa with a QMCI score of ≥ 5) compared to the upstream monitoring site or baseline monitoring scores; and f) Mitigation works will be undertaken, which may include raking or other sediment clearance procedure. As part of the report required above the consent holder shall, in consultation with the Manager, detail what mitigation measures are proposed and the timeframes for implementing these. The consent holder shall implement the mitigation measures approved by the Manager. These measures shall be implemented to the Manager's satisfaction and within the timeframe specified by the Manager.
G.43	The consent holder shall undertake the following monitoring post-construction (in accordance with the methods, locations, frequency, reporting and all operation and maintenance procedures as outlined in the EMP): a) Monitoring the following areas of native bush and wetlands: i) Planted exposed edges of Hautere Bush F, Cottle's Bush and bush to south of Te Hapua Road; ii) The restored remnant of the Ōtaki Railway Wetland; iii) The two new wetland areas – the Kennedy Wetland and the wetland at Mary Crest; iv) The area of bush identified for protection and enhancement if this offset option is adopted; and v) The area identified for bush habitat creation at Mary Crest if this option is adopted; b) The monitoring in a) above shall occur for 3 years, except for the area of bush created at Mary Crest (if that option is chosen) which shall be monitored for a period of 5 years; and c) Aquatic ecology monitoring shall include: i) Monitoring, at the same 5 waterways and sites used for construction monitoring, for: a. Fine sediment, aquatic macroinvertebrates and fish for 2 years; b. Inspection of fish passage as set out in condition [WS.4]; ii) Monitoring of aquatic invertebrates in the newly established Kennedy and Mary Crest wetlands for 3 years; and iii) Riparian buffer monitoring in the areas proposed for offset waterway mitigation for a period of 3 years.
G.44	The consent holder shall ensure that: a) All ecological monitoring required under the EMP shall be undertaken by suitably qualified and experienced ecologists. b) The results of all monitoring carried out pursuant to the EMP shall be: i) Available for inspection during normal office hours where such data is available; ii) Submitted to the Manager at quarterly intervals; and iii) Summarised and submitted as part of the annual report required under condition [G.15].
G.45	Except for exceedence of the turbidity trigger level set out in condition [G.42] in the event of an exceedence of any limit set for monitoring in the EMP, or any management trigger level set in the EMP, during or post-construction, the consent holder shall: a) Notify the Manager of the exceedance within 1 working day of the exceedance being identified; b) Investigate a plausible cause-effect association with the Project. If the adaptive management trigger level exceedance is not assessed (by a suitably qualified and experienced ecologist) to be attributable either partially or fully to the Project, the consent holder shall not be held liable for any remediation or mitigation measures;

	c) Should the exceedance be linked either partially or fully to the Project, the following steps shall be undertaken by the consent holder: i) Notify the Manager of the causes of the exceedance within 5 working days of identifying the exceedance; ii) Within a timeframe approved by the Manager, identify the on-site practice that is generating the effect; iii) Implement measures necessary to prevent future exceedances and to alter the operational measure in consultation with the Manager; iv) Remedy or mitigate the effects of the exceedance which have been approved by the Manager; v) Obtain certification of any necessary amendments to management plans or other documents and obtaining any necessary resource consents; vi) Undertake further monitoring approved by the Manager to assess the effectiveness of the measures implemented to avoid, remedy or mitigate the exceedance and cause of the exceedance; and vii) In the event that the measures implemented to avoid, remedy or mitigate the effects of the exceedance or cause of the exceedance actions are unsuccessful, in the opinion of the Manager, the consent holder will implement appropriate remedial actions and further monitoring within a timeframe and which have been approved by the Manager and obtain necessary resource consents for those measures; and d) Provide a written report to the Manager within 10 working days of each exceedance which includes details of the exceedance, reasons for the exceedance and measures implemented in responses to the exceedance.
Ecological Mitigation	
G.46	a) The consent holder shall ensure that land is dedicated to the restoration of vegetation, wetlands, and streams for the purposes of ecological mitigation as follows; i) A minimum of 1.5 ha of planted indigenous terrestrial habitat, or protection of a minimum of 1.0 ha of established indigenous terrestrial habitat, as mitigation for the loss of 0.5 ha of indigenous vegetation habitat; plus ii) A minimum of 1.1 ha of landscaped and planted indigenous wetland habitat, as mitigation for the loss of 0.5 ha of indigenous wetland; and iii) A minimum of 2,601 linear metres of stream mitigation including naturalisation of channels. b) Landscape and visual mitigation shall be comprised of approximately 17,700 m^2, comprising landscape treatments including grass, specimen trees, and visual screening at the Pare-o-Matangi reserve. c) These mitigation areas shall closely correspond to the maps entitled Plan Set [to insert]. “Landscape and Visual”; and Plan Set [to insert] “Proposed Ecological Mitigation Sites”, unless otherwise agreed with the Manager.
Revegetation Monitoring	
G.47	The ecological mitigation required in condition [G.46] for loss or modification of any wetland or terrestrial habitat shall comprise, as far as practicable, mitigation that reflects the indigenous habitat types and wetland classes lost, and the ecological functioning of those areas, and that is based on development of similar representative vegetation communities.
Proposed consent conditions for works in watercourses	
General Conditions	
WS.1	The consent holder shall use natural rock and soil material, where practicable, to reclaim the stream bed. All fill material shall be placed and compacted so as

	to minimise any erosion and/or instability.
WS.2	The consent holder shall seek to ensure that all construction works authorised by this consent are undertaken in the dry bed of the stream as far as practicable, and are completed before the flow of the stream is diverted into the stream bed.
WS.3	The consent holder shall design and construct all permanent diversions in a manner that seeks to maintain stream flows (both volume and velocity) in a similar state to its natural state at the time of Commencement of Work.
WS.4	Culverts and bridges on various watercourses (as specified in technical report 12) shall be designed to facilitate fish passage, in accordance with the GWRC publication Fish Friendly Culverts and Rock Ramps in Small Streams (or equivalent industry standard methods). Specific requirements to facilitate fish passage in respect of the Mangapouri and Mangaone Streams are as follows: a) The design of the Project crossings of the Mangapouri Stream shall be constructed from over-depth box culvert sections in order to incorporate a minimum 0.5m thick layer of cobbles along the invert with the cobble layer either cemented in place or sized large enough to be immobile under design flood conditions. b) The design of the Project (eastern) crossing of the Mangaone Stream shall be constructed from over-depth box culvert sections in order to incorporate a minimum 0.5m thick layer of existing gravel bed material along the invert.
WS.5	Within 20 working days of the completion of each permanent stream diversion, the consent holder shall provide evidence in writing to the Manager that an appropriately qualified engineer and an appropriately qualified ecologist have inspected the completed diversion works, and are satisfied that they have been constructed according to the SSEMP stream diversion plan(s) that was certified by the Manager.
WS.6	The design of the waterway crossings shall also meet the following performance criteria: a) Waterway crossings shall be designed in accordance with the NZTA Bridge Manual, with the following exceptions: i) Freeboard for the Ōtaki River Bridges above the modelled level for the 1% AEP flood, plus climate change to 2090 (mid range) estimated, shall be at least 1.7m. ii) Freeboard for the Waitohu Stream Bridge above the modelled level for the 1% AEP flood, plus climate change to 2090 (mid range) estimated, shall be at least 1.2m. iii) The design of the Expressway and relocated NIMT Railway Crossings of the Mangapouri Stream shall be designed to operate under free surface flow conditions for the 1% AEP flood plus climate change to 2090 (mid range) estimated with a freeboard of at least 0.3m. iv) To avoid doubt, freeboard for the Project (western) crossing of the Mangaone Stream above the modelled level for the 2% AEP flood, plus climate change to 2090 (mid range) estimated, shall be at least 0.6m. b) The Lucinsky Overflow Culvert on the local link road between Gear Road and Te Horo Beach Road shall be designed to pass between 80% and 120% of the total flow volume diverted by the existing Lucinsky Overflow in the 1% AEP flood, plus climate change to 2090 (mid range) estimated.
WS.7	For any Work that will occur within the wetted channel of any stream outside of the period from 1st March to 31st July, the consent holder shall, in consultation with GWRC, develop a specific programme and methodology to manage migration of native fish. The programme and methodology shall be developed with reference to the Freshwater Fish Spawning and Migration Calendar (Hamer 2007) and the programme shall be included as part of the SSEMP to be certified by GWRC prior to the relevant work occurring.

WS.8	The maximum extent of reclamation or diversion of all Water Bodies for the Project shall be 2,834 linear metres.
WS.9	a) Unless otherwise approved by the Manager, the consent holder shall engage an appropriately qualified aquatic ecologist to undertake the following: i) A visual inspection of all structures and works where fish passage is required, one year after instalment; and ii) A visual inspection of all structures and works where fish passage is required, four years after instalment. b) If it is found that fish passage may be restricted, inspections and appropriate remedial actions shall be repeated (for the specific structure/area of works/scour protection where the restriction occurs) annually until the Manager is satisfied that fish passage is being appropriately provided for. c) A visual inspection shall be carried out (as above) in order to determine the following: i) That the substrate bed of the Water Body is being retained within the culverts, pipes and new stream channels, or appropriate baffle or rock fixtures are in place; ii) Whether there are any signs of erosion or scour of the stream bed or banks around the structures/works/depositions; iii) The condition of the structures/works. iv) That stream flow velocities are not increased in any areas within the structures/works or upstream/downstream of the structures/works that could compromise fish passage (e.g. baffles and rock protection are adequate and in good condition); and v) Whether there is debris that could block the passage of fish or increase velocities. d) The consent holder shall implement the measures/works required to address any actual or potential effects on fish passage within three months of submitting the report to the Manager (where practicable).
Conditions During Construction	
WS.10	The works shall be regularly inspected and maintained by the consent holder so that: a) The waterway within the culverts remains substantively clear of debris; b) Any erosion of the stream banks or bed that is attributable to, and is within 20m up or downstream of, the stream works authorised by this consent is remedied as soon as practicable by the consent holder; and c) Fish passage through the structure is not impeded. ***Advice Note**: Maintenance does not include any works outside the scope of the application. Any additional works (including structures, reshaping or disturbance to the stream bed) following completion of the construction Work as proposed in the application may require further resource consents.*
WS.11	For construction works in the bed of the Ōtaki River, the SSEMP(s) submitted for certification under condition [G.28] shall include details of the following matters: a) Construction methods and sequencing, including how weather forecast information will be factored into timing of Works; b) A protocol for flood warnings and procedures for the safe and timely evacuation of plant and equipment from the riverbed in the event of a flood warning being received; c) Measures to ensure that all plant and equipment (except temporary staging equipment and formwork for pier construction) used for in-stream works are capable of being evacuated safely and quickly from the riverbed in the event of a flood warning being received;

	d) Measures to ensure that, where practicable, plant and equipment used for in stream works are operated away from and above flowing water; and e) Measures to ensure that all plant and equipment used for in-stream works incorporate features for preventing spills of fuel, oil, and other contaminants.
Temporary Culverts	
WS.12	All temporary culverts shall be designed to meet the following criteria unless otherwise agreed with the Manager: a) To pass a 2-year Annual Recurrence Interval (ARI) flood event without heading up (as assessed at the time of commencement of construction Work); b) Culverts to be installed 300mm below stream bed level in order to provide a continuous wetted perimeter to facilitate the passage of native fish species; and c) Minimum size of any temporary culvert shall be not less than 600mm in diameter.
WS.13	Unless otherwise agreed in writing with the Manager, upon removal of any temporary crossing, the consent holder shall reinstate the stream bed and margins to, as far as practicable, a natural state to closely match the upstream and downstream riparian and in-stream habitats and visual appearance.
WS.14	Unless otherwise agreed in writing with the Manager, all temporary stream crossings shall be removed within 2 years of their installation.
Conditions Applying to consents for earthworks and erosion and sediment control	
Erosion and Sediment Control Plan	
E.1	a) The consent holder shall submit an Erosion and Sediment Control Plan (ESCP) to the Manager for certification at least 20 working days prior to Work commencing in accordance with condition [G.18]. b) The purpose of the ESCP is to describe the methods and practices to be implemented to minimise the effects of sediment generation and yield on the aquatic receiving environments associated with the Project. In addition, the ESCP shall: i) Outline the principles to which the ESCP shall adhere; ii) Be developed in accordance with the objectives outlined in the NZTA's Environmental Plan; iii) Ensure construction and maintenance activities avoid, remedy or mitigate effects of soil erosion, sediment run-off and sediment deposition; iv) Identify areas susceptible to erosion and sediment deposition and implement erosion and sediment control measures appropriate to each situation with particular emphasis on high-risk areas, including the northern dunescape, Ōtaki River, and the Railway Wetland area; and v) Use bio-engineering and low-impact design practices where practicable. c) Work shall not commence until the consent holder has received the Manager's written certification for the ESCP.
E.2	The consent holder shall include site specific construction erosion and sediment control measures within the SSEMPs, for all land disturbing activities including in-stream work. The purpose of the erosion and sediment control detail in the SSEMP is to allow the consent holder and GWRC to further develop methodologies to be implemented throughout the duration of the Project to address the specific characteristics of various sites along the route. In addition, the SSEMPs shall: a) Be consistent with the CEMP (as relevant) and the ESCP. b) Ensure that any changes to the SSEMP shall be certified by the Manager prior to the amendment being implemented in accordance with condition

	[G.21]. ***Advice Note**: These SSEMPs will be developed within the context of the principles and practices of the ESCP and will allow for innovation, flexibility and practicality of approach to erosion and sediment control. The SSEMPs will also enable ongoing adaption (subject to certification by the Manager) to changing conditions throughout the Project lifetime.*
Erosion and Sediment Control Monitoring	
E.3	The consent holder shall carry out monitoring in accordance with the ESCP and the SSEMP, and which will seek to ensure that: a) The proposed erosion and sediment control measures have been installed in accordance with the ESCP; b) Methodologies are carried out properly; c) Erosion and sediment control measures are functioning in accordance with the ESCP throughout the duration of the construction of the Project; and d) The sediment discharge implications of any impeded drainage to ground, such as by deposition of fine sand, are a particular focus of site control monitoring, with appropriate remedial action taken as required.
E.4	a) In the event of either a failure of erosion and sediment control devices or where a storm event exceeds the design volume of the device, and where the discharge is to a perennial or intermittent fresh Water Body, a suitably qualified ecologist shall be notified within 24 hours, who shall then inspect the relevant area to determine whether significant adverse effects on the affected area's ecological values have occurred. b) The consent holder shall prepare a report on the effects of the failure and any recommended measures that may be required to remedy the effects. The report shall be submitted to the Manager for approval within 5 working days of the event. c) The remedial measures shall be implemented within 10 working days of the approval of the Manager.
E.5	The consent holder shall carry out inspections, at a minimum frequency of weekly, of all working areas of the site in order to ensure they are well maintained and that erosion and sediment control devices remain effective.
Erosion and Sediment Control	
E.6	Prior to any earthwork commencing within each area of Work (other than those required to establish erosion and sediment control measures), a certificate signed by an appropriately qualified and experienced sediment control practitioner shall be submitted to the Manager to certify that the erosion and sediment control measures (including clean and dirty water diversion channels, silt fences, decanting earth bunds, sediment retention ponds, sediment retention ponds, rock filters and chemical treatment systems) for that area have been constructed in accordance with the relevant SSEMP. The certificate is to be provided to the Manager 2 working days prior to the commencement of construction in that area of Work.
E.7	A copy of the "as-built(s)" and the certified SSEMPs shall be kept on site, and all erosion and sediment control measures (including staging boundaries and particularly the extent of exposed areas) shall be updated as soon as practicable as changes are made. As-built plans shall be prepared by a suitably qualified person and shall be accompanied by text detailing the relevant earthworks methodology, constraints and likely progressions, and shall be revised as required to enable clear interpretation as to the day-to-day operation and management of erosion and sediment control measures, provided that such revisions are in general accordance with the SSEMPs.

E.8	No erosion and sediment control measures shall be removed or decommissioned from a site, or Stage before the entire area is stabilised, unless such removal and decommissioning is in accordance with the CEMP or a SSEMP, and the Manager has been informed not less than 2 working days prior.
Chemical Treatment (Flocculation)	
E.9	a) Should it be determined that chemical treatment is or may be required (in accordance with condition [E.6], the detail of this shall be included in the relevant SSEMP. b) Each SSEMP where chemical treatment is proposed shall include, but need not be limited to: i) Specific design details of the chemical treatment system; ii) Monitoring, maintenance (including post-storm) and contingency programme (including a Record Sheet); iii) Details of optimum dosage (including catchment specific soil analysis and assumptions); iv) Procedures for carrying out an initial treatment trial; v) A spill contingency plan; vi) A performance monitoring plan; and vii) Details of the person or bodies that will hold responsibility for the maintenance of the chemical treatment system and the organisational structure which will support the system.
Bulk Earthworks Contaminated Land Management Plan	
E.10	***Advice Note**: if necessary, depending on the results of detailed site investigations (once access to sites is readily available), the consent holder shall apply for additional regional consents and/or for district consents under the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health.* a) The consent holder shall submit the BECLMP to the Manager for certification at least 20 working days prior to Work commencing. The BECLMP shall be in general accordance with the draft BECLMP submitted with the application. The BECLMP shall be submitted as an appendix to the CEMP. b) The purpose of the BECLMP is to provide a framework and general procedures for the management of contaminated soil and other contaminated materials/structures potentially present in ground that may be disturbed or require removal to complete the Project. c) The BECLMP shall include: i) A summary of previous contaminated land assessments undertaken within the Project footprint; ii) Indicative management procedures for handling and stockpiling of contaminated soils; iii) General procedures for site worker health and safety related to contaminated soil; iv) Indicative procedures should unexpected contaminated soil be encountered during the construction works; and v) A basis for assessing whether contaminated soils may remain or should be removed from the site.
Proposed consent conditions for Borehole Construction	

General Conditions	
BC.1	a) The location, design, implementation and operation of the monitoring bore shall be in general accordance with the resource consent application. b) Within one month after completion of all monitoring bore installations, the consent holder shall submit to the Manager a copy of the borehole logs and details of the piezometer installations. c) Within one month after completion of each water supply well, the consent holder shall submit to the Manager a copy of the driller's bore log form as completed by the driller who constructed the bore) and details of the well installation. d) The bore shall be constructed and maintained in accordance with the New Zealand Environmental Standard for Drilling of Soil and Rock (NZS 4411:2011). e) In the event of the bore being decommissioned or abandoned, the bore will be backfilled in accordance with NZS 4411:2011.
BC.2	A stepped rate pumping test shall be carried out in the water supply bore to determine the volume of water that can be abstracted from the bore. The stepped rate test shall be followed by a constant rate pumping test of at least 8 hours duration at the desired pumping rate. Monitoring of water levels in at least one observation bore shall be carried out during the constant rate test.
BC.3	Within 3 months of the completion of the pumping test, the consent holder shall submit a report to the Manager, which contains but need not be limited to, the following information: a) Presentation of and analysis of the collected pumping test data; b) Use results to simulate drawdown at any potentially affected neighbouring boreholes; c) An assessment of the potential effect on nearby streams / wetlands; and d) An assessment on the risk of saline intrusion.
BC.4	If so requested by the Manager, the consent holder shall make its bore available for monitoring of water levels and water quality.
Conditions applying to consents for taking and using groundwater	
Groundwater Monitoring	
GT.1	In managing the construction of the Project, and the potential for changes to the groundwater levels to occur, the consent holder shall achieve the following outcomes: a) That there shall be no changes to the groundwater levels that shall result in a significant change to wetland hydrological conditions; and b) That there shall be no permanent changes to the ability of existing bore owners to abstract water from their existing water supply bores.
GT.2	The consent holder shall include measures to manage the groundwater level as part of any relevant SSEMP. The purpose of the measures to manage groundwater level in the SSEMP is to set out the best practicable options for groundwater monitoring and management and procedures to minimise changes in groundwater levels. The groundwater level detail in the SSEMP shall include information regarding: a) the schedule of groundwater monitoring bores identifying piezometer depth, screen length and geological unit; b) the locations of groundwater monitoring bores shown on plans; c) the locations of monitoring stations;

	d) a summary of understanding of the hydrological regime in each high-value wetland at the time of preparation of the SSEMP; e) monitoring frequency; f) monitoring methods; g) reporting requirements; h) alert and action programmes; i) response management; and j) review procedures.
GT.3	At 6 monthly intervals during construction, and for 12 months following completion of construction within each Stage, the consent holder shall review and report the results of monitoring as compared with expected effects on groundwater levels assessed from groundwater modelling and the established range of groundwater levels determined from groundwater monitoring prior to the Work. This review will consider the final construction methodology and progress at the time of the review. In addition, an annual report will be prepared and submitted to the Manager by 1 May each year that describes: a) The groundwater monitoring that has been undertaken since the Commencement of Work; b) The actual and potential effects arising from the groundwater level changes c) Any remedial or mitigation measures that have been implemented; d) Any changes to proposed remedial and mitigation measures; and e) Any changes proposed for the future monitoring programme or to alert levels.
Groundwater take and use	
GT.4	Groundwater take and use a) The location, design, implementation and operation of the groundwater takes shall be in general accordance with the consent application. b) The rate at which water is taken from the water supply bores shall not exceed: i) 110,000 m^3/year at a maximum of 300 m^3/day (cumulatively, across all bores); and ii) a maximum pumping rate of 35 litres/sec.
GT.5	The consent holder shall undertake the following: a) Install and maintain a water meter on the water supply bore prior to the commencement of the take and for the duration of the abstraction from the point of take. The water meter shall measure both cumulative water abstraction and the instantaneous rate of take, and be capable of providing a pulse counter output; and b) The water meter shall be calibrated to ensure that the error does not exceed +/- 5%. The water meter shall be installed in accordance with manufacturer's specifications.
GT.6	The consent holder shall ensure that existing groundwater users (consented users) or those identified in condition [GT.1b)] who cannot use their own water supply as a result of the Project receive a replacement water supply. The consent holder shall avoid adversely affecting KCDC's public water supply bores and shall ensure access to those bores for maintenance and servicing is maintained throughout the Project.

Proposed consent conditions for wetland reclamations and vegetation clearance	
Conditions - Wetland Reclamation	
WR.1	The effects will be managed under the relevant General Conditions applicable to the proposed wetland reclamation.
Conditions - Vegetation Clearance	
VC.1	The effects will be managed under the relevant General Conditions applicable to the proposed clearance of vegetation.
Proposed consent conditions for stormwater discharge	
Stormwater Conditions	
SW.1	Operational stormwater discharge from the Expressway shall meet the following performance criteria: a) Expressway stormwater shall be treated before discharge to the receiving environment in accordance with the NZTA publication Stormwater Treatment Standard for State Highway Infrastructure 2010, or equivalent industry standard methods. b) The peak rate of stormwater discharge from the Expressway at any point shall not exceed 100% (urban areas) or 100% (rural areas) of the pre Expressway peak discharge from the same footprint, in each of the 50%, 10% and 1% AEP critical duration storm events, except where stormwater from the Project discharges into the Ōtaki River or to ground, or where it has been shown through modelling set out in technical reports 9 and 10, or by similar modelling to the satisfaction of the Manager, that attenuation is not needed.
SW.2	The effects of the Project embankment, waterway crossings and stormwater discharge on flood risk shall be addressed in the following manner: a) Flood risk shall be assessed against the 1% AEP flood, with climate change to 2090 (mid-range) estimated. b) The effects of any loss of flood plain storage due to fill embankments shall be offset by: i) provision of equivalent alternative flood storage volume; ii) provision of additional flood containment; iii) attenuating runoff; iv) removing downstream constraints; or v) a combination of the above. c) Culvert and bridge waterway crossings shall be designed so that any increase in flood risk in the 1% AEP flood is contained within: i) the designation; ii) the landform of an existing watercourse; or iii) defined flood ponding areas (as described in d)). d) For the purposes of c), "defined flood ponding areas" means the inundation areas shown on Sheets 1 to 8 of Drawing 5/2664/1/6504, annexed to

	technical report 10. e) Notwithstanding a) to d) above, in respect of the Ōtaki River Floodplain, the residual effects of an over-design flood overtopping or causing breaching of the Chrystall's Bend extended stopbank (0.2% AEP flood with climate change to 2090 (mid range) estimated) shall be assessed for the purpose of of detailed design of the vertical alignment of the Expressway embankment across the floodplain, the Otaki Overflow Culvert and the secondary containment bund shown on Sheet 2 of Drawing 5/2864/1/8504. f) The combined effects of filling, waterway crossings and Project stormwater discharge shall be assessed through the use of hydrological and hydraulic modelling. g) The final stormwater management design and flood risk modelling shall be independently peer reviewed by a suitably qualified and experienced engineer agreed with GWRC and KCDC (at the cost of the consent holder) to ensure that the hydraulic modelling is appropriate and that the stormwater design and flood risk management meets the performance criteria set out in c). The results of the peer review shall be provided to the Manager.

Chapter 33
Part I

VOLUME 2

Statutory Assessment

Overview

The objectives and policies that are relevant to the Project span national, regional and district planning documents. An analysis of these is provided in this Chapter.[57] The principal conclusions that are reached are:

- The Project is a key part of the Government's national policies for transportation: as part of the Wellington Northern Corridor RoNS the Project will make an important contribution to travel time savings between Wellington Airport and Levin, remove congestion, especially through Ōtaki, improve travel time reliability, improve route security, ease freight movements into and out of Wellington, and result in significant safety improvements;
- Overall the Project is consistent with the objectives and policies of the relevant national, and regional statutory planning documents;
- The Project is consistent with the transport-related policies of the RPS, the RLTS and the KCDP;
- The Project will enable communities at a local, regional and national level to provide for their social, economic and cultural wellbeing;
- The Project will meet the growing transportation needs of the Region, in a manner that does not preclude future opportunities for other land transport development, such as public transport;
- The Project will sustain the potential of natural and physical resources for future generations, and safeguard the life-supporting capacity of air, soils, water and ecosystems;
- As set out in Part H of this AEE report (Chapters 30 to 32), the adverse effects of the Project on the environment will be sufficiently avoided, remedied or mitigated to satisfy the requirements of s5 of the RMA;
- The Project recognises and provides for the matters in s6 RMA;
- The Project has particular regard to those matters in s7 RMA; and
- Engagement with tangata whenua in developing the Project has taken into account the principles of the Treaty of Waitangi in accordance with s8 RMA.

Consequently, the Project meets the statutory tests of the RMA and is consistent with its purpose and principles, particularly when the benefits of the Expressway and NIMT realignment are considered alongside the proposed measures to avoid, remedy and mitigate the adverse effects. To this end it is considered that the sustainable management purpose of the RMA will be achieved by confirming the designations and granting the resource consents sought.

33 Statutory Assessment

33.1 Introduction

The assessment of the Project against the relevant statutory documents generally follows the hierarchy of applicable planning documents and concludes with an assessment against Part 2 of the RMA.

[57] A summary of the 'scope' of the various documents is provided as an Appendix in Part J "Statutory Context", Volume 2 of the AEE report.

33.2 National Policy Statements

There are three NPSs potentially relevant to the Project:

- the National Policy Statement for Freshwater Management 2011(NPSFM);
- the National Policy Statement on Electricity Transmission 2008 (NPSET); and
- the New Zealand Coastal Policy Statement 2010 (NZCPS).

Although not yet operative, there is also a proposed National Policy Statement on Indigenous Biodiversity (PNPSIB) to which reference will be made for completeness.

33.2.1 National Policy Statement for Freshwater Management 2011

Objectives and policies from the NPSFM of relevance to the Project are:

Water Quality

Objective A1 To safeguard the life-supporting capacity, ecosystem processes and indigenous species including their associated ecosystems of freshwater, in sustainably managing the use and development of land, and of discharges of contaminants.

Objective A2 The overall quality of freshwater within a region is maintained or improved while:

- protecting the quality of outstanding freshwater bodies;

- protecting the significant values of wetlands; and

- improving the quality of freshwater in water bodies that have been degraded by human activities to the point of being over-allocated.

The NPSFM sets out a staged implementation programme, over which time councils are required to include objectives and policies in their plans to reflect the stated objectives (including those above). In particular, the NPSFM provides a transition policy (Policy A4) that has immediate effect on discharge consent applications. This policy applies until such time as GWRC adopts policies for inclusion in its RPS and Regional Plans to give effect to Policy A1 and Policy A2 (freshwater quality limits and targets). Policy A4 states that:

1. When considering any application for a discharge the consent authority must have regard to the following matters:

(a) the extent to which the discharge would avoid contamination that will have an adverse effect on the life-supporting capacity of freshwater including on any ecosystem associated with freshwater; and

(b) the extent to which it is feasible and dependable that any more than minor adverse effect on freshwater, and on any ecosystem associated with freshwater, resulting from the discharge would be avoided.

2. This policy applies to the following discharges (including a diffuse discharge by any person or animal):

(a) a new discharge; or

(b) a change or increase in any discharge – of any contaminant into freshwater, or onto or into land in circumstances that may result in that contaminant (or, as a result of any natural process from the discharge of that contaminant, any other contaminant) entering freshwater.

3. This policy does not apply to any application for consent first lodged before the National Policy Statement for Freshwater Management takes effect on 1 July 2011."

During the development of the Project, options to avoid discharges to freshwater that will have more than a minor effect have been extensively considered and adopted where practicable. Mitigation initiatives are proposed, including the provision of swales along the Expressway that will provide significantly greater removal of contaminants from stormwater than exists along the present SH1.

Methods to avoid and mitigate adverse effects are discussed in chapter 20 (Stormwater) and chapter 22 (Aquatic Ecology). The methods are based on an integrated approach between the specialists.

The overall conclusion is that the Project will be generally consistent with the intent of the NPSFM in relation to water quality.

Water Quantity

The NPSFM sets out the following objectives for water quantity:

> *Objective B1 To safeguard the life-supporting capacity, ecosystem processes and indigenous species including their associated ecosystems of freshwater, in sustainably managing the taking, using, damming, or diverting of freshwater.*
>
> *Objective B2 To avoid any further over-allocation of freshwater and phase out existing over-allocation.*
>
> *Objective B3 To improve and maximise the efficient allocation and efficient use of water.*
>
> *Objective B4 To protect significant values of wetlands.*

The choice of the Expressway alignment has avoided a significant area of bush (and associated wetland) at Mary Crest. However a second wetland (c.0.5ha), the Ōtaki Railway Wetland, is significantly affected. This 'loss' will be mitigated by the creation of new areas of wetland within the designation (total area c.1.1ha). Further detail on this proposed mitigation is provided in chapter 19. Overall, the Project is consistent with these objectives.

During construction of the Project some small streams will be diverted, particularly during the installation of culverts and other structures. Accordingly, Policy B7 is relevant:

> *Policy B7*
>
> *1. When considering any application the consent authority must have regard to the following matters:*
>
> *(a) the extent to which the change would adversely affect safeguarding the life-supporting capacity of freshwater and of any associated ecosystem and*
>
> *(b) the extent to which it is feasible and dependable that any adverse effect on the life-supporting capacity of freshwater and of any associated ecosystem resulting from the change would be avoided.*
>
> *2. This policy applies to:*
>
> *(a) any new activity; and*
>
> *(b) any change in the character, intensity or scale of any established activity –*
>
> *that involves any taking, using, damming or diverting of freshwater or draining of any wetland which is likely to result in any more than minor adverse change in the natural variability of flows or level of any freshwater, compared to that which immediately preceded the commencement of the new activity or the change in the established activity (or in the case of a change in an intermittent or seasonal activity, compared to that on the last occasion on which the activity was carried out).*

3. This policy does not apply to any application for consent first lodged before the National Policy Statement for Freshwater Management takes effect on 1 July 2011.

As outlined in chapters 19 and 20, the Project proposes a range of methods to safeguard the life-supporting capacity of freshwater and any associated ecosystem. Through the use of treatment swales and attenuation basins, the potential effects of run-off have been mitigated in compliance with industry best practice.

Overall it is concluded that the Project will have a net positive effect on contaminant levels entering freshwater due to the 'transfer' of most traffic from the existing SH1, which has no formal stormwater treatment, to the Expressway. This will result in a significantly greater removal of contaminants from stormwater. The Project is therefore consistent with Policy B7.

Integrated Management

Part C of the NPSFM emphasises the importance of integrated management.

Objective C1 states - To improve integrated management of freshwater and the use and development of land in whole catchments, including the interactions between freshwater, land, associated ecosystems and the coastal environment.

Related policies are:

Policy C1 - By every regional council managing freshwater and land use and development in catchments in an integrated and sustainable way, so as to avoid, remedy or mitigate adverse effects, including cumulative effects.

Policy C2 - By every regional council making or changing regional policy statements to the extent needed to provide for the integrated management of the effects of the use and development of land on freshwater, including encouraging the co-ordination and sequencing of regional and/or urban growth, land use and development and the provision of infrastructure.

The development of the Project has been based on an integrated approach involving the various specialists, such that the inter-relationship/s between the various matters has been a key focus. This was an essential approach given that the Expressway covers a number of catchments.

Based on this approach, and in view of the mitigation initiatives proposed, it is considered that the Project is consistent with the objective of improving integrated management of land use and development.

Tangata Whenua Roles and Interests

Objective D1 the NPSFM seeks to:

To provide for the involvement of iwi and hapū, and to ensure that tangata whenua values and interests are identified and reflected in the management of freshwater including associated ecosystems, and decision-making regarding freshwater planning, including on how all other objectives of this national policy statement are given effect to.

In turn Policy D1 requires that local authorities take reasonable steps to work with iwi and hapū to identify and reflect tangata whenua values and interests in freshwater and freshwater ecosystems.

While the NPSFM requires actions to be taken by local authorities to develop policies consistent with the Policy D1, rather than requiring actions by applicants, throughout the Project the NZTA has worked closely with tangata whenua to better understand tangata

whenua values and interests and appropriately reflect those values and interests in the Project design.

33.2.2 National Policy Statement on Electricity Transmission 2008

The NPSET came into effect on 10 April 2008.

Any effects that the Project may have on the electricity transmission network would need to be considered and managed. The Project does not pass under any high voltage transmission lines. While various transmission lines may need to be moved to allow for the Project, these are local distribution lines which fall outside of the purview of the NPSET. The NPSET therefore is not required to be taken into consideration as part of this application.

33.2.3 New Zealand Coastal Policy Statement 2010

The NZCPS provides guidance and direction on the management of the coastal environment.

Although the Project is a considerable distance from the coast it does cross the Ōtaki River and several other streams. However, due to the significant separation distance from the coastline and (in the case of the proposed bridges over the Otaki River) intervening existing road and rail bridges, it is considered that the Project will have little or no adverse effect on the coastal environment.

Accordingly, the following planning assessment of the Project is provided for the relevant objectives and policies of the NZCPS.

The Extent and Characteristics of the Coastal Environment (Objectives 1 and 2, and Policies 1 and 4)

A key focus of the Project has been to mitigate effects on freshwater through contamination (through operation of the Project, i.e. run-off of contaminant-laden water from the exposed Expressway earthworks) or sediment run-off (construction). The assessments conclude that any such adverse effects on the ecological values of the Ōtaki River and other streams will be very low. Indeed, in the longer-term, it is anticipated that there will be an overall improvement in operational contaminant levels entering the freshwater due to the 'transfer' of most traffic from the existing SH1, which has no formal stormwater treatment, to the Expressway, and, as such, will treat all run-off. Accordingly, the ecological values of the coastal environment will not be at risk as a result of the Project.

Treaty of Waitangi, Tangata Whenua and Maori (Objective 3 and Policy 2)

Through engagement with tangata whenua in the design process, Māori customary knowledge, traditional knowledge or intergenerational knowledge (matauranga Māori) has been incorporated into the Project (refer to chapter 26 and Technical Report 19).

Natural Character (Objective 2 and Policies 13 and 14)

Policy 13 relates to preserving the natural character of the coastal environment and recognises that natural character is different to natural features, landscapes and amenity values. Policy 14 promotes the restoration or rehabilitation of the natural character of the coastal environment.

Some landscape elements that are associated with/formed by coastal processes (e.g. dunes and former coastal/sea cliff) are either within or alongside the footprint of the Project. Some dune landforms (especially north of Ōtaki) are affected. The former sea cliff south of Mary Crest (Te Horo 'abandoned' sea cliff) is not affected.

Where the Project traverses dune landforms the objective is to minimise the extent of any cuts and to re-create natural contours to the greatest extent practicable.

From an ecological perspective, given the mitigation measures proposed (primarily erosion and sediment controls), the actual and potential adverse effects on the stream and river mouths within the coastal environment from construction works in up-stream/up-river beds and wetlands, will have little adverse effect on the coastal environment.

Water Quality (Objectives 1 and 6 and Policy 21, 22 and 23)

Policy 21 requires that where water quality in the coastal environment has deteriorated, priority should be given to enhancing it. Policy 22 requires consideration of controls to manage the effects of sedimentation on the coastal environment, including through managing land uses, forestry and vegetation removal. Policy 23 seeks to manage the discharge of contaminants to the coastal environment.

Potential effects on water quality from the Project, both during construction and post-construction operation, have been a key consideration through the development of the Project.

Given the mitigation measures proposed (refer chapters 18 and 20) it is concluded that any adverse effects during construction will be low, and during the post-construction operation of the Project, the overall outcome will be a reduction in contaminants from the Expressway entering freshwater and therefore a net positive effect. Accordingly, in relation to water quality in the coastal environment, the Project will not give rise to any deterioration.

Indigenous Biological Diversity (Policy 11)

Some works which are required for the Project may result in discharges and in-stream works which have the potential to adversely affect threatened or at risk indigenous taxa and their habitats, as detailed in Policy 11 of the NZCPS. To ensure any adverse effects are mitigated, Technical Reports 11 and 12 look at both terrestrial and aquatic ecological values, and the mitigation recommended in these reports is adopted and reflected through the Project design and the conditions proposed.

Overall Conclusion in Relation to the Coastal Environment

The conclusion is that the Project is consistent with the relevant objectives and policies of the NZCPS. Any adverse effects on the characteristics of the coastal environment, including water quality, the most likely area of 'risk', will be negligible. Indeed, the proposed mitigation measures incorporated into the Project should result in an overall improvement in water quality.

33.2.4 Proposed National Policy Statement on Indigenous Biodiversity

The PNPSIB is intended to provide clearer direction to local authorities on their responsibilities for managing indigenous biodiversity under the RMA. It seeks to promote the maintenance of indigenous biodiversity while recognising the rights and responsibilities of landowners and the interests of Māori.

While the PNPSIB is not operative, and therefore has no statutory weight, for completeness an assessment has been undertaken (refer chapter 19 and Technical Report 11, Volume 3).

As the assessments record, some existing wetland will be reclaimed but this will be mitigated by the creation of new wetland areas. The loss of bush habitat will be compensated either by planting new areas of bush or protecting existing bush that is threatened by on-going degradation. The recommended mitigation adequately meets the "no-net-loss in biodiversity" outcome promoted by the proposed NPS IB.

No threatened or at-risk terrestrial or wetland species of flora or fauna were identified along or immediately adjacent to the Project footprint.

33.3 National Environmental Standards

There are four NESs which are considered relevant, or potentially relevant, to the Project:

- The Resource Management (National Environmental Standards for Air Quality) Regulations 2004 (amended 2011);
- The Resource Management (National Environmental Standards for Sources of Human Drinking Water) Regulations 2007;
- The Resource Management (National Environmental Standards for Electricity Transmission; Activities) Regulations 2009 (NESET); and
- The Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NESCS).

33.3.1 National Environmental Standards for Air Quality 2004

Regulation 13 sets the ambient air quality standards and the requirements for management of air quality within those air sheds identified. It is the responsibility of Regional Councils to manage air quality and to comply with the Regional Air Quality targets for their air shed(s). No consents relating to this standard are required, but the relevant regulations in the NES have informed the assessment of construction and operational air quality effects and proposed mitigation measures.

As the specialist assessment concludes (refer chapter 21, Volume 2 and Technical Report 13, Volume 3) the primary air discharge from the construction of the Project will be dust. This will require mitigation in some areas to reduce the potential for nuisance effects, and a number of measures are recommended including: speed restrictions on construction vehicles operating near sensitive receptors; the placement of a construction envelope around activities that have the potential to create dust effects; and the use of water tankers to dampen surfaces that have the potential to create dust.

The potential effects from vehicle exhaust pollutants once the Project is in operation were also assessed. The ambient concentration of NO_2, C0 and PM_{10} were assessed for the design year (2021) and the opening year (2031). The results of the assessment indicate that a slight reduction in concentration in urban areas can be expected between 2021 and 2031 for the pollutants assessed.

No post construction mitigation is recommended as the contribution of air pollutants from the operation of the Project is not expected to cause any adverse effects.

33.3.2 National Environmental Standards for Sources of Human Drinking Water 2008

This NES requires regional councils to ensure that effects on drinking water sources are considered in decisions on resource consents and regional plans. No consents under this NES are required as none of the water takes relating to the construction of the Project are for drinking water supplies.

The potential effects of the Project on groundwater resources are addressed in chapter 13 and in Technical Report 4, Volume 3.

Any effects on groundwater flows and licensed water takes are considered to be insignificant and able to be mitigated through conditions. Accordingly, there should be no adverse effect on potable water supplies.

33.3.3 National Environmental Standards for Electricity Transmission 2009

The Project does not pass under any high voltage transmission lines. While various transmission lines may need to be moved to allow for the Project, these are local

distribution lines which fall outside of the purview of the NESET. Therefore, the standard is not applicable as none of the activities to which the NESET relates are required to be undertaken as part of the Project.

33.3.4 National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health 2011

The NESCS came into effect on 1 January 2012.

A specialist Phase 1 contaminated land assessment identified five sites with potential for ground contamination at Ōtaki Railway Station, Ōtaki railway sidings, Winstones Aggregates, Clifden and Mary Crest. Ten other sites of potential concern of lower risk were identified. Further, as the specialist assessment notes, additional sites may be encountered during construction.

Potential effects on human health and the environment may occur if contaminated land is disturbed and/or used during the construction of the Project.

These potential effects can be avoided through the application of appropriate procedures to manage contaminated soils and materials. This may include retaining soil and materials in situ where appropriate to be capped by the Expressway. Any soils and materials not suitable to remain on site will be excavated, removed off-site and disposed of in accordance with the procedures outlined in the NESCS.

Once the detailed design is complete, a detailed assessment of the contaminated sites within the Project area will be undertaken, and all necessary resource consents required to undertake works in these areas will be sought at that time.

33.4 Regional Policy Statements

There is both an operative and proposed RPS for the Wellington Region. The operative RPS came into effect in 1995. The RPS identifies the regionally significant issues around the management of the Region's natural and physical resources and sets out what the GWRC is seeking to achieve (objectives) and the way in which they will seek to achieve those objectives (policies and methods). It is a key statutory instrument that regional and district plans are required to give effect to.

At this stage the PRPS is considered to carry significantly greater weight than the operative RPS, because the PRPS has been through the public notification, submission, hearing and GWRC decision-making process and is currently in the final stage where outstanding appeals on some of its provisions are being resolved. For this reason, the regional policy assessment to follow is based on the provisions of the PRPS. That said, however, the operative RPS remains a relevant document. Nevertheless, the operative RPS's regional issues and related objectives and policies are essentially picked up in the PRPS such that the assessment against the PRPS picks up these issues as well.

33.4.1 Proposed Wellington Regional Policy Statement 2009

An assessment of the Project against the relevant objectives and policies of the PRPS follows. The PRPS is intended to provide a robust, integrated approach to promoting the sustainable management of natural and physical resources. Under section 59 of the RMA *"the purpose of a regional policy statement is to achieve the purpose of the Act by providing an overview of the resource management issues of the region and policies and methods to achieve integrated management of the natural and physical resources of the whole region".*

The assessment that follows addresses each relevant resource management issue identified in the PRPS in turn. The assessment draws on the relevant specialist technical assessments, the majority of which are summarised in Part G of Volume 2, with the full reports included in Volume 3 of the AEE report.

Air Quality

The PRPS separates air quality issues into two categories: Amenity (Objective 1) and Health Effects (Objective 2). Policy 1 corresponds to Objective 1, while Policy 2 provides direction for both Objectives. The PRPS states that overall regional air quality in Wellington is generally good. The PRPS approach is to maintain and enhance air quality in the Region.

The specialist assessment (refer Technical Report 13, Volume 3) concludes that the primary discharge from the construction of the Project will be dust. This will require mitigation in some areas to reduce the potential for nuisance effects. In relation to construction-related dust, a number of mitigation measures have been recommended (refer Technical Report 13) to reduce the potential of dust emissions.

The potential effects from vehicle exhaust pollutants once the Expressway is operational were also considered. The assessment concluded that there will be a slight reduction (positive effect) in concentration in urban areas (albeit mainly due to improvements in vehicle technologies). No specific mitigation is recommended in relation to vehicle exhaust pollutants as no adverse effects are anticipated.

Based on the technical assessment it is concluded that there will be negligible air quality effects arising from the construction of and use of the Project; and, in the urban area will result in a slight improvement. Consequently, the operation of the Project will not have any adverse effects on human health.

Overall, it is concluded that the Project is consistent with the relevant objectives that relate to air quality.

Coastal Environment

The regionally significant resource management issues for the coastal environment and corresponding objectives and policies are categorised into four areas: adverse effects on natural character, and restoring natural character (Objective 4 and Objective 5 respectively); and natural habitats and features, coastal water quality and ecosystems (Objectives 3, 6 and 7).

In relation to these objectives and policies it is noted that:

- The Project route is considerably inland (some 3 to 4 kilometres) of the coast. However, it does traverse some dune landform, notably north of Ōtaki. Therefore the adverse effects of Project construction in the dune landform have been mitigated to the extent practicable through minimising the necessary earthworks and 're-creating' natural contours along the edges of the cuts;
- The magnitude of any adverse effect on the ecology of the coastal environment from discharges of stormwater or other contaminants to the Ōtaki River, or other streams that discharge to the coast, will be negligible; and
- The Project will not adversely affect public access to the coastal environment.

Overall, it is concluded that the Project is consistent with the relevant objectives and policies that relate to the coastal environment.

Energy, Infrastructure and Waste

The "Infrastructure" objective (Objective 10) and policies (Policies 6, 8 and 9) are relevant to the Project.

Objective 10 states that the "*social, economic, cultural and environmental benefits of regionally significant infrastructure are recognised and protected*", where the definition of '*regionally significant infrastructure*' includes the "*Strategic Transport Network, as defined in the Wellington Regional Land Transport Strategy 2007-2016*", and includes the State highway network. It is relevant that the Government has nominated the Project as a

key part of the Wellington Northern Corridor RoNS in the GPS on Land Transport Funding. The Project is therefore consistent with the policy direction in the PRPS and related documents such as the RLTS.

Policy 6 refers to "the social, economic, cultural and environmental benefits of regionally significant infrastructure" (such as the Project) and directs regional and district plans to recognise these benefits.

The Project will be consistent with, and will support Objective 10 insofar as the Project provides for a more efficient road transport network that will allow people to travel more quickly, safely and reliably around the Region.

As discussed in chapter 14, Volume 2 and Technical Report 6, Volume 3 "Assessment of Transport and Traffic Effects", the Project will:

- Make a contribution to reduced travel times through the Kāpiti district and around the Region;
- Provide a second route, built to a significantly higher standard, which will be more resilient to natural hazards and will provide a choice of routes;
- Reserve the use of existing SH1 for use by people making local trips; and
- Have a significant positive effect on road safety.

In relation to the NIMT, the Project improves track alignment to the north of the Ōtaki Railway Retail area. Importantly, the Project results in the removal of five existing at-grade crossings across the NIMT, including two significant 'public' crossings at Rahui Road and at Te Horo. All the public level crossings in the Project area are removed by the Project.

Recognising the benefits from regionally significant infrastructure is an important consideration for the Project, and it is concluded that the Project is consistent with Policy 6.

Under the heading of 'energy, infrastructure and waste' the PRPS also provides direction on reducing the use and consumption of non-renewable transport fuels and promoting travel demand management, in Policies 8 and 9 respectively. These policies recognise the significant contribution the transport sector makes to carbon dioxide emissions and non-renewable fuel consumption. The policies seek that a reduction in both emissions and consumption is advanced through the RLTS.

Policy 9 also directs district plans to promote travel demand mechanisms, including improvements to the efficiency of the existing network. The policy also recognises that it is important to ensure good connectivity within and between settlements.

As summarised in chapter 14, and discussed in more detail in Technical Report 6, Volume 3, the Project is expected to deliver a range of benefits which would be consistent with achieving Policy 9, including:

- Reduced average journey times;
- A significant reduction in congestion, especially into and through the Ōtaki Railway Retail area;
- Reduced levels of traffic on the existing SH1 (following its change to a local road) making it more conducive to non-motorised travel; and
- Through design and layout of the interchanges at north and south Ōtaki, provide fast and efficient motor-vehicle access to and from Ōtaki without increasing travel distance for residents, visitors or passing trade.

In terms of waste water (Policies 43 and 44), opportunities for water recycling will be addressed at the detailed design stage of the Project.

Overall, in relation to transportation infrastructure, the Project will have a significantly positive effect, particularly through enhanced road safety, a second road corridor, built to

a higher standard through the Kāpiti district and through removal of five of eight at-grade crossings, including two significant 'public' crossings at Rahui Road and at Te Horo.

Freshwater

The focus of PRPS policy in relation to the Region's freshwater 'resource', including rivers, lakes, wetlands and streams, is safeguarding the life-supporting capacity of water bodies and maintaining healthy functioning ecosystems (Objectives 12 and 13). To this end Policies 11, 39 and 42 encourage the maintenance and, where possible, enhancement of aquatic ecosystem health, both in freshwater and the coastal marine area; while Policy 40 identifies a series of mechanisms to reduce adverse effects of stormwater run-off. Policy 42 specifically relates to protecting the aquatic ecological function of water bodies.

In chapters 18 (Stormwater) and 20 (Aquatic Ecology) in Volume 2, and the associated Technical Reports 10 and 12, Volume 3, various measures are identified to address potential adverse effects on the freshwater resource and the associated ecosystems along with their aquatic ecological functions. These measures include the treatment of run-off from the Expressway in vegetated attenuation swales and dry ponds, enhancement of riparian planting (to mitigate for culverting) and establishment of 'new' wetlands to mitigate the loss of existing wetland.

These mitigation mechanisms are consistent with Policies 40 and 42.

Policies 43 and 44 relate to water takes, using water efficiently and the recycling (also addressed in *Energy, Infrastructure and Waste*, above) of water, in particular requiring justification of proposed water take, as well as the actual take being measured and reported. The proposed groundwater take, as well as the reuse of water from sediment retention ponds during the construction period, will be able to occur in such as manner so as to ensure efficiency, and thereby not compromise these provisions.

Chapter 20 (Terrestrial Ecology) also makes an assessment of the Project's effects on indigenous ecosystems and habitats, under the criteria set down by Policy 22: *Identifying indigenous ecosystems and habitats with significant biodiversity values*, although the policy is not referred to directly in that chapter. The Project will adversely affect indigenous vegetation along the riparian margins of rivers and streams. However, the proposed mitigation initiatives, including new wetland habitat creation detailed in chapter 20, will adequately meet the biodiversity objectives contained within the PNPSIB, the PRPS and the NZTA's Environmental Plan.

During Project construction the management of vegetation removal and earthworks will be undertaken in accordance with the procedures and methods included in the ESCP (refer Appendix C, Volume 4 of the AEE report), which will be directed toward avoiding any adverse effects on the freshwater resource and associated ecosystems from potential sediment run-off.

Historic Heritage

The PRPS seeks to avoid the inappropriate modification, use and development of historic heritage (Objective 15). As is recorded in the specialist heritage assessment (refer chapter 25, Volume 2 and Technical Report 18, Volume 3) there are a number of heritage buildings within the boundaries of the proposed designation, or in close proximity.

The overall conclusion reached in the specialist heritage assessment is, that subject to some recommended mitigation measures, the overall effects of the Project will be less than minor on heritage values.

The four statutorily identified buildings considered to be affected by the Project are:

- Ōtaki Railway Station: a slight realignment of the building is necessary to 'realign' the station platform and verandah with the realigned NIMT;

- Former Te Horo Railway Station Building (re-located on the former Mirek Smišek pottery site): the Expressway will be within 40 metres of the building thus changing its existing setting;
- Former Rahui Milk Treatment Station: the Expressway will be in close proximity to the north elevation of the building, thus changing its existing setting; and
- Former Rahui Factory Social Hall: the Expressway will be in very close proximity to the building, thus changing the existing setting.

In respect of the Ōtaki Railway Station building, the proposal is for reorientation of the building with the realigned NIMT. Subject to the brickwork, including chimneys and the central brick firewall, being reconstructed and all other interior and exterior fabric, including the verandah, being relocated with the building, the heritage effects on the building will be less than minor.

The setting of the former Te Horo Railway station will be affected by the Expressway, as it will be located approximately 40 metres from the building, there will be no physical effects or loss of fabric. Also, as the association of the building to its original site was lost when it was relocated in 1971, and while the building is considered to have moderate to high architectural and historical values, the effects of the Expressway on those values are assessed to be less than minor.

The former Rahui Milk Treatment Station and former Rahui Social Hall will have their immediate setting modified because the Expressway will be in close proximity. However, there will be no physical intervention to the buildings or loss of fabric. Planting is proposed to mitigate the effects of the Expressway on the amenity values of these buildings. On balance, it is assessed that the effects on the architectural and historic values of the two buildings will be less than minor.

Two non-statutorily identified buildings/structures, which will be affected by the Project, have been assessed as having heritage value:

- former Mirek Smišek pottery site consisting of two kilns and brick flue, preparation shed and house. The site of the kilns, brick flue, preparation shed and house will be occupied by the Expressway, resulting in a reduction in the size of the site by approximately half, as well as changing the setting of the group of structures associated with the Smišek pottery; and
- 'Clifden' at Bridge Lodge: reputed to be one of the earliest houses built in Ōtaki, the site of the house will be occupied by an over-bridge access road.

Although not statutorily recognised, it is considered that the beehive kilns and flue have sufficient heritage values to be considered under the RMA as being 'historic heritage'. Consequently their demolition would be inconsistent with the requirement to protect historic heritage. The alternative of relocation would provide for their protection with the optimum location being as close as possible to their existing site and maintaining a physical relationship with the preparation shed. Thus, the recommendation of the specialist assessment is that the beehive kilns and flue should be carefully deconstructed, relocated and reinstated in a sympathetic environment on site. With the relocation and reinstatement of the kilns in this manner, it is concluded that the adverse effects on their historic heritage will be appropriately mitigated.

The approach to the proposed Expressway bridge no. 6 at south Ōtaki will occupy the approximate location of 'Clifden'. Although the building is not statutorily recognised, the assessment undertaken has concluded that it has sufficient heritage value to be considered as being 'historic heritage of local significance'. Adverse effects will be minimised if the original house, without its additions, can be relocated to an appropriate site. In this way its historic heritage will be recognised and provided for.

With the implementation of the recommended mitigation measures the conclusion is that the Project will promote the protection of historic heritage in a manner consistent with the PRPS objectives and policies.

Indigenous Ecosystems

The PRPS acknowledges that ecosystems are constantly changing and that all parts of an ecosystem are important to support each other. Objective 16 and Policies 22 and 23 have a particular focus on identifying and protecting indigenous ecosystems with significant biodiversity values, as these relate to future regional and district plan provisions. The PRPS also acknowledges the importance of healthy ecosystems is central to Māori cultural values.

Policy 46 addresses projects requiring consent or notice of requirement, and provides guidance on the determination of *"whether an activity may affect indigenous ecosystems and habitats or areas with significant biodiversity values".*

The specialist assessment on terrestrial ecology (refer chapter 19, Volume 2 and Technical Report 11, Volume 3) notes that the Project passes through a landscape that has been highly modified by agriculture, and to a lesser extent horticulture, viticulture and urbanisation. It also notes that the most significant ecosystems, in particular a significant area of indigenous bush and associated wetland at Mary Crest, have been avoided.

The areas of indigenous vegetation and habitats of indigenous fauna affected by the Project are the Ōtaki Railway Wetland that is significantly affected, lengths of water ways affected by culverting, and the edges of several bush remnants. These adverse effects are sufficiently significant to warrant mitigation to compensate for the loss.

The significant reduction of the Ōtaki Railway Wetland will be offset by the creation of new areas of wetland, in the general location of the existing wetland; while the loss of bush habitat will be compensated either by planting new areas of bush or protecting existing bush that is threatened by on-going degradation. The effects of culverting will be offset by the fencing and planting of riparian areas. Mitigation will adequately meet the "no-net-loss in biodiversity" objectives contained within the PNPSIB.

The assessment did not identify any threatened or at-risk terrestrial or wetland species of flora or fauna along or immediately adjacent to the Project footprint.

The overall assessment is that with the proposed remediation measures and mitigation offsets undertaken, the adverse effects of the Expressway and the realignment of the NIMT on terrestrial ecology will be no more than minor and that "no-net-loss" in ecological values can be achieved.

It is concluded therefore that the Project is consistent with PRPS policy in relation to indigenous ecosystems.

Landscape

The PRPS acknowledges that the Region has a diversity of distinctive landscapes and that different values are attributed to these landscapes, "depending on their characteristics and our own culture, personal history, relationship with the land and ideas about what is significant". The PRPS also states that the 'landscape' is shaped and constantly re-shaped by a combination of natural processes and human actions.

The PRPS outlines the Region's significant resource management issue as being the inappropriate modification and destruction of outstanding natural features and landscapes, and significant amenity landscapes, which is causing a loss of values associated with those landscapes and features.

Objective 17 sets the overarching aim for landscape management in the Region, which is "to identify the region's outstanding natural features and landscapes, and protect their

values from inappropriate subdivision, use and development". Policies 24, 25, 26 and 27 provide direction on regional and district plan policy and regulation with respect to outstanding natural features and landscapes, and the management of 'significant amenity landscapes'.

The PRPS nominates policies that are of particular relevance in the consideration of resource consents, notices of requirements and plan changes/variations. Both Policy 49 and 52 are relevant for the assessment of the landscape, visual and open spaces values of the Project. Policy 55 relates to managing development in rural areas, and is also relevant.

Technical Report 8, Volume 3 provides a detailed assessment of the landscape and visual effects of the Project, and this assessment is summarised in chapter 16.

The assessment acknowledges that the Expressway as a large roading infrastructure element will result in changes to the landscape. Potential landscape and visual effects include physical effects of the Project construction, effects on landscape character and landscape values and visual effects.

It is considered that the effect on the development on any rural areas will be no more than minor, given that most urbanisation along the proposed route is concentrated near the present State Highway 1. The existing environment is characterised as a developed area, and modifying elements will be concentrated into one area.

In terms of overall landscape effects the assessment is that the effect is significant for two short sections of the Project, being:

(a) a section from North Ōtaki to Rahui Road where the Project traverses an existing community open space (the Pare-o-Matangi reserve) and an area of dune landform; and

(b) a section from the Ōtaki River to Addington Road.

At the Ōtaki River crossing itself, while there will be a cumulative effect of placing two bridges side-by-side across the river in close proximity to the existing SH1 and NIMT bridges, the landscape and visual effects are assessed as no more than moderate.

Various mitigation measures have been proposed and are included in the Project design and conditions. While accepting that the construction of the Project will have an adverse effect on the landscape, the overall effect is considered to be acceptable.

No identified 'outstanding natural feature' is affected. Part of the Ōtaki River is identified as an ONL, but not that part affected by, or near to, the Project.

The landscape assessment assesses the effect of the new bridges on the Ōtaki River landscape as follows:

> *The Ōtaki River follows a braided path from the Tararua Ranges to the coast at Ōtaki Beach and provides a source of material for the shingle plant and pre-stressed concrete plant just north of the existing railway bridge and existing SH1 bridge. The river forms the southern edge to Ōtaki township with the existing SH1 bridge across the river being the current southern 'entrance' to 'gateway' to the Ōtaki Railway Retail area. These two bridges are located approximately 50m apart, crossing the river in parallel. Together, they contribute to the modified character of this section of the river and constitute a large scale, built element that dominates the setting. The modified character is reinforced by the exotic vegetation planted in rows along the banks, and the gabions placed along the edges for river protection work. A haul road that is part of the shingle plant operation runs under the northern abutments of both bridges, along with a riverbank walkway.*

The landscape assessment concludes that:

> *The addition of the Expressway bridges approximately 100m upstream of the existing rail bridge will increase the degree of modification already in place in this*

portion of the river. However, the existing environment is characterised as a developed area, with two bridges and modified embankments. The Expressway bridges will add to the overall degree of modification, but by placing them in close proximity to the existing bridges, the modifying elements will be concentrated into one area. While this has the benefit of confining the extent of modification, it does create a cumulative effect in this area. The scale of the setting and of the braided river is sufficiently large to accept the additional bridges, without dominating the landscape.

The landscape assessment concludes that the effect on the Ōtaki River landscape will be no more than "moderate" given the degree of modification that is existing.

Natural Hazards

The PRPS has three natural hazards Objectives 18, 19 and 20. In summary, these objectives seek to reduce the risks and consequences from natural hazards; ensure that these risks are not exacerbated by hazard mitigation measures; and, ensure that communities are more resilient to natural hazards, including impact from climate change. In addition, Policy 50 provides a list of matters to be considered when determining whether the risk and consequences of natural hazards on people, communities, their property and infrastructure are minimised, to assist in determining whether an activity is inappropriate.

The Project is located in an area of high seismicity. Primary geo-hazards identified along the route include active faults, fault rupture, ground shaking, earthquake induced slope failure and liquefaction. The Project also crosses the floodplains associated with the Mangaone Street, Ōtaki River and Waitohu Stream.

The issue of seismic risk is assessed in Technical Report 4, Volume 3 of the AEE report and a summary provided in chapter 13, Volume 2 of the AEE report.

The technical assessment concludes that the Expressway will have good resilience. The Expressway is likely to remain open for access in a large local magnitude 7.5 earthquake event in the Region, possibly with some reduced level of service due to road deformation associated with localised liquefaction and subsidence. These areas are likely to be able to be reinstated quickly within 3 days to 2 weeks.

The design approach has been to avoid crossing the Northern Ohariu Fault on structures which may be severely damaged and will take a long time to reinstate, but rather to cross the fault on earthworks which would enable quick restoration of access. This has been achieved.

In terms of any issues arising from the Project crossing the Waitohu Stream, Ōtaki River and Mangaone Stream floodplains, the technical assessment (refer Technical Report 9, Volume 3 of the AEE report and the summary in chapter 17 of Volume 2) concludes that natural hazards are able to be managed and mitigated through design elements. Based on the findings of the technical assessments it is concluded that the Project is consistent with the PRPS objectives relating to natural hazards.

Regional Form, Design and Function

The Regional Form section of the PRPS is concerned with "the physical arrangement within and between urban and rural communities". The PRPS acknowledges that the Wellington Region has a generally compact pattern of development, based on strong transport "corridors". The regional pattern is a strength as it supports local centres, supports passenger transport, reduces energy use and makes services more accessible. One issue highlighted in the PRPS is that "the region also has limited east-west transport linkages, which means that freight and commuter movements are focused along the north-south corridors, increasing congestion of some major routes".

Objective 21 states *"A compact well designed and sustainable regional form that has an integrated, safe and responsive transport network"*. The Objective goes on to list twelve further attributes (a) – (l) which add to the regional form, including:

> *(k) efficient use of existing infrastructure (including transport network infrastructure).*

Policies relevant to implementing Objective 21 include Policy 32 and Policy 53:

> *Policy 32: Supporting a compact, well designed and sustainable regional form – Regional Land Transport Strategy.*
>
> *Policy 53: Achieving the region's urban design principles.*

Furthermore, Policy 56 directs the consideration of integrated land transport matters for the assessment of a notice of requirement. The matters identified in this policy are:

> *(a) whether traffic generated by the proposed development can be accommodated within the existing transport network and the impacts on the efficiency, reliability or safety of the network;*
>
> *(b) connectivity with, or provision of access to, public services or activities, key centres of employment activity or retail activity, open spaces or recreational areas;*
>
> *(c) where there is good access to the strategic public transport network;*
>
> *(d) provision for safe and attractive environments for walking and cycling;*
>
> *(e) whether new, or upgrades to existing, transport network infrastructure have been appropriately recognised and provided for.*

Having regard to Objective 21 and the related relevant policies (including overall urban design principles), the following points are relevant:

- In relation to the integrated approach to land use and transportation promoted by Objective 21, the NZTA has, in developing the Project, prepared and been guided by an ULDF (Technical Report 23, Volume 3). The ULDF contains a full description of the urban and landscape design context for the Project;
- Existing urban form and land use patterns are not significantly disrupted by the Project. The Expressway route follows closely the alignment of the existing SH1 and NIMT railway. The Project does not result in a new transport corridor;
- A key design outcome, which was strongly influenced by community input through the consultation process, was retention of the underlying urban form within Ōtaki township and, in particular, the east/west connection across the Expressway at Rahui Road at the northern end of the Ōtaki Railway Retail area;
- The form of the new south Ōtaki and north Ōtaki interchanges that 'bookend' the township, and their ease of use reinforced through strong 'gateway' signage, is a key component of the Project in relation to enhancing the amenity of the Ōtaki Railway Retail area and contributing to its economic viability; and
- The Ōtaki interchanges also provide good connectivity between the Expressway and the growing industrial / 'clean tech' area around the Riverbank Road area at the southern end of Ōtaki, and other future land use development and growth for Ōtaki Township, which is the 'focus' area for growth at the northern end of the Kāpiti district and the Region.

At the wider regional level, the Project assists in accommodating the Region's growth in a manner consistent with the PRPS, and its strategic objectives by improving accessibility and efficiency of the transport network between centres of economic development and growth (Policy 56 and Policy 57).

In conclusion, the Project is assessed as being consistent with the PRPS objective and related policies on regional form, design and functioning.

Tangata Whenua

Chapter 3.10 of the PRPS focuses on tangata whenua aspirations for achieving an integrated and holistic approach to managing the Region's natural and physical resources. The PRPS explains that kaitiakitanga is the environmental guardianship system of tangata whenua, which is based on Māori views of the world and its origins, and the principle that everything is inter-related and inter-connected. Mauri is the life force that exists in all things in the natural world. Tikanga, or customary practices, are followed in order to protect mauri. Observing tikanga is central to kaitiakitanga. Kaitiakitanga is a parallel system of environmental management that should be given equal consideration in resource management.

Objective 22 promotes working together on resource management, and Policy 66 seeks to enhance the involvement of iwi in decision-making processes. Objective 23 and Policy 47 emphasise the statutory requirement to take into account the principles of the Treaty of Waitangi and Objective 25 seeks to ensure the concept of kaitiakitanga is integrated into the Region's resource management. Policy 48 implements the tangata whenua objectives by directing the avoidance of adverse effects on matters of significance to tangata whenua, and links are made back to topic-based chapters (indigenous ecosystems, heritage and water quality) to ensure integrated resource management.

The tangata whenua for the Project area (Peka Peka to North Ōtaki) are Nga Hapū o Ōtaki which comprises five Ōtaki resident Ngati Raukawa hapū.

There has been close and on-going consultation and engagement with Nga Hapū o Ōtaki throughout the design process. This consultation and engagement has been directed toward ensuring that the NZTA had a full appreciation and understanding of the significance of any issues of concern and/or interest to tangata whenua. Representatives of Nga Hapū o Ōtaki have participated in site visits and 'route walkovers' during which tangata whenua input and advice to understanding Māori values was sought by the NZTA.

In this way tangata whenua have been key stakeholders in, and contributors to, the route selection and associated Project design processes. This involvement has included the preparation of a cultural impact assessment report by Nga Hapū o Ōtaki (refer Technical Report 19, Volume 3 of the AEE report).

Notwithstanding this consultative process with Nga Hapū o Ōtaki, there are limited locations where the Project traverses a landscape potentially containing sites of cultural significance to tangata whenua. Mitigation measures have been identified and agreed with Nga Hapū o Ōtaki to remedy or mitigate these effects. To this end an MoU has been entered into between the NZTA and Nga Hapū o Ōtaki to ensure on-going consultation and engagement through the continuing developed design processes and construction.

The Project is therefore seen to be consistent with the tangata whenua objectives and policies in the PRPS, and the process of engaging with tangata whenua has been in accordance with the principles of the Treaty of Waitangi.

Soil and Minerals

Issue 3 of the PRPS acknowledges highly productive agricultural land is under threat from development, including the construction of roads. Accelerated soil erosion is another key issue (Issue 1) and Objective 28 promotes land management practices that do not accelerate soil erosion. Objective 29 promotes maintaining the desirable characteristics of soils that enable them to have an ecosystem function. To implement these objectives, Policies 14 and 40 seek to minimise effects from earthworks and vegetation disturbance on aquatic ecosystem health from slit and sedimentation and Policy 59 directs

consideration of the productive capability for agriculture Class 1 and II land. Having regard to these objectives and policies, the following points are relevant:

- The Project area traverses environments with different soil, vegetation and hydrological characteristics (including class I and II soils), and the design and construction of the Project, and the environmental management, has been tailored to address these different characteristics;
- Significant earthworks, vegetation removal and disturbance will be necessary along the Expressway alignment. The adverse effects of these works on the health of the river, streams and wetlands have been evaluated in Technical Reports 9 through to 12, Volume 3. The findings of these assessments conclude, subject to recommended mitigation measures, and the implementation of an ESCP, that any effects on the water quality of streams and wetlands will be less than minor; and
- Although the Expressway alignment will result in the loss of productive land, given that the Expressway closely follows the alignment of the existing SH1 and NIMT railway for most of its length, this loss is not significant.

In conclusion, it is assessed that the Project is consistent with achieving the objectives and policies of the PRPS in relation to the management of the soil resources of the district. Any loss of existing soil resource/productive land will be less than minor.

33.5 Regional Plans

Regional Plans provide guidance for the carrying out of GWRC's functions under the RMA. There are five regional plans that are relevant to the Project. These are:

- Regional Freshwater Plan for the Wellington Region 1999;
- Regional Air Quality Management Plan for the Wellington Region 2000;
- Regional Coastal Plan for the Wellington Region 2000;
- Regional Plan for Discharges to Land for the Wellington Region 1999; and
- Regional Soil Plan for the Wellington Region 2000.

33.5.1 Regional Freshwater Plan

The RFWP applies to all freshwater in the region, including water in rivers, lakes, streams, ponds, aquifers and artificial watercourses, but excluding freshwater in the coastal marine area (CMA). It applies to all land in rivers and lake beds, and all types of activities that use freshwater or that occur in the beds of rivers and lakes.

Table 3-2 in chapter 3 provides detail on the type and activity status of the regional consents required.

General Policies and Objectives

Chapter 4 of the RFWP sets out general objectives and policies which the consent authority will have regard to when assessing applications for resource consents for projects that involve works that affect freshwater resources. In summary, objectives and policies considered to be particularly relevant to this Project include:

- Objectives 4.1.1-4.1.3 and Policies 4.2.1-4.2.8 (the relationship of tangata whenua with freshwater);
- Objectives 4.1.4-4.1.6 and Policies 4.2.9-4.2.14 (Natural values);
- Objectives 4.1.7 and 4.1.8 and Policies 4.2.15-4.2.17 (Amenity values and access);
- Objectives 4.1.9 and 4.1.10 and Policies 4.2.18-4.2.22 (Flood mitigation); and
- Objectives 4.1.11-4.1.17 and Policies 4.2.23-4.3.38 (Use and development).

These topic areas are assessed below.

The Relationship of Tangata Whenua with Fresh Water

Consultation with tangata whenua has been a significant part of the information gathering and development stages of the Project. Consultation with iwi authorities, in particular the resident Ngati Raukawa hapū in Ōtaki, Nga Hapū o Ōtaki, commenced in early 2010 and continued throughout the development phases of the Project. This engagement and consultation provided the NZTA with an understanding of the cultural values of the site and the wider locality. Thus, tangata whenua have been a key stakeholder since the commencement of project investigations and influenced the shaping of the final project and mitigation measures. The NZTA considers that the process and outcomes of the Project demonstrate recognition of principles of the Treaty of Waitangi (the partnership between tangata whenua and the NZTA as a Crown agency). On this basis it is concluded that the Project is consistent with these objectives and policies (Objective 4.1.1 and 4.1.3 and Policies 4.2.2 and 4.2.6).

The CIA prepared by Nga Hapū o Ōtaki to inform the AEE (Technical Report 19, in Volume 2 of the AEE report) provides background on the cultural values of local waterways to the tangata whenua. With regard to fresh water, the CIA observes that culvert works on the Mangapouri Stream will not interfere with the kaitiakitanga of Nga Hapū o Ōtaki. During construction of the Project there will be on-going involvement with tangata whenua (Policy 4.2.7).

Overall, it is concluded that the Project will allow tangata whenua to maintain their relationship with fresh water.

Natural Values

The natural values objectives cover matters in relation to the natural character of wetlands, lakes and rivers (and their margins), life-supporting capacity of water and aquatic ecosystems and significant indigenous aquatic vegetation and habitats. The objectives reflect the purpose and principles of Part 2, set out in sections 5(2)(b), 6(a) and 6(c) of the RMA, in reference to freshwater natural resources. The policies provide methods to characterise (and therefore identify) high priority water resources and then apply commensurate levels of protection.

Given the national priority of protection of natural character (RMA section 6(a)), there is a consistent direction in the objectives and policies of the RPS and PRPS which flows through into the RFWP.

Policy 4.2.9 sets out the characteristics to be considered when considering the protection of the natural character of streams and wetlands. Policy 4.2.10 provides direction for the management of the natural character of the water bodies and their margins listed in Appendix 2. This includes all water bodies and river beds within the catchment of the Ōtaki River upstream of the Suspension Bridge at S26 958 402, and all river and lake beds and water bodies upstream of Park Boundaries marked on NZMS 260 series maps that have their sources in, and flow in the Tararua Forest Park. These catchments are outside the Expressway alignment, and upstream of points where the Expressway crosses the Ōtaki River.

Policy 4.2.11 requires adverse effects on freshwater environments to be avoided, remedied or mitigated. In particular, Policies 4.2.13 and 4.2.14 relate to the protection of nationally threatened indigenous aquatic plants and nationally threatened freshwater fauna. Parts of the area affected by the Project may contain nationally threatened plants and fauna but consideration of this has been given in determining the mitigation appropriate for the Project.

The aquatic ecology report (Technical Report 12, Volume 3) outlines that adverse effects on streams, and the species within them, can be avoided through effective implementation of the CEMP and ESCP. Where adverse effects of the Project are unavoidable, measures such as the creation of new wetlands within the stormwater swale system will mitigate for

the loss, such as the Ōtaki Railway Wetland. An adaptive management approach will be applied throughout the duration of the construction of the Project whereby any adverse changes that arise can be monitored and responded to accordingly.

The results of assessments carried out on all waterways throughout the Project area are outlined in Technical Report 12. These ecological values were one of the contributing factors that informed the decision-making process that led to the final alignment. A key aspect of this aspect of the decision-making process was the ability to avoid adverse effects on streams and wetlands, and where this could not occur, options were available for the remedying or mitigating of effects (including through offsetting).

The natural character of wetlands and rivers are preserved and protected (Objective 4.1.4) through the Project. The modification of freshwater environments such as wetlands, streams and rivers throughout the extent of the Project, will be appropriately mitigated by the implementation of riparian planting and restoration and through offsetting to compensate for any loss of wetland habitat.

Amenity Values and Access

Maintaining and enhancing access to lakes and rivers (and the coast) is to be recognised and provided for as a matter of national importance under section 6(d) of the RMA. Section 7(c) of the RMA also requires particular regard to maintaining and enhancing amenity values. Consequently, this is given a high status in the relevant planning instruments including the RFWP. Specifically, Objectives 4.1.7 and 4.1.8 and Policies 4.2.15 to 4.2.17 of the RFWP relate to amenity values and access.

Objective 4.1.7 outlines that the amenity and recreational values of wetlands, and lakes, and rivers are maintained, and where appropriate enhanced. The works proposed to remedy and mitigate adverse effects of the Project on freshwater environments will have a positive overall effect on amenity values.

There will be short term limitations imposed on access to various stretches of waterways during the construction of the Project due to safety reasons. However, alternative routes will be supplied and clearly signposted. After the construction of the Project is completed, there will be an overall enhancement in access to streams and their margins (Objective 4.1.8).

Policy 4.2.15 refers specifically to the water bodies identified in Appendix 5 of the RFWP in relation to their regionally important amenity and recreational values. The Ōtaki River, in the vicinity of the Project, is identified as being important for kayaking and angling. Further upstream reaches of the River are also identified as being important for rafting and tubing. The construction of the Ōtaki River Bridges will affect the amenity and recreational values associated with this section of the River. However, there are already two bridges, the current SH1 bridge and the Ōtaki River Rail Bridge. As such this stretch of the River has already been modified. The Project effectively 'groups' infrastructure together, minimising adverse effects that the bridges would have if located elsewhere on the River. The design of the bridges has been undertaken so as to minimise the presence and obtrusiveness of the structure. In addition, the proposed plantings around the bridge will lessen the visual impact.

Many of the streams which will be affected by the proposal currently have little riparian cover. Through the riparian and restoration measures proposed with the Project the overall amenity and recreational value associated with the freshwater environments will be enhanced (Objective 4.1.7).

Overall, while there are adverse effects on amenity values and access to and along watercourses, the mitigation proposed will provide an overall positive outcome. Consequently, the Project is assessed as being consistent with the relevant polices of the RFWP.

Flood Mitigation

Objectives 4.1.9 and 4.1.10 and Policies 4.2.18-4.2.22 are concerned with health and safety of the public and the effects of flooding both on natural and physical resources including people's property.

Hydrological investigations undertaken have improved the understanding of flood flows and the potential for adverse effects throughout the Project area. This information has informed the design of the Project and the mitigation measures proposed (Policy 4.2.20).

The design of the Project incorporates an elevated transport link across the floodplains of four waterways, and therefore effects on natural drainage. The design of the Project was undertaken on the basis of achieving hydraulic neutrality, whereby the effect of flood hazards should in general be no worse than the current situation. Measures by which this has been largely achieved include:

- Attenuation of swales and wetlands;
- Secondary containment bunds;
- Dry culverts within the Expressway embankment to allow for natural flow paths to be maintained;
- Low head culvert design; and
- Overflow weir sections incorporated into the road profile to provide a secondary means of water flow;

It is considered that the potential adverse effects of the Project on flood risk can be appropriately mitigated (Objectives 4.1.9 and 4.1.10 and Policy 4.2.18).

In addition, the proposed stormwater system will largely ensure that run-off from the Expressway will not exacerbate flood risks during significant rainfall events. Therefore, the Project is considered to be consistent with Objectives 4.1.9 and 4.1.10.

Use and Development

The use and development objectives and policies refer to the enabling aspect of the RMA, as set out in section 5, where people and communities are able to use and develop freshwater resources to provide for their social, economic and cultural well-being and for their health and safety (Objective 4.1.11).

Encouragement is also provided to activities that enhance freshwater resources (Objective 4.1.13) and recognition given to the adverse effects of the use and development of freshwater resources being avoided, remedied and mitigated (Objective 4.1.12).

With respect to lawful water users (Objective 4.1.14 and Policy 4.2.29) the NZTA has worked with the GWRC to understand the requirements of the Regional water supply, and the management of continuity of quality and supply of water during construction. Landowner access to water will also be provided, as required, by the NZTA (Policy 4.2.29).

There will be temporary adverse effects on water quality associated with the construction of the Project as discussed in Technical Report 12 Volume 3. However, these will be appropriately managed and mitigated and, in the long run, these will be countered by the riparian and restoration works that are proposed to be undertaken (Objectives 4.1.12 and 4.1.13, and Policy 4.2.23). Opportunities have also been identified where offsetting can be used to counter the loss of wetlands or adverse effects on waterways that cannot be avoided. The enhancement of freshwater resources is encouraged through Policy 4.2.27.

Conditions have been developed that offer an effective means through which adverse effects can be avoided, remedied or mitigated through the construction of the Project (Objective 4.1.17). Policy 4.2.34 seeks to avoid, remedy or mitigate effects by using conditions, and the policy explanation cross-references to section 108 of the RMA. Policies 4.2.35 and 4.2.36 set out the matters to have regard to when determining the

nature and extent of any conditions that may be imposed on a resource consent. Policy 4.2.33 seeks to provide for those activities which will have no more than minor adverse effects on the environment and sets out specific criteria (1) to (7) to assess an activity against.

Because of the comprehensive and integrated approach adopted in regard to the mitigation of adverse effects, it is considered that overall the Project is consistent with the Objectives and Policies relevant to use and development of water resources.

Water Quality and Discharges to Fresh Water

The Water Quality objectives emphasise the sustainable management of freshwater resources (Objective 5.1.1 and 5.1.2), and also specify that the quality of water, as far as possible, is consistent with the values of the tangata whenua (Objective 5.1.3).

The Project design has sought to maintain and, in some cases, enhance water quality. There will be some temporary adverse effects on water quality during construction which will be appropriately managed and mitigated. However, there will be a long-term positive effect on water quality as a result of stormwater treatment that is not more than minor, riparian re-vegetation and native planting. The mitigation as part of the Project will result in a long term benefit (Objective 5.1.1 and 5.1.2; Policy 5.2.1).

Water quality was identified by Nga Hapū o Ōtaki as an important aspect for which tangata whenua have a strong interest (Technical Report 19, Volume 3 of the AEE report). On-going involvement will be maintained throughout the construction of the Project to ensure that the values of tangata whenua regarding the quality of water are recognised (Objective 5.1.3).

The water quality of streams affected by the Project will be managed during the construction phase to appropriately avoid and mitigate adverse effects. It is anticipated that for some streams the proposed riparian planting and mitigation will result in medium to long-term benefits (Objective 5.1.2 and Policy 5.2.6). Policy 5.2.9 relates to water bodies in which water is to be enhanced, and the Mangaone Stream is identified as one such water body. As with other waterways, enhancements of the waterway will be achieved through riparian plantings and restoration works and incorporating fish passages where appropriate.

The Project design incorporates swales and attenuation wetland areas along the Expressway alignment to capture stormwater discharge and treat this water as it moves westward towards the coast. Policy 5.2.14 encourages the treatment of stormwater discharges and the Project is consistent with this approach. The operation of the stormwater system will be carried out in a way that appropriately manages the quality of the discharge.

Policy 5.2.10 allows for consideration of applications to discharge contaminants where they do not satisfy Policies 5.2.1 to 5.2.9, subject to criteria (1) to (5). Although there will be some adverse construction effects on water quality, it is considered that the Project will meet these criteria because the construction works are temporary in nature and will be appropriately managed through the CEMP.

As part of the CEMP, the position of the refuelling, machinery storage and construction are not to be in close proximity to surface water bodies. As a precaution, the CEMP also requires contractors to have an agreed accidental spill management process in case a spill event should happen, to ensure that contractors will be able to minimise the effects of any event.

Overall, it is considered that the Project is consistent with the Water Quality objectives and policies.

Water Quantity

Objectives 6.1-6.1.4 and Policies 6.2.1–6.2.19 set out the water quantity objectives and policies in chapter 6 of the RFWP. These relate to the taking, use, damming or diversion of freshwater.

The Project involves the temporary diversion of water courses during construction stages, the effect of which will be low in the short-term and neutral to positive following completion of mitigation works (Objective 6.1.1 and Policies 6.2.1 and 6.2.2). Three of the watercourses that the Project will traverse are listed under Policy 6.2.1 which stipulates minimum flows and water allocation, these watercourses being the:

- Waitohu Stream;
- Ōtaki River; and
- Mangaone Stream.

The parameters of Policy 6.2.1 have been considered in the development of the Project.

To ensure that appropriate mitigation measures are triggered in the event that actual changes to groundwater levels differ from those predicted, a monitoring programme will be implemented prior to the commencement of construction.

Geotechnical investigations (Technical Report 4, Volume 3) have confirmed areas throughout the alignment that require ground improvements. For this to be undertaken localised groundwater levels are required to be lowered. This is not expected to have an adverse effect on the environment, or on groundwater takes and will be undertaken with the aquifer allocation limits outlined in Policy 6.2.3.

To provide water supply for the construction phase of the Project, it is proposed to install four bores in appropriate locations to access groundwater. It is not anticipated that surface water will be required, beyond that held in sediment control structures. The use of groundwater as a preference to surface water recognises the importance of maintaining quantity for ecological, recreational and amenity values in line with Policy 6.2.7. The construction of bores/wells required for the Project will avoid damage to and contamination of the underlining aquifer (Policy 6.2.4). Extractions from bores will seek to avoid any significant adverse effects on other nearby bores and on surface water (Policy 6.2.8).

Temporary diversions will be utilised throughout the construction stages of the Project. This may have localised adverse effects in the short term but in the long term these will be minimal (Policy 6.2.14).

Diversion of water between catchments is not proposed as part of the Project. This accords with tikanga Māori (Policy 6.2.16).

The Project is not considered to have any significant adverse effects on river flows, water levels in wetlands or on groundwater yields (Policy 6.2.17). In areas where effects are unavoidable, such as the loss of the Railway Wetland, riparian planting, restoration and offsetting have been utilised so that there are no net environmental losses as a result of the Project.

Overall, it is considered that the Project will be consistent with the water quantity objectives and policies of the RFWP.

Use of the Beds of Rivers and Lakes and Development on the Floodplain

Objectives 7.1.1-7.1.4 and Policies 7.2.1-7.2.15 of chapter 7 are particularly concerned with appropriate use of the beds of lakes and rivers while avoiding, remedying or mitigating any adverse effects and being consistent with the values of tangata whenua. Maintaining flood mitigation works is also recognised.

The Project involves activities and installing structures in the beds of streams. Policy 7.2.1 is relevant because it seeks to allow for particular uses within river and lake beds where adverse effects can be avoided, remedied or mitigated (with reference to Policy 7.2.2), which include:

- *structures for transportation and network utility purposes;*
- *structures for activities which need to be located in, on, under, or over the beds of rivers and lakes;*
- *the diversion of water associated with activities that are otherwise authorised; and the enhancement of the natural character of any wetland, lake or river and its margins.*

The integrated engineering and environmental team design process, comprising a wide range of technical specialists, has enabled a continuing refinement of the Project design and the approach to avoiding, remedying or mitigating any adverse effects on the environment (Objective 7.1.1).

Policy 7.2.1 seeks to provide for particular uses within river and lake beds provided that any adverse effects are avoided, remedied or mitigated and that the significant adverse effects identified on the matters and values in Policy 7.2.2 are avoided. Policy 7.2.2 lists the following:

- *the values held by tangata whenua; and/or*
- *natural or amenity values; and/or*
- *lawful public access along a river or lake bed; and/or*
- *the flood hazard; and/or*
- *river or lake bed or bank stability; and/or*
- *water quality; and/or*
- *water quantity and hydraulic processes (such as river flows and sediment transport); and/or*
- *the safety of canoeists or rafters.*

Objective 7.2.2 outlines that the risk of flooding should not be exacerbated by locating structures on the beds of rivers and lakes or on the floodplain. The Expressway embankment will bisect the floodplains and traverse several water courses throughout the Project area. Technical Report 9, Volume 3, outlines the approach of achieving hydraulic neutrality and how the effect of the Expressway on flooding is mitigated via the incorporation of measures such as dry culverts to allow for natural flow paths to be maintained. The flood mitigation structures have been developed using hydrological modelling (Technical Report 9) to provide a holistic approach for addressing effects on flooding (Policies 7.2.3 and 7.2.4).

The Project will not compromise the functioning of existing flood mitigation structures (Objective 7.2.3 and Policy 7.2.7). The design of the Project has incorporated this into the flood mitigation proposed.

As outlined in Technical Report 12, Volume 3, several watercourses will be altered through the use of culverts or moving the stream route. The Project incorporates extensive areas of protection and restoration to mitigate for this loss (Objective 7.1.1 and Policy 7.2.2).

While it is expected that the construction period will result in some adverse effects on the beds of streams and rivers throughout the Project area, the CEMP and the various specific management plans will minimise these. Overall, through the remediation, restoration and offsetting there will be an improvement in water quality and in the quality of in stream habitats. Therefore, the Project is considered to be consistent with the objectives and policies of chapter 7 of the RFWP.

33.5.2 Regional Air Quality Management Plan

The RAQMP applies to discharges to air in the whole of the Wellington Region, excluding the coastal marine area and sets out objectives and policies to manage these discharges.

Table 3-2 in chapter 3, provides further detail on the type and activity status of the relevant regional consents required, with all discharges to air submitted as being permitted activities. The following assessment is however provided for completeness.

Objective 4.1.1 of the RAQMP aims to maintain and protect the high quality air in the Region, enhance degraded air quality, and ensure there is no significant deterioration in ambient air quality. Objective 4.1.2 aims to manage (avoid, remedy and mitigate) adverse effects from air discharges.

The assessment of the RAQMP is relevant to the Project because of the anticipated air discharges associated with the construction activities. Policies 4.2.6, 4.2.7, 4.2.14 and 4.2.15 provide direction on the analysis of effects, sensitive environments, and best practice (minimise at source). Policies 4.2.22 and 4.2.23 are also noted in terms of their reference to effects of discharges to air from mobile transport sources, the promotion of improved air quality through different modes of transport and reduction of motor vehicle congestion in urban centres.

An evaluation of the effects of the Project on operational air quality, and air quality during construction is included in Technical Report 13, Volume 3. Based on these assessments the Project is considered to be consistent with the intent expressed in the relevant objectives and policies for the following reasons:

- Air Quality: overall, the Project is expected to improve air quality in the Project area, partly as a result of improved traffic flows and corresponding reductions in traffic emissions, as well as due to improvements in vehicle technology;
- Reductions in concentrations of vehicle air pollutants are expected:
  - along the existing SH1 through the Ōtaki Railway Retail area; and
  - along the western side of the main arterial road through Te Horo;
- Significant increases are not expected at the South Ōtaki interchange;
- Minor increases in concentrations are expected:
  - to receptors within 200m of the Expressway through Ōtaki township; and
  - along the eastern side of the Expressway through Te Horo;
- Increases in concentrations are expected to be well below air quality assessment criteria, and no mitigations are proposed for operational effects to air quality; and
- Effects from construction - Project construction has the potential to generate dust which may have an adverse effect on air quality, particularly during the large scale earthworks. This potential effect is proposed to be mitigated to an acceptable level through the dust management measures detailed in the CAQMP (Appendix B of the CEMP, Volume 4).

33.5.3 Regional Coastal Plan

There are no activities or structures proposed to be undertaken within the CMA, and no resource consents are required for works in the CMA. There are also no anticipated direct effects on marine ecological values due to the construction or operation of the Project as the alignment is located some considerable distance (3 to 4 kilometres) from the marine environment. Potential effects could occur during the construction and operational phases of the Project as a result of run-off to the Ōtaki River and other streams the Expressway crosses, which in turn discharge to the marine environment. However, given the proposed mitigation measures, any such discharges will be minimal and any effects on the marine

environment indiscernible (refer chapters 18 and 20, Volume 2, and Technical Reports 10 and 12, Volume 3).

The overall conclusion is that the Project does not raise issues of concern in relation to the objectives and policies of the Regional Coastal Plan, including the objectives and policies relating to: managing land based activities within the CMA; the discharge of contaminants to coastal water; or tangata whenua values associated with the CMA.

33.5.4 Regional Plan for Discharges to Land

The RDLP applies to the whole of the Wellington Region, except the coastal marine area, and manages discharges of contaminants to land, both solid (such as contaminated soil) and liquid (such as stormwater and human effluent), to ensure that the receiving environment is sustainably managed. Discharges of particular relevance to the Project that are regulated under the Plan include:

- disposal to land of any contaminated material; and
- discharge of hazardous substances (including pesticides, waste oil, discharges from contaminated sites).

The Project has been assessed against the RDLP objectives and policies, and Policies 4.2.1, 4.2.8, 4.2.30 and 4.2.41-4.2.49 have been identified as being relevant to the assessment. These policies address matters relating to waste management and the management of identified contaminated soil, particularly its use, capping and/or disposal.

The following principal points are noted:

- The NZTA implements a general Environmental Plan that contains objectives on resource efficiency (Objective RE1 and RE2) and aims to manage waste in a cost effective and sustainable manner. Consequently, the waste generated during the construction of the Project would be managed, taking into consideration the waste management hierarchy to reduce, re-use, recycle and recovery, along with responsible disposal of residual waste. This consideration of waste minimisation and management will be consistent with Policy 4.2.1 and Policy 4.2.8.
- Policy 4.2.30 seeks to reduce the environmental effects of unplanned discharges of hazardous substances. The CEMP includes methods to ensure best practice is implemented with respect to the use and application of hazardous substances, and to reduce the risk of unplanned hazardous discharges occurring (refer Volume 4).
- Policies 4.2.44 – 4.2.49 address the identification, use and management of contaminated sites. The specialist assessment (chapter 23, Volume 2) has identified five sites with potential for ground contamination:
  - Ōtaki Railway Station: current and historic railway maintenance and operation activities. Potential sources of contamination within the Project corridor;
  - Ōtaki railway sidings: current or historic railway maintenance and operational activities. Potential sources of contamination within the Project corridor;
  - Winstone Aggregates: current and historical maintenance, operational and fuel storage activities. Potential sources of contamination within the Project corridor;
  - Clifden: historic fuel storage and potential for septic tanks. Potential sources of contamination within the Project corridor; and
  - Mary Crest: historic fuel storage and potential for septic tanks. Potential sources of contamination within the Project corridor.

Detailed investigations and resource consents for the management of soil contamination will be applied for following detail design.

With the implementation of these measures, the construction and operation of the proposed Expressway is consistent with the objectives and policies of the RDLP.

33.5.5 Wellington Regional Soil Plan

The RSP manages soil and vegetation disturbance activities for the purpose of soil conservation and water quality. Consents relating to earthworks and land disturbance are being sought for the Project, and Table 3-2 in chapter 3 provides further detail on the type and activity status of the relevant consents required.

This section includes an assessment of these proposed works against the relevant objectives and policies of the RSP. It is noted that many of the objective and policy matters identified in the RSP are consistent with, overlap those identified in the NZCPS, PRPS and RFWP.

The assessment of the Project against the RFWP is particularly relevant because, during its construction, the Project is a large-scale earthworks site and the consideration of effects is directly related to the in-stream health of the freshwater habitats in the Kāpiti district. The themes in the objectives and policies of the RFWP and the RSP are similar, and the conclusion of the assessment of the proposal against the RSP is therefore similar. The objectives and policies contained in Section 4 of the RSP are all considered to be directly relevant to the assessment of the Project.

The following matters are relevant:

- Objectives 4.1.8, 4.1.9, 4.1.10 and 4.1.11 promote avoiding, remedying and mitigating the effects of vegetation removal and earthworks, with a particular emphasis on riparian vegetation. The Project is consistent with this approach, and a flexible conditions framework involving the use of management plans and performance standards to promote this approach during construction is sought.
- Policy 4.2.2 requires the consideration of locating activities which have the potential for irreversible effects on soils, in certain areas, in particular where there are soils of low versatility. While consideration of the soil versatility is one element in the overall determination of the Project location, the ultimate decision is that the Expressway be located where proposed for a range of reasons, and as a result, the Expressway will cross Class I and II soils and will impact on the future ability of these soils to be used for other activities.
- A draft ESCP has been prepared (refer Appendix C, Volume 4 of the AEE report). The ESCP is consistent with both GWRC and the NZTA's erosion and sediment control guidelines and is therefore consistent with Policy 4.2.15 and 4.2.16. Erosion and sediment control principles incorporated into the ESCP include:
  - minimising disturbance;
  - staging construction;
  - protecting steep slopes;
  - protecting water bodies;
  - progressive and rapid stabilisation of disturbed areas;
  - controlling surface water; and
  - using sediment retention devices.
- As more detailed design occurs as the Project progresses, site-specific environmental management plans will be prepared and implemented prior to construction.
- Landscape and visual measures to mitigate the effects of the Project on landform are also proposed. These were derived from the assessment of landscape and visual effects that was undertaken (refer Technical Report 8, Volume 3 of the AEE report) and involve, in particular, the shaping of the bunds and screen planting.

- Mitigation planting is proposed along significant portions of the Expressway. The integrated approach to the design and plant mix specifications of the proposed planting will achieve a result that respects ecological, landscape and cultural values. The vegetation will also help improve long term soil conservation values, an outcome which would be consistent with Policies 4.2.13 and 4.2.14.

With the implementation of the above measures, the construction and operation of the Project would be consistent with the objectives and policies of the RSP.

33.6 Kāpiti Coast District Plan 1999

The list of considerations for requirements, as set out in Section 171 of the RMA, include, amongst other matters, having particular regard to any relevant provisions of a district plan or proposed plan. The NoRs by the NZTA and KiwiRail relate to land managed under the provisions of the KCDP.

33.6.1 Existing Designations

The KCDP includes the following (existing) designations that are potentially relevant to the Project:

- Designation D010 - the existing SH1 through the district. The NZTA is the requiring authority.
- Designation D0301 - the existing NIMT railway through the district. New Zealand Railways Corporation / KiwiRail is the requiring authority.
- Designation D0404 – Chrystalls Extended Stopbank. GWRC is the requiring authority.
- Designation 0901 – Telecommunication and radio communication and ancillary purposes. SHI, Te Horo. Telecom NZ Ltd is the requiring authority.
- Designation D1135 – district-wide (local) roads. KCDC is the requiring authority.
- Designation D1120 – Water supply Hautere/Te Horo Bores and treatment plant. KCDC is the requiring authority.
- Designation D1121 – Ōtaki Water Bores (1), (2) and (3). KCDC is the requiring authority.

The NZTA will need the prior written consent of the Telecom NZ Ltd and KCDC as the respective requiring authorities in relation to Designations D0901, D1135, D1120 and D1121, if the Project has any effect on those designations. It is understood that there will be no effect on Designations D0901, D1120 and D1121.

In respect of Designation D0301 - the existing NIMT railway, the relevant section of the NIMT at Ōtaki is to be realigned. This is intended to occur prior to the construction of the Expressway, so that part of the existing designation can be removed and/or written consent provided by KiwiRail to enable the Expressway to proceed in that location.

33.6.2 Zones

The Expressway alignment traverses the following zones:

- Rural;
- Residential; and
- River Corridor.

In addition to these underlying zones, there are a number of other KCDP items that are located under or closely adjacent to the Project footprint:

- outstanding natural landscape (Ōtaki River);[58]
- B1 Ōtaki Railway Station;
- B54 Once Te Horo Railway Station;
- K037 Cottle's Bush;
- K038 Hautere Bush F;
- K134 Ōtaki Railway Wetland; and
- G10 Te Horo "abandoned" sea cliff.

There are a number of objectives and policies contained in the following sections of the KCDP that are of relevance to the Project:

- Residential Zone (C1.1);
- Rural Zone (C.2.1);
- Tangata Whenua (C.6.1);
- Earthworks (C7.3.1);
- Heritage (C.8.1);
- Landscape (C.10.1);
- Ecology (C.11.1);
- Noise (C.14.1);
- Natural Hazards (C.15.1); and
- Transport (C18.1).

The assessment that follows has had regard to these provisions, which are referenced where appropriate.

Residential Zone

The objectives and policies relating to the Residential Zone seek to maintain the character and amenity of those areas.

Whilst the Expressway and the realigned section of the NIMT generally follow the alignment of the existing SH1 and NIMT, at Ōtaki an area of residential land and approximately 12 existing houses will need to be removed. The total number of existing houses that will need to be removed over the full length of the Project is approximately 30.

North of Rahui Road/Mill Road, where the route lies to the west of the existing SH1, a number of residential properties will 'back onto' the Expressway. Whereas at present some of these properties' outlook to the west is across a dune landscape, the Expressway will be a significant new element in the landscape. A range of mitigation measures relating to visual and noise mitigation are proposed to reduce the loss of residential amenity as far as practicable. Other measures include addressing construction-related effects through the implementation of relevant site-specific environmental management plans.

[58] Note the identification applies to the upper reaches of the Ōtaki River (refer Planning Map 22) and not the section of the river in the vicinity of the SH1 and NIMT bridges (refer Planning Map 18). The latter section of the Ōtaki River is subject to Designation D0404 "Chrystalls Extended Stopbank", for which the GWRC is the requiring authority.

Rural Zone

For much of its route, the Project traverses rural zoned land. Some of the land is used for agricultural or horticultural purposes, while some is developed into 'rural life style' blocks. At Te Horo, the settlement is a significant feature on rural zoned land.

The primary objective for the Rural Zone is:

> *Objective 1.0 General - Ensure that any effects of activities on the natural and physical environment of rural areas and of rural based activities beyond this environment are avoided, remedied or mitigated with particular regard to sustaining the life supporting capacity of the resources of the land to meet the needs of future generations.*

The new Expressway will 'sit' in this rural landscape and therefore be a significant new feature. Some rural zoned land will be 'lost' to roading purposes. Some stands of native vegetation adjacent to the Expressway will be affected.

Avoidance and mitigation measures will reduce the significance of the adverse effects on the rural land resource and its associated character and amenity values. These measures will include:

- avoidance of wetland and bush areas (e.g. at Mary Crest);
- screen planting of native species;
- landscaped bunds;
- planting of replacement shelter belts and amenity tree planting; and
- landscape and ecological mitigation planting to reinstate the exposed western edges of the various stands of native vegetation.

The aim is to integrate the Project into its 'receiving' environment to the greatest extent possible.

A ULDF – refer Technical Report 23, Volume 3 of the AEE report, has been prepared to 'guide' the integrated design process.

33.6.3 Tangata Whenua

In relation to tangata whenua the KCDP (Objective C.6.1) adopts similar wording to that in Part 2 of the RMA with reference to taking into account the principles of the Treaty of Waitangi, having particular regard to kaitiakitanga, and ensuring the relationship of tangata whenua with the natural environment is recognised and provided for.

In relation to tangata whenua 'representation', Policy 1 under Objective C.6.1 states:

> *Recognise Te Runanga o Toa Rangatira Inc., Te Runanga o Raukawa Inc., and Ati Awa ki Whakarongotai Inc. as the authorised voices of tangata whenua.*

The attached explanation is that Te Runanga O Raukawa Inc is the recognised iwi authority for "Ōtaki/Te Horo".

Consultation with the resident Ngati Raukawa hapū in Ōtaki, Nga Hapū o Ōtaki, commenced in early 2010 and continues throughout the development phases of the Project. This engagement and consultation provided the NZTA with an understanding of the cultural values of the site and the wider locality. Thus, tangata whenua have been a key stakeholder since the commencement of Project investigations and have influenced the shaping of the final Project and mitigation measures. The NZTA considers that the process and outcomes of the Project demonstrate recognition of principles of the Treaty of Waitangi (the partnership between tangata whenua and the NZTA as a Crown agency).

Tangata whenua through the process of early engagement and consultation were provided with opportunities to influence the design of the Project at a number of key stages. From the NZTA perspective, this process of engagement and consultation informed the design

team, including the various specialists, about the issues that were of primary interest to tangata whenua.

An outcome of the consultative processes engaged by NZTA is the preparation of the CIA (Technical Report 19, Volume 3 of the AEE report), which was prepared by tangata whenua, which concludes that:

- Nga Hapū o Ōtaki /Ngati Raukawa views the Expressway as not interfering with our kaitiakitanga.

On this basis it is concluded that the Project is consistent with the KCDP objectives and policies in relation to tangata whenua.

33.6.4 **Earthworks**

The KCDP's objectives in relation to earthworks seek to:

- maintain the district's natural landforms by ensuring that adverse effects of earthworks on the natural, physical and cultural environment are avoided, remedied or mitigated (Objective C.7.3.1);
- avoid, remedy or mitigate the adverse effects of earthworks on outstanding landscapes (Objective C.7.3.2); and
- protect sites of significance to tangata whenua from inadvertent destruction causes by earthworks (Objective C.7.3.3).

The Project involves significant earthworks. However, the earthworks generally do not involve significant landform modification. This is because for much of its length the Expressway sits relatively flat in the landscape. An area where this is not the case is in the section immediately north of Rahui Road and where the Expressway crosses dune landforms. The adopted design approach has been to minimise the extent of the earthworks, but where they are necessary to reflect natural contours to the greatest extent practicable.

No outstanding landscapes are affected by Project earthworks (Objective 2).

In relation to Objective 3, the cultural impact assessment prepared by Nga Hapū o Ōtaki (refer Technical Report 19 of Volume 3 of the AEE report) identifies the potential for unknown sites of significance being located between Taylors Road and Rahui Road, including in the dune landform. Careful monitoring of earthworks in this location is proposed.

At paragraph 14.3 the further comment is made that:

> *In addition, and for the whole route, there should be a detailed protocol established with Nga Hapū o Ōtaki to manage the process of earthworks and the protocols in the event that any koiwi or taonga are unearthed during development. The transplanting of soil from one area to another is a permitted activity except where accidental discoveries have occurred.*

The NZTA is entering into a MoU with Nga Hapū o Ōtaki in relation to the further development and construction of the Project. The MoU will anticipate finalisation of an ADP, which will also be covered by appropriate conditions on the designation and any related resource consents.

The intended actions are consistent with earthworks Policy 3, which is:

> *Protect sites of significance to Tangata Whenua from inadvertent destruction by earthworks.*

The 'explanation' to Policy 3 emphasises that:

To prevent destruction of these sites inadvertently from earthworks it is important that a mechanism exists to protect these sites from further damage if discovered during earthworks.

As set out above, appropriate mechanisms will be in place.

33.6.5 Heritage

The two KCDP listed heritage buildings directly affected by the Project are the Ōtaki Railway Station (B1) and the former Te Horo Railway Station building (B54). In relation to these two buildings the specialist technical assessment records (refer Technical Report 18, Volume 3 of the AEE report):

- Ōtaki Railway Station: the Project includes a slight realignment of the NIMT, which in requires the equivalent realignment of the station to suit. As the assessment concludes: *Heritage values of the station will be retained intact if the full extent of the platform and verandah is realigned with the new alignment of the building*.
- Former Te Horo Railway Station: although the setting of the building will be affected by the Expressway as it will be located approximately 40 metres from the building, there will be no physical effects or loss of fabric. Also, the association of the building to its original site was lost when it was relocated in 1971. While the building is considered to have moderate to high architectural and historical values, the effects of the Expressway on those values are assessed to be less than minor.

As discussed in section 33.4 above in relation to regional (PRPS) policy on protecting 'historic heritage', although not listed as a heritage items in the KCDP, a number of other buildings and structures with historic heritage value are affected to a greater or lesser extent by the Project.

However, with the implementation of the recommendations of the specialist heritage advisor, the heritage outcome is positive given that the various buildings and structures to be 'protected', including Clifden at Bridge Lodge and the beehive pottery kilns at the former Mirek Smišek pottery at Te Horo.

The Project is therefore consistent with Objective 1.0 General:

To identify and protect heritage features of significance to the Kāpiti Coast District

And also with Objective 2.0 Adjacent Land:

To recognise the relationship a heritage resource may have with the land surrounding the resource.

33.6.6 Landscape

The Landscape objective is:

Objective C.10.1 - That the District's outstanding landscapes are identified and protected from adverse environmental effects of subdivision, use and development.

The four related policies include:

Policy 1 - Ensure new buildings, structures, services and earthworks within outstanding landscapes are located so that they will not be visually dominant (e.g. below the dominant ridgeline where practicable).

Policy 3 - Ensure no dune or landform modification takes place within outstanding landscapes of the open space, rural and residential zones, except to the minimum necessary for roading, access, provision of services, building site and farming purposes.

Policy 4 - Ensure the following landscapes are protected from inappropriate subdivision, use and development through controls on subdivision and land uses.

The one 'outstanding landscape' potentially affected by the Project is the landscape of the Ōtaki River (Policy 4). However, the identification applies to the upper reaches of the river (refer Planning Map 22) and not the section that the Expressway bridges cross. However, and notwithstanding that the section of the Ōtaki River at the point of the bridge crossing is not within the outstanding landscape area, the design approach has been to locate and design the structures so that they sit as low as practicable in the landscape thus reducing their visual impact.

The specialist technical assessment (Technical Report 8, Volume 3 of the AEE report) notes that the section of the Ōtaki River landscape that the Expressway will cross is already affected by the existing SH1 and NIMT railway bridges and the modification associated with the gravel extraction plant (Winstone's Aggregates). Whilst acknowledging the potential for cumulative effects associated with the placement of two further parallel bridges in close proximity to the existing bridges, the assessment concludes that the effect of the new bridges is 'low'.

33.6.7 Ecology

The ecology (natural environment) objective seeks to protect and enhance the 'ecological integrity' of the district (Objective C.11.1.1).

Of the 13 related policies the following are considered particularly relevant to an assessment of the Project:

C.11.1.1 Identify and protect significant sites of flora and fauna.

C11.1.2 Ensure that potential or adverse effects on the natural environment from subdivision, use and development are avoided, remedied or mitigated.

C11.1.4 Ensure significant native vegetation is not removed and any disturbance is avoided, remedied or mitigated.

C11.1.5 Ensure that the effects of subdivision, land use and development activities do not alter the water table of significant wetlands and lakes to a significant extent.

C11.1.8 Encourage planting of locally sourced indigenous species adjacent to water bodies and other areas that will restore linkages and ecological corridors.

C11.1.10 Advocate for the protection of areas identified as suitable for providing linking corridors for fauna.

The Project is in close proximity to three identified ecological sites:

- K037 Cottle's Bush;
- K038 Hautere Bush F; and
- K134 Ōtaki Railway Wetland

The specialist assessment that has been undertaken (Technical Report 11 "Terrestrial Ecology", Volume 3 of the AEE report) has assessed the degree of impact on these sites, which are each ranked as having "district significance".

The following points are noted:

- K037 Cottle's Bush: a few mature trees are lost from the extreme western edge of the bush remnant. The degree of effect is assessed as 'minor' due to the relatively low value of the trees.
- K038 Hautere Bush F: between 40 and 60 mature native trees are lost from the western edge of the bush remnant. The degree of effect is assessed as being 'more than minor' due to the number of trees lost.
- K134 Ōtaki Railway Wetland: most of the wetland is lost. The degree of effect is assessed as 'more than minor' due to the scale of loss. The reason for the loss not

being assessed as 'significant' is due to the relatively poor condition of much of the wetland.

The recommended mitigation measures include:

- Creating areas of new wetland within the designation to compensate for the loss of most of the Ōtaki Railway Wetland (K134). One will be created nearby to the west of County Road (c.0.4ha), and a new area of wetland adjacent to the Mary Crest bush (c.0.7ha). The cumulative area of these three wetlands is c.1.1ha. The new areas to be created exceeds the area that will be lost. The technical assessment concludes that, given the modified nature of the wetland lost, it is expected that the new wetlands will rapidly achieve values at least comparable to that lost.
- In relation to the bush remnant areas, it is recommended that where mature native trees are removed from the existing edges of areas of remnant bush wind breaks should be planted along the edge to provide protection. The specialist assessment recommends that these should be dense plantings of fast growing wind tolerant species (e.g. ngaio, kanuka, wineberry, Pittosporum tenuifolium and Coprosma repens). The trees should be sourced from the coastal zone to ensure that they are genetically adapted to wind tolerance. Ideally the wind break should be at least 10m wide and so where there is limited room within the designation to plant on the flat, the Expressway embankments should be planted. Additionally to mitigate the relatively small 0.5 ha loss of native bush, the specialist assessment notes that there are a number of existing bush areas in the vicinity of the Expressway that are presently under threat from grazing and/or plant and animal pests. By fencing and covenanting such areas to ensure their long-term protection the long-term viability of such areas could be significantly enhanced. Alternatively, new areas of bush totalling at least 1.5 ha could be planted.

In addition to the effects on the identified sites (K037, K038 and K134), a number of other areas of significant bush and/or wetland have been 'protected' through redesign of the Expressway route to 'avoid' these areas. In particular an area of significant forest and wetland at Mary Crest has been avoided through route realignment. This is a positive outcome supported by tangata whenua.

Overall, although these is some loss of indigenous bush and wetland, given the proposed mitigation measures the overall residual effect, post-mitigation, is consistent with the KCDP's objectives and policies relating to ecology.

33.6.8 **Noise**

In relation to noise, Objective C.14.1 and the related policies (C.14.1.1 – C14.1.3) require that consideration is given to the effect of noise from non-residential activities on the amenity, character and health of residents in residential and rural environments, and that any adverse effects are avoided, remedied or mitigated.

Objective C14.2 is specific in relation to traffic noise. The objective is:

> *Ensure that the adverse effects of road traffic noise on the amenity values of the residential environment are avoided, remedied or mitigated.*

Related policies C14.2.2 and C14.2.4 are specific to new roads:

> *Policy C14.2.2 Ensure that new roads, in locations which may result in excessive traffic noise at existing or predicted residential sites, shall be designed to avoid, remedy or mitigate adverse effects of traffic noise in the residential areas without restricting the movement of traffic.*

Policy C14.2.4 Ensure that the adverse effects of road traffic noise generated from new roads, on the inhabitants of existing residential accommodation, are avoided, remedied or mitigated.

As the Project has the potential to cause adverse road-traffic noise and rail noise and vibration effects, a full assessment of these potential effects has been undertaken (refer Technical Report 14, Volume 3 of the AEE report).

For road traffic, this assessment includes both the Expressway and the new local arterial road and other local roads which are either being built or altered to accommodate the Expressway. For rail traffic the assessment is for the section of the NIMT being realigned through Ōtaki to make room for the Expressway.

For road-traffic noise, the assessment method from NZS 6806:2010 was used. For rail and noise vibration, criteria based on KiwiRail's reverse sensitivity guidelines were used[59].

The Expressway route closely follows the existing SH1 and NIMT through both rural and urban areas. A number of PPFs affected by the Project are already subject to high levels of road-traffic and rail noise from the existing SH1 and NIMT.

In many instances there will be a reduction in sound levels due to the Project. In some other instances there will be a slight increase in road-traffic noise levels. With the mitigation proposed, the road-traffic noise will be at reasonable levels defined by NZS 6806, and rail noise will be within reasonable levels determined from KiwiRail's reverse sensitivity guidelines.

There will be a significant improvement in the acoustical amenity of the Ōtaki Railway Retail area with the reduction in through traffic, and in particular HCVs. There will also be a significant reduction in noise for those properties directly accessing the existing SH1 at Te Horo.

Mitigation has been recommended in some locations to reduce potential effects. OGPA (or similar) will be used as an appropriate form of noise mitigation for the road surface through Ōtaki. Building treatment has been identified as being appropriate at one PPF near Te Horo to protect the premises from road-traffic noise, and two PPFs in Ōtaki to protect them from rail noise. For the remainder of the Project no specific noise mitigation is proposed.

One particular positive effect, given the removal of the level crossings at Rahui Road and Te Horo, will be the 'removal' of warning bells and the need for trains to sound their horn as they approach the crossings.

Based on the above conclusions reached by the technical assessment, it is concluded that the Project is consistent with the KCDP's objectives and policies relating to noise.

33.6.9 **Natural Hazards**

The KCDP records that the Kāpiti district is susceptible to natural hazards which include earthquake and geological hazards, coastal hazards and flood hazards.

As the Project is set back from the coast by a considerable distance it is not expected that there will be any effect from coastal hazards, including tsunamis.

In respect to earthquake and geological hazards these are addressed in Technical Report 4, Volume 3 of the AEE report and are summarised in section 33.4.1 above when addressing PRPS objectives and policies on natural hazards. The overall conclusion is that the Expressway will have a good level of resilience to major earthquakes that are possible in the region.

[59] Refer Technical Report 14, Volume 3 of the AEE report.

Potential flood hazards have been addressed in detail in Technical Report 9, Volume 3 of the AEE report, and is also addressed in chapter 17, Volume 2 of the AEE report.

The Expressway crosses four significant waterways within the Ōtaki Coastal Plain: the Waitohu and Mangapouri Streams, the Ōtaki River and the Mangaone Stream.

The design approach of the Project is based around achieving hydraulic neutrality (i.e. no exacerbation of the existing situation), taking into account both the barrier posed by the Expressway to overland flow paths across floodplains and the loss of floodplain storage under the footprint of the Expressway. For these waterways the increased run-off from the Expressway is negligible in comparison to the volume of flood flows.

As Technical Report 9 records, detailed hydrological and hydraulic modelling has been undertaken to inform the design and environmental assessment process. As a result of this closely integrated process, the majority of potential adverse effects have been avoided through refinement of the Expressway design. In summary, with the proposed design and mitigation, it is concluded that:

- The effects of the Expressway crossing of the Waitohu Stream and floodplain are no more than minor.
- The effects of the proposed crossing of the Mangapouri Stream including the Rahui Road local link connection are no more than minor.
- The effects of the proposed crossing of the Ōtaki River will be no more than minor. The effects on the Ōtaki River floodplain will be greater in areas to the east of the Expressway that are used for pasture; but effects on populated areas to the west of the Expressway will be little or no worse than the existing situation.
- The effects of the Expressway crossing of the Mangaone Stream and floodplain will be no more than minor. Proposed modifications in School Road, in partnership with KCDC, will reduce an existing flood nuisance to a number of residential properties.

Objective C15.1.1 and related policies C15.1.1.1, C15.1.1.2 and C15.1.1.6 are relevant. The focus is on avoiding, remedying and mitigation actual and potential adverse effects arising from development within the vicinity of a natural hazard. Given the conclusions reached in the technical assessments, as summarised above, it is concluded that the Project is consistent with the KCDP's objectives and policies for natural hazards.

33.6.10 Transport

Transport Objective C18.1.1 is particularly relevant to the Project as it seeks to:

> *... achieve a transport infrastructure that provides for efficient and safe movement of people and goods throughout the District and which avoids, remedies or mitigates adverse effects of existing and new transport routes.*

Related policies which are also particularly relevant are:

> *Policy C1.18.1.2 Designate new routes which are an essential part of the future Kāpiti Coast roading network, as determined by roading authorities.*
>
> *Policy C1.18.1.11 Ensure the adverse effects of earthworks associated with new roads are avoided, remedied or mitigated (refer C.7.3 Earthworks).*
>
> *Policy C1.18.1.12 Protect the existing state highway and/or proposed routes from the adverse effects created by adjoining land use activities including the subdivision of land, to ensure the safe and efficient movement of goods and people through the District.*

The anticipated environmental outcomes that are expected from the effective implementation of the transport objectives and policies are:

- The efficient and safe movement of people and goods throughout the Kāpiti district;

- The prevention or mitigation of adverse effects associated with transport activities; and
- The prevention or mitigation of adverse effects on transport routes and networks including State highways that may be generated by other land use activities.

The Project is entirely consistent with Objective C18.1.1 and Policy C1.18.1.1.1. As is detailed in the specialist transportation assessment (Technical Report 6, Volume 3 of the AEE report) the Project will make a significant contribution to the more efficient movement of people and goods throughout the Kāpiti district and region, reduce travel times and provide a safer more reliable through route. At the same time, the Project will significantly reduce traffic flows on the existing SH1 and make it more available for local trips.

A significant outcome from the Project is the improved cross-connections across the national transport corridor (Expressway and NIMT).

The Expressway will provide a second transportation route through the district, built to a significantly higher standard, which will be more resilient to natural hazards and provide a choice of routes.

In relation to the prevention or mitigation of adverse effects associated with the construction and operation of the Expressway, these have been considered in other parts of the assessment (when addressing the PRPS and other sections of the KCDP). The conclusion(s) are that when regard is had to the proposed design approach and mitigation measures the adverse effects in relation to earthworks, landscape and visual, noise, ecological values, and economic and social values, the Project is consistent with the KCDP provisions and the anticipated environmental outcomes.

In relation to 'social wellbeing' (refer Technical Report 20, "Social Effects", Volume 3 of the AEE report) key positive effects will be improvements in road safety and connectivity through improved travel times, reduced congestion, improved pedestrian and cyclist safety through grade-separated crossings, and the removal of level crossings, including existing crossings across the NIMT at Ōtaki (Rahui Road) and Te Horo, and through an improvement in the pedestrian and shopping amenity of the Ōtaki Railway Retail area.

In relation to 'economic wellbeing' (refer Technical Report 21, "Economic Effects", Volume 3 of the AEE report) although there will be some adverse effects on a small number of Te Horo businesses as a result of a lack of connection to/from the Expressway at Te Horo, overall the Project is expected to have neutral or positive effects for the majority of businesses. Through the layout of the interchanges at north and south Ōtaki, direct and efficient motor-vehicle access is provided to the Ōtaki Railway Retail area.

33.7 Proposed Kāpiti Coast District Plan 2012

The KCDC publicly notified the Proposed KCDP 2012 on 29 November 2012. Submissions closed on Friday 1 March 2013.

The public notice confirms that:

> *The only new or amended rules that will have immediate legal effect are those relating to the protection of historic heritage and areas of significant indigenous biodiversity, and these rules are specifically identified in the Proposed District Plan. The others will only come into force once submissions have been evaluated, hearings and appeals held, and necessary changes made to provisions.*

In relation to historic heritage no new items that may be affected by the Project have been added to Schedule 10.1 Historic Heritage. However, two areas of significant indigenous vegetation and significant habitats of indigenous flora have been added to Schedule 3.1 Ecological Sites. The areas are identified on Map 18D as "K234" and "K235". In Schedule 3.1 the sites are described as "Te Hapua Road Forest" and "Mary Crest" respectively. [Note: In Schedule 3.1 both sites are listed as "K234". It is assumed that the Schedule is in error as the Mary Crest site is noted as "K235" on Map 18D]

Other relevant proposed changes include:

- changing the zoning of Pare-o-Matangi reserve from Residential and Rural to Open Space (Local Parks);
- identifying the section of the Ōtaki River at the point of the proposed new Expressway bridge as a "significant amenity landscape";
- delineating on the Plan Maps the extent of the "coastal environment"; and
- the creation of a Future Urban Development Zone to the north of Ōtaki.

In chapter 11 (section 11.6 "Access and Transport"), under the heading "Changes to the State Highway Network", the following statement is made:

> *Peka Peka to Ōtaki (PP20)*
>
> *NZTA propose a bypass of Ōtaki, consisting of a four-lane expressway. This will reduce the congestion commonly experienced when travelling on SH1 through Ōtaki.*

33.7.1 Proposed KCDP Objectives

Chapter 2 of the Proposed KCDP lists twenty objectives for resource management issues of the Kāpiti district. Those that are considered to be potentially relevant to an assessment of the Project are:

> *Objective 2.1 - Tāngata whenua*
>
> *To work in partnership with the tāngata whenua of the District in order to maintain kaitiakitanga of the District's resources and ensure that decisions affecting the natural environment in the District are made in accordance with the principles of the Treaty of Waitangi (Te Tiriti o Waitangi).*

The NZTA has engaged in close and on-going consultation with tāngata whenua (Nga Hapū o Ōtaki) throughout the route selection and design process. Nga Hapū o Ōtaki are the authors of the cultural impact assessment (refer Technical Report 19, Volume 3 of the AEE). An MoU has been entered into between the NZTA and Nga Hapū o Ōtaki to ensure on-going consultation and engagement through the continuing development design processes and construction.

The assessment provided under section 33.6.3 above in relation to the operative KCDP objectives and policies relating to tāngata whenua, continues to be valid.

> *Objective 2.2 - Ecology and biodiversity*
>
> *To improve indigenous biodiversity and ecological resilience through the:*
>
> *(a) protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna;*
>
> *(b) restoration of the ecological integrity of important degraded environments and habitats;*
>
> *(c) enhancement of the health of terrestrial and aquatic ecosystems; and*
>
> *(d) enhancement of the mauri of waterbodies.*

A new policy direction of the proposed KCDP is the concept of 'environmental off-setting'. Policy 3.5 states:

> *Where subdivision, land use or development is deemed or considered to have adverse effects (including cumulative effects) on land containing sensitive natural features or locally indigenous vegetation, lookout points, dominant ridgelines and dominant sand dunes, which cannot be avoided without preventing reasonable use of the land, environmental offsetting will be considered as part of the remediation or mitigation where all the following principles can be demonstrated to have been achieved:*

(a) it should only be considered where remediation or mitigation on-site is not possible;

(b) it should be as close as possible to the site (because benefit diminishes with distance) so that it is in the same area, landscape or environment as the proposed activity;

(c) there should be a substantial, significant, demonstrable and measurable net environmental benefit as opposed to a mere mitigation of effects;

(d) it must be effective – usually there should be conditions (a condition precedent of a bond) to ensure that it is completed or supplied;

(e) there should be public consultation or at least an opportunity for public participation in the process by which the environmental compensation or offsetting is set; and

(f) the methodology for setting the degree of biodiversity off-set shall be recognised and transparent, and shall include best practice monitoring and adaptive management procedures and processes.

In explanation of Policy 3.5 it is noted that:

In achieving the sustainable management objectives of the Act, resource managers and decision makers have the option of applying avoidance, remediation and mitigation in managing adverse effects. Remedying or mitigating can include the concept of off-setting

"Off-setting" for the purposes of this Plan means the provision of a positive effect in one location to off-set adverse effects of the same or similar type caused by the activity proposed at another location with the result that the overall adverse effects on the values of the ecosystem are remedied or mitigated.

Where off-setting is to be applied, there should be a clear connection between the adverse effect, the inability to avoid the effect, and the off-setting measure. The off-setting measure should preferably be applied as close as possible to the site incurring the effects.

Off-setting should, as far as can be achieved, maintain and enhance the particular natural values affected by the project when assessed overall. To ensure an off-setting measure is effective, the methodology used to assess the measure should be transparent in that it is assessed as a recognised methodology.

Two new ecological sites are located in close proximity to the Project route: K234 Te Hapua Road Forest and K235 Mary Crest.

As a consequence of concerns raised by tangata whenua, and also in response to the Project ecologist confirming the significance of the Mary Crest indigenous bush remnant and associated wetland, the decision was taken by the NZTA to adjust the route to avoid the Mary Crest site.

The Project will affect proposed new ecological site K234 (Te Hapua Road Forest). Bush remnants along the Te Horo 'straight'.

Mitigation measures, including significant riparian plantings and environmental-off setting, are identified in Technical Report 11, Volume 3. For example, in relation to the Ōtaki Railway Wetland the loss will be off-set by the creation of new areas of wetland within the designation. The loss of bush habitat along the Te Horo straight will be off-set either by planting new areas of bush or protecting existing bush that is already threatened by on-going degradation.

Although not an identified ecological site, the loss of much of the Pare-o-Matangi reserve will be off-set by the establishment of a 'new' area of open space/reserve on immediately adjacent land.

These proposed 'mitigation' measures are considered to be generally consistent with proposed Policy 3.5.

> *Objective 2.3 - Development management*
>
> *To maintain a consolidated urban form within existing urban areas and a limited number of identified growth areas which can be efficiently serviced and integrated with existing townships, delivering:*
>
> *(a) urban areas which maximise the efficient end use of energy and integration with necessary infrastructure;*
>
> *(b) a variety of living and working environments in a manner which reinforces the function and vitality of centres;*
>
> *(c) resilient communities where development does not result in an increase in risk to life or severity of damage to property from natural hazard events;*
>
> *(d) higher residential densities in appropriate areas, and avoidance of such development where it would adversely affect areas of special character or amenity;*
>
> *(e) sustainable settlements that are developed in a manner which preserves: natural processes including freshwater systems; areas characterised by productive soils, ecological and landscape importance; and other places of significant natural amenity; and*
>
> *(f) an adequate supply of housing and areas for business/employment to meet the needs of the District's anticipated population which is provided at a rate and in a manner that can be sustained within the finite carrying capacity of the District.*

An issue raised during public consultation was the lack of off/on ramps to the Expressway at Te Horo. These have not been included because of the relatively close proximity of interchanges north and south of Te Horo. Another consideration supporting the decision to not provide direct connections to the Expressway at Te Horo was the concern that this would have encouraged a growth 'node' to develop. A growth node at Te Horo would be inconsistent the Rural zoning of the area under both the Operative and Proposed District Plans and with the KCDC's strategy (the GOV) for a consolidated urban form, and with Ōtaki being the identified growth node in the northern part of the district.

The draft Te Horo Local Outcomes document (submissions closed on 15 November 2012), part of the "Kāpiti Coast Choosing Futures – Community Plan", identifies as local outcomes the following:

> *Development*
>
> - *The rural and low density character of the area is retained with small settlements surrounded by productive rural land.*
> - *Rural lifestyle development is undertaken in a way that protects and maintains natural systems and landforms.*
> - *The cumulative impact of new development does not change the character of vey low density built environment.*
>
> *Population Growth*
>
> - *The cumulative impact of new development and additional population does not change the unique character of Te Horo.*

The design of the Project with direct connections at Ōtaki and not at Te Horo maintains consolidated urban form and is consistent with the district's development management strategies and therefore consistent with Objective 2.3

Consideration of the Future Urban Development Zone to the north of Ōtaki is identified in the Proposed KCDP has being subject to a future Structure Plan. This will therefore require consideration of the environment that exists at the time that the Structure Plan is developed. That existing environment will likely include the developments proposed in this AEE Report. Therefore at that time, consideration of reverse sensitivity effects from infrastructure approved through designation, whether constructed or not, will be required to be had. No specific consideration has been given at this time to the effects of reverse sensitivity given no detail is available as to the density or nature of specific developments within this Zone, particularly as there are no permitted activities identified within this Zone. The Project will not hinder the development in this area, and to some extent will support it through the removal of through traffic from local roads and the current SH1.

The conclusion is that the Project is consistent with proposed Objective 2.3.

Objective 2.4 – Coastal environment

To have a coastal environment where:

(a) natural character, natural systems, natural landforms and natural processes, are protected, and restored where degraded;

(b) appropriate public access to and along the coast is improved;

(c) development does not result in further loss of coastal dunes;

(d) communities are not exposed to increased risks from coastal hazards.

The extent of the coastal environment is now mapped in the proposed KCDP. Although the Project is generally to the east of the coastal environment, in the vicinity of Mary Crest the coastal environment extends inland of the Project route to incorporate the "Te Horo abandoned sea cliff", an identified "significant geological site". However, the Project lies to the west of the sea cliff with the NIMT lying between the Expressway route and the sea cliff. Thus, there is no effect on this coastal environment geological site.

Further comment was made in relation to the coastal environment when assessing the RPS (refer section 33.4 above). Those previous comments remain valid in relation to proposed Objective 2.4, and the conclusion is that the Project is consistent with this proposed objective.

Objective 2.5 – Natural hazards

To ensure the safety and resilience of people and communities by avoiding exposure to increased levels of risk from natural hazards, while recognising the importance of natural processes and systems.

For the reasons stated in the assessment of the operative KCDP's natural hazard objective and related policies (refer section 3.6.9), the conclusion is that the Project is consistent with proposed Objective 2.5. The Project will provide significantly increased resilience to natural hazards.

Objective 2.7 – Historic heritage

To protect historic heritage in the District for the social, cultural and economic wellbeing of the Kāpiti Coast community and future generations, this includes:

(a) supporting the contribution of historic heritage values, features and areas to the identity, character and amenity of places and landscapes;

(b) recognising and protecting tāngata whenua historic heritage, including places, knowledge, histories and ngā taonga tuku iho.

As no additional historic heritage sites that might be potentially affected by the Project have been added by the proposed KCDP, the assessments provided in relation to the RPS and the operative KCDP (refer sections 33.4 and 33.6.5 above respectively) remain valid. The conclusion is that the Project is consistent with proposed Objective 2.7.

Objective 2.9 – Landscapes

To protect the District's natural landforms and valued landscapes, including:

(a) identified outstanding natural features and landscapes, significant amenity landscapes and areas of high natural character;

(b) stream and river corridors, including stream and river mouths, head waters and estuaries;

(c) remaining coastal dunes, wetlands and native vegetation;

(d) the landscape values of coastal hills and escarpments.

As noted above, the section of the Ōtaki River at the location of the proposed bridge crossings (just upstream of the present NIMT bridge) is identified as a proposed "significant amenity landscape".

The specialist landscape assessment undertaken assessed the affect of the Project on the landscape amenity of the Ōtaki River (refer chapter 16 above and Technical Report 8, Volume 3); and a summary is provided in the section above discussing the RPSs (section 33.4) and the operative KCDP (section 33.6). As the landscape assessment concludes:

The addition of the Expressway bridges approximately 100m upstream of the existing rail bridge will increase the degree of modification already in place in this portion of the river. However, the existing environment is characterised as a developed area, with two bridges and modified embankments. The Expressway bridges will add to the overall degree of modification, but by placing them in close proximity to the existing bridges, the modifying elements will be concentrated into one area. While this has the benefit of confining the extent of modification, it does create a cumulative effect in this area. The scale of the setting and of the braided river is sufficiently large to accept the additional bridges, without dominating the landscape.

The landscape assessment concludes that the effect of the Project on the Ōtaki River landscape will be 'low'.

In relation to clause (c) of Policy 2.9, the Project will traverse an area of dune landform to the north of Ōtaki in the vicinity of the Ōtaki Railway Wetland (ecological site K134). This area of dune landform is not within an area identified on the Plan Map 03D as a 'dominant ridgeline of dominant dunes'. It is, however, within an area identified as a 'priority area for restoration'.

There will be an effect on the dune landform. Those effects have been mitigated to the greatest extent practicable through minimising the necessary earthworks and 're-creating' natural contours along the edges of the cuts.

The conclusion is that the Project is consistent with proposed Objective 2.9.

Objective 2.14 – Access and transport

To ensure that the transport system in the Kāpiti Coast District:

(a) integrates with urban form and maximises accessibility;

(b) improves the efficiency of travel and maximises mode choice to enable people to act sustainably as well as improving the resilience and health of communities;

(c) contributes to a strong economy;

(d) minimises adverse effects of land uses and vice versa; and

(e) is safe, for purpose, cost effective and provides good connectivity for all communities.

The consistency of the Project with the transport objectives and policies of the operative KCDP was discussed in section 33.6.10 above. The points made are 'repeated' to support the conclusion that the Project is consistent with proposed Objective 2.14.

Objective 2.16 – Economic vitality

To promote sustainable and on-going economic development of the local economy with improved number and quality of jobs and investment through:

(a) encouraging business activities in appropriate locations within the District, principally through differentiating and managing various types of business activities both on the basis of the activity, and the potential local and strategic effects of their operation;

(b) reinforcing a compact, well designed and sustainable regional form supported by an integrated transport network;

(c) enabling opportunities to make the economy more resilient and diverse;

(d) providing opportunities for the growth of a low carbon economy, including clean technology;

(e) protecting business activities from reverse sensitivity effects and enhance the amenity of business activities; and

(f) enhancing the amenity of business areas;

whilst:

(a) ensuring that economic growth and development is able to be efficiently serviced by infrastructure

(b) encouraging commercial consolidation and co-location of community services and facilities primarily within the Paraparaumu Sub Regional Centre and Town Centres;

(c) managing contamination, pollution, odour, hazardous substances, noise and glare, and requiring enhanced levels of amenity values as associated with business activities.

The Project is referred to in the proposed KCDP as a 'bypass' of Ōtaki which will reduce the congestion commonly experienced when travelling on SH1 through Ōtaki.

An issue for assessment by the NZTA Project Team is the potential for adverse effects, including economic/business vitality effects, on the Ōtaki Railway Retail area.

The specialist assessment (refer Technical Report 21, Volume 3 of the AEE) has concluded that through the layout of the interchanges at north and south Ōtaki, along with appropriate signage at both 'gateways', direct and efficient motor-vehicle access is provided. This in turn will minimise the potential loss of trade from passing traffic as the Ōtaki Railway Retail area increasingly strengthens its role as a 'destination' centre. With the removal of significant amounts of heavy traffic, the streetscape and pedestrian environment and consequent amenity/ambience of the Ōtaki Railway Retail area will be significantly enhanced.

The conclusion is that the Project is consistent with proposed Objective 2.16.

Objective 2.18 – Open spaces / active communities

To have a rich and diverse network of open spaces that:

(a) is developed, used and maintained in a manner that does not give rise to significant adverse effects on the natural and physical environment;

(b) protects the District's cultural, ecological and amenity values, while allowing for the enhancement of the quality of open space areas;

(c) supports the identity, health, cohesion and resilience of the District's communities; and

(d) ensures that the present and future recreational and open space needs of the District are met.

As noted, the proposal is to zone the Pare-o-Matangi reserve 'Open Space – Local Park'. Presently the zoning is a combination of Rural and Residential.

The Project will have a significant effect on the existing reserve. The intention however is to mitigate this significant direct effect through the development of immediately adjacent land as open space/reserve. The proposed mitigation is discussed in detail in the landscape assessment (refer chapter 16 above and Technical Report 8, Volume 3).

Ultimately, it would be appropriate for any 'new' Pare-o-Matangi reserve to be zoned Open Space – Local Park, which would be consistent with the history of the reserve's development by the local community and its intended long-term function.

The conclusion is that the Project, with the proposed mitigation for Pare-o-Matangi reserve is consistent with proposed Objective 2.18.

33.7.2 Conclusion

In general terms, the majority of the objectives and policies of the proposed KCDP (2012) are similar to those of the operative KCDP. There are however some new objectives and policies, including those relating to centres, urban design and economic vitality. The Project is assessed as being broadly consistent with those objectives and policies.

Another new policy direction that is relevant to an assessment of the Project is the use of environmental off-setting as part of remediation or mitigation. In relation to the effects of the Project on ecological sites, including the Ōtaki Railway Wetland (ecological site K134), environmental off-setting is used to positive effect.

Overall, it is concluded that the Project remains broadly consistent with the KCDP objectives and policies – both the operative and proposed versions.

33.8 Other Relevant Documents and Matters

Other relevant documents in terms of section 104(1)(c) and section 161(1)(d) include both statutory documents (for example those required to be prepared under other legislation such as the Land Transport Management Act 2003 or Conservation Act 1987) and those non-statutory documents that, whilst not having a regulatory function under the RMA, have been through a public process and/or are important policy documents that set national regional direction on key resource or environmental matters.

33.8.1 Resource Management (Measurement and Reporting of Water Takes) Regulations 2010 (MRWT)

The Resource Management (Measurement and Reporting of Water Takes) Regulations 2010 apply to all water takes where the abstraction is at a rate of more than 5 litres per second. However, non-consumptive takes are not subject to these regulations. The Project construction will involve only non-consumptive takes, therefore these regulations are not relevant.

33.8.2 The Freshwater Fisheries Regulations 1983

The FFR under Section 48A of the Conservation Act 1987, require that fish passage be provided for freshwater and sports fish. The regulations give the Director-General of Conservation a decision-making role in relation to fish passage when facilities such as new or modified culverts, dams, weirs and diversions on natural waterways are proposed. The Department of Conservation uses the RMA processes to comment on the effects of

instream structures and activities. Where it is satisfied that appropriate conditions relating to fish passage have been proposed, any additional permission under the FFE is at its discretion.

The provision where appropriate for fish passage within culvert design will be determined at the detailed design stage.

33.8.3 National Land Transport Programme (2012-2015)

The 2012-2015 NLTP includes funding for projects intended to address economic growth and productivity, value for money, and road safety. Continued funding for the Wellington Northern Corridor RoNS reflects the importance of this programme of work at a national level. As part of the Wellington Northern Corridor RoNS, the Project delivers improvements to this corridor in order to reduce congestion, provide alternative routes out of Wellington City and deliver greater efficiencies for long distance freight traffic.

33.8.4 New Zealand Transport Strategy (2008)

The NZTS seeks to provide direction for the transport sector through to 2040. The strategy relates to all parts of the transport sector, and includes the following relevant items:

- environmental sustainability including: reducing vehicle emissions, renewable fuels, fuel efficient technology and electric vehicles, increasing the area of Crown transport land covered with indigenous vegetation;
- assisting economic development through improving journey times and journey time reliability;
- assisting safety and personal security through reducing deaths and serious injuries;
- improving access and mobility through increasing public transport, walking and cycling; and
- protecting and promoting public health through reducing people exposed to transport noise and reducing people exposed to dangerous concentrations of air pollution.

The Project will be generally consistent with all the above aims for the following reasons:

- it involves extensive landscaping/vegetation measures involving locally sourced native vegetation;
- it will significantly improve journey times and improve journey reliability;
- there will be a reduction of road crashes and a significant improvement in overall traffic safety both through a modern designed new route and a reduction of traffic on local roads (e.g. existing SH1)
- properties likely to be exposed to higher levels of noise than allowed under the relevant standard will be protected by noise mitigation measures; and
- in relation to air quality a slight reduction in concentration in urban areas is expected.

33.8.5 National State Highway Strategy (2007)

The NSHS sets out how the NZTA will develop and manage the State highway network as an integral part of a multimodal transport system over the next 30 years. It provides a link between the NZTS, the LTMA (and other legislation) and NZTA's plans and policies. The goals of the strategy are to:

- ensure State highway corridors make the optimum contribution to an integrated multimodal land transport system;
- provide safe State highway corridors for all users and affected communities;
- ensure State highways enable improved and more reliable access and mobility for people and freight;

- improve the contribution of State highways to economic development; and
- Improve the contribution of State highways to the environmental and social wellbeing of New Zealand, including energy efficiency and public health.

The Project is consistent with these goals for the same reasons outlined in section 33.8.4.

33.8.6 Government Policy Statement on Land Transport Funding (2009/10 – 2018/19)

A GPS is developed and issued under the LTMA.

The current GPS builds on the projects in the 2009/10 GPS to support economic growth through infrastructure development, particularly the RoNS projects. The GPS 2012 covers the financial period 2012/13 to 2017/18 and provides indicative figures from 2018/19 to 2021/22. It will be in effect from 1 July 2012 to 30 June 2015.

The NZTA must ensure that the NLTP gives effect to the GPS and must take into account the GPS when deciding whether or not to approve activities for funding from the national land transport fund. Regional transport committees preparing a RLTS must take into account the GPS and RLTPs must be consistent with the GPS.

The GPS identifies and recognises the RoNS as New Zealand's most essential routes, and that they require development in order to reduce congestion, improve safety and support economic growth. The purpose of listing roads as nationally significant in the GPS is to ensure that they are taken fully into account when the NZTA develops the NLTP.

The Project is one of eight that comprise the Wellington Northern Corridor RoNS linking Levin with Wellington Airport.

33.8.7 State Highway Asset Management Plan 2012-2015

The SHAMP recognises the importance of the State highway network throughout New Zealand and highlights how the NZTA intends to maintain, renew, operate and improve the network. The SHAMP outlines a range of services, goals and factors that together contribute to the programme for the maintenance and development of the State highway network.

As stated in the previous section, the Project forms part of the national RoNS programme. The SHAMP has been applied throughout the investigation and design stages to date. In alignment with the SHAMP the Project seeks to meet and allow for future demand based on projected traffic forecasts in line with population and economic changes throughout the Region and the country.

For Wellington, the SHAMP identifies that the topography and limited availability of routes in and out of the Wellington City affects road users, and the RoNS projects, such as this Project, are designed to address these issues.

The Project has been developed under, and is consistent with, the goals of the SHAMP.

33.8.8 The 2012/13 State Highway Plan

The SHP has been developed in alignment with the SHAMP.

The Project is outlined in the SHP, with goals of lodging the Expressway Notice of Requirement during the 2012/13 period. The Project has been developed under and is consistent with the goals of the SHP.

33.8.9 NZTA Environmental Plan (2008)

The NZTA Environmental Plan outlines NZTA's environmental policies and provides guidance on a wide range of environmental issues.

The Project is consistent with these policies. In particular, these policies have influenced and shaped the proposed route alignment and project design, and have also informed relevant technical assessments including the terrestrial ecology assessment (Technical Report 11), the aquatic ecology assessment (Technical Report 12), the landscape and visual assessments (Technical Report 8), air quality assessment (Technical Report 13), the assessment of heritage effects (Technical Report 18) and the assessment of construction and operation noise and vibration (Technical Reports 5 and 15).

33.8.10 Getting There - On Foot, By Cycle - Strategic Implementation Plan 2006-2009

The New Zealand Cycling and Walking Strategy sets out a strategy to advance walking and cycling in New Zealand transport.

The Project does not impact on existing river-side walking and cycling routes through the Project area. Positive outcomes for cyclists are grade-separated crossings (e.g. at Ōtaki and Te Horo).

Also, the Project will create the opportunity for future cycleways following the revocation of the existing SH1.

33.8.11 New Zealand Urban Design Protocol (2005)

The New Zealand Urban Design Protocol provides a platform to make New Zealand towns and cities more successful through quality urban design.

Consistent with the intent of the Protocol a ULDF has been developed for the Project. The ULDF (refer Technical Report 23) has helped to inform the nature and extent of investigations into the urban and landscape design matters relating to the Project, and also sets out the underlying design principles to guide Project development and implementation. Implementation of the ULDF will ensure the Project is consistent with the New Zealand Urban Design Protocol.

33.8.12 National Infrastructure Plan

The National Infrastructure Plan outlines the Government's 20-year vision for New Zealand's infrastructure to 2030, and provides a three-year programme of work to progress this vision.

The vision for transport is outlined as "a transport sector that supports economic growth by achieving efficient and safe movement of freight and people".

The relevant goals for transport are as follows:

- Maximising the potential synergies between regional planning and central government strategies;
- A flexible and resilient transport system offering greater accessibility and can respond to changing patterns in demand;
- A network of priority roads to improve journey time and reliability, and ease severe congestion, boosting the growth potential of key economic areas and improving transport efficiency, road safety and access to markets; and
- A continued reduction in the number of accidents, deaths and serious injuries that occur on the network.

For the reasons set out in Technical Report 6, the Project is consistent with all of these goals.

33.8.13 Wellington Regional Strategy

The WRS was developed by the nine local authorities in the Region, working in tandem with central government and business, education, research and voluntary sector interests.

The WRS is a sustainable economic growth strategy and contains a range of initiatives to realise economic potential. It aims to enhance the Wellington Region's "regional form" by addressing such issues as transport, housing, urban design and open spaces, which are all the things that contribute to quality of life.

The WRS identifies three focus areas for sustainable growth. They are:

- Leadership and partnership – key players working together to deliver the region's sustainable growth.
- Grow the region's economy, especially its exports – export more and become less reliant on trade within New Zealand.
- Good regional form – building on the physical arrangement of our communities and how they link, and strengthening our city and town centres, matching transport decisions and land use, creating quality urban design, creating strong open spaces and recreation amenities, and providing good housing choice – essentially, making the Wellington Region a great place to live, with a good quality of life.

Relevant WRS initiatives to promote an efficient regional form include:

- Integrating transport with urban and rural needs - the WRS identifies that more employment needs to be created close to where people live. The efficient operation and use of the transport system and consideration of the development 'fit' with the transport network are fundamental to creating a good regional form;
- More homes close to city centres and transport links - one of the Region's strengths is its wide range of housing and lifestyle options. An identified need is to enable medium and higher density development close to centres and transport links, while protecting the character of the traditional low-density family-focused suburbs; and
- Rural lifestyles - the WRS identifies that the Region offers excellent opportunities for rural residential living. It recognises the benefits in making lifestyle options available in certain areas including making better use of poor productivity areas, strengthening smaller communities, unlocking economic development opportunities, and enhanced management of special environmental features. However, it also recognises that in delivering on these opportunities caution needs to be exercised regarding removing high quality soils from primary production, threatening sensitive ecosystems or significant landscapes, and land fragmentation creating urban expansion difficulties.

The strategy also identifies Ōtaki as one of a 'nodes' on the Kāpiti Coast where new growth will be focused.

The Project will be consistent with the WRS initiatives because:

- It will strengthen cross-region linkages and improve connectivity;
- It will enhance the liveability of coastal communities as the significant reduction in the existing SH1 (which will become a local road) traffic volumes and speeds (which will shift to the Expressway) will improve local amenity;
- It will improve the environment of the Ōtaki Railway Retail area through the removal of freight and long haul transportation; and
- It will not preclude future development of rail and other public transport modes.

33.8.14 Wellington Regional Land Transport Strategy (2010–2040)

The RLTS 2010-2040 is a statutory document prepared under the LTMA. It is the strategic transport document that guides the development of the Region's transport system. It sets the framework and vision for the provision and management of movement and transport throughout the Region.

The vision of the RLTS is:

> *To deliver an integrated land transport network that supports the region's people and prosperity in a way that is economically, environmentally and socially sustainable.*

The objectives of the RLTS are to:

- Assist economic and regional development;
- Assist safety and personal security;
- Improve access, mobility and reliability;
- Protect and promote public health;
- Ensure environmental sustainability; and
- Ensure that the RLTP is affordable for the regional community.

The Project will make an important contribution to achieving these objectives, including: relief from congestion at peak times and on public holidays; improved safety; improved route security and network resilience; and support for increasing freight volumes by providing more reliable journey for 'just-in-time' goods delivery.

The Expressway forms part of the Wellington Northern Corridor RoNS, which is identified as "strategic" road project in the Western Corridor Plan.

33.8.15 Western Corridor Plan

The latest Western Corridor Plan was adopted by the GWRC in August 2012. The Plan notes that:

> *"This Corridor Plan has been developed to support and contribute to the Regional Land Transport Strategy (RLTS), which sets the objectives and desired outcomes for the region's transport network".*

Along the Western Corridor from Ngauranga to Ōtaki, SH1 and the NIMT will provide a high level of access and reliability for passengers and freight travelling within the region in a way which recognises the important strategic regional and national role of this corridor. These primary networks will be supported effectively by local and regional connector routes.

The key objectives developed for the Plan respond to the significant issues and opportunities relating to this specific corridor, and include:

- Reduce off-peak and weekend congestion between Pukerua Bay and Paekakariki as well as from Waikanae to Ōtaki;
- Improve route security and network resilience; and
- Improve road safety throughout the Corridor.

The Expressway is identified in Action Table 1 at Page 13 of the Plan as a "strategic road project" with an indicative cost of $342m.

33.8.16 The Wellington Regional Land Transport Programme 2012-2015

The RLTP sets out all the transport projects, what they will cost and how they will be funded. It also identifies other significant transport projects to start within the next ten years, along with a 10-year financial forecast. The RLTP provides the region's funding bid for funding transport projects from the NLTP.

The RLTP reflects both the national direction provided in the GPS – which includes a focus on economic growth and productivity, value for money and road safety – and the regional priorities and outcomes in the RLTS.

The RLTP notes that "*there are some significant projects to improve State Highway 1 as part of the Wellington [Northern Corridor] Roads of National Significance. These contribute to the Government's priorities, as well as many of our regional goals around a safer, more reliable, more resilient state highway network*".

The Project is included in Table 3 "Land Transport Activities Proposed for the Next Three Years (2012-2015)", given a priority of "Committed", with the investigation phase having started in 2010 and the design phase due to start in 2014.

The Project is included In Table 5 "Other Significant Activities Expected to Commence within the Next 10 Years", with a total project cost of $342.84m.

Appendix A provides indicative timing for all the significant activities included in the RLTP. The timing for the Project is indicated as:

- Investigation: 2012/13;
- Detailed Design: 2014/2015 - 2015/2016; and
- Construction: 2016/2017 – 2019/2020.

33.8.17 Regional Freight Plan - Greater Wellington Regional Council (2011)

The Wellington Regional Freight Plan is a supporting document to the RLTS as it provides a pathway to implement the RLTS objectives and policies that are relevant to freight. It also supports the GPS with its focus on economic growth.

The key actions identified within the Freight Plan 2011 that are relevant to the Project are as follows:

- integrate planning processes – support the implementation of projects in the Corridor Plans identified as having significant freight benefits; and
- improve road freight reliability – ensure the design of State highway projects facilitate the efficient movement of freight, including provision for over-dimension and over-weight vehicles.

The Project implements these actions as the proposed Expressway will have benefits for freight transportation.

33.8.18 Kāpiti Coast Choosing Futures: Community Plan (2009)

Kāpiti Coast Choosing Futures: Community Plan is the KCDC's LTCCP. It was adopted prior to the proposed Expressway being announced.

Outcomes for Ōtaki include a focus of new growth at Ōtaki; strengthening the retail focus of the Ōtaki Railway Area; focusing industrial development in the Riverbank Road 'Clean Tech' industrial area.

These local outcomes for Ōtaki were considered as part of the design of the Project, and in particular through locating and designing north and south entry 'gateways' to Ōtaki .

33.8.19 KCDC Development Management Strategy (2007)

The Strategy contains a range of policies that outline KCDC's high level aspirations for developing and shaping the district. The Strategy refers to a roading network that supports and encourages the development and use of pedestrian, cycle and bridle tracks and quality of design. Regard has been had to these policies in developing and refining the Project.

33.8.20 KCDC Sustainable Transport Strategy (2008)

The intent of the Kāpiti Coast Sustainable Transport Strategy is to act as a conduit between the transport direction outlined in the KCDP and that set out in the RLTS. It contains five focus areas as follow:

The strategy recognises that traffic congestion on SH1 is a problem. However, as it was published prior to the Expressway proposal being introduced, reference is made solely to the proposed Western Link Road (WLR) which effectively 'terminated' at Peka Peka at the south end of the Project.

The Project will achieve or be consistent with the overall intent of the Strategy. The Expressway will substantially improve accessibility through and within the Kāpiti district. Reduced congestion and improved travel movements will reduce the overall level of vehicle emissions. The Expressway will remove through traffic from the existing SH1 which acts as an important local road, providing opportunities to enhance its role and function as a local road. It will also support improved safety and access within Ōtaki.

33.8.21 KCDC Cycleways, Walkways and Bridleways Strategy (2009)

The Project will make a contribution to improved cycling and walking linkages within Ōtaki. The grade-separated crossings over the Expressway including at Rahui Road and Te Horo will separate pedestrians and cyclists, including school generated movements, from traffic using the Expressway and, at Te Horo, the local road (current SH1).

Pedestrian footways are provided within the Expressway corridor within Ōtaki.

Outside of Ōtaki in the rural area, there is little or no provision for non-motorised road users. A footway is provided on the southern side of School Road in Te Horo.

33.8.22 KCDC Subdivisions and Development Principles and Requirements (2005)

This document sets out KCDC's development requirements, with emphasis placed on the integrated management of the effects of activities on the environment.

The document contains one transportation objective:

> *To plan, provide and maintain an efficient road network appropriate to the level of use that will ensure the safe and orderly passage of road users (including cyclists) and pedestrians throughout the Kāpiti Coast District. The Council wishes to encourage pleasant, cyclable and walkable neighbourhoods with a low speed environment which provides increased amenity.*

The Project is consistent with this objective as it will contribute to achieving an efficient, secure and resilient road network in the Kāpiti district. An improved traffic environment through the Ōtaki Railway Retail area will alleviate a presently severely affected area as a consequence of the heavy north/south traffic flows passing through the centre. Important environmental enhancement will be possible with the 'diversion' of the majority of north/south traffic flows onto the Expressway, particularly freight traffic passing through the district.

33.8.23 KCDC Streetscape Strategy and Guideline (2008)

The Kāpiti Streetscape Strategy and Guideline supports the assessment of applications for subdivision consents and proposals to upgrade existing streets. It provides design guidance to enable a coordinated approach to streetscapes.

A section on the SH1 streetscape is included in the document, outlining important issues and elements associated with the existing SH1 streetscape. Opportunities to improve the existing SH1 once the Project is operative will be dealt with as part of the revocation process as a separate project.

33.8.24 Kāpiti Coast: Choosing Futures: Community Outcomes (2009) - Te Horo Local Outcomes (Draft) (2012) and Peka Peka Local Outcomes (2011)

No development for the Expressway is proposed for the beaches, dunes, wetlands or rural areas of Te Horo or Peka Peka. The Project will actually improve transport movements in

and out of Ōtaki, which is an aspiration of the *Te Horo Local Outcomes (Draft) (2012)*, with the reduction of traffic build-up and therefore delays being particularly obvious at weekends and holiday times.

33.8.25 Kāpiti Coast: Choosing Futures. Community Outcomes, Ōtaki Local Outcomes Greater Ōtaki Vision (2007)

Nothing in the Project development is at odds with the GOV. It is considered that the Project is unlikely to have any effect on the aspirations of the Ōtaki community as identified in this Vision statement.

33.8.26 Open Space Strategy 2012

The Project is in an area which, with the exception of the Pare-o-Matangi reserve, is generally some distance from formal open space areas. One challenge which is detailed in this Strategy is the potential severance caused by the Project, as well as the loss of open space in the current SH1 corridor. The encroachment on the open space area adjacent to SH1 will be compensated for by providing suitable open space elsewhere. This is particularly relevant for the Pare-o-Matangi reserve where there is a change in the current available land as a result of the Project passing directly through its current location, however additional land is to be included within the reserve area to ensure that this open space facility and the amenity that it provides the community is retained.

33.8.27 Positive Aging on the Kāpiti Coast (2011)

No adverse effect on the ability of the aging population of the Kāpiti district to move around the Kāpiti district is expected from the proposal. A more efficient transport system with less road congestion is a positive effect for the aging population, as they can get to regional healthcare hubs in a more timely manner.

33.8.28 Youth2U Action Plan (2011)

It is considered that the particular effects of the Project on the youth of Kāpiti will be negligible. However, a more efficient transport system with less congestion is a positive effect for the youth of the Kāpiti district, as they can get to regional urban centres in a more timely manner.

33.8.29 Kāpiti Coast: Choosing Futures, Stormwater Management Strategy 2008

Stormwater management has been addressed in section 18 of this AEE report, and again at 33.5 for the regional planning documents, and therefore is considered to be consistent with the intentions expressed in the Kāpiti Coast: Choosing Futures, Stormwater Management Strategy 2008.

33.8.30 Kāpiti Coast: Choosing Futures, Coastal Strategy (2006)

As this Strategy focuses on the immediate coastal margins and access across the dunes to the beach, it does not take into account any effects from the Project. The Project will not however impede any access to the coast or result in any compromise of coastal issues.

33.8.31 Kāpiti Coast District Council Monitoring Strategy, "Capturing Our Environment", August 2002

The relevant KCDC indicators identified in the Monitoring Strategy are for completed works, rather than proposed works, and therefore once the Project is complete and operational, monitoring can occur. The Project is not anticipated to impede any ability to implement the Strategy during construction.

33.8.32 Water Matters - Kāpiti Coast District Sustainable Water Management Strategy (2002)

There are no water supplies required for the ongoing operation of the Project. Water is required for construction, however this is considered to be a minimal volume that will not impact on the ability to sustainably manage water resources, and therefore not be in conflict with this Strategy.

33.9 Assessment of Section 105 Matters

Section 105(1) RMA sets out the matters that a consent authority must have regard to when considering a resource consent application for a discharge permit. In particular, consideration needs to be given to:

- the nature of the discharge:
- the sensitivity of the receiving environment to adverse effects:
- the applicant's reasons for the proposed choice; and
- any possible alternative methods of discharge, including discharge into any receiving environment.

As some of the applications relating to the Project are for permits to discharge contaminants into water and onto land, section 105 is relevant.

Section 105(1)	Comments	Cross-references
Nature of the discharge and sensitivity of the receiving environment to adverse effects-	Construction of the Project involves major earthworks, with the resultant effect being that stormwater discharges will contain higher levels of sediment than normal during the construction period and will potentially increase the volume of sediment run-off to freshwater, wetland and marine receiving environments. A detailed description of these receiving environments and the nature of the corresponding discharges proposed are included in Part G, Volume 2 and relevant Technical Reports, Volume 3 of the AEE report.	Chapters 18 and 20. Technical Reports 10 and 12.
The applicant's reasons for the proposed choice Any possible alternative methods of discharge, including discharge into any other receiving environment	The design process to date has, as far as possible, avoided creating adverse effects on sensitive receiving environments. In circumstances where this has not been achievable the BPO is to be employed to remedy, mitigate or offset any actual and potential effects on these areas as no other feasible alternative method of discharge is available. The selection of a BPO will be informed by the following principles regarding the control of erosion and sediment:	Chapters 18 and 20. Technical Reports 10 and 12. ESCP and site specific EMPs Appendix H

Section 105(1)	Comments	Cross-references
	• Minimising disturbance; • Staging construction; • Protecting steep slopes; • Protecting water bodies; • Undertaking progressive and rapid stabilisation of disturbed areas; • Perimeter control; and • Deploying detention devices. The construction of the Project will involve all discharges being appropriately managed through the CEMP to ensure that any effects on freshwater, marine and wetland receiving environments are negligible to minor and acceptable. These effects and their associated mitigation are discussed in detail in the relevant Technical Reports in Volume 3, Part G of Volume 2 and, in relation to the statutory provisions, in the preceding sections of this Chapter.	

33.10 Assessment of Section 107 Matters

Section 107 is relevant because the Project involves the discharge of contaminants or water into water (i.e. it involves the potential discharge of silt-laden water into streams) which are likely to increase sediment levels above current levels during construction. The potential effects under section 107(1) that may occur as a result of discharge of contaminants from the Project are:

- a conspicuous change in the colour or visual clarity (section 107(1)(d)) – earthworks and construction works will cause a change in colour or visual clarity of affected water bodies running through the worksite at times. However, the proposed application of the CEMP will be focused on ensuring that the level of change does not cause significant or permanent adverse effects on water quality and on the receiving environment; and
- any significant adverse effects on aquatic life (section 107(1)(g)) – it is unlikely that there will be any significant adverse effects on shellfish and other organisms in the coastal marine environment.

A consent authority may grant a discharge permit which gives rise to these effects if it is satisfied:

- that exceptional circumstances justify the granting of the permit; or
- that the discharge is of a temporary nature; or
- that the discharge is associated with necessary maintenance work - and that it is consistent with the purpose of the RMA to do so.

The assessments in this AEE report and in the technical reports demonstrate that the Project will meet the tests within section 107(2)(b) for the following reasons:

- the discharges will be short-term;

- the effects will occur at times, but not consistently, during the construction period of the Project which is expected to be staged over 3.5 to 4 years;
- any effects on the coastal environment will be those associated with sediment transport firstly from construction areas, then from rivers and streams that discharge into wetlands and/or the coastal marine area;
- the assessment of effects contained in Technical Report 10, Volume 3 demonstrates that there will be negligible adverse effects on the marine environment;
- effects on stream water quality are not representative of a "typical" day of work on the site, but instead represent the result of an unlikely or extreme weather event (1 in 10 year storm or worse);
- measures can be taken to minimise the likelihood of adverse effects resulting from an extreme weather event - these are set out in the ESCP;
- there will be no on-going adverse effects once the Project's construction has been completed, and there will be some positive effects arising from the implementation of the Project in terms of improving the overall level of discharge of contaminants from roads in the Kāpiti district; and
- it will be consistent with the purpose of the RMA to grant the discharge permits given the scale and significance of the Project and the temporary nature of the approvals sought.

In summary, it is considered that the Project will meet the tests in section 107 of the RMA.

33.11 Assessment of Part 2 Matters

Any consideration under sections 104 and 171 is subject to Part 2 of the RMA which sets out the purpose and principles of the RMA. The purpose of the RMA as expressed in section 5 is to promote the sustainable management of natural and physical resources, with 'sustainable management' defined in section 5(2) as:

> *managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety while—*
>
> *(a) Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
>
> *(b) Safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and*
>
> *(c) Avoiding, remedying, or mitigating any adverse effects of activities on the environment.*

Part 2 provides further direction on the matters of national importance (section 6 – "recognise and provide for"), other matters (section 7 – "have particular regard to") and the principles of the Treaty of Waitangi (section 8 – "take into account").

The promotion of sustainable management often requires a balance between competing resource values and the benefits and adverse effects associated with a proposal, recognising that development, particularly of large-scale projects, will result in some adverse effects. The designation of a large-scale public work often involves careful consideration of the balance to be struck between the regional or national benefits that might accrue from the work and the more localised adverse effects that the work (and its activities) might have on the environment, including on people, communities, and natural resources and values.

At a local level part of the overall balancing involves assessing positive effects alongside adverse effects. As Williamson J stated in the High Court:

> *"... to ignore real benefits that an activity for which consent is sought would bring necessarily produces an artificial and unbalanced picture of the real effect of the activity"*[60].

In terms of section 5 of the RMA, the construction of the Project (and its role as part of the Wellington Northern Corridor RoNS) will enable people and communities to provide for their social, economic and cultural wellbeing and for their health and safety, by:

- providing for the economic growth of the Region by improving accessibility and connectivity, particularly between economic centres and through new connections across the Region;
- providing significant community, social and transport benefits including:
  - resilience and route security of the transport network;
  - health and safety benefits through reduced incidence of crashes both on the new route, and on the existing SH1 through reduced traffic flows; and
  - reducing traffic flows on the existing SH1, making the local environments more pleasant – for example, through making it easier to walk and cycle along the road with less passing traffic;
- providing social and economic benefits through improved travel time reliability and quicker trips;
- achieving improved reliability for freight movements and resulting economic benefits; and
- completing a section of the Wellington Northern Corridor RoNS - an alternative strategic transport corridor between Wellington Airport and Levin.

The completion of the Project is consistent with the RLTS, and is therefore one component of the strategic land transport solution for the Region's economic prosperity and sustainable growth.

In balancing these considerations with the matters in section 5(2) (a) through to (c) of the RMA, the following conclusions are derived from the planning assessment contained in preceding sections of this chapter:

- in terms of sustaining the potential of natural and physical resources for future generations, the Project will meet the growing transportation needs of the Region and does not preclude future opportunities for other transport development, such as improvements to public transport, particularly rail, and additional improvements to walking and cycling routes beyond those new elements provided by the Project;
- the Project will safeguard the life-supporting capacity:
  - of air, by reducing congestion and improving air quality;
  - of water, because, while during construction there will be a minor short-term adverse effect on water quality from sediment deposition, there will be important long-term benefits arising from revegetation and planting and the treatment of stormwater discharges from the Expressway;
  - of soils, by the management of construction works (to control erosion and land disturbance) and remediation of sites of land contamination;

[60] Elderslie Park Limited v Timaru District Council CP1/94, Williamson J.

  - of ecosystems, by avoiding, remedying and mitigating the adverse effects on ecological values of terrestrial vegetation (including wetlands) and fresh water (rivers and streams);
  - of people and communities; by managing actual and potential adverse effects both during construction and operation, and by having significant positive effects on the transport network; social wellbeing by improving Expressway crossings and connectivity and improving the amenity potential for the Ōtaki Railway Retail area; and the economic benefits associated with improved transport networks; and
- the Project appropriately avoids, remedies and mitigates adverse effects on the environment, including through identification of mitigation and offsetting measures and conditions for the consent applications and designations (refer chapters 31 and 32).

The Project recognises and provides for the matters within section 6 of the RMA, particularly in the following aspects:

- s6(a): the alignment of the proposed Expressway has sought to minimise, as far as practicable, adverse effects on streams and wetlands. Proposed restoration, wetland creation and planting along riparian edges will mitigate the loss of habitat and natural character, and in the long-term it is anticipated that the quality of instream habitats will be improved. The design of culverts and bridges has taken into account the effect on the ecological functioning of the affected waterways to mitigate any impact. Overall, the Project will result in a long-term improvement in the freshwater habitat of the Project area;
- s6(b): the Ōtaki River bridge has been designed to mitigate adverse effects on the characteristics and values of the Ōtaki river corridor;
- s6(c): the alignment of the Expressway minimises adverse effects on areas of significant indigenous vegetation. In particular, through alignment refinement a significant area of indigenous bush and wetland at Mary Crest has been avoided. The indigenous biodiversity of the Project area will be enhanced through new plantings and the enrichment of existing vegetation using locally sourced indigenous species as much as practicable. In regard to indigenous flora and fauna, the corridor was comprehensively investigated. It was concluded that no threatened or at risk terrestrial or wetland species of flora or fauna were present along or immediately adjacent to the Project footprint. Recommendations have been made concerning minimising potential adverse effects on one non-threatened species – peripatus. This has been proposed as a precaution due to the taxonomy of the species being under review which could result in a new species being identified. The risk of significant adverse effects on these animals is identified as low;
- s6(d): the Project will not impact on public access to or along the coastal marine area or along the margins of any river or stream;
- s6(e) the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, wāhi tapu, and other taonga has been fully taken into account in the selection of the alignment of the Expressway, and in the design of mitigation measures which has occurred in consultation with iwi;
- s6(f): the protection of historic heritage has been recognised and appropriate mitigation measures are recommended where there are actual or potential adverse effects. Detailed investigations will be undertaken in areas of high archaeological potential prior to construction (refer Technical Report 17, Volume 3 of the AEE report); and
- s6(g): the Project does not impact on any recognised customary activities.

The Project has also had particular regard to and has appropriately responded to the matters in section 7 of the RMA. While not exhaustive, the following are considered particularly relevant:

- s7(a): the kaitiakitanga of tangata whenua has been recognised in seeking a specific cultural impact assessment from Nga Hapū o Ōtaki (refer Technical Report 19, Volume 3). This process has recognised the principles of the Treaty of Waitangi (the partnership between iwi and the NZTA as a Crown agency, and the retention by Māori of rangatiratanga over their resources and taonga in particular);
- s7(aa): the ethic of stewardship has been recognised through engagement with and participation of tangata whenua in hui early in and throughout the Project's development process;
- s7(b): the Project will improve the efficient use of the State highway network as a physical resource, and improve the use and function of the wider network;
- s7(c)/s7(d): the selection of the alignment and the design of the Expressway sought to avoid, or minimise potential adverse effects on amenity values and the intrinsic ecosystems within the Project area. Where this was not appropriate (e.g. in relation to the Pare-o-Matangi reserve and the Ōtaki Railway Wetland) measures have been developed to mitigate the effects of the Project on amenity and ecosystem values;
- s7(f): the selection of the alignment and design of the Expressway sought to mitigate the effect of the Project on local amenity values, with a focus on the relationship of the Project with the adjacent communities at Te Horo and Ōtaki and on those points along the proposed road with which most of the community would interact – i.e. interchanges and under-bridges. An inter-disciplinary approach was undertaken to address all related aspects of the Project design (e.g. noise attenuation, air quality, lighting, urban design, landscape and visual and ecology (terrestrial and aquatic)) to develop the best practicable solutions in assessing alternatives and designing appropriate mitigation on adjoining amenity values. It is acknowledged that the Project represents a permanent and considerable change to the existing character of parts of the Project area and on the quality of its environment. However, the route of the Expressway has been selected to minimise the overall impact on the Kāpiti district while best meeting Project objectives. The alignment selected was consistent with the present 'urban form' of this northern part of the Kāpiti district and located within a corridor sufficiently wide enough to provide a significant level of mitigation; and
- s8: the Project has taken into account the principles of the Treaty of Waitangi through early and on-going consultation, engagement, and partnership with tangata whenua, including the request for tangata whenua to prepare a cultural impact assessment of the Project.

Overall, when the benefits of the Project are considered alongside the proposed measures to avoid, remedy and mitigate the associated adverse effects, the Project promotes sustainable management of natural and physical resources and is consistent with the purpose and principles of the RMA. As a result, it is considered that the purpose of the RMA will be achieved by confirming the NoRs and granting the resource consents sought.

33.12 Conclusion

The Expressway from Peka Peka to North Ōtaki, and the consequent realignment of the NIMT through Ōtaki, represents a project of national significance.

The statutory assessment that has been undertaken and reported on in this chapter, has concluded that the Project is consistent with the relevant objectives and policies of the applicable national, regional and district level statutory instruments.

The Project will promote the sustainable management of natural and physical resources and is consistent with the purpose and principles of the RMA.

Notwithstanding the above, the Project will result in some adverse effects, particularly in relation to landscape, and visual amenity, earthworks, terrestrial and aquatic ecology and historic heritage.

On the other hand the Project will result in significant positive effects, particularly in relation to transportation and traffic, the 'essential' purpose of the Project, but also in terms of social and economic wellbeing.

Throughout the consideration of alternatives / route selection process, and the subsequent design process, the approach has been to avoid and, where avoidance is not possible, remedy or mitigate actual or potential adverse effects associated both with the construction phase and the operation of the Project.

To this end comprehensive management plans directed toward 'managing' the construction phase have been developed, as has a comprehensive suite of recommended consent conditions which set the framework and key environmental parameters in which the management plans operate.

As has been previously established:

> *The idea of mitigation is to lessen the rigour or the severity of effects. We have concluded that the inclusion of the word in s5(2)(c) of the Act, contemplates that some adverse effects from developments such as those we have now ascertained may be considered acceptable, no matter what the attributes the site might have. To what extent the adverse effects are acceptable, is however, a question of fact and degree.* [61]

The overall conclusion is that in relation to 'adverse effects on the environment' the Project has effectively responded to section 5(2)(c) in relation to avoiding, remedying and mitigating adverse effects. Where there remain some adverse effects post-mitigation, for example in relation to landscape and visual effects, those effects are acceptable.

The Expressway, which forms part of a RoNS, and the realignment of the NIMT will deliver significant national and regional benefits. It will have some limited adverse effects at the local Kāpiti district level. It will also have some significant positive effects at the local level.

As a result, it is the conclusion of this statutory assessment that the purpose of the RMA will be achieved by confirming the NoRs and granting the resource consents sought for the Project.

[61] Trio Holdings v Marlborough District Council, W103/96, p37.

Part J
Appendix A
VOLUME 2

Appendix A – Statutory Context

Appendix One
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Statutory Context

Overview

There are various national, regional and district planning documents that need to be taken into consideration during the determination of the NoRs and resource consent applications. In addition, there are 'other matters' that may be considered. The RMA does not define what 'other matters' are to be considered: however it is accepted that these can include matters outside the RMA, including matters arising from non-statutory documents and processes, so long as they are related to RMA matters and effects.

This Report provides a brief description of the main statutory considerations of relevance to the Project and therefore establishes the 'context' for the statutory assessment provided in Chapter 37 of the AEE (Volume 2).

1 Statutory Context

1.1 Introduction

When considering NoRs (under section 171) and applications for resource consent (under section 104), regard must be had to various matters, including national, regional and district level planning documents. There are also 'other matters' that may need to be considered.

Section 171 requires the consideration of any relevant provisions of:

- a national policy statement;
- a New Zealand coastal policy statement;
- a regional policy statement or proposed regional policy statement;
- a plan or proposed plan; and
- any other relevant matters.

Section 104 requires the consideration of all of the same matters, as well as any relevant provisions of:

- national environmental standards; and
- other regulations.

1.2 National Policy Statements

The purpose of a national policy statement (NPS) (other than the New Zealand Coastal Policy Statement) is to state objectives and policies for matters of national significance that are relevant to achieving the purpose of the RMA (section 45(1)). There are three NPSs that are potentially relevant to this Project:

- the National Policy Statement for Freshwater Management 2011(NPS FM);
- the National Policy Statement on Electricity Transmission 2008 (NPS ET); and
- the New Zealand Coastal Policy Statement 2010 (NZCPS).

1.2.1 National Policy Statement for Freshwater Management 2011

The NPS for Freshwater Management came into effect on 1 July 2011. The NPSFM is divided into five groups of objectives and policies:

(A) Water quality;

(B) Water quantity;

(C) Integrated management;

(D) Tangata whenua roles and interests; and

(E) Progressive implementation programme.

As the Project includes works which may affect several waterways, the NPSFM is relevant. An assessment of the Project in relation to the NPS FM is provided in section 34.2.1, Chapter 34 of the AEE (Volume 2).

1.2.2 National Policy Statement on Electricity Transmission 2008

The NPS on Electricity Transmission came into effect on 10 April 2008. The objective of the NPSET is:

> *"to recognise the national significance of the electricity transmission network by facilitating the operation, maintenance and upgrade of the existing transmission network and the establishment of new transmission resources to meet the needs of present and future generations, while:*
>
> - *managing the adverse environmental effects of the network; and*
> - *managing the adverse effects of other activities on the network."*

Any effects that the Project may have on the electricity transmission network will need to be considered and managed. The Project does not, however, pass under any high voltage transmission lines. Various transmission lines may need to be moved to allow for the Expressway, but these are local distribution lines which fall outside of the scope of the NPSET. The NPSET is therefore not relevant to an assessment of the Project.

1.2.3 New Zealand Coastal Policy Statement 2010

The NZCPS came into effect on 3 December 2010 and contains objectives and policies relating to New Zealand's coastal environment and the management of that area by local authorities. Although the Project does not involve any activities directly in the coastal marine area (CMA), some of the activities involved in the Project do have the potential to cause effects on the coastal environment. Both coastal and land-based activities are required to have regard to the NZCPS.

The relevant objectives of the NZCPS are those that relate to safeguarding and preserving the natural character of the coastal environment, whilst taking into account the principles of the Treaty of Waitangi and maintaining public open space opportunities in the coastal environment.

Policies in relation to the following matters are considered to be relevant:

- the extent and characteristics of the coastal environment (Policy 1);
- the Treaty of Waitangi, tangata whenua and Mā ori heritage (Policy 2);
- integration (Policy 4);
- the activities in the coastal environment (Policy 6);
- indigenous biological diversity (Policy 11);
- preservation of natural character (Policy 13);
- the restoration of natural character (Policy 14);
- walking access (Policy 19);
- vehicle access (Policy 20);
- enhancement of water quality (Policy 21);
- sedimentation (Policy 22); and
- discharge of contaminants (Policy 23).

The seaward extent of the CMA is clearly defined whereas there is not such exactness on the landward side due to various geographical and local influences resulting in uncertainty

in the scope of the 'coastal environment'. Therefore to avoid any doubt, an assessment of the Project in relation to the NZCPS is provided in section 34.2.3, Chapter 34 of the AEE (Volume 2).

1.2.4 Proposed National Policy Statement on Indigenous Biodiversity

There is also a further proposed national policy statement, the Proposed National Policy Statement on Indigenous Biodiversity (NPSIB).

The proposed NPSIB is intended to provide clearer direction to local authorities on their responsibilities for managing indigenous biodiversity under the Resource Management Act 1991. The NPSIB outlines policies and decision-making frameworks for the identification and management of indigenous biodiversity found outside the public conservation estate. The proposed NP SIB also contains a list of criteria for identifying areas of indigenous vegetation and habitats of indigenous animals that have been recognised as being rare and/or threatened at a national level. The proposed NPSIB requires district and relevant regional plans to identify these areas of significant biodiversity within five years of the NPS taking effect.

Local authorities would be required to manage the effects of activities through district and regional plans and resource consent decisions (or be satisfied that effects are managed by other methods) to ensure there is no net loss of significant indigenous biodiversity.

The proposed NPSIB seeks to promote the maintenance of indigenous biodiversity while recognising the rights and responsibilities of landowners and the interests of Mā ori.

The NPSIB is not operative, and therefore has no statutory weight. For completeness, however, it has been referred to here and will be discussed in section 34.2.4, Chapter 34 of the AEE (Volume 2).

1.3 National Environmental Standards

A national environmental standard (NES) is a regulation made under section 43 of the RMA. The standards are mandatory, have the force of regulations and are applied nationally. If there are any disparities between regional/district plans and a NES, then the local authority is obliged to amend the plan to remove such a disparity.

There are four NESs which are considered relevant, or potentially relevant, to the Project. These are:

- The Resource Management (National Environmental Standards for Air Quality) Regulations 2004;
- The Resource Management (National Environmental Standards for Sources of Human Drinking Water) Regulations 2007;
- The Resource Management (National Environmental Standards for Electricity Transmission Activities) Regulations 2009; and
- The Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011.

1.3.1 National Environmental Standards for Air Quality 2004

The National Environmental Standards for Air Quality (NESAQ) are intended to protect public health and the environment of New Zealand by, among other things, setting concentration limits for air pollutants. Different parts of the NESAQ came into effect between 2004 and 2006.

There are five ambient air quality standards relevant to the Project. These standards came into effect on 1 September 2005. Schedule 1 of the NESAQ sets out ambient air quality concentration limits for the following:

- carbon monoxide;

- nitrogen dioxide;
- sulphur dioxide;
- ozone; and
- fine particulate matter (PM10).

An assessment of the Project in relation to the NESAQ is provided in section 34.3.1, Chapter 34 of the AEE (Volume 2).

1.3.2 National Environmental Standards for Sources of Human Drinking Water 2008

The National Environmental Standards for Sources of Human Drinking Water (NESSHDW) came into effect on 20 June 2008. The NES SHDW aims to reduce the risk of contamination of drinking water sources by requiring regional councils to consider the effects of certain activities on drinking water sources when granting water permits or discharge permits. Sources of drinking water have been identified in the vicinity of the Project.

An assessment of the Project in relation to the NESSHDW is provided in section 34.3.2, Chapter 34 of the AEE (Volume 2).

1.3.3 National Environmental Standards for Electricity Transmission 2009

The National Environmental Standards for Electricity Transmission (NESET) came into effect on 14 January 2010. The NESET sets out a national framework of permitted activities and consent requirements for most activities that relate to the operation, maintenance, upgrading, relocation or removal of existing electricity transmission lines. Activities regulated by the NESET include the operation, maintenance and upgrading of existing lines.

As none of the activities to which the NESET relates are required to be undertaken as part of the Project, this NES is not relevant to an assessment of this Project. Rather, it has been listed for completeness.

1.3.4 National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health 2011

The National Environmental Standard for Assessment and Managing Contaminants in Soil to Protect Human Health (NES CSHH) came into effect on 1 January 2012 and contains a set of nationwide regulations for undertaking certain land use activities and subdivisions in relation to contaminated or potentially contaminated land. The NES CSHH is intended to increase protection for human health. The provisions of the NES CSHH have particular emphasis on methods of sampling contaminated soil and providing the findings of investigations to the relevant territorial authorities. The NES CSHH identifies five activity categories that are subject to the regulations:

- Removing or replacing fuel storage systems;
- Sampling of soil to determine whether or not it is contaminated;
- Disturbing soil;
- Subdividing land; and
- Changing the use of land to a use that because the land is contaminated or potentially contaminated, is likely to harm human health.

The Project involves disturbance of soil, particularly during the construction phase of the Expressway. An assessment of the Project against the NES CSHH is therefore provided in section 34.3.4, Chapter 34 of the AEE (Volume 2).

1.4 Regional Policy Statements

Relevant to the Project are:

- the operative Regional Policy Statement for the Wellington Region 1995; and
- the proposed Regional Policy Statement for the Wellington Region 2009.

1.4.1 Operative Wellington Regional Policy Statement 1995

The operative Regional Policy Statement for the Wellington Region (RPS) became operative on 15 May 1995. The RPS provides a framework for managing the region's natural and physical resources through identifying regionally significant issues, and by setting out what needs to be achieved through defining objectives and the way in which these are to be achieved through identified policies and methods to be applied to implement the policies.

Relevant chapters of the RPS in relation to the Project are:

- the iwi environmental management system (Chapter 4);
- freshwater (Chapter 5);
- soils and minerals (Chapter 6);
- the coastal environment (Chapter 7);
- air (Chapter 8);
- ecosystems (Chapter 9);
- landscape and heritage (Chapter 10);
- natural hazards (Chapter 11);
- energy (Chapter 12);
- waste management and hazardous substances (Chapter 13); and
- the built environment and transportation (Chapter 14).

1.4.2 Proposed Wellington Regional Policy Statement 2009

Although the operative RPS still has effect, there is also a Proposed Regional Policy Statement for the Wellington Region (PRPS) as the RMA requires Councils to review the RPS every 10 years and ensure that it continues to be in line with and promotes the purposes of the RMA. The PRPS was publicly notified on 21 March 2009. Hearings were held in November 2009 and GWRC's decisions were released in May 2010. The PRPS is currently subject to appeals to the Environment Court, although none of the points of appeal are directly relevant to the Project. Neither the NZTA nor KiwiRail have lodged an appeal on the PRPS.

Accordingly, in the statutory assessment (Chapter 34 of the AEE, Volume 2), the PRPS has been given greater weight as the 'dominant' statement of regional policy.

Relevant resource management issues addressed in the PRPS are:

- air quality (Section 3.1);
- coastal environment (including public access) (Section 3.2);
- energy, infrastructure and waste (Section 3.3);
- fresh water (including public access) (Section 3.4);
- historic heritage (Section 3.5);
- indigenous ecosystems (Section 3.6);
- landscape (Section 3.7);
- natural hazards (Section 3.8);
- regional form, design and function (Section 3.9);

- resource management with tangata whenua (Section 3.10); and
- soils and minerals (Section 3.11).

The PRPS also defines 'regionally significant infrastructure', addressing and emphasising the importance of this through specific objectives. The strategic transport network, as defined in the Wellington Regional Land Transport Strategy 2007-2016, is included in the definition of 'regionally significant infrastructure'. This includes State highway networks.

An assessment of the Project in relation to the PRPS is provided in section 34.4.1 of Chapter 34 of the AEE (Volume 2).

1.5 Regional Plans

Regional Plans provide guidance for the carrying out of GWRC's functions under the RMA. There are five regional plans that are relevant to the Project. These are:

- The Regional Freshwater Plan for the Wellington Region 1999;
- The Regional Air Quality Management Plan for the Wellington Region 2000;
- The Regional Coastal Plan for the Wellington Region 2000;
- The Regional Plan for Discharges to Land for the Wellington Region 1999; and
- The Regional Soil Plan for the Wellington Region 2000.

1.5.1 Regional Freshwater Plan for the Wellington Region 1999

The Regional Freshwater Plan for the Wellington Region (RFP) became operative on 17 December 1999. There have been five plan changes made since the Plan became operative.

The RFP applies to all fresh water in the region, including water in rivers, lakes, streams, ponds, aquifers and artificial watercourses, but excluding fresh water in the CMA. It also applies to all land in rivers and lake beds. The RFP applies to all types of activities that use fresh water or that occur in the beds of rivers and lakes. Activities covered by the RFP which are relevant to the Project include:

- the relationship of tangata whenua with fresh water;
- natural and amenity values and access;
- water quality and discharges to fresh water;
- the taking, using, damming or diverting of fresh water;
- building and modifying structures in river and lake beds;
- disturbing river and lake beds;
- reclaiming or draining river and lake beds;
- development on the flood plain; and
- flood mitigation.

An assessment of the Project in relation to the RFP is provided in section 34.5.1, Chapter 34 of the AEE (Volume 2).

1.5.2 Regional Air Quality Management Plan for the Wellington Region 2000

The Regional Air Quality Management Plan for the Wellington Region (RAQMP) became operative on 8 May 2000. There has been one Plan Change, which became operative in 2003. The RAQMP applies to discharges to air in the whole of the region, except for the CMA. The RAQMP contains objectives, policies, methods and rules related to managing the air quality impacts of the discharge of contaminants to air.

An assessment of the Project in relation to the RAQMP is provided in section 34.5.2, Chapter 34 of the AEE (Volume 2).

1.5.3 The Regional Coastal Plan for the Wellington Region 2000

The Regional Coastal Plan for the Wellington Region (RCP) became operative on 19 June 2000. There are no proposed Plan Changes to the RCP. The RCP applies to the CMA of the region. The CMA is the foreshore, seabed and coastal water, and the air space above the water, between the outer limits of the territorial sea and the line of mean high water springs. The RCP identifies areas of significant value within the CMA.

The Project does not involve any activities in the CMA. However, some of the activities involved in the Project do have the potential to cause effects on the coastal environment. This relates to potential effects of the Project on the Ōtaki River and other streams along the route, all of which ultimately discharge to the coastal environment. Accordingly, the general objectives and policies of the RCP (Chapter 4) are considered to be of relevance to the Project.

An assessment of the Project in relation to the RCP is therefore provided in section 34.5.3, Chapter 34 of the AEE (Volume 2).

1.5.4 The Regional Plan for Discharges to Land for the Wellington Region 1999

The Regional Plan for Discharges to Land for the Wellington Region (RPDL) became operative on 17 December 1999. There has been one plan change to the RPDL, which was made operative in 2003.

The RPDL applies to the whole of the Region, except the CMA. The RPDL aims to manage the discharge of contaminants to land, regardless of whether or not the discharge enters water, in order for the receiving environment to be managed sustainably. Provisions of relevance to the Project are:

- the discharge of chemically-treated sediment-laden water to land; and
- the discharge of contaminated fill to land.

An assessment of the Project in relation to the RDLP is provided in section 34.5.4, Chapter 34 of the AEE (Volume 2).

1.5.5 Regional Soil Plan for the Wellington Region 2000

The Regional Soil Plan for the Wellington Region (RSP) became operative on 9 October 2000. Plan Change 1 (made operative on 1 September 2003) changed the definition of 'soil' in the RSP but there were no changes to the rules.

The RSP applies to the whole of the region, except the CMA. It identifies issues to be addressed so that the effects of soil disturbance and vegetation clearance can be managed sustainably. Objectives, policies, and methods (including rules) that aim to address these issues are set out in the RSP.

The Project is located approximately on the border between Area 1 and Area 2 – SH1 forms the border between the two areas north of Pukerua Bay. Where the Project is located on the west of the existing SH1 it is within Area 1, where it is east of the existing SH1 it is in Area 2. Erosion prone land is identified as land within Area 1 with a slope greater than 23 degrees, and within Area 2 land with a slope greater than 28 degrees.

Activities addressed by the RSP which are relevant to the Project include:

- roading and tracking activities; and
- vegetation disturbance on erosion prone land.

An assessment of the Project in relation to the RSP is provided in section 34.5.5, Chapter 34 of the AEE (Volume 2).

1.6 Kāpiti Coast District Plan 1999

The Kāpiti Coast District Plan (KCDP) became operative on 30 July 1999. 1

The vision for the KCDP (as set out in Section A.7 of the Plan) includes provision for a variety of lifestyles, recreational and cultural experiences, and basic infrastructure, whilst protecting the natural environment and cultural heritage of the District. The KCDP also seeks to provide and maintain public utility services, and a transport network which meets high standards of environmental protection, and provides for safe and efficient movement of people and freight through the District, including within and between communities, as well as offering residents a selection of transport mode alternatives. The KCDP also recognises the District as a major growth centre in the region, and sets an objective to continue to provide water, essential public utility systems, efficient arterial traffic links and employment opportunities for the community, whilst conserving and enhancing natural resources, valuable agricultural land, visual values and taonga (treasures, spiritual, physical) and protecting land, air and water from pollution.

The Project is proposing to designate land in the following KCDP zones:

- Residential zone;
- Rural zone; and
- River Corridor zone.

The relevant objectives, policies and rules of the KCDP will be applicable in the consideration of the resource consent and NoR applications for the Project.

An assessment of the Project in relation to the KCDP is provided in section 34.6, Chapter 34 of the AEE (Volume 2).

1.7 Other Relevant Regulations

Regulations may be made for various purposes as listed under section 360(1) of the RMA.

Regulations relating to the Measurement and Reporting of Water Takes (MRWT Regulations) came into effect on 10 November 2010. These regulations were made under section 360(1)(d) of the RMA. This regulation is relevant to the Project as the NZTA is seeking resource consent for water takes.

The regulations require consent holders to keep records and provide reports to regional councils on their consented water takes. Water takes for the Project will need to comply with these regulations.

1.8 Other Relevant Matters

Regard must be had to "*any other matter the consent authority considers is relevant and reasonably necessary to determine the application*" (section 104 (1)(c)) when considering resource consent applications. For NoRs, regard must be had to "*any other matter it considers reasonably necessary in order to make the decision on the requirement*" (section 171(1)(d)).

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[1] The Council has commenced a review of the KCDP. The provisions which the review aims to address have been made public through a series of discussion documents. Along with the discussion documents, background work to produce a set of draft District Plan provisions has occurred. The draft District Plan has been made available for public consultation. The point has now been reached where the KCDC is planning to publicly notify the proposed District Plan by 30 November 2012 for formal submissions. The submission period is expected to take place from early December 2012 to early March 2013, with hearings on submissions beginning around July 2013.

The RMA does not define what matters are to be considered under these sections; however, it is accepted that these can include matters outside the RMA, including matters arising from non-statutory documents and processes.

It is considered that there are a number of other non-RMA matters relevant to the assessment of this Project. Factors used to determine other potentially relevant other matters were:

- the subject of the matter;
- whether it applied to the appropriate areas - i.e. the Project area;
- whether the matter had been through a public process; and
- whether the outcome of the matter (for example, a plan or strategy document) was widely publicly available.

The "other matters" that are deemed to be of relevance to the Project are:

- National State Highway Strategy
- Government Policy Statement on Land Transport Funding prepared under the LTMA;
- New Zealand Transport Strategy 2008;
- National Infrastructure Plan 2011;
- National Land Transport Programme (2009-2012) prepared under the LTMA;
- State Highway Asset Management Plan (2012-2015);
- The 2012/13 State Highway Plan;
- NZTA Environmental Plan (2008);
- Getting There – On Foot, By Cycle Strategic Implementation Plan 2006-2009 – Ministry of Transport
- New Zealand Urban Design Protocol (2005);
- Wellington Regional Strategy (2007);
- Wellington Regional Land Transport Strategy 2010-2040 – prepared under the LTMA;
- Western Corridor Plan 2006 (updated 2012);
- Wellington Regional Land Transport Programme 2009-2012;
- Regional Freight Plan – Greater Wellington Regional Council (2011);
- Kā piti Coast: Choosing Futures - Community Outcomes (2009);
- KCDC Development Management Strategy (2007);
- KCDC Sustainable Transport Strategy (2008);
- KCDC Cycleways, Walkways and Bridleways Strategy (2009);
- KCDC Subdivisions and Development Principles and Requirements (2005); and
- Kāpiti Coast Streetscape Strategy and Guideline (2008).
- Local Outcomes Statements
- Draft Te Horo (2012)
- Peka Peka (2011)
- Kapiti Coast: Choosing Futures. Community Outcomes, Otaki Local Outcomes, Greater Otaki Vision (2007)
- Open Space Strategy (2012)
- Positive Aging on the Kāpiti Coast (2011)
- Youth2U Action Plan (2011)
- Kapiti Coast: Choosing Futures, Stormwater Management Strategy 2008
- Kapiti Coast: Choosing Futures, Coastal Strategy (2006)
- Kapiti Coast District Council Monitoring Strategy, "Capturing Our Environment" (2002)

- Water Matters – Kāpiti Coast District Sustainable Water Management Strategy (2002).

An assessment of the Project in relation to these potentially relevant 'other matters' is provided in section 34.7, Chapter 34 of the AEE (Volume 2).

1.8.1 National State Highway Strategy

The National State Highway Strategy (NSHS), published in June 2007, takes a 30-year view and provides a link between the New Zealand Transport Strategy, the Land Transport Management Act (and other legislation) and NZTA's (formerly Transit) plans and policies and the State Highway Forecast. It also addresses the need for integration between State highway planning and local land use and multi-modal transport planning. The NSHS recognises that highways must respond to differing and sometimes conflicting expectations. The NSHS sets out NZTA's eight principles for planning, building, operating, and managing the State highway network and re-introduces the idea of categorising State highways for route planning purposes and also sets out how the State highway network will support economic transformation and the objectives of the New Zealand Transport Strategy 2008.

An assessment of the Project in relation to the NSHS is provided in section 34.7.3 of Chapter 34 of the AEE (Volume 2).

1.8.2 Government Policy Statement of Land Transport Funding

A Government Policy Statement on Land Transport Funding (GPS) is developed and issued under the Land Transport Management Act 2003.

The current GPS builds on the projects in the 2009/10 GPS to support economic growth through infrastructure development, particularly the RoNS projects. The GPS 2012 covers the financial period 2012/13 to 2017/18 and provides indicative figures from 2018/19 to 2021/22. It will be in effect from 1 July 2012 to 30 June 2015.

The NZTA must ensure that the National Land Transport Programme gives effect to the GPS and must take into account the GPS when deciding whether or not to approve activities for funding from the national land transport fund. Regional transport committees preparing a regional Land Transport Strategy must take into account the GPS and Regional Land Transport Programmes must be consistent with the GPS.

An assessment of the Project in relation to the GPS is provided in section 34.7.4, Chapter 34 of the AEE (Volume 2).

1.8.3 New Zealand Transport Strategy 2008

The NZ Transport Strategy (NZTS) seeks to provide direction for the transport sector through to 2040. The strategy relates to all parts of the transport sector, and includes the following relevant items:

- environmental sustainability including: reducing vehicle emissions, renewable fuels, fuel efficient technology and electric vehicles, increasing the area of Crown transport land covered with indigenous vegetation;
- assisting economic development through improving journey times and journey time reliability;
- assisting safety and personal security through reducing deaths and serious injuries;
- improving access and mobility through increasing public transport, walking and cycling; and
- protecting and promoting public health through reducing people exposed to transport noise and reducing people exposed to dangerous concentrations of air pollution.

An assessment of the Project in relation to the NZTS is provided in section 34.7.2, Chapter 34 of the AEE (Volume 2).

1.8.4 National Infrastructure Plan

The National Infrastructure Plan (NIP) outlines the Government's 20 year vision for New Zealand's infrastructure to 2030, and provides a three year programme of work to progress this vision.

The vision for transport is outlined as "a transport sector that supports economic growth by achieving efficient and safe movement of freight and people".

An assessment of the Project in relation to the NIP is provided in section 34.7.10, Chapter 34 of the AEE (Volume 2).

1.8.5 National Land Transport Programme (2009-2012)

The National Land Transport Programme (NLTP) is developed every three years to give effect to the Government Policy Statement on Land Transport Funding. The NLTP sets out activities that address the transport priorities of the GPS. It lists the land transport activities which have either been approved for funding or are proposed for funding from the National Land Transport Fund over the following three financial years. The National Land Transport Fund only provides resources for core transport activities, which includes things such as public transport services and new and improved infrastructure. To be included in the NLTP activities have to be:

- included in a regional land transport programme (including those concerning State highways) and proposed for funding from the National Land Transport Fund; or
- an activity that will be delivered nationally.

An assessment of the Project in relation to the NLTP is provided in section 34.7.1, Chapter 34 of the AEE (Volume 2).

1.8.6 State Highway Asset Management Plan 2012-2015

The State Highway Asset Management Plan (SHAMP) describes the services that the State highway network provides now and in the future; how it is intended to maintain, renew, operate and improve the network; and how it is proposed to fund the work that is needed. The SHAMP recognises that State highways are an integral aspect of the New Zealand Transportation network, and that there is a need for journeys utilising these to be as reliable and as safe as possible. The SHAMP is used to inform different audiences, such as NZTA staff and the NZTA Board, the Ministry of Transport, road user groups and stakeholders, and the Government, about the objectives of NZTA and how it wishes achieve them.

The SHAMP covers the infrastructure assets that form the State highway network, including carriageways, structures, drainage features, traffic facilities and lighting, traffic management and other services. It covers all forms of expenditure, beginning with capital investment and including the operation, maintenance, renewal and disposal of assets.

An assessment of the Project in relation to the SHAMP is provided in section 34.7.5, Chapter 34 of the AEE (Volume 2).

1.8.7 The 2012/13 State Highway Plan

The State Highway Plan (SHP) is developed within the context of the State Highway Asset Management Plan (SHAMP). The SHP sets out and communicates the NZTA's State highway annual work programme to its own staff, within the context of the wider NZTA strategic priorities. It is one in a suite of strategic documents that describe the service targets that the NZTA plans to deliver across the network, and the Agency's longer term programme and portfolio delivery strategy. The SHP provides internal guidance on how the State

highway network can be best developed to achieve the Government's objectives and meet customer needs, while balancing available funding over the period.

An assessment of the Project in relation to the SHP is provided in section 34.7.6, Chapter 34 of the AEE (Volume 2).

1.8.8 NZTA Environmental Plan (2008)

The Transit Environmental Plan's (TEP) purpose is to set a framework for managing the interface between the environment and the State highway network in a way that improves environmental sustainability and public health in New Zealand. The TEP guides staff, consultants, and contractors who plan, design, build, maintain and operate the State highway network, as well as making a commitment to local authorities, affected communities and interest groups. The NZTA's environmental policy is to be socially and environmentally responsible and improve the contribution of State highways to the environmental and social wellbeing of New Zealand by:

- Protecting and enhancing the environment where appropriate;
- Avoiding adverse effects to the extent reasonable in the circumstances;
- Using and managing resources efficiently;
- Considering environmental issues early;
- Contributing to sustainable outcomes by working with others; and
- Continually improving environmental performance.

The TEP outlines the key social and environmental impacts that typically result from the construction and operation of the State highway network (for example, noise, air quality, and heritage impacts), and discusses methods to address these impacts. This outlines impacts that works might have on:

- Noise;
- Air quality;
- Water resources;
- Erosion and sediment control;
- Social responsibility;
- Culture and heritage;
- Ecological resources;
- Spill response and contamination;
- Resource efficiency;
- Climate change;
- Visual quality; and
- Vibration

An assessment of the Project in relation to the TEP is provided in section 34.7.7, Chapter 34 of the AEE (Volume 2).

1.8.9 Getting There – On Foot, By Cycle – Strategic Implementation Plan 2006-2009

Getting There - On Foot, By Cycle is essentially a New Zealand cycling and walking strategy. The document was published in 2005 in response to the New Zealand Transport Strategy 2002 and sets out a strategy to advance walking and cycling in New Zealand transport. It is a high-level strategic document with a vision of:

"A New Zealand where people from all sectors of the community walk and cycle for transport and enjoyment".

This vision is supported by three goals:

- Community environments and transport systems that support walking and cycling;
- More people choosing to walk and cycle, more often; and
- Improved safety for pedestrians and cyclists.

Getting There recognises that to achieve these goals, action is required across ten priorities, under four focus areas:

- Strengthening foundations for effective action;
- Providing supportive environments and systems;
- Influencing individual travel choices; and
- Improving safety and security.

The document recognises that not all New Zealanders have independent access to motor vehicles and therefore cycling and walking needs to be provided for. Much of the initiative undertaken through this plan is essentially 'grass-roots', but it also recognises that there is a need for a national layer of action to underpin and support implementation. The Project needs to take into account any impacts that it may have on walking and cycling as a mode of transportation throughout the area.

An assessment of the Project in relation to the "Getting There – On Foot, By Cycle – NZ Transport Strategy" is provided in section 34.7.8, Chapter 34 of the AEE (Volume 2).

1.8.10 **New Zealand Urban Design Protocol (2005)**

The New Zealand Urban Design Protocol (NZUDP) provides a platform for "*making New Zealand towns and cities more successful through quality Urban Design*". The NZUDP identifies seven essential key design qualities that together create quality urban design. These qualities include the seven 'Cs':

- Context: seeing buildings, places and spaces as part of whole towns and cities;
- Character: reflecting and enhancing the distinctive character, heritage and identity of our urban environment;
- Choice: ensuring diversity and choice for people;
- Connections: enhancing how different networks link together for people;
- Creativity: encouraging innovative and imaginative solutions;
- Custodianship: ensuring design is environmentally sustainable, safe and healthy; and
- Collaboration: communicating and sharing knowledge across sectors, professions and with communities.

The NZTA is a signatory to the NZUDP. Urban and landscape design frameworks for the Project have been developed within the key urban design principles.

An assessment of the Project in relation to the NZUDP is provided in section 34.7.9, Chapter 34 of the AEE (Volume 2).

1.8.11 **Wellington Regional Strategy (2007)**

The Wellington Regional Strategy (WRS) was developed by the nine local authorities in the Region, working in tandem with central government and business, education, research and voluntary sector interests. The WRS is a sustainable economic growth strategy and contains a range of initiatives to realise economic potential. It aims to enhance the Wellington Region's "regional form" by addressing such issues as transport, housing, urban design and open spaces, which are all the things that contribute to quality of life.

The WRS identifies three focus areas for sustainable growth. They are:

- Leadership and partnership – key players working together to deliver the region's sustainable growth.
- Grow the region's economy, especially its exports – export more and become less reliant on trade within New Zealand.
- Good regional form – building on the physical arrangement of our communities and how they link, and strengthening our city and town centres, matching transport decisions and land use, creating quality urban design, creating strong open spaces and recreation amenities, and providing good housing choice – essentially, making the Wellington Region a great place to live, with a good quality of life.

Relevant WRS initiatives to promote an efficient regional form include:

- integrating transport with urban and rural needs - the WRS identifies that more employment needs to be created close to where people live. The efficient operation and use of the transport system and consideration of the development 'fit' with the transport network are fundamental to creating a good regional form;
- more homes close to city centres and transport links - one of the Region's strengths is its wide range of housing and lifestyle options. An identified need is to enable medium and higher density development close to centres and transport links, while protecting the character of the traditional low-density family-focused suburbs; and
- rural lifestyles - the WRS identifies that the Region offers excellent opportunities for rural residential living. It recognises the benefits in making lifestyle options available in certain areas including making better use of poor productivity areas, strengthening smaller communities, unlocking economic development opportunities, and enhanced management of special environmental features. However, it also recognises that in delivering on these opportunities caution needs to be exercised regarding removing high quality soils from primary production, threatening sensitive ecosystems or significant landscapes, and land fragmentation creating urban expansion difficulties.

The strategy also identifies Otaki as one of a 'nodes' on the Kapiti Coast where new growth will be focused.

An assessment of the Project in relation to the WRS is provided in section 34.7.11, Chapter 34 of the AEE (Volume 2).

1.8.12 **Wellington Regional Land Transport Strategy 2010-2040**

The Wellington Regional Land Transport Strategy (RLTS) 2010-2040 is a statutory document prepared under the Land Transport Management Act 2003. It is the strategic transport document that guides the development of the Region's transport system. It sets the framework and vision for the provision and management of movement and transport throughout the Region.

The vision of the Wellington RLTS 2010-40 is:

To deliver an integrated land transport network that supports the region's people and prosperity in a way that is economically, environmentally and socially sustainable.

The objectives of the RLTS are to:

- Assist economic and regional development
- Assist safety and personal security
- Improve access, mobility and reliability
- Protect and promote public health
- Ensure environmental sustainability
- Ensure that the Regional Land Transport Programme is affordable for the regional community.

An assessment of the Project in relation to the WRLTS is provided in section 34.7.12, Chapter 34 of trhe AEE (Volume 2).

1.8.13 **Western Corridor Plan**

The latest Western Corridor Plan (WCP) was adopted by the Greater Wellington Regional Council (GWRC) in August 2012. The Plan notes that:

"This Corridor Plan has been developed to support and contribute to the Regional Land Transport Strategy (RLTS), which sets the objectives and desired outcomes for the region's transport network

Along the Western Corridor from Ngauranga to Otaki, State Highway 1 and the North Island Main Trunk railway line will provide a high level of access and reliability for passengers and freight travelling within the region in a way which recognises the important strategic regional and national role of this corridor. These primary networks will be supported effectively by local and regional connector routes."

An assessment of the Project in relation to the WCP is provided in section 34.7.13, Chapter 34 of the AEE (Volume 2).

1.8.14 **Wellington Regional Land Transport Programme 2009-2012**

The Regional Land Transport Programme (RLTP) sets out all the transport projects, what they will cost and how they will be funded. It also identifies other significant transport projects to start within the next ten years, along with a 10-year financial forecast. The RLTP provides the region's funding bid for funding transport projects from the National Land Transport Fund.

An assessment of the Project in relation to the RLTP is provided in section 34.7. 14, Chapter 34 of the AEE (Volume 2).

1.8.15 **Regional Freight Plan - Greater Wellington Regional Council (2011)**

The Wellington Regional Freight Plan is one of a number of implementation plans that have been developed to respond to and meet the objectives of the Regional Land Transport Strategy (RLTS) that are relevant to freight. The Freight Plan identifies issues and opportunities in relation to improving rail and road freight efficiency and reliability both within the Wellington region and between regions.

The Regional Freight Plan was published in 2007 and an updated document was published in draft for consultation in April 2011 and then adopted in June 2011. The Freight Plan is a supporting document to the RLTS, as it provides a pathway to implement the RLTS objectives and policies that are relevant to freight. The Freight Plan identifies a number of trends affecting the freight sector throughout the region:

- Growth in centralised distribution centres and how these impact just-in-time delivery services;
- Possible introduction of bigger ships making calls at select New Zealand ports;
- Introduction of the Emissions Trading Scheme, changes to Road User Charges and the rising cost of fuel; and
- Introduction of high productivity motor vehicles (HPMV) changing the composition of the New Zealand truck fleet.

The Regional Freight Plan 2011 responds to these changes by broadening the scope of the action programme from that contained in the 2007 plan. The 2011 plan now includes relevant work being done at a national level by the NZTA (including the projects to upgrade the RoNS) and the KiwiRail Turnaround Plan (which focuses on improving the reliability and economic performance of rail freight).

An assessment of the Project in relation to the Regional Freight Plan is provided in section 34.7.15, Chapter 34 of the AEE (Volume 2).

1.8.16 **Kapiti Coast: Choosing Futures: Community Outcomes (2009)**

Kāpiti Coast: Choosing Futures: Community Outcomes is the name of the KCDC's Long Term Plan (LTP) prepared under the Local Government Act 2002. The LTP was adopted by KCDC in June 2009. The Peka Peks to Otaki section of the Kāpiti expressway was not incorporated as a RoNS at that time. Under the "Main Features of the Long Term Programme", the "continued advancement of solutions for improved access in the District" are referred to. As the Project section of the Kāpiti expressway provides improved access throughout the District, it is incorporated within this 'feature' of the LTP. The LTP also makes mention of the Western Link Road which has since been modified to the Mackays to Peka Peka section of the Kāpiti Expressway; a stretch of road which, like the Project, forms part of the Wellington Northern Corridor road of national significance (RoNS).

There are seven community outcomes identified in the Community Plan that indicate the direction and goals that the community and Council would like their District to develop in reflection of. These are:

1. There are healthy natural systems which people can enjoy;
2. Local character is retained within a cohesive District;
3. The nature and rate of population growth and development is appropriate to community goals;
4. The Community makes wise use of local resources and people have the ability to act in a sustainable way on a day to day basis;
5. There is increased ability to work locally;
6. The District is a place which works for young people; and
7. The District has a strong, healthy, safe and involved community.

The district-wide outcomes are applied to eight individual areas within the District and a set of locality-specific outcomes (Local Outcomes) identified for each area.[2]

These relate to such matters as the natural features, unique characteristics and urban environments of the Kapiti Coast and their associated values.

An assessment of the Project in relation to the Kāpiti Coast Choosing Futures: Community Plan is provided in section 34.7.16, Chapter 34 of the AEE (Volume 2).

1.8.17 **KCDC Development Management Strategy (2007)**

The KCDC Development Management Strategy was published in September 2007. It was produced as part of the overall 2003/04 Choosing Futures: Community Plan. When the 2009 Choosing Futures Plan was adopted (superseding the 2003/04 version), the Development Management Strategy (2007) remained applicable. The Development Management Strategy fits within the requirements of both the Local Government Act 2002 and the RMA 1991. The Development Management Strategy outlines the framework that KCDC follows for development and settlement patterns, being:

- the management of location and intensity of growth pressures and change;
- improvement to the quality of the built environment; and

[2] These areas are Greater Ōtaki; Waikanae North; Paraparaumu Town Centre; Paraparaumu Beach; Raumati Beach, Raumati South; Paekakariki and Otaihanga. The 'local outcomes' document for Otaki is the "Greater Otaki Vision".

- the development management processes that Council will use over time.

An assessment of the Project in relation to the KCDC Development Strategy is provided in section 34.7.17, Chapter 34 of the AEE (Volume 2).

1.8.18 KCDC Sustainable Transport Strategy (2008)

'Towards a Sustainable Transport System' was published in 2008 as the Sustainable Transport Strategy for the District. The Strategy exists within a national and regional transport planning framework. The Strategy outlines several challenges that the Kā piti Coast community is faced with. Two of these are:

- *"very constrained transportation corridors – in terms of locating and improving transport services"; and*
- *"like many other communities, a high dependence on car travel."*

The intent of this Strategy is to bring together a coherent vision and framework which maps out a clear path to achieving the vision and provides a clear basis for engagement with all 'transport players'.

The document contains five focus areas, being:

- Overall Transport System;
- Shifting Travel Modes;
- Network Hierarchy;
- Vehicle Fleet Emissions; and
- Living with the State highway.

The Strategy recognises that a second arterial route through the Kā piti Coast is required to provide for an alternative route for local traffic. Although the Strategy was adopted prior to the NZTA Board's decisions regarding the proposal for the Peka Peka to Ōtaki section of the Kā piti expressway being made, it supports the decision to make progress with implementation.

An assessment of the Project in relation to the KCDC Sustainable Transport Strategy is provided in section 34.7.18, Chapter 34 of the AEE (Volume 2).

1.8.19 KCDC Cycleways, Walkways and Bridleways Strategy (2009)

The Cycleways, Walkways and Bridleways Strategy was published by KCDC in December 2009 as part of the overall Kā piti Coast Choosing Futures: Community Plan, superseding the original strategy document that was published in 2004. The Strategy outlines the focus as being improved travel connections for walking, cycling and horse riding between the major towns and key recreation routes on the Kā piti Coast. The strategy gives direction for the future planning for such activities in Kā piti, as well as providing a foundation for implementation of a network that will enhance the user's experience of walkways, cycleways and bridleways. The vision of the Strategy is that:

"The Kāpiti Coast is renowned for its walking, cycling and horse riding".

This vision is to be met through the following three objectives:

1. *To promote walking, cycling and horse riding as safe, everyday modes of transport and recreation.*
2. *To develop safe networks that improve walking, cycling and horse riding access and linkages throughout Kāpiti.*
3. *To encourage and improve local, regional and national co-ordination, co-operation and collaboration in the planning and provision of safe walking, cycling and horse riding opportunities.*

An assessment of the Project in relation to the Cycleways, Walkways and Bridleways Strategy is provided in section 34.7.19, Chapter 34 of the AEE (Volume 2).

1.8.20 KCDC Subdivisions and Development Principles and Requirements (2005)

The KCDC's Subdivisions and Development Principles and Requirements report was published in 2005, and sets out what KCDC requires from all developers in the District to meet the requirements of the RMA and the KCDC District Plan.

There is one transportation objective in the document, being:

"... to plan, provide and maintain an efficient roading network appropriate to the level of use that will ensure the safe and orderly passage of road users (including cyclists) and pedestrians throughout the Kāpiti Coast District. The Council wishes to encourage pleasant, walkable neighbourhoods, with a low speed environment, which provides increased amenity by, for example, enhancing connectivity, decreasing the area of "black top", differentiating parking bays and providing associated landscaping. This will be achieved by:

4. *Planning and implementing a balanced roading network with adequate opportunity for future growth.*
5. *Planning and constructing cycleways and footpaths to provide safe access between home, work, shops and schools for cyclists, pedestrians and mobility scooter users.*
6. *Planning and implementing a linked network of accessways using streams, riverbanks and pathways to link reserve areas and open spaces for recreational uses such as cycling, walking and horse riding, in accordance with the Council's Cycleways, Walkways and Bridleways strategy.*
7. *Planning and developing low speed, attractive and connected neighbourhood areas.*

An assessment of the Project against the Subdivisions and Development Principles and Requirements report is provided in section 34.7.20, Chapter 34 of the AEE (Volume 2).

1.8.21 Streetscape Strategy and Guideline (2008)

The Kāpiti Coast Streetscape Strategy and Guideline was published in 2008. This Strategy, in conjunction with the Subdivisions and Development Principles and Requirements report, provides design guidance to enable a coordinated approach to streetscapes for both the subdivision process and the upgrading of existing streets. The streetscape of SH1 is identified as a distinctive street type, with unique issues based on its strategic role in the national transport / road network. Important issues and elements of the existing SH1 streetscape in the Kāpiti Coast District are recognised in the document as including:

8. *The lack of access to highways means they are often treated as 'backs' to land use, with solid fencing and poor interfaces presented. The use of back-lane or slip-road approaches in particular can reduce connection issues;*
9. *Reverse sensitivity issues (especially related to large freight vehicles in terms of noise, visual and air pollution) means uses turn their backs to highways, which causes the loss of passive surveillance;*
10. *State Highways are not designed for pedestrians or cyclists, as such there are inherent safety issues that limit crossing opportunities to selected signalled interchanges within certain town centres;*
11. *Changes to the strategic network, including new or realigned sections of the highway and new on / off ramps can isolate communities and further limit crossing opportunities;*
12. *Large-scale concrete barriers or acoustic fences can present monotonous mass for several continuous kilometres, reducing the quality of views of the District; and*

13. *Interchanges act as critical entry / departure gateways to the District and towns within it. The opportunity to integrate these with land uses, specific art or architectural statements, and other treatments to maximise this 'front door' effect have traditionally been ignored in other places.*

Key treatments to improve the streetscape of the different categories of road are provided within this document. The safety aspects of the current State highway network are identified as a key issue, especially as it passes through Ōtaki township. An assessment of the Project against the Streetscape Strategy and Guideline is provided in section 34.7.21, Chapter 34 of the AEE (Volume 2).

1.8.22 Kāpiti Coast: Choosing Futures: Community Outcomes (2009)

- **Te Horo Local Outcomes (Draft) (2012)**

Te Horo is a small rural community bisected by State Highway 1. Its estimated population is 700 with 1500 for Ōtaki Forks. Between 100-200 people are employed in the Te Horo area. The *Draft Te Horo Local Outcomes* report was developed under the umbrella report *Kapiti Coast: Choosing Futures: Community Outcomes (2009)* and aims to represent community aspirations for the Te Horo locality and village. In the document, the particular character of the Te Horo community, as well as its vision, predominant themes and issues are acknowledged. Future guidance is provided for Te Horo in terms of what is important to those who live and work there.

- **Peka Peka Local Outcomes (2011)**

Like the *Draft Te Horo Local Outcomes* document, the *Peka Peka Local Outcomes Statement* focusses on the aspirations of the local community, and is also written to sit under the the umbrella report *Kāpiti Coast: Choosing Futures: Community Outcomes* (2009). Peka Peka is a small and emerging community, with no central community point of focus and generally low density settlement. The Peka Peka coastline has a rich history of Maori occupation, with wide, accreting sandy beaches which are inclose proximity to rural landscapes. It has been agreed by residents that the character of the beach hamlet with its seim-rural residential character should be retained.

An assessment of the Project in relation to the Te Horo Local Outcomes (Draft) (2012) and Peka Peka Local Outcomes (2011) is provided in section 34.7.22, Chapter 34 of the AEE (Volume 2).

1.8.23 Kāpiti Coast: Choosing Futures. Community Outcomes, Ōtaki Local Outcomes Greater Ōtaki Vision (2007)

This document builds on *Kāpiti Coast: Choosing Futures – Community Outcomes*. Under the umbrella of those broader community outcomes, this document sets out a further layer of information about the community's vision for Greater Ōtaki. Much of the focus on this report is to provide more guidance on what this means for the community, and to signal a desired direction for Ōtaki.

An assessment of the Project in relation to the Kāpiti Coast: Choosing Futures. Community Outcomes, Ōtaki Local Outcomes, Greater Ōtaki Vision (2007) is provided in section 34.7.23, Chapter 34 of the AEE (Volume 2).

1.8.24 Open Space Strategy 2012

The terrain of the District is made up of hill country and a coastal plain, consisting of alluvial sediment and silt, overlain by dunes accumulated over the last 6000 years. Floodplains have been fashioned by rivers flowing from catchments in the mountains. In the southern portion of the district, many coastal and farming areas have been subdivided

for residential use. The Strategy aims to address issues in maintaining, acquiring and approving the accessibility, quantity, and quality of open space.

An assessment of the Project in relation to the Open Space Strategy is provided in section 34.7.24, Chapter 34 of the AEE (Volume 2).

1.8.25 **Positive Aging on the Kāpiti Coast (2011)**

This report considers many aspects which may improve the lives of older people, and people as they age, on the Kāpiti Coast. It is designed to provide a basis for future planning for the wellbeing of the ageing community. Implementation of positive actions which contribute to that wellbeing are discussed.

An assessment of the Project in relation to the Positive Aging on the Kāpiti Coast (2011) is provided in section 34.7.25, Chapter 34 of the AEE (Volume 2).

1.8.26 **Youth2U Action Plan (2011)**

The Youth2U Action Plan (2011) has been developed by young people for young people, and is grounded in youth participation in decision making. Youth2U is aimed at 12-24 year olds. This group represents New Zealand's national definition of 'youth', as provided by the Ministry of Youth Development. The five goals of Youth2U are a direct response to young people's experiences, ideas, issues and opinions which were captured in the Kāpiti Youth Survey 2010. This action plan addresses the key findings of the Kāpiti Coast Youth Survey which captured the views of over 10 percent of the youth population. One key finding was that young people struggle with transport options around the District, but no further detail was provided. The Youth Development Strategy Aotearoa (YDSA) was used as a basis for the values which underpin the Action Plan.

An assessment of the Project in relation to the Youth2U Action Plan (2011) is provided in section 34.7.26, Chapter 34 of the AEE (Volume 2).

1.8.27 **Kāpiti Coast: Choosing Futures, Stormwater Management Strategy 2008**

The KCDC is tasked with management of development impacts on stormwater systems, and regulation of location of development and design of structures in relation to specified stormwater risks. In addition, the GWRC is tasked with management of specified stream corridors under the KCDC/GWRC agreement. This is part of a KCDC integrated catchment concept. Three aspects of development need to be managed in relation to storm water, including where and when development should occur, and the effect of hard surfaces that will be created by development.

The four drainage areas which may require consideration with regard to the proposed expressway. The Peka Peka undrained and Te Horo Beach Management areas have no stormwater network, but require stormwater management in relation to settled areas. Both of these are a significant distance from the proposed expressway. The other two Management Areas which should be considered are the Mangaone Stream and the Kowhai area. In the Kowhai area, the management of the Mangaone affects the stormwater management of the stream in the north. In the Mangaone area, management of the Mangaone affects stormwater management at Te Horo Beach.

An assessment of the Project in relation to the Kāpiti Coast: Choosing Futures, Stormwater Management Strategy 2008 is provided in section 34.7.27, Chapter 34 of the AEE (Volume 2).

1.8.28 **Kāpiti Coast: Choosing Futures, Coastal Strategy (2006)**

The Strategy builds on the *Kāpiti Coast: Choosing Futures – Community Outcomes and Community Plan*. The Strategy has been developed to guide management of the coastal environment over the next 20 years, focussing on the immediate coastal margins. It

emcompasses the entire Kāpiti Coast from Paekakariki to north of Ōtaki. It determines the management of coastal activities, access, recreation, harvesting, the natural and built environments and coastal hazards.

An assessment of the Project in relation to the Kāpiti Coast: Choosing Futures, Stormwater Management Strategy 2008 is provided in section 34.7.27, Chapter 34 of the AEE (Volume 2).

1.8.29 Kāpiti Coast District Council Monitoring Strategy, "Capturing Our Environment", August 2002

A small number of indicators and objectives detailed in this report are of potential consideration in the context of the proposed expressway. Some data on indicators will be collected from Ōtaki and Te Horo area units by KCDC. In terms of high level landscape objectives, the relevant anticipated environmental outcomes for the outstanding landscapes of the district are that they are protected from inappropriate subdivision, use and development, and that the outstanding landscapes are managed to improve, retain or enhance their visual character as appropriate.

Monitoring objectives for landscape, noise and transportation are relevant for potential consideration: For landscape, the objective to monitor the extent to which outstanding landscapes are modified by subdivision and development is relevant. In terms of noise, the effect of noise from State Highway 1 and the Western Link Road on amenity values is also monitored. The specific indicator for this objective is the number of complaints regarding the adverse effects of traffic noise. Transportation is monitored in terms of whether KCDC roads and the State Highway function safely, and this is to be done by monitoring the number of existing and new access points (crossing places and road junctions) onto State Highway 1 per year. The trends in traffic movements and the efficiency of transport routes through the Kāpiti District are being monitored by scrutinizing modes of transport to work, the peak flow traffic counts at specific points on State Highway 1 and peak flows on main local arterials.

An assessment of the Project in relation to the Kāpiti Coast District Council Monitoring Strategy, "Capturing Our Environment", August 2002 is provided in section 34.7.29, Chapter 34 of the AEE (Volume 2).

1.8.30 Water Matters - Kāpiti Coast District Sustainable Water Management Strategy (2002)

This strategy sets out the Kāpiti District Council's vision for water management in the wider district over the next fifty years. It works towards a vision of balanced community development, and covers Ōtaki, Hautere, Te Horo, Waikanae, Paraparaumu, Raumati and Paekakariki. It covers all aspects of water supply for the district, but does not cover discharge issues relating to stormwater or road wash water.

An assessment of the Project in relation to the Water Matters - Kāpiti Coast District Sustainable Water Management Strategy (2002) is provided in section 34.7.30, Chapter 34 of the AEE (Volume 2).