




Technical Report 6

# Assessment of Urban Planning and Design Effects

## Revision History

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## 1. Introduction

### 1.1. Purpose and Scope of this Assessment

The following is an assessment of the urban planning and urban design effects (AEE) associated with the MacKays to Peka Peka Expressway Project (Expressway). The AEE has been prepared to address the requirements of the Resource Management Act (1991) (RMA). Alongside and as a companion document to this AEE, is the Urban and Landscape Design Framework (ULDF) for the proposed Expressway.

The NZ Transport Agency (NZTA) requires that the urban and landscape design considerations for its projects (Urban and Landscape Frameworks – Highways and Operations Guideline [2009]) are addressed within an Urban and Landscape Design Framework (ULDF). The ULDF is a technical document rather than an assessment of effects. It contains a full description of the relevant contextual considerations for the urban and landscape design aspects of the proposed Expressway, identifies key design decisions made, and sets in place important design considerations to be applied in the more detailed phases of the Project.

The ULDF is a companion document to the extent that it contains design detail that will be a useful reference to the reader requiring this level of information. Content from the ULDF has been summarised within the AEE where practicable to maintain continuity and to enable the assessment to stand alone.

The reasons for undertaking this assessment are:

Aspects of the Project will have a bearing on local and regional amenity values, the quality of the environment, and the efficient use of natural and physical resources which are matters of interest under the RMA [see 2.1 below];

Although technical reports by other specialists will address some of the above matters (such as the landscape, social and economic effects), it is the collective interaction of these factors on the urban environment that this urban planning and design assessment is addressing; and

Some perspectives on the proposed Expressway are different when viewed by different disciplines – for example, the efficiency with which local road traffic is moved through a roundabout intersection may be positive in terms of a traffic planners technical assessment – but may be negative from an urban design perspective if that roundabout makes it difficult for cyclists and walkers to move through it. This assessment can provide for different perspectives to be given to some of the proposed Expressway's effects.

## 1.2. Urban Planning and Design and the RMA

The terms 'urban planning' and 'urban design' are not used in the RMA. However, there is a correlation between requirements of Part 2 of the RMA (Purpose and Principles) and urban planning and design matters associated with the proposed Expressway. These are cross-referenced in the table below and will relate to the headings of the urban design matters to be addressed by this assessment. It is noted that only those provisions of the RMA that relate to urban planning and design are addressed in the table - there are many other RMA matters which will be addressed by other technical reports for the proposed Expressway.

Table 1 RMA and proposed Expressway Urban Planning and Design Correlation	
RMA Part 2	Urban Planning
<p>Section 5 Purpose</p> <p>(1) The purpose of this Act is to promote the sustainable management of natural and physical resources.</p> <p>(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—</p> <p>(a) sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and</p> <p>(b) safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and</p> <p>(c) avoiding, remedying, or mitigating any adverse effects of activities on the environment.</p>	<p>The overarching consideration of people and communities providing for their social, economic, and cultural well being and for their health and safety whilst sustaining resources, safeguarding life supporting elements, and avoiding, remedying or mitigating effects</p>
<p>Section 6 Matters of national importance</p> <p>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:</p> <p>(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:</p> <p>(b) the protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development:</p>	<p>Access to and along rivers is an aspect of accessibility and connectivity that is</p>

<p>(c) the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna:</p> <p>(d) the maintenance and enhancement of public access to and along the coastal marine area, lakes, and rivers:</p> <p>(e) the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga:</p> <p>(f) the protection of historic heritage from inappropriate subdivision, use, and development:</p> <p>(g) the protection of protected customary rights</p>	<p>relevant to urban planning</p>
<p>Section 7 Other matters</p> <p>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—</p> <p>(a) kaitiakitanga:</p> <p>(aa) the ethic of stewardship:</p> <p>(b) the efficient use and development of natural and physical resources:</p> <p>(ba) the efficiency of the end use of energy:</p> <p>(c) the maintenance and enhancement of amenity values:</p> <p>(d) intrinsic values of ecosystems:</p> <p>(e) [Repealed]</p> <p>(f) maintenance and enhancement of the quality of the environment:</p> <p>(g) any finite characteristics of natural and physical resources:</p> <p>(h) the protection of the habitat of trout and salmon:</p> <p>(i) the effects of climate change:</p> <p>(j) the benefits to be derived from the use and development of renewable energy</p>	<p>Efficient use and development of resources is good urban planning practice</p> <p>Amenity values means the qualities and characteristics of an area that contribute to people's appreciation of its pleasantness, aesthetic coherence, and cultural and recreational attributes</p> <p>Quality of the environment includes a range of attributes that relate to the urban environment including but not limited to amenity, accessibility and connectivity</p>

The terms urban design and urban planning are frequently used in interrelated ways and there is often confusion as to what is meant by the terms. In this assessment which relates to the Designation for the proposed Expressway, 'urban planning' is being used as a catch-all term to

address the higher range of scales that the urban issues pertaining to the proposed Expressway have been considered at this stage. Detailed urban design and landscape design will still be required to be undertaken for the proposed Expressway to proceed towards construction and, as noted in section 1.1 of this AEE, the ULDF provides a series of specific items that this design process will need to address.

It is noted that some of the policies relevant to the consideration of this Project under the RMA (at national, regional and local levels) seek certain urban outcomes. These policies are a statutory consideration for this Project and specific policies are identified and considered in section 6 of this assessment.

## 2. Existing Environment

The proposed Expressway environment context is described in detail in the ULDF with graphics and written content. A summary of the key aspects of the context is provided below.

### 2.1. Landform

The proposed Expressway is located within a relatively narrow coastal plain defined by the Tararua Ranges and the Tasman Sea. The ranges, coastal plain and Kāpiti Island are distinctive landform elements in the district. From the coastal beach the prevailing westerly winds have blown sand inland, forming an extensive network of dunes aligned in a west-northeast to east-southeast direction (approximately parallel to the coast). The successive rows of inter-dunal hollows are damp and form wetlands that filter, collect and transport water, soil and silt, and vegetative material. Over time these areas form peat and eventually rich organic soil.

With the exception of the alluvial deposits of the Waikanae River flood plain, the proposed Expressway route from MacKays Crossing to Peka Peka is situated in sand country. The elevation of the landform along the proposed Expressway route varies between 3m amsl and 20m amsl.

Large areas of the original dune landforms of the Kāpiti Coast have been modified to facilitate farming and urban development. The wet areas have been drained and filled over. The remnants of these wet areas and the systems that support these are drainage channels, some recreated wetlands and low-lying flood-prone land. In the north part of the District the less urbanised areas retain some highly valued less modified wetland areas.

The little that remains of the original and unmodified dunes in the more urban part of the District is within the corridor of land originally designated for the Sandhills Motorway and now proposed to accommodate the proposed Expressway. This designation (applied more than 50 years ago) has 'frozen' this land and prevented its development.

As the area has been settled, roads have been developed. Local roads that connect across the plain east to west to the beach areas have typically cut through the dunes and these cuttings are prevalent in places such as Raumati and Mazengarb Roads.

## **2.2. Hydrology**

Prior to European settlement the Kāpiti coastal plains were a complex network of dunes, wetlands and streams. These networks sustained an ecological system inextricably linked to the natural hydrological processes. Since the early 1900s the plains have been drained, at first to facilitate pastoral farming and then further drainage has occurred to enable urbanisation and reduce flood risk. The area remains visibly wet in places as, despite the surface hydrological modification, there is a relatively high water table which accompanies the low lying coastal plains.

The drainage of the subject area today comprises rivers, streams (often channelised), wetlands, flood plains, ponding areas, constructed drains and high groundwater. Potential for surface flooding is high throughout the district because of the relatively flat gradient across the coastal plain and the high water table.

The Waikanae River is the largest water body in the area between MacKays Crossing and Peka Peka. Its catchment is the foothills of the Tararua Ranges and it is a distinctive feature of the area. The river has recreational and natural values and is identified in the Kāpiti Coast District Plan as an Outstanding Landscape. The Wharemauku, Mazengarb, Muaupoko and Waimeha Streams are smaller than the Waikanae River, but similarly drain local catchments at the foot of the Tararua Ranges.

## **2.3. Vegetation**

Prior to human occupation, the Kāpiti coastal plain was covered with a diverse mix of vegetation types. Predominant among these were the areas of lowland podocarp forest. This was interspersed with areas of swamp forest.

Most of these vegetation types and combinations have now been removed to facilitate farming and more latterly urbanisation. The original forests and dune wetlands now occur as isolated fragments and pasture is the dominant vegetation cover.

Most remnants are located north of the Waikanae River where there is a lower intensity of urban development. Small areas of regenerating indigenous vegetation are also present, such as the prominent stand of semi-mature kanuka on the dunes at the southern end of the proposed Expressway corridor, and groups and small of kanuka at various other locations. The lack of connectivity between the fragmented indigenous plant communities reduces the potential to prolong and enhance their overall ecological health and biodiversity.



Mature exotic trees feature in places. Typically these are grouped around rural dwellings as shelterbelts, or erosion control planting in the river corridors, or amenity planting in rural and urban areas.

At Waikanae there has been a strong tradition of tree planting and gardening and it is well known for this today. It is in the areas north of Waikanae where some of the more natural vegetation and wetland areas remain.

## **2.4. Ecology**

As wetlands are now so poorly represented in this region most of those remaining, irrespective of the state of modification, are generally considered to be ecologically significant. The historical nature of the proposed Expressway corridor's wide reservation for a road purpose combined with subsequent land purchases by NZTA and KCDC has left many of these ecological features relatively unmodified.

Many of the existing wetlands are under pressure from invasive weeds and long-term management (including hydrology), need to be taken into account in planning for any enhancement or supplementation with new wetland areas associated with the proposed Expressway.

Water bodies such as drains, streams and rivers located along the Kāpiti Coast are recognised as providing habitat for rare or threatened freshwater fish species including giant kokopu, brown mudfish and long-finned eel. These will be susceptible to road run-off and stormwater contaminants.

The Kāpiti coastal area is also home to a number of indigenous bird species, some of which are nationally threatened. The nature of the fragmented ecological areas along the Kāpiti Coast, combined with the presence of Kāpiti Island and the large Hemi Matenga Scenic Reserve and Tararua Range, means that the continued east-west movement of bird species between these fragments is important to their sustainability.

In addition to providing habitat for birds, the isolated stands of regenerating manuka, kanuka and mahoe along the Kāpiti Coast may provide habitat for lizards.

## **2.5. Heritage**

The Kāpiti coast has always been a highly desirable place to live - radiocarbon dating suggests people were present there in the 14th century. This long history of use over time has generated many places of cultural heritage interest. Archaeology on the coast can be divided into three broad areas:

### **Pre-European Māori occupation**

The predominant site types on the coast are middens and ovens, with the shell middens reflecting the high reliance on the sea for subsistence. Burials also occur moderately frequently in the shifting sands and the urupa at Takamore is a well recognised and still active example of a burial site

### **Post contact Māori occupation**

Post contact Māori occupation is marked by the continuation of existing subsistence activities and adoption of new ones. Grown crops included wheat and white potatoes, and steel fishhooks were utilised. Māori worked on the whaling stations that sprung up along the coast, and in new industries including flax milling.

### **Early European occupation**

Early European archaeology includes both commercial and residential sites. Remains of houses and farms, including the buildings themselves survive on the coast, as do remains of early churches such as Hadfield's church at Kena Kena. The railway line built in 1889 is an archaeological site in its own right.

In general there is a prevalence of known archaeological sites across the subject area, but with an emphasis on coastal locations and areas north of Waikanae River. Specifically and in relation to the proposed Expressway route the area around Waikanae River is important and the history of use and occupation of this area by Māori has left a legacy of physical evidence and remains, continued use and occupation (Takamore) as well as strong associations with the place.

More recent European historic heritage values coexist in this location with the Greenaway Homestead (corner of Kauri and Pururi Roads) being the most well known. There is no other recognised European historic heritage within the route area.

## **2.6. Land Use and Built Environment**

The area of the Kāpiti District through which the proposed Expressway passes has a range of land uses (refer to Figure 1) and lower densities of use typical of a New Zealand urban area. Building heights are typically low (no more than 2 storeys including in the town centres) with a few exceptions like at Paraparaumu Beach. The Kāpiti area started its urban life as a series of beach communities and the lateral east-west connections from the existing SH1 leading to the beach places are now an important part of the movement network and have provided a street structure that urban development has occurred from. The arterial and connector roads connectivity is limited in an east/west as well as north/south direction.

The older parts of the District's urban areas retain some of the beach settlement character. However, with improved access to transport since the 1950's the coast developed rapidly and with a more suburban character. The original designation for the "Sandhills Motorway" (Mackays to Peka Peka Expressway broadly follows) occurred at this time.

Much of the former dune landscape has been subsumed by development. Typically this more recent development has filled in around the beach settlements and spread back to and out from the main

centres at Waikanae and Paraparaumu. The Waikanae and Paraparaumu suburbs have remained separated by open space which is now generally occupied rural-residential density land uses. The Waikanae River itself and its corridor reserve has served to maintain this open space gap, and its retention is an objective of KCDC's Development Management Strategy.

The identity and naming conventions of the District's urban areas continues to follow the pattern established historically - a string of 'beach' communities (Raumati Beach, Paraparaumu Beach, Waikanae Beach, Peka Peka Beach); and the inland communities (Raumati, Paraparaumu, Waikanae). Most of these have some local amenities in the form of shops and schools (with the exception of Raumati Beach for a school and Peka Peka for both). The two colleges are located at Paraparaumu.

Notable in the District is the senior living residential land use. There are many 'retirement villages' as well as people of an older age living independently in the District. The same lifestyle has attracted people of working age.

The town centres at Waikanae and Paraparaumu are less than 40 years old. At the largest and regional centre of Paraparaumu the centre is based around a mall with civic facilities separated away. Plans for a town centre with a higher level of public amenity have been in train for some time. KCDC has also investigated with the community options for improvements at the Waikanae town centre in recent times.

## **2.7. State Highway 1**

A 14.4 km length of current State Highway 1 (SH1) will be handed over to KCDC by NZTA when the proposed Expressway becomes operational. The process of design for the proposed Expressway has included consideration of the existing SH1 context and has identified opportunities for what its future condition may best be to serve the needs of the community. This AEE includes consideration of the existing SH1 because its future function and the opportunity it presents to affect the urban future of the Kāpiti area is a direct result of the proposed Expressway being located on a different alignment (than an upgrade of the existing SH1 route for the proposed Expressway for example).

The existing SH1 currently has a series of rural, suburban and urban (town centre) uses along its length (refer to Figure 1). Of particular note is that Paraparaumu and Waikanae are currently bisected by the existing SH1. Over time the centres have developed with most of the retail and civic activities away from the existing SH1 - a response to limited access opportunities, parking and amenity constraints as well as to provide for retail growth. The growth has been in a westerly direction which mirrors residential urban development.

Large sections of SH1 are rural and the rail line is approximately parallel for much of the length. The two rail stops at the town centres are adjacent and east of SH1. The suburban (residential and other commercial) uses at Paraparaumu typically gain access from SH1.

## 2.8. Movement Networks

The movement network within the Kāpiti District is provided by a combination of a hierarchy of roads and streets as well as pathways and other non-vehicular linkages. This network is used by vehicles, walkers and cyclists as well as recreational users such as horse riders. There is a public transport system in the form of a bus service as well as inter-regional trains with stops at Waikanae and Paraparaumu. There is also an airport at Paraparaumu on Kāpiti Road which began a regional service of flights in late 2011.

KCDC expresses its aspirations and supporting policy towards developing a movement network that enables and encourages walking and cycling activities as well as horse riding. Walking and cycling is promoted as both a commuting and recreational mode of movement for people and can utilise both on road and off road facilities.

SH1 is currently the busiest vehicular route (see Table 2) and conducts traffic both within the district (i.e. between the towns and communities) as well as regionally and nationally within the North Island.



Figure 1 Diagrammatic drawing of broad spatial form

Table 2 SH1 Traffic Flow	
location	daily flow
south of Poplar Ave	22,700
south of Kāpiti Road	26,900
south of Otaihanga Road	22,400
south of Te Moana Road	26,900
north of Peka Peka Road	15,900

The proposed Expressway will replace the current highway and it will revert to an arterial level road with a consequent reduction in traffic volumes. The existing SH1 presents opportunities for revitalisation as a local arterial.

Most of the communities within the area of the proposed Expressway route have developed from lateral roads extending west to the coast from the existing SH1. These roads typically have extended in relatively straight lines across the flatter coastal plain south of Paraparaumu and sometimes cut through (eg Poplar Ave, Raumati Road, Mazengarb Road) the roughly north south oriented dune system. The roads have then wound around these dune forms where they are more complex closer to the coast. They have various levels of traffic use (refer to Table 3).

The pattern of local roads and streets has had the lateral east/west links from the highway as its formative structure which until more recent urbanisation served to conduct vehicles down to the beach communities. These communities developed north-south streets that followed the dune forms and there is reasonably continuous connectivity along the coastline - it is only at Waikanae River that this coastal connectivity is severed.

Further inland the other local arterial roads such as Otaihanga and Ratanui Road that provide north-south connectivity were country roads that now conduct reasonably large numbers of vehicles on a daily basis. With the urban areas that have developed inland of the original beach settlements the subdivision pattern has typically occurred with a roading pattern has been provided that serves only that enclave of development. There is a relatively circuitous pattern of local arterial and collector streets that has resulted.

Table 3 Local Road Traffic Flow	
location	daily flow
Poplar Ave - east of Matai Road	2,600
Raumati Road - west of SH1	12,900
Kāpiti Road - west of Arawhata Road	24,900
Mazengarb Road - east of Guildford Drive	5,300
Otaihanga Road - west of SH1	6,500
Te Moana Road - west of SH1	10,700
Peka Peka Road - west of SH1	1,100

It is noted also that there are residential areas where there is only one point of access which is to the current highway. At places - such as Hadfield Road - where these relate to potential proposed Expressway /existing highway interfaces these need to be integrated into the design of proposed Expressway intersections/interchanges. Where these areas - such as at Elizabeth Street - will continue to connect to the former highway the accessibility can be expected to improve as a result of lowering traffic volumes and opportunities to recalibrate the intersections to provide better vehicle as well as walking and cycling function.

### 3. Project Description – General Design

#### 3.1. Summary

In summary, the Project involves the design, construction, operation and maintenance of an Expressway for a 16 km section of what will form a new SH1 alignment between MacKays Crossing and Peka Peka north of Waikanae. Of specific relevance for this report are that it includes:

- An Expressway that will ultimately link with other sections of improved SH1 at Transmission Gully to the south and Peka Peka to Levin in the north as part of the Wellington northern corridor Roads of National Significance;
- An alignment within with a traffic design speed of 110kmh within an existing open corridor of typically 100 metres width, much of which has been designated for roading projects and that passes through both urban and rural environment;
- A width of pavement of up to 25 metres that includes a 2.5 metre wide shoulder on each outside edge, two active lanes of 3.5 metres width in each direction, and a median that varies between 4 and 6 metres depending on the location;
- Eighteen (18) bridges that facilitate local roads crossing under or over the proposed Expressway and for the proposed Expressway to cross over watercourses including the larger Wharemauku Stream and Waikanae River;
- Two full interchanges where access onto and off the proposed Expressway to local road will be provided for – one at Kāpiti Road in Paraparaumu and the other at Te Moana Road in Waikanae;
- Two ‘half’ interchanges where access on to or off the proposed Expressway to or from local roads will be possible in only one direction – one at Poplar Avenue and the other at Peka Peka Road;
- A cycleway/walkway alongside, but separated from the proposed Expressway between Raumati South and Peka Peka with provision for horse riding in the south and north section;
- Noise mitigation land forms and other structures (fences and walls) along the route;
- Landscape and ecological treatment which in some instances provides planting for stormwater management as well as for visual and habitat mitigation; and
- Lighting at interchanges and part of the cycleway/walkway.



## 4. Methodology

### 4.1. Investigation and Assessment Process

The process of determining the urban planning and design effects relevant under the RMA followed several process steps:

- A set of objectives was established at the outset of the Project (refer to ULDF); these objectives guided the assessment throughout the entire Project scoping and design process and are common to the other Wellington Corridor RoNs;
- An investigation to establish the character of the existing environment of the proposed Expressway route was undertaken to establish an evidential base and the design options promulgated with the team with reference to this environment. The same process was followed for the existing SH1 to consider changes after its revocation;
- Consultation was undertaken on options and feedback on urban planning and design issues identified so these could be added to the assessment; and
- An assessment of the potential effects of the preferred proposed Expressway design (and revocation of SH1) on the existing urban environment was undertaken with specific regard to the urban conditions that will result from its construction.

As noted in the introduction to this assessment, those matters specifically addressed in this urban planning and design assessment relate to:

- Connectivity
- Urban Form
- Amenity and Quality of the Environment

The process of assessing the effects of the proposed Expressway did not wait until a design was produced – it was on-going throughout the design process to ensure that decisions made in regard to urban planning and design effects were incorporated.

This process is significant as it has enabled many effects to be avoided through the Alignment and design of the Expressway as it is now proposed, as well as the identification of the potential ways to mitigate effects if the design could not be changed to avoid those effects.

There have been different techniques employed to address urban effects in the design option decision-making process and these are set out in the following sections.

## 4.2. Multi-Criteria Analysis

The multi-criteria analysis (MCA) tool was the Project's main vehicle for design option decision-making and it was used throughout the process of considering design options. This process is fully documented in the *M2PP Options Report (2011)*. Within the MCA to address urban issues, a specific criterion was defined under the heading of 'Built Environment'. This criterion was defined as having the components below.

Visual effects	Visual relationship with the local environment; extent of visual effects of structures and earthworks in relation to context, including town centres, residential areas, Waikanae River corridor and other public amenity locations. Ability to integrate into landscape context.
Built form	Relationship and integration with urban form and town centres, including responding to the individual urban identities of Raumati Village, Paraparaumu, Paraparaumu Beach and Waikanae. Includes the potential for built form improvements.
Public Areas/ Parks/ Recreational Areas.	Effects on public open space areas including the (loss of) potential for park/recreation improvements.

As described in the *M2PP Options Report (2011)*, the MCA process utilised a scoring system (-3 to +3) as indicators as to the relative merits of the each of the options considered in selecting the preferred alignment, combination of interchange locations and local road crossings. The key to the process was not the score itself, but the relative scores of the options as an indication as to the performance of those options in achieving the outcomes described in the Built Environment criterion. The various criteria (of which built environment was only one) were also able to be sensitivity tested to establish the extent to which an emphasis on one criterion or another would affect the outcome of a combined assessment.

The MCA process was conducted in workshop settings to enable all the specialists and Project team<sup>1</sup> members to present their findings and for these to be discussed and challenged by the group. Records of the scores and the notes were taken and the results circulated to the assessment team as a record of decisions made.

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<sup>1</sup> This Technical Report refers to the Project team as carrying out works on behalf of and as contracted by the NZTA. The NZTA is the requiring authority and the consent holder.

In relation to the Interchange locations, alignment options and local road crossings the process followed is outlined below.

#### **4.2.1. Proposed Expressway Interchange Locations**

Early in the Project, a number of high level options were considered, which included the locations of interchanges (where there is full connectivity to the local road network) or partial interchanges (where there may be only on or off ramp connectivity in either a north or south direction).

An understanding of the built environment at each of the possible interchange locations was developed using GIS information to map and model in 3 dimensions and by field work. Reference was made to KCDC strategic planning documents (such as the Development Management Strategy), and KCDC officers also attended and contributed at the MCA workshops.

Key from an urban planning point of view was the extent to which the interchange locations could provide good levels of connectivity between the communities of the district and region (demonstrated by the Transportation Modelling), and how legible these are in the network (i.e., are they at locations recognised as existing or future nodes/gateways).

#### **4.2.2. Alignment Options**

The preferred Expressway route corridor (which occupies part of the existing Western Link Road (WLR) designation and prior to that the Sandhills Motorway) was selected by NZTA in 2009. However, the design process since that decision has provided the opportunity to optimise the proposed Expressway Alignment to avoid or minimise environmental effects, as well as to increase its functionality as a highway.

The method used to determine the alignment options involved early constraints mapping of the features considered desirable to avoid and then iterations of geometry investigations to identify possible options. These were then reviewed in MCA workshop sessions as described above. As part of the process, working visual simulations were produced to assist the understanding of urban and landscape, as well as visual effects.

In the first round of public consultation (Expo 1), the four preferred route options were presented to the community. At the second round of consultation (Expo 2) the preferred option was presented.

#### **4.2.3. Local Road Crossings**

There are nine places along the route where an existing (and one proposed) local road needs to be grade separated from the proposed Expressway to provide continuity of connectivity for both the local users and the proposed Expressway users. There are also other connections (like to the El Rancho Holiday Camp) and watercourses that the proposed Expressway will bridge. Watercourses such as the Wharemauku Stream and the Waikanae River are important for the landscape and ecological values (especially Waikanae River), but also as recreational and movement corridors.

Both watercourses have well used pathways alongside that provide important links in the cycle/walking and bridleway network.

The decision as to whether the proposed Expressway would bridge over a local road, or the local road would bridge over the proposed Expressway was informed by the use of the MCA process as described above. At each of these crossing points, the urban design issues were focused on:

- the ability to maintain good local accessibility (for example, footpaths should have gentle gradients);
- the effects of bridges on surrounding property and their access (particularly if a local road were to bridge over the proposed Expressway);
- the maintenance of the identity and qualities of local roads; and
- the ability to produce quality public environments (i.e. the local street) for walking, cycling and other non-vehicular use.

As with the alignment options, visual simulations were used to assist the process of determining effects and relative merits of options

### **4.3. Other Investigations and Assessments**

In addition to the assessment of the Project utilising the MCA tool, several other aspects of urban design related matters within the Project were investigated by other methods. These are outlined below with respect to:

- Walking and cycling and horse riding activities; and
- Structures – bridges, abutments, noise walls.

#### **4.3.1. Walking and Cycling Activities**

To investigate and understand spatially the routes and frequency with which people move within the District by non-vehicular modes (for example, walking, cycling, horse riding) information was gathered using three methods:

##### **a) Local Area Movement Survey [LAMS]**

A survey was conducted by providing the community with survey sheets with a map base asking people to show what routes they used over a week. It also asked them to record the key destinations they were going to and what mode they used (eg walking, mobility scooter, cycle). The surveys were provided as hard copies that had a freepost return option, or as digital copies on the NZTA website to allow for downloads. They were available to people starting from the first consultation expo (December 2010) and finishing after the second expo consultation period (June 2011). 150 surveys were returned.

The results were digitised in GIS and then presented graphically to describe the frequency of use of each route (be that street or other path).



Figure 2 LAMS of cycling movements

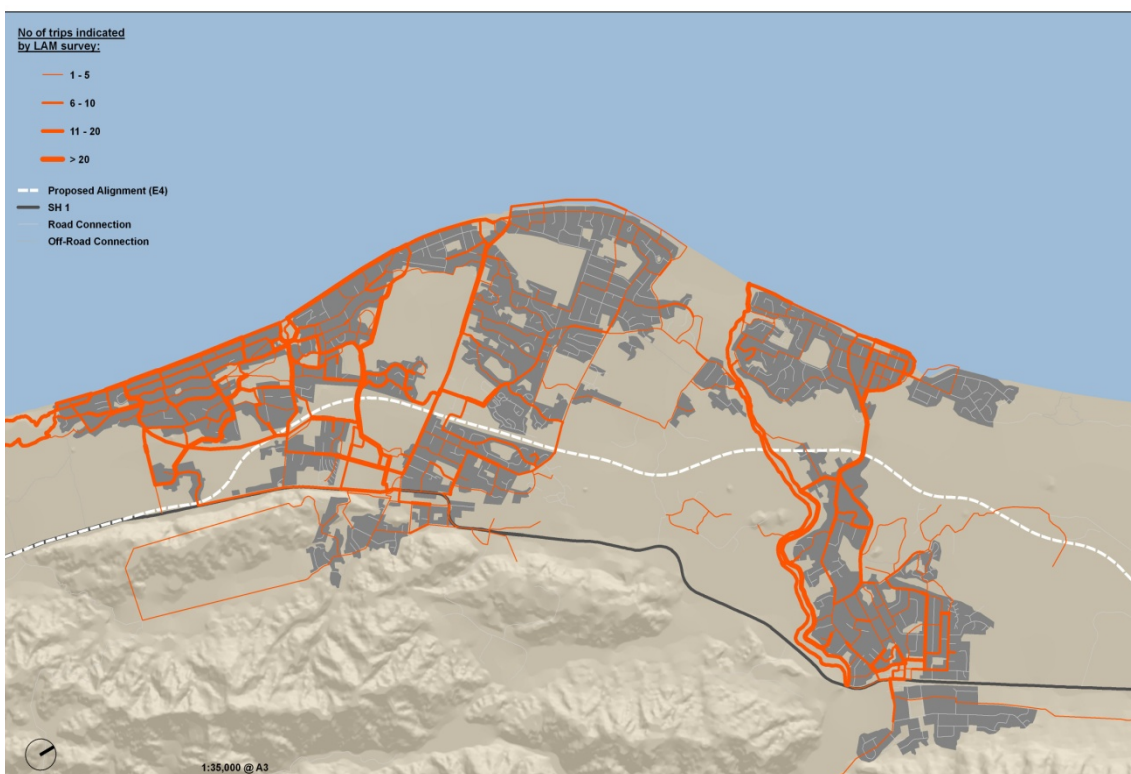


Figure 3 LAMS of walking movements

The number of surveys completed is relatively small within the total population. However, it is considered that the relative frequency of use of each of the routes usefully demonstrates the most popular routes, and assisted with determining design options and provision for non-vehicular modes of movement. In particular, the survey highlights the way in which informal (i.e., using unformed tracks) movements occur across the existing WLR designated corridor, the use of off-road paths (such as the watercourses), and the distance range of movements.

#### **b) On Site Counters**

Pedestrian and cycle counts were undertaken by the Project team at four locations in the study area on 14 June 2011:

- Kāpiti Road where crossed by the proposed Expressway;
- Te Moana Road where crossed by the proposed Expressway;
- Wharemauku Trail; and
- Waikanae River crossing at Otaihanga Domain.

The Kāpiti Road and Te Moana Road counts were undertaken to gain an understanding of the pedestrian and cycle movements at the location of the proposed Expressway interchanges. The Wharemauku Trail and Waikanae River crossing counts were undertaken to gain an understanding of the pedestrian and cycle movements on these key routes. The surveys were undertaken during the following weekday periods to capture the school peaks:

- 7:30 to 9:30am; and
- 1:30 to 4:30pm.

This has enabled week time users to be recorded, but will not have shown weekend and so some recreational users. The weekend use is expected to have been better represented in the LAMS which were undertaken over a 7 day period.

#### **c) School Accessibility Plans**

KCDC has worked with the local schools to prepare accessibility plans that assist people in planning routes for walking and cycling to school. The locations of each of the schools and the catchment of people that have identified that they will walk or cycle to that school have been mapped in GIS. This information describes the distance people are moving to get to which school.

#### **d) Pneumatic Counters**

KCDC has had pneumatic counters located on several of the local roads calibrated to record cyclists and these figures have assisted to understand frequency of use by cyclists.

#### **e) Observations**

Throughout the Project design process specific observations were undertaken – such as at Waikanae River at a school end time – to observe specific local use patterns.

#### **4.3.2. Structures – Bridges, Abutments and Noise Barriers**

The proposed Expressway crosses a series of local roads and other east-west corridors such as streams and paths. At each of these locations, a structure is required. To establish the approach to the design of these structures a 'Bridge Aesthetic Evaluation Hierarchy' was developed to provide a basis for determining which was a more significant bridge location and which was less – this would direct the level of design investment.

A set of principles for the design of bridges was established, and key criteria (visibility, gateway, connectivity) used to evaluate each location and determine some sense of hierarchy as to the most significant and least significant locations. A scoring of 1-3 was used for this evaluation, supplemented with comments.

However, having undertaken this evaluation, further investigations into the constructability, structural design, and architectural influences were undertaken. The outcome of this combined approach (workshops) suggested benefits from a less hierarchical approach which recognised the potential and importance for all bridges to be of a reasonable quality of design, rather than singling out one over another for special treatment. By considering the constructability and opportunity for pre-fabrication, all of the bridges can be considered as a set with similar quality finishes and sculptural shapes that allows for design consistency along the route.

The same approach has been used to consider the bridge abutment forms and shapes. Coordination with the other local NZTA projects has also been undertaken to consider the way in which continuity in the proposed Expressway users' experience, as well as potential reuse of similar shapes can contribute to the cost effectiveness of all the Project sections.

In regard to noise attenuation, the basic location and dimensions of the noise mitigation structures, as well as their performance, are driven by a factor of traffic modelling and geometric design. Through a process of MCA analysis, the options for noise structures were considered, and then the design of these developed further to ensure their function is effective while also being acceptable within the existing environment.



## 5. Policy Assessment

### 5.1. Policy Context

The design of the route was influenced by reference to a number of policy documents. The relevant policies from these documents are summarised below. A comprehensive set of all policies can be found in Part I, Chapter 35, Volume 2 of the MacKays to Peka Peka Expressway AEE report.

The entire 16km length of the proposed route is within the Kāpiti Coast District Council (KCDC) territorial local authority area, which is located within the Greater Wellington Regional Council (GWRC) area.

#### 5.1.1. Wellington Regional Strategy

The Wellington Regional Strategy (WRS) is a sustainable growth strategy covering all of the Region's nine districts. This is not a statutory document in terms of the RMA.

The aim of the WRS is to make Greater Wellington 'internationally competitive'; that is, a region which offers a great lifestyle and job opportunities, supported by a strong economy. The Strategy notes the importance of a secure and efficient route along Wellington's western corridor and links east-west to the Hutt Valley [Investment in Good Urban Form (p34)]. The Strategy also notes that providing secure and reliable transport connections to the rest of the country is a key ingredient in regional economic development. Of particular relevance to urban planning is its focus on regional urban form.

The Strategy identifies eight urban form 'change areas', and the commentary is summarised below:

**Paraparaumu to Paraparaumu Beach:** The area from Paraparaumu town to Paraparaumu Beach incorporates an industrial estate, the Kāpiti Coast Airport and vacant land adjoining the town centre. It is subject to residential and retail – especially big box – development pressure which potentially could undermine goals for the intensification of the town centre and the development of passenger transport. The Plan notes that the area is bisected by the existing and proposed road routes and a bus/rail transport hub, and notes that careful planning will be required integrate current and potential uses with the overall objectives of the area.

**Northern Waikanae edge:** There is potential for continued northern spread of development at Waikanae North. In response, KCDC has implemented a northern urban edge at Waikanae to focus new urban growth around selected centres including Otāki. The WRS supports the development of this concept, given the risks to containment and enhancement of centres, or general urban sprawl.

In relation to the regional level issues and opportunities, the proposed Expressway will be an important influence and affect the two change areas described above. It will release the current SH1 as a local road. This will enable its reconfiguration as an alternative and less busy connection route between the Paraparaumu and Waikanae town centres. It will also assist connections from the



current town centres at Paraparaumu and Waikanae to the public rail transport on the opposite side of the SH1. It will be important for the integrity of the KCDC's Kāpiti District: Choosing Futures Development Management Strategy (2007) and the District Plan provisions that follow this strategy that the state highway status revocation does not induce commercial development or other urban development along the old highway route outside of the urban extent of these centres.

The relocation of what will be SH1 to its new position in the proposed corridor has been designed to continue to provide the existing local area connectivity east-west to by retaining at-grade local roads with the proposed Expressway crossing over on bridges.

There will be an effect from the proposed Expressway on the way in which proposed urban land use change is planned to occur at north Waikanae as one of the change area concepts supported by the WRS. This is particularly in relation to Ngarara as the proposed Expressway would remove a part of the land zoned for urban development and this may accordingly reduce the planned capacity for development here. This effect is described in further detail below in section 7 of this assessment.

There are alternative options for providing for any reduced residential capacity at Ngarara. However, in order that these do not contravene KCDC's desired outcomes for development expressed in its Development Management Strategy, these will need to ensure that they do not include urban growth at unwanted locations (such as Otaihanga, Peka Peka or as a ribbon along the former SH1). There will continue to be a risk that despite the proposed Expressway providing no immediate connectivity to these rural areas, that privately initiated District Plan Changes could challenge the planned urban form due to the reduced inhibition to roading connections to the old SH1 brought about by its changed status to local arterial. Potential mitigation options for these effects are addressed in section 7 of this AEE.

#### **5.1.2. Proposed Regional Policy Statement 2009 (Greater Wellington Regional Council)**

The Wellington Regional Policy Statement (WRPS) is an RMA statutory document and identifies the regionally significant issues around the management of the region's natural and physical resources and sets out what needs to be achieved (objectives) and the way in which the objectives will be achieved (policies and methods).

Of specific relevance to the urban planning aspects of the Project is the specific section related to regional form, design and function, which includes a number of objectives and policies.

The WRPS recognises that the Region has a strong corridor pattern that reinforces local centres, supports passenger transport, reduces energy use and makes services more accessible. The importance of the role of SH1 is recognised, and this section of the Policy Statement includes objectives related to transport outcomes across the region. The regionally significant resource management issues for regional form, design and function are identified as:

- Poor quality urban design

- Sporadic and uncoordinated development
- Integration of land use and transportation

A number of development strategies and/or frameworks for growth and development already exist within the region, and the WRPS notes the role of structure plans in being able to deliver high quality urban design outcomes.

### **5.1.3. Kāpiti Coast District Plan**

The proposed Expressway traverses or abuts a number of the District Plan (KCDP) land use zones:

- Open Space
- Rural
- River Corridor
- Residential
- Town Centre Zone

This urban planning and design assessment concentrates on the residential and town centre zones as the more urban environments.

#### **a) Residential Zone**

The general objective for the Residential Zone is to:

Ensure that the low density, quiet character of the district's residential environments is maintained and that adverse effects on the amenity values that constitute this character and make the residential environments safe, pleasant and healthy places for residents are avoided, remedied or mitigated.

The KCDP also allows for medium-density housing near to Paraparaumu Town Centre. Such development would be required to meet design guidelines to ensure good design outcomes.

The proposed Expressway passes directly through residential areas at its south end from Leinster Avenue to Raumatī Road and from Kāpiti Road to Mazengarb Road. At the north end, it passes through a residential area at Puriri, Kauri and Te Moana Roads. Consideration of the effects on the future urban growth areas at North Waikanae is given later in this assessment (see Plan Changes below).

With reference to the objective above, it is not anticipated that the proposed Expressway would prevent the continued development of the District's residential environment. However, in respect of this general objective, the proposed Expressway will present challenges in respect of maintaining amenity values, including quietness, in residential neighbourhoods within close proximity of the new road.

However, in at least part balance with this change it is noted that the approximately 100m wide designated corridor within which the proposed Expressway is generally located has been identified for over 50 years (since the Sandhills' Motorway Route definition in 1954) as being an arterial road of some description. In particular, for the section between Kāpiti Road and Mazengarb Road where the residential development is typically less than 30 years old there should be some balance in the consideration of the effects relative to this known change to the environment that has been planned since well before the land was subdivided for residential purposes.

In the section of the proposed Expressway between Leinster Avenue and Raumati Road, the proposed Expressway deviates from the existing designated corridor, with a new route to connect the proposed Expressway with the existing SH1. This route has brought the proposed Expressway closer to residential properties than the currently designated route. Other residential properties (and Raumati South School) will have benefited by being further from the proposed Expressway than would have occurred if the current designation was proceeded with. To some extent, this is a similar situation in the north at the Puriri/Kauri and Te Moana Road area where the proposed Expressway route is closer to the residential area of Puriri/Kauri/Te Moana Roads, but further away from the residential area of Waikanae Beach than the existing WLR designation or earlier motorway alignments.

It is also noted that the residential areas along the existing SH1 will see a benefit from reduced traffic and consequentially an improvement in amenity values will result. As noted in the Alternative Options Report (Executive Summary), the alternative routes for the proposed Expressway that generally followed the existing SH1 route would have resulted in significantly greater effects on residential property (the number of affected properties for the other route options ranged between 209 and 368, with between 127 and 241 buildings affected).

In terms of amenity values, the noise effects of the proposed Expressway are recognised as a significant issue for many residents living in the vicinity of the Project; the noise technical assessments describe in detail these potential effects and proposed mitigation.

It is noted that, while some measures to manage noise (for example, road surface treatment and buffer distances) will have little adverse effect on amenity values, the use of noise barriers will be one which has the potential to generate adverse effects in its own right. As many of these barriers as practicable will be provided by shaping ground levels to create 'natural' low hill forms (bunds) to attenuate proposed Expressway noise for nearby residential properties. These barriers can be integrated into existing land forms and planted so neutralizing the visual effects while reducing noise emissions to residential areas to appropriate levels.

However, in some places where either space is tight and/or the elevation of properties relative to the proposed Expressway would make the use of bunds difficult or ineffective, noise barrier structures will be used. The form of these structures will vary in height, but they will be a combination of residential boundary fences, walls beside the proposed Expressway and overbridge barriers.

The aim with all of these structures has been to keep them as low as possible with boundary fences at no more than 2m in height and other walls less than 3m in height. This approach would limit the visual effects, the loss of views, shading and potential for the structure to dominate the residential environment.

The noise structures at residential boundaries are proposed to be timber, which will replicate a typical residential boundary fence, albeit of a more solid construction than standard residential fences (i.e. no gaps between boards) to attenuate noise. The bridge and bridge extension barriers will be a standard concrete barrier type 1.1m high. Where the barrier extends past the bridge, the ground behind the barrier (i.e., facing out to adjoining properties) will be shaped up behind so it blends with the slopes leading up to the proposed Expressway. This area can then be planted in the same way as the surrounding landscape. The larger wall structures (up to 3m) are proposed to be constructed from stone filled gabions, gabion type facing, or concrete. Again, as with the lower height barriers these will be 'greened' by earth ramped up against and/or mass planting.

The heights of some of these structures will not allow for complete cover on their sides and accordingly the organic and natural visual appearance of the gabion provides for a better visual integration with the planted and natural ground shapes. It also allows for more of an undulating ground forms to be used along the length of longer gabion walls where the ground can be built up high and low to again provide a more natural appearance to the way these structures are seen in the landscape. The most difficult position to visually mitigate for these noise walls will be at the Kāpiti Road interchange. Careful design will need to make the most of the changing ground levels, planting and wall materiality to ensure the visual mitigation is successful here. This is also where the cycleway/walkway runs on the west side of the proposed Expressway and the design will need to recognise the visual amenity and safety of this space.

With further reference to the KCDP objective for the Residential Zone, there are other amenity values as well as noise levels that contribute to the character of the residential environments. These amenity values include access to facilities, air quality, and visual character. The effects of the proposed Expressway in relation to these other amenity values are addressed by other technical reports (Social Impacts Technical Report 20, Volume 3; Air Quality Technical Report 13, Volume 3; and Landscape and Visual Effects Technical Report 7, Volume 3).

In terms of the residential environments being safe, pleasant and healthy places for residents, the provision for all existing local roads to pass across the proposed Expressway at grade (either under or over) means that people can continue to walk, cycle and for mobility impaired people to move easily from one side to the other. The alternative – an over bridge for the local road – would have required slopes that would have inhibited the ease of movement. In order to make these slopes as gentle as possible, large extents of adjoining land would have been sterilized as accesses to frontages would not have been possible without extending the widths of local roads to provide long adjoining access lanes.

With the proposed Expressway crossing over local roads, there will be a need to ensure that the spaces beneath the proposed Expressway bridges are safe and comfortable, especially for people walking or cycling as they will be exposed to the conditions under the bridges. To this end, the design provides for split bridges to allow light down into the space beneath. It also proposes the use of 'spill through' abutments (the walls underneath the bridges) that slope back away from the local road to give more space and less dominating edges to the pathways beneath, lighting, detail and texture in the forms of the abutments through the use of local materials, and bridge forms that are sculptural and visually appealing.

Other aspects of the proposed Expressway are the provision of a continuous cycleway/walkway (and bridleway) along the proposed Expressway corridor that will enhance access for residents moving and connecting between existing destinations and cycle and walking networks. This will include two new pedestrian over bridges. One over bridge will be midway between Kāpiti Road and Mazengarb Road which is one of the longest blocks without an existing east/west local road connection. The other over bridge will be near Leinster Avenue to provide for walking and cycling connectivity for residents in the area moving across to the existing SH1- the current road connection from Leinster Avenue to SH1 will be severed by the proposed Expressway.

In summary, it is acknowledged that the amenity values of the residential areas close to the proposed Expressway will be changed. However, the effects of these changes are mitigated or need to be balanced in their consideration by the following points:

- at the existing SH1 that effect will be reduced from that currently so benefiting 80-100 residential properties on that route;
- many of the residential properties close to the proposed Expressway (Milne Drive, and between Kāpiti and Mazengarb Road) have been zoned for residential use and subdivided well after the proposed route was identified as a road (albeit the nature of that road varied) and at least some account needs to be made for this in considering effects;
- noise effects are to be mitigated in some places by structures which will require careful design and integration with the landscape to ensure they do not generate adverse visual effects in their own right; and
- safe and functional connectivity and access east to west past the proposed Expressway will be maintained by the way in which the bridges have been designed and enhanced by the addition of a walking and cycling path along the proposed Expressway length.

#### **b) Town Centre Zone**

The KCDP Paraparaumu Town Centre Zone is to give effect to KCDC's vision for the town centre (in (Paraparaumu Town Centre Planning Study: Final Report Implementation Strategy (October 1994))). A range of objectives and policies are relevant to the proposed Expressway Project. These are summarised below:

- developing and enhancing a ‘sense of place’ or character for the town centre which reflects the natural and physical characteristics of the locality, if not the district;
- developing and enhancing the natural and physical environment and landscape by recognising the relationships between existing landscape features including stream, wetlands, sand dunes and the back-drop of Kāpiti Island;
- integration of community (cultural and recreational) and civic amenities and facilities in a town centre core to reinforce the ‘sense of place’;
- development of the community and civic open spaces, amenities and facilities at a human/residential scale to a high standard of design and appearance;
- town centre activities should be visually and physically linked to the retail core east of Rimu Road;
- medium density housing is encouraged in specific areas;
- a low density built environment within the town centre in a high quality park-like setting is desired with 12 metre high buildings and views to Kāpiti Island sought;
- a network of access routes for public transport, cyclists, pedestrians in addition to vehicle access is required; and
- The need to take flood protection into account in this area is also required.

In respect of the objectives and policies summarised above, it is considered that the proposed Expressway would not counteract their achievement. The development of wetland and stormwater management areas associated with the proposed Expressway will establish large open spaces with values from wetland plantings. The future development of the large area of town centre zoned land will similarly require areas of open space and stormwater detention/treatment. The proposed Expressway design provides for these areas to work together and to visually as well as hydrologically provide a core part of the town centre open space structure. Such an integrated series of spaces would generate a clear sense of place that derives from the natural management of the environment and responds to the historical conditions of this area which was originally low lying wetlands and dunes.

In terms of a network of non-vehicular as well as vehicular routes the design continues to provide for the Wharemauku cycleway/walkway as well as for a future link of Ihakara Street to the airport. A parallel path is also designed to run alongside the proposed Expressway which will connect from the Wharemauku path to Kāpiti Road enhancing north-south connectivity for walkers and cyclists. The capacity for the town centre zoned land to in the future accommodate a network of paths and streets for movement is not inhibited by the proposed Expressway in the location it is proposed.

### **c) Plan Changes**

The KCDDP has been subject to a number of plan changes that have included rezoning rural land for urban development and modifying urban zones to accommodate expansion of centres.

*Plan change 69 – Waikanae North Development Zone (operative 19/03/09)*



This private plan change rezoned approximately 69 hectares of land north of the existing residential area of Waikanae from Rural to a new Waikanae North Area including a Low Impact Urban Area and an Eco Hamlet Area (see Figure 4 below). The Waikanae North Area extends from State Highway 1 to east of the Ngā Manu Sanctuary, on the northern edge of the existing Waikanae urban area. Within the Area, six precincts are proposed which provide for varying densities of residential development. Limited retail and commercial development is provided for. Approximately 2400 people are projected to live within the development area, in about 700-800 households. The Development Zone falls within the urban growth framework established for the Waikanae area by Plan Change 79 (see below).



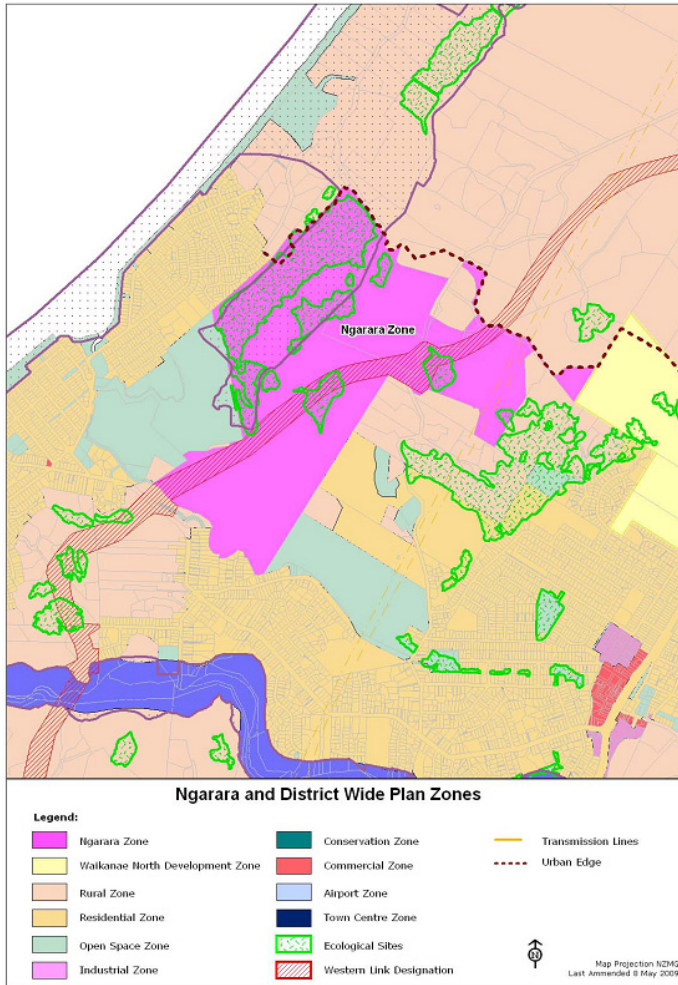
**Figure 4 Waikanae North Area – note the black hatched corridor is the existing WLR designation - the proposed Expressway deviates from that corridor in some places**  
*Plan Change 79 - Waikanae North Urban Edge (operative 26/03/10)*

The structure plan provided for an alternative alignment of the existing WLR designation in order to avoid the significant wetlands within Ngarara and to accommodate the development that fitted within the landscape. The proposed Expressway Alignment generally follows the existing WLR designation shown in the Plan Change, but does deviate from it in the northern section of Ngarara. At least some parts of the Ngarara structure plan will need to be revised to take account of the proposed Expressway Alignment and footprint. This may have an effect on the ability to realise the extent of urban growth planned for this area and the details of this are addressed in the assessment in section 7 below.

#### *Plan Changes Summary*

As noted earlier in this assessment, the proposed Expressway may affect the planned provision for urban growth in the District. The extent of this effect relates to the quantum of land affected by the proposed Expressway, whether the effect can be addressed by changing densities within the growth areas, and the level to which market demand for urban development affects the type of development sought and the timing of its provision. Further detail is provided in section 7 of this AEE on that quantum. It is important to the integrity of current KCDC policy that any adjusted spatial configuration reflects the development outcomes and policies as set out in the Development Management Strategy. In particular relation to the proposed Expressway this means no inducement to urban growth at Peka Peka, Otaihanga and the rural and open spaces areas along the current SH1 between the town centres.





**Figure 5 Ngarara Area – note the red hatched corridor is the existing WLR designation - the proposed Expressway deviates from this corridor in some places**

## 5.2. Choosing Futures

‘Choosing Futures: the community’s vision for the Kāpiti Coast District’ is a non-statutory set of documents that describes seven outcome areas for the district. These documents fed into the development of the KDCDC Long Term Plan (LTCCP) and were developed prior to the MacKays to Peka Peka Expressway Project. It is considered here as it is a foundation set of documents that articulate the community expectations for amenity and urban form within the District. The areas that have outcomes documents that are relevant to the proposed Expressway Project are commented on below.

### 5.2.1. Otaihanga

Local outcomes for Otaihanga include the need for future planning for natural areas, cycling and walking, protection of the natural environment and local biodiversity, floodwater and stormwater

management and protection of local character. In urban planning terms the outcomes sought specify:

That the semi-rural and village character of Otaihanga is retained and enhanced by the continued use of buffer zones to separate Otaihanga Village from suburban Paraparaumu and the existing WLR designation corridor, and that these buffer zones are provided through rural blocks, rural residential hamlets and reserve areas to the south, west and east of Otaihanga Village.

### **5.2.2. Waikanae North**

The Local Outcomes for Waikanae North signal a collective direction for the Waikanae North area as a place and as a community. There are defined development principles for the area, particularly in terms of the nature and character of any urban form. The need for a local population to support a local economy is highlighted, but the role of Otāki in absorbing population growth in the area is recognised.

The Outcomes provide for an 'urban edge' to limit the extent of urban development for at least the next 25 years. The need for local roads to provide linkages is stated, but a four lane arterial road through the area is opposed.

### **5.2.3. Paraparaumu Town Centre**

The Local Outcomes for Paraparaumu Town Centre contains specific detailed outcomes for the goal of natural areas shaping the fundamental form and quality of the district's settlements. The role of the Town Centre as the symbolic heart for the District is stated, with a preferred focus for commercial activities on Rimu Road. Enhancing the natural environment, culture and lifestyle are also key objectives.

The document also recognises the population pressures facing the district in terms of intensification, public transport and character. Mixed use and medium density housing is suggested in the Town Centre as a means of increasing amenity and vitality, along with measures to improve economic benefits. The role of urban design in creating quality environments for this to occur is recognised. The ability to respond to the needs and aspirations of young people, and the role of community facilities, is recognised.

There are also a number of outcomes relating to the Wharemauku stream and environs, in particular the challenge to investigate 'innovative' ideas for flood storage in the area near to the existing WLR designation.

### **5.2.4. Choosing Futures Summary**

In considering the proposed Expressway relative to the Choosing Future documents there is some overt expression of the opposition to a four lane road through the area. However, there are also clear references to the community's desire for planning to provide for natural areas, cycling and

walking, protection of the natural environment and local biodiversity, floodwater and stormwater management, protection of local character, connection to public transport, housing mixes and economic development.

Although the proposed Expressway is counter to the document's expectations for roading, other of the outcomes sought have been provided for within the proposed Expressway proposal. This includes protecting ecological areas, cycling and walking facilities being significantly improved, extensive areas are being set aside for flood and stormwater management and the use of natural process that recognise groundwater systems and wetland viability are being utilised, and the potential for improved connectivity to the railway stations is being provided for at the town centres.

The positioning of the interchanges in both Paraparaumu and Waikanae will enable better connectivity both for people in vehicles as well as cycling given the proposed cycleway/walkway. The interchanges will enable more efficient regional access to the district's primary town centre at Kāpiti Road in Paraparaumu and the associated airport development. Heavy vehicles accessing the airport from the proposed Expressway will be assisted from the interchange's close proximity. Connectivity from the Kāpiti Road interchange to the Paraparaumu town centre will benefit from the future development of new street network through the currently vacant land to the west of the town centre, where new town centre development is zoned to occur in the future.

Until such time as that development occurs, vehicles from the proposed Expressway interchange will access the current town centre via Kāpiti and Rimu Roads. It is noted also that access to the town centre along the existing SH1 from the off ramp interchange at Poplar Avenue will continue to be facilitated, albeit this not being as direct as the current arrangement. Signage and the roundabouts proposed at this interchange will signal this access option to visitors and local users accessing the Coastlands side of the town centre can reasonably be expected to continue to use this current SH1 route.

In terms of the economic effects of the proposed Expressway in relation to the town centres, the Assessment of Economic Effects notes that there will potentially be significant negative business redistribution effects for a relatively small number of businesses that currently have some reliance on the passing SH1 traffic trade. However, the Economic Effects chapter of the AEE (Part G, Chapter 29, Volume 2) states that the vast majority of businesses are not so dependent on the passing motorized trade that they will be significantly affected. Signage – such as that at the Poplar Avenue and Peka Peka interchange - may help retain some of this business.

## **5.3. Walking and Cycling**

### **5.3.1. Regional Cycling Plan 2008 (GWRC)**

The Regional Cycling Plan was adopted by GWRC in December 2008. It responds to the policy framework for cycling set out in the Wellington Regional Land Transport Strategy (WRLTS). A

number of agencies are responsible for delivering the Cycling Plan, including the NZTA. NZTA's role is to carry out improvements to the cycling network where appropriate and feasible on or across the state highway network and to assist local authorities to make improvements broadly parallel to state highways. The NZTA is also identified as providing funding support for a number of the initiatives in the Cycling Plan. The Regional Cycling Network map identifies the core strategic routes that link the region's centres and should provide an acceptable level of services. In the vicinity of the MacKays to Peka Peka route, these include a route up SH1 and a route along the coast. It is also expected that each of the local authorities in the region will identify their important cycle routes through development of their local cycling strategies.

### **5.3.2. Cycleways, Walkways and Bridleways Strategy 2009 (KCDC)**

The purpose of the Strategy is to set a clear strategic vision for cycling, walking and horse riding on the Kāpiti Coast. The development of an inter-connected network of cycle, walking and horse-riding routes across the District is a key action identified by the Strategy. In the vicinity of the MacKays to Peka Peka route, this includes:

- A coastal walkway and cycleway from Paekakariki to Otāki;
- Relatively easy 'middle height' access along the coastal escarpment and lower hills;
- Extensive linkages through the built-up areas to key natural features such as rivers and areas of bush;
- Good linkages to schools, town centres and community facilities; and
- Increased areas for dog walking.

The Strategy identifies a number of issues for cyclists, pedestrians and horse riders in Kāpiti, noting that a major disincentive to cycling is the perception of danger from vehicles. It also states that personal security should be an important consideration in route planning and detail design: for example, to avoid hidden areas and dark corners.

### **5.3.3. Towards a Sustainable Transport System – A Strategy for Managing Transport on the Kāpiti Coast 2008 (KCDC)**

This document provides a long-term strategy for transport by all modes. Within the overall District vision, the primary transport objective for the Kāpiti Coast is to... Create a physical transport system that is attractive, affordable, connected, responsive, safe and offers effective mode choice so that it enables people to act in a sustainable way.

Of particular relevance to the Project is the focus on walking and cycling. The first Community Outcome underpinning the Transport Vision is:

That Kāpiti Coast becomes nationally famous for an extensive walkway, cycleway and bridleway system that has [amongst others] the following features:

- A coastal walkway and cycleway from Paekakariki to Otāki;
- Safe cycling commuter links between communities, from Paekakariki in the south to Otāki in the north and a clear focus on improved safe east-west cycling and pedestrian linkages;
- Particular regard needs to be had for safety for old and young users;
- Relatively easy 'middle height' access along the coastal escarpment and lower hills;
- Extensive linkages through the built-up areas to key natural features such as rivers and areas of bush;
- Improved linkages between residential areas, schools, shopping and workplaces;
- Good linkages between schools and centres

Other Community Outcomes also highlight the need to address transport issues across the District.

Outcome 2 focuses on quality of access:

That the level and quality of access within and between communities is improved, including:

- provision of more road linkages and multiple bridge crossings between Paraparaumu and Waikanae;
- provision of a passenger rail service to Ōtaki;
- improved night-time bus services;
- improved internal north/south and east/west linkages within Paraparaumu;
- all communities have safe and interesting pedestrian links (with good signage ) that encourage use of local areas;
- that there is easier and safer pedestrian and safer road access to the town centres – especially the Waikanae and Paraparaumu Town Centres;
- that the District's main east/west roads, especially Kāpiti Road and the road to Ōtaki Beach are developed as beautiful boulevards;
- improved night time bus services that cater for late travelling commuters.

Outcome 3 highlights the issues of local links, requiring linkages between Waikanae and Paraparaumu to be improved to reduce energy use and travel time.

Outcome 4 raises the issue of freight transport, seeking that the District develops a role as a transport hub, including the distribution of freight.

Outcomes 5, 6 and recognise the need to provide for local movement and local links across the district.

#### **5.3.4. Walking and Cycling Summary**

In summary, the regional and local aspirations for walking and cycling are being provided for by the proposed Expressway through the incorporation of a shared cycleway/walkway along the length of the route. It also allows for horse riding as a result of the formed width of the path allowing a grassed edge in most places. This facility will connect into the existing local pathway network and includes a new bridge crossing at Waikanae River. With regard to the broader Sustainable Transport System policy the proposed Expressway delivers a new connection between Paraparaumu and Waikanae including new bridge, will free up the former SH1 for local arterial slower speed access between the two centres, and adds a new east west linkage mid block between Mazengarb and Kāpiti Roads as well as a link across in the area of Leinster Avenue. All other formal existing walking and cycleways will be unaffected by the proposed Expressway, recognising that the informal tracks within the currently designated corridor will be lost.

## 6 Corridor and Sector Design Effects Assessment

### 6.1 Urban Form and Land use

This section of the technical report considers the effects of the proposed Expressway in relation to the current and planned urban form of the District. The urban area of the District through which the proposed Expressway passes is described in section 2.5 of this AEE.

KCDC has had an urban planning focus on improving the way in which development can respond to the natural features of the existing environment and provide improved community amenity and economic outcomes through better connectedness, housing choices, and the range of modes of travel especially walking and cycling.

The KCDC's approach to the future of its urban areas is encapsulated in the (2007) Kāpiti Coast: Choosing Futures Development Management Strategy document. This is also described in the Policy section of this report.

#### 6.1.1 Current Urban Form

In the wider sense of urban form the subject area of the proposed Expressway is within a section of the District that conducts state highway traffic (i.e. it has a national function) north and south and the proposed design will continue to enable this movement. There will be increased efficiency of movement given the design of the proposed Expressway enables a consistent speed of traffic at up to 100kmh along its length. The interchanges at Paraparaumu and Waikanae will facilitate access to these two settlement areas and enable wider area movement to other district and regional towns. The existing sub-regional urban form of settlements along the highway will continue to be sustained by the proposed Expressway. Longer term there can be expected to be a reduced travel time within the region as sections of the RoNS are constructed. This may increase the development interest in communities further north such as Otāki or Levin which will be a shorter travel time from the larger centres and employment south.

Within the urban areas of Kāpiti the proposed Expressway design continues to provide for east/west connections between the current SH1 and the communities to the west and beaches. This will enable those places to continue to function in the way they do currently and the proposed Expressway will provide no physical barrier to enable movements between the inland or coastal areas. The perception of the proposed Expressway being a barrier will rely to some extent on the success of the local road bridges and the quality of the experience in passing beneath the new road. This is addressed later in this technical report under Amenity. The proposed Expressway corridor is sufficiently wide that some effects on the land uses around it can be mitigated, although the character of the environment (such as noise levels) will change and in currently quiet places the stillness will be interrupted by the road traffic activity. However, the land uses adjacent to the



proposed Expressway are expected to remain, unless these have been reliant on the open land provided by the long standing designation (the Raumati pony club for example).

The development of interchanges at the two proposed locations will tend to attract new commercial development unless a strategy to limit this is adopted. The positive and potentially negative effect of interchanges on the urban form is described later in this technical report under the town centres. The revocation of the SH1 status on the current route generates potential for this arterial road to take on a new role in the District.

Again, this is discussed later in the technical report, but at each of the town centres the removal of approximately half the traffic from this route will enable the town centres to reposition themselves. In urban form terms, the former SH1 could allow some consolidation of the centres with the railway line and stations as more integral to the centre's function. This may see more commercial development as viable to the east and opportunities for residential development in association with this as mixed use. However, any more intensive mixed use development is expected to be a long term change to urban form and would be consistent with good urban planning practice in these town centre locations.

It will be important for the integrity of KCDC's development management strategy that the urban form does not change to extend urban development along the former SH1 and close the gaps of the open space that currently provides some distinction to the settlements at Waikanae and Paraparaumu.

The urban form for residential development that may occur in the future is described below under Waikanae North.

### **6.1.2 Kāpiti Coast Airport**

The Kāpiti Coast Airport is located close to the proposed Expressway corridor to the west of the recent residential development centred on Milne Drive. The Airport was recently rezoned to allow for a large extent of commercial development whilst maintaining a regional airport function. A nationwide passenger service provided by Air New Zealand commenced in October 2011. The first stages of the commercial development have started.

Of particular relevance to the proposed Expressway and urban planning are two factors:

That the later stages of the airport development will require (as per the District Plan) an additional east/west link road to be constructed – this is known as the Ihakara Street extension. This would cross under the proposed Expressway at grade and allow commercial and other traffic from the airport development to connect to the existing local road network and the current SH1 – this would reduce demand on Kāpiti Road and the need for its substantial upgrade as the only other existing local road access.

That the proposed Expressway includes an interchange at Kāpiti Road to provide ready access to the airport (and town centre) by the proposed Expressway users, including trucks. The interchange



is expected to assist the development of the airport area by providing an immediate and efficient access for employees, airport users and customers in general. Consideration was given to the way in which the interchange could be configured to allow access directly to the airport as an alternative or addition to the Ihakara Street extension.

However, there are constraints in terms of:

- the space required to fit deceleration lanes and ramps relative to existing residential properties with the consequential impacts on residential properties;
- adverse effects on the Wharemauku Stream and cycleway/walkway and the amenity of this corridor; and
- less legibility to users by having ramps located partly at Ihakara Street (where only some traffic will want to go) as well as at Kāpiti Road which is central to the town centre and the larger communities of Paraparaumu and Paraparaumu Beach.

In terms of the impacts on Kāpiti Road of the proposed Expressway interchange there will be a need for some widening in the vicinity of the airport frontage and also new slip lane access for the commercial properties in area the north west of the interchange. It is understood from the Assessment of Transport Effects that any widening that is required at Kāpiti Road is a direct result of the airport's development growth and projected traffic growth as at 2026, rather than as induced by the proposed Expressway interchange.

The sliplane is required to address the loss of frontage caused by the interchange north bound on ramp. This will reduce the immediacy of the commercial property frontages, but will continue to provide service at an appropriate level. It is noted that other areas of Kāpiti Road's commercial properties have an existing similar arrangement.

The Ihakara Street extension is an important part of the future road network in terms of providing connectivity for local traffic accessing the airport and town centre in an east-west direction (walking and cycling is already accommodated to some extent by the Wharemauku Stream path). The block between Kāpiti Road and Raumati Road is wide (1.7km) for an urban area and the Ihakara Street extension will provide a useful new intermediate link between the Raumati and Paraparaumu areas.

It is noted that the District Plan (Airport Zone D.9.2.2) requires that the additional airport road linkage (as it was then to the existing WLR designation and Ihakara Street extension) are required to have started construction prior to certain thresholds (43,050m<sup>2</sup>) of airport development floor area occurring.

Without this new roading infrastructure the effects on Kāpiti Road would be significant in terms of needing additional widening along its length. Although Kāpiti Road is busy in some sections (especially the east end) and also has poor visual amenity and function for walking and cycling, it is ultimately the responsibility of KCDC to determine the future form needed for Kāpiti Road to meet natural district-wide growth and to improve its amenity as an important local road.

### 6.1.3 Paraparaumu Town Centre

Integrally linked to the points made above regarding the airport and the proposed Expressway is their relationship to the aspirations for the future of the Paraparaumu Town Centre. There is a long history to planning for the town centre at Paraparaumu which extends back to the 1970s when it started to develop as a larger centre to support the growing residential population (refer to Figure 6 below). The recent proposals for the town centre are as follows:

- Since 1999 the area has had a town centre zoning and more latterly a residential development overlay;
- In 2004, a concept plan was formulated in consultation with the community (see Figure 6), which assumed a Western Link Road on about the same alignment at the proposed Expressway but smaller in scale; and
- A District Plan change to give effect to part of this concept plan was promulgated but has been delayed in implementation due to disputes over KCDC's ownership of a large area of the subject land and appeals.

The Expressway proposal is not counter to the Council's latest concept plan as the interchange on Kāpiti Road will usefully feed traffic in from the west side of the town centre via Kāpiti Road and/or new local road network in the town centre zoned currently vacant land.

The interchange is within an area that, in relation to the future town centre, is where there is sufficient currently vacant space to allow visual integration. This can be achieved by the consideration of the design of the town centre street pattern and building relationships. Any future town centre land uses will not be able to have direct vehicle access to the proposed Expressway, but the positioning of buildings in relation to the proposed Expressway can be managed to visually screen the wider town centre land from the proposed Expressway should this be considered desirable.

The design of the interchange will address its aesthetic appearance and moderate its scale as observed from the town centre through the shaping and planting of the landforms associated with the Kāpiti Road interchange and its on and off ramps. In this respect, the town centre does not need to be built up in order for the interchange to be visually integrated to its context.

Although not counter to the town centre plan in its current concept form, the proposed Expressway (which differs from the Western Link Road assumed for the concept plan) and the opportunities that it would afford for the refurbishment of the current State Highway 1 suggests there may be some merit in reconsidering the town centre concept plan in some respects.



FIGURE 16  
 KDC's Paraparaumu Town Centre Concept Plan (2004) with expressway and Bukara link overlain for reference - this Plan has not been formally adopted, but describes the concept of Eainu Road with a 'main street' type frontage and then future mixed use and residential development to the west.

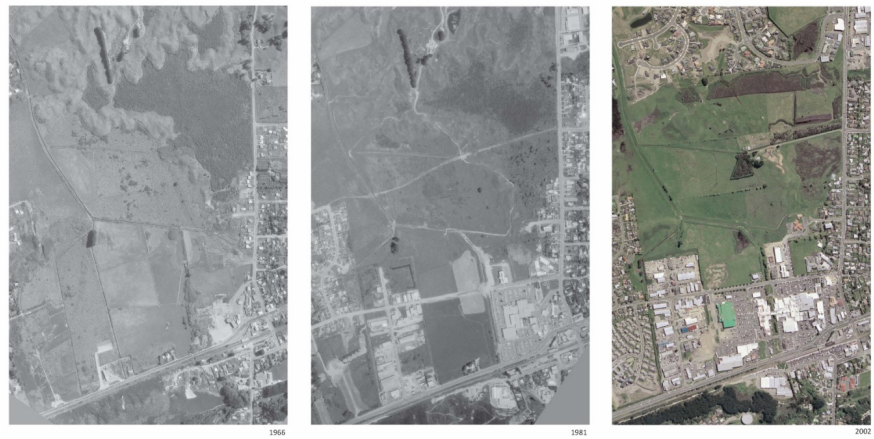


Figure 6 Paraparaumu Town Centre

#### 6.1.4 Paraparaumu Town Centre and SH1 Relationship

In parallel with the development of the proposed Expressway design was a separate process that considered options for the future condition of the current SH1 (referred to as the SH1 Revitalisation Study 2011).

With the future revocation of SH1, there would be significant opportunities to develop the current town centres of Paraparaumu and Waikanae (see 8.2.6 and 8.2.7 Waikanae assessment below) and adjoining residential areas (see Figures 7-9 ) in new ways that the use of the current road as a State Highway has either inhibited or prevented to date.

Within the limited scope of this SH1 'modification' design process, the principal design opportunities were based on a reconfiguration of the road to enable:

- better accessibility by at grade walking and cycling links between the town centre and rail station at Paraparaumu. This is important as there are many people that use this station each day<sup>2</sup>, so it represents a key facility for the town, and therefore access to the station (either by walking, cycling, or by bus or car) is a critical requirement for the town
- a lower traffic speed environment and consequent opportunities for new retail or other uses to front onto the highway with additional car parking able to be provided on the road
- reduced traffic lanes and use of ex-road space for planting and other visual amenity improvements
- better layout and function of the bus interchange

It is recognised that the former SH1 corridor is best not planned in isolation from the whole town centre, but there were reasons for this to occur – namely to allow for KCDC and NZTA to better understand the opportunities for modifying the road for its new local arterial purpose. It has always been recognised that, once an agreement as to the future reconfiguration of the existing SH1 is in place between KCDC and NZTA, a more holistic review of the planning for the town centre would be undertaken; this review is planned by KCDC to occur later this year (2011).

Defining the proposed Expressway location will provide some certainty for the way in which the town centre can grow and change into the future. It can reasonably be anticipated that, with this certainty and with a town centre concept plan and appropriate implementation methods (for example, District Plan and asset investment), new private investment in the town centre will be catalysed.

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<sup>2</sup> A current survey [GWRC 2011] records 524 people at the peak time (7-9am outbound south from Paraparaumu) and 267 from Waikanae

This change will likely result in some repositioning of businesses within the town centre over time to take advantage of adjusted movement patterns and in relation to the type of business. Car-oriented businesses will look to position themselves where there is easy vehicular access and highest visibility from the most traffic.

The businesses that take advantage of amenity factors such as sun, outdoor seating, pleasant outlook, lower noise levels, public life and vibrancy, and foot traffic will locate where there is less road traffic, more walking and a quality public and street environment.

The current urban form of Paraparaumu favours the former of these business types (large surface car parking area and internalised mall, large format retail stores, fast food takeaways).



# 1 MacKays to Peka Peka Expressway

## Paraparaumu Town Centre

4

### Objectives

- Create a more pleasant walking and shopping environment including footpath and street furniture improvements.
- Enhance pedestrian flow from train station to Coastlands and shops across the road with wider footpaths and pedestrian crossings.
- Create a more pleasant, better oriented bus stop/interchange between train station street and shops.
- Locate bus stops on street frontage to improve bus route and improve connectivity
- Plant trees between carparks and in raised medians to create amenity and slow traffic.
- Reduce through traffic and speeds.
- Encourage active shop fronts with new kerbside parking and improved pedestrian amenity.
- Create a narrower carriageway with tighter kerb radii.
- Use the road improvements as a setting to encourage new business shopping and other amenity.

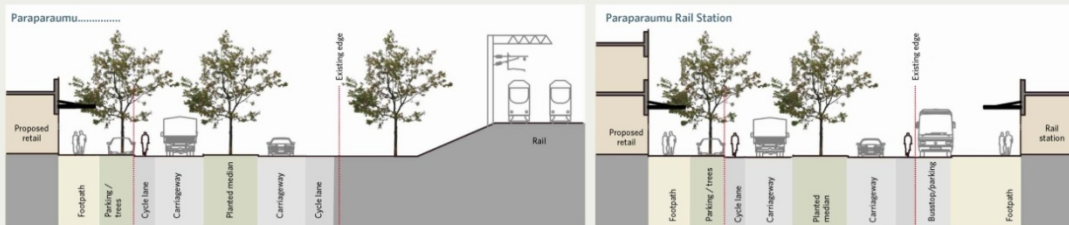


Figure 7 Paraparaumu SH1 Revitalisation opportunities (consultation panel)

# 1 MacKays to Peka Peka Expressway

## Waikanae Town Centre

5

### Objectives

- Create a more pleasant walking and shopping environment including footpath and street furniture improvements.
- Open up pedestrian desire lines with pleasant generous pedestrian crossings across roads.
- Enhance pedestrian flow from train stations to shops across SH1.
- Locate bus stops on the main road beside the train stations.
- Provide a new signalized intersection at Ngaio Street Waikanae.
- Create a narrower carriageway with narrower kerb radii.
- Plant trees between carparks and in raised medians to create amenity and slow traffic.



Figure 8 Waikanae SH1 Revitalisation opportunities (consultation panel)



# 1 MacKays to Peka Peka Expressway

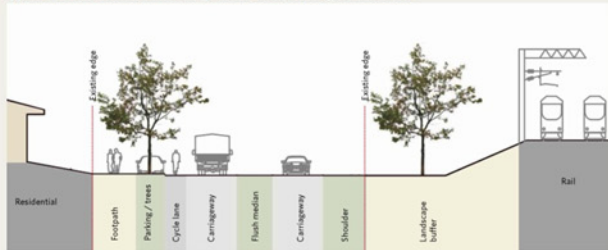
## Suburban zones

6

- Provide a street network for new development areas. Some areas may be implemented as part of SH1 revitalisation, new areas will be developed in response to subdivision consents.
- Remove one southbound lane and reduce road width to create on-road cycle lanes and off-road shared cycle/walkway on west edge and provide space for kerbside parking.
- Provide space for planting which creates 'screens' for pedestrians, slows traffic and improves amenity and property value.
- Consider the option of discarding flush median for right turns. Flush medians may create safer access to properties but can result in a wider road which may restrict parking and tree planting.



Typical cross-section showing trees and parking at kerbside



Existing street view



Preferred option - trees and parking at kerbside



Trees and parking at kerbside



Parking kerbside and trees behind footpath



No parking, trees at kerbside



Figure 9 Suburban areas SH1 Revitalisation opportunities (consultation panel)



It is KCDC's intention (expressed through its various Town Centre schemes) to broaden and evolve the town centre to having higher levels of amenity. This objective would create an improved quality of civic environment, a street network that supports smaller scale businesses including hospitality, food and beverage, and a central business district that functions not just as a retail place but a place where people go to spend time and be part of public life.

As noted in the Policy part of this assessment (section 5), KCDC is also seeking to create a 'sense of place' or character for the town centre which reflects the natural and physical characteristics of the locality. Part of that is the desire for developing and enhancing the natural and physical environment and landscape by recognising the relationships between existing landscape features including stream, wetlands, sand dunes and the backdrop of Kāpiti Island.

In terms of the directions sought by Council in its evolution of a quality town centre environment, it is considered that the proposed Expressway will not prevent such an outcome, or prevent the range of existing business types from continuing to have a viable role. However, where these businesses (especially on the west side of the current highway) rely currently on access to high traffic flows on SH1, changes can be expected with adverse effects for some aspects of these businesses (refer to Assessment of Economic Effects). The traffic continuing to use what would become the former SH1 will approximately halve (as described in the Assessment of Transportation Effects) with consequent reduction in passing traffic trade.

Balancing to some extent the loss of trade is the reduced traffic speeds and improved amenity possible for former SH1 which may encourage traffic from both directions to utilise these businesses where currently it is only feasible for traffic from one side (traffic heading north). Continued access along the former SH1 from Poplar Avenue will also continue to supply vehicles into the town centre from the south.

Of some interest to these business owners (and to the future of the town centre in general) will be the way in which the proposed Expressway and the Kāpiti Road interchange serve to influence the most desirable places for vehicle-oriented businesses like the drive-in takeaways and service stations for example. Without planning, these activities may locate where they could impact negatively on other urban quality and amenity outcomes being sought for the town centre. This will be an aspect of planning that needs to be given consideration to in the next iteration of the Paraparaumu town plan concept.

In summary, the proposed Expressway and location of the Kāpiti Road interchange will bring about increased accessibility as well as opportunities for the revitalisation of the existing State highway that will set in place a foundation for an urban structure that will facilitate the achievement of the aspirations for the town centre after many years of uncertainty. The Assessment of Economic Effects concludes that the business redistribution effects of the new proposed Expressway will not be sufficiently significant to affect the public amenity values of the centres 'by-passed' by the Project.

Also as explained above, the proposed Expressway Project will bring a number of positive benefits for other businesses in town centres adjacent to the existing SH1 alignment.

#### **6.1.5 Waikanae Town Centre**

There is no interchange proposed close to the town centre at Waikanae – the nearest access to the proposed Expressway will be via an interchange on Te Moana Road some 3 km to the west. As noted above with reference to the Paraparaumu Town Centre there can be expected to be some adverse economic effects for businesses that rely on the passing trade along the current SH1. There are some 36 tenancies along the highway edge (a few vacant) out of a total of 92 within the centre. However, only part of the frontage has car parking on the highway and many of these businesses by their nature (eg banks, real estate, law office) will have less of a reliance on passing traffic for trade. The Assessment of Economic Effects noted that the businesses in the Waikanae town centre most significantly affected are the two motel complexes, a supermarket (with a fuel retail facility), a fast food outlet, two service stations and 11 restaurants, cafés and takeaway outlets. Whilst all of these businesses are located on the existing SH1 alignment, the assessment is that not all of their trade is reliant on passing motorists.

There has been concern expressed during consultation that the location of the interchange will increase traffic flows on Te Moana Road to the detriment of the amenity of residents and other users along it (especially walkers and cyclists including children needing to access schools). However, the traffic modelling shows that there will be a reduction in traffic flows on Te Moana Road given local Waikanae and Waikanae Beach traffic intending to go south (towards Paraparaumu and Wellington) will likely use the interchange and so not have to travel up Te Moana Road to the current highway at its top end. Similarly traffic heading to Waikanae Beach from Paraparaumu and Wellington can exit at the Te Moana Road interchange and so avoid traversing the full length of Te Moana Road.

It is noted also that the planned for growth areas of North Waikanae is located close to the proposed interchange location. As a result traffic volume growth from here will also have ready highway access and avoid the need to travel up Te Moana Road to get access to SH1, when travelling outside the local community. For local movements such as to the town centre the current street network will continue to be utilised. There is a planned road link between the current SH1 north of the town centre and Ngarara. This is aligned with the proposed Smithfield Road proposed Expressway over bridge and will enable access to the town centre from the north for residential areas developed on the west side of the proposed Expressway. The timing of that link road will be dependent on the Ngarara development and the other contiguous Waikanae north development area's progress.

The relative location between the current highway route and proposed Expressway is such that it is anticipated that residents of the Waikanae area who live closer to the current highway may continue to use this route to travel to Paraparaumu.

In considering heavier vehicles such as trucks, those that are moving through Kāpiti to Wellington area expected to use the proposed Expressway as it will allow continuous movement at highway speed. For those trucks servicing the Waikanae town centre (supplying supermarkets or service stations for example) it is anticipated that they will either access Waikanae from the north or south along the current SH1, or from the proposed Expressway. If trucks are also servicing at Paraparaumu they will be most likely to also use the current highway. The number and frequency of trucks is expected to be relatively low making service deliveries compared to the current truck movement through the Waikanae town centre and there will consequently be centre amenity improvements as a result.

As with Paraparaumu town centre, KCDC has conducted design studies to examine how the centre layout can better provide for local needs and this work will recommence this year (2011) now that the proposed Expressway location is known.

#### **6.1.6 Waikanae Town Centre and SH1 Relationship**

The assessment above for Paraparaumu town centre relates also to Waikanae town centre in relation to the opportunities to better enable physical connections and accessibility from the east and west sides of the centre.

The same opportunities explored as part of the SH1 revitalisation study in Paraparaumu town centre are also available for the Waikanae town centre: i.e., slow traffic speeds, add planting and trees to soften the visual appearance, reduce the surface area used for vehicles and widen footpaths and seating areas, add additional pedestrian crossing points, and to make the transport interchange of buses and trains and the location of bus stops work more effectively.

A local issue at Waikanae is the Elizabeth Street connection across the rail corridor and current highway. The issue is that Elizabeth Street is the only connection point between the two sides of the town. Anyone wanting to access by vehicle the east side of the current SH1 must use Elizabeth Street. There is a walking crossing from approximately opposite Ngaio Road that connects to the east across the railway tracks to the civic facilities area near the Memorial Hall and give access also to residential areas.

There are facilities (such as church, cemetery, urupa, recreation facilities, and community hall) as well as many residential properties and businesses that require people to utilise this crossing point frequently in vehicles as well as walking and cycling. The Waikanae area is home to a large number of older people (as well as young children) that find this crossing very difficult due to the current volumes of highway traffic, the timing of the crossing at the traffic lights mixed with the train movements.

The downgrading of the current highway to a local arterial road will have the benefit of improving the ability for people to move more comfortably across the Elizabeth Street crossing. The timing of the

traffic lights, as well as the potential to add another pedestrian crossing point over the current highway at Ngaio Road, are proposals that were considered in the SH1 Revitalisation study.

While the limitation of one vehicle crossing of the railway line for Waikanae at Elizabeth Street will continue, the proposed Expressway will not exacerbate it (and in fact will give more latitude to resolve it). It remains a matter that can only be considered by KCDC as part of its wider town centre planning work scheduled to occur later in 2011.

### **6.1.7 Urban Growth at Waikanae North**

As discussed above, the Waikanae North Area is the descriptor for the planned urban growth in the area north of Waikanae (see Figure 10). This comprises two large areas – Ngarara Zone and Waikanae North Development Zone, as well as other smaller parts such as Ferndale.

The formulation of the urban planning policies that define the form, quality and character of the future urban environment sought from its development has been an extensive process. The subject area has a designation for a road (the existing WLR designation) within it (see existing WLR designation notation in Figure 10). The proposed Expressway largely follows this alignment, although it would avoid the significant wetlands within Ngarara crossed by the existing WLR designation.

Of the land planned for urban growth in this area, only the Ferndale development has been given effect to (although only a few residences have been built) so far. There is some advancement of development in the Waikanae North Development Zone (Plan Change 69), although this differs from that set out in the concept master plan in the District Plan in that parts of this area is now proposed to contain a new primary school and a retirement village. This land is not affected by the proposed Expressway.

In terms of the extent of area within the Waikanae North affected by the proposed Expressway it is parts of the Ngarara Zone where the effects are of most significance due to the reduced areas that will be available for its development. Figure 22 shows the development areas within the Ngarara Zone (described as 'neighbourhood areas') and how this relates to the proposed Expressway footprint. The construction footprint of the Designation for the proposed Expressway reduces the total neighbourhood areas of approximately 128 hectares by approximately 23 hectares (a reduction of approximately 17%).

There may be some ability to reduce the loss of development potential by narrowing the proposed Expressway construction Designation in Ngarara after completion of the proposed Expressway. A substantial separation distance may still be required to provide sufficient amenity for residential development as noted below in terms of visual and noise effects. An assumption that the loss of developable area may be in the order of 20% is reasonable.

In terms of the effects the proposed Expressway has on the Ngarara Zone there is clearly a reduction in the capacity of this area to provide for the District's urban growth. The structure plan for this area would need to change to reflect the proposed Expressway and an examination of the densities

proposed may allow for some increased densities to compensate for lost potential. Consideration may also need to be given to market conditions and growth projections to determine the timing of development. It is reasonable to expect that during the proposed Expressway construction (2013-2017) that development for residential activities may be difficult to progress.

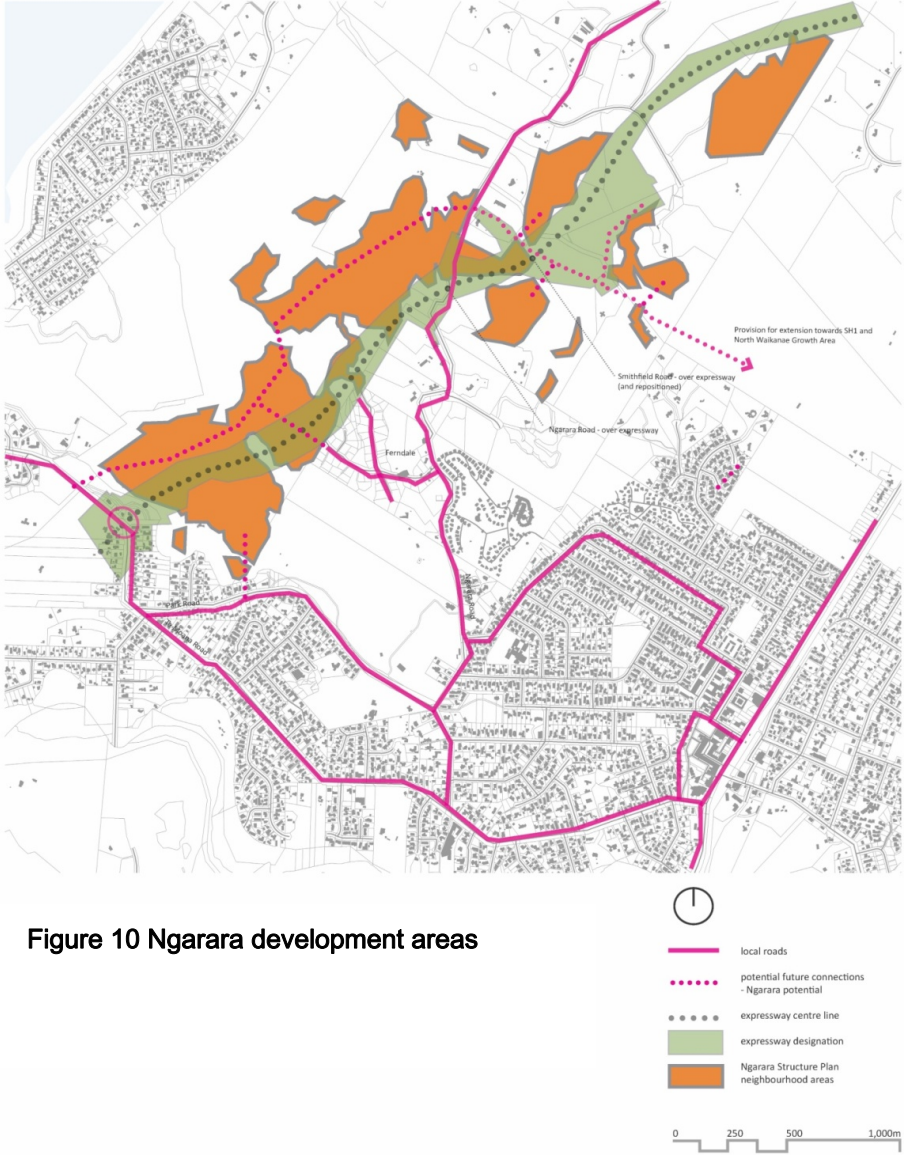


Figure 10 Ngarara development areas

In terms of the visual and noise effects, these can be addressed to some extent by the orientation of development, although there is no doubt there would be a change to the current quiet nature of this area. The ability to design the street networks and higher density configurations of buildings that face away from the proposed Expressway will need to be explored, as will utilisation of the natural land forms that may assist to provide visual barriers to the proposed Expressway. It is noted, too,

that the wetland areas within Ngarara have been carefully avoided in the design of the proposed Expressway Alignment (and in fact, along the entire route, the nine recognised wetlands that would have been affected by the existing WLR designation are avoided by the proposed Expressway). The wetland areas still offer (as they would have with the Ngarara Zone) opportunities as to the form of any urban development areas as open spaces within an urban spatial structure.

In terms of connections, there is provision for a new road connection into Ngarara from Te Moana Road. Ngarara Road itself crosses over the proposed Expressway and this gives an immediate connection across to the east part of Waikanae from Ngarara development on the west. It is also planned to provide a new bridge link over the proposed Expressway to replace the Smithfield Road connection currently to Ngarara Road. This will also be positioned to allow a link back into the Waikanae North Development Area at current SH1 providing a continuous Waikanae east-west link from Ngarara.

In summary, the effect on the Ngarara Zone is a loss of development area potential. The extent of this loss cannot be understood without re-planning the area, but it could reasonably be in the order of 20% of that planned. In terms of the proposed density for the development area under the Ngarara Structure Plan the yields may need to be revisited to test the potential for compensating the loss brought about by the proposed Expressway. However, some of the planned yields are already relatively high compared to the existing development context and at the higher end of the density range. Notwithstanding this conclusion, there remains the potential for some urban development in the Ngarara Zone. The development of North Waikanae Development Zone on the east side would be unfettered by the proposed Expressway. The ability to link via the new Smithfield Road proposed Expressway over bridge from the west side of Ngarara through the land to the east and connect to the current SH1 is continued to be provided for.

At the broader level, if the reconfiguration of the planned urban development in Waikanae North area indicates a reduced urban development yield, then consideration will need to be given to an adjusted spatial configuration. As noted earlier in this AEE, the integrity of the KCDC development management strategy will be important to maintain. This will require the avoidance of, or the inducement of, urban development at Peka Peka, Otaihanga and along the current SH1 between existing urban areas.

The ability to mitigate the effects of the proposed Expressway on the interface urban growth areas is described below.

#### **a) Buffers**

There will be utilisation and treatment of the wide buffers that exist between the actual proposed Expressway road and the outside edge of the designation to mitigate effects. As Figure 10 describes, the width of the designation is nominally 100metres although it widens in some areas to be broader than this (eg around Smithfield Road bridge). The road itself is up to 25 metres width which leaves a buffer distance of some 35metres on either side. The landform of this buffer area will



be significantly altered by the cutting of the road alignment into the dunes. Reshaping and substantial replanting is proposed. Cross-sections within Technical Report 7 Assessment of Landscape and Visual Effects describe the changes to landform and proposed remediation planting as part of the proposed Expressway.

#### **b) Replanning Ngarara**

As noted above there is no development yet at Ngarara and the current masterplan for Ngarara will logically be revisited in order to understand the optimum layout for the growth area assuming the Expressway is in place and operational. The degree to which the entire plan needs to be revisited, or just those parts of it that are immediately impacted on by the proposed Expressway footprint, will require some consideration by the interested parties. The process of revisiting the layout will enable the effects to be considered and mitigated given that none of the urban development proposed has been given effect to there. In this way the relative placement of building sites and their orientation, open space areas, the contouring of the land that will be a necessary part of urban development no matter how light handed it is planned to be, and provision for internal road layout are aspects of the design that can be revised to take account of the effects of the Expressway.

#### **c) Noise Mitigation**

On the assumption that the general Waikanae north area will urbanise as part of urban growth over time there would have been some change to the noise environment there in any event. The noise generation effects of the proposed Expressway are proposed to be mitigated by use of noise suppressing road surface treatment (OGPA) and the buffer area described above will also lessen noise where the landforms create blocks to noise transfer to those developable area. However, there will remain a significant change to the noise environment in the area of the Expressway which will not practically be able to be fully mitigated. As noted above, given there is no urban development in the Ngarara area at this point, the process of reconsidering the plan for the areas affected by the Expressway enables noise effects to be taken into consideration. In other sections of the corridor where the proposed Expressway is near to residential or sensitive existing land uses, noise mitigation structures (mounding of ground to reflect natural land forms and specially formed noise walls with recontoured land around them) have been proposed to mitigate noise to appropriate levels.

### **6.1.8 Managing Unplanned Development Pressure**

The proposed Expressway deliberately excludes direct connectivity at areas where urban growth is unwanted. However, there will remain a risk that privately initiated District Plan changes may seek to enable urban growth in contradiction to KCDC's growth management strategy. In addition to not having interchanges where they could induce new urban development, the Limited Access Road status can remain (under the provisions of the Local Government Act) on the current SH1 as a

mechanism to reduce the potential for new urban growth along it. This status would allow additional roading connections to be declined approval given the intention for this road to remain as an important local arterial. This may be most helpful outside of the existing urban areas where KCDC are seeking the retention of the open and rural landscape and the planned urban form.

#### **a) Interchanges/intersections**

There is likely to be some recalibration of the land uses following the proposed Expressway becoming operational. It has already been noted that there will be some benefits (as well as lesser adverse effects) for the town centres. At Paraparaumu, the proposed interchange would be compatible with and support current and future land uses. Its proximity to the large commercial centre at the Airport and the future town centre growth area are positive. There is some potential for the adjacent area in the north east corner on Kāpiti Road that is currently a mix of residential and services (medical practitioners) to come under pressure for commercial uses. This is not considered to be a significant issue or to be in conflict with the Council's urban planning as this land is on a busy local road (Kāpiti Road) and on the other three corners of the interchange the land is either planned for or has existing commercial development.

The Waikanae Interchange on Te Moana Road is within a relatively wider area of open land and may be more at risk of the land uses (such as service stations) wanting to locate adjacent to the proposed Expressway. As noted above with respect to the Limited Access Road provisions these could similarly be applied at Te Moana Road if considered appropriate by KCDC. It is noted that much of the flat land around the interchange at Te Moana Road is within an overland flow path from the Waikanae River towards the Waimeha Stream. NZTA will retain ownership of large areas of this land (shown as planted in Figure 11 below) in order to allow for this over land flow path to operate in extreme flood events which overtop or break the Waikanae River stopbanks.





**Figure 11 Te Moana Interchange**

At the south end of the proposed Expressway, a partial interchange is proposed (south facing ramps only) at Poplar Avenue. This context would provide limited space for development (for example, commercial) to occur in a manner that would be incompatible with the current policies on commercial development and town centre viability. The space here is limited by the proximity of the railway line, the current SH1, proposed Expressway over bridge and the road berm which provides a cycleway/walkway connection around the corner. There is some open land which runs back from the Leinster Avenue properties and has a south facing frontage towards the proposed Expressway. However, gaining a road access for new commercial uses that were seeking connections to the proposed Expressway off ramp would be difficult given the frequency of traffic movements from Poplar Avenue to current SH1.

At the north end of the proposed Expressway, it is proposed to construct a partial interchange (north facing ramps) at Peka Peka Road. This area is relatively open (rural land). The current nursery and associated café are well used, and although the proposed Expressway will change access arrangements to Peka Peka, it will still be connected to the current SH1 and local people are expected to continue to frequent it. The risk of new commercial type development at this intersection is likely to be limited by the inability to get off the proposed Expressway for travellers heading north. Also there is a relatively small local area catchment to support any substantial commercial development seeking to take advantage of traffic turning off at Peka Peka Road from the proposed Expressway.

## 6.2 Amenity Values

Amenity values is defined in the RMA (s2) to mean 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.

In urban design terms, the focus of this assessment of the effects of the proposed Expressway is in relation to:

- The appreciation of pleasantness in regard to local road and other east-west links (like Waikanae River and Wharemauku Stream) which the proposed Expressway would cross, as well as at town centres where people come together for social and cultural reasons, as well as for the various services offered from there;
- The aesthetic coherence of all proposed Expressway structures and the way in which these are designed in relation to the landscape, recognising that the landscape design itself is addressed by Technical Report 7, Volume 3;
- The recreational attributes in regard to horse riding, cycling and walking and how provision can be made for these activities;
- The proposed Expressway user experience in terms of its appreciation of its pleasantness, aesthetic coherence and cultural and recreational attributes.

This assessment is not addressing recreation across the whole of the proposed Expressway area, and nor is it addressing noise, visual, cultural or social effects, all of which are addressed by other assessments. Similarly, the transport assessment examines the amenity generated by the proposed Expressway providing access to local centres and the wider region.

### 6.2.1 Local Road and Other Crossings

The primary point at which local people will have a direct experience of the proposed Expressway in its context – i.e., experience its physical presence – is at the points where the proposed Expressway crosses over a local road for other path – typically these are on east-west roads and paths. There is a lesser level of immediate interaction for the two locations where the local roads will go over the proposed Expressway, but there is still some experience to be considered.

A significant aspect of these local road and path connections is that there are 8 of them (not including Ngarara and Smithfield Roads which go over the proposed Expressway):

- Poplar Avenue
- Raumati Road
- Ihakara Extension/Wharemauku Stream
- Kāpiti Road

- Mazengarb Road
- Otaihanga Road
- Waikanae River
- Te Moana Road

Furthermore, while the experience of local road users will primarily be people in vehicles, the most important consideration in urban planning terms is for people walking, cycling or otherwise moving beneath the proposed Expressway. Experience with underbridge locations elsewhere is that these can be uncomfortable places that will inhibit people's movement patterns if the quality of the space is poor.

This poor quality may encourage people not to walk or cycle and use a car instead, or may direct them to use alternative routes. It is proposed as part of the proposed Expressway Project that a pedestrian overbridge be provided in the block between Kāpiti and Mazengarb Roads as well as near Leinster Avenue. Apart from these links (and a planned street extension at Ihakara Street) there are no alternatives to moving under the proposed Expressway for the east-west connections, except at the north end of the route, reinforcing the importance of the design of these underbridge spaces for users.

The number of users walking and cycling on these east-west routes is described in the ULDF and section 4 of this AEE. Council is strongly encouraging of non-vehicular movements (active modes) as a way to provide healthy and accessible options for how people get between their local destinations and also as a recreational pursuit. Accordingly, Council has a strategy which advocates for walking and cycling and horse riding (refer to section 5 Policy Context) that leads to investment in the infrastructure to support this activity.

It has been a focus of the urban design for the proposed Expressway to ensure satisfactory level of provision for walking, cycling and horse riding. At the local road and other path crossing points the amenity that will encourage walking and cycling and other active modes of movement has been promoted by the following measures (note the cycle and walking network is addressed separately in section 6.3 Connectivity).

#### **a) Local Roads at Grade**

The reason the proposed Expressway is going over local roads and paths is due to decisions made during the design process that it was, on balance, a better option than having the local road bridge over the proposed Expressway. Although there were various reasons for this decision at each location, in urban design terms what this means is that people walking and cycling and undertaking other active mode movements are not required to go up and down the 6 metres (i.e. 2 storeys) required to bridge over the proposed Expressway which would discourage walkers and cyclists.

This up and over movement would additionally inhibit mobility impaired people and, for people of an older age, generate additional barriers to local active mode movements.

Keeping the local 'at grade' (i.e., at its current level) also maintains the current street pattern which is part of the existing character of the area. Some of these characteristics include bends to get around dunes, cuttings through dunes, and view perspectives that are part of the history of how local places have developed over time and in response to the natural landscape.

Although rationalisation of these characteristics of local roads occur (for example, taking bends out and straightening the roads), could be seen as a benefit for traffic efficiency or even safety, such changes would affect their existing character, and so diminish local amenity values.

Another undesirable by-product of having local roads go over the proposed Expressway would be that the long ramps necessary to get the road to cross the proposed Expressway at a height of 6 metres above the proposed Expressway would prevent access to the existing properties that line the local road adjacent to the ramps on both sides. In turn, this would require either acquisition of the properties affected as no access would be possible due to the ramp blocking it, or else a parallel access road would be required to be built beside the local road at existing ground level to give access. This would add significantly to the apparent widths of road infrastructure and would be difficult to achieve within road reserves without acquisition of additional frontage widths to the affected properties.

#### **b) Light**

For all of the bridge locations where people are known to walk and cycle in larger numbers (all crossing south of Otaihanga), the bridges for the proposed Expressway over are split such that the north bound and south bound lanes are on separate bridges. This is in order to allow more natural light into the space below. The gap between each bridge will be 4 metres across. At Te Moana Road, there is no split, but the long spans for the bridge will provide a lighter experience beneath than for the shorter spans typical of the other local road crossings.

#### **c) Abutment Forms**

In some locations, the proposed Expressway would sit on raised ground, and where there are local road crossings the raised ground will be cut and shaped to form the edges to the local road under the bridge. Typically, where abutments are on local roads and paths frequented by people walking and cycling they are angled back (at a slope of 1:2) from the local road edge (back from the footpath or berm) to the underside of the bridge to create a wider and more airy space. The exception is at Wharemauku Stream and Waikanae River where the space beneath the bridge is very wide and people are not walking adjacent to the abutment walls. It would also occur on one side of the proposed bridge over Mazengarb Road where the steep bank entering into the under-bridge will be continued as a sloped back but more upright form. This bank will need to be carefully designed to ensure that the relationship of the height of the wall and the footpath users is a comfortable one.

Design proposals include having some stepped wall sections and the use of a textured finish or gabion type structure that provide some visual relief and interest to the wall. Design work will also be undertaken with the aim of expressing the curve of the road leading up to around and under the proposed Expressway bridge.

As noted above, for people in vehicles these abutment forms are of less concern, but for people walking and cycling under the bridge the pleasantness of this experience will be influenced by the abutment forms. With vertical walls rising to the underside of the bridge and a normal width of footpath (1.5m) beside an over-bearing scale is created that is uncomfortable for pedestrians.

The treatment of the surfaces of these abutments under the bridges has also been considered. The proposal is to utilise materials that have some texture and local references to local materials. These surfaces also need to be considered in terms of their maintenance and ability to be cleaned in the natural event of dust and dirt, but also if tagging or graffiti occurs.

The purpose of this texture is for walkers who will move under the bridge at walking speed and will as a result be looking at the surfaces; this texture will provide some visual relief to pedestrians, which will be important given the scale of the proposed Expressway infrastructure. The human eye and other senses are calibrated to look for detail at walking speed and our experience of the pleasantness of walking in places is influenced by the texture of what could otherwise be flat and relentless surfaces.

The design approach proposed for the proposed Expressway is to use natural materials assembled in structured forms that respond to the functionality of the crossings (and other locations as described further below such as noise mitigation structures). The main material proposed will be natural rock – either river sourced or quarried rock. The forms proposed to be used include:

- pre-formed panels using the rock as a surface under bridges where a more even and architectural response is appropriate
- gabion blocks which utilise a consistent rock grade to form edges to the back of footpaths and extend out beyond the bridges into the landscape and so serve to 'lead' people to and beyond the bridge
- gabion baskets which are a looser form and in some places will respond to the more natural landscape setting

The use of local rock will relate to the natural colours in the landscape and is a reference to the coastal processes that have formed the coastal plain on which the proposed Expressway is located. From experience with other roading projects, it is known that the use of these natural type materials will attract less damage from graffiti and tagging due to the uneven surfaces and resultant inability to make a strong graphic statement. In the panel forms under bridges, these can be treated with graffiti guard and can be water blasted to remove any graffiti or tagging which does occur. For the gabion forms the rock can either be turning or again water blasted to remove any such damage.



#### **d) Bridge Forms**

The approach to bridge design has been to achieve the following objectives:

- The bridges should respond to the local road crossing and landscape context to make them pleasant to be around - there are many of these structures and they need to look good from the ground as the first priority over and above the proposed Expressway motorist user who will be travelling at speed;
- Satisfying the seismic and geotechnical conditions which will require bridge forms and piers that support the bridges to be structurally simple and to operate as portal forms in order to remain standing as core elements of this important national road; and
- Utilising the opportunity created by the number of bridges and potential to standardise the bridge designs to a set of components that can be used at the multiple locations and so be more cost efficient than individual designs for each. This could conceivably be as pre-fabricated components to allow higher quality finishes and more 'shaped' forms as well as more rapid assembly and construction.

The design process has seen a number of options for bridge forms being considered. Principally, however, the design seeks to integrate the main bridge components (barrier, deck, cross heads, piers) so that they visually 'read' as one shape and thus provide more fluid and sculptural forms that are aesthetically pleasing.

There is provision also for uplighting these forms to highlight their sculptural shapes and to similarly add to the experience for people moving under the bridges after dark.

In terms of their response to the landscape the bridges will be perceived by local road users as sitting across the gaps they bridge – i.e., between the landforms which will themselves be treated as dunes or dune extensions. The landscape treatment (ground and plants) will emphasise the gaps by coming up past the bridge deck level and barrier to some extent to enhance the visual impression that the bridge is across the gaps and not continuous across the landscape.

#### **e) Safety**

The safety of the spaces beneath bridges has been carefully considered. A safe environment will be created by:

- providing clear lines of sight for people walking or cycling beneath so any risky situations can be avoided by not entering the under-bridge area and waiting for the risk to pass;
- having sufficient path space that cyclists and walkers are not pushed close to moving vehicles and so at risk from being hit;
- providing good light levels to provide clear visibility;
- ensuring there are no spaces where people can conceal themselves and confront or attack unsuspecting users;

- maintaining direct visual contact between vehicles passing and walkers or cyclists (passive surveillance); and
- encouraging by the quality of the space, high levels of use by walkers, cyclists and other active modes so there is the mutual benefit of people looking out for each other.

Although surveillance cameras can be used to deter antisocial behaviour or attacks, these are generally used where there are existing unsafe conditions. It is preferable to design the spaces associated with the proposed Expressway to be 'naturally' safe rather than have to install security cameras with the attendant cost of maintenance and their typically 'after the fact' nature (i.e., cameras may record crimes rather than prevent them occurring in the first place unless monitors are being actively watched).

### **6.2.2 Town Centres**

The amenity of the town centre at Waikanae and Paraparaumu has been canvassed in earlier sections of this assessment. As noted, the opportunities that the proposed Expressway provides for the town centres is the ability to revitalise the existing road due to the removal of the heavy and volume of traffic from the current highway route. This revitalisation would result in improved amenity because of the easier connections between the centres and the public transport hubs and rail stations, reduced lanes widths and amenity planting and 'softening' of the landscape, reduced noise and disruption to the adjacent properties and added cycling and walking facilities. However, there will be some adverse economic effects from some business from a loss of trade traffic.

### **6.2.3 Other Structures**

The other key structures (apart from the proposed Expressway itself) which have been carefully considered in urban design terms have been the proposed noise barriers. It is noted that, where possible noise 'bunds' (shaped rising ground), have been used as physical barriers between the proposed Expressway and the noise receiving environment. These barriers will ideally be integrated with the existing ground natural form.

The reason for this design approach is that the noise barriers will typically have to be used at or near the bridge locations, as well as where residential properties are relatively closely located to the proposed Expressway. The Landscape and Visual Assessment (Technical Report 7, Volume 3) describes the visual effects of these structures – these effects need to be balanced with their primary purpose of improving amenity by reducing noise to acceptable levels for the areas in which they are located.

As described in the Landscape and Visual Assessment, the noise barriers have been designed as having three main types and forms:

- On some property boundaries 'acoustic' fences which are timber construction – these are up to 2 metres in height;

- Low solid barrier of 1.1 metre height (concrete) which typically extend beyond the bridge end barrier; and
- Higher solid barrier (stone gabion) of up to 3 metres height which would be located immediately behind the proposed Expressway shoulder.

The design provides for these two latter barrier types to be integrated into the landscape by the ramping up of earth material behind them (i.e., the face seen from public areas and private properties) which can then be planted. The property boundary fences can be designed in a range of materials and combinations to suit both the acoustic needs and the aesthetic requirements. Some offsetting of the fences in plan or stepping the wall surfaces would allow for planting on the property owners side of the fence and provide some breaking up of the linear surface when viewed from the proposed Expressway side and cycleway/walkway path.

In this respect, the most challenging part of the proposed Expressway route is at the Kāpiti Road interchange where there are multiple combinations of the three types of noise barriers and a constrained proposed Expressway and interchange footprint which demands a more 'built' form to the structure. In other places, the proposed Expressway corridor provides space for landforms and landscape treatment through a range of planting types to visually integrate it.

At Kāpiti Road, the design will need to consider the vertical wall faces to the raised bridge approaches, the noise structures and the way in which the cycleway/walkway is positioned in relation to private property boundaries and noise walls. There is a risk to the amenity of this interchange area from creating unsafe places of entrapment along the path, exacerbated by the scale of structures adjacent. The design proposed addresses this risk through the materiality of the barriers (gabion forms), the use of planting and maintenance of clear visual links. It will be important that detailed design develops these spaces to continue to enhance the quality of this space at the cycle and walking path connections, as well in the under bridge areas on Kāpiti Road.

An extension of this design process is to Kāpiti Road itself where the current amenity is poor. The proposed Expressway and interchange design does not preclude the Council's development and improvement of Kāpiti Road amenity values, as it will continue to enable walking and cycling movements along the Road, with sufficient width to provide multiple lanes and accessibility to adjoining properties.

#### **6.2.4 Recreational Amenity**

The recreational amenity of the area is multi-faceted and its assessment addresses the effects on this amenity in terms of how the proposed Expressway has a direct impact on the venue for recreational activities. The Assessment of Social Effects identifies the range of recreational facilities and activities that occur and for each community identifies effects on reserves and recreation.

There are some locations where reserves are directly affected and this includes the small local purpose reserve north of Kāpiti Road off Makarini Street, and the Waikanae River corridor. More



widely the recreational activities that involve the use of the network of paths and streets are also considered.

In terms of the local reserves the effect of the proposed Expressway will be to prevent the current informal access through Makarini Street reserve to Te Roto Drive. A new connecting path from this reserve to Kāpiti Road is proposed as a new link, although it is less direct than the current informal path. In recreational terms of the reserve will continue to function for informal activities as no space is being subsumed. There is however, a risk that its location behind residential property with limited visibility from the street will generate unsafe space. This situation cannot be easily avoided or mitigated given the current arrangements of residential properties. The proposed pathway link will continue to enable connectivity through to Kāpiti Road from this residential area and it is expected that this will continue to enable passive surveillance of this space by users.

At the Waikanae River, there are very well used pathways which will continue as well as the new river bridge including a separate (attached) walking and cycling bridge which will enhance the crossing opportunities for recreational users. Overall, in terms of the circuits people can make, the network will be enhanced.

Also at the River, there are other recreational uses including swimming, fishing and boating which the proposed Expressway will not prevent from continuing. At the river and on other parts of the work there will be construction effects as sections need to be closed for use during parts of the construction period. These will be clearly signalled well in advance to allow users to make alternative arrangements where required.

In terms of the way the proposed Expressway affects the network for cycling, walking and horse riding it is noted and has been previously considered in this technical report that these modes provide both active recreational opportunities and access to community destinations (for example, schools or shops). In recreational terms, these modes use the existing road and other pathway networks within the District. The environment description in section 3 of this report describes these network use patterns, while the Social Impact Assessment describes the organisations and clubs that support these activities. Consultation with representatives of walking, cycling and horse riding groups has assisted the understanding of the commonly used networks and aspirations for its development and extension.

It is considered that there will be, in overall terms, positive effects for walking, cycling and horse riding recreational users from the construction of the proposed Expressway given that current formal networks are not only being retained but also significantly added to and connected by the development of the proposed shared cycleway/walkway along the proposed Expressway route which can also accommodate horse riders.

### 6.2.5 Proposed Expressway User Experience

The primary focus of the urban design assessment has been from the point of view of the local area and residents. However, there is also the amenity values that users of the proposed Expressway will experience that need to be considered. As a part of the national road network, the proposed Expressway will be used by thousands of people every day, including tourists, regional and local users.

#### a) Network

The appreciation of this experience and the aesthetic coherence will be related to the sections of the highway network that extend beyond just the subject section of the proposed Expressway. To this end, coordination has occurred between the designers of the other Roads of National Significance (RoNS) projects that make up the network in this part of the Wellington Region.

It has been determined that the sections of the network from north of Transmission Gully all have a similar context (a coastal plain) and that there is some logic to coordinating the designs of these three sections. This includes:

- highway furniture used (lights, barriers, signs etc)
- median width which will range between 4 and 6 metres and shoulder widths of 2.5 metre
- design speeds (110kmh) and geometry
- landscape treatment

In addition, consideration of the consistency in bridge design has also been given. It has been determined that there is no need for a design statement 'gateway' type structure as an entry to the region. The proposal is that the north part of the Wellington RoNS Expressway should be an experiential sequence that arises as the frequency of the bridges over or under increases the closer the highway moves towards Wellington. Within the MacKays to Peka Peka section, the design is largely for the proposed Expressway to go over the local roads and this is a consistent pattern until the north end where the land uses are more rural and the arrangement reverses so local roads bridge over the proposed Expressway.

The next section of the highway north of Peka Peka (Peka Peka to Otāki) would continue this local road over proposed Expressway arrangement which generates a coherent experience for the highway user. The arrangement responds to the rural environment context of the two projects (MacKays to Peka Peka north end and north to Otāki) rather than the arbitrary division at Peka Peka Road.

There has been urban design discussion regarding the potential to utilise a unified bridge design across these three coastal plain RoNS. However, for the reasons noted above there is no particular amenity value to be gained from this. In the MacKays to Peka Peka section, the proposed Expressway will largely bridge over local roads so that proposed Expressway users will not 'read' the

bridge forms beneath them except for whatever above road structures are required (for example concrete barriers). In the Peka Peka to Ōtaki section, the local road bridges are over and thus the proposed Expressway user will see the bridges; as long as these structures use a consistent design, there will be aesthetic coherence at speed. It is noted that the Otāki to Levin third section of this coastal plains RoNS is not in an advanced stage of design such that bridge design has been determined.

#### **b) Landscape**

The way in which the proposed Expressway fits into the landforms and the way areas changed by the proposed Expressway are treated will affect the user experience. This subject is given full consideration in the Landscape and Visual Assessment. There are opportunities to consider views beyond the proposed Expressway to the wider landscape to enhance the understanding and appreciation of the context through which the user is travelling. This is also the case for cyclists either on the proposed Expressway or shared cycleway/walkway.

### **6.3 Connectivity**

Connectivity in terms of this urban planning and design assessment means the functionality and quality of the physical connections between the multiple places people need to access for their use and enjoyment of the area.

As noted above earlier, the benefits to the community of having improved connectivity north south between the two population areas of Waikanae and Paraparaumu are described in the Transportation Assessment.

In summary, a current constraint to connectivity between these two centres is having just the one vehicle bridge over the Waikanae River. The additional connection that the proposed Expressway will provide across the river will significantly enhance the connectivity between these places, which share many facilities and community interactions. The value of this additional connection is enhanced by the location of an interchange on both sides of the river – one in Paraparaumu and one in Waikanae thereby allowing local use of the proposed Expressway for movement between the two centres.

It is also been noted previously in the assessment that, once the proposed Expressway is operational, the former SH1 can provide a lower traffic volume alternative for these movements between the two centres. This alternative may suit better drivers seeking a less fast paced driving environment which is a benefit to the choices available for older or less experienced drivers.

Within the local road networks all the existing east to west connections would remain, and all existing connections would remain.

An additional bridge is also proposed in the block between Kāpiti Road and Mazengarb Road to provide pedestrian and cycle connectivity. This block is one of the longest in the urban areas and an additional connection will benefit the movement of people from one side to the other. There is also a pedestrian and cycling bridge proposed near to Leinster Avenue to enable the cycle and walking movements that will be disconnected by the serving of Leinster Avenue from SH1 to continue.

Cycling and walking connectivity is being significantly enhanced through the provision of a shared path the length of the proposed Expressway, which is intended to extend south to Paekakariki from Raumati South. The shared path will connect to all local roads and to the two well used paths at Wharemauku Stream and Waikanae River. Connections to other path networks are also being provided for and the grades on embankments will be designed to enable the best practicable levels and include provision for horses. The catchments for primary schools are known and the cycleway/walkway is expected to add to the options for people moving to and from these schools.

There are challenges at the two interchanges for local area movements and connectivity across the local roads. At Kāpiti Road, which will be a busy interchange, traffic light signals will enable clear periods for crossing by pedestrians and cyclists and other active modes. Although busy, the design process has eliminated free turns onto and off the proposed Expressway making the crossing of the on and off ramps more predictable and controlled by the traffic lights. This significantly improves the safety and quality of the crossings for pedestrians and cyclists.

At the Te Moana Road interchange, it is proposed to use roundabouts to manage traffic flows to and from the proposed Expressway to the local road. These will be difficult crossings to make and will inhibit the connectivity along the local road. Te Moana Road is an important east-west road link as it is the only link between the Waikanae Beach area and the main body of Waikanae. It is well used by school children as there is no school at Waikanae Beach. It is also used by recreational and other users moving between the beach and lower river area and Waikanae township including horse riders. An improved arrangement at Te Moana Road for the interchange should be developed.

The need for any future additional connections across the proposed Expressway is addressed in relation to the future urban growth in the Waikanae North area part of this assessment.

Connectivity at the current town centres in Waikanae and Paraparaumu has been addressed in section 6.1 of this assessment and significant improvements are achievable given the down grading of the former highway route that currently bisects these centres.

## 7. Mitigation and Conditions

Many of the potential adverse effects in urban planning and design terms have been addressed through the design process. However, there remain two types of mitigation that could be applied by way of conditions on the proposed Expressway Designation. These are:

- Challenging elements in the proposed Expressway design that have yet to be fully resolved: in these situations, enough design work has been done to satisfy the Project team that there is an ability to resolve design issues in further stage of detailed design
- Where there are known adverse effects that will need some other form of mitigation because they cannot be avoided by further design or remedied by other means.

Set out below are the elements of the Project urban planning and design which will require conditions to address effects that have not been fully avoided, remedied or mitigated. These are not expressed here as precisely worded conditions, but are intended to provide direction to condition wording as part of the statutory processes:

1. The design of noise barrier forms and the detailed way in which the landforms behind these provide for their integration to the landscape and associated planting.
2. The specific positioning and arrangement for the way in which the bridge piers intersect with the local roads and the footpaths to ensure that no visual barriers to line of sight are created, and to provide for tidy connections to the ground surface or abutment slopes/edges.
3. The underbridge lighting should be designed by a lighting expert to both optimise the expression of the bridge forms and the safety and comfort of the underbridge space.
4. The bridge forms should accommodate any off road drainage and any other services, whether contained within the bridge deck or within the void space between the road safety barrier and the barrier external cover to retain the simple bridge forms.
5. The shape and form of the abutments where these are beneath the bridges and utilising precast panels with stone insert should explore the potential for a shapes curve of the form as it runs down to the pavement.
6. Anti-graffiti finishes should be used on all wall and surfaces that may be targeted by vandalism.
7. The design for the way in which the shared cycleway/walkway ties into local roads should ensure that crossings at these local roads are safe and that an appropriate line of sight is provided to allow for safe crossing - an alternative may be to conduct the cycleway/walkway across (attached to) proposed Expressway bridges.
8. The detailed design of the cycleway/walkway should be undertaken in conjunction with KCDC, making provision of an unformed width of grass of at least 1.5 m alongside for horse riding.
9. Local road bridges over the proposed Expressway should include a sufficient width of footpath on at least one side of 2 m width to allow for horses to cross, out of the flow of vehicle traffic.
10. During construction and as part of construction management plans (CEMP Appendix F and O, Volume 4) at least one side of the local roads and paths should continue to provide for safe and direct walking and cycling movements.

11. The design, implementation and maintenance of the shared cycle way/walkway through Queen Elizabeth Park will be undertaken by GWRC/KCDC with a contribution to construction costs from NZTA of no greater than the alternative route alongside Raumati Straight to MacKays Crossing from Poplar Avenue.
12. The design of the transitions and the space beneath the Waikanae River bridge will need to provide a ground surface that is suitable for walking and cycling activities and address the potential for dry and dusty conditions or wet conditions from flood events. Consideration should be given to using rock cobbles that have sufficient compaction to withstand smaller flood events and are set in a way that allows them to be comfortably walked over. Larger cobbles or rock can be applied to the normally dry and non-tracked areas beneath the bridge recognising the vegetation will not establish to any scale in this underbridge zone.
13. The design of the interchanges needs to be further developed to provide for the optimum pedestrian and cycle movements including:
  14. on and off ramp arrangements to provide direct crossing points on the desire line; and
  15. Potential need for of traffic light controls at Te Moana Road or an alternative round about design that reduces the complexity of walking and cycling cross movements on this local road.

## 8. References

Evans, B. and Faulkner, B. Assessment of Landscape and Visual Effects: Technical Report 7, Volume 3 of the MacKays to Peka Peka Expressway Project AEE.

Kirkby, C. Assessment of Operational Air Quality Effects: Technical Report 13, Volume 3 of the MacKays to Peka Peka Expressway Project AEE.

Meade Rose, J. Assessment of Social Effects: Technical Report 20, Volume 3 of the MacKays to Peka Peka Expressway Project AEE.