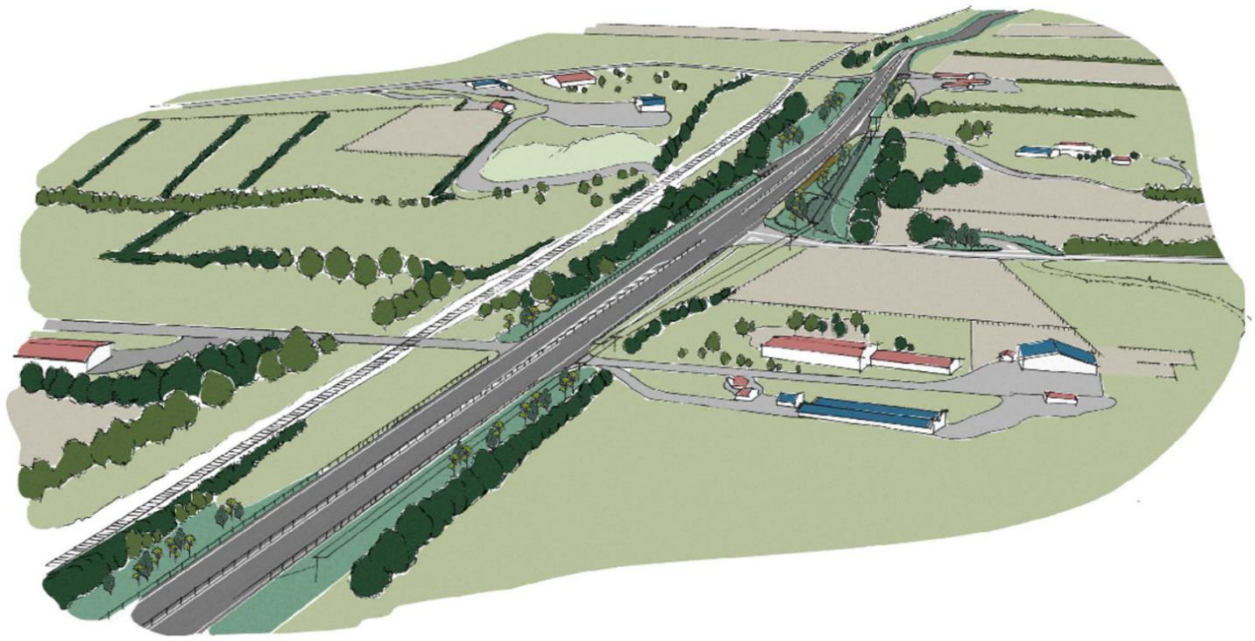
# State Highway 16 Brigham Creek to Waimauku Project

## Stage 1 works - Huapai to Waimauku

### Application for Resource Consent and Assessment of Environmental Effects

November 2019



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## VERIFICATION PROCESS

| | | |
|---|---|---|
| **Job Number** | SR 10033 / BECA 3412857 | Date: 27/11/2019 |
| **Project Phase** | Pre-Implementation | |
| **Project Name** | SH16 Stage 1 (Huapai to Waimauku) Safety Improvements | |

| | Name & Surname | Signature | Date |
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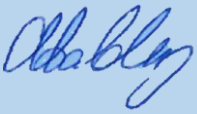
| Review: (Project Manager) | Craig Hatley |  | 27/11/2019 |
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# GLOSSARY OF TERMS

| ABBREVIATION | TERM |
|---|---|
| AADT | Average Annual Daily Traffic |
| AEE | Assessment of Environmental Effects |
| AT | Auckland Transport |
| AUP-OP | Auckland Unitary Plan- Operative in Part |
| CMP | Construction Management Plan |
| CNVMP | Construction Noise and Vibration Management Plan |
| CTMP | Construction Traffic Management |
| DSIs | Deaths and serious injuries |
| ESC | Erosion and sediment control |
| ESMP | Environmental and Social Management Plan |
| FSI | Fatal and serious incidents |
| HAIL | Hazardous Activities and Industries List |
| NES | National Environmental Standards for Contaminants in Soils to Protect Human Health |
| NoR | Notice of Requirement |
| ONRC | One Network Road Classification |
| PSI | Preliminary Site Investigation |
| RMA | Resource Management Act 1991 |
| RTB | Right turn bays |
| SH(#) | State Highway (number) |
| SRA | Safe Roads Alliance |
| SSBC | Single stage business case |

# 1. INTRODUCTION

This Assessment of Environmental Effects (AEE) has been prepared by Safe Roads Alliance (SRA) to support the Notice of Requirement (NoR), served by NZ Transport Agency pursuant to s168(2) of the Resource Management Act 1991 (RMA), to alter the State Highway 16 (SH16) designation.

The alteration to the designation is required in order to undertake Stage 1 (Section E) of the SH16 Brigham Creek to Waimauku Project. Stage 1 of the SH16 project (the Project) comprises safety improvement works between Huapai and Waimauku.

The AEE forms part of the NoR. The AEE also supports the required resource consents for the safety improvement works.

## 1.1 The NZ Transport Agency

The NZ Transport Agency (the Transport Agency) is a Crown entity with its objective, functions, powers and responsibilities set out in the Land Transport Management Act 2003 and the Government Roading Powers Act 1989. Its purpose is delivering great journeys to keep New Zealand moving. The Transport Agency is a requiring authority under s167(3) of the RMA.

The Transport Agency shapes New Zealand's transport networks and people's safe and efficient use of them. It connects families, helps businesses take goods to market, and helps others work, study and play.

The Transport Agency takes an integrated approach to transport planning, funding and delivery. This includes investment in public transport, walking, cycling, local roads and the construction and operation of State Highways. The Transport Agency must exhibit a sense of social and environmental responsibility when undertaking this work.

Improving safety on the roads is a priority for the Transport Agency. The Transport Agency's vision is a safe road system increasingly free of death and serious injury. The Safe System recognises that people make mistakes and are vulnerable in a crash. It aims reduce the outcomes of these crashes, in particular deaths and serious injuries.

The Transport Agency is working to achieve a safe road system through:

- Safe roads and roadsides – improving the level of safety built into our roads;
- Safe road use – alert users who stick to the road rules and look out for each other;
- Safe speeds – speeds that are right for each type of road; and
- Safe vehicles – choosing the safest vehicle you can afford.

## 1.2 Background

### 1.2.1 Safe Roads and Roadsides Programme

The Transport Agency has established a Safe Roads and Roadsides Programme to enable safety improvements to be made to over 90 high-risk rural state highways across New Zealand over 6 years. The improvements will be delivered as immediate, short term treatments to make roads more forgiving of human error, helping to reduce the occurrence of crashes, and limiting their severity when they do happen. The programme aims to reduce deaths and serious injuries (DSIs) on New Zealand roads by 900 over 10 years by making over 400 kilometres of rural roads safer.

The Safe Roads and Roads Programme is required because around 8 out of 10 fatal and serious crashes on state highways occur on rural roads and of those state highway crashes, 85 to 90% are run-off road, head-on and intersection crashes. The highest proportions of deaths and serious injuries on all New Zealand roads are caused by head-on and run-off-road crashes.

Each individual project that is part of the Safe Roads and Roadsides Programme is identified as a section of the rural state highway network that is high-risk due to crash history, traffic volumes and road safety rating. On the selected sites, a combination of the following short-term engineering treatments will be implemented:

- Side barriers;
- Median barriers;
- Rumble strips;
- Curve improvements; and/or
- Improved road markings and signs.

All of these treatments have been proven to reduce DSIs from head-on and run-off road crashes.

The Safe Roads and Roadsides Programme is being delivered by the Safe Roads Alliance (SRA), which is made up of the Transport Agency and consultants Beca, Bloxam Burnett & Olliver (BBO) and Northern Civil Consulting (NCC).

### 1.2.2 The Project

This Project involves the SH16 Brigham Creek to Waimauku corridor, which has been identified as one of the sections of rural state highway requiring the Safe Roads and Roadsides Programme. The works are required to retrofit the corridor with safety mechanisms specifically designed to reduce the incidents of deaths and serious injuries on this stretch of rural state highway.

The whole corridor extends from the end of the Auckland North-Western Motorway at the intersection (roundabout) of SH16, Brigham Creek Road and Fred Taylor Drive (Route Station/Route Position (RS/RP) 016-0019/0.000) through to the posted speed limit change (to 70km/hr) east of Waimauku (016-0019/9.892), a total distance of approximately 10km. The safety improvement works are focused on addressing safety issues on existing rural roads, which excludes works in townships. The project is focused on two distinct 'rural' parts of the SH16 Project corridor, which are separated by the Huapai-Kumeu townships. Works within the townships themselves are not part of this project.

**Project Sections**

During the Business Case process, the Project was divided into five sections, based on key characteristics, so a more detailed assessment of specific problems in each section could be undertaken. This allowed appropriate treatments and options to be developed and assessed. These are the following sections:

- Section A: From Brigham Creek roundabout through to Coatesville-Riverhead Highway intersection.
- Section B: The SH16 / Coatesville-Riverhead Highway intersection.
- Section C: From Coatesville-Riverhead Highway intersection through to Taupaki Road / Old North Road roundabout.
- Section D: From Taupaki Road / Old North Road roundabout through to Old Railway Road, east of Kumeu.
- Section E: From Trigg Road, west of Huapai to Factory Road, east of Waimauku.

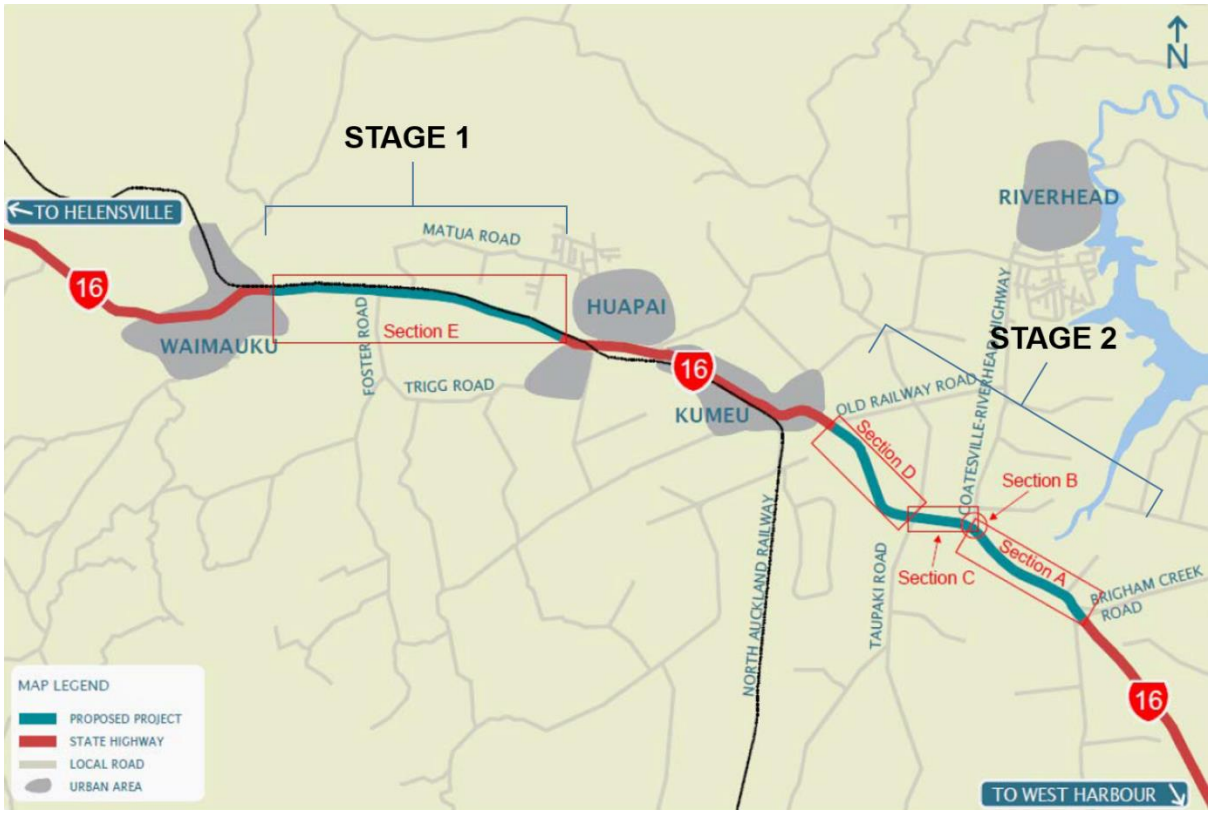


**Figure 1 Project Corridor (Transport Agency, 2017)**

The historic crash record for the wider corridor shows that there have been 21 fatal and serious incidents (FSI) crashes resulting in 34 DSI casualties (4 deaths and 30 serious) over the 2006-2015 period. The majority of these crashes were due to a loss of control, resulting in head-on or run off road crashes. It is considered that the unforgiving highway environment and poor geometry, combined with high traffic volumes, contribute to a high number of head-on and run-off FSI crashes. The SRA have designed safety improvements to reduce the probability of DSI's and improve the safety of the corridor.

The SH16: Brigham Creek to Waimauku safety and capacity improvements include road widening to four lanes and median barriers between Brigham Creek roundabout to Taupaki roundabout. A new roundabout is introduced at the Coatesville Riverhead Highway junction; the section between Taupaki roundabout and Old Railway will receive a 2.5m flush median.

Further northwest of Huapai, median barriers are introduced to the section between Trigg Road to Factory Road. Four turnaround facilities with right-turn bays will be provided in this section including at Factory Road, Foster Road and near Trigg Road.

Furthermore, the full length of the corridor will have widened shoulders between 1.5 to 2.0m wide, and side barriers will be located on both sides of the corridor at three locations. To accommodate the road widening, Brigham Creek culvert, Kumeu No. 2 bridge and Berry Bridge will be widened.

The proposed safety improvements are predicted to reduce overall DSIs by approximately 23.6 within 10 years (60%) whilst improving 5.5km (75%) of the corridor to a KiwiRAP[1] star rating of 3.5 star or above. The predicted Collective Risk for Stage 1 of the corridor reduces from High to Medium and the predicted Personal Risk reduces from Medium to Low.

[1] KiwiRAP is the New Zealand Road Assessment Programme. It is part of the International Road Assessment Programme, otherwise known as iRAP, which a not-for-profit organisation working in partnership with government and non-government organisations in 60 countries to investigate road networks. The key objective of KiwiRAP is to reduce deaths and injuries on New Zealand's roads by systematically assessing risk and identifying safety shortcomings that can be addressed with practical road improvement measures.

**Project Stages**

During Pre-implementation, the corridor has also been divided into two delivery stages; Stage 1 (Section E) and Stage 2 (Section A-D) (see Figure 1 above). Section E was identified through the business case as a standalone section that could be isolated from the remainder of the works. Less land acquisition was required in this section and it is a predominantly rural segment.

## 1.3 Stage 1 (Section E) Works

This application applies specifically to Stage 1 works of the SH16 project, between Trigg Road (west of Huapai), to Factory Road (east of Kumeu). It requires construction of safety improvement works to upgrade the existing State highway. The Project includes Section E (described above) and will be undertaken to provide immediate safety improvements to the corridor. A separate application and notice of requirement will be lodged for Stage 2.

Full details of the proposed works are presented in the General Arrangement Drawings (Appendix B) and Section 4 of this report (Project Proposal).

## 1.4 Assessment Methodology

This AEE includes an assessment of the relevant provisions of the following Acts and documents:

- Resource Management Act 1991;
- National Environmental Standard (NES) for Assessing and Managing Contaminants in Soil to Protect Human Health; and
- Auckland Unitary Plan: Operative in Part (AUP-OP).

# 2. STATUTORY AND CONSENTING REQUIREMENTS

In this section, the relevant statutory matters for consent are set out. The assessment of the Project in relation to these matters is provided in Section 8.

## 2.1 Notice of Requirement

### 2.1.1 Designation 6766

This AEE supports the NoR for an alternation to the existing Designation 6766 in the Auckland Unitary Plan – Operative in Part (AUP:OP), which extends over SH16 from Brigham Creek, Hobsonville to SH1 Wellsford (see Figure 2). The designated purpose is "State Highway 16" and there are no conditions nor lapse date on the existing designation.

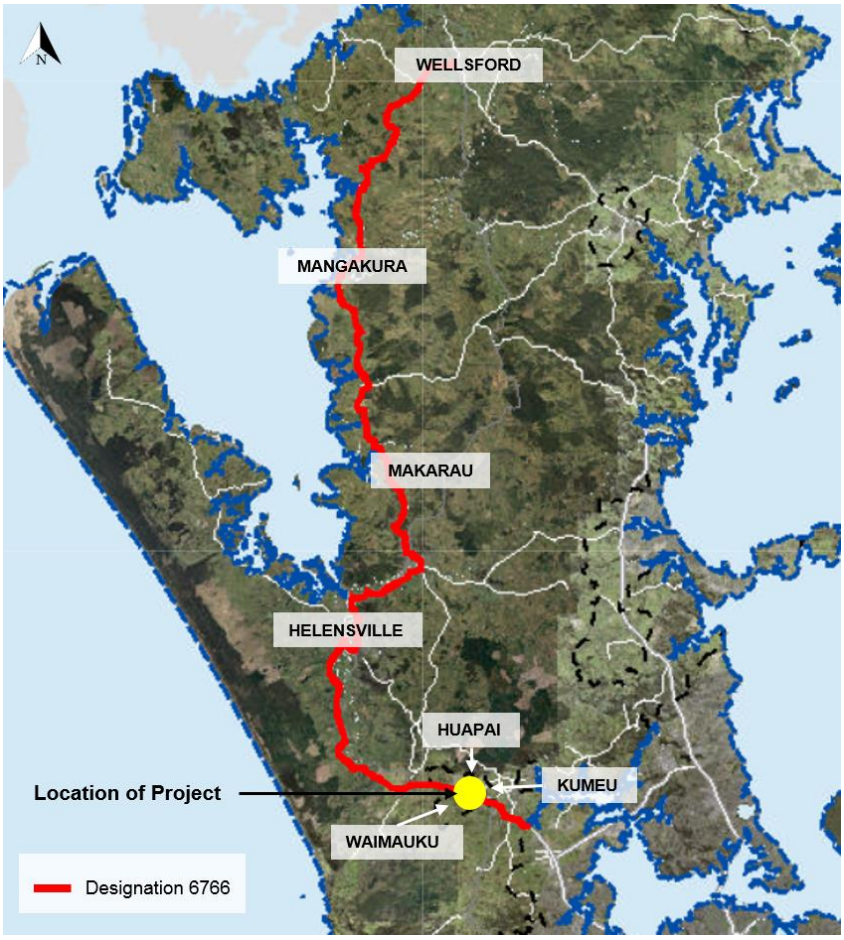


**Figure 2 Designation 6766 (red) (Source: Auckland Council GeoMaps, 2018)**

In order to undertake the proposed works the Transport Agency is seeking to alter Designation 6766 in accordance with Section 181 of the RMA.

To accommodate both temporary construction works and the permanent operational components of the Project, approximately 9239m² of land alongside the existing SH1 corridor is required to be included in Designation 6766. The Land Requirement Plans (Appendix C) detail the location of the proposed alterations and the specific property details.

### 2.1.2 RMA Section 181 - Alteration to Designation

In accordance with Section 181(1) of the RMA the Transport Agency as the requiring authority can give notice to Auckland Council (as the territorial authority) of its requirement to alter the designation.

Under Section 181(2), alterations are subject to Sections 168 to 179 and treated as a new designation unless the criteria set out in Section 181(3) can be met. This NoR has not been made under 181(3) as 181(3)(b) requires approval of directly affected landowners. Engagement with the directly affected landowners is ongoing. Therefore, in accordance with 181(2) this application is a new application and is subject to Section 168 to 179.

## 2.2 Resource Consents

This AEE also supports resource consent applications required for the construction, operation and maintenance of the Project.

Regional resource consents are required pursuant to the Auckland Unitary Plan – Operative in Part (AUP-OP). Resource consent is also required under the National Environmental Standards for Contaminants in Soils to Protect Human Health (NESCS).

The following table lists the identified resource consents required and sought by the applicant, in order to construct, operate and maintain the Project.

**Table 1 Resource Consents Required**

| CONSENT | PLAN REF | STATUS | COMMENT |
|---|---|---|---|
| **E8 Stormwater – Discharge and diversion** | | | |
| Diversion and discharge of stormwater runoff from impervious areas of road | E8.4.1(A10) | Discretionary | The total impervious area of road is increased by 22% to a total of approximately 52,534m²; stormwater will be discharged from this new area to a suite of stormwater management infrastructure including planted swales and proprietary treatment devices (Stormwater360 Stormfilters). |
| **E9 Stormwater quality – high use roads** | | | |
| Development of a new or redevelopment of an existing high use road greater than 5,000m2 | E9.4.1 (A7) | Controlled | The total impervious area of road is increased by 22% to a total of approximately 5,234m²; stormwater will be discharged from this new area to a suite of stormwater management infrastructure including planted swales and proprietary treatment devices (Stormwater360 Stormfilters) which meet the relevant standards and are in accordance with Auckland Councils Technical Publication 10: Design Guideline Manual for Stormwater Treatment Devices (2003) |
| **E10 Stormwater management area – Flow 1 and Flow 2** | | | |
| Development of new or redevelopment of existing | E10.4.1(A7) | Restricted Discretionary | Hydrology mitigation is provided by a bio retention |

| | | | |
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| impervious areas greater than 5,000m² for a road, motorway or state highway operated by a road controlling authority or rail corridor within Stormwater management area control – Flow 1 or Stormwater management area control – Flow 2 that complies with Standard E10.6.1 and Standard E10.6.4.2 | | | device in the SMAF area, however does not meet the standards in E10.6.3.1.1 |
| **E26 Infrastructure** | | | |
| Underground gas transmission pipelines at a gauge pressure exceeding 2000 kilopascals including any aerial crossings of streams or other low lying areas using bridges or any other structures, and ancillary underground equipment and fittings | E26.2.3.1(A30) | Discretionary | The underground gas transmission pipelines at a gauge pressure exceeding 2000 kilopascals do not meet standard E26.2.5.3(1)(a)(ii) at two locations along the corridor. The IP20 and MP4 gas pipes run longitudinally along the road edge and will require relocation. The pipes will be relocated to more than 5m from the existing alignment at Joyce Adams Place (approx. chainage 199460 to 199690) and between Matua Road and Foster Road (approx. chainage 198400 to 198760). |
| Earthworks greater than 2,500m² where the land has a slope equal to or greater than 10 degrees other than for maintenance, repair, renewal, minor infrastructure upgrading | E26.5.3.2(A106) | Restricted Discretionary | Earthworks of approximately 80,000m² are proposed in the area with a slope greater than 10 degrees. |
| Earthworks greater than 2,500m² within the Sediment Control Protection Area other than for maintenance, repair, renewal, minor infrastructure upgrading | E26.5.3.2(A107) | Restricted Discretionary | Earthworks greater than 2,500m² are proposed within the Sediment Control Protection Area associated with Berry Bridge and Kumeu No 2 bridges. |
| **NES for Assessing and Managing Contaminants in Soil** | | | |
| Soil disturbance within identified HAIL sites | Regulation 11(1) of the NESCS | Discretionary | The duration of construction works in HAIL sites will be longer than 2 months and a DSI has not been prepared |

### 2.2.1 Permitted Activities

The following permitted activity standards from the AUP have been identified as achievable and therefore resource consent is not required.

| CONSENT | PLAN REF | STATUS | COMMENT |
|---|---|---|---|
| **E3 Lakes, rivers, streams and wetlands** | | | |
| Replacement, upgrading or extension of existing structures complying with the standards in E3.6.1.1; E3.6.1.10; and E3.6.1.12 (bridges, riprap and culverts) | E3.4.1(A23) | Permitted | The replacement, upgrading or extension of existing bridges, meets the following standards:<br>E3.6.1.1:<br>- There will be no effects on receiving waters because best practice erosion and sediment control measures will be implemented in accordance with Auckland Council<br>Guidance Document: Erosion and Sediment Control (GD05, 2016).<br>- The bridge widening will not increase existing flood levels.<br>- The bridge widening will not result in erosion or land instability.<br>- There will be no machinery within the wetted cross section of the bed.<br>- No explosives will be used in the bed.<br>- Best site management practices in accordance with GD05 will ensure there is no mixing of construction materials, refuelling or equipment maintenance within 10m of the bed.<br>- The area of works is not located within the Historic Heritage Overlay or the Sites and Places of Significance to Mana Whenua Overlay.<br>- The works will not permanently prevent public access to the watercourse.<br><br>E3.6.1.10:<br>-Temporary construction works will generate limited bed disturbance which will be contained within 10m of each side of the existing bridges.<br>-Best practice erosion and sediment control measures will be implemented in accordance with GD05.<br>- No debris or material will be deposited in the bed of a lake, river or stream. |

| | | | |
|---|---|---|---|
| | | | - No changes will be made to the bridge structures at the bed level.<br>- The structural integrity of each bridge will not be compromised.<br><br>E3.6.1.12:<br>All standards are met:<br>- The total width of Kumeu No.2 bridge after extension is approximately 20.5 (existing bridge is 15m). The total widened width of Berry's bridge is 17.2m (existing bridge is 8.4m). The total length of extended structures does not exceed 30m when measured parallel to the direction of water flow.<br>-The erosion and scour management works at Kumeu No.2 bridge are approximately 3m in length, and therefore do not exceed 5m permitted standard.<br>-The contractor will be required to remove construction material and all structures at completion of the works.<br>-The changes proposed to both bridges replicate the existing structural form; there is no new obstruction to fish passage.<br>-Temporary piles in the watercourse are not anticipated to affect fish passage.<br><br>The proposed riprap meets the permitted activity standard in E3.6.1.12.(2)(b) as the total required erosion or scour management works at Kumeu No.2 bridge is less than 5m in length.<br><br>The total length of extended culverts will not exceed 30m in length. Refer to Section 4.1.6 of this report for a summary of the culverts. |
| **E4 Other discharges of contaminants** | | | |
| Discharge of water and/or contaminants (including washwater) onto or into land and/or into water from any of the following:<br>(a) cleaning, maintenance and preparation of | E4.4.1(A11) | Permitted | All discharges (includes washwater) associated with the hydro demolition of the bridges will be contained and not discharged onto or into land or water by adopting erosion and sediment control practices in accordance with GD05 guidelines. The measures will be implemented on a case-by-case situation, which will be detailed in site specific plans. |

| | | | |
|---|---|---|---|
| surfaces of buildings, and associated structures;<br>(b) construction, repair, maintenance, upgrade or removal of network utility infrastructure; or<br>(c) construction, repair, maintenance, upgrade or removal of any component of the stormwater or wastewater network | | | Use of coffer dams, sheet piling or silt curtains may be required. |

## 2.3 Outline Plan Waiver

The physical works for the project will provide for the ongoing operation and safety of the State highway at this location. Section 3 of this report includes a level of information that meets the requirements of s.176A(2)(b) of the RMA and therefore no further submission of an Outline Plan is considered necessary.

# 3. EXISTING ENVIRONMENT

## 3.1 The Project Site

This application for Stage 1 works applies only to Section E, from Trigg Road, west of Huapai to Factory Road, east of Waimauku (see Figure 3). The route provides an important link between the two communities, connecting services and facilities and employment centres. Safety improvement works will take place within Designation 6766 and over private land where an alteration to the designation is proposed (see Land Requirement Plans, Appendix C).

Section E includes 3.6km of existing Strategic Transport Corridor (as zoned in the AUP:OP), over an area of approximately 92,000m$^2$. The area of the proposed alteration to the designation (temporary and permanent) within Section E consists of rolling countryside including rural lifestyle blocks with some pastoral land, orchards and commercial operations. The KiwiRail North Auckland Line (NAL) Rail borders the northern side of SH16 (Designation 6300).

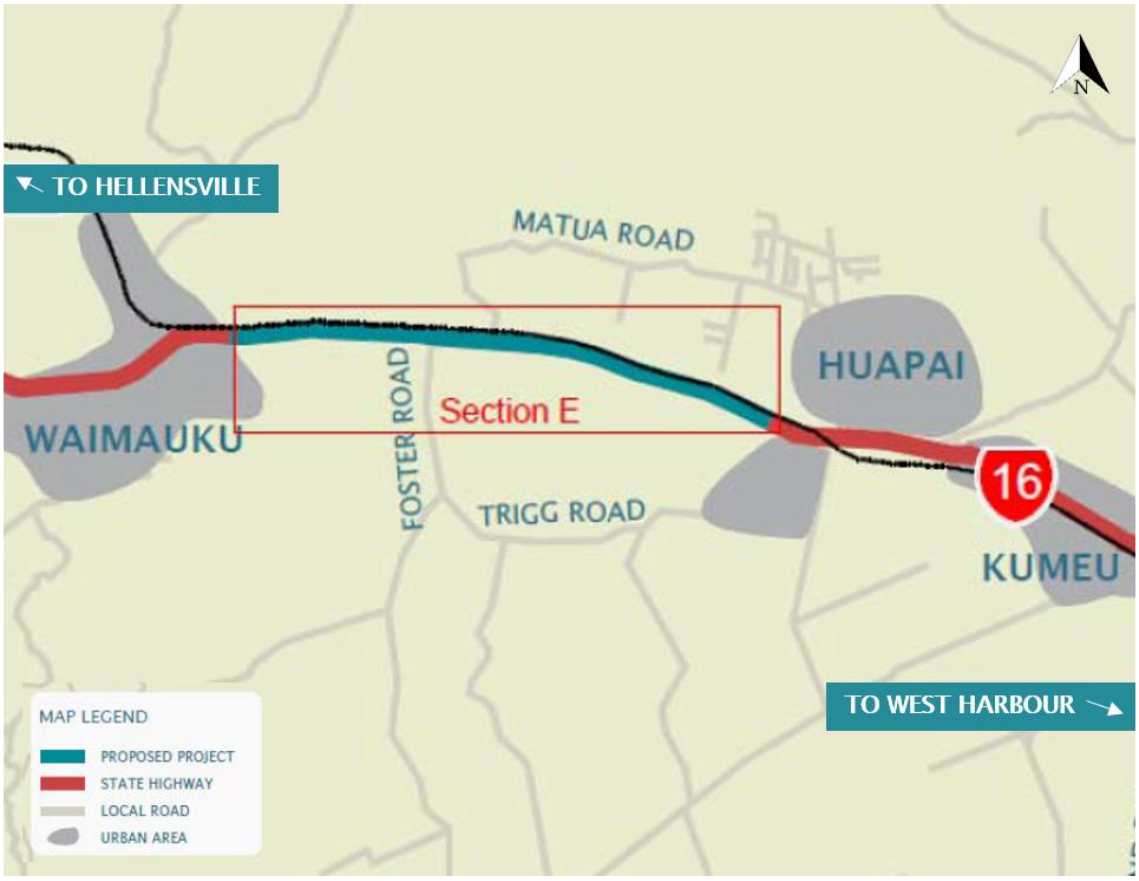


**Figure 3 Project Corridor (Transport Agency, 2017)**

The underlying geology of the length of the Project is made up of Tauranga Group Holocene soils (alluvium/colluvium, estuarine, lacustrine, fan and swamp deposits) and Late Pleistocene soils (alluvium/colluvium and fan deposits). This soil type is free draining.

The Project corridor itself is narrow and flanked with established large exotic trees, hedgerows and pockets of native plantings typically located at stream crossing points.

The posted speed limit change along the corridor is from 60km/h west of Huapai Township through to 100km/h after Trigg Road, then changes to 70km/h east of Wintour Road.

### 3.1.1 Relevant Zones and Overlays

The AUP-OP Map (refer to Figure 4) shows the majority of the proposed road improvement works will take place within Designation 6766 which has an underlying zone of Strategic Transport Corridor. Work outside the designation and Strategic Transport Corridor will be undertaken in land zoned Mixed Rural Zone, Future Urban Zone, Residential – Single House Zone and Open Space – Sport and Active Recreation Zone.

The Project Site is also within a High Use Stream Management Area Overlay and High-Use Aquifer Management Area Overlay (both over entire area of works), and a Stormwater Management Area Control – Flow 1.

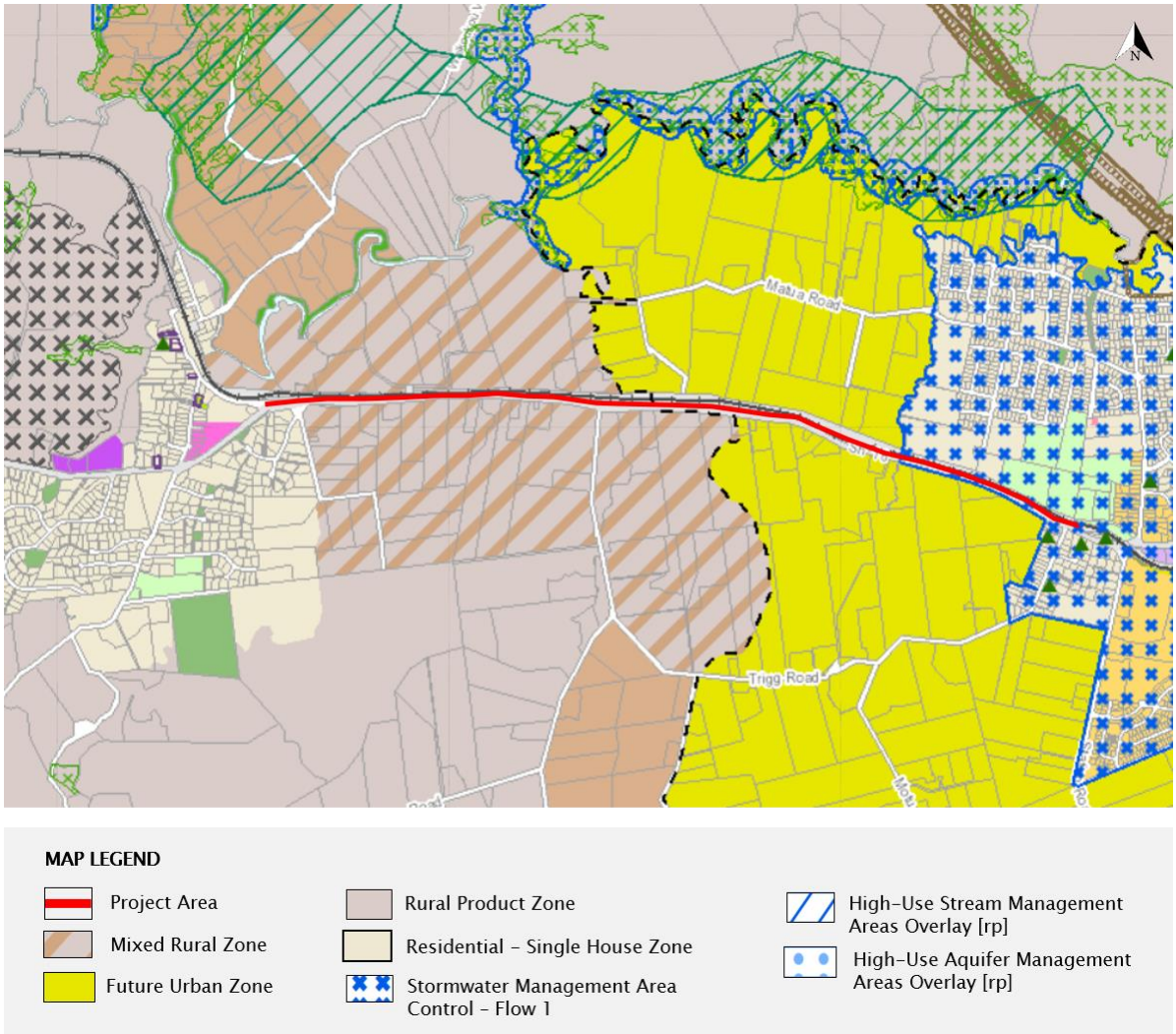


**Figure 4 AUP-OP Zoning and Overlay Map of the Project (Source: Auckland Council GeoMaps)**

### 3.1.2 Catchment Description

The Project traverses the Kumeu Huapai catchment, which drains to the Kumeu River and into the Kaipara Harbour. The total catchment area upstream of the Project is approximately 89km$^2$.

The existing stormwater management along the corridor consists of gravel/rock/lined channels, dirt or grass swales with minimal catchpit, manhole and pipe drainage systems. Culverts are located throughout the alignment to transport the road surface and external catchment runoff to downstream overland flow paths, directly to pastoral land or water bodies for final discharge. All runoff passes through the railway line on the downstream side

of the Highway which acts as a throttle on flows further downstream. No formal stormwater quality treatment is currently provided within the existing project corridor.

A detailed description of the catchments is provided in the Stormwater Report (Appendix D).

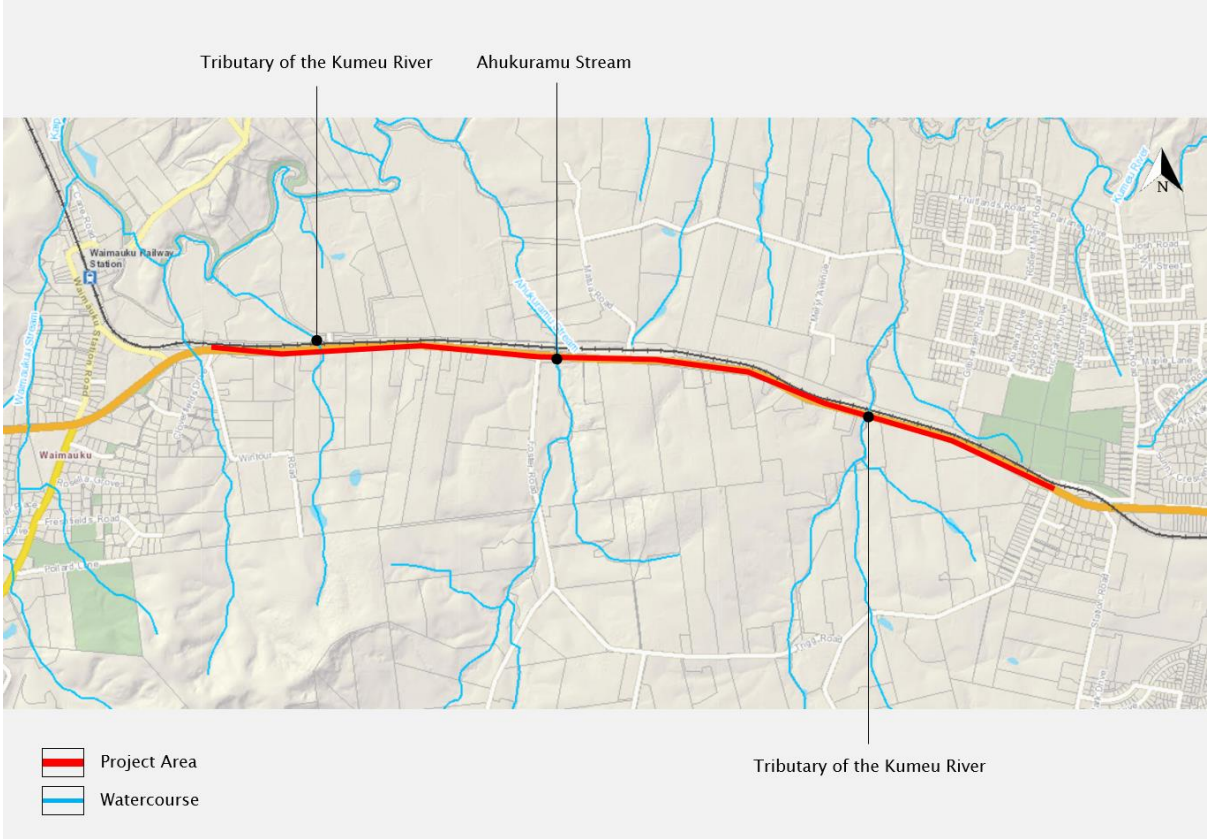


**Figure 5 Watercourses within the Project area (Source: Auckland Council Geomaps)**

### 3.1.3 Archaeological and Built Heritage

A Preliminary Archaeological Assessment of the Project was prepared by Clough & Associates Ltd. and is attached in Appendix E.

The Preliminary Archaeological Assessment (Appendix E) has identified that it is unlikely for archaeological remains to be exposed during development as there are no historic or archaeological sites located within the proposed area of works.

There are no recorded archaeological sites of Māori origin identified within the project corridor. A Cultural Values Assessment (see Appendix F) identifies the core values of mana whenua and how they can be considered and incorporated into the design and construction of the Project. Refer to Appendix F for the full report including recommendations.

### 3.1.4 Contaminated Land

The Preliminary Environmental Site Investigation (Contaminated Land) (refer to Appendix G) identifies that there are HAIL activities, which have potentially contaminated sites within and along the Project corridor. These are associated with past or present horticultural and commercial activities such as orchards and vineyards including barns/sheds identified to be potentially contaminated sites within proximity of the safety improvement works. The key contaminants associated with these activities include heavy metals, acidic herbicides, organochlorines and organophosphates, which have potentially contaminated the following sites:

- 6 Joyce Adams Place
- 529-751 SH16
- 32 Meryl Avenue
- 307 Matua Road
- 726 SH16

Further details are included in the Preliminary Environmental Site Investigation in Appendix G.

## 3.2 Surrounding Environment

The Project works are bordered by two communities (see Figure 6). Waimauku is situated west of the corridor and is a growing township with an increasing suburban/lifestyle block population. The local centre contains a range of small businesses as well as Waimauku Primary School. Huapai is a larger community bordering the east of the project extent. The town is a key part of the wider Kumeu wine growing industry and contains a range of community facilities including a local fire station, church, preschool and primary school.

Access to the businesses and facilities at both towns are heavily reliant on SH16. Public transport is available via the 125 bus line which provides connections north to Helensville and south towards Massey. The KiwiRail North Auckland Line (NAL) railway line borders the northern side of SH16.


**Figure 6 Surrounding environment of the proposed works (Auckland Council GeoMaps, 2018)**

This section of the SH16 corridor is located within the North West future growth areas of the Supporting Growth Programme, which look to deliver future transport networks over the next 30 years. The works being proposed as part of the Safe Roads SH16 Project are focused on addressing existing safety concerns on the corridor, ahead of longer-term plans under development by Supporting Growth.

# 4. PROJECT PROPOSAL

This section describes the physical works of the proposed safety improvements, and the anticipated construction activities.

In summary, the proposed safety works include:

- Widening of the corridor to accommodate a 1.5m flush median and 1.5 to 2m shoulder widening;
- Right-turn bays for turnarounds and at intersections;
- Turnarounds;
- Wire rope safety barriers through the median and combination of wire rope safety barriers and guardrails at three selected locations;
- Bridge widening at Kumeu No.2 and Berry Bridge;
- Stormwater box culvert extension;
- Retaining walls;
- Landscaping areas on both sides of the corridor; and
- Stormwater network improvements.

Appendix B includes the General Arrangement Plans for the proposed works which shows these works.

## 4.1 Permanent Works

### 4.1.1 Pavement Widening

The full length of the Section E corridor will be widened to provide for the following lane rearrangements:

- 3.5m lane width;
- 1.5m median width; and
- 1.5 to 2m shoulder widths.

This will provide sufficient space for the wire median barriers and shoulders to accommodate passing, turning or stationary vehicles.

Shoulder widening will assist to lower the current run-off road risk by providing additional space for driver recovery. It will provide resilience to the corridor by allowing distressed vehicles to stop off the carriageway and therefore minimise the distribution to through-traffic. The 1.5m to 2m road shoulders will provide improved safety for cyclists along SH16.

### 4.1.2 Median Treatments

**Flexible Wire Rope Median Barriers**

Approximately 2.8km of flexible wire rope median barriers will be installed down the centre of the highway. Medium barriers are a very effective prevention of head-on crashes and reducing the risk of head-on crashes.

Where the barriers are installed (see General Arrangement Plans, Appendix B) the highway will have a total width of approximately 12.5m:

- 1.5m centreline with barrier;
- 3.5m lanes; and
- 1.5m to 2m shoulders with side barriers.

### 4.1.3 Side Barriers

Most of the corridor has side barriers installed already; where pavement widening is required the side barriers will be replaced (approximately 2.4km). Roadside barriers help to

reduce the severity of run-off road crashes. For location details, see the General Arrangement Plans (Appendix B).

### 4.1.4 Right Turn Bays

To minimise high severity intersection crashes, the mid-barrier is continued through as many intersections as is practicable. Right turn bays will be provided at seven locations along the corridor to provide a break opposite minor side-roads and turnaround facilities with higher volumes of turning traffic (see General Arrangement Plans in Appendix B). This will create a safe delineated area for turning traffic.

### 4.1.5 Turnarounds

The installation of median-barriers will restrict drivers from making a right-hand turn from private properties across the highway. Therefore, four turnaround facilities will be constructed. They will be located at:

- Trigg Road;
- Coopers Creek Vineyard;
- Matua Road; and
- Foster Road.

The turnarounds will be installed approximately every 1.5km or less to allow drivers to turnaround and travel in the opposite direction. The design and location of the turnarounds was based on both the Safe Roads Safety Toolkit (which is a design guidance document) and in conjunction with stakeholder feedback and consultation with landowners along the corridor.

Where there is insufficient space within the existing designation to provide for the turnaround areas, the designation has been altered to accommodate these. Figure 7 illustrates the typical arrangement of turnaround facilities anticipated to be installed along SH16.


**Figure 7 Turnarounds and Right Turn Bays example (Source: Safe Roads Alliance)**

### 4.1.6 Stormwater

**Stormwater treatment**

The new stormwater drainage design for the Project proposes to treat all new impervious road surface from road widening and as much as practicable from existing surfaces.

Stormwater runoff generated from the high use road surface will be collected and treated before discharged by using a combination of natural and proprietary treatment devices proposed along the corridor. Natural stormwater systems such as swales are proposed where there is sufficient land available to meet the required catchment areas of >4 Ha. Alternatively, wetland swales are proposed where land acquisition opportunities are more restricted as well as some proprietary treatment devices such as cartridge filter units.

See the Stormwater Report (Appendix D) for further details regarding the proposed stormwater design.

## SMAF Requirements – Retention and Detention

The Auckland Unitary Plan Stormwater Management Area Flow 1 (SMAF 1) Overlay applies to approximately 780m of the road corridor within the Kumeu Huapai township catchment (approximately Ch. 197400 to 196555). To cater for the required SMAF1 retention and detention volumes, it is proposed that the road run-off is collected by a pipe network and discharge into a retention swale located on the westbound side of the road (approximately Ch. 197200 to 197400).

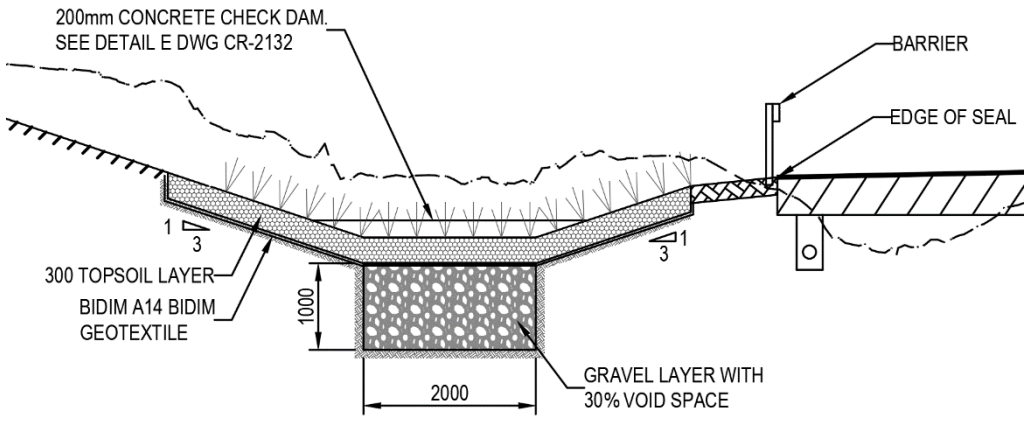


**Figure 8 Proposed bioretention swale section (Modified, source: GD01)**

## Culverts

There are existing culverts throughout the Project Corridor. Where road widening will occur, culverts will be extended to suit the proposed road geometry as required, approximately 0.5m to a maximum of 15m. The total length of the extended culverts will not exceed 30m in length for all culverts throughout the corridor, except for one culvert located at the proposed Foster Road turnaround (CH198760). The existing culvert is used to convey overland flow and will be extended to a total length of 31.23m. The culvert is not channelling a stream. Table 2 provides a summary of the proposed extensions to existing culverts:

**Table 2 Proposed culvert extensions**

| Chainage | Existing Length (m) | Extension Length (m) | Total Length (m) |
|---|---|---|---|
| 196750 | 19.64 | 2.19 | 21.83 |
| 196910 | 22.1 | 0 | same |

| | | | |
|---|---|---|---|
| 197550 | 33.9 | 0 | same |
| 197780 | 42 | 0 | same |
| 198050 | 17.84 | 1.2 | 19.04 |
| 198140 | 39.56 | 0 | same |
| 198220 | 25.5 | 0.54 | 26.04 |
| 198330 | 21.16 | 0 | same |
| 198760 | 12.42 | 18.99 | 31.23 |
| 199220 | 16.01 | 0 | same |
| 199580 | 15.1 | 5.99 | 20.09 |
| 199710 | 24.07 | 0 | same |
| 200080 | 35.93 | 0 | same |

The locations of the culverts are identified in the General Arrangement Plans included in Appendix B. Further information is also provided in Appendix D – Stormwater Report.

### 4.1.7 Landscaping

Landscaping is proposed to mitigate the effect of the required tree removal as part of the proposed works. The planting philosophy is to tie the highway landscape into the surrounding landscape through vegetation patterns and use of species that complement the rural character of the area.

The key landscape features are:

- Removal of existing exotic species and replacement with eco-sourced native vegetation that is appropriate to the area.
- Riparian planting at Coopers Creek and Ahukuramu Stream edges to enhance stream habitat.
- Planted swales, which will also be part of the stormwater treatment process. This eliminates the need for mowing maintenance behind the barriers.
- Trees will be planted on cut and fill batter slopes. Species will be selected to integrate with the existing trees in each area.

Further details are provided in Appendix H Landscape Design.

### 4.1.8 Bridge Works

The works include widening of the existing Kumeu No 2 and Berry bridges. The general arrangement plans demonstrate the locations, area of works, bridge widening methodology, and sizes of the bridges (Appendix B).

The streams are both tributaries of the Kaipara River that flow northward toward the Kawau Parua Inlet. Both bridge catchments are located in the upper half of the Kaipara River catchment.

Following the works, the Kumeu No 2 Bridge will increase in size from 15m to 20.5m in width. The new bridge beams will be supported on new abutments following the edge of the stream. No piles will be required in the stream, but piles are required at the abutment.

The edge of existing bridge wall and deck will be demolished by hydro demolition and re-built with the new part of the structure. Water and debris run off and noise resulting from the hydro demolition will be managed through implementation of an Environmental and Social Management Plan (ESMP) during construction.

Construction in the channel will be limited to scour mitigation works which will include excavation of the channel and placement of a block wall and riprap. The block wall will extend along the width of the extended bridge and 4m along the western retaining wall and 1m along the eastern retaining wall. The riprap will protrude as far as 5m upstream of the footprint of the new bridge. The channel will be excavated to minimise changes to the channel cross section after placing of the new scour protection.

Berry Bridge will increase in width from 8.6m to 17.2m on the downstream side. The new substructure will be constructed in line with the existing structure. The existing barrier and wall on the northern edge of the bridge will be demolished to allow the new extension of the structure to be constructed. Each abutment and pier extension will comprise reinforced concrete bored piles supporting a reinforced concrete capping beam with an integral abutment or pier wall. No scour mitigation work will be carried out at Berry Bridge as part of this package of work. The design of the bridge extension will allow for the effects of scour in the design of the structural elements.

## 4.2 Construction Methodology

Construction of the Project (Section E) is divided into 2 separable portions. The proposed separable portions are included in Table 3 below. The proposed starting date for construction is March 2020, and works are expected to be complete by March 2022.

**Table 3 Constructing staging for Section E**

| PHASES | DESCRIPTION | START | FINISH |
|---|---|---|---|
| 1 | North Side (KiwiRail) Construction | March 2020 | March 2021 |
| 2 | South Side (Residential) Construction | March 2021 | March 2022 |

### 4.2.1 Construction Programme

Construction works are proposed to be undertaken during the day and at night-time across the entire Project. Night-time works may include constructing bridge works and other on-line works such as median barriers and road resurfacing.

The construction methodology will be finalised once a contractor has been appointed and may be adapted depending on the specific approach adopted by the contractor. The Assessment of Effects (AEE) set out in Section 8 of this report is broad enough to address the effects from various construction methodologies and contains appropriate methods to manage environmental effects.

A Construction Management Plan (CMP) further detailing the proposed methodology and sequencing will be completed by the contractor, prior to the commencement of works.

The CMP will include a Traffic Management Plan (CTMP), which will set out specific details of construction traffic management. The Contractor will aim to keep two lanes of traffic available at all times. When works require lane closures, it will, where possible, take place at night or during off-peak hours. All other traffic management will be in accordance with the Transport Agency Code for Practice for Temporary Traffic Management (CoPTTM).

The key construction activities associated with the proposed works are summarised as follows:

- Traffic management;
- Implementation of environmental controls;
- Site clearance and tree removals;
- Utilities services diversions;
- General earthworks;
- Bridge construction and culvert extension works;
- Retaining wall construction;
- Pavement widening and surfacing;
- Barrier installations;
- Street lighting installations;
- Road-marking and signage installation; and
- Landscaping.

### 4.2.2 Construction Areas

Temporary construction areas will provide off-line access and construction space for construction of the Project including pavement widening, installing stormwater treatment devices, bridge widening and/or constructing retaining walls. These are provided within the designation where possible, however the alteration to the designation includes allowance for these temporary construction areas where there is insufficient land available within the existing designation (see the General Arrangement Plans (Appendix B) for the proposed locations (alterations to designation)).

All local roads will remain open and access to private property will be managed directly with the landowners.

The Project works will include a temporary construction yard at Factory Road, which is zoned Strategic Transport Zone and/or Road. The Factory Road site has two designations 6300 (KiwiRail) and 6766 (NZTA). However, the area proposed to be used for the construction yard is entirely owned by the Transport Agency. The site will be used for temporary site offices, toilets, storage of materials and machinery.

As discussed above, the construction objectives seek to minimise risk to construction workers and the public to reduce the potential for conflict. The provision of off-line construction areas facilitates construction within a safe working area whilst maintaining live traffic lanes in each direction on SH16.

### 4.2.3 Earthworks

Earthworks will be required to remove the existing highway shoulder and obtain the desired grade for the widened highway corridor followed by hardfill placement and stabilisation. In general, most earthworks are programmed to be completed section by section. Overall the project earthworks will require approximately 5711m³ cut and approximately 7934m³ of fill across a total area of approximately 76,677m². Earthworks cut to waste operations are relatively minor and no large areas of clearing or earthworks will be exposed at any one time. Material imported to the site for the purposes of filling and landscaping will be certified cleanfill. A Preliminary Site Investigation (Contaminated Land) report (PSI) was undertaken for the corridor and identified some potentially contaminating sites within and along the Project extent. These activities are predominantly associated with horticulture and the potential use of pesticide application. Contaminant concentrations of these areas are unknown as no sampling has been undertaken in locations of potential soil disturbance due to the inability to sample soils because of land access restrictions. Soil sampling will likely be undertaken during construction and the results will assist the contractor with onsite management and disposal of these soils on a case by case basis.

All soils will be reused on the site in which they are disturbed. Soils from contaminated sites will not be spread elsewhere throughout the alignment construction unless testing has identified the material to be clean fill. Excess cut from contaminated sites will be temporarily stockpiled, loaded onto trucks and disposed of to a facility licenced to accept such waste unless the necessary regulatory consents are sought, and procedures followed.

The contractor will ensure that records are kept of all excavations and soil movement from identified contaminated sites.

### 4.2.4 Erosion and Sediment Control Measures

Erosion and sediment control (ESC) measures will be implemented prior to the commencement of construction activity and carried out during the construction period in accordance with the Erosion Sediment Control Principles and Practices set out in Appendix I.

These measures are in general accordance with Auckland Council's Guidance Document Erosion and Sediment Control (GD05, 2016), which is currently recognised as industry best practice for ESC. They include the following erosion and sediment controls:

**Erosion Controls**

- Timing of earthworks;
- Management of site access points;
- Minimising exposed areas;
- Limiting site length;
- Stabilisation and Reinstatement;
- Dust Control;
- Management and minimisation of stock piling; and
- Watercourse protection.

**Sediment Controls**

- Clean water diversion;
- Slope protection;
- Decanting earth bunds or sediment retention ponds;
- Dewatering; and
- Stormwater protection.

See Appendix I for full details.

### 4.2.5 Vegetation Alteration

Vegetation removal is required to facilitate the road widening and construction of road infrastructure. To mitigate effects to land owners and improve the visual amenity of the corridor, planting will be undertaken. Planting associated with any accommodation works (related to reinstatement of property i.e. driveway resurfacing, reinstatement of boundary fences and planting) will be confirmed when landowner consultation agreements have been completed.

# 5. PURPOSE AND DRIVERS FOR THE PROJECT

## 5.1 Need for the Project

The Stage 1 works are required to improve the safety of the Waimauku to Huapai section of the rural state highway network. Safety improvements are required due to the unforgiving highway design and existing high traffic volumes, which contribute to a high number of head-on and run-off road fatal and serious injury crashes that result in a high probability of DSIs. This safety focus is important as the SH16 corridor is the primary link for the Kumeu-Huapai area to the rest of Auckland. This link performs all movement and access functions for all modes of transport, including commuter, visitor and freight movements.

The historic crash record for this corridor shows that there have been 21 FSI crashes resulting in 34 DSI casualties (4 deaths and 30 serious) over the 2006-2015 period. In the period from 2011-2015 there were 11 FSI crashes (2 fatal and 9 serious) along this corridor, resulting in 18 DSI casualties (2 deaths and 16 serious).

Between 2006 and 2016, approximately 45% of all crashes have been intersection related. This resulted in 5 FSI and 6 DSI. In the period 2011 to 2015, there was 2 FSI and 2 DSI related to intersection crashes. Within the Project area of SH16, there are 3 current intersections designs that lead to an unacceptable risk of high speed crashes. Joyce Adams Place intersection is identified as medium-high risk, Foster Road as medium risk and Matua Road has a medium-low risk rating.

From 2016 to November 2018, 7 FSI crashes have been reported resulting in 9 causalities (no fatal and 9 serious). This indicates that there continues to be a crash problem through the corridor.

The Project Corridor has been assessed using a New Zealand Roadside Assessment Programme (KiwiRAP) classification, this star rating method is a predictive measure of the personal safety of a longer length of road based on the road protection (RPS) score for each 100m section and typically averaged over 5km. The published 5km KiwiRAP star rating average across the SH16 corridor is 2 star. When analysed at 100m segments, the Star rating across the corridor ranges from 1 to 4, with the majority of the route as 2 or 3 star. The corridor has a 1 star rating for some 100m segments (generally at intersections with local roads).

The published One Network Road Classification (ONRC) for this corridor is Primary Collector but the eastern half (stage 2) of the corridor functions as a National (high volume) and the western half (stage 1) lends itself to a Regional classification. Based on the Safer Journeys – Safe Roads and Roadsides (PBC) 2014, a KiwiRAP star rating of 3.5 has been adopted for this corridor. (Note that KiwiRAP rating is not assigned to a Primary Collector road so adopting the PBC target made sense here).

## 5.2 Project Objectives

The Safer Roads and Roadsides Programme is based on a strategy of reducing the number of New Zealanders that are killed or seriously injured on our roads annually, minimising the social harm and economic impact of road crashes.

During the Business Case Phase of the Project, Problem Statements and Project Objectives were identified for the Project as a whole (Stage 1 and 2). The specific safety issues associated with the entire project corridor (Stage 1 and 2) have been summarised in the following problem statements:

1. The existing corridor does not support current and growing demand leading to poor travel time and reliability (30%);

2. An unforgiving corridor design is leading to an unacceptable number of high severity head-on and run-off-road crashes (40%);
3. The current intersection design is leading to an unacceptable risk of high speed crashes [which has potential to be exacerbated with increased growth] (20%); and
4. The changing function and increasing use of roadside access points is leading to increased crash risk (10%).

To address the above issues the following Project objectives have been developed for the entire project corridor (Stage 1 and 2):

1. Reduce the probability and severity of predicted DSI crashes by at least 30 - 50% (8 - 20 DSI) within 10 years.
2. Increase the length of existing below 3.5 star rated corridor to 3.5 star or above within 10 years.
3. Maintain travel time between Kumeu and Brigham Creek Road over the next 10 years.

Addressing the identified problems would result in the following benefits:

1. Reduction in DSI casualties on the SH16 Brigham Creek to Waimauku corridor (65%).
2. Maintain or improve travel time between Kumeu and Brigham Creek Road (35%).

For Stage 1 of the Project, only Objectives 1 and 2 are relevant.

## 5.3 Necessity Test

Section 171(1)(c) of the RMA requires consideration of whether the work and alteration to designation are reasonably necessary for achieving the objective of the requiring authority for which the alteration to designation is sought.

The proposed designation is considered reasonably necessary for achieving these objectives because:

- It enables the Transport Agency to have the flexibility and ability to construct, operate and maintain the corridor and undertake the Project in accordance with the designation notwithstanding anything contrary with the AUP-OP;
- It enables the works to be undertaken in a comprehensive and integrated manner;
- It achieves certainty through identifying in the AUP-OP the location, nature and extent of the Project and the Transport Agency's intended use of the land; and
- It enables the Requiring Authority to avoid, remedy and mitigate any adverse effects of the project.

The following summarises why it is considered that the Project is reasonably necessary to achieve these objectives.

### 5.3.1 The Project

To address the identified problems in Section 2.2 and achieve the proposed Project objectives, the Project Corridor requires upgrading to incorporate new safety treatments.

**Wire rope median barriers:** currently there is no physical separation between opposing traffic to provide protection from vehicles crossing the centreline. To address this issue and reduce the risk of head-on crashes physical separation of opposing traffic is required. Wire median barriers are considered the most effective method, they provide physical separation, are more forgiving than other physical barriers and are appropriate for a single lane road environment. Where multiple turning points are required along a section of corridor, flush medians provide separation and flexibility of allowing right turn movements.

**Side barriers:** run-off road crashes are noted as a problem along this corridor, the provision of side barriers reduces the severity of these types of crashes.

**Wide shoulders:** shoulder widening lowers the current run-off road risk by providing additional space for recovery. They will also provide resilience to the corridor by allowing distressed vehicles to stop off the highway and minimise the disruption to through-traffic.

**Right turn bays:** high volumes of traffic cross the highway via right turn manoeuvres. Currently right turning traffic are not separated from through traffic increasing the risk of crashes. Right turn bays will provide additional space to accommodate turning traffic improving the safety at these intersections.

**Turnarounds:** continuous median barriers will restrict right turn movements from some private driveways and side roads. Turnaround facilities will be provided for vehicles to turn right at a detour length of approximately 1.5km. The design and location of the turnarounds is based on both the Safe Roads Safety Toolkit, which is a design guidance document, and in conjunction with stakeholder feedback and consultation with landowners along the corridor.

This proposed suite of safety improvements outlined above will achieve a reduction of 23.6 DSI over a 10 year period (approximately 60%) and improve the 5.5km of the corridor to a KiwiRAP star rating of 3.5 star or above. Therefore, the Project meets both investment objectives identified for this corridor and, in fact, well exceeds both objectives. The Project, once implemented, will reduce the predicted Collective Risk from High to Medium and the predicted Personal Risk from Medium to Low.

### 5.3.2 The Proposed Alteration to Designation

In general, most of the permanent and temporary works are accommodated within the existing designation. However, where this has not been possible an alteration to the designation is sought.

Alterations to the designation are sought for 17 properties which require temporary and/or permanent land requirements:

**Table 4 Number of properties with permanent and temporary land requirements**

| LAND REQUIREMENT | NO. OF PROPERTIES |
|---|---|
| Permanent (only) | 0 |
| Temporary (only) | 4 |
| Both temporary and permanent | 13 |

Permanent land requirements are required where there is inadequate space to widen the pavement to the necessary width and/or provide turn around facilities at required locations (these need to be spaced at regular intervals to address turning requirements of traffic within the corridor) (see Appendix C for details).

To provide for median barriers/side barriers/wider shoulders the highway will need to be approximately 11.5m in width and up to approximately 16m where right turn bays and intersections are required. Currently where there are single lanes along the corridor, the existing paved width is approximately 10m to 11m in width, requiring approximately 2.5m to 3.5m in pavement reconstruction to accommodate the proposed safety improvements. In areas where right-turn bays and intersection improvements are proposed, an additional 3m to 6m is required and for turnaround bays, an additional 12.5-15m is required at the widest section.

An alteration to designation is also required for temporary land use. In order to achieve the construction objectives identified above in Section 2.2, widening of the existing designation

is required to accommodate construction activities within the constrained corridor. Where an alteration to the designation is required for construction purposes, it is proposed that the corridor is surveyed on completion and the designation is rolled back to the operational designation boundary.

# 6. ASSESSMENT OF ALTERNATIVES

Section 171(1)(b) of the RMA requires a territorial authority when considering a notice of requirement to consider the effects on the environment of allowing the requirement, having particular regard to whether adequate consideration has been given to alternative sites, routes, or methods of undertaking the work.

The proposed works take place on or adjacent to SH16 between Huapai and Waimauku. The purpose of the Safe Roads and Roadsides Programme is to upgrade an existing rural highway which has safety issues. On this basis, an alternative off-line location was not considered.

The Assessment of Alternatives was undertaken for the whole corridor (Stages 1 and 2) up to the Pre-Implementation Phase. A number of alternative safety improvement options were considered during the Single Stage Business Case (SSBC) development.

During the Pre-Implementation Phase, the preferred option undertook detailed design to confirm land requirements for construction and operation of the proposed safety solutions.

The Assessment of Alternative Process is summarised in Figure 9 below, explaining the stages and consideration of alternatives.

Sections 6.1 to 6.5 explain the Steps in Figure 9 in more detail.

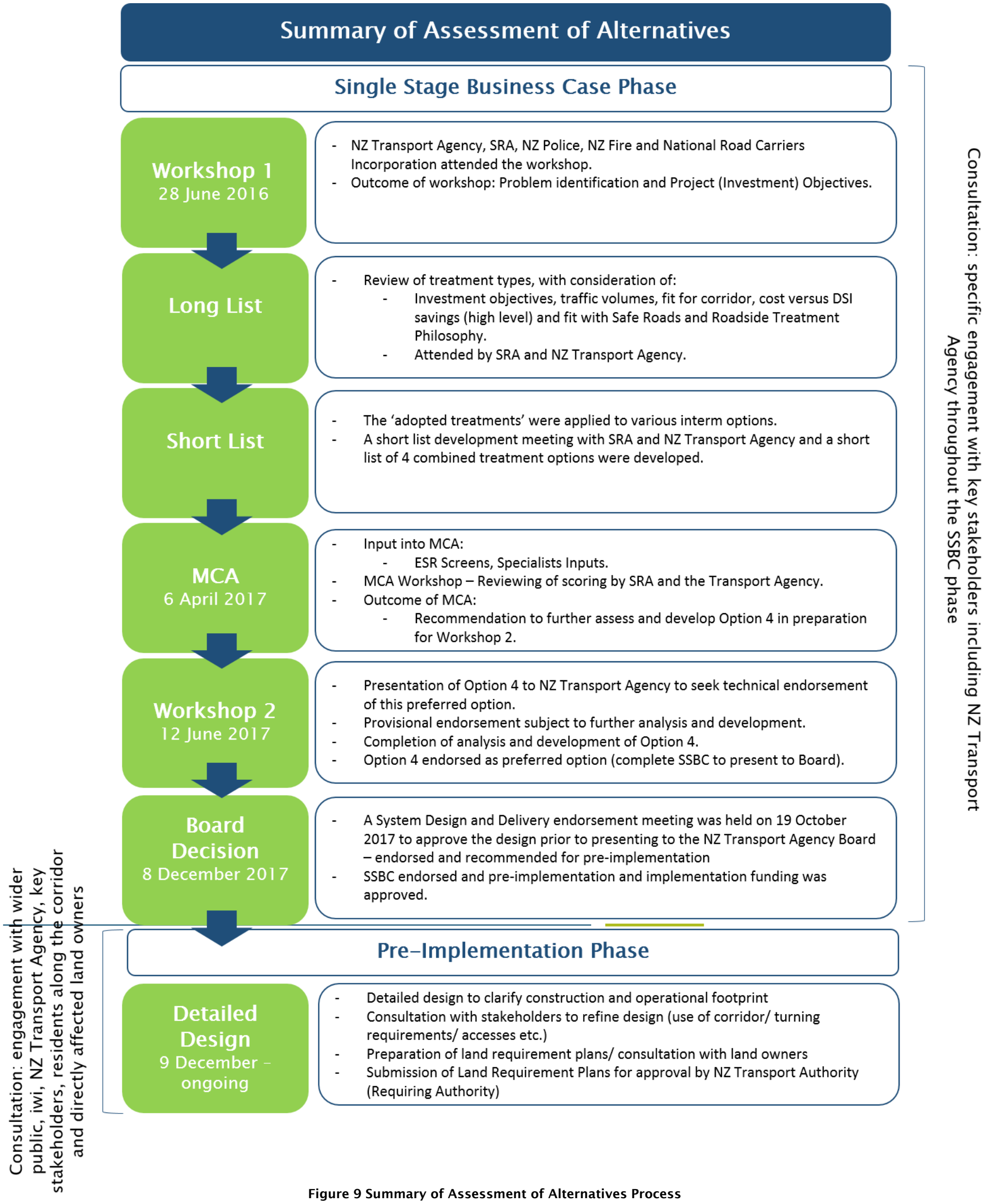


**Figure 9 Summary of Assessment of Alternatives Process**

## 6.1 Project Identification and Project Investment Objectives

### 6.1.1 Workshop 1

Problems associated with this Project Corridor and benefits of treating those problems were identified in consultation with key stakeholders at Workshop 1 held on 28 June 2016 by the SRA. The purpose of the workshop was to gain a better understanding of the problems associated with the corridor, the benefits of resolving those problems, and to explore what high-level mechanisms might be used as a strategic response to remedy these problems.

Project investment objectives were developed for this project following Workshop 1, based on the overarching strategic and programme level objectives. For the SH16 Brigham Creek to Waimauku corridor the agreed investment objectives are:

**Investment objective 1:** Reduce the probability and severity of predicted DSI crashes by at least 30 - 50% (8 - 20 DSI) within 10 years
**Investment objective 2:** Increase the length of existing below 3.5 star rated corridor to 3.5 star or above within 10 years
**Investment objective 3:** Maintain travel time between Kumeu and Brigham Creek Road over the next 10 years

## 6.2 Option Development

### 6.2.1 Long List Options

A wide range of high-level treatments were considered, with the understanding that those treatments carried through to the short list would form the platform for subsequent option development.

The long list evaluation and screening of the treatments was considered at a high level to determine how they contributed towards meeting the investment objectives. Treatments were either Adopted, Rejected or Deferred.

The evaluation also considered the following:

- Traffic volumes, i.e. median treatment will not be appropriate for a corridor with a low number of vehicles per day.
- An assessment is made of what looks good for the corridor. i.e. lighting over a short length may not be appropriate.
- A high-level assessment for each option comparing the potential construction cost to the potential DSI savings per 10 years.
- Safe Roads and Roadsides treatment philosophy: screening and short-listing options that are most appropriate within the safe roads and roadsides quadrant. Options which fall outside of this were noted and passed on to the relevant groups with NZ Transport Agency as appropriate.

Treatments were considered in the following categories:

- Full corridor safety treatments
    - Median treatments
    - Roadside treatments, e.g. widening shoulders
    - Other treatments, e.g. intersection improvements; pavement improvements; signage; speed limits
- Efficiency treatments by Section, e.g. additional lanes
- Coatesville-Riverhead Intersection treatments

### 6.2.2 Short List Options

Following completion of the long list 'treatment' assessment, those treatments that were 'adopted', were developed into short list options to progress or further detailed assessment and consultation.

Short list options were developed based upon the following considerations:

- Long list treatment assessment
- High Risk Rural Roads Guide treatment philosophy for this classification of corridor
- Consideration of the agreed investment objectives
- Stakeholder (including community) feedback received during the engagement process

Four short listed options were presented for the Project. These included:

1. Existing layout, plus baseline
2. Existing layout with double yellow line median plus baseline
3. Existing layout with wide centreline plus baseline
4. Existing layout with wire median plus baseline (turnarounds required)

The 'baseline' included:

- Widened shoulders to meet current standards
- Maximum side barriers where possible (taking into account constraints of existing side access points including driveways)

## 6.3 Option Selection

### 6.3.1 MCA

A Multi-Criteria Analysis (MCA) assessment workshop was held on 6 April 2017 with key Transport Agency personnel and the SRA project team to review and confirm the MCA significance scores for options 1 to 4 in relation to Section E of the corridor.

This allowed the project team to recommend the right combination of treatment and return on investment. For each option, the assessment included:

- Effectiveness relative to the investment objectives;
- Effect on collective and personal risk;
- Cost per DSI saved;
- Estimated capital cost range;
- Benefit-cost-ration (BCR);
- Social and environmental screen and multi-criteria analysis (safety, economy, integration, social, natural environment, human health, cultural and property issues); and
- Implementability (technical, consentability, operational/maintenance, safety in design, financial and public/stakeholders issues.

Analysis of the MCA outputs resulted in the following option recommendation to take forward and seek endorsement:

**Option 4:** Existing layout with median safety barrier plus baseline (turnarounds required)

Option 4 was selected as the preferred option. The option has high safety benefits as it reduces the 10 year predicted DSI by 60% for Section E and results in a total increase of 2.3km of 3.5 or greater KiwiRAP star rating. With the existing 100km/hr. posted speed limit and approximately 15,000 AADT, the full corridor length of median barrier proposed in this option reduces the risk and severity of head-on crashes resulting in death and serious injury. It therefore provides for a better safety outcome.

## 6.4 Preferred Option

### 6.4.1 Workshop 2 (Option endorsement meeting)

Workshop 2 was held with the Transport Agency stakeholders and Safe Roads Alliance staff on 12 June 2017. The purpose of the workshop was to seek technical endorsement of the recommended option. Option 4 was endorsed at the workshop, subject to detailed design.

Following further development post workshop 2 it was agreed that Option 4 was still the preferred option as it provides 60% DSI savings on route within 10 years, as well as a BCR above 1 for the 40 year evaluation period. Option 4 also exceeds the project outcome (investment objective) relating to the KiwiRAP star rating.

Furthermore, the MCA and implementability appraisal for Option 4 did not identify any significant adverse effects; although some challenges will need to be managed in relation to social impacts, technical and public/stakeholder management.

### 6.4.2 The NZ Transport Agency Board Decision

The SSBC was completed and an endorsement meeting was held with the NZ Transport Agency's System Design and Delivery Group on 19 October 2017 to approve the design prior to presenting the option to the NZ Transport Agency Board. The Board decision was made on 8 December 2017, where the SSBC was endorsed and implementation funding was approved.

## 6.5 Detailed Design

Following the completion of the SSBC, the project moved into the Pre-Implementation Phase where the preferred option was progressed through detailed design. The key activities in this phase include:

- Applying for the necessary RMA approvals and undertaking technical assessments required to support these applications.
- Public and stakeholder engagement: consultation throughout this phase was used to gain feedback and refine the design see Section 7 for full details.

Consultation was used to help refine access designs, location of turnaround facilities and land requirement details.

### 6.5.1 Preferred Option Refinement

As part of the pre-implementation phase the preferred option was refined further as the design developed. Once the required pavement widths were developed and the stormwater requirements were established, the corridor was analysed to identify where within the corridor the proposed design may not be able to be operated and/or constructed within the existing designation.

Each location was considered in terms of necessity and possible alternative, and the following is a summary of this process (for full details see Appendix J). Where temporary land is required the following considerations were reviewed:

Why is temporary land required at this location?

- Can this be managed within the corridor?
- What are the benefits/dis-benefits of an offline versus online solution?
- What is the minimum land required?

Where permanent land is required the following considerations were reviewed:

- Why is permanent land required?
- Is this necessary for the project?

- Is there a more efficient alternative?
- What is the minimum land required?

The output of this process was the final land required to incorporate the project into the existing designation. This is shown as the Land Requirement Plans included as Appendix C.

# 7. CONSULTATION AND ENGAGEMENT

## 7.1 Purpose and Objectives

The purpose of the consultation undertaken to date in relation to the Project has been to:

- inform stakeholders and directly affected land owners such that they achieve an understanding of the Project and its effects;
- gather knowledge and input from stakeholders and directly affected land owners to inform the Project; and
- support the legislative requirements for the NoR under the RMA, in particular with respect to consultation with Tangata Whenua regarded as best practice as part of the assessment of Part 2 matters provided for under Sections 6(e), 7(a) and 8 RMA.

Consultation has been an integral component of project development and pre-application phases. Consultation for the Project has been undertaken in accordance with the Transport Agency's own guidelines meets the requirements of the RMA.

## 7.2 Summary of Consultation

SRA has engaged with the local community and mana whenua. SRA will continue communications throughout the construction period. A summary of the groups consulted is outlined in Table 5 below. The table includes dates of physical meetings. However engagement has also included emails and phone calls with all listed stakeholders.

**Table 5 Summary of Stakeholder Engagement**

| STAKEHOLDER ENGAGEMENT | ENGAGEMENT |
|---|---|
| Public Open Days – Local Community | 3 Open Days held with the local community:<br>- Open Day 1 (5 December 2017): held at Waimauku War Memorial Hall<br>- Open Day 2 (7 December 2017): held at Riverhead Citizens Hall<br>- Open Day – Cycle Groups (11 December 2017): held at Bakehouse Café and The Food Vault |
| Northern iwi Integration Group | Hui:<br>- June 2017<br>- January 2018<br>- August 2018 |
| Ngati Whatua o Kaipara | Hui:<br>- Rewiti in December 2016<br>- March 2018<br>- August 2018<br>- November 2018<br>- December 2018 |
| Kawerau a Maki | Hui:<br>- April 2018<br>- July 2018<br>- November 2018<br>- December 2018 |

| | |
|---|---|
| Local Board | - Presentations to Local Board in:<br>- August 2016<br>- March 2017<br>- May 2017<br>- February 2018<br>- May 2018<br>- September 2018<br>- February 2019<br>- Engagement with Member Pirrie<br>- Site visit, Facebook, email correspondence and phone calls |
| KiwiRail | Engagement from June 2018 and ongoing into 2019 |
| Police | Engagement in June, April, October and December 2018 |
| AA | Engagement in January, September and October 2018 |
| Fire and Emergency NZ | Engagement in June 2017 and September 2018 |
| National Road Carriers | Engagement in June 2017, February 2018 and September 2018 |

### 7.2.1 Land Owners

All land owners identified as directly affected by land requirements for the alteration to designation have been notified by either phone or email correspondence, with details of the land requirements and an information sheet on the overall project. All landowners that have responded have been met with or spoken to. A summary of the consultation undertaken is included in Appendix J.

### 7.2.2 KiwiRail

The railway line that borders the northern side of SH16 is owned and administered by KiwiRail (Designation No. 6300). The area of construction works that affects KiwiRail land has been minimised as much as possible and there will be no permanent land required. All construction works that will be undertaken within 5 metres from the rail track centreline will be subject to a licence agreement with KiwiRail.

Engagement with KiwiRail regarding the temporary occupation required commenced in June 2018 and has continued.

KiwiRail have not identified any concerns with the works to-date. The Safe Road Alliance continue to work with KiwiRail to formalise the agreement for a temporary licence

### 7.2.3 Roading and Utility Owners

The Foster Road turnaround facility is located within a side road managed by Auckland Transport (AT). SRA attended a meeting on 3 August 2018 and has been in ongoing contact with AT and the parties are in the process of jointly developing a plan for the construction and maintenance of this facility. The SRA team also attended and presented the project to the 8th North West Infrastructure Workshop on Wednesday 27th June.

There are multiple network utility and network utility providers along the corridor. These include:

- Chorus (Telecommunications);
- Public Networks (Stormwater/Wastewater/Water Supply);
- First Gas;

- Taitokerau Fibre Networks;
- Vector Electricity;
- Vector Gas Distribution; and
- Refining New Zealand.

All utility providers have been made aware of the works through face to face meetings and email correspondence since April 2018 and consultation with each is ongoing. The proposed design is collaborative and takes into account the requirements of each utility by providing future capacity. For example, Vector and Chorus are including extra ducts in order to enable upgrades in the future.

Ongoing consultation is also taking place with the Auckland Transport Operations Centre (ATOC) and the Auckland Motorway Alliance (AMA) regarding relocation of traffic counts and operational matters during construction. Overall, all roading and utility owners are generally supportive of the project.

### 7.2.4 Mana Whenua

SRA has presented the Project to the wider Transport Agency Northern Iwi Integration Group and interested iwi nominated themselves for further engagement beyond this platform. SRA has met with Ngati Whatua o Kaipara and Kawerau a Maki on several occasions and conducted a site visit with both iwi groups. Nga Maunga Whakahii O Kaipara (the development trust that represents Ngati Whatua O Kaipara) have prepared a Cultural Values Assessment (Appendix F) outlining the history of the area and potential cultural effects of the Project. Table 6 provides a summary of their concerns related to art, signage, planting, earthworks and stormwater management. Any interest or feedback provided by the two iwi groups have been considered and incorporated throughout the design process and are also detailed in Table 6.

**Table 6 Summary of Consultation with Mana Whenua**

| STAKEHOLDER | FEEDBACK |
|---|---|
| Ngati Whatua o Kaipara | Held meetings to present and discuss the planting strategy, stormwater treatments and the opportunities for iwi artwork along the route.<br><br>Raised their interests related to the mana whenua values of kaitaki and mauri, taonga and whanau.<br><br>Have been offered to do a karakia blessing as part of the project opening event and be involved in the cultural induction. Noted importance of following the accidental discovery protocol in the event of discovering cultural material. Ongoing coordination will take place once construction commences for any cultural monitoring opportunities.<br><br>Ngati Whatua o Kaipara indicated early interest in ensuring a diversity of planting and the importance of providing native planting. Both matters raised were incorporated into the planting plan and presented to the group, who were largely supportive of the strategy. This includes riparian planting around watercourses and |

| | |
|---|---|
| | a range of native planting along the corridor. The opportunity will also be given to iwi to quote on providing the plants.<br><br>The proposal for iwi artwork on retaining walls received favourable feedback. Meetings were held regarding mana whenua input on artwork and getting a local iwi artist onboard to design. Ngati Whatua o Kaipara were involved in preparing an expression of interest, which was issued out. Further meetings will be held to progress this discussion when construction commences. |
| Kawerau a Maki | Supportive of the Project and are happy for Ngati Whatua o Kaipara to take the lead and complete a CVA.<br><br>Preference for stormwater management to be designed to meet the GD01 guidelines. Raised concerns around the modification of water whilst bridge widening and also encourage daylighting of streams.<br><br>Raised interest in the proposed planting for the corridor, with a preference of including native planting and procurement through the nursery at Kaipara. Native planting has been incorporated into the planting strategy and the opportunity will be given to iwi to quote on providing the plants.<br><br>Raised interest in having a collaborative approach for iwi artwork, mana whenua signs and naming related to the Project works. Meetings were held regarding mana whenua input on artwork and getting a local iwi artist onboard to design. Kawerau a Maki were involved in preparing an expression of interest, which was issued out. Further meetings will be held to progress this discussion when construction commences. |

# 8. ASSESSMENT OF EFFECTS ON THE ENVIRONMENT

This Assessment of Environmental Effects (AEE) has been provided in such detail as corresponds with the scale and significance of the effects that the activity may have on the environment. It has been prepared in accordance with Schedule 4 of the RMA and the relevant matters of control and discretion from the AUP-OP.

## 8.1 Positive Effects

The proposed works will contribute to the improvement of the safety of SH16 area of works. Additional side barriers, median barriers, wide centrelines and widened shoulders will assist in reducing the severity of head-on and run-off road accidents. Reducing the possibility and severity of a crash occurring will have positive effects on road users' health and safety and social wellbeing by lowering the potential for injury or death. Reducing the possibility and severity of a crash also has positive economic effects by lowering the potential for delays in freight delivery and/or damage of goods. Environmentally, reducing the risk of a crash also reduces the potential for spills, fire or other contamination to and/or damage of the surrounding environment.

The proposed works will have a positive impact on road users by creating a more reliable and safer driving experience. The median barriers and side barriers provide a legible and consistent layout which will keep the driver alert whilst maintaining the views of the surrounding landscape and rural environment. The landscape design also focuses on demarking the entry points of Waimauku and Huapai to provide a sense of place for communities and a safety cue for traffic speed transition between rural and urban areas.

## 8.2 Construction Effects

In accordance with The Transport Agency's Environmental and Social Responsibility Policy, State highway projects are required to develop an Environmental and Social Management Plan (ESMP) to manage construction effects including earthworks, contamination, and noise and vibration. As shown in Figure 10, these effects are addressed in management plans that form part of the ESMP. The ESMP is part of a wider framework of management plans.

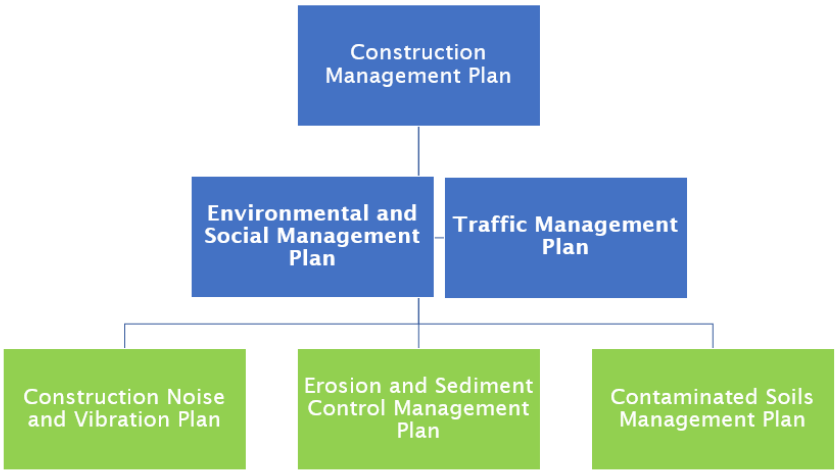


**Figure 10 NZTA Environmental and Social Management Plan framework**

Draft consent conditions are proposed in Appendix M to manage effects related to earthworks, stormwater, and archaeological features.

### 8.2.1 Cultural Effects

Mana whenua (Ngati Whatua O Kaipara and Te Kawerau a Maki) have matters they are specifically interested in with regards to the construction and operation of the Project.

For Te Kawerau a Maki, the matters generally fall into the following categories:

- Art, mana whenua signs, Naming: would like to have a collaborative approach and explore opportunities for light treatments at bridges, railings etc, and any naming opportunities.
- Planting, Planting plan; to include native plants and procurement through the nursery at Kaipara.
- Earthworks; to be designed with GD05. The construction footprint is to be minimised.
- Stormwater concept and management; to be designed with GD01. The modification of water is to be avoided whilst bridge widening, and daylighting of streams is encouraged.

Nga Maunga Whakahii O Kaipara (the development trust that represents Ngati Whatua O Kaipara) prepared a Cultural Values Assessment (Appendix F), identifying their matters of interest which fall within four mana whenua values;

- Kaitiaki & Mauri
    - Preference for riparian planting/fencing
    - Preference for native planting
    - Preference for rain gardens & wetlands
    - Preference for earthworks (GD05) and stormwater (GD01) standards
    - Consultation for soil removal
    - Incorporation of Mauri model of decision making
    - Preference for pest & weed control
- Taonga
    - Karakia to bless the site
    - Cultural induction
    - Accidental discovery protocol – including taonga & koiwi
- Cultural Heritage/Footprints, Naming Opportunities, & utilising Te Aranga design principles
- Whanau
    - Importance of inclusion of Rewiti Marae
    - Interest in employment opportunities for local mana whenua
    - Indicated interest in procurement for plants i.e. providing plants from their nursery

The project is designed to address the matters that have been identified of interest to both mana whenua groups with exceptions of rain gardens, wetlands, design of the bridge changes and naming opportunities, as these opportunities are not within the scope of the Project. Riparian planting will be provided along all swales and stream crossings, and the majority of planting will be native. Exotic shelter belt species have been included where requested through landowner agreements. The mix of proposed plants aim to achieve quick canopy closure and therefore reduce the need for weed maintenance.

Mana whenua will be offered to do a karakia blessing as part of the project opening event and be involved in the cultural induction. The accidental discovery protocol will be followed in the event of discovering cultural material.

Consultation and communication have been undertaken to date with Rewiti Marae, and will continue through into construction. In terms of employment opportunities and plant procurement, this will be considered through the construction tender. The construction footprint has been minimised by-way of design of the works. Earthworks have been designed with GD05 and the stormwater concept and management is to be designed with GD01.

All plants and seeds required for re-vegetation and restoration work for the Project will be eco-sourced from the Rodney Ecological District. With early and ongoing mana whenua engagement, the Project has been designed in such a way that any adverse cultural effects will be mitigated or specifically managed to have less than minor effects.

### 8.2.2 Archaeological and Built Heritage

An Archaeological Assessment has been undertaken by Clough and Associates and is attached in Appendix E.

There are no recorded archaeological or historic heritage sites, nor scheduled sites, within 200m of the project area. Overall, the project has no known archaeological or other heritage values and significance, as there are no sites located within the project boundary, and the potential for any sites to be disturbed by works is considered low/nil.

If suspected archaeological remains are exposed during construction works, the NZ Transport Agency Minimum Standard P45 – Accidental Archaeological Discovery Specification will be complied with (see Appendix E for a copy of P45).

Therefore, any adverse effects on archaeology and heritage during construction are less than minor.

### 8.2.3 Traffic and Cyclists

It is anticipated that the construction work may have the potential to incur disruptions to private and commercial vehicles, public transport, pedestrians and cyclists. However, the following mitigation strategies will minimise the effects:

- In the event that construction works would require a lane to be closed on the highway the works will be undertaken between 7pm and 7am to minimise traffic effects and ensure disruptions occur during low traffic times. The alteration to designation for temporary construction space has been requested to minimise lane closure requirements. Detours will be organised where appropriate.
- Cyclists will be accommodated along the highway during these works.
- To minimise traffic delays for through traffic the Contractor will monitor and manage the traffic management on the highway to minimise traffic delays
- Access to property will be negotiated with the landowner to ensure access is maintained as required.

As set out in Section 4.2.1 above the CMP (prepared by the contractor, prior to the commencement of works) will include a Traffic Management Plan (CTMP), which will set out specific details of construction traffic management.

With the implementation of appropriate mitigation strategies during construction, it is considered that any potential adverse effects on traffic and cyclists will be less than minor.

### 8.2.4 Construction Noise and Vibration

Construction works, including earthworks to widen the road shoulders, bridge and retaining walls construction works, the relocation of utility services, construct right turn bays and turnaround facilities and install median barriers and side barriers are anticipated to be undertaken during both the day and night.

Marshall Day Acoustics has undertaken an assessment of the potential noise and vibration effects that may be generated, and this assessment is contained in the Assessment of Acoustics Effects (refer Appendix L). In summary, the noise generated by the works is similar to that of normal state highway construction and maintenance activities.

The most appropriate and effective method of managing construction noise and vibration effects is through on-site management and an engagement strategy, based on a Construction Noise and Vibration Management Plan (CNVMP) to be implemented by the contractors. As detailed in Appendix L, the best practicable mitigation option will be

implemented as outlined in the CNVMP (as part of the ESMP framework), which will be prepared in accordance with the NZTA State Highway Construction and Maintenance Noise and Vibration Guidelines that are consistent with NZS 6803:1999 and BS 5228-2:2009. General noise mitigation measures include:

- Ongoing communication and consultation with residents/landowners
- Barriers – sheets of plywood or construction noise curtains can be placed between dwellings and the construction activities to reduce noise levels by up to 10 decibels.
- Avoidance of unnecessary noise and vibration – levels can be reduced by means of site management and protocols and considerate use of machinery.
- Response to non-compliance – prepare an overarching CNVMP with schedules added as required to address issues of non-compliance;
- Use of specific machinery and/or pre-construction survey.

Overall, the proposed works can be constructed in such a way that any adverse construction noise effects are either mitigated or specifically managed to have less than minor effects.

### 8.2.5 Earthworks

**Erosion and Sediment Effects**

Earthworks have the potential to cause adverse effects from erosion of bare soils and sediment runoff causing sedimentation of local streams. To manage these potential effects works will be staged to minimise the areas of exposed soil open at any one given time. An Erosion and Sediment Control Principles and Practices (Appendix I) report has been prepared to provide guidance on the management of the potential erosion and sedimentation effects from earthworks proposed in relation to pavement widening and retaining structures. This report (Appendix I) has been prepared in general accordance with GD05 and proposes a range of measures to be utilised throughout the Project corridor to mitigate potential sedimentation effects on neighbouring properties and local streams.

Once a contractor is on board, a site specific Erosion and Settlement Control Management Plan (ESCP) will be devised following the principles of this document and will be in general accordance with the NZTA Erosion and Sediment Control Guidelines for State Highway Infrastructure and the ESMP framework.

The controls proposed include the use of physical devices to contain sediment, as well as construction methods to reduce sediment generation caused by the earthworks. Given that the earthworks will take place in small volumes along the corridor in various stages and locations, the controls proposed under the ESCMP are also considered to be appropriate to manage potential sedimentation effects associated with the proposed works.

Under the Draft conditions of consent (refer to Appendix M), it is proposed that the final Erosion and Sediment Control Plan (ESCP) shall be submitted to the Team Leader - Compliance Monitoring for certification, prior to construction commencing.

Overall, the potential adverse erosion and sedimentation effects of the proposed earthworks activity will be less than minor.

### 8.2.6 Contamination

A Preliminary Site Investigation (Contaminated Land) report (PSI) was prepared for the Project by Safe Roads Alliance and is included in Appendix G of this report.

The assessment comprised a review of historical aerial photography, Auckland Council information including discharge consents and a site walkover to identify any possible contamination issues, and areas requiring further investigation, remediation and management to avoid, remedy or mitigate any potential adverse contamination effects. The risks assessed included environmental discharge (as considered under the contaminated land rules of the AUP-OP); and adverse effects on human health as considered under the National Environmental Standard for Contamination (NESCS).

The PSI identified some potentially contaminated sites within and along the Project corridor that are listed in the Ministry for the Environment Hazardous Activities and Industries List (HAIL). The activities particularly relate to persistent pesticide application within a horticultural setting, identified as HAIL A10. The key contaminants for land historically or currently in use as horticulture includes organochlorine and organophosphorus pesticides. The sites include:

- 6 Joyce Adams Place
- 529-751 SH16
- 32 Meryl Avenue
- 307 Matua Road
- 726 SH16

Along the Project corridor, potential HAIL activities include orchards, vineyards, and related barns/sheds. The NESCS permitted activity soil disturbance thresholds for each HAIL property will not be exceeded by the minor boundary works, however works are anticipated to exceed the 2-month soil disturbance timeframe. The PSI identifies that that the longer timeframe is unlikely to generate any additional risk as the exposure pathway is restricted to dermal contact and dust inhalation by constriction works which can be managed.

A Contaminated Soils Management Plan was also prepared by the Safe Roads Alliance (included in Appendix K) to describe the management requirements that the Contractor should comply with in order to address the land contamination risks associated with the Project, including:

- Procedures relating to the management of dust, sediment, stormwater and stockpiling;
- Soil excavation and disturbance procedures, including onsite soil management and movement, off-site disposal and unexpected contamination discovery;
- Quality control of any imported fill materials to ensure that contaminated materials are not imported to the site; and
- Groundwater procedures.

Overall, the potential contamination effects will be managed and are considered to be less than minor.

### 8.2.7 Landscape and Visual Effects

Landscape and visual effects will primarily be a result of bulk earthworks and the removal of vegetation associated with the construction of the Project. This includes the construction of retaining walls due to the road's elevation above the surrounding landscape and constraints with the designation width, as well as cut and fill slopes.

Significant vegetation removal has been avoided where possible. A planting philosophy is proposed to maintain vegetation patterns and compliment the rural character of the area. The planting typologies include:

- Revegetation planting;
- Wetland/riparian planting;
- Shelterbelt trees; and
- Grass.

Planting proposed is anticipated to mitigate effects of the removed vegetation. Any potential effects will therefore be less than minor.

The planting proposed is intended to tie the highway landscape into the surrounding landscape through vegetation patterns and use of species that complement the rural character of the area (refer to Appendix H).

The landscape design for the Project integrates the proposed bridge abutments at Berry Bridge and Kumeu No 2 bridge into the surrounding landscape whilst naturalising the

stream edges. Planting around the two waterways includes native planting enhancing an existing vegetation pattern and thereby providing a connection across the highway. This approach provides legibility of valleys and integrates with the existing vegetation patterns.

The native planting will include endemic eco-sourced species and replacement trees along the rural areas of the corridor may be a mix of native and exotic trees species as agreed with property owners during discussions.

Retaining walls are proposed as part of the design and required due to the road's elevation above the surrounding landscape, to facilitate widening of the carriageway and to stabilise earth cuts. Planting will be used to reduce the prominence of these structures and provide a pattern that is fitting with the rural character of the landscape.

Overall, the proposed planting is considered appropriate for the rural environment where it will be planted, and the scale of replanting will visually mitigate effects of the removed vegetation and retaining wall structures. Any potential effects are considered to be less than minor.

### 8.2.8 Arboriculture Effects

Trees will be removed during construction to facilitate construction of the improvements and widen the road. Approximately 200 trees will be removed. Removal within the designation is driven by the road geometric design and supporting elements including barriers, utilities service corridor and stormwater treatment devices. Significant landscape planting is proposed to mitigate the effects of the tree removal and improve the visual amenity of the road corridor. Of the trees to be removed, no trees are scheduled. There is no proposed removal or works in proximity to Kauri trees which would require specific biosecurity protections.

Landscape mitigation measures included as conditions of the resource consent will form part of the main alignment landscape scope.

Overall, the arboricultural effects of the Project are therefore considered to be less than minor.

### 8.2.9 Watercourse Effects

The works include widening of both Kumeu No 2 and Berry Bridge. Detailed construction information relating to the bridge widening works will be developed by the contractor (e.g. temporary pile locations, machinery refuelling areas). It is anticipated, based on the proposed construction methodology for each bridge that construction equipment will be located above the bed on either the temporary or constructed bridge platform during construction works. Construction materials and fluids will be managed by the contractor to ensure none are discharged into the watercourses below. All materials and machinery will be removed upon completion of construction. Works at both bridges will also not increase existing flood levels up to and including the 1% AEP. No instability will be created, nor erosion, scouring or bank undercutting. Neither bridge provides easy public access to each watercourse; regardless, public access to both watercourses at the area of works will be temporarily prevented during construction works.

Riprap consisting of large rocks will be installed from the stormwater infrastructure to the watercourse to slow clean water being discharged. The rip rap is also anticipated to reduce erosion of the banks of the watercourse.

As a result of the bridge works and proposed riprap, there will be no changes to fish passage upstream nor downstream and permanent works will be small in scale and will not change the channel cross section. Watercourse effects will be managed using best practice methods to prevent discharges. Effects are anticipated to be less than minor.

### 8.2.10 Services and Network Utilities

All network utility providers have been made aware of the works and are generally supportive of the proposed works. SRA continue to work with the providers as the design has progressed. Of the providers, the following are specifically affected:

- At CH199000, the Natural Gas Corporation of New Zealand, and the New Zealand Refining Company Limited have a building. The Refining New Zealand Petroleum Pipeline and the First Gas pipelines (Taupaki to Topuni and Taupaki to Kaukapakapa) run perpendicular across State Highway 16. Discussions have been undertaken with a representative of the utility providers to ensure the works will not affect these assets; and
- Vector Electricity have many overhead power poles and cabling located predominantly along the southern side of SH16. These will be temporarily relocated during construction and then either undergrounded or relocated outside of the new road corridor.

This infrastructure is accommodated in the road improvement design. All utilities will be temporarily relocated during construction. No adverse effects are anticipated to services and network utilities.

### 8.2.11 Temporary Land Acquisition

Approximately 2,137m$^2$ of land is required for temporary works. This temporary land requirement affects 17 properties and results in narrow strips of land being required adjacent to the existing land parcel. Work within these areas will take place over approximately 2-3 months for each location. This land is required for construction, primarily for access off line to the road reserve where construction or upgrading of pavement widening and retaining structures will take place (refer to the Land Requirement Plans, Appendix B).

The land identified is predominantly pastoral, shelter belts or front yards. Potential effects include temporary loss of grazing pasture, stock-proof fencing, disruption to farm activities, disruption to access, changes to driveway gradient, loss of shelter belt vegetation and temporarily affected amenity.

To mitigate these effects, the area of works will be fenced at each site. The fencing will be erected around the site prior to commencement of works and reinstated on completion of works within that site. Landowner access to this area of land may be restricted during active construction (approximately 2-3 months). On completion the land will be reinstated as agreed with the landowner.

The table in Appendix J (Land Requirement Analysis) sets out the following in relation to each individual landowner:

- amount of land required for temporary occupation during construction from each property;
- rationale for the land acquisition;
- anticipated effects of the land acquisition; and
- potential mitigation options for each property.

The table in Appendix J sets out the level of consultation that has been undertaken with each property owner.

It is proposed to draw back the designation to the operational boundary once construction is complete. Effects from temporary land acquisition can be mitigated through site specific arrangements which are being developed with the individual landowners, e.g. fencing and via lease agreements/ compensation through the Public Works Act processes. Effects will be temporary and therefore it is considered that they will be less than minor.

## 8.3 Operational Effects

A number of effects associated with the operation of the project are anticipated, these are summarised below.

### 8.3.1 Traffic Noise

An Assessment of Acoustics Effects Report (Appendix L) prepared by Marshall Day Acoustics assessed the potential traffic noise effects of the Project under the *NZS 6806:2010 Acoustics – Traffic Noise.* As the safety improvement works will not increase the traffic volume and capacity of the existing state highway corridor, an assessment has been made on the potential impacts of the turning bays and shoulder widening. The assessment has concluded that there will be no adverse noise effects from the use of the turning bays as the main source contribution will continue to be from SH16. The effect of the limited road widening is also considered insignificant due to the noise level changes being less than 1 decibel. Therefore, the provisions of the road noise standards are not relevant to the Project and the potential traffic noise effects will be less than minor.

### 8.3.2 Visual Effects - Retaining Wall

In order to facilitate the wider road carriageway, earthworks and retaining walls are necessary. Retaining walls are proposed at the locations shown in Table 7. The lower walls will be constructed from timber, whereas walls 2m high and over will be constructed using a steel H pile retaining structure. To mitigate the visual effects from the walls, climbing plants can be planted to soften the façade. There is also iwi artwork being considered to apply to the wall surface. Either ground cover plants will be installed above (to drop down), or in front of the lower retaining walls (to climb up) to soften the appearance of the walls.

**Table 7 Properties where retaining walls are proposed**

| Property Address | Land Requirement Plan Number | Chainage | Length | Wall Height | Wall Type |
|---|---|---|---|---|---|
| Outside KiwiRail land SH16 (opposite no. 601) | | CH 197530 – 197555 | 25m | 1m | Timber |
| 587 & 601 SH16 | 23 & 24 | CH 197460 - 197595 | 135m | 4m | Steel H Pile |
| 609 SH16 | 22 | CH 197630 - 197710 | 80m | 2m | Timber |
| 805 SH16 | 5 | CH 199605 - 199675 | 70m | 2m | Steel H Pile |

### 8.3.3 Stormwater Effects

The proposed works will increase the highway pavement area due to the proposed 2-5m widening of the corridor. The Stormwater Report in Appendix D has assessed and identified that the average increase in impervious area within the Project area will be 22% to a total of approximately 52,534m².

**Stormwater Treatment**

There is currently no existing stormwater network in this section of the SH16 corridor. The objective of the proposed stormwater design is to treat approximately 84% (44,042m2 of

treated area out of 52,534m2 total impervious area) of the total impervious area treated using natural stormwater systems such as swales and retention swales to treat the runoff prior to discharging to the natural environment. Proprietary treatment devices are also proposed to minimise land take requirements.

**Retention/ Detention**

The SMAF 1 overlays applies to approximately 780m of the SH16 corridor within the Project. Retention and detention are required at discharge points (DP), DP3 and DP4 which are located within the SMAF overlay and require hydraulic mitigation. DP5 is located outside of the SMAF 1 area, however the required retention volume is provided within the proposed retention design for DP3 and DP4. The retention and detention required under E8 of the Unitary Plan can only be provided under DP10. It is proposed that a total of 42.5m³ of hydrology mitigation volume is provided in DP10, which is more than the total required.

The Stormwater Report (Appendix D) concludes that although there will be a slight increase in peak flows as a result of the works, the flooding effects on streams and buildings will be minimal. The proposed stormwater systems and devices are expected to improve retention and detention given that there is currently no network in place.

Overall, based on the compliance with the AUP requirements to treat all of the new impervious road surface and as much as possible for the existing surfaces, effects are considered to be less than minor.

### 8.3.4 Ecological Effects

The proposed earthworks and stormwater works will result in works within existing overland flow paths. Overland flow paths can potentially be classed as intermittent streams or areas that serve as a habitat for wetted species (wetlands).

Streams

As set out in Sections 2.3.1 and 4.1.6 the project will result in extensions to existing culverts. The location of these culverts is identified in the General Arrangement Plans (Appendix B). As set out in Table 2, the works only result in one culvert being extended to a length greater than 30m. That culvert is the existing culvert under Foster Road, which carries overland flow under the local road. This culvert is not channelling an intermittent or permanent stream.

Wetlands

The proposed works will not require earthworks within any existing wetlands. The works predominantly involve widening adjacent to the existing state highway corridor and will not result in the reclaiming of any wetlands on adjacent properties. This is shown on the General Arrangements Plans (Appendix B) and the Land Requirement Plans (Appendix C).

In summary, it is considered that the ecological effects of the project works will be less than minor.

### 8.3.5 Lighting Effects

The existing lighting along SH16 consists of rural (flag) lighting and a consistent lighting approach is proposed for the area of works.

The area of works that require lighting are turn around bays, intersections, bus stops, and median barrier start and end terminals. Lighting in these areas have been designed to meet the relevant standards for lighting on the side of roads. Specifically, turn around bays have been designed to meet road subcategory V4 of AS/NZS 1158 and bus stops have been designed to meet road subcategory V3 of AS/NZS 1158 in addition to the relevant requirements of Transport Agency M30. Flag lighting will be provided at intersections and the luminaires are proposed to be tilted at up to 5 degrees. Effects of the street lighting are considered to less than minor as they have been designed to meet the relevant standards for lighting on roads.

### 8.3.6 Permanent Land Acquisition

Approximately 6,880m$^2$ of land acquisition is required for permanent works, split over 14 properties. This land is required for pavement widening of the road shoulder, vehicle turn-around facilities, or providing for network utilities or stormwater infrastructure (refer to the Land Requirement Plans, Appendix C).

The land requirements are on the boundary of these properties (adjacent to the existing state highway corridor) and do not include any buildings. Land requirements do not preclude the overall existing functions and use of each property continuing.

Refer to Appendix J (Land Requirement Analysis) for details of potential effects on individual land owners and mitigation proposed. The table in Appendix J sets out the:

- amount of land acquisition required from each property;
- rationale for the land acquisition;
- anticipated effects of the land acquisition; and
- potential mitigation options for each property.

The table in Appendix J sets out the level of consultation that has been undertaken with each property owner.

The individual land requirements (per property) range from 51m² to 1,792m². The largest portion of land at 1,792m² will be purchased from the landowner. The majority of this area is currently used for grazing. It is directly accessible from Foster Road and will provide maintenance access to the bridge. The remaining portions of land under private ownership are relatively small. The primary effect is loss of productive land and will be mitigated by compensation through the Public Works Act process. It is therefore considered that the effects of land acquisition will be less than minor on these landowners.

## 8.4 Summary of Effects

As described above, the Project will improve the safety of SH16 within the area of works. The Project will increase the safety of the corridor for the increased number of users, benefiting community's health and safety and social wellbeing by lowering the potential for injury or death.

The construction methodology has identified ways in which effects will be minimised to cyclists and traffic such as traffic management options and ensuring any disruptions occur during low traffic times. The construction works will be undertaken largely within the existing designation and consist of normal state highway operation and maintenance activities, which can be undertaken under the purpose of the designation. Noise and vibration effects will be managed through the CNVMP. Effects to the watercourses relating to the bridge works will be managed using best practice methods to prevent discharges.

Earthworks will take place in small volumes along the corridor in various stages and locations and will be managed by way of controls to manage potential sedimentation effects outlined in the ESCP. Any potential effects associated with land contamination will be managed through the implementation of a Contaminated Soils Management Plan.

Landscape and visual effects resulting from the earthworks and vegetation removal will be mitigated by replacement planting and visual treatments to the retaining walls.

Effects arising from the temporary land acquisition will be mitigated through site specific arrangements with landowners, e.g. fencing and via lease agreements/ compensation through the Public Works Act processes.

There is currently no stormwater treatment in this section of SH16. project will result in an increase in impervious surface. The proposed stormwater management system will treat all of the new impervious road surface from the road widening and as much as practical for

existing surfaces. Stormwater retention/ detention will be managed, and the effects are considered to be less than minor.

Approximately 6,880m2 of land acquisition is required for permanent works. The primary effect for the majority of the land parcels is the loss of productive or useable land, which will be mitigated by compensation through the Public Works Act process. The extent of the land requirements from each individual property will not preclude the overall existing function and use of each property continuing. It is therefore considered that the effects of land acquisition will be less than minor.

Draft consent conditions are also proposed in Appendix M to manage effects related to earthworks, stormwater, archaeological features and construction noise and vibration. Effects are therefore considered to be less than minor.

# 9. NOTIFICATION ASSESSMENT

A Notice of Requirement for an alteration to the existing designation and regional resource consents are being concurrently sought.

## 9.1 Alteration to Designation Notification

Section 169 of the RMA sets out the process that Council must follow in considering the need to notify a NoR made under section 168. The notification assessment for a NoR is set out in section 149ZCB(1) to (4), 149ZCC(1) to (4), 149ZCE and 149ZCF. Using modifications as set out in section 169((1)(b), these state:

### 9.1.1 149ZCB Public notification of requirement at territorial authority's discretion

(1) The territorial authority may, in its discretion, decide whether to require the territorial authority to publicly notify an application or a notice.
(2) Despite subsection (1), the territorial authority must publicly notify an application or a notice if—

  (a) the territorial authority decides (under section 149ZCE) that the activity that is the subject of the application or notice will have, or is likely to have, adverse effects on the environment that are more than minor; or
  (b) the requiring authority requests public notification of the application or notice; or
  (c) a rule or national environmental standard requires public notification of the application or notice.

(3) Despite subsections (1) and (2)(a), the territorial authority must not publicly notify the application or notice if–
  (a) a rule or national environmental standard precludes public notification of the application or notice; and
  (b) subsection (2)(b) does not apply.
(4) Despite subsection (3), the territorial authority may publicly notify an application or a notice if the territorial authority decides that special circumstances exist in relation to the application or notice.

Assessment

Section 8 of this NoR concludes that any actual and potential adverse environmental effects will be minor in relation to the sites within the alteration to designation, and less than minor beyond the alteration to designation.

The Transport Agency as the requiring authority does not seek public notification.

There is no rule or national standard which requires public notification of this alteration to designation.

There are no special circumstances that require public notification.

### 9.1.2 149ZCC Limited notification of notice of requirement

(1) If the territorial authority decides not to require the territorial authority to publicly notify an application or a notice, the territorial authority must, in relation to the activity,—
  (a) decide if there is any affected person (under section 149ZCF); and
  (b) identify any affected protected customary rights group or affected customary marine title group.
(2) The territorial authority must give limited notification of the application or notice to any affected person unless a rule or national environmental standard precludes limited notification of the application or notice.

(3) The territorial authority must give limited notification of the application or notice to an affected protected customary rights group or affected customary marine title group even if a rule or national environmental standard precludes public or limited notification of the application or notice.
(4) In subsections (1) and (3), the requirements relating to an affected customary marine title group apply only in the case of applications for accommodated activities.

Assessment

It is concluded that landowners where land is required for the alteration to designation (Appendix C) require notification as an affected party, for the reasons set out in Section 9.1.3 below.

There are no identified affected customary rights group or customary marine title group.

Section 8 of this NoR concludes that any actual and potential adverse environmental effects will be minor in relation to the sites within the alteration to designation, and less than minor beyond the alteration to designation.

There are no affected protected customary rights group or affected customary marine title group for this Project.

### 9.1.3 149ZCF Territorial authority to decide if person is affected

(1) The territorial authority must decide that a person is an affected person, in relation to an activity, if the adverse effects of the activity on the person are minor or more than minor (but are not less than minor).
(2) The territorial authority, in making his or her decision,—
    (a) may disregard an adverse effect of the activity on the person if a rule or national environmental standard permits an activity with that effect; and
    (b) in the case of a controlled activity or a restricted discretionary activity, must disregard an adverse effect of the activity on the person if the activity does not relate to a matter for which a rule or national environmental standard reserves control or restricts discretion; and
    (c) must have regard to every relevant statutory acknowledgement made in accordance with an Act specified in Schedule 11.
(3) Despite anything else in this section, the territorial authority must decide that a person is not an affected person if—
    (a) the person has given, and not withdrawn, approval for the activity in a written notice received by the authority before the authority has decided whether there are any affected persons; or
    (b) it is unreasonable in the circumstances to seek the person's written approval.

Assessment

It is considered that where land is required (permanent or temporary) the land owner is an affected party as the assessment of effects in Section 8 of this AEE concluded that effects on these parties were minor.

All identified affected land owners (see Appendix J) have been contacted and written approval is being sought but is not anticipated prior to lodgement.

### 9.1.4 Summary

Given the above assessment it is our opinion that the NoR does not warrant public notification under Sections 149ZCB and 149ZCE of the RMA.

The above assessment of limited notification concludes that landowners from which land is required for the alteration of designation have minor effects and in accordance with 149zcc (1) (a) and 1497ZCF (1) require notification.

Therefore, for the reasons outlined in the table above, it is requested that this notice of requirement be processed on a limited notified basis. It is recommended that notification is limited to landowners within the alteration to designation for which land is required (Appendix C).

## 9.2 Resource Consent Notification

### 9.2.1 Section 95A Notification at Discretion of the Council

Section 95A sets out the steps that a territorial authority must follow to determine whether to publicly notify an application for resource consent.

***Step 1: mandatory public notification in certain circumstances***

If an application meets Section 95A (3) it is mandatory public notification:

(a) the applicant requests public notification of the application; or
(b) public notification is required under Section 95C
(c) the application is made jointly with an application to exchange recreation reserve land under Section 15AA of the Reserve Act 1997

Assessment

The Transport Agency as the applicant does not seek public notification of the resource consent matters and does not meet the requirements of 95A (3b) or (3c).

***Step 2: if not required by step 1, public notification precluded in certain circumstances***

95A (5) The criteria for step 2 are as follows:
(a) the application is for a resource consent for 1 or more activities, and each activity is subject to a rule or national environmental standard that precludes public notification:
(b) the application is for a resource consent for 1 or more of the following, but no other, activities:

(i) a controlled activity:
(ii) a restricted discretionary or discretionary activity, but only if the activity is a subdivision of land or a residential activity:
(iii) a restricted discretionary, discretionary, or non-complying activity, but only if the activity is a boundary activity: (iv)a prescribed activity (see section 360H(1)(a)(i)).

Assessment:

The overall application is for a discretionary activity and therefore does not meet the criteria above. In accordance with 95A(4) (b) the assessment proceeds to step 3.

***Step 3: if not precluded by step 2, public notification required in certain circumstances***

Public notification is required if the criteria set out in Section 95A (8) are met:

(a) the application is for a resource consent for 1 or more activities, and any of those activities is subject to a rule or national environmental standard that requires public notification:
(b) the consent authority decides, in accordance with section 95D, that the activity will have or is likely to have adverse effects on the environment that are more than minor

Assessment:

Section 95A(8)(a): there is no rule or national standard which requires public notification of this resource consent.

### 9.2.2 Section 95D Consent authority decides if adverse effects likely to be more than minor

A consent authority that is deciding, for the purpose of Section 95A(8)(b), whether an activity will have or is likely to have adverse effects on the environment that are more than minor –

(a) must disregard any effects on persons who own or occupy –
  (i) the land in, on, or over which the activity will occur; or
  (ii) any land adjacent to that land; and
(b) must disregard any effect on a person who has given their written approval to the relevant application.

Assessment

Section 95A(8)(b) and 95D: Section 6 of this AEE concludes that any actual and potential adverse environmental effects in relation to the resource consent matters will be less than minor.

No parties have provided written approval in terms of s95D(e).

***Step 4: public notification in special circumstances***

95A (9) Determine whether special circumstances exist in relation to the application that warrant the application being publicly notified and —

(a) if the answer is yes, publicly notify the application; and

(b) if the answer is no, do not publicly notify the application, but determine whether to give limited notification of the application under section 95B.

Assessment:

It is considered that there are no special circumstances that would warrant the application being publicly notified. Generally, the public feedback to the proposal has been supportive (refer to section 9). The scale of the works are not considered to be exceptional, or unusual and the works, in terms of both construction and operation, are of a type that could reasonably be expected to occur on a state highway project.

### 9.2.3 Section 95B Limited Notification of Consent Applications

Section 95B sets the process for a consent authority to determine whether to give limited notification.

***Step 1: certain affected groups and affected persons must be notified***

95B (2) Determine whether there are any—

(a) affected protected customary rights groups; or
(b) affected customary marine title groups (in the case of an application for a resource consent for an accommodated activity).

(3) Determine—

(a) whether the proposed activity is on or adjacent to, or may affect, land that is the subject of a statutory acknowledgement made in accordance with an Act specified in Schedule 11; and
(b) whether the person to whom the statutory acknowledgement is made is an affected person under section 95E.

Assessment:

There are no affected protected customary groups.

***Step 2: if not required by step 1, limited notification precluded in certain circumstances***

95B (5) Determine whether the application meets either of the criteria set out in subsection (6) and,—

(a) if the answer is yes, go to step 4 (step 3 does not apply); and
(b) if the answer is no, go to step 3.

The criteria for step 2 are as follows:

(c) The application is for a resource consent for 1 or more activities, and each activity is subject to a rule or national environmental standard that precludes limited notification:
(d) the application is for a resource consent for either or both of the following, but no other, activities:
    (i) a controlled activity that requires consent under a district plan (other than a subdivision of land):
    (ii) a prescribed activity (see section 360H(1)(a)(ii)).

***Step 3: if not precluded by step 2, certain other affected persons must be notified***

(7) Determine whether, in accordance with section 95E, the following persons are affected persons:

(a) in the case of a boundary activity, an owner of an allotment with an infringed boundary; and
(b) in the case of any activity prescribed under section 360H(1)(b), a prescribed person in respect of the proposed activity.

(8) In the case of any other activity, determine whether a person is an affected person in accordance with section 95E.

(9) Notify each affected person identified under subsections (7) and (8) of the application.

***Step 4: further notification in special circumstances***

(10) Determine whether special circumstances exist in relation to the application that warrant notification of the application to any other persons not already determined to be eligible for limited notification under this section (excluding persons assessed under section 95E as not being affected persons), and,—

(a) if the answer is yes, notify those persons; and
(b) if the answer is no, do not notify anyone else.

Assessment:

It is considered that there are no special circumstances that would warrant the application being publicly notified. Generally, the public feedback to the proposal has been supportive (refer to section 9). The scale of the works are not considered to be exceptional, or unusual and the works, in terms of both construction and operation, are of a type that could reasonably be expected to occur on a state highway project.

***Consent authority decides if person is affected person***

95E (1) For the purpose of giving limited notification of an application for a resource consent for an activity to a person undersection 95B(4) and (9) (as applicable), a person is an affected person if the consent authority decides that the activity's adverse effects on the person are minor or more than minor (but are not less than minor).

(2) The consent authority, in assessing an activity's adverse effects on a person for the purpose of this section,—

(a) may disregard an adverse effect of the activity on the person if a rule or a national environmental standard permits an activity with that effect; and
(b) must, if the activity is a controlled activity or a restricted discretionary activity, disregard an adverse effect of the activity on the person if the effect does not relate to a matter for which a rule or a national environmental standard reserves control or restricts discretion; and
(c) must have regard to every relevant statutory acknowledgement made in accordance with an Act specified in Schedule 11.

(3) A person is not an affected person in relation to an application for a resource consent for an activity if—

(a) the person has given, and not withdrawn, approval for the proposed activity in a written notice received by the consent authority before the authority has decided whether there are any affected persons; or

(b) the consent authority is satisfied that it is unreasonable in the circumstances for the applicant to seek the person's written approval.

(4) Subsection (3) prevails over subsection (1).

Assessment:

The actual and potential adverse effects in relation to this resource consent application are considered to be less than minor (see Section 8 of this report). Therefore, it is considered that there are no affected parties that require limited notification. Steps 2 to 4 do not apply to this application, there are no activities that preclude limited notification or activities listed in Step 3 or 4 that apply to this application.

### 9.2.4 Summary

Given the above it is our opinion that this resource consent application does not warrant public notification under Sections 95A and 95D of the Act, and does not warrant limited notification under Sections 95B and 95E of the Act. Itis recommended that the resource consent application be processed on a non-notified basis.

# 10. STATUTORY ASSESSMENT

This section provides an assessment of the Project against all of the statutory documents identified in section 2 above.

## 10.1 Resource Management Act 1991

The key statutory matters under the RMA of relevance to the Project are:

- Part 2, which establishes the purpose and principles of the Act (sections 5-8);
- Section 104, which sets out the principal matters, subject to Part 2, that a consent authority shall have regard to (and other matters it must disregard) when considering an application for resource consent and any submissions received;
- Section 105, which relates to matters relevant to applications for discharge permits;
- Sections 166 to 186, which set out the process and procedure for a requirement for a designation or alteration to designation.

Further detail regarding the relevant provisions and the specific Project components subject to each of the authorisation processes is provided in sections 10.1.1 and 10.1.2 below.

### 10.1.1 Part 2 – Purpose and Principles

Part 2 sets out the purpose and principles of the RMA. The purpose of the RMA as set out in Section 5 is to promote the sustainable management of natural and physical resources. Section 6 of the RMA sets out matters of national importance. Section 7 sets out other matters to be considered. Section 8 requires that the Transport Agency take into account the principles of the Treaty of Waitangi.

Of particular relevance to the proposed works are:

- Social, economic and cultural wellbeing, and health and safety;
- The efficient use and development of natural and physical resources;
- The maintenance and enhancement of amenity values; and
- Avoiding, remedying or mitigating any adverse effects of activities on the environment.

**Section 5**

Section 5 focuses on managing the use, development and protection of resources in a way that provides for communities' social, economic, and cultural wellbeing, health and safety, tempered by the need to provide for future generation's needs, safeguard the life supporting capacity of the natural environment and avoid, remedy and mitigate adverse environmental effects.

The objective of the proposed works are to improve the health and safety of the road users, therefore contributing to their social, economic and cultural well-being. The safety improvements are necessary to provide a safer road user experience and crash history data has demonstrated that the current highway environment does not provide the adequate safety measures required in the Project.

Effects of the works are predominately constrained to the temporary construction works area. The operational and ongoing effects of the works are limited to the stormwater and landscape visual effects. Section 8.4 of this report has concluded that the temporary and operational effects will be appropriately managed, and effects will be less than minor.

**Section 6**

The works proposed do not change the natural character of watercourses along the alignment of the Project. There are no outstanding natural features and landscapes within the area of works. Whilst some indigenous vegetation will be removed as a result of the

works, as assessed in section 8.2.7, the effects of this are considered to be less than minor. Replacement planting will use native species and be installed along the corridor.

**Section 7**

The works proposed will maintain amenity values of the Project corridor by way of the replacement planting proposed. The landscape and visual assessment concludes that the proposed planting is considered appropriate for the rural environment where it will be planted, and the scale of replanting will mitigate effects of the vegetation to be removed. The quality of the environment will therefore be maintained as concluded in section 8.2.7. As such, the works are considered to be consistent with Section 7 of the RMA.

**Section 8**

With regard to Section 8 of the RMA, the proposed works have not been identified as affecting any matters relating to the Treaty of Waitangi. Consultation with mana whenua is outlined in Section 7 of this report. Mana whenua will be offered the opportunity to work with Contractors to ensure cultural values are protected.

**Summary**

Overall, the proposed works are necessary to provide the necessary safety improvements to this corridor for the sustainable long term use and safety requirements of the community and will therefore enable people and communities to provide for their social, economic and cultural wellbeing, and for their health and safety. The proposed works are therefore considered to be consistent with Part 2 of the RMA.

### 10.1.2 Section 104 – Consideration of Applications

Overall, the Project requires resource consent as a Discretionary activity and the statutory assessment contained in the following sections has been undertaken on the basis of this activity status.

Section 104 is relevant for assessing those Project components (and their effects) for which resource consent is sought. Section 104 sets out the matters the consent authority must, subject to Part 2, have regard to when considering an application for resource consent as follows:

(1) When considering an application for a resource consent and any submissions received, the consent authority must, subject to Part 2, have regard to–
  (a) any actual and potential effects on the environment of allowing the activity; and
  (b) any relevant provisions of—
    i. a national environmental standard:
    ii. other regulations:
    iii. a national policy statement:
    iv. a New Zealand coastal policy statement:
    v. a regional policy statement or proposed regional policy statement:
    vi. a plan or proposed plan; and
  (c) any other matter the consent authority considers relevant and reasonably necessary to determine the application.

Actual and potential adverse effects are discussed in detail in section 8 of this AEE and is concluded that adverse effects will be less than minor. Relevant planning provisions are assessment in detail in section 10.2 and 10.3 and it is concluded that the Project is consistent with the relevant planning provisions.

Therefore, the AEE concludes that it is appropriate for the consent authority to grant consent under section 104 of the RMA.

### 10.1.3 Section 105 & 107 - Matters Relevant to Discharge Permits

Consent is sought to discharge stormwater. S105 requires the consent authority to, in addition to the matters in section 104(1), have regard to—

(a) the nature of the discharge and the sensitivity of the receiving environment to adverse effects; and
(b) the applicant's reasons for the proposed choice; and
(c) any possible alternative methods of discharge, including discharge into any other receiving environment.

In terms of the subject proposal, all stormwater discharged will be treated. The environments to which it will be discharged are considered to not be particularly sensitive. As discussed above in section 8, the proposed discharge locations are considered to be the best practicable option given topography, the location of the two watercourses and nature of the catchment within which the Project is located.

### 10.1.4 Section 171 – Recommendation by the Territorial Authority

Section 171 is relevant for assessing those Project components (and their land use effects) to be authorised by designation. These Project components include:

- Construction, operation and maintenance of the safety improvement works;
- Mitigation for adverse noise and vibration effects during construction and operation;
- Vegetation removal; and
- Urban and landscape design, including measures proposed to address effects on and enhance cultural values.

When considering a requirement, section 171(1) of the RMA requires a territorial authority to consider the effects on the environment of allowing the requirement, subject to Part 2, having particular regard to a range of specified matters. These are:

- The relevant provisions of any policy statement or plans: These are considered in section 2 of this AEE and summarised below in 10.2 and 10.3;
- Whether adequate consideration has been given to alternative sites, routes, methods of undertaking the works: This is considered in section 6 of this report, and it is concluded that adequate and robust consideration has been given to the reasonable alternatives that achieve the Project Objectives;
- Whether the work and designation are reasonably necessary for achieving the objectives of the requiring authority: The designation and works are necessary for the reasons below; and
- Relevant "other matters" that the territorial authority considers reasonably necessary in order to make a recommendation on the requirement. There is no other relevant legislation.

The proposed works are reasonably necessary for achieving the Project objectives, as the Project will increase the safety of the corridor by reducing the number of DSIs. This was discussed in more detail in Section 5.3 of this Report.

Overall, with regard to Section 171(1) of the RMA, it is considered that:

- The Project is consistent with the relevant provisions of the RMA planning documents;
- Adequate consideration has been given to alternative sites, routes, or methods of undertaking the work; and
- The designation and proposed works are reasonably necessary to achieve the Transport Agency's Project Objectives.

## 10.2 National Policy Statements

### 10.2.1 National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health

The NES for Contamination came into effect on 1 January 2012 and is of relevance to this Project given the requirement to undertake earthworks within areas of potentially contaminated land.

The purpose of the NES for Contamination is to:

- Provide a nationally consistent set of planning controls and soil contaminant values; and
- Ensure that land affected by contaminants in soil is appropriately identified and assessed before it is developed – and if necessary, the land is remediated, or the contaminants contained to make the land safe for human use.

A Primary Environmental Site Investigation (Contaminated Land) was undertaken for the Project (Appendix G) as is assessed in detail in section 8.3.4 of this AEE. A desktop assessment of the likely soil contaminants has been undertaken and concludes that it is possible there is some contamination along sections of the Project alignment. The report recommends undertaking further studies as part of detailed design, in accordance with the NES for Contamination and prior to construction works commencing. Given the existing assessment and future assessment that will undertake, it is considered the project is consistent with the purpose of the NES for Contamination and will not lead to any adverse effects on human health.

## 10.3 Auckland Planning Documents

### 10.3.1 Auckland Unitary Plan (Operative in Part) – Regional Policy Statement (AUP-OP – RPS)

The objectives and policies of the Regional Policy Statement that are considered relevant to this application are outlined and commented on in Table 8 below.

**Table 8 Assessment of Relevant AUP-OP Regional Policies and Objectives**

| REFERENCE | OBJECTIVE/POLICY | COMMENT |
|---|---|---|
| **Chapter B3 – Infrastructure, transport and energy** | | |
| **Objectives** | | |
| B3.3.1 | (1) Effective, efficient and safe transport that:<br>(a) Supports the movement of people, goods and services; and<br>(d) Avoids, remedies or mitigates adverse effects on the quality of the environment and amenity values and the health and safety of people and communities. | The Project aims to reduce both the amount and seriousness of crashes along this corridor by implementing safety improvements. This will improve the effectiveness, efficiency and safety of this transport corridor and support users to move safely and efficiently. No adverse effects are anticipated from the works and any effects identified will be managed or avoided. Earthworks effects will be managed using ESC measures. |
| **Policies** | | |
| B3.3.2 Managing transport infrastructure | (1) Enable the effective, efficient and safe development, operation, maintenance and upgrading of all modes of an integrated transport system. | |
| | (2) Enable the movement of people, goods and services and ensure accessibility to sites. | |

| | | |
|---|---|---|
| | (3) Identify and protect existing and future areas and routes for developing Auckland's transport infrastructure. | |
| B3.3.2 Managing effects related to transport infrastructure | (7) Avoid, remedy or mitigate the adverse effects associated with the construction or operation of transport infrastructure on the environment and on community health and safety. | |
| **Chapter B6 – Mana Whenua** | | |
| **Objectives** | | |
| B6.3 | (3) The relationship of mana whenua and their customs and traditions with natural and physical resources that have been scheduled in the Unitary Plan in relation to natural heritage, natural resources or historic heritage values is recognised and provided for. | SRA have engaged with mana whenua. Refer section 7.2.4 of this report for a summary of the feedback received from Nga Maunga Whakahii O Kaipara and Te Kawerau a Maki. |
| **Policies** | | |
| | (1) Enable mana whenua to identify their values associated with all of the following:<br>(a) ancestral lands, water, air, sites, wāhi tapu, and other taonga;<br>(b) freshwater, including rivers, streams, aquifers, lakes, wetlands, and associated values;<br>(c) biodiversity;<br>(d) historic heritage places and areas; and<br>(e) air, geothermal and coastal resources. | |
| **Chapter B7 – Natural resources** | | |
| **Objectives** | | |
| B7.4.1 | (1) Coastal water, freshwater and geothermal water are used within identified limits while safeguarding the life-supporting capacity and the natural, social and cultural values of the waters. | The surrounding environment will be protected during construction through ESC measures (see Appendix I). Works within proximity of the two streams will be minimal and will not have adverse effects on these waterbodies. |
| | (2) The quality of freshwater and coastal water is maintained where it is excellent or good and progressively improved over time where it is degraded. | |
| | (4) The adverse effects of point and non-point discharges, in particular stormwater runoff and wastewater discharges, on coastal waters, freshwater and geothermal water are minimised, and existing adverse effects are progressively reduced. | |
| **Policies** | | |
| B7.4.2 Water quality | (7) Manage the discharges of contaminants into water from subdivision, use and development to avoid where practicable, and otherwise minimise, all of the following: | |

| | | |
|---|---|---|
| | (b) adverse effects on the quality of freshwater and coastal water; | |
| B7.4.2 Stormwater management | (9) Manage stormwater by all of the following:<br>(a) requiring subdivision, use and development to:<br>(i) minimise the generation and discharge of contaminants; and<br>(ii) minimise adverse effects on freshwater and coastal water and the capacity of the stormwater network;<br>(b) adopting the best practicable option for every stormwater diversion and discharge; and<br>(c) controlling the diversion and discharge of stormwater outside of areas serviced by a public stormwater network. | |

### 10.3.2 Auckland Unitary Plan (Operative in Part) – Objectives and Policies

The objectives and policies of the AUP-OP that are considered relevant to this application are outlined and commented on in Table 9 below.

**Table 9 Assessment of Relevant AUP-OP Policies and Objectives**

| REFERENCE | OBJECTIVE/POLICY | COMMENT |
|---|---|---|
| **E1 Water quality and integrated management** | | |
| **Objectives** | | |
| E1.2 | (1) Freshwater and sediment quality is maintained where it is excellent or good and progressively improved over time in degraded areas. | The contaminants in stormwater runoff from the highway will be reduced for the overall project area, reducing potential adverse effects (see Appendix D for full details).<br><br>The stormwater design is based on the best practicable approach for:<br>• the spatial limitations of the project corridor;<br>• the topographical limitations of the project corridor;<br>• the scale and significance of adverse effects (the increase impervious area is 24%); and<br>• the proposed treatment will result in less than minor overall effects. |
| | (3) Stormwater and wastewater networks are managed to protect public health and safety and to prevent or minimise adverse effects of contaminants on freshwater and coastal water quality. | |
| **Policies** | | |
| E1.3 | (12) Manage contaminants in stormwater runoff from high contaminant generating car parks and high use roads to minimise new adverse effects and progressively reduce existing adverse effects on water and sediment quality in freshwater systems, freshwater and coastal waters. | |

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| | | See the Stormwater Report in Appendix D for full details. |
| **E3 – Lake, river, streams and wetlands** | | |
| **Objectives** | | |
| E3.2 | (4) Structures in, on, under or over the bed of a lake, river, stream or wetland are provided for where there are functional or operational needs for the structure to be in that location, or traverse that area. | The new bridge piers align with the existing piers on Berry Bridge, and the works at Kumeu No 2 will not require piles in the stream, but will require piles at the abutment.<br>There will be no increase in existing flood levels.<br>No construction will be required in the bed of the watercourse; no diversion is required.<br>Staging on the stream bank may be required for pilling work, which might mean temporary piles in the stream bank or stream bed. This will be confirmed as more construction methodology information is required.<br>No debris or material will be deposited in the bed of the lake, river or stream. |
| | (5) Activities in, on, under or over the bed of a lake, river, stream and wetland are managed to minimise adverse effects on the lake, river, stream or wetland. | |
| **Policies** | | |
| | (7) Provide for the operation, use, maintenance, repair, erection, reconstruction, placement, alteration or extension, of any structure or part of any structure in, on, under, or over the bed of a lake, river, stream or wetland, and any associated diversion of water, where the structure complies with all of the following:<br>(d) the structure is for any of the following:<br>(ii) designed to maintain and/or enhance public access to, over and along any lake, river, stream or wetland and their margins;<br>(iv) associated with infrastructure; | |
| | (8) Enable the removal or demolition of any structure or part of any structure in, on, under, or over the bed of a lake, river, stream or wetland, and any associated diversion of water, provided adverse effects are avoided, remedied or mitigated. | |
| **E10 Stormwater management area – Flow 1 and Flow 2** | | |
| **Objectives** | | |
| E10.2 | (1) High value rivers, streams and aquatic biodiversity in identified urbanised catchments are protected from further adverse effects of stormwater runoff associated with urban development and where possible enhanced. | The proposed works include stormwater management improvements. All stormwater runoff will be treated prior to discharge.<br>Most of the stormwater will be conveyed in bio-retention swales.<br>Constraints to the hydrological mitigation that is proposed are predominantly due to the constrained area in which to install stormwater infrastructure – the railway corridor is located on the north side of the road, and |
| **Policies** | | |
| E10.3 | (1) Manage stormwater runoff from impervious areas in Stormwater management area – Flow 1 and Flow 2 areas to minimise the adverse effects of stormwater runoff on rivers and streams to retain, and where possible enhance, stream naturalness, biodiversity, bank stability and other values. | |
| | (2) Require stormwater hydrology mitigation in Stormwater management | |

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| | area control – Flow 1 and Flow 2 areas where there are:<br>(a) new impervious areas;<br>(b) redeveloped impervious areas; or<br>(c) entire sites where the area of development or redevelopment comprises more than 50 per cent of the site area. | private properties line the adjacent side of the road. |
| | (3) Recognise that there may be limitations to the hydrology mitigation that can practicably be achieved in some circumstances, particularly in association with redevelopment, including: (a) space limitations; (b) requirements to provide for other utility services; and (c) the function of roads as overland flow paths conveying stormwater runoff from surrounding land uses which the road controlling authority has limited ability to control. | |
| **E11 – Regional land disturbance** | | |
| **Objectives** | | |
| E11.2 | (1) Land disturbance is undertaken in a manner that protects the safety of people and avoids, remedies and mitigates adverse effects on the environment. | Potential adverse effects of sedimentation arising from the proposed land disturbance on water quality and/or neighbouring sites will be appropriately mitigated through the implementation of suitable ESC measures. These measures are in general accordance with Auckland Council's Guidance Document Erosion and Sediment Control (GD05, 2016). See Appendix I for full details.<br><br>No site of cultural significance have been identified within the corridor (refer Appendix E and Appendix F). The following measures will be implemented to mitigate potential effects of accidental discovery:<br>• a cultural induction will be provided by a nominated party to the Contractors prior to commencement of works; and<br>• Accidental Discovery Protocols (E12.6.1) set out in the AUP-OP will be complied with.<br><br>Earthworks are required to construct the safety |
| | (2) Sediment generation from land disturbance is minimised. | |
| | (3) Land disturbance is controlled to achieve soil conservation. | |
| **Policies** | | |
| E11.3 | (1) Avoid where practicable, and otherwise mitigate, or where appropriate, remedy adverse effects on areas where there are natural and physical resources that have been scheduled in the Plan in relation to natural heritage, mana whenua, natural resources, coastal environment, historic heritage and special character. | |
| | (2) Manage land disturbance to:<br>(a) retain soil and sediment on the land by the use of best practicable options for sediment and erosion control appropriate to the nature and scale of the activity;<br>(b) manage the amount of land being disturbed at any one time, particularly where the soil type, topography and location is likely to result in increased sediment runoff or discharge;<br>(c) avoid, remedy and mitigate adverse effects on accidentally discovered sensitive material; and<br>(d) maintain the cultural and spiritual values of mana whenua in terms of land and water quality, preservation of wāhi tapu, and kaimoana gathering. | |

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| | (3) Manage the impact on mana whenua cultural heritage that is discovered undertaking land disturbance by:<br>(a) requiring a protocol for the accidental discovery of kōiwi, archaeology and artefacts of Māori origin;<br>(b) undertaking appropriate actions in accordance with mātauranga and tikanga Māori; and<br>(c) undertaking appropriate measures to avoid adverse effects. Where adverse effects cannot be avoided, effects are remedied or mitigated. | improvement works that will provide for the health and safety of the wider community. Earthworks will be managed in accordance with the specific site constraints (see Appendix H) and are designed in manner that address potential contamination and safety of the surrounding land and road. |
| | (4) Enable land disturbance necessary for a range of activities undertaken to provide for people and communities social, economic and cultural well-being, and their health and safety. | |
| | (6) Require that earthworks are designed and undertaken in a manner that ensures the stability and safety of surrounding land, buildings and structures. | |
| **H22 Strategic Transport Corridor Zone** | | |
| H22.2 | (1) Railway and state highway corridors are used safely, effectively and efficiently for the transportation of people and goods in an integrated manner. | The proposed works are required to improve the safety of the corridor which will therefore enable the state highway to be used safely, effectively and efficiently to transport people and goods.<br><br>The Acoustics Assessment (Appendix L) has concluded that the noise associated with construction and operation of the road will not be significant. Chapter 8 concludes that there will be less than minor noise and vibration effects on adjacent properties. A CNVMP will be implemented by the appointed Contractor to apply noise and vibration mitigation measures.<br>The amenity values of the Project corridor will be maintained by way of the replacement planting proposed. Section 8.2.7 concludes that the planting will be appropriate for the rural environment where it will be planted. The scale of replanting will mitigate effects on adjoining properties. |
| | (3) Potential effects of the location and design of noise mitigation measures on adjacent development are managed. | |
| | (4) Any non-transport related activities do not generate adverse reverse sensitivity effects on the operation of the corridor | |
| **Policies** | | |
| H22.3 | (1) Provide for the operational requirements of transport activities and a range of appropriate transport related activities | |
| | 4) Enable the provision of works and measures such as noise mitigation, landscaping and artworks that enhance infrastructure and minimise its adverse effects on adjoining development existing at the time of infrastructure construction. | |

# 11. CONCLUSION

The purpose of the project is to provide for safety improvements to SH16 between Huapai and Waimauku.

The Project proposes to install safety infrastructure including side barriers, median barriers, and widened shoulders that will assist in reducing severity of head-on and run-off road accidents. This will have significant positive effects on road users' health and safety and social wellbeing by lowering the potential for injury or death. It will also support economic development by lowering the potential for delays in freight delivery and/or damage of goods and environmentally, reducing the risk of a crash reduces the potential for spills, fire or other contamination to and/or damage of the surrounding environment.

The stormwater management and landscaping proposed will improve the physical environment.

The adverse effects associated with the Project have been assessed in terms of actual and potential effects through both construction and operation, and against the relevant provisions of relevant legislation and policy documents.

## 11.1 Alteration to Designation

Potential effects of the alteration to the state highway designation relate to the permanent acquisition of land. The extent of the land required from individual properties is relatively minor and will not preclude the existing land use continuing. It is considered that the land acquisition will result in effects which are minor but can be mitigated through compensation through the Public Works Act process and through accommodation works (e.g. replacement planting and/or reconstruction of access).

However, the written approval of the landowners, from which land is required, has not yet been obtained and therefore, the potential adverse effects are currently assessed as being minor.

## 11.2 Resource Consents

It is concluded that with appropriate mitigation, the adverse effects of the proposed works will be less than minor. It is concluded that the proposed works are in accordance with the relevant provisions of relevant legislation and statutory planning documents.

Accordingly, it is our opinion that Auckland Council are able to grant the resource consents sought.