s 9(2)(f)(ii), s 9(2)(g)(i)

s 9(2)(f)(ii), s 9(2)(g)(i)

s 9(2)(f)(ii), s 9(2)(g)(i)

s 9(2)(f)(ii), s 9(2)(g)(i)

Comments on applications for referral under the COVID-19 Recovery (Fast-track Consenting) Act 2020

This form is for persons requested by the Minister for the Environment to provide comments on an application to refer a project to an expert consenting panel under the COVID-19 Recovery (Fast-track Consenting) Act 2020.

Organisation providing comment	Auckland Transport
Contact person (if follow-up is required)	Katherine Dorofaeff, Principal Planner, Land Use Policy and Planning North / West
	s 9(2)(a)
	s 9(2)(a)

Comment form

Please use the table below to comment on the application.

Project name	Whenuapai Development Project PJ-0000839
General comment	Thank you for the opportunity to provide comments on the referral of the Whenuapai Development Project (the Project) for consideration under the COVID-19 Recovery (Fast-track Consenting) Act 2020 (Covid 19 Recovery Act). Due to the Future Urban zoning (FUZ) of the site Auckland Transport considers it more appropriate for the Project to proceed through the private plan change process, rather than through the Covid Recovery Act. Under the Auckland Unitary Plan (Operative in Part)(AUP) the sites are currently zoned Future Urban. The AUP states that Future Urban zoned land should not be developed for urban purposes until it has been through a structure planning and plan change process (refer Policy B2.2.2(3), Objective H18.2(1) of AUP). While a structure plan has been completed for FUZ land at Whenuapai, the land has not been rezoned for urban use. It is noted that Sites A to C were part of the area of Whenuapai included in the Council's previously proposed Plan Change 5, which was withdrawn in June 2022 due to infrastructure funding concerns. Site D was not included in Plan Change 5. Auckland Transport requests that, should the project be accepted for Fast-track consenting, the requirement for an Integrated Transport Assessment (ITA) which includes analysis addressing the matters set out below, is formally stated in the referral order to accompany any resource consent application for the Project lodged with the Environmental Protection Authority. A Stormwater Management Plan should also be required. Auckland Transport also requests that the referral order specifically identifies Auckland Transport as a party which the Expert Consenting Panel must invite comments from.
Other considerations	If the Project is referred for processing under the Covid 19 Recovery Act, then a comprehensive Integrated Transport Assessment should be provided. A transport memorandum has been provided by Commute Transportation Consultants (Commute) to support the application. The Commute memo provides a preliminary assessment of the potential transport implications of the proposal. However, a more comprehensive ITA should be provided. As noted by Commute, Waka Kotahi New Zealand Transport Agency will have an interest in the effects of the developments at Sites A to C on the operation of the Brigham Creek Road / SH18 interchange. The main objective of an ITA is to ensure that the potential adverse transport effects of a development proposal are well considered and addressed with particular consideration of

accessibility to and from the development for all modes as well as safety and efficiency effects. The assessment should ensure that any potential adverse transport effects of the development have been effectively avoided, remedied or mitigated. Auckland Transport requests the following assessments and information form part of the ITA:

- Whether the Project meets the relevant objectives and policies of the AUP as they relate to transport, including integration of land use and transport;
- The potential adverse safety effects on the surrounding transport network and how these effects will be avoided, remedied or mitigated;
- The potential adverse effects on the efficient operation of the surrounding transport network and how these effects will be avoided, remedied or mitigated. There should be particular emphasis on key intersections;
- Clear identification of the mitigation required to address transport effects, who is responsible for providing it, and how it would be staged and sequenced with site development;
- Whether the Project provides for adequate future roading connections to adjacent sites in the future;
- The bicycle parking requirements for the residential and industrial activities / lots;
- The appropriate location and provision of bus stops;
- The street design including the design philosophy for all new roads supporting the spatial allocation for each mode and outlining how the design appropriately and safely provides for all transport users;
- Whether proposed roads to vest meet the relevant transport standards of the Auckland Code of Practice for Land Development and Subdivision;
- The effects of any other reason for consent under Chapter E26 Infrastructure and Chapter E27 Transport of the AUP;
- A Draft Construction Traffic Management Plan (CTMP) including assessment of effects of construction traffic (including measures to maintain safe and efficient operation for all road users), the construction period and associated earthworks;
- The likely impacts of earthworks and construction activity and heavy vehicle movements on road pavements in the vicinity of the site;
- For Site D, 90 Trig Road, plans should show the location of the Notice of Requirement (NoR) boundaries for the Trig Road and Spedding Road upgrade projects so that the impacts can be better evaluated.

If the project is referred for processing under the Covid 19 Recovery Act, a Stormwater Management Plan should be provided. For Site D, further information is sought about the private stormwater pond proposed and whether it provides stormwater management for the new road included in the Project. The design for the NoRs (Trig Road and Spedding Road upgrade projects) has sized stormwater ponds to treat and attenuate for those road corridors only.

Residential development (227 lots) is proposed on the three sites at Sinton Road and Clarks Lane i.e. 15 Clarks Lane (Site A), 10 & 16 Sinton Road (Sites B & C). A residential use is consistent with the Whenuapai Structure Plan. None of the sites are contiguous. All dwellings will gain vehicle access via public roads or Jointly Owned Access Lots. The applicant has shown a proposed layout which indicates how roads serving the sites could be extended to connect through adjoining sites in the future. The applicant would like to construct a road along the alignment of paper road running along the eastern boundary of Site B. However this needs to be confirmed with Auckland Transport, and in the meantime the plan shows an alternative road within the site.

Commute recommends the following works to support the residential development:

- extend the unformed portion of Sinton Road by about 60m in front of Site C;
- widen an approximately 300m of the carriageway on Sinton Road from 5m to 6m to safely accommodate two-way traffic;
- urbanise the frontages of all sites including kerb and channel, footpaths, landscaping, street lighting;

	• provide approximately 840m of footpath to connect all sites to the SH18 overbridge at the southern end of Clarks Lane. This includes some interim facilities in front of neighbouring undeveloped sites; • some NSAAT markings may be required on the site frontages to achieve visibility requirements. An industrial development is proposed on Site D at 90 Trig Road. An industrial use is consistent with the Council's Whenuapai Structure Plan. The development is for nine industrial lots. Two of the lots are expected to have warehouse buildings while the remaining lots are expected to be storage yards (e.g. for contractors). Seven lots gain access via a new local road connecting to Spedding Road. The remaining two lots have direct access to either Spedding Road and Trig Road. Commute recommends the following works for the industrial development: • urbanise the frontages of all sites directly in front of each development site including kerb and channel, footpaths, landscaping, street lighting; • if the PC69 works have not been implemented in front of the site (footpath on the southern side of Spedding Road), construct footpath in front of the site only; • upgrade footpath on the western side of Trig Road to 1.8m in front of the site, in accordance with Auckland Transport specifications; • some NSAAT markings may be required on the site frontages to achieve visibility requirements. Site D is affected by two NoR notified on 23 March 2023 as part of the North West Local Network package. One NoR is for Trig Road (Project W1) and the other is for Spedding Road (Project W4). Auckland Transport is the requiring authority for these NoR. The purpose of both proposed designations is for the construction, operation and maintenance of an arterial transport corridor. Both arterials would be 24m wide two-lane cross sections with separated cycle lanes and footpaths. As part of the NoR, a new roundabout is proposed at the Trig Road / Spedding Road intersection. Under section 178(2) the NoR has interim effect and 'no person may do anything that would prevent or hinder the public work, project, or work to which the designation relates unless the person has the prior written consent of the requiring authority'. The works provided for in the NoR are unfunded and extended lapse dates of 15 years are sought by Auckland Transport. Development on Site D should integrate with the NoR projects. Frontage upgrades should provide separated walking and cycling facilities.
[Insert specific requests for comment]	Click or tap here to insert responses to any specific matters the Minister is seeking your views on.

Note: All comments, including your name and contact details, will be made available to the public and the applicant either in response to an Official Information Act request or as part of the Ministry's proactive release of information. Please advise if you object to the release of any information contained in your comments, including your name and contact details. You have the right to request access to or to correct any personal information you supply to the Ministry.

Comments on applications for referral under the COVID-19 Recovery (Fast-track Consenting) Act 2020

This form is for local authorities to provide comments to the Minister for the Environment on an application to refer a project to an expert consenting panel under the COVID-19 Recovery (Fast-track Consenting) Act 2020.

Local authority providing comment	Auckland Council
Contact person (if follow-up is required)	Hailey Kim s 9(2)(a)
	Ian Smallburn s 9(2)(a)
	Click or tap here to enter text.

Comment form

Please use the table below to comment on the application.

Project name	Whenuapai Development Project
General comment – potential benefits	Will add additional housing supply and choice. Public road extension and upgrades are proposed as part of the proposal. The proposal will also provide esplanade reserves, which will provide an opportunity for public access to the coastal and stream edges. Light industrial activities/lots are added to the community.
General comment – significant issues	• It is considered that the proposal could potentially contribute to and exacerbate misalignment between the timing of the infrastructure delivery and the urbanisation of greenfield areas. This compromises the ability to sequence and deliver future urban development in a sustainable, coordinated, and cost-efficient way. It is acknowledged that there is capacity in the current roading network. However, the existing infrastructure is not considered to be of an urban standard, and upgrades should be provided prior to consent being granted. Further details on this are contained in the responses from the Council's policy planner. • The application is inconsistent with the Auckland Unitary Plan and not aligned with the outcomes in the Auckland Plan 2050 as well as the Auckland Plan Development Strategy and Future Urban Land Supply Strategy. (See the Policy planner's comments below). • There is no immediate funding solution to respond to the cumulative effects from the unplanned urbanisation as explained in the Local Board Chairperson's response. This could potentially result in future wider network infrastructure upgrades required for this development to be borne by the ratepayer (See the Policy planner's comments below). • There is a risk that the vested assets Council may inherit are not consistent with the Council's standards or the community needs (see the Parks team's and the local board's comments). • There may be also potential reverse sensitivity issues as there will not be an appropriate regulatory framework (i.e. an urban residential zone) in place to manage those effects. • The proposal includes discharging stormwater to a Significant Ecological Area – Marine. At this stage, we are unable to determine that appropriate thought has been applied by the

	applicant on the potential impacts of the development on this environment (See Healthy Waters' response).
Is Fast-track appropriate?	• There are issues associated with the infrastructure needed to service this development which have not been resolved and would be ahead of the integrated provision of appropriate infrastructure. We have no immediate funding solutions to mitigate any actual and potential adverse effects to the wider environment from the unplanned urbanisation of the greenfield. • In addition, further investigation is required for the Council to review the appropriateness of the proposed park and the esplanade reserve from an asset owner's point of view. • It is therefore Auckland Council's view is that the application should appropriately proceed through the existing RMA consenting processes. We consider the greenfield areas, where the subject site sits in, should have comprehensive and coordinated planning carried out before they are urbanised.
Environmental compliance history	The following companies/stakeholders have been reviewed for previous compliance history: • Cabra Developments Limited • Lloyd William BARKER • Ian Gordon BOOCOCK • Duncan Murray UNSWORTH No enforcement action has been taken against any of the stakeholders above. There are no significant outstanding compliance concerns for the parties above that we are aware of.
Reports and assessments normally required	• An AEE • Acoustic assessment • Archaeological assessment • Lighting impact assessment • Integrated transport assessment • Ecological impact assessment • Geotechnical assessment • Groundwater effects assessment • A contaminated land detailed site investigation Report/Site Validation Report • Water and wastewater capacity assessment • Stormwater infrastructure report including a stormwater management plan and flood assessment • Urban design assessment • Visual impact assessment • Construction and erosion and sediment effects assessment • Economic assessment • Esplanade reserve assessment • Arboricultural assessment • Crime prevention through environmental design (CPTED) assessment • Cultural values assessment • Coastal hazard assessment

Iwi and iwi authorities	Ngāti Manuhiri - Ngati Manuhiri Settlement Trust Ngāti Maru - Ngāti Maru Rūnanga Trust Ngāti Pāoa - Ngāti Paoa Iwi Trust Ngāti Pāoa - Ngāti Paoa Trust Board Ngāti Tamaterā - Ngāti Tamaterā Settlement Trust Ngāti Te Ata - Te Ara Rangatu o Te Iwi o Ngāti Te Ata Waiohua Ngāti Whātua o Kaipara - Ngā Maunga Whakahii o Kaipara Development Trust Ngāti Whātua Ōrākei - Ngāti Whātua Ōrākei Trust Te Ākitai Waiohua - Te Ākitai Waiohua Iwi Authority Te Kawerau ā Maki - Te Kawerau Iwi Settlement Trust Te Rūnanga o Ngāti Whātua - Te Rūnanga o Ngāti Whātua
Relationship agreements under the RMA	NA
Insert responses to other specific requests in the Minister's letter (if applicable)	1. This is answered above. Detailed reasons are available below. 2. This is answered above. 3. This is answered above.
Other considerations	A local scale coastal hazard assessment was previously undertaken for the Whenuapai area under AUP Plan Change 5. While this plan change was formally withdrawn, and the CHA therefore not formalised, the report for the local scale CHA remains available and there is the opportunity for the applicant to update the approach and data with the current best practice, including Auckland Council's Coastal Hazard Assessment Guidance – please refer to the comments provided by the Council's Parks specialist. The Independent Māori Statutory Board requested that the Ministry ensures the initial engagement approach made by the applicant should be followed-up and a clear view from iwi on this application should be determined prior to any further progress.

Note: All comments, including your name and contact details, will be made available to the public and the applicant either in response to an Official Information Act request or as part of the Ministry's proactive release of information. Please advise if you object to the release of any information contained in your comments, including your name and contact details. You have the right to request access to or to correct any personal information you supply to the Ministry.

Asset Owner / Specialist Response

From: *Todd Elder, Senior Policy Planner, Plans and Places*

Date: 3 April 2023

Overall Summary:

(1) The following is Plans and Places comments on the 'Whenuapai Development Project' application under the COVID-19 Recovery (Fast-track Consenting) Act 2020 ("FCTA"), requested by the Resource Consents Department of Auckland Council.
(2) Plans and Places considers that if this application is to proceed under the FCTA, this will potentially urbanise the Site and influence the land-use of the site for more than the lifetime of the Auckland Unitary Plan (Operative in part) ("AUP").
(3) Plans and Places oppose this application, and request that this application to go through a Schedule 1 process of the Resource Management Act 1991 ("RMA") and then obtain resource consent through the AUP. It is also considered that this application should be split into two projects, being the residential component and business land-use component.
(4) More specifically, the residential component of this application (with it known geographic and infrastructure constraints) are of greater concern and requires a wider public participation that is provided under Schedule 1 of the RMA. I will expand on these points below.

Strategic Documents

(5) The Whenuapai Structure Plan (WSP) indicates the site is in 'stage 1' of development, which is identified in the Future Urban Land Supply Strategy as being development ready between in the next 2 – 10 years (2018-2026). The Future Urban Land Supply Strategy (FULSS) informs the Council's infrastructure funding priorities and feeds directly into the Council's long-term plans, annual plans, and other strategic documents. The Council's Future Urban Land Supply Strategy was refreshed in July 2017.
(6) Council is currently drafting Auckland's Future Development Strategy (as required by the National Policy Statement on Urban Development 2020 and the Local Government (Auckland Council) Act 2009) which will provide updated information on the timing and sequencing of all Future Urban Areas that align with key infrastructure requirements.
(7) A contributions policy which reflects the infrastructure needed to urbanise the Whenuapai area has not yet been developed and will likely be behind the developer's timeframe for development. This policy will ensure the cost of new infrastructure is fairly shared between developers and ratepayers on the basis of who causes the need for and who benefits from the investment. Allowing this development to proceed ahead of an updated contributions policy will result in future wider network infrastructure upgrades required for this development to be borne by the ratepayer under the current policy setting. This is assuming funding becomes available to deliver these upgrades.

Auckland Unitary Plan (AUP OP)

(8) *Reverse Sensitivity* - If this is to proceed, this application must take a strategic approach to all resource management matters as occurs in the Schedule 1 process of the RMA.

(9) An application proceeding on Future Urban Zoned (FUZ) land could lead to future reverse sensitivity issues for future resource consent applications, as there will not be an appropriate regulatory framework (i.e. An urban residential zone or business zone) in place to manage those effects.

(10) If the activity is legally established through the FCTA, any future land use consents will be considered against the FUZ objectives and policies. The nature of the FUZ objectives and policies are to enable rural use of the land until a site has been through the plan change process. The FUZ is not an efficient and effective zone for these types of development until the site is re-zoned for urban purposes.

(11) It should not be anticipated that the Council will initiate a plan change to urbanise this site, as the current Covid Recovery Budget means that it is unlikely to be come to a priority for the Council.

Council Initiated - Plan Change 5 (PC 5 - Withdrawn)

(12) Infrastructure Funding and Financing – one of the reasons for withdrawing PC5 was that there was no funding budgeted in the lifetime of the Auckland Unitary Plan (ten years) for the upgrading of the wider transport network to address the anticipated adverse effects from increased traffic generated by the development of land in the proposed plan change area. There remains no funding allocated for the upgrade of the wider transport network. Allowing the application to proceed could effectively orphan the development without suitable infrastructure or result in an infrastructure expectation forced on the council, meaning the costs of that infrastructure will fall on ratepayers (see comment regarding development contributions above).

(13) The applicant will need to provide further information on how infrastructure upgrades (including for the wider network to manage cumulative effects) will be funded. Noting that Auckland Council does not have any dedicated funding to the PC5 area.

(14) *Aircraft Engine Testing* – PC 5 was notified on 21 September 2017. PC 5 was delayed in 2020 as the Council prepared a Variation to PC 5 (V1 to PC5) in response to updated noise contours. The residential component of this application is affected by the Aircraft Engine Testing that occurs at Whenuapai Airbase, specifically the sites fall under the 65db to 57db noise contour. These noise contours are not managed under AUP OP, and were being integrated via the Council plan change.

(15) The Applicant needs to address the effects of the Aircraft engine testing which is consistent with Chapter D24 Aircraft Noise Overlay.

(16) *Sinton Road Peninsula* – Three of the sites proposed on the Sinton Road Peninsula are for residential activity. The remaining site for Light-industry use is located on Trig Road. Plans and Places has concerns for the sites on the Sinton Road Peninsula due to the potential effects on the existing infrastructure. As proposed, the application considers the existing infrastructure has the capacity to accommodate the growth.

(17) Flow Transport Assessment – Whenuapai Structure Plan – Integrated Transport Assessment (Attachment 1) July 2016 report included in PC 5 identifies that there is capacity for some development, however, as outlined in the attached report, there is only capacity for 550 dwellings before the significant roading upgrade is required being:

a) Closure of the Sinton Road/Brigham creek roundabout; and
b) Construction of a connection to Kauri Road and Signalized intersection.

(18) This was confirmed in the preparation of the Variation 1 to PC 5 supporting transport assessment attached as Attachment 2.

(19) The applicant has not raised this upgrade in its application nor has it provided any indication of its assessment of its contribution to the upgrades. Further, as outlined above the Council does not have the ability to fund such projects. It is also considered that this application should not cause the Council to re-allocate potential or actual

infrastructure funding, which may be the result of approving this consent application.

(20) The Schedule 1 RMA process is considered more suitable, as the nature of this application, and the effects on the surrounding landowners that could be limited by the roading capacity requires public notification and the ability to participate in a plan change hearing. This approach may require a precinct to be applied to the site, requiring infrastructure upgrades prior to development, which is a consistent approach with greenfield development in the Auckland Region (PC 48, PC 49, PC 69).

(21) There are also concerns that this application, including Economic Assessment supporting the application has overlooked:

a) The enabled capacity of the AUP OP as notified in 2016;
b) The capacity enabled by the immediate legal effect of the Medium Density Residential Standards.

(22) For the reasons stated above, Plans and Places consider the Residential component of this application should be refused.

(23) *Trig Road – Light Industry Application*: Plans and Places consider that the currently proposed mitigation measures are inconsistent with other like-for-like processes in the area. The applicant's approach to infrastructure, relying on existing capacity, is inconsistent with other projects in the area. For example, PC 69 (soon to be made operative) contains a non-complying activity status for development that is to proceed prior to a range of infrastructure being built.

(24) It is acknowledged that there is capacity in the current roading network. However, the existing infrastructure is not considered to be of an urban standard, and upgrades should be provided prior to consent being granted. The Applicant should address this in their reporting.

Information required (but not limited to):

a) Include in the Assessment of Environmental Effects:
   i. Auckland Councils Strategic Framework, Including an assessment against the Whenuapai Structure Plan, Auckland Plan 2050, Future Urban Land Supply
   ii. An assessment of required infrastructure, to an urban standard, to be provided in facilitate this development

b) An assessment against all relevant parts of Auckland Unitary Plan's Regional Policy Statement, noting that an assessment only against '*Chapter B2 urban Growth and form*' is not sufficient for a strategic decision.

c) Economic assessment, that includes:
   i. Analysis in the context of the COVID-19 Recovery (Fast-track Consenting) Act 2020;
   ii. Enabled residential capacity of the AUP OP
   iii. Outlining the likely location where future residents will access key amenities and work opportunities.

d) Integrated Transport Assessment:
   i. That includes information on Public Transport services, including future upgrades and current level of service;
   ii. Infrastructure upgrades required to facilitate the development including any network upgrades that may be required for the wider area.
   iii. An assessment against Regional Policy Statement objectives and policies
   iv. An assessment against the objectives and policies of the National Policy Statement on Urban Development.

e) Set of draft conditions for staging development until key infrastructure projects are delivered.

f) Information on what infrastructure will be funded and built by the applicant and how all remaining infrastructure will be funded that is not being funded by the applicant, noting that Auckland Council does not have any allocated funding for the Whenuapai FUZ area.

(25) If this application is approved for processing, the non-infrastructural economic and social benefits should not be counted as contributing to the current shortfall of funding for infrastructure projects in the region. For certainty on this matter, the Applicant should fund the infrastructure required in full and not anticipate any funding from the Council.

Local Board's Response

From: *Anna Atkinson - Local Board Chairperson*

Date: 06/04/2023

Overall Summary:

Additional comments from the Upper Harbour Local Board on the Fast Track Application for the Whenuapai Development Project.

After reading through the comments from other Auckland Council departments in the provided document, the Local Board strongly recommends that the application should be referred to an expert consenting panel for the consideration of the full application under the existing Resource Management Act processes.

We share many of the same concerns as raised by Plans and Places and also mentioned in our feedback below.

In addition, we think that 20m esplanade reserves should be required with full public access to those reserves and that all formed pathways should be shared path width to enable safe and enjoyable walks and rides.

We are concerned about the lack of playgrounds and play spaces and note that the application seems to be relying on council allocating funding to supply these spaces. This is not guaranteed.

We are concerned about the cumulative effects on roading and other infrastructure for both the residential and commercial developments.

We are concerned about the impacts of reverse sensitivity – especially on the residential development.

We are concerned that the Trig Road site will have negative impacts on both the environment (large impermeable surfaces) and on roading infrastructure.

We are concerned about the effects of plan changes that are occurring in advance of appropriate infrastructure and that this will not result in a 'well functioning urban environment.'

We think this application is of such a scale and will have such large consequences that the full application be considered under the existing Resource Management Act processes.

The following are Upper Harbour Local Board comments on the Cabra Developments Limited Whenuapai Development Project application under the COVID-19 Recovery (Fast-track Consenting) Act 2020 ("FCTA"), requested by the Resource Consents Department of Auckland Council.

Specific question 1. Are there any reasons you consider it more appropriate for the project, or part of the project, to proceed through existing Resource Management Act 1991 (RMA) consenting process rather than in the FTCA.

Answer: We believe that the fast-track consent should be declined and the project should follow the standard RMA consenting process.

The Local Board oppose this fast-track application. We recommend decline and go through the existing RMA process for the following reasons:

A. We have serious concerns about this development and the need for supporting infrastructure and the need to avoid any potential adverse effects on the environment. All these issues are best identified through a full RMA process rather than fast track.

B. We have concerns that there is no immediate funding solution to respond to the cumulative effects of increased traffic on the wider northwestern transport system

C. We have financial concerns:

    a. This development could have a financial implication for the local board. The applicant has proposed to fund infrastructure to mitigate the immediate local effects of the proposed development. The council most likely does not have enough

information to accurately assign a fair proportion of future costs to the proposed development.

b. Full costs of the infrastructure for the wider network are unlikely to be determined at this time and are likely to take some time to be calculated. The shortfall in funding of the infrastructure costs is not provided for in the Long-Term Plan 2021-2031. Therefore, the council is unable to recover the costs of future infrastructure via either the Development Contributions Policy or by having another funding mechanism in place. Should the development go ahead without these matters being resolved it will result in future wider network infrastructure upgrades required for this development to be borne by the ratepayer under the current policy setting. This is assuming funding becomes available to deliver these upgrades.

D. This proposal will add even more pressure on an area already underserved for play and recreation spaces. The Upper Harbour Strategic Play Provision Assessment 2018 states in the Whenuapai section “As more of the Future Urban Areas are developed, community playspaces with provision for informal recreation, fitness and teen play should be included. More neighbourhood play spaces focused on younger age groups, for new families in the area, should also be provided for.”
E. This proposal contains discharge of stormwater into the coastal marine environment. We are concerned about this and the cumulative effects of the developments
F. express concern that this development may result in the removal of mature trees as the adopted Urban Ngahere 10 year action plan shows that Whenuapai currently has less than 10% tree cover, whereas the goal for each local board area is 30%.
G. There are no bus stops in the areas proposed for residential development, which in reality would lead many people to drive. That does not seem like a well functioning urban environment.
H. Express concerns that in light of recent flooding events the stormwater and wastewater plans are reassessed. We are concerned about the flood plain and overland flow paths.
I. We note that the current Unitary Plan allows 100% impermiable surfaces on light industrial zoning. In light of recent floods we think that this needs to be reassessed to ensure we are not building future disasters.
J. The residential lots in Clarks Lane and Sinton Road are shown as Low Density in the Whenuapai Structure Plan. This does not appear to be what is shown in the plans here. Thus, the development is not in keeping with the structure plan and may lead to shortfalls in provided infrastructure.

K. Nothing more detailed than the ‘structure’ plan currently exists, thus it’s difficult to ensure the effects of development on the receiving environment.
L. We have enough concern about the potential for negative effects on the environment that we believe that a full RMA hearing is the best way to ensure the best outcome for the environment. We note that in the application the development will ‘likely’ provide an ecological gain. ‘Likely’ isn’t good enough as the current area is very degraded so there must be a significant ecological gain.

Specific question 2. What reports and assessments would normally be required by the council for a project of this nature in this area.

Subject matter experts within council will require many reports detailing such things as stormwater and infrastructure assessments. The Local Board would also like a report showing the impact of the development on the surrounding areas.

- We would also like assurance from Supporting Growth that any upgrades that occur now are in alignment with their plans for the future.
- We are concerned about the stormwater flows.
- We would like to see more detail on the esplanade reserves. How wide are the esplanade reserves to be created and vested and will there be public access to the reserves. Will any other public land be created?
- We would like to see the anticipated percentage tree cover of the sites once complete taking into account road and site planting. Noting that the council is aiming for 30% tree cover.
- We (local board) would like to see the plans for the upgrade of Sinton Road and the width of the proposed footpath. We believe there should be a separated and safe cycleway here leading to the Clarks Road overbridge to Hobsonville. There is no bus service here so we need to be as encouraging of active transport as possible.

Specific Question 3. Does the applicant, or a company owned by the applicant, have any environmental regulatory compliance history in your region?

This is not a question the local board can answer.

Additional information

The local board consider that plan changes for Future Urban areas in Whenuapai should be halted until a more detailed strategic plan for the area can be done. The strategic plan should consider in particular the waterways, wetlands, connectivity, planting and parks and ensure they are managed together to connect people and nature across the city. This will provide resilience and mitigate climate change impact

Parks Asset Owner / Specialist Response

From: *Roja Tafaroji, Senior Parks Planner, Auckland Council*

Date: *04.04.2023*

Background information:

This response is prepared based on the information received as outlined in the email from Hailey Kim, Senior Planner, North West Resource Consenting dated 27 March 2023.

The proposal is to construct 227 dwellings and subdivide accordingly at 15 Clarcks Lane, 10 and 16 Sinton Road, Whenuapai, and to construct and subdivide 90 Trig Road, Whenuapai into an industrial storage yard ad two warehouse buildings.
As part of the proposal, public roads, esplanade reserves and access reserves (local purpose) are proposed to be vested to Auckland Council.

Positives of application

From the planning assessment provided by the applicant in Appendix 3, it can be determined that:

- Vesting of the 20m wide esplanade reserves on three sites within CMA in accordance with s230 of the RMA and Rule E38.4.1(A8) of the Unitary Plan.
- An opportunity for public access to the coastal and stream edges through proposed esplanade reserves and walkways along them.
- Vesting of 20m wide (in average) esplanade reserve along the stream on the southwestern side of Site A in accordance with s230 of the RMA and Rule E38.4.1(A8) of the Unitary Plan.
- Vesting of access lots to be held as local purpose (access) reserves from the public road to the esplanade reserves to provide access to public as well as Council staff for the purpose of maintaining the reserves.

Key Issues from a Parks Planning Perspective

The key issue with the project going through the COVID-19 Recovery Act 2020 fast track consenting process is the potential for Auckland Council to inherit park's assets where they have not had the opportunity to assess and comment on prior to receiving them. There is a risk that the vested assets Council may inherit are not to the same standard or consistent with those assets which go through the normal resource consent and engineering plan approval process, resulting in a financial burden not anticipated.

<u>Esplanade reserves to vest</u>

Parks is supportive of receiving full 20m width esplanade reserves on 15 Clarks Lane, 10 and 16 Sinton Road with the proposed walkway along as required under section 230 of RMA.
It is also important to understand whether the proposed amenity and design of the reserve to be vested meet Council standard as well as the community needs.

Figure 1. Proposed 20m wide esplanade reserves on Site A(15 Clarkes Lane), Site B(10 Sinton Rd.), and Site C(16 Sinton Rd.)

John McKellar, Council's Parks and Place specialist has reviewed the application and confirmed that the proposed esplanade reserves along with three above mentioned sites with the proposed walkway will provide an opportunity to link the area to the wider network of the proposed Greenway in the area around the coastal margin of the Whenuapai area. Mr. McKellar also considers that the proposed walkway along the esplanade reserves will connect directly to the Waiarohia Stream and ultimately across State Highway 18 into cycleways in Hobsonville Point while will also make a link to Clarks Lane Reserve to the East.

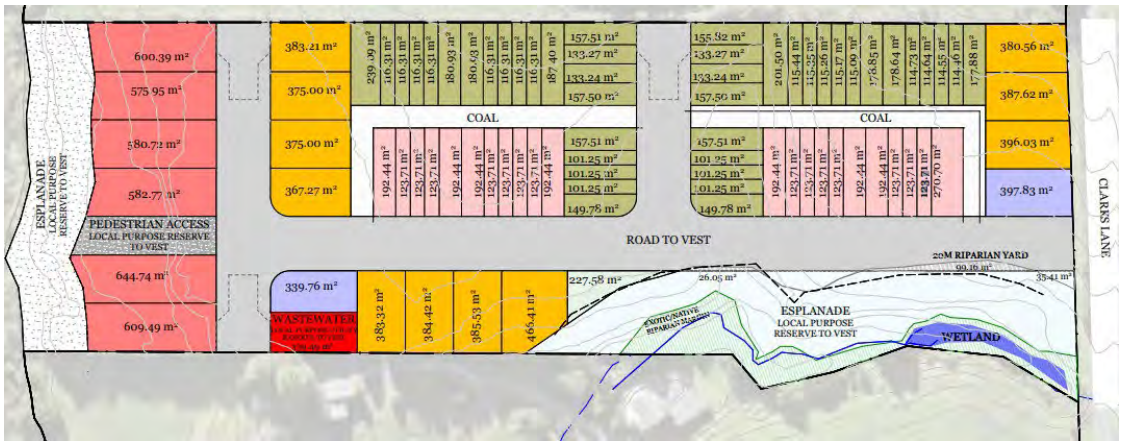
Considering AUP Objective E38.2 (3) and Policy E38.2 (24), Parks Planning conclude that providing the full 20 metres required by s230 of the RMA is appropriate in this instance. The applicants have provided sufficient width to aid future connection and public access along the coastal edge. The setback will also ensure that the natural functioning coastal environment will be maintained and enhanced as necessary. Accordingly, Parks confirms that full 20m wide esplanade reserves are necessary to achieve the purposes under Section 229 of RMA.

While there are some landscaping memorandums provided by the applicant, there is not much information provided for the landscaping proposed within the esplanade reserve. The landscape architect Chris Campbell has noted in these memos that Auckland Council's design manuals will be used as guidance for the esplanade reserve planting. No more detailed information or

planting plan has been provided at this stage which has not let Parks to provide an assessment of the acceptability of the proposed planting on esplanade reserves.

According to the plans provided in Appendix 1 and the planning assessment provided in Appendix 3, an esplanade reserve is also proposed along the stream adjoining the southwestern boundary of Site A (15 Clarks Lane) with and average width of 20m.

Figure 2.Proposed Masterplan for Site A, prepared by DKO Architectural (NZ) Pty Ltd. revision A.



Parks is supportive of a full width provision of an esplanade reserve along the stream as proposed on the site which will achieve the purposes under S229 of RMA. However, more detailed information is needed to be provided on the proposed scheme plan based on an updated survey to demonstrate the updated reserve boundary as well as the exact width of the reserve. Additionally, a landscaping package is required to provide sufficient information on the proposed planting within the esplanade reserve area. Without this information, Parks cannot provide its full assessment as whether the proposed esplanade reserve is acceptable to vest in Auckland Council.

<u>Coastal Hazard</u>

The proposed esplanade reserves are on the sites (Sites A, B and C) which are subject to coastal inundation overlay. Although the planning assessment provided under AUP indicates less than minor adverse effects on the environment, there is no information provided to support that.

Council's Coastal Hazard specialist, Christoph Soltau has reviewed the application and requested that a Local Scale hazard assessment would be appropriate considering the scale of the development. Mr. Soltau also provided the following comment:

"A local scale coastal hazard assessment was previously undertaken for the Whenuapai area under AUP Plan Change 5 for. While this plan change was formally withdrawn, and the CHA therefore not formalised, the report for the local scale CHA remains available and there is the opportunity for the applicant to update the approach and data with the current best practice, including Auckland Council's Coastal Hazard Assessment Guidance, and include information such as:

a) *IPCC6 climate change projections*
b) *MfE Interim Coastal Hazard Assessment guidance.*
c) *NZ Sea Rise Vertical Land Movement data."*

<u>Local Purpose (Access) reserves to vest (Pedestrian access to esplanade reserve)</u>

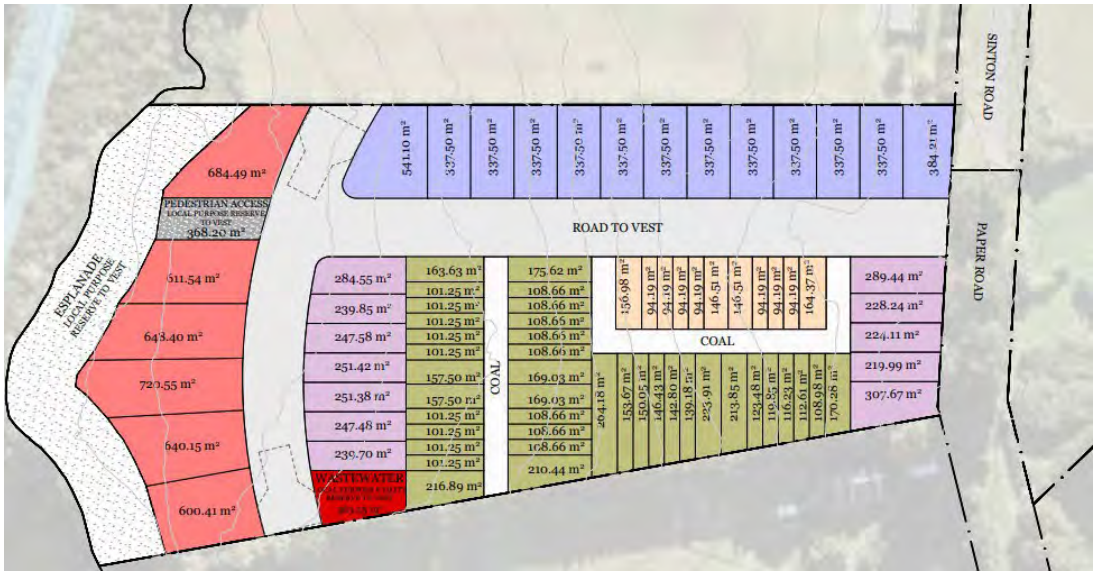
The Planning Assessment report prepared by Forme Planning Ltd in Appendix 3 mentions about

proposed "*construction of a pedestrian walkway to improve pedestrian access to the respective waterway (prior to vesting as esplanade reserve)".* It is to provide pedestrian access within each site (15 Clarks Lane, 10 and 16 Sinton Road) to the proposed esplanade reserves. It is important to note that these access reserves are important for Council staff to the access the esplanade reserves for the purpose of maintenance.

Figure 3. Proposed Masterplan for Site B, prepared by DKO Architectural (NZ) Pty Ltd. revision A.

While an annotation is provided for "Pedestrian Access, Local Purpose Reserve to Vest" on the Masterplan drawings for each three sites included in Appendix 1, there are information missing to understand whether the proposed "access reserves" are of appropriate width and design for their purpose of access, also, whether the boundary treatment along the accessways and the adjacent sites provides for an acceptable level of passive surveillance.

Figure 4. Proposed Masterplan for Site C, prepared by DKO Architectural (NZ) Pty Ltd. revision A.



<u>Roads to vest</u>

The proposed Masterplan Drawings provided show there are roads to be constructed and vested on each site (15 Clarks Lane, 10 and 16 Sinton Road, and 90 Trig Road). There are also Landscape Memorandum prepared by Greenwoods Associates provided for Proposed Design Approach taken for each of the subject sites which gives some general explanation of the landscaping to be implemented. However, there is not much detail on the streetscape landscaping provided. Benedict Free, Council's senior landscape specialist advisor has reviewed these documents and mentioned that we cannot provide an assessment whether the streetscape/reserve landscaping is acceptable or not with the level of detail provided.

Figure 5. Proposed Site Plan, showing proposed roading for Sites A, B and C, prepared by DKO Architectural (NZ) Pty Ltd. revision A.

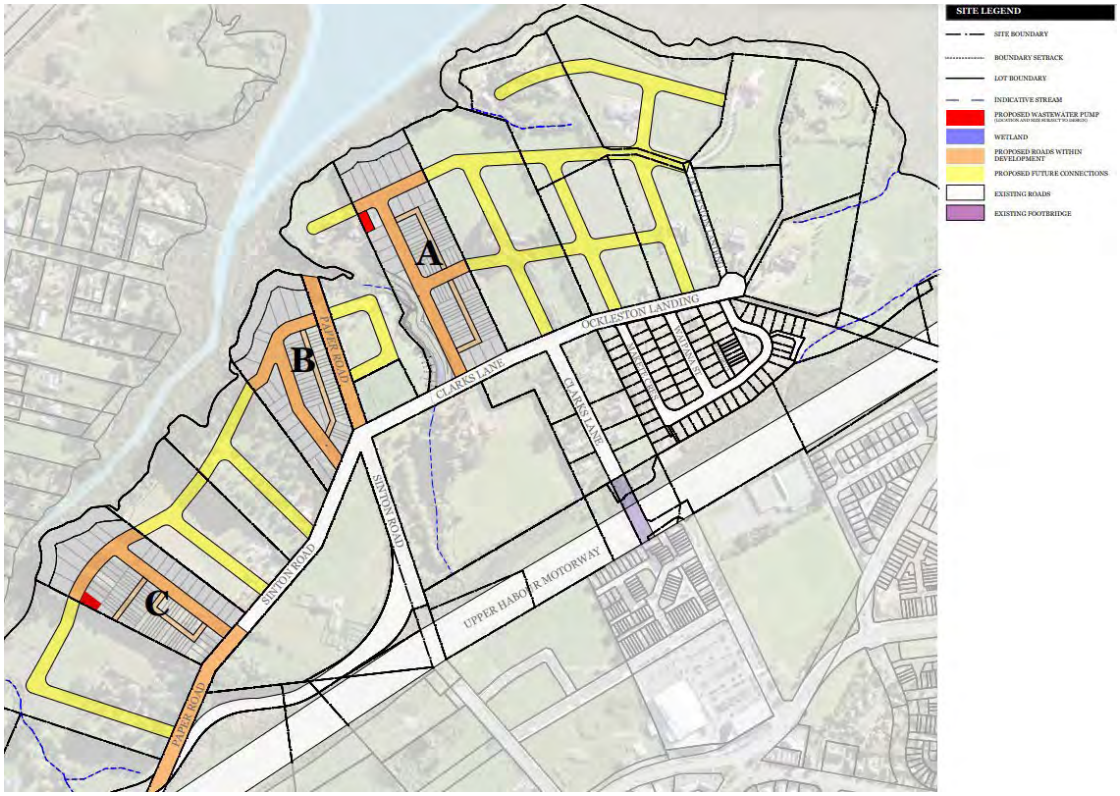
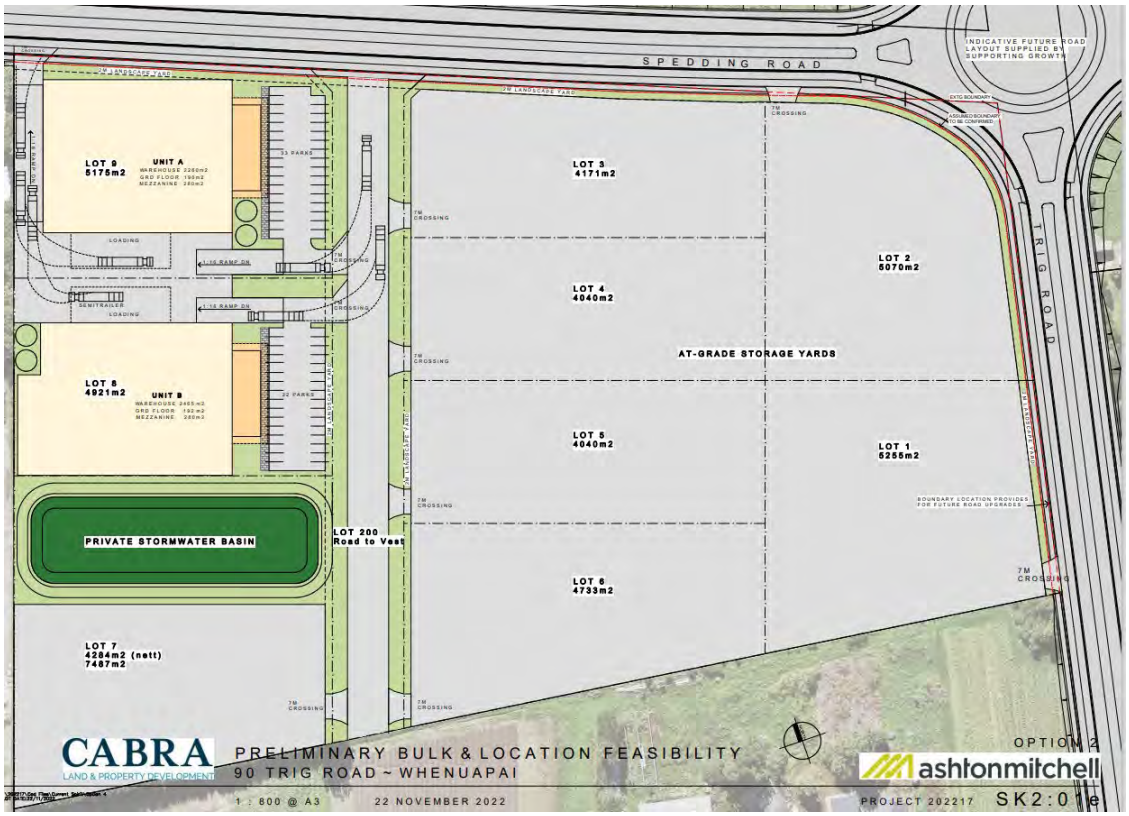


Figure 6. Preliminary Bulk and Location Feasibility Drawing, proposed roading on Site D, prepared by CABRA Land & Property Development, dated 22 Nov. 2022



The proposed concept has implications for council operations in inheriting any future assets. This is accompanied by long-term maintenance obligations.

- Please provide landscape concept plans for the streetscape for any roads to vest. Planting should be appropriate and will be reviewed by Auckland Council Parks landscape specialists.
- The applicant will be required to maintain streetscape landscaping and street trees for 2 years post completion.

<u>Boundary Treatments</u>
There is no landscape plan provided to demonstrate how boundary treatments are proposed on lots bordering the esplanade reserves and the pedestrian accessways (access reserves) to provide passive surveillance for these areas. Information such as proposed fence material/height and planting along the boundary with the reserves would be required to clarify the boundary treatment. Also, it is not clear whether the proposed dwellings on the proposed lots would comply with

Parks information, reports and assessment requirements:

d) Landscape Plans and Planting Plans for the proposed esplanade reserves, access reserve and roads to be vested.

e) Boundary treatments on lots bordering esplanade reserves and the pedestrian accessway (Access reserve) will need to be low height (1.2m) and/or permeable (poolstyle fencing or visually permeable if over 1.2m in height) to provide passive

surveillance of these areas. This is required to be indicated on a Landscape Plan.

f) Subdivision plans showing public assets to be vested, including esplanade reserves.
g) Landscape plans sufficiently detailed to properly assess any proposed assets in the streetscape, reserves to be vested, accessways, and boundary treatment adjoining open space.
h) Planting plans with a schedule of species to understand the extent of landscaping proposed or mitigation provided. These should be in accordance with the Infrastructure Code of Practice – Chapter 7.
i) Assessment to demonstrate width of the streams on site in accordance with s230(4), particularly around the proposed Lots on the southern boundary of the subject site adjacent to Brigham Creek Road.
j) Subject to stream width assessment results, an assessment against the requirements for an esplanade reserve under s230 of the RMA and the Auckland Unitary Plan (Operative in Part) Chapter E38. Esplanade reserves of 20m on both sides of the stream would be required for qualifying streams/rivers.
k) a site-specific (coastal) hazard assessment based on an updated survey of the line of mean high water springs and site specific data including geotechnical investigations.

This would provide Council with the means to determine factors such as:

- Whether open space, walkways, and streetscape assets are to be public or privately owned.
- Whether the proposed esplanade reserves to vest in Auckland Council are acceptable as per the requirements under s230 of the RMA and Rule E38.4.1(A8) of the AUP.
- Whether streetscape planting is appropriate. Council has significant experience in this area as an asset owner and promotes the Auckland Council Urban Ngahere (Forest) Strategy, species which provide attractive streetscapes including species which are also suitable from a maintenance perspective and are practical in their chosen location such as where it will not impact on services in the road reserve (above or underground), hinder the sight lines of drivers or reduce usability of footpaths over time.
- Whether any aspects of the design would require the approval of the Local Board or Governing Body to accept any proposed assets as delegated decision makers.
- Whether proposed accessways to the proposed esplanade reserves are suitable from a crime prevention through environmental design (CPTED) perspective. This includes assessing building orientation and fencing on properties adjoining parks and park accessways to ensure appropriate passive surveillance over these areas is provided. Accessway widths and gradients are also important for the safe movement of walkers and cyclists.
- Hard assets such as stormwater outfalls or retaining walls are designed and located where they do not reduce the amenity of the esplanade reserves or pedestrian accessways.
- Whether the development meets (or otherwise) the objectives and policies of the Future Urban Zone, and align with the vision and key elements of Whenuapai Structure Plan 2016.
- Whether sufficient pedestrian access is provided to the proposed esplanade

reserves which will also allow for Council staff to maintain the reserves.

Acquisition of land
In the cases of proposed pedestrian accessways to the esplanade reserves, it would be expected that these accessways to be vested to Council as a Local Purpose (Access) Reserve.

Works proposed on the reserve
In accordance with section 239 RMA esplanade reserves should vest free from all encumbrances and interests in land. Where any services, structures (e.g. stormwater lines and outfalls) or any type of encumbrance is proposed on the reserves to vest in Auckland Council, it would require Land Owner or Asset Owner approval and are not for Parks Planning and should be referred to Land Advisory team.
The applicant is required to apply for Asset owner Tree removal for any proposed tree works on council-owned land (trees within existing streetscape or open spaces).

Overall position of Parks Planning
Overall, it is considered that measures will need to be put in place under the COVID-19 Recovery Act 2020 fast track consenting process to ensure Council is able to provide sufficient input to decisions around the acquisition of land and the acceptance of vested assets. This is to ensure Auckland Council receives vested park, reserve and streetscape assets that are to an acceptable standard and consistent with those that have gone through a normal resource consent process.

The proposed development with proposed walkways along proposed 20m wide esplanade reserves can have a significant effect on the wider network of greenways with walkways and cycleways. Parks Planning request the proposed esplanade reserves to be in a 'fit for purpose' condition (clear of buildings, retaining, parking, weed-free etc.) at the time of vesting.

An optimal boundary treatment is requested along the boundary of all proposed lots with a reserve/accessway to encourage passive surveillance. Future low and visually permeable fencing is also supported for any pedestrian accessways and will be required for any properties adjoining the proposed park.

Vesting of assets must also be confirmed demonstrated on the proposed Scheme Plan.

Conclusion
Should the EPA decide to allow the development to go through the Covid-19 Fast Tack process, it is recommended that the proposal address all information requirements from a Parks perspective supplemented by a suitable assessment for the matters of concern.

The applicant should also be made aware of any political decisions that are required for proposed vested assets (off-setting mitigation on asset owner land or proposed land for vesting, land acquisition, easements, reserve embellishments etc.) which may impact on the delivery of the project.

Healthy Waters / Specialist Response

From: *Sam Clare, Senior Specialist, Healthy Waters, Auckland Council*

Date: *3 April 2023*

Overall Summary:

Healthy Waters notes the following:

- Proposed activities may trigger Restricted Discretionary and/or Discretionary status for consent under E8.4.1 (A5, A10).
- Preparing a design to service unconnected sites may well not result in appropriately integrated stormwater management for the catchment.
- The proposed development in Future Urban Zone cannot be covered by Auckland Council's Regionwide Stormwater Network Discharge Consent (NDC); private discharge consents will be required. A private discharge consent under E8 may not ensure the specific important outcomes reflected by compliance with the NDC. Also, the constructed common drainage conveyance/attenuation/treatment assets could not be vested in Auckland Council at a future time unless the private discharge consents (including built assets) reflect the requirements of the NDC.
- The proposal states intended compliance with basic technical standards for stormwater infrastructure and for discharge arrangements to the coastal environment. It is not known whether the precise nature of the discharge locations within the SEA – Marine may call for particular requirements that are not fully anticipated by the design standards, and instead warrant specific design.

Ordinarily, a development within the zoned areas of Auckland would call for technical stormwater and flooding reports and, importantly, a demonstration of appropriately integrated approach to stormwater catchment planning. The requirement to comply with Council's NDC is the core manner in which sufficient outcomes for stormwater are obtained within the city, most especially in respect of Greenfield developments.

For these four dissimilar sites, the many, complicated and interdependent aspects of flood risk management and efficient and effective stormwater catchment servicing are unlikely to be addressed as effectively by a single FastTrack representative as they would be by the usual iterative evaluation and specific feedback of the wide range of Heathy Waters specialists and our catchment planner.

Healthy Waters recommends that this application does not go via the Fast Track process; we consider that it should go through the RMA process as normal.

Asset Owner / Specialist Response

From: Katherine Dorofaeff, Principal Planner - Land Use Policy and Projects North/West, Auckland Transport

Date: 31 March 2023

Response to Auckland Council specific questions:

Auckland Council has asked Auckland Transport to:

- check the proposal's alignment with the NoR.
- provide estimated timelines for the relevant roads upgrades.
- undertake the capacity check.

AT's response to these specific questions is below:

> The Project sites at 15 Clarks Lane (Site A), 10 & 16 Sinton Road (Sites B & C) are not directly affected by any of the NoR lodged by Auckland Transport / Te Tupu Ngātahi Supporting Growth for the North West Local Network, or the North West Housing Infrastructure Fund (HIF) Trig Road Network.
>
> The Project site at 90 Trig Road (Site D) is affected by two NoR notified on 23 March 2023 as part of the North West Local Network package. One NoR is for Trig Road (Project W1) and the other is for Spedding Road (Project W4). The purpose of both designations is for the construction, operation and maintenance of an arterial transport corridor. Both arterials would be 24m wide two-lane cross sections with separated cycle lanes and footpaths. As part of the NoR, a new roundabout is proposed at the Trig Road / Spedding Road intersection. Under section 178(2) the NoR has interim effect and 'no person may do anything that would prevent or hinder the public work, project, or work to which the designation relates unless the person has the prior written consent of the requiring authority'.
>
> North West HIF Trig Road project is to upgrade the southern section of Trig Road in Whenuapai between State Highway 18 and Hobsonville Road. This is a funded project with a lapse period of 15 years being sought in the NoR. Auckland Transport / Te Tupu Ngātahi Supporting Growth has also lodged NoR to route protect for the following north-west transport projects: Trig Road (North), Māmari Road, Brigham Creek Road, Spedding Road, and Hobsonville Road. None of these projects are funded for implementation. With the exception of Hobsonville Road (which an alteration of an existing designation already given effect to) lapse dates of 15 years are sought.
>
> Sites A to C have frontage to Sinton Road and Clarks Lane. Auckland Transport does not currently propose any upgrades to these roads.
>
> The applicant's transport consultant (Commute Transportation Consultants) has provided limited assessment of network capacity. If the application is referred by the Minister to an expert consulting panel, further detail will be required from the applicant's transport consultant. As noted by Commute, Waka Kotahi New Zealand Transport Agency will have an interest in the effects of the developments at Sites A to C on the operation of the Brigham Creek Road / SH18 interchange.

Overall Summary:

Under the Auckland Unitary Plan (Operative in Part)(AUP) the sites are currently zoned Future Urban. The AUPOP states that Future Urban zoned land should not be developed for urban purposes until it has been through a structure planning and plan change process (refer Policy B2.2.2(3), Objective H18.2(1) of AUP(OP)). While a structure plan has been completed for FUZ zoned land at Whenuapai, the land has not been rezoned for urban use. It is noted that Sites A to C were part of the area of Whenuapai included in the Council's previously proposed Plan Change 5, which was withdrawn in June 2022 due to infrastructure funding concerns. Site D was not included in Plan Change 5.

Due to the Future Urban zoning of the site Auckland Transport considers it more appropriate for the Project to proceed through the private plan change process, rather than through the Covid Recovery Act.

If the Project is referred for processing under the Covid Recovery Act, then a comprehensive Integrated Transport Assessment should be provided. A transport memorandum has been provided by Commute to support the application. This assessment provides a preliminary assessment of the potential transport implications of the proposal. However, a more comprehensive ITA should be provided.

The main objective of an ITA is to ensure that the potential adverse transport effects of a development proposal are well considered and addressed with particular consideration of accessibility to and from the development for all modes as well as safety and efficiency effects. The assessment should ensure that any potential adverse transport effects of the development have been effectively avoided, remedied or mitigated. Auckland Transport requests the following assessments and information form part of the ITA:

- Whether the Project meets the relevant objectives and policies of the AUP as they relate to transport, including integration of land use and transport;
- The potential adverse safety effects on the surrounding transport network and how these effects will be avoided, remedied or mitigated;
- The potential adverse effects on the efficient operation of the surrounding transport network and how these effects will be avoided, remedied or mitigated. There should be particular emphasis on key intersections;
- Clear identification of the mitigation required to address transport effects, who is responsible for providing it, and how it would be staged and sequenced with site development;
- Whether the Project provides for adequate future roading connections to adjacent sites in the future;
- The bicycle parking requirements for the residential and industrial activities / lots;
- The appropriate location and provision of bus stops;
- The street design including the design philosophy for all new roads supporting the spatial allocation for each mode and outlining how the design appropriately and safely provides for all transport users;
- Whether proposed roads to vest meet the relevant transport standards of the Auckland Code of Practice for Land Development and Subdivision;
- The effects of any other reason for consent under Chapter E26 Infrastructure and Chapter E27 Transport of the AUP;
- A Draft Construction Traffic Management Plan (CTMP) including assessment of effects of construction traffic (including measures to maintain safe and efficient operation for all road users), the construction period and associated earthworks;
- The likely impacts of earthworks and construction activity and heavy vehicle movements on road pavements in the vicinity of the site.

A Stormwater Management Plan should be provided, if the project is referred for processing

under the Covid 19 Recovery Act.

Residential development (227 lots) is proposed on the three sites at Sinton Road and Clarks Lane i.e. 15 Clarks Lane (Site A), 10 & 16 Sinton Road (Sites B & C). A residential use is consistent with the Whenuapai Structure Plan. None of the sites are contiguous. All dwellings will gain vehicle access via public roads or JOALs. The applicant has shown a proposed layout which indicates how roads serving the sites could be extended to connect through adjoining sites in the future. The applicant would like to construct a road along the alignment of paper road running along the eastern boundary of Site B. However this needs to be confirmed with AT, and in the meantime the plan shows an alternative road within the site.

Commute recommends the following works to support the residential development:

- extend the unformed portion of Sinton Road by about 60m in front of Site C
- widen an approximately 300m of the carriageway on Sinton Road from 5m to 6m to safely accommodate two-way traffic
- urbanise the frontages of all sites including kerb and channel, footpaths, landscaping, street lighting
- provide approximately 840m of footpath to connect all sites to the SH18 overbridge at the southern end of Clarks Lane. This includes some interim facilities in front of neighbouring undeveloped sites
- some NSAAT markings may be required on the site frontages to achieve visibility requirements.

An industrial development is proposed on Site D at 90 Trig Road. An industrial use is consistent with the Council's Whenuapai Structure Plan. The development is for nine industrial lots. Two of the lots are expected to have warehouse buildings while the remaining lots are expected to be storage yards (e.g. for contractors). Seven lots gain access via a new local road connecting to Spedding Road. The remaining two lots have direct access to either Spedding Road and Trig Road.

Commute recommends the following works for the industrial development:

- urbanise the frontages of all sites directly in front of each development site including kerb and channel, footpaths, landscaping, street lighting
- if the PC69 works have not been implemented in front of the site (footpath on the southern side of Spedding Road), construct footpath in front of the site only
- upgrade footpath on the western side of Trig Road be upgraded to 1.8m in front of the site, in accordance with Auckland Transport specifications.
- some NSAAT markings may be required on the site frontages to achieve visibility requirements.

Asset Owner / Specialist Response

From: *Ameya Bhiwapurkar, Development Engineer, Watercare Services Ltd.*

Date: 3/04/2023

Overall Summary:

The proposed development is in the Whenuapai area proposing to develop under the COVID19 fast track consenting process at various locations. These properties are listed below, along with the development proposals:

- 15 Clarks Lane, Whenuapai (Lot 2 DP 92753) – Residential Subdivision
- 10 Sinton Road, Whenuapai (Allot 2 PSH of Waipareira) – Residential Subdivision
- 16 Sinton Road, Whenuapai (Lot 9 DP 57408) – Residential Subdivision
- 90 Trig Road, Whenuapai (Lot 4 DP 55087) – Light Industrial Subdivision

It is proposed to construct and subdivide 15 Clarks Lane and 10 and 16 Sinton Road, Whenuapai into approximately 227 standalone and terraced dwellings and to construct and subdivide 90 Trig Road, Whenuapai to provide at-grade industrial storage yard and two warehouse buildings.

Watercare's comments on the proposal

Water supply

- For the proposed development @15 Clarks LN Hobsonville 0618
  The existing network (100 mm pipe) has the capacity to provide the required demand as well as the fire flow of FW2.

- For the proposed development @90 Trig Road, Whenuapai
  The existing network (150 mm pipe) has the capacity to provide the required demand as well as the fire flow of FW2.

- For the proposed developments @10 &16 Sinton Road, Whenuapai
  The rider main doesn't have the capacity to supply the developments, so we would recommend upgrading the rider main to a pipe with an internal diameter of 100mm, see snip below.

Figure 1: Proposed watermain required to proceed with the development

Wastewater

Watercare confirms that, in principle, the servicing proposal meets with Watercare's expectations. There is a significant lack of detail preventing approval of the scheme, particularly regarding the sizing of the pumping stations for the full proposed catchment and subsequent capacity assessment of the downstream network.

Clark Lane is considered at high risk of requiring an alternative discharge location due to capacity availability in the network downstream of the proposed connection location. The developer needs to resolve this during the further stages.

- 15 Clarks Lane, Whenuapai – The proposed development would require a pump station which is not just for the proposed development but for the entire catchment (needs to meet the long-term needs of the catchment). This pumping station will need to be constructed by the developer at no cost to Watercare. Please note the currently proposed connection to the 150mm may not be the connection point for the proposed development due to network capacity, as this will depend on the final determined flow rate of the pumping station.

- 90 Trig Rd, Whenuapai - The developer needs to ensure the proposed drainage design is sufficient for the wider catchment and not only the proposed development. The sizing and position should be considered properly to convey flows from upstream sites reasonably.
- 10 and 16 Sinton Rd, Whenuapai - The developer must coordinate with the developments around this site rather than having another pump station. The solution should be optimized to meet long-term catchment needs.

Independent Māori Statutory Board Response

From: Miriana Knox | Pouārahi - Principal Advisor Environmental Outcomes

Date: 06/04/2023

Kia ora Hailey

This is probably the third fast-track consenting application in the last few days that has shown a similar lack of evidence of the applicant having undertaken any substantive engagement with iwi and therefore it is difficult to determine if there has been any iwi input received.

The Ministry must ensure that the initial engagement approach made by the applicant should be followed-up and a clear view from iwi on this application should be determined prior to any further progress.

Ngā mihi nui,

Miriana

Ward Councilor's Response

From: Councillor John Watson

Date: 03/04/2023

Hi Hailey

This is now the sixth application for the Whenuapai area that has been lodged recently through this legislation. As previously stated in earlier applications, we are concerned with the increasing number of applications for the Whenuapai area that are being processed under the fast track legislation that, as the name suggests, was designed to aid the covid-19 recovery.

We are particularly concerned with the cumulative effect of these applications in the one area and the fact that while reservations are being expressed by council, the Ministry for the Environment is still in a number of circumstances pursuing these applications. We believe it is now well and truly time to put these applications through the normal processes including the ability to publicly notify.

We are of the view that in the present circumstances the public scrutiny is not what it should be and that those with a legitimate interest in these applications are being cut out of the process. In these circumstances we do not support progression to a panel for consideration.

Thank you

John Watson

Councillor, Albany Ward

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Whenuapai Structure Plan

Integrated Transport Assessment Report

July 2016

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Project:	**Whenuapai Structure Plan**
Title:	**Integrated Transport Assessment Report**
Document Reference:	**S:\ATSP Auckland Strategy and Policy\042 Whenuapai Structure Plan\ITA report\R1C160729_AC .docx**
Prepared by:	**Rachel Gasson, Qing Li, Michael Jongeneel, Angie Crafer**
Project Manager	**Angie Crafer**
Reviewed by:	**Angie Crafer**

Revisions:

Date	Status	Reference	Approved by	Initials
1 June 2016	Draft A	R1A160428	A Crafer	
23 June 2016	B	R1B160623	A Crafer	
29 July 2016	C	R1C160729	A Crafer	ALC

EXECUTIVE SUMMARY

Flow Transportation Specialists Ltd (Flow) has been commissioned by Auckland Transport to contribute to the development of a Structure Plan for Whenuapai and to undertake an integrated transport assessment (ITA). The ITA considers the transport effects of the proposed land use zoning and associated transport infrastructure of the Structure Plan area, which would subsequently be amended through a Plan Change process. Further to the report issued in June 2016, additional staging and sensitivity tests have been undertaken and the analyses of these are included in this report.

The following key transport aspects have been identified and are addressed in further detail in the body of the report.

- The Structure Plan requirements for future urban zoned greenfield land and brownfield land, as outlined in Part 5 section 1.1 of the Proposed Auckland Unitary Plan (PAUP)
- The density and location of land use activities in relation to transport facilities
- The transport network within the Structure Plan area and the connections to the wider area.

The ITA has been undertaken in parallel to the structure planning process. The process has included a workshop with a variety of specialists from Auckland Council, Auckland Transport, Watercare and the New Zealand Transport Agency, including planners, urban designers, stormwater, wastewater and water engineers, as well as transportation planners and transportation engineers. It has involved an iterative process where different land uses have been tested to help determine a preferred zoning for Whenuapai. The proposal outlined in this report broadly aligns with the output of that workshop, although it is noted that the characteristics of the Structure Plan are still evolving and the ITA will need to be amended when the land use activities, scale, mix and location, as well as staging are further refined.

The transport provisions for all modes as well as the traffic effects of the proposed Structure Plan have been assessed using specific trip rates and a SATURN traffic model, with scenarios representing 2021, 2026, 2036 and 2041 to assess various stages of Whenuapai's development. The model incorporates the anticipated land use developments in Whenuapai and predicted, albeit adjusted land use elsewhere from Auckland Transport Models. The road network investments recommended by the NorSGA and TFUG studies have been assessed and reviewed, with changes being proposed to satisfy the requirements of the proposed Structure Plan.

Public transport and active travel effects have also been assessed, using a first principles approach.

A series of investments have been identified that will be necessary to accommodate travel demands associated with the Structure Plan land use. These include:

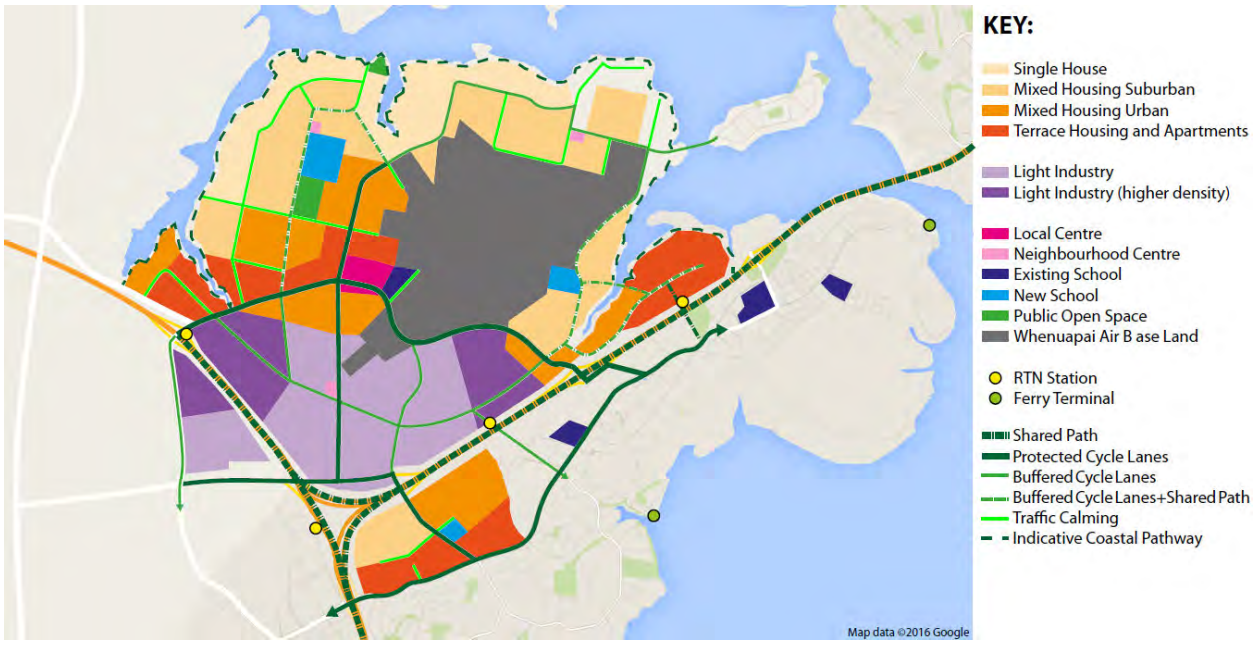
Walking and Cycling Network

- Physically separated cycle lanes on key roads including Brigham Creek Road, the southern section of Totara Road, Mamari Road, Northside Drive, Trig Road south of SH18 and Hobsonville Road. Where separated cycle lanes are provided there needs to be restrictions on driveway crossings (ie rear access only) and ideally few side roads

- Buffered cycle lanes on a number of the connector roads including the main roads in the industrial areas and roads linking to the RTN station at the new bridge across SH18 and links to Marina View Drive towards the West Harbour ferry
- Buffered cycle lanes and shared paths where residential catchments are close to schools, therefore providing for commuter cyclists as well as providing a safer environment for those wishing to cycle or scooter to school. Where shared paths are provided there needs to be restrictions on driveway crossings (ie rear access only) and ideally few side roads
- Pedestrian/cycle links through areas of land that may not necessarily (although could) provide a road connection

The proposed walking and cycling network for the Whenuapai Structure Plan area is shown in Figure ES1.

Figure ES1: Proposed Walking and Cycling Network

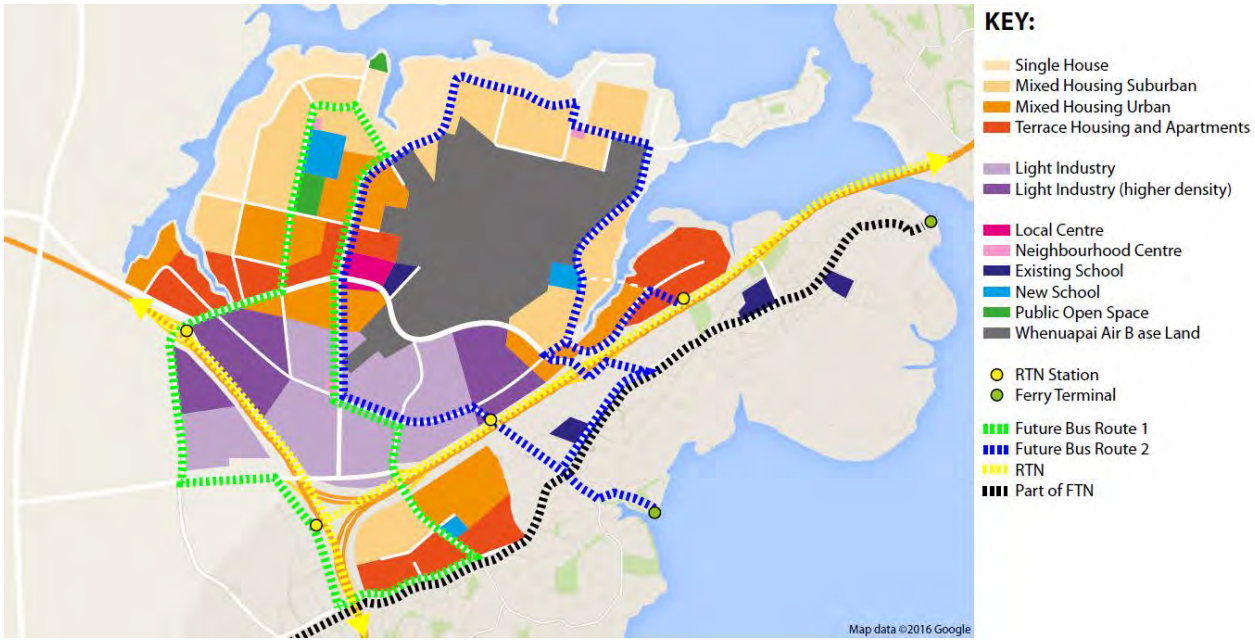


Public Transport Network

- Rapid Transit Network (RTN) services along SH16, from Kumeu to central Auckland, with stations at Westgate and at Brigham Creek Road
- RTN from Westgate to the North Shore along SH18, with stations between Trig Road and Brigham Creek Road, and between Brigham Creek Road and Squadron Drive
- Frequent Transport Network (FTN) bus services to RTN stations, Westgate, Hobsonville and West Harbour
- More frequent ferry services from Hobsonville Point and West Harbour, supported by improved transport connections for all modes of travel
- Connections for all modes and park and ride facilities at proposed RTN stations
- Frequent connector services within Whenuapai.

An indicative public transport network for the Structure Plan is shown in Figure ES2. This shows proposed RTN services on SH16 and SH18, as well as frequent bus services connecting Whenuapai residential and business areas to RTN stations, centres and ferry terminals.

Figure ES2: Indicative Public Transport Network



Regional Transport Network

The following investments are proposed through planning programmes other than the Whenuapai Structure Plan, but are considered necessary to support the Structure Plan. By extension, the Structure Plan will strengthen the case for these investments:

- SH16 widening between Hobsonville Road and Lincoln Road and a bus shoulder lane in each direction[1]
- A new four lane arterial (alternative to SH16) between Brigham Creek Road and Kumeu[2]
- An interchange at the realigned SH16/Brigham Creek Road, with signalised intersections[2]
- Northside Drive connection to Trig Road interchange and SH16/Northside Drive south facing ramps[2]
- SH16/SH18 motorway connections[2]
- SH18 Squadron Drive Interchange west facing ramps[2]
- Additional lane SH18 eastbound between Trig Road and Squadron Drive[3]
- Additional lane SH18 westbound between Tauhinu Road and Trig Road[3]

[1] Part of NZTA's Western Ring Route project
[2] Identified in draft preferred Transport for Future Urban Growth (TFUG) project
[3] Identified through the Whenupai Structure Plan ITA

- Trig Road re-alignment south of SH18 to Luckens Road and traffic signals at the Trig Road/Hobsonville Road/Luckens Road intersection[4]
- Hobsonville Road widening to four lanes between Trig Road and Marina View Road[4]
  - Traffic signals along Hobsonville Road[4] at
    - Marina View Road
    - Westpark Drive
    - Suncrest Drive
    - Brigham Creek Road
    - Sinton Road
    - Clark Road
- Traffic signals at SH18/Trig Road interchange[2]

Whenuapai Structure Plan Network

The following investments, generally internal to Whenuapai or directly bounding it, are required to support the proposed Structure Plan:

- Brigham Creek Road urbanisation between SH16 and SH18 (50 kph speed limit, footpaths, cycle facilities), plus widening to four lanes between Totara Road and Tamatea Road, between SH16 and Spedding Road Extension and between SH18 and Kauri Road. Given the number of traffic signals on Brigham Creek Road, four lanes is likely to be appropriate from SH16 through to Tamatea Road rather than just the sections identified[5]
- Traffic signals at the old SH16/Brigham Creek Road (provided appropriate separation can be achieved to adjacent intersections)
  - Extension of Spedding Road northwards to Brigham Creek Road, east of SH16, with signals at the Spedding Road/Brigham Creek Road/Kennedys Road link intersection
  - Link into Kennedys Road area
- Extension of Bristol Road to Brigham Creek Road and signalising this intersection
  - Extension of Riverlea Road to Brigham Creek Road and to Spedding Road Extension, with signals at the Riverlea Road/Brigham Creek Road intersection
- Traffic signals at the Mamari Road/Totara Road/Brigham Creek Road intersection
- Traffic signals at the Totara Road/Dale Road intersection
- Traffic signals at the Brigham Creek Road/Tamatea Avenue intersection
- Traffic signals at the Trig Road/Brigham Creek Road intersection

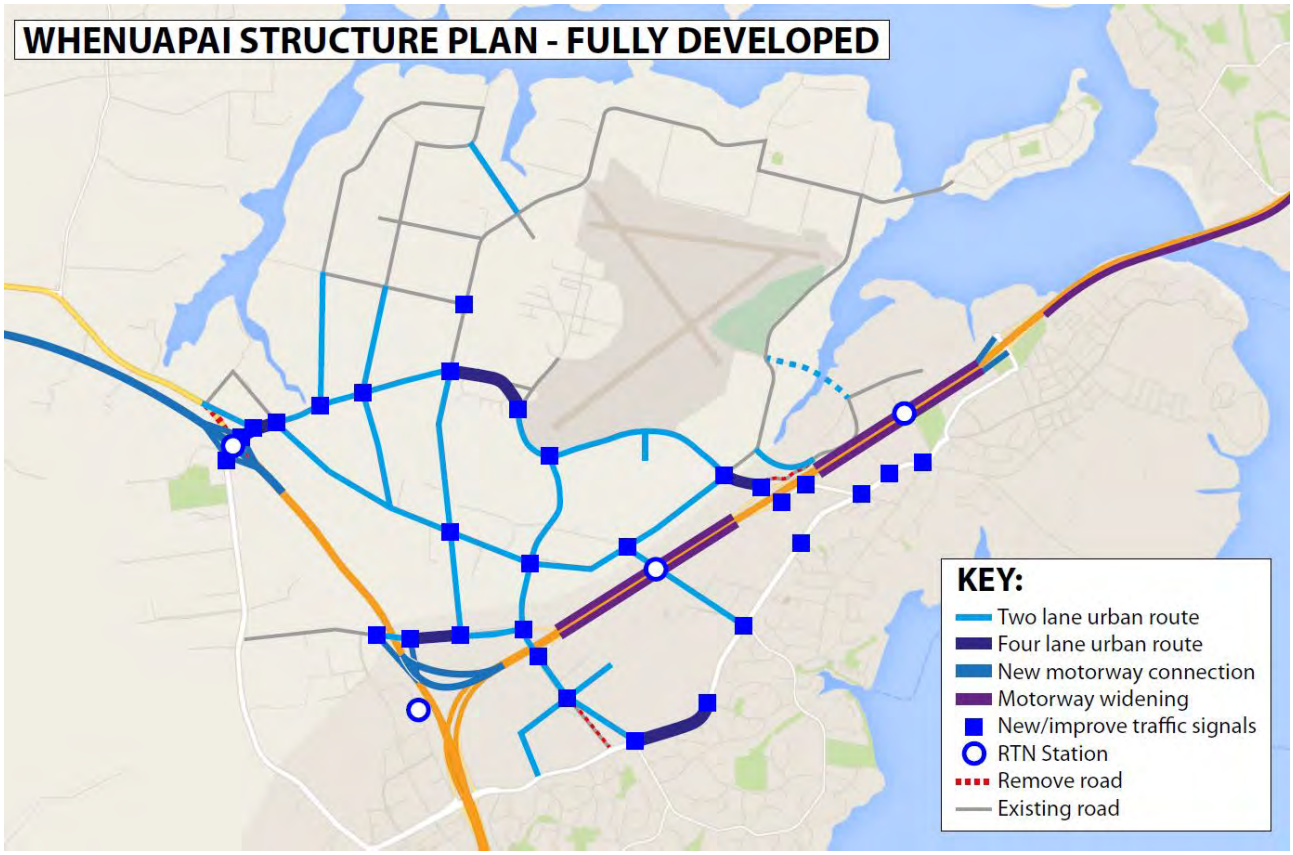
[4] Identified in Northern Strategic Growth Area (NorSGA) project

[5] Widening and urbanising the length of Brigham Creek Road was identified in the TFUG project, however this ITA identifies that two lanes will be sufficient between Tamatea Road and Kauri Road

- Traffic signals at the Spedding Road East/Brigham Creek Road/Kauri Road intersection Traffic signals at the Spedding Road/Mamari Road intersection
- Traffic signals at the Spedding Road/Trig Road intersection
- Traffic signals at the Northside Drive/Mamari Road intersection
- Local connections and bridge over SH18 connecting to Hobsonville Road/Marina View Drive and Spedding Road[2]
- Traffic signals at the intersection of the local connection crossing SH18 and Spedding Road Extension
- Closure of the Sinton Road approach to the Brigham Creek Road/SH18 east facing ramps intersection and realignment of Sinton Road to join Kauri Road
- New road or shared pedestrian/cyclist path between Sinton Road and Kauri Road via Rata Road for accessibility, connectivity and resilience given nature of peninsula with one access road (this link was not included in the model)
    - A new access road from Trig Road (south of SH18) to provide access into the development areas either side of Trig Road and to the new primary school, with signals at this intersection. An access road on the west side of Trig Road joins Hobsonville Road.
- Widening of Northside Drive between the SH16 Interchange and Mamari Road to two lanes per direction

The above road infrastructure works are illustrated in Figure ES3 below.

Figure ES3: Proposed Road Network



Staging

Interim development years have been assessed, broadly representing 2021, 2026, 2036 and 2046 (full build out) scenarios. The land use and transport network assumptions for each of these staging scenarios are summarised in Table ES1 overleaf, as are the transport investments considered necessary to mitigate the effects of the Structure Plan.

It is important to note that the staging scenarios below are notional only. While each scenario has been based on a specific forecast year from the ART model, there is not necessarily certainty around the scale or location of land use development within Whenuapai or elsewhere, or on the timings of uncommitted transport projects. The staging scenarios are less a prediction and more a guide to demonstrate the appropriate transport responses required to support a given development scenario. Further to the scenarios assessed and reported on in the June 2016 ITA, this report includes sensitivity staging tests (1a to 1e and 2a) that assume growth scenarios for land within and outside Whenuapai. Building consent information and Land Supply Inventory data provided by the Council was used to predict development rates outside Whenuapai in these tests.

Table ES1: Whenuapai Structure Plan– Assessed Staging

Scenario	Land Use Assumptions			Associated Transport Infrastructure	
	Whenuapai	Adjacent Land Use Development (new growth in brackets)		Regional Transport Network	Structure Plan Transport Network
		Dwellings	Employees		
Scenario 1a (background growth based on ART 2021)	◆ Existing primary schools at Whenuapai and Hobsonville ◆ New primary school in south Trig Road area ◆ 3,400 dwellings in Whenuapai including: ▪ 850 existing outside future urban zone ▪ 1,150 consented dwellings located either side of Totara Road between Brigham Creek Road and Dale Road ▪ 1,400 new dwellings around Trig Road south of SH18 ◆ No new industrial activity	◆ 250 (250) PC14 Hobsonville ◆ 2,900 (2,100) Hobsonville Point ◆ 2,600 (1,450) Kumeu/Huapai ◆ 1,750 (1,500) Redhills ◆ 1,550 (550) Riverhead ◆ 850 (800) Scott Point ◆ 800 (250) Westgate ◆ 650 (650) Westgate North	◆ 450 (0) PC14 Hobsonville ◆ 1,050 (400) Hobsonville Point ◆ 1,800 (150) Kumeu/Huapai ◆ 600 (150) Redhills ◆ 850 (100) Riverhead ◆ 250 (200) Scott Point ◆ 1,100 (50) Westgate ◆ 2,100 (1,100) Westgate North	◆ FTN on Hobsonville Road which may require widening of Hobsonville Road to provide bus priority[6] ◆ FTN from Brigham Creek Road to Kumeu[7] ◆ Bus shoulder running Auckland CBD to Westgate[8] ◆ SH16 widening between Hobsonville Road and Lincoln Road[8] ◆ Re-alignment and urbanisation (50 km/hr) of Trig Road south of SH18 to connect to Luckens Road and traffic signals at the Trig Road/Hobsonville Road/Luckens Road intersection[6] ◆ Widening of SH16 between Brigham Creek Road and Coatesville-Riverhead Highway to provide two lanes in each direction[9] ◆ SH16/Brigham Creek Road roundabout capacity improvements comprising a signalised roundabout or three lanes on the SH16 northbound approach and three lanes around the western side of the roundabout[9] ◆ New roundabout at SH16/Coatesville-Riverhead Highway intersection[7] ◆ Traffic signals on Hobsonville Road[6] at ▪ Brigham Creek Road ▪ Sinton Road ▪ Clark Road	◆ A comprehensive network of pedestrian footpaths and appropriate cyclist infrastructure commensurate with development but in line with ultimate provisions ◆ Bus connector network within Whenuapai connecting to Westgate FTN/RTN and FTN along Hobsonville Road ◆ Brigham Creek Road urbanisation with 50 km/hr speed restriction between SH16 and SH18 interchanges ◆ Widening of Brigham Creek Road to four lanes between Totara and Tamatea roads, and between Kauri Road and SH18/Brigham Creek Road interchange. ◆ Extension of Riverlea Road to meet Brigham Creek Road ◆ Traffic signals at: ▪ Brigham Creek Road/Riverlea Road ▪ Brigham Creek Road/Totara Road/Mamari Road ▪ Brigham Creek Road/Tamatea Avenue ◆ New local road west of Trig Road between Trig Road and Hobsonville Road ◆ New local road east of Trig Road, south of SH18 ◆ Traffic signals at Trig Road/Local Road between SH18 and Hobsonville Road intersection

[6] Identified in Northern Strategic Growth Area (NorSGA) project
[7] Identified in draft preferred Transport for Future Urban Growth (TFUG) project
[8] Part of the Western Ring Route project

Table ES1: Whenuapai Structure Plan– Assessed Staging

Scenario	Land Use Assumptions			Associated Transport Infrastructure	
	Whenuapai	Adjacent Land Use Development (new growth in brackets)		Regional Transport Network	Structure Plan Transport Network
		Dwellings	Employees		
Scenario 1b (background growth based on ART 2021)	◆ Primary schools at Whenuapai, Hobsonville and Trig Road south ◆ New secondary school on Riverlea Road ◆ 4,100 dwellings in Whenuapai including: ▪ 850 existing outside future urban zone ▪ 1,150 consented dwellings located either side of Totara Road between Brigham Creek Road and Dale Road ▪ 1,400 new dwellings around Trig Road south of SH18 ▪ 700 new dwellings in the Kauri Road area ◆ No new industrial activity	As above.	As above.	As above.	As above, plus ◆ Traffic signals at the Kauri Road/Brigham Creek Road intersection
Scenario 1c (background growth based on ART 2021)	◆ Primary schools at Whenuapai, Hobsonville and Trig Road south ◆ Secondary school on Riverlea Road ◆ 4,300 dwellings in Whenuapai including: ▪ 850 existing outside future urban zone ▪ 1,150 consented dwellings located either side of Totara Road between Brigham Creek Road and Dale Road ▪ 1,400 new dwellings around Trig Road south of SH18 ▪ 700 new dwellings in the Kauri Road area ▪ 200 new dwellings northwest of the SH18/Brigham Creek Road interchange ◆ No new industrial activity	◆ As above.	◆ As above.	As above.	As above, plus ◆ Addition of fourth leg to Kauri Road/Brigham Creek Road intersection and include two right turn lanes from Brigham Creek Road to Kauri Road.

Table ES1: Whenuapai Structure Plan– Assessed Staging

Scenario	Land Use Assumptions			Associated Transport Infrastructure	
	Whenuapai	Adjacent Land Use Development (new growth in brackets)		Regional Transport Network	Structure Plan Transport Network
		Dwellings	Employees		
Scenario 1d (background growth based on ART 2021)	◆ Primary schools at Whenuapai, Hobsonville and Trig Road south ◆ Secondary school on Riverlea Road ◆ 5,190 dwellings in Whenuapai including: ▪ 850 existing outside future urban zone ▪ 1,150 consented dwellings located either side of Totara Road between Brigham Creek Road and Dale Road ▪ 1,400 new dwellings around Trig Road south of SH18 ▪ 700 new dwellings in the Kauri Road area ▪ 200 new dwellings northwest of the SH18/Brigham Creek Road interchange ▪ 890 new dwellings in the Sinton Road area ◆ No new industrial activity	◆ As above.	◆ As above.	As above, plus ◆ RTN/FTN along SH18 with station in Sinton Road area[7]	As above, plus ◆ Removal of the existing Sinton Road connection to the Brigham Creek Road/SH18 Northbound Ramps intersection, with a new local connection between Sinton Road and Kauri Road ◆ Kauri Road widening may be required between Brigham Creek Road and Sinton Road
Scenario 1e (background growth based on ART 2021)	◆ Primary schools at Whenuapai, Hobsonville and Trig Road south ◆ Secondary school on Riverlea Road ◆ 6,190 dwellings in Whenuapai including: ▪ 850 existing outside future urban zone ▪ 1,150 consented dwellings located either side of Totara Road between Brigham Creek Road and Dale Road ▪ 1,400 new dwellings around Trig Road south of SH18 ▪ 700 new dwellings in the Kauri Road area ▪ 200 new dwellings northwest of the SH18/Brigham Creek Road interchange ▪ 890 new dwellings in the Sinton Road area ▪ 1,000 new dwellings in the Kennedys Road area ◆ No new industrial activity	◆ As above.	◆ As above.	As above, plus ◆ RTN/FTN along SH16 with station at Brigham Creek Road interchange[7] ◆ Capacity improvements at the SH16/Brigham Creek Road roundabout comprising signalising the roundabout and increasing the number of lanes on the SH16 approaches and around the roundabout	As above, plus ◆ Signals at the intersection of Brigham Creek Road and the local road serving the Kennedys Road development ◆ Widening of Brigham Creek Road between SH16 and Riverlea Road

Table ES1: Whenuapai Structure Plan– Assessed Staging

Scenario	Land Use Assumptions			Associated Transport Infrastructure	
	Whenuapai	Adjacent Land Use Development (new growth in brackets)		Regional Transport Network	Structure Plan Transport Network
		Dwellings	Employees		
Scenario 2a (background growth based on ART 2026)	◆ New primary school on Riverlea Road ◆ Primary schools at Whenuapai, Hobsonville and Trig Road south ◆ Secondary school on Riverlea Road ◆ 6,550 dwellings in Whenuapai including: ▪ 850 existing outside future urban zone ▪ 1,150 consented dwellings located either side of Totara Road between Brigham Creek Road and Dale Road ▪ 1,400 new dwellings around Trig Road south of SH18 ▪ 700 new dwellings in the Kauri Road area ▪ 200 new dwellings northwest of the SH18/Brigham Creek Road interchange ▪ 890 new dwellings in the Sinton Road area ▪ 1,000 new dwellings in the Kennedys Road area ◆ New industrial activity including 1,000 employees in the vicinity of Brigham Creek Road and Trig Road. A more detailed distribution of these activities is provided in Section 7.7.3	◆ 1,700 (1,400) PC14 Hobsonville ◆ 3,100 (200) Hobsonville Point ◆ 3,350 (750) Kumeu/Huapai ◆ 3,250 (1,500) Redhills ◆ 1,600 (50) Riverhead ◆ 1,400 (600) Scott Point ◆ 1,200 (450) Westgate ◆ 1,150 (500) Westgate North	◆ 1,450 (1,000) PC14 Hobsonville ◆ 1,100 (50) Hobsonville Point ◆ 1,850 (50) Kumeu/Huapai ◆ 750 (150) Redhills ◆ 850 (00) Riverhead ◆ 400 (150) Scott Point ◆ 1,300 (200) Westgate ◆ 3,750 (1,600) Westgate North	As above, plus ◆ Capacity improvements at the SH16/Brigham Creek Road roundabout comprising signalising and increasing the number of lanes on all approaches and around the roundabout ◆ Hobsonville Road widening between Trig Road and Marina View Road[6] ◆ Traffic signals on Hobsonville Road[6] at: ▪ Marina View Road ▪ Westpark Drive ▪ Suncrest Drive	◆ Frequent service Whenuapai Structure Plan proposed bus routes ◆ Additional fourth leg at signalised intersection at Brigham Creek Road/Spedding Road Extension/Kennedys Road link intersection ◆ Extend/widen Mamari Road to provide access to industrial area ◆ Construct new road opposite Riverlea Road south of Brigham Creek Road into industrial area ◆ Upgrade existing sections of Spedding Road and Mamari Road, and their intersections, to be suitable for industrial traffic, including footpaths, cyclist facilities ◆ Construct Spedding Road Extension south from Brigham Creek Road, east of SH16 into industrial area ◆ Construct new road into industrial area from Brigham Creek Road east of Trig Road ◆ Urbanisation of Trig Road between Brigham Creek Road and SH18 Interchange ◆ Widen Fred Taylor Drive between SH16/Brigham Creek Road and Northside Drive ◆ Traffic signals at the Brigham Creek Road/Trig Road intersection

Table ES1: Whenuapai Structure Plan– Assessed Staging

Scenario	Land Use Assumptions			Associated Transport Infrastructure	
	Whenuapai	Adjacent Land Use Development (new growth in brackets)		Regional Transport Network	Structure Plan Transport Network
		Dwellings	Employees		
Scenario 3 (background growth based on ART 2036)	◆ 7,400 dwellings in Whenuapai including: ▪ 850 existing outside future urban zone ▪ 1,150 consented dwellings located either side of Totara Road between Brigham Creek Road and Dale Road ▪ 3,300 new dwellings north of Brigham Creek Road ▪ 700 new dwellings between Waiarohia Inlet and SH18 ▪ 1,400 new dwellings around Trig Road south of SH18 ◆ New industrial activity including 6,500 employees. A more detailed distribution of these activities is provided in Section 7.7.4	◆ 1,700 (0) PC14 Hobsonville ◆ 4,350 (1,250) Hobsonville Point ◆ 7,050 (3,700) Kumeu/Huapai ◆ 6,050 (2,800) Redhills ◆ 1,950 (400) Riverhead ◆ 3,000 (1,600) Scott Point ◆ 1,700 (500) Westgate ◆ 2,300(1,100) Westgate North	◆ 1,850 (850) PC14 Hobsonville ◆ 1,500 (400) Hobsonville Point ◆ 2,100 (250) Kumeu/Huapai ◆ 1,100 (350) Redhills ◆ 900 (50) Riverhead ◆ 850 (400) Scott Point ◆ 1,550 (250) Westgate ◆ 7,700 (3,950) Westgate North	As above, plus ◆ RTN from Westgate to the North Shore (as per Scenario 1d) with an additional station along SH18 at a new bridge over SH18 between Trig Road and Brigham Creek Road interchange[7] ◆ New arterial road alternative to SH16 between Brigham Creek Road and Kumeu (initially a two lane road)[7] ◆ Interchange at realigned SH16/Brigham Creek Road with signalised intersections[7] ◆ Investigation of realignment of “old” SH16 to provide appropriate separation from new SH16/Brigham Creek Road interchange, and future Kennedy’s Road link intersection with Brigham Creek Road. Traffic signals would be required on Brigham Creek Road if intersection is feasible[7] ◆ Traffic signals at SH18/Trig Road interchange[7] ◆ Northside Drive connection to Trig Road interchange and SH16/Northside Drive south facing ramps[7] with four lanes between Northside Drive and Mamari Road ◆ SH16/SH18 motorway connections[7] ◆ Additional lane SH18 eastbound between Trig Road and Brigham Creek Road[9] ◆ Additional lane SH18 westbound between Tauhinu Road and Squadron Drive[9] ◆ Traffic signals at the SH18/Brigham Creek Road interchange[7]	As above, plus ◆ Additional lanes at the Brigham Creek Road/Totara Road/Mamari Road intersection ◆ Upgrades to existing roads within industrial areas and provision of new roads as necessary to avoid driveways onto Brigham Creek Road, Mamari Road and Northside Drive ◆ Local road connection between Riverlea Road and Totara Road near Rarawara Creek ◆ Capacity improvements at the Brigham Creek Road/Totara Road/Mamari Road intersection ◆ Mamari Road extension to Northside Drive, plus traffic signals at the Mamari Road/Northside Drive intersection and Mamari Road/Spedding Road intersection ◆ Spedding Road connection between Brigham Creek Road and Trig Road ◆ Signals at Totara Road/Dale Road intersection ◆ Traffic signals at the Spedding Road/Trig Road/Spedding Road extension intersection ◆ A new bridge between Marina View Drive and Spedding Road extension, with signals on Spedding Road Extension[7] ◆ Extension of Bristol Road to meet Brigham Creek Road, and traffic signals at the intersection of these roads

[9] Identified through the Whenuapai Structure Plan ITA

Table ES1: Whenuapai Structure Plan– Assessed Staging

Scenario	Land Use Assumptions			Associated Transport Infrastructure	
	Whenuapai	Adjacent Land Use Development (new growth in brackets)		Regional Transport Network	Structure Plan Transport Network
		Dwellings	Employees		
Scenario 4 (background growth based on ART 2046)	◆ 9,480 dwellings in Whenuapai including: ▪ 850 existing outside future urban zone ▪ 1,150 consented dwellings located either side of Totara Road between Brigham Creek Road and Dale Road ▪ 5,190 new dwellings north of Brigham Creek Road ▪ 890 new dwellings between Waiarohia Inlet and SH18 ▪ 1,400 new dwellings around Trig Road south of SH18 ◆ New industrial activity including 9,200 employees south of Brigham Creek Road.	◆ 1,700 (0) PC14 Hobsonville ◆ 4,350 (1,250) Hobsonville Point ◆ 9,950 (2,900) Kumeu/Huapai ◆ 8,900 (2,850) Redhills ◆ 2,450 (500) Riverhead ◆ 3,000 (1,600) Scott Point ◆ 2,250 (500) Westgate ◆ 3,300(1,000) Westgate North	◆ 1,850 (00) PC14 Hobsonville ◆ 1,500 (00) Hobsonville Point ◆ 2,350 (250) Kumeu/Huapai ◆ 1,400 (300) Redhills ◆ 950 (50) Riverhead ◆ 850 (00) Scott Point ◆ 1,750 (250) Westgate ◆ 11,050 (3,350) Westgate North	As above, plus ◆ SH18 Squadron Drive Interchange west facing ramps[7] ◆ SH18 eastbound widening between Brigham Creek Road and Squadron Drive[9] ◆ SH18 westbound widening between Squadron Drive and Trig Road[9] ◆ Four laning of the new arterial to Kumeu (alternative to SH16)[7]	◆ As above

CONTENTS

1 INTRODUCTION

Flow Transportation Specialists Ltd (Flow) has been commissioned by Auckland Transport to contribute to the development of a structure plan for Whenuapai through an integrated transport assessment (ITA) that considers the transport effects of the anticipated zoning of the structure plan areas, which would subsequently be amended through a Plan Change process. Further to the ITA report issued in June 2016, additional staging and sensitivity tests have been undertaken and the analyses of these are included in this report.

The ITA has been undertaken in accordance with Auckland Transport's guidelines[10] and this report documents the assessment of the relevant transport effects of the proposed land use at Whenuapai and mitigation offered to help manage those transport effects, as well as information required by Auckland Council (the Regulatory Authority), and Auckland Transport and the New Zealand Transport Agency as transport infrastructure/service providers.

The following key transport aspects have been identified and are addressed in further detail in the body of the report.

- The structure plan requirements for future urban zoned greenfield land and brownfield land, as outlined in Part 5 appendix 1.1 of the Proposed Auckland Unitary Plan (PAUP)
- The density and location of land use activities in relation to transport facilities
- The road network within the structure plan area and the connections to the wider area.

The ITA has commenced at the same time and alongside the planning process. The process has included a workshop with a variety of specialists from Auckland Council, Auckland Transport, Watercare and the New Zealand Transport Agency, including planners, urban designers, stormwater, wastewater and water engineers, as well as transportation planners and transportation engineers. It has involved an iterative process where different land uses have been tested to help determine a preferred zoning for Whenuapai. The anticipated land uses assessed in this report broadly align with the output of that workshop, although it is noted that the characteristics of the structure plan are still evolving and the ITA and this report will need to be amended when land use activities, scale, mix and location, as well as staging are refined.

1.1 Transport Assessment Purpose

The requirement to prepare an ITA sits within the rules of the PAUP for the development of a structure plan (or plan change) with land use in excess of the thresholds stated in Rule 2.7.9.1 of the notified PAUP, and as noted above, appendix 1.1 of Part 5 of the PAUP provides details that are required in a structure plan.

[10] Integrated Transport Assessment Guidelines, Auckland Transport January 2015

This ITA covers the transport planning and traffic related matters required to support the Whenuapai Structure Plan. It provides details around the following matters:

- The location of the site and the surrounding land use and road network
- The proposed zoning, including intensity specifications, and the supporting infrastructure in the Whenuapai area
- The integration of the site with the wider area, specifically focussing on the transport network
- The mode split and trip generation that will be generated by the proposed activities within the Structure Plan
- The transport network proposed to support the Structure Plan
- The transport effects of the proposed activities within the Structure Plan, both internally and on the wider transport network
- The mitigation proposed to reduce the traffic effects of the Structure Plan.

The assessment shows that the proposed land use activities can be accommodated provided that appropriate transport networks and services are provided in a timely manner to provide viable transport options and accommodate expected demands for moving within as well as to and from the Structure Plan area. Staging of such interventions has been investigated but assumptions regarding growth and transport provisions in the wider area have a significant bearing on when transport infrastructure and services are needed. Should the land use activities, location and intensities change however, further investigation would be required to understand the transport needs and effects of the new scenario.

2 SCENE-SETTING

2.1 Site Location

Whenuapai is located in northwest Auckland and is bound by the Waitemata Harbour, the North-Western Motorway (SH16) and the Upper Harbour Motorway (SH18) as shown in Figure 1.

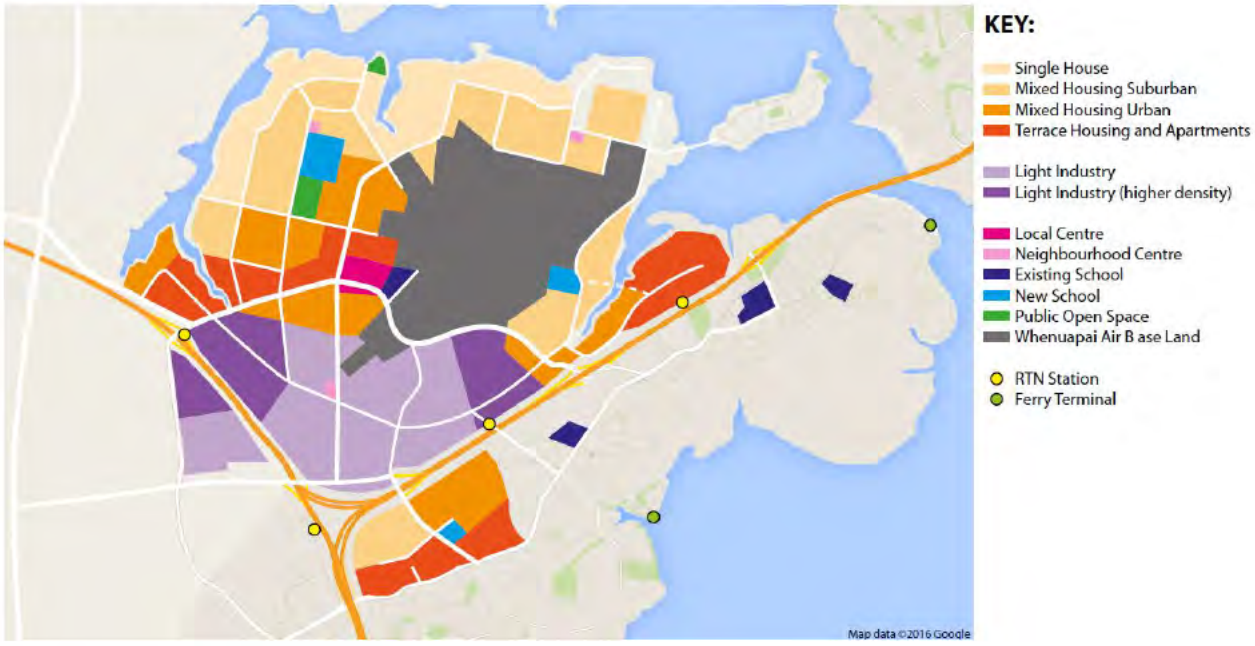
Currently the land is predominantly greenfield land with the exception of the Whenuapai airbase, some residential development mainly in the northeast and some small scale retail and commercial development around the central area on Brigham Creek Road. The land is zoned countryside living under the Auckland District Plan – Operative Waitakere Section and Future Urban Zone under the PAUP.

Figure 1: Site Location

2.2 Assessed Whenuapai Structure Plan

The Whenuapai Structure Plan scenario developed and assessed in this report is shown in Figure 2 and highlights the anticipated transport network, the land use zones and the density of the various land uses. Higher density development is generally assumed to be concentrated around proposed Rapid Transit Network (RTN) stations as well as around the local centre.

Figure 2: Whenuapai Structure Plan



The plan includes the provision of the following land uses:

- A variety of residential dwelling types, concentrated (denser) around the local centre, RTN stations and Frequent Transit Network (FTN) routes
- Light industry, with higher employment densities around RTN stations
- The expansion of the existing local centre
- Neighbourhood centres at relatively busy locations such as RTN stations and main cross roads
- Three new primary schools and the expansion of the existing primary school
- One new secondary school

With the majority of the Whenuapai Structure Plan area bounded by motorways and water, transport connections across the motorways will be critical for the viability of the area. The proposed connections include the following:

- A bridge at the Brigham Creek Road/SH16 interchange
- A bridge and south facing ramps onto SH16 at Northside Drive
- A bridge at Trig Road, which has east facing ramps with SH18
- An underpass at the Brigham Creek Road/SH18 interchange
- A new north-south bridge across SH18 between Trig Road and Brigham Creek Road
- The existing pedestrian/cycle bridge over SH18 at the Hobsonville Village.

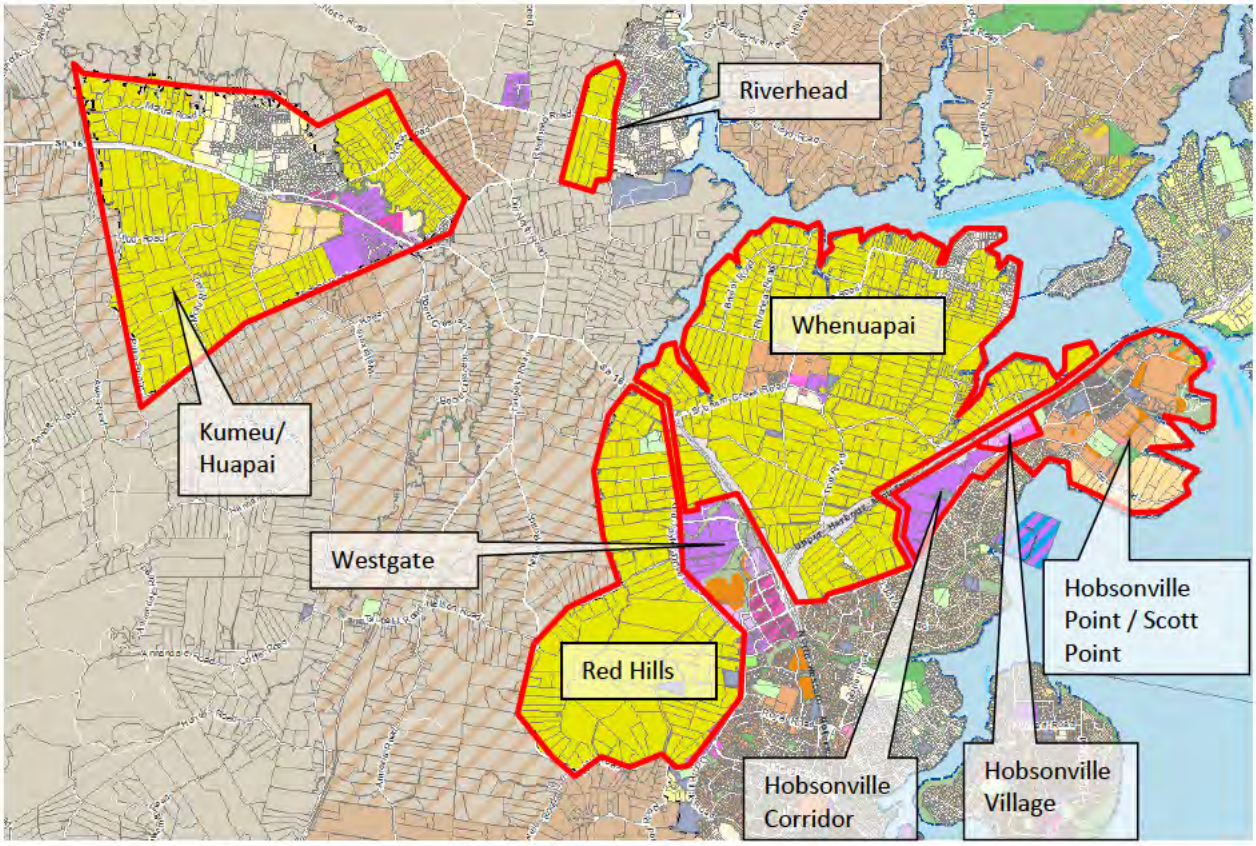
Other key transport interventions that will provide transport to, from and within the Structure Plan area include the RTN extending along SH16 and SH18, bus connector services within Whenuapai along routes that have higher densities, connecting to the RTN stations as well as to ferry wharves at West Harbour and Hobsonville.

The transport network within the Structure Plan area should be designed to facilitate and encourage cycling as a viable mode of transport. This will require road cross sections being sufficiently wide to accommodate separated cycle facilities, cycle paths and shared facilities as appropriate in relation to surrounding land uses, expected traffic volumes and the likely types of user of the facility (eg shared paths around schools versus separated cycle facilities for highly trafficked commuting routes).

2.3 Surrounding Areas

There is a considerable amount of development anticipated in the northwest, particularly in close vicinity to Whenuapai. Westgate, Hobsonville Village, Hobsonville Point and Riverhead areas are undergoing significant development. Scott Point has had a plan variation approved following a structure plan process and is anticipated to develop in the near future. Developers in Red Hills are proposing to proceed with higher densities than anticipated and Kumeu-Huapai has a significant amount of future urban zoned land. These areas are shown in Figure 3.

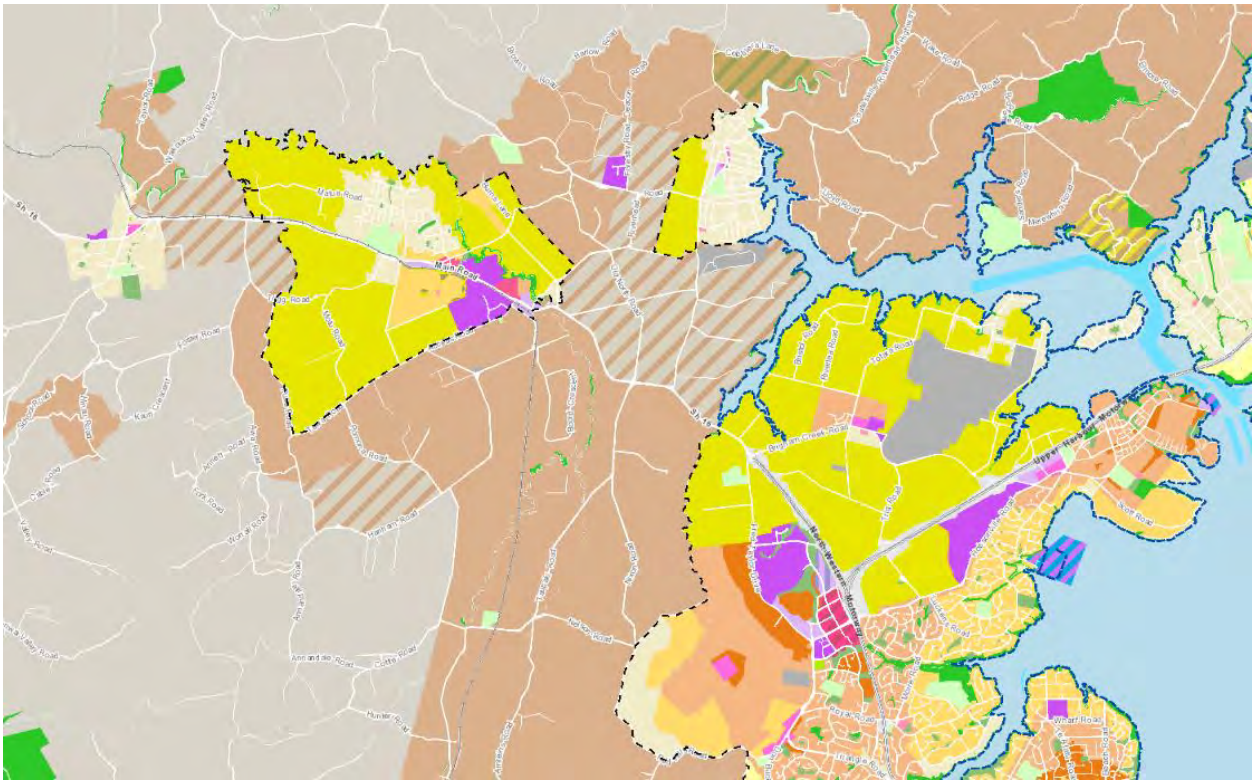
Figure 3: PAUP Surrounding land uses[11]



The Independent Hearing Panel's recommended changes to the PAUP include residential zoning in Red Hills, rather than the proposed future urban zoning and mixed rural and rural countryside living rather than rural production and mixed rural zones between RedHills/Whenuapai, as shown in the following figure.

[11] Sourced from the Auckland Council Proposed Auckland Unitary Plan (notified 30 September 2013), updated 15 March 2016

Figure 4: IHP Recommendations to the PAUP[12]



The transport assessment documented in Section 7 includes staged development in Red Hills that is considered to be commensurate with the ability to construct houses and is therefore considered to be consistent with the Recommendation Version. With regard to the change in zoning of the rural land to the northwest of Whenuapai, additional traffic generated in this area may require improvements on SH16 and at the SH16/Brigham Creek Road interchange to occur earlier than otherwise planned; however are unlikely to affect the suggested transport infrastructure requirements during the early stages of development at Whenuapai.

The Council is expected to release its decisions on the Panel's recommended plan and designations on 19 August 2016.

2.4 Auckland Council's Long Term Plan

The Auckland Council's Long Term Plan[13] identifies investment in transport with regard to projects that are being implemented in the northwest during the 2015-25 period, including "*Upgrade of the Hobsonville Road corridor to accommodate a quality transit network of buses, upgraded intersections, wider footpaths and cycleways to support new developments. Initiatives at Massey North/Westgate are also includ*ed." It notes that Auckland Transport's obligations in the North-west Transformation

[12] Sourced from the Auckland Council Proposed Auckland Unitary Plan Independent Hearings Panel Recommendation Version, 22 July 2016

[13] Auckland Council Long-term Plan 2015-2025, Volume 2 of 3, Page 44 http://www.aucklandcouncil.govt.nz/SiteCollectionDocuments/aboutcouncil/planspoliciespublications/ltp2015volume2.pdf

area are related to pre-existing RMA plan changes and linked to legacy infrastructure funding and works development agreements.

2.5 Auckland Transport's Long Term Plan

2.5.1 Integrated Transport Plan 2012-2041

Auckland's 2012-2041 Integrated Transport Plan (ITP) sets out the 30-year investment programme to meet the transport priorities outlined in the Auckland Plan across travel modes covering the responsibilities of all transport agencies. Developed by Auckland Transport and the New Zealand Transport Agency in collaboration with Auckland Council, the ITP provides a consolidated transport investment programme across the transport system over the next 30 years. The programme covers footpaths, cycle facilities, public transport, state highways and local roads, intermodal transport facilities and supporting facilities such as parking and park-and-ride.

In particular, the Integrated Transport Programme:

- Guides transport agencies in their detailed planning activities for maintaining, operating, renewing and developing their transport networks.
- Directs transport asset management, corridor and network development, transport service levels and the transport capital portfolio for each of the 10 year periods to 2041.
- Informs the detailed programming of activities in the Regional Land Transport Programme (RLTP).

Projects relevant to the Whenuapai Structure Plan identified in the ITP include the following:

- Western Ring Route completion (2012 – 2021)
- Major investment in SH16, from Brigham Creek to Waimuaku (2022 – 2031)
- Investment in SH18 eastbound (2032 – 2041)
- Busways on SH16 (Westgate to Pt Chevalier) and SH18 (Westgate to Constellation) (2032 – 2041)
- Extension of the Northwestern Cycleway to Westgate (2012 – 2021).

2.5.2 Regional Land Transport Programme 2015-2025

The 2015-2025 RLTP identifies the priority of a number of transport projects for the Whenuapai and adjacent areas, as listed below. Some of these are region wide and do not specify how they would apply in the northwest. It is however, noted that the Auckland Transport Alignment Project (discussed below) could result in different projects and different priorities. Furthermore, the Transport for Future Urban Growth Study (discussed in Section 2.7) will identify additional projects related to the future growth anticipated by the Auckland Plan.

- Priority 8 - Bus Priority Improvements and Transit Lanes (2015-2025)
- Priority 9 – Walking and Cycling Programme - Auckland Transport (2015-2025)
- Priority 10 - Walking and Cycling Programme - Transport Agency (2015-2025)

- Priority 18 - Safety programmes (including safety and minor improvements, safety around schools, crash reduction implementation, regional safety programme and safety speed management) (2015-2025)
- Priority 33 – SH16/SH18 intersection
- Priority 34 - Brigham Creek Road Corridor road improvements (2018-2025)

2.5.3 Auckland Transport Alignment Project

Given the growth challenges that Auckland is facing, and the need for some big transport decisions to deal with this, the Government and Council have agreed on the need to improve alignment on a long-term strategic approach to transport in Auckland. In August 2015, a joint project commenced involving Auckland Council, the Ministry of Transport, Auckland Transport, the New Zealand Transport Agency, the Treasury and the State Services Commission, that would identify a preferred approach for developing Auckland's transport system over the next 30 years.

At the end of the project, in mid to late 2016, the Government and Auckland Council intend to reach an agreed view on the way Auckland's transport system should develop over the next 30 years, which will supersede the ITP. The plan will inform decisions on how much investment is needed and how that investment will be funded, but the project itself will not address particular funding options.

2.5.4 Auckland Regional Public Transport Plan 2013

The Auckland Regional Public Transport Plan outlines the public transport services that Auckland Transport proposes for the region over the next ten years.

A key feature of the Plan is the introduction of a simpler, and more integrated public transport network that will allow more people to use public transport, even though some passengers will need to transfer at key interchanges. The improved public transport system is anticipated to offer more frequent and reliable transport over a longer time span (seven days a week) and with easier access to more destinations.

The Plan proposes RTN services between Auckland's CBD and Westgate and between Westgate and the North Shore by 2022, as well FTN services on Hobsonville Road, and all day services through West Harbour and north to Kumeu-Huapai.

2.6 Northern Strategic Growth Area – Transport Provisions

The Northern Strategic Growth Area (NorSGA) project provided a recommended transportation response to local government plan changes (PC) 13 (Hobsonville Point), 14 (Hobsonville Corridor and Village) and 15 (Massey North Town Centre). PC 13 was anticipated to support up to 2,000 jobs, 3,000 homes, two schools and small areas of retail and office, plus open space. PC 14 was anticipated to provide some 1,500 jobs (mainly industrial, low employment density), a 4,000 m^2 supermarket, a small number of retail shops, residential apartments and offices. PC 15 will provide a new regional centre including a town centre, library, town square, shopping centre, offices, education, administration, leisure, recreation, retail and residential developments. The regional centre is anticipated to provide

some 5,770 jobs and 7,000 residents with an Employment Special Area for a range of business uses providing some 3,000 jobs[14].

Transport provisions associated with the growth anticipated by these plan changes were investigated and included the following[15].

- A ferry terminal and bus interchange at Hobsonville Point
- Improvements to Hobsonville Road through the PC 14 area, including traffic signals at a number of intersections along this road between Marina View Drive and Clark Road
- Replacement of Don Buck Road/Fred Taylor Drive roundabout with signals and improvements to Fred Taylor Drive west of SH16
- Construction of a new arterial road between the Fred Taylor Drive and Trig Road via Northside Drive including a bridge over the motorway

Traffic modelling that was undertaken as part of the NorSGA project identified the following additional projects in relation to PC 14 that potentially affect the transport provisions for Whenuapai

- Widening Hobsonville Road to four lanes between SH16 and Hobsonville Point Road
- Re-alignment of Trig Road so that it intersects Hobsonville Road at Hobsonville Road/Luckens Road intersection, including traffic signals at the intersection
- Traffic signals at the Hobsonville Road/Westpark Road intersection
- An internal road network within PC 14, including a new road parallel to Hobsonville Road between Trig Road and Brigham Creek Road, with side roads connecting Hobsonville Road and the new road

2.7 Transport for Future Urban Growth

Auckland Transport, Auckland Council and the New Zealand Transport Agency are working together on a transport network to support Auckland's new housing and business areas, which are anticipated to include some 29,000 dwellings and 13,300 jobs in the northwest area over the next 30 years. This will include a mix of new or upgraded roads, upgraded state highways, optimising existing networks, new public transport and cycling infrastructure.

Committed projects[16] that are relevant for Whenuapai include the following:

- Westgate bus interchange and park and ride
- Bus shoulder lanes on SH16 south of Westgate

[14] Sourced from http://www.aucklandcouncil.govt.nz/SiteCollectionDocuments/aboutcouncil/committees/aucklandfuturevisioncommittee/meetings/aucklandfuturevisioncommag20110405.pdf (on 30 May 2016)
[15] Sourced from https://at.govt.nz/media/imported/4046/Agenda%20item%209%28iv%29%20-%20Closed%20-%20Development%20Projects%20Update%20%28incl%20Att%201%29.pdf (on 30 May 2016)
[16] Sourced from Auckland Transport website: https://at.govt.nz/media/1756621/committed-projects-map-for-the-north-west.jpg

- Western Ring Route, including SH16 improvements between Lincoln Road and Westgate and a new motorway connection between SH1 and SH18.

A draft preferred transport network for northwest Auckland is provided on Auckland Transport's website[17], with the second round of public consultation having ended recently on 13 May 2016. This network recognises the need to move people efficiently and reliably and accordingly focuses on providing a high capacity public transport network. Two RTN routes are proposed adjacent to SH16 and SH18 as identified in Figure 5.

Figure 5: Draft Preferred Transport Network for the Northwest as at April 2016[18]

As noted in the figure, the draft preferred transport network is anticipated to include the following:

- RTN route connecting Westgate to the CBD
- RTN route connecting Huapai and Kumeu to Westgate
- RTN route connecting Westgate to the North Shore
- Higher frequencies on Hobsonville and West Harbour ferries
- Park and Ride at RTN stations
- Dedicated walking and cycling paths connecting to public transport and existing cycle routes
- An alternative corridor parallel to SH16 from the SH16/Brigham Creek Road interchange to Kumeu-Huapai
- Motorway links between SH16 (north) and SH18
- Improved connections to better connect growth areas
- Improved connections east-west to Redhills

[17] https://at.govt.nz/media/1758310/draft-preferred-transport-network-north-west.pdf
[18] https://at.govt.nz/media/1758310/draft-preferred-transport-network-north-west.pdf accessed 26 May 2016

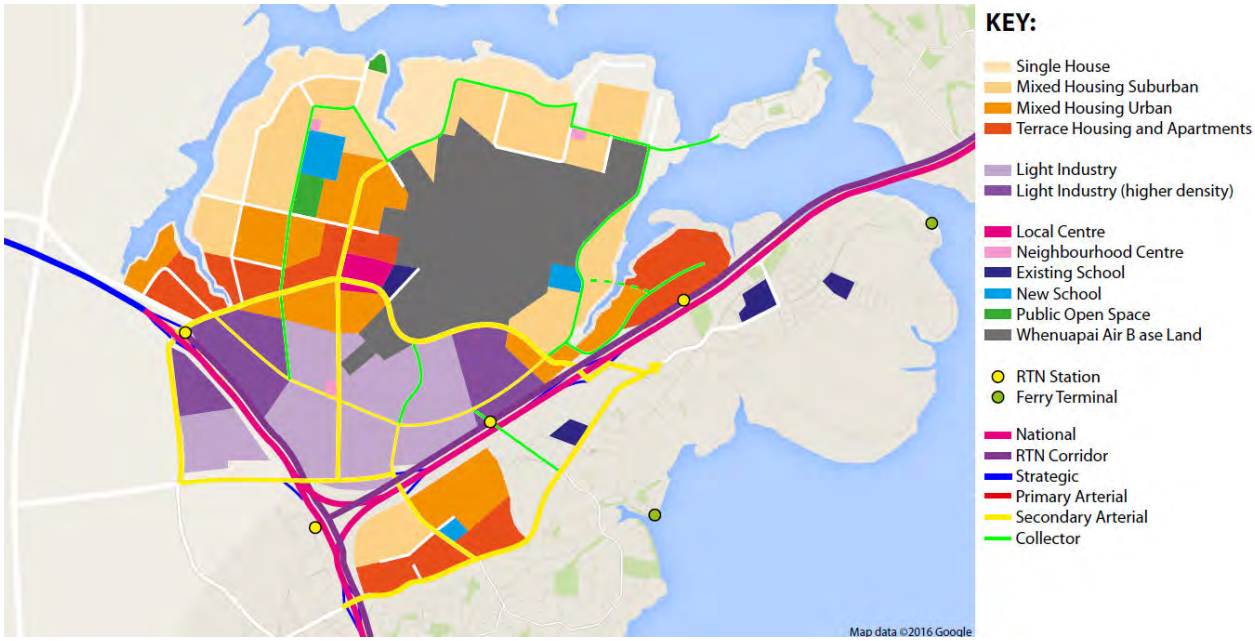
- Improved connections to Coatesville, Riverhead and the North Shore
- New north-south connection west of Westgate
- New connections into Whenuapai
- Safety improvements on SH16 north of Brigham Creek Road.

The draft network notes that the feasibility of a range of different types of interchanges at Northside Drive and Squadron Drive will also be investigated; it is understood that west facing ramps at Squadron Drive may be needed to help reduce congestion at the SH18/Brigham Creek Road interchange.

2.8 Assessed Whenuapai Structure Plan

The assumed land uses, RTN stations and indicative road layout within the structure plan area are shown in Figure 6. The plan includes the main roads only, omitting local roads, which will be identified through future planning and design processes. The provision of RTN services and stations is critical in the assumptions used to assess trip mode proportions (with lower vehicle trip generation rates assumed for land in close proximity to the RTN stations) and in the assumptions regarding density (with higher density anticipated in the vicinity of RTN stations).

Figure 6: Assessed Whenuapai Structure Plan and Transport Network



3 LAND USE AND FUTURE TRANSPORT ENVIRONMENT

3.1 Land Use

The structure plan area is bordered by Fred Taylor Drive and a state highway to the west (SH16), Hobsonville Road and a state highway (SH18) to the south, and the upper Waitemata Harbour and Brigham Creek to the north, as shown in the following figure.

As mentioned above, the land is zoned countryside living under the Auckland District Plan–Operative Waitakere Section. This is supported by a few semi-rural roads including Brigham Creek Road, a District Arterial Road, as well as Totara Road, Trig Road, Puriri Road and Kauri Road, which are all Connector Roads under the District Plan.

Currently the main parts of the Whenuapai Structure Plan area are accessed via either Brigham Creek Road or Trig Road, with these intersecting with the North-Western Motorway (SH16) and the Upper Harbour Motorway (SH18).

Figure 7: Extent of Whenuapai Structure Plan area

The road network within and connecting to the structure plan area will need to consider the various functions of different roads as places for journeys and social interactions as well as accommodating utilities, stormwater, landscaping, street furniture and facilities for different modes of transport. It is be important to understand where key destinations, including schools and community facilities will be located so that they can be accessed appropriately.

A number of key destination land uses are located in the vicinity of Whenuapai, including Westgate and the new North West shopping mall to the southwest, and Hobsonville Primary School and Hobsonville Point Secondary School to the southeast. Westgate is located only a few kilometres from Whenuapai and is likely to provide employment opportunities as well as be a shopping destination for Whenuapai residents. The Hobsonville Point Secondary School is no more than 7 km from the northern parts of Whenuapai, which is a feasible distance to travel. A link from Kauri Road to Clarks

Lane would shorten the route and allow cyclists to use the pedestrian/cycle bridge to Hobsonville Village, and therefore also avoid the heavily trafficked SH18/Brigham Creek Road interchange bridge.

The Royal New Zealand Air Force base is located within Whenuapai and it is understood that it will remain operational for the foreseeable future, with flight paths and noise contours also being considered in the preparation of the structure plan. Currently a section of Brigham Creek Road at the southwestern end of the runway is closed for the take-off and landing of large planes. The airbase includes residential dwellings and it is anticipated that the Whenuapai and airbase communities will coalesce.

3.2 Pedestrian Facilities

Limited pedestrian facilities are currently provided in the Whenuapai area with the current land use being predominantly rural. Brigham Creek Road has footpaths on both sides through the existing local centre and a shared path along the eastern side between the centre and Brigham Creek Road interchange. Totara Road, Trig Road and Puriri Road have a footpath on one side of the road for most of their length.

Minimal pedestrian crossing facilities are currently provided on roads within the structure plan area. A few are provided on Brigham Creek Road within the local centre, including a zebra crossing near Whenuapai School and a pedestrian refuge in the middle of the existing local centre.

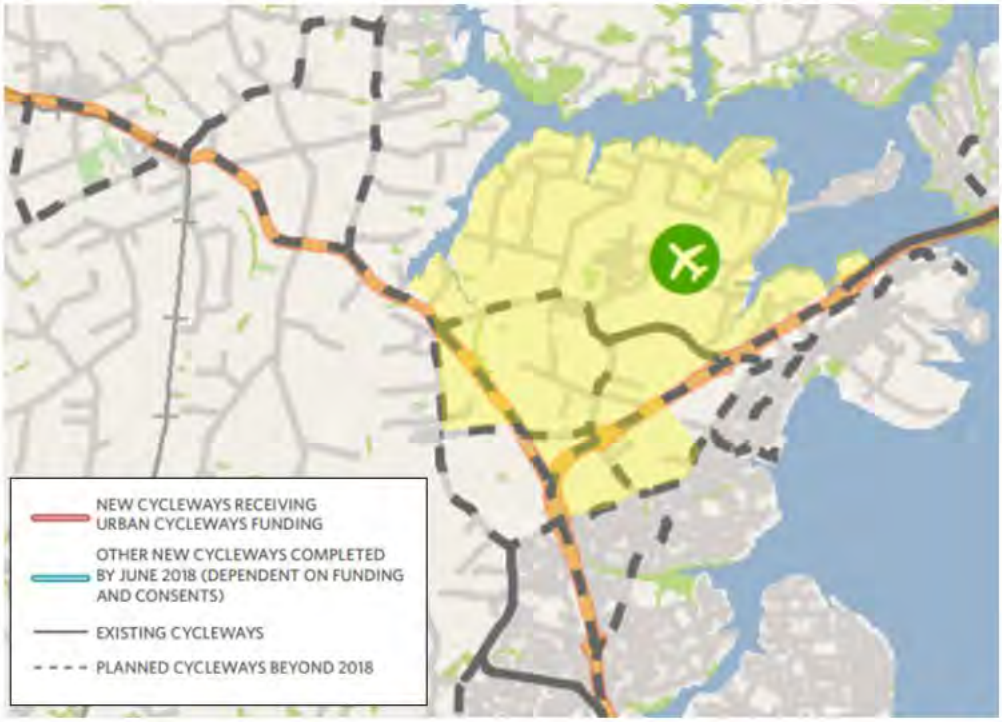
Future pedestrian facilities are anticipated to become more comprehensive as Whenuapai is developed. Given the anticipated scale and type of land use, footpaths on both sides of roads, as well as a network of pedestrian facilities through parks and open space areas will be important for the area.

3.3 Cyclist Facilities

The Auckland Cycle Network, replicated in Figure 8 below, shows Brigham Creek Road, Trig Road and Northside Drive as future connector cycle routes. The North-Western Motorway and the Upper Harbour Highway are proposed to incorporate metro routes, providing a high level of service to cyclists.

A shared path is currently provided over a portion of Brigham Creek Road, located adjacent to the Whenuapai Airbase, as noted above.

Figure 8: Proposed Auckland Cycle Network – Northwest[19]



As per the future pedestrian facilities, future cyclist facilities are anticipated to become more comprehensive as Whenuapai is developed. A connected cycle network with both on road and off road facilities will be important for creating a multimodal network in the area.

Cyclist provisions associated with the Whenuapai Structure Plan are discussed and identified in Section 6.3 below.

3.4 Public Transport

Currently there are two bus routes that service the Whenuapai area being the 093 and 095 as shown in Figure 9. The 095 connects Whenuapai to Midtown, with only one service provided in each direction daily. The 093 connects Whenuapai to the Westgate bus terminal from which riders can transfer to other services connecting to Henderson, New Lynn and Midtown. This service operates on a frequency of approximately two hours.

[19] https://at.govt.nz/media/1152675/Proposed-Auckland-Cycle-Network.pdf accessed 23 May 2016

Figure 9: Whenuapai bus services[20]

Auckland Transport has undertaken consultation on the proposed New Network for west Auckland, with the New Network now finalised. The New Network is expected to be implemented in mid-2017 and will provide a local service through the Whenuapai area. The key difference between the two routes is that Whenuapai bus services will in future connect to Westgate, either via Trig Road in the short term, or via Northside Drive once that link is constructed across the motorway.

Figure 10: Auckland Transport New Network in the vicinity of the structure plan area[21]

[20] https://at.govt.nz/media/1331051/w03_massey_hobsonville_oct-2015-web.pdf
[21] https://at.govt.nz/media/1050127/West-Auckland-New-Network-Consultation-report-maps.pdf

It is noted that the New Network doesn't take account of the land use, scale, location and intensity anticipated by the Whenuapai Structure Plan and that the above routes and services would need to be reviewed and enhanced to accommodate the anticipated development. Indicative bus routes for the Whenuapai Structure Plan are discussed and identified in Section 6.4 below.

3.5 Road Network and Hierarchy

Currently the Whenuapai road network is supported by a few key roads including Brigham Creek Road, a District Arterial Road, as well as Totara Road, Trig Road, Puriri Road and Kauri Road, which are all Connector Roads under the District Plan.

Figure 11: District Plan Road Hierarchy

The key future road connections associated with the Whenuapai Structure Plan are discussed in Section 7 below, and are as previously identified in Figure 2.

3.6 Whenuapai Future Transport Network

As noted previously, Auckland Transport, Auckland Council and the New Zealand Transport Agency have been working together to define a transport network that can support Auckland's growth anticipated by the Auckland Plan. The draft preferred transport network for Whenuapai and Red Hills is shown on Auckland Transport's website, and replicated in the figure below.

Figure 12: Draft Preferred Transport Network for Whenuapai and Red Hills as of April 2016[22]

The key components identified in the Future Transport work have been assumed, albeit tested with regard to need and staging, in the development of the transport network for Whenuapai.

4 PROPOSAL

4.1 Description and Development Layout

The Structure Plan land use assumptions, developed through liaison with planners at Auckland Council, and assessed from a transportation perspective are described below. It is recognised that these assumptions will change following inputs from other disciplines and based on a review of the outcomes of this assessment. Furthermore, details of the viability of assumed transport provisions from a funding, physical or consenting perspective have not been investigated and future studies will be needed to confirm or otherwise how feasible the assumptions are.

For the purposes of this ITA, the Structure Plan is anticipated to provide a variety of land uses within Whenuapai including the following:

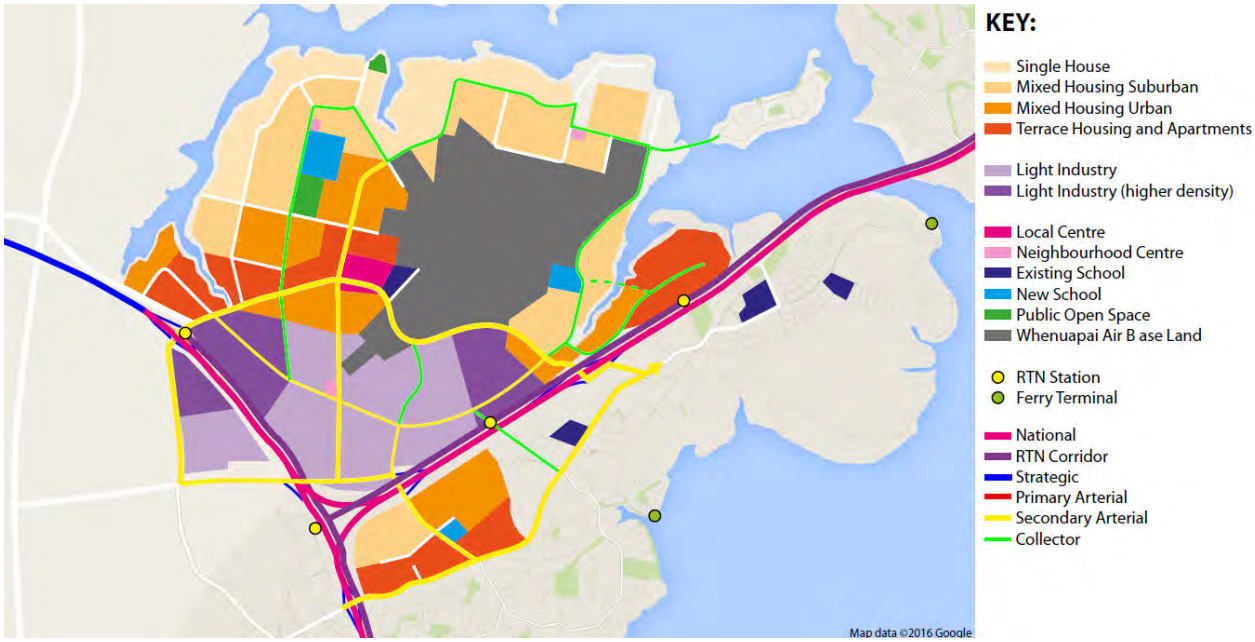
- A range of housing options, with denser development around RTN stations, the local centre and frequent bus routes, transitioning to lower density dwellings fronting the coastline. In total some 9,480 dwellings are anticipated
- Light industry, with higher employment densities assumed around the RTN stations. A total of 9,200 employees are anticipated by the proposed activity
- A local centre of 8,000 to 10,000 m^2 gross floor area (GFA) in the vicinity of the existing centre on Brigham Creek Road

[22] https://at.govt.nz/media/1758294/draft-preferred-transport-network-whenuapai-redhills.pdf accessed 26 May 2016

- New smaller neighbourhood centres, similar to the existing centre at the intersection of Waimarie Road and Puriri Road, located at the cross roads of Mamari Road and Spedding Road within the light industrial land, in the vicinity of a new primary school and new secondary school on Riverlea Road, and at the new RTN stations alongside SH16 and SH18
- Schools, including expanding the existing primary school on Tamatea Avenue, a new primary and a new secondary school on Riverlea Road, a new primary school in the vicinity of Kauri Road, and a new primary school in the southern area in the vicinity of Trig Road
- Public open space areas including the coastal esplanade, a park at the northern end of Riverlea Road and another park on Riverlea Road in the vicinity of the new schools.

The assessed land allocation to the various land uses is shown below in Figure 13.

Figure 13: Proposed Development Layout and Transport Network



Key transport infrastructure assumptions associated with these land uses and development growth outside Whenuapai includes the following (in no particular order):

- A comprehensive network of pedestrian footpaths and appropriate cyclist infrastructure. An overall plan is needed to ensure that piecemeal development does not preclude the provision of these networks, but also that as development proceeds, developers provide the appropriate facilities ultimately needed
- Frequent bus connections to RTN stations, Westgate, Hobsonville and West Harbour. This is particularly important prior to the RTN being extended to Brigham Creek Road and the North Shore
- More frequent ferry services from Hobsonville Point and West Harbour, supported by transport connections by all modes of travel. This is particularly important for Whenuapai as access to the ferry terminals requires all modes to cross SH18
- Connections by all modes and park and ride facilities at proposed RTN stations, with these stations assumed to be located at Westgate, in the vicinity of the SH16/Brigham Creek Road

interchange, near a new north-south bridge over SH18 between Trig Road and Brigham Creek Road and close to the pedestrian/cycle bridge connecting to Hobsonville Village. The location of the RTN corridors and stations will be developed further by Auckland Transport and the New Zealand Transport Agency however the provision of these networks will be critical in providing viable transport options that also help to lower traffic volumes and their associated adverse effects

- Localised widening of Brigham Creek Road and signalising of key intersections. Brigham Creek Road is a busy road now with a count from 2014 indicating 10,700 vehicles per day (5 day ADT[23]) at the western end and 7,830 5 day ADT at the eastern end. It carries through traffic between SH16 north of Brigham Creek Road and SH18 east of Brigham Creek Road as well as local traffic, particularly to and from Whenuapai School and the airbase. The TFUG study suggested widening Brigham Creek Road to four lanes, however, ultimately, proposed SH16 to SH18 connections will reduce traffic volumes on Brigham Creek Road, meaning that only localised widening is required. In the meantime, before the motorway connections are provided, Brigham Creek Road will continue to be busy, which may hinder development within Whenuapai. However, urbanisation (50 kph speed limit, traffic signals, footpaths, cycle facilities and landscaping) will reduce the desirability of the road as a through route, which could then allow development to occur.
- Capacity increases on SH16 in the vicinity of the SH16/Brigham Creek Road roundabout including additional lanes on the roundabout approaches, widening and/or signalisation of the roundabout and two lanes in each direction on SH16 north of Brigham Creek Road.
- Extension of Spedding Road to connect with Brigham Creek Road in the northwest at a cross roads with a link extending into the Kennedys Road area. Traffic signals will be required at the intersection on Brigham Creek Road to accommodate future turning movements and to provide signalised pedestrian crossings. It is noted that this intersection will be located in close proximity to the Brigham Creek Road interchange with the old (current) SH16. The exact location is dependent on the new interchange design as well as the location of the old SH16 connection to Brigham Creek Road and access to the RTN station
- Extension of Spedding Road to connect with Brigham Creek Road in the east, at Kauri Road. Traffic signals at the Brigham Creek Road/Kauri Road/Spedding Road intersection will be needed for capacity, safety and pedestrian crossings
- A network of roads within the industrial area including connecting and widening Mamari Road and extending it south from Spedding Road to Northside Drive to provide a north-south connection through Whenuapai with traffic signals, including bus priority at Mamari Road/Brigham Creek Road/Totara Road. Other signalised intersections will also be required.
- A network of roads within the residential areas, including:
    - a connection between Totara Road and Riverlea Road
    - a connection from Riverlea Road to Brigham Creek Road
    - a connection from Bristol Road to Brigham Creek Road

[23] Average Daily Traffic over five day week Monday to Friday

  - a link into the Kennedys Road area
  - realignment of Sinton Road into Kauri Road
  - links to Trig Road south of SH18 providing access into residential areas with traffic signals on Trig Road
  - links to Hobsonville Road west of Trig Road
- A number of signalised intersections based on land use (eg for pedestrian connections) and anticipated traffic, with bus priority as appropriate
- Traffic signals at the intersections within the SH18/Brigham Creek Road interchange and realignment of the western end of Sinton Road so that it connects to Kauri Road rather than to the intersection at the SH18 interchange east facing ramps
- A new link between Kauri Road and Sinton Road via Rata Road. Whilst not driven by expected traffic volumes, this road would provide a vital connection and resilience to the accessibility of the Sinton Road peninsula and access to schools and the RTN station. At the least, a pedestrian/cycle connection should be provided. This would also be a useful connection for buses to the SH18 RTN station
- A new road bridge over SH18 providing a local connection between Whenuapai (north and south of SH18) and Hobsonville, including to the adjacent RTN station and also the West Harbour ferry wharf. Traffic signals where this link meets Spedding Road
- A new bridge over SH16 at Northside Drive, south facing ramps onto SH16, and a local connection to SH18 at the Trig Road interchange. This connection will provide a key link into Westgate as well as to SH16 and SH18
- Traffic signals at the SH18/Trig Road ramp intersections
- Direct motorway to motorway connections, allowing vehicles to transfer from southbound on SH16 to eastbound on SH18 and from SH18 westbound to SH16 northbound. This connection will reduce the through traffic volumes on Brigham Creek Road, removing the need for widespread road widening in the longer term.
- A new arterial road parallel to the existing SH16 north of Brigham Creek Road, providing additional capacity and bypassing the SH16/Riverhead-Coatesville intersection. This new arterial would initially be a two lane road, but ultimately be widened to four lanes. A new diamond interchange would be provided at SH16/Brigham Creek Road. Depending on the proximity of the new interchange and existing state highway intersections on Brigham Creek Road, a new east-west road may be required that joins with a new north-south road and the Riverhead-Coatesville Highway instead of retaining the existing SH16 to meet Brigham Creek Road. This would be the subject of a separate study.

As noted previously, details of the viability of the above transport provisions from a funding, physical or consenting perspective have not been investigated.

The proposed road network varies slightly from that developed during the TFUG study and presented in the draft preferred network for Whenuapai and Red Hills (refer Figure 5 above), which includes a north-south road extending from Trig Road north to Totara Road. The ITA assessment has shown that

this layout would not accommodate the expected traffic volumes using the south facing Northside Drive ramps as efficiently as a layout that includes a central north-south road joining Northside Drive centrally between the SH16/Northside Drive ramps and SH28/Trig Road ramps. The new layout is anticipated to attract more industrial related traffic to the Northside Drive ramps than the SH16/Brigham Creek Road ramps, ultimately resulting in lower traffic volumes on the northern section of Brigham Creek Road. This distribution is considered to be more appropriate, given the more residential traffic function of Brigham Creek Road than Northside Drive.

4.2 Staging of Development

It is acknowledged that further work regarding understanding the most appropriate staging for the release of land needs to be undertaken and that this will also inform a potentially different staging approach to that investigated in relation to transport provisions. This has eventuated due to the timeframe of these investigations. However, additional sensitivity tests were undertaken in July 2016 based on Building Consent and Land Supply Inventory data provided by the Council, which has been used to better understand growth during earlier stages.

4.2.1 Staging for Water and Wastewater

A key determinant for staging of the release of land is the supply of water and the management of wastewater and stormwater.

It is noted that the 21 April 2016 workshop Key Outcomes Report[24] refers to staging related to water infrastructure and two possible scenarios. An alternative to the "current thinking" scenario was discussed as if the area west of Brigham Creek Road goes to market before the RTN is in place then the densities needed to support public transport will not be achieved. However it was considered that business development should not be held back. Acknowledging this, an alternative staging approach was proposed. Further to this, a second workshop held on 26 May 2016 introduced another staging scenario. All three water staging scenarios are summarised below.

Table 1: Water and Wastewater Staging

21 April 2016 Workshop Outcomes Staging - "current thinking"	21 April 2016 Workshop Outcomes Alternative, to be investigated	26 May 2016 Workshop Indicative Staging
Stage 1: Business zone area between SH16/SH18, the high density residential area west of Brigham Creek Road at RTN stations and the Redhills SHA	Stage 1a: Residential north of Brigham Creek Road	Stage 1a: Residential area south of SH18 and east of Trig Road, residential and industrial areas north of SH18 and south of the airbase, except Kauri Road east of airbase and Sinton Road/Clark Lane area
	Stage 1b: Some industrial areas	Stage 1b: Residential area south of SH18 and west of Trig Road,

[24] Whenuapai Structure Plan Workshop Outcomes Report, May 2016 (not an approved Council document)

Table 1: Water and Wastewater Staging

21 April 2016 Workshop Outcomes Staging - "current thinking"	21 April 2016 Workshop Outcomes Alternative, to be investigated	26 May 2016 Workshop Indicative Staging
		residential area Kauri Road east of airbase and Sinton Road/Clark Lane area
Stage 2: Residential areas north of Brigham Creek Road	Stage 2: High density residential northwest of Brigham Creek Road and remaining industrial areas	Stage 2: Remaining areas (require new major pump stations)

Given the timing of the investigations being undertaken, the above scenarios were not assumed explicitly in relation to the release of land and associated transport provisions. However, the assumptions used are more broadly aligned with the 26 May workshop information with the exception of the stage 1a industrial being clustered on the northern side of SH18. Instead this has been assumed to occur slightly later with industrial development first occurring in the vicinity of Brigham Creek Road and Trig Road to help with the urbanisation of these roads.

4.2.2 Staging for Transport

The staging of land use development and transport provisions for the Whenuapai Structure Plan area has been assessed based on the level of development applied within the ART model[25], scaled to reflect the land use assumed in the assessed Structure Plan.

The ART model forecast years used in the assessment include 2021, 2026, 2036 and 2046. Full build out of the Whenuapai Structure Plan area and associated transport provisions are assumed to occur by 2046. The modelled intermediate years have been used to help determine planning provisions, as the modelled years are only useful in understanding background growth and what other new growth outside Whenuapai is anticipated to occur concurrently. Accordingly, the planning provisions determined for transport will not be related to specific years or specific numbers of dwellings and industrial development, but will be based on assessing the need for transport infrastructure and services based on where an application sits in relation to the scenarios considered. As the structure planning work progresses, some additional scenarios will need to be derived and considered to allow consideration of likely development patterns.

[25] The Auckland Regional Transport (ART) model is a four stage transport demand model that determines trip generation, trip distribution, mode choice and traffic routing based on land use information provided by the Auckland Strategic Planning (ASP) land use model. The ART model assigns traffic volumes to a modelled roading network and provides demand flows that can be used in more detailed traffic models. The ART and ASP models interact with population and employment numbers fed from ASP to ART and accessibility, environment and transport costs fed from ART to ASP. The ASP model runs through a "DELTA" (development, employment, location transition and area quality) programme and the ART model runs through an "EMME" (Equilibre Multimodal Multimodal Equilibrium) programme. Combined, the ASP and ART models are part of the "Auckland Transport Models". The Auckland Public Transport (APT) model is part of the model set.

It is noted that growth outside Whenuapai may have more of a bearing on when regional transportation provisions are required than development in Whenuapai itself. Further to this, the timing of the release and take up of industrial land in and around Whenuapai will have a direct bearing on how far people travel – providing local jobs for local people will help to reduce the length of vehicle trips, which could delay the need for large scale infrastructure improvements. By extension, transportation provisions identified with the full build out of the northwest area rely on jobs being available locally; if they are not, then greater transport demands to industrial employment opportunities in other areas of Auckland may eventuate, with corresponding additional transport requirements. Added to this, is that transport provisions also have a bearing on trips rates – if the RTN is not provided or is delayed, then vehicle trip rates will be higher than anticipated and this will lead to the earlier need of other transport provisions. Accordingly, it can be seen that the assessment of staging for Whenuapai with regard to development and transport provisions is very complex. Greater understanding of the complexities of different land use and transport scenarios would need to include additional scenarios being tested in the Auckland Transport Models.

Some manual corrections to the assumed growth in Whenuapai have been made to intermediate forecast years, based on logical expectations regarding growth. For example, it is expected that while industrial development should not be held back, the current housing situation in Auckland will likely see residential development progress faster than industrial development in the initial years and as a result, no new industrial activity is assumed in Whenuapai for the 2021 scenario.

Land use development assumptions for surrounding areas have similarly been based on ART model land use projections for each year, adjusted to reflect more logical and balanced growth and also following a review of building consent and land supply inventory data from Auckland Council.

To estimate 2021 traffic volumes and origins/destinations generated outside Whenuapai, the following process has been assumed:

- Building consent information for 2013 and 2014 has been reviewed to obtain an estimate of dwellings for 2015
- Using the Council's Land Supply Inventory spreadsheet and assuming no more than 300 dwellings per year per ART zone, an estimate of the dwellings built by 2021 has been developed
- The 2015 and 2026 ART matrices (I9 land use) have been used to interpolate the traffic demands in ART zones in the areas around Whenuapai for a 2021 year
- The 2021 traffic demands interpolated from the ART 2015 and 2026 models have been adjusted to reflect the growth in dwellings assumed from the building consent and Land Supply Inventory.

The above proposed changes to the growth in residential development is somewhat linked to growth in employment opportunities as the ART models assume a closed system where the employment to dwellings ratio is essentially fixed. Accordingly, assumed employment in the ART zones has been adjusted to match the adjusted growth in dwellings. As a result, the numbers of dwellings and employment assumed to be available by year end 2015 and 2021 are as follows.

Table 2: 2015 and 2021 Dwelling Assumptions

Location	Dwellings			Employments		
	2015	2021	Growth	2015	2021	Growth
Hobsonville Point	830	2,910	2,080	530	1,050	520
Kumeu/Huapai	1,150	2,590	1,430	1,650	1,810	160
Redhills	250	1,750	1,500	440	580	140
Riverhead	980	1,540	560	740	780	40
Scott Point	50	840	790	50	260	200
Westgate	520	790	270	1,030	1,110	80
Westgate North	20	670	650	680	2,110	1,430
Total	3,810	11,080	7,270	5,130	7,700	2,580

It should be noted that the ART I9 land use scenario was developed prior to the Marine Industry Precinct in Hobsonville Point being considered for 890 dwellings rather than some 1,400 FTEs and that the ART models would need to be re-run to adjust for this.

A similar process has been followed to estimate 2026, 2036 and 2046 traffic volumes and origins/destinations, with ART growth adopted post 2021 but capped at 300 dwellings per year per area.

Transport investments have been applied to each modelled scenario, with these initially based on the recommendations of the NorSGA and Transport for Future Urban Growth (TFUG) studies. The timing of various projects has been modified however, with the need for each project being determined by:

- The predicted Level of Service (LOS) for intersections and road links, with a target LOS of D; this measure is discussed more fully in Section 7.4
- Accessibility and safety, such as signalised pedestrian crossings at major intersections as local centres and schools develop.

The land use assumptions and resulting transport investment recommendations for eight land use scenarios are summarised in Table ES1 in the executive summary. Further discussion on the transport assumptions and traffic modelling is provided in Section 6 of this report. Detailed discussions of the staging tests are provided in Section 7.7 of this report.

It is important to note that the staging scenarios below are notional only. While each scenario has been based on a specific forecast year from the ART model (2021, 2026, 2036 and 2046), there is not necessarily certainty around the scale or location of land use development within Whenuapai or elsewhere, or on the timings of uncommitted transport projects. The staging scenarios are less a prediction and more a guide to demonstrate the transport response required to support a given development scenario.

4.3 Pedestrian and Cycle Network

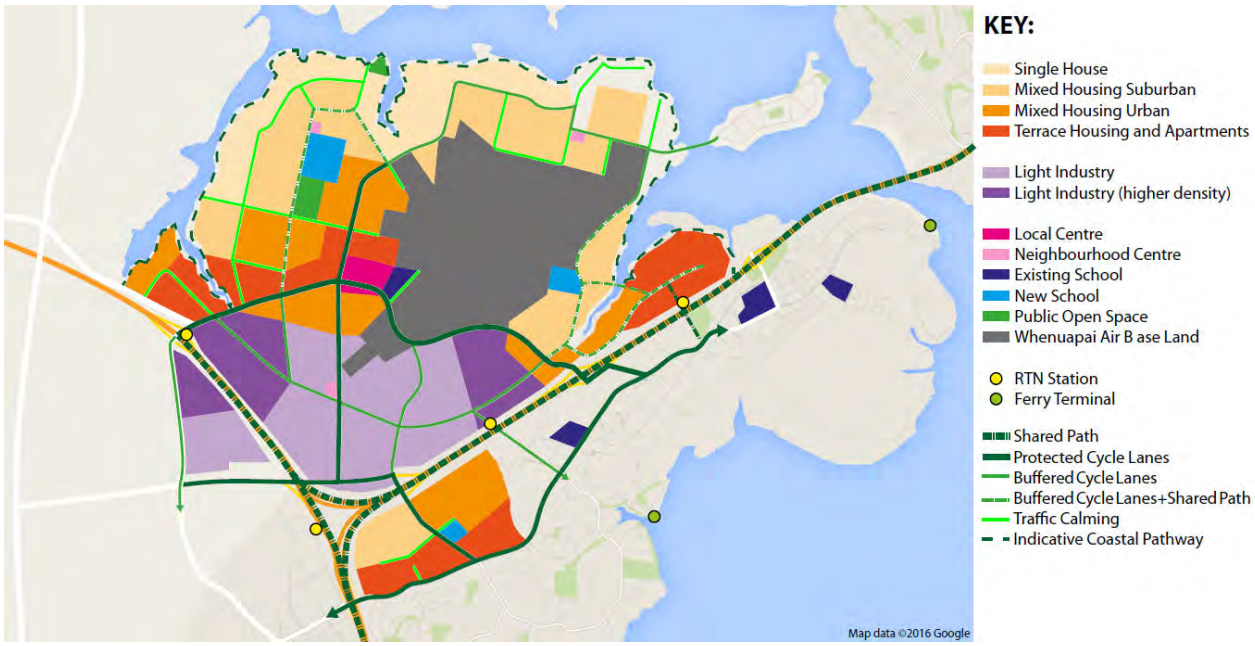
All roads within the Whenuapai structure plan area will provide footpaths on both sides, forming a connected pedestrian network.

Two new shared paths adjacent to SH16 and SH18 are anticipated as part of the Auckland Cycle Network. Connections to these facilities, as well as to the Metropolitan Centre at Westgate and other centres at Hobsonville Village and Hobsonville Point, as well as to major public transport stops including the RTN stations and ferry wharves will need to be provided. Cycle facilities proposed within and in the vicinity of the structure plan area include:

- Physically separated cycle lanes on key roads including Brigham Creek Road, the southern section of Totara Road, Mamari Road, Northside Drive, Trig Road south of SH18 and Hobsonville Road. Where separated cycle lanes are provided there needs to be restrictions on driveway crossings (ie rear access only) and ideally few side roads
- Buffered cycle lanes on a number of the connector roads including the main roads in the industrial areas and roads linking to the RTN station at the new bridge across SH18 and links to Marina View Drive towards the West Harbour ferry
- Buffered cycle lanes and shared paths where residential catchments are close to schools, therefore providing for commuter cyclists as well as providing a safer environment for those wishing to cycle or scooter to school. Where shared paths are provided there needs to be restrictions on driveway crossings (ie rear access only) and ideally few side roads
- Pedestrian/cycle links through areas of land that may not necessarily (although could) provide a road connection

The proposed walking and cycling network for the Whenuapai Structure Plan area is shown in Figure 14.

Figure 14: Walking and cycling network



The indicative coastal pathway has been shown to follow the coast for the entire area. As development has already occurred in the northeastern corner of the structure plan area the route may need to diverge from the coast in a few locations, however for the majority of the route the path is anticipated to follow the coastline.

New facilities outside the structure plan area are needed to provide improved safety and connectivity to key destinations. These may be the subject of other studies undertaken by Auckland Transport, such as links to the West Harbour ferry wharf.

4.4 Public Transport

The New Network for public transport in west Auckland will be significantly enhanced to help accommodate the anticipated demands associated with growth in Whenuapai and other growth areas.

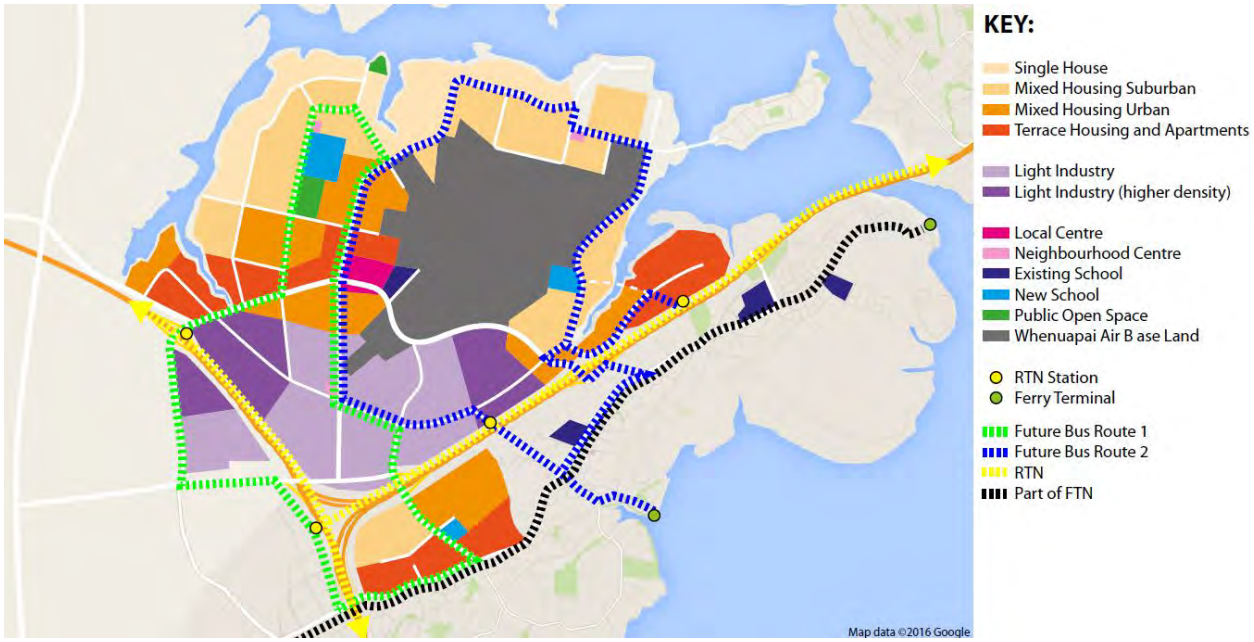
Of key significance to public transport for Whenuapai are the anticipated RTN corridors along SH16 and SH18. These will significantly increase the attractiveness of public transport due to reduced travel times to major regional destinations. The location of and ease of access to RTN stations is crucial to providing a service that will be able to be used. Four RTN stations are proposed adjacent and close to the Whenuapai structure plan area, including one at Westgate, one in the proximity of the SH16/Brigham Creek Road interchange, one in the vicinity of the new local road and bridge crossing SH18 between Trig Road and Brigham Creek Road (east) and the fourth located close to the existing pedestrian/cycle bridge over SH18 at the Hobsonville Village. It is anticipated that through the structure plan process, higher densities in terms of dwellings and employment will be encouraged in close proximity to the RTN stations (within some 800 m), and that they may also provide facilities associated with neighbourhood centres (eg convenience retail).

Bus access to the RTN stations will be provided by frequent connector services, which should also provide a robust network within and to/from Whenuapai. Indicative FTN or Connector routes, providing a service at least every 15 or 30 minutes, 7 am to 7 pm, seven days a week, are shown in Figure 15. These services will be supported by Local and Peak services, which are not identified in the figure below.

Initially, and based on the significant investment (both financially and in terms of time) required for each to be operational, the northwest RTN (ie Brigham Creek Road to central Auckland, via Westgate) has been assumed to be provided within the next five to ten years (ie between 2021 and 2026) and extending the RTN onto SH18 (Westgate to the North Shore) was assumed to be needed in the following ten year period (between 2026 and 2036). However, the scenarios tested for 2021 that include medium to high density development in the Kennedys Road area and Sinton Road area have been assumed have low vehicle trips rates, associated with their proximity to FTN/RTN services. The earlier that these transport provisions are provided, the less reliance there will be on private vehicles, thus enabling further development to occur earlier.

Indicative bus routes through Whenuapai area shown in Figure 15. This shows proposed FTN or Connector bus routes connecting Whenuapai residential and employment areas to RTN stations, centres and ferry terminals.

Figure 15: Indicative Bus Routes for Whenuapai



In order to support and encourage public transport travel, a connected public transport network with priority allocation is required. Bus priority is proposed for Mamari Road, Totara Road and Trig Road, particularly at signalised intersections. Furthermore, bus priority is recommended to be considered at a number of intersections, with considerable attention given to the approaches to the RTN stations.

4.5 Proposed Roads

The network of key roads within the structure plan area has been shown in previous figures including in Figure 13.

The classification of these roads has been based on the road classification categories in Chapter 4 of Auckland Transport's draft Code of Practice (ATCoP) and should also be reflective of Auckland Transport's Road and Street Strategy (RSS), which is under development.

ATCoP broadly classifies road functionalities in order to determine levels of service and specific maintenance, operational and investment decisions. The RSS is a comparable road classification scale but classifies roads based on both movement and place, with the aim of resolving modal conflict as well as giving strategic direction to spatial outcomes. Using existing place shaping, policies, data, and applying base typologies, direction can be given with regard to how the roads and streets could be designed in order to achieve the desired function. Following confirmation of the land use for Whenuapai, further work will be able to be undertaken to develop appropriate guidance in this regard.

Generally, the structure plan area is anticipated to be supported by four key road types. These roads have been developed cognisant of ATCoP and desired outcomes of the RSS. The typical provisions for each of these roads are shown in Table 3.

Table 3: Road Types

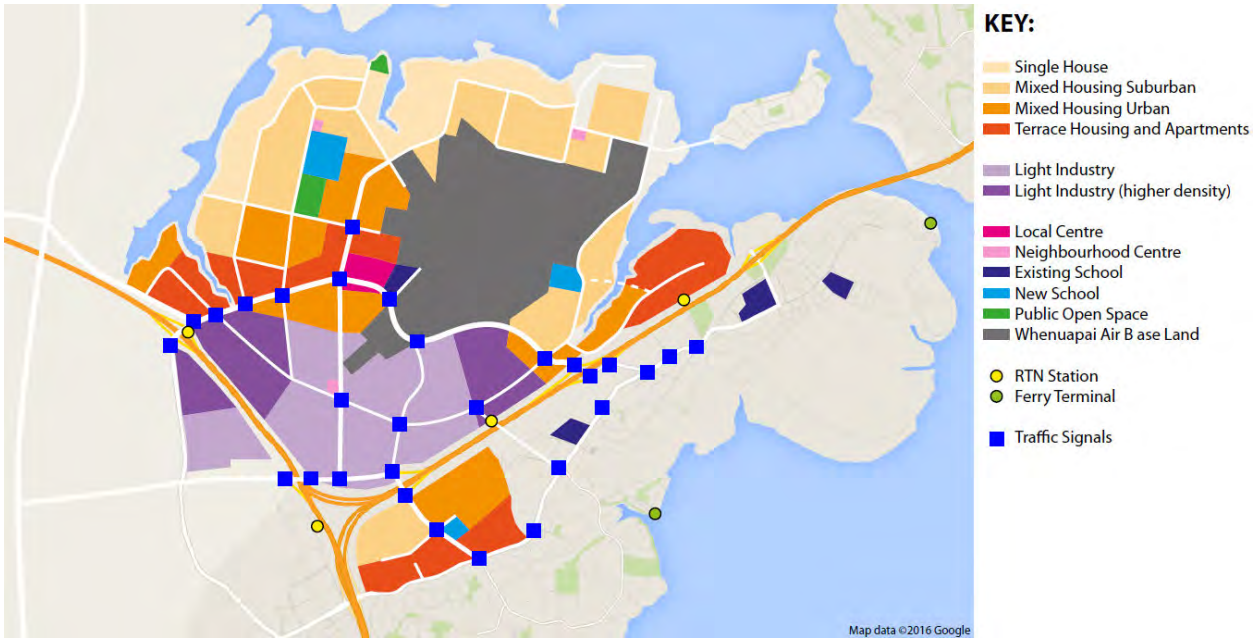
Road Type	Anticipated Layout
Primary Arterial Road	Two to six vehicle lanes separated by a median with segregated cycle facilities and footpaths. Generally form part of the Frequent Transit Network and may include bus priority. Parking and access generally controlled. Traffic volumes may be in excess of 40,000 vehicles per day.
Secondary Arterial Road	Two to four vehicle lanes with segregated cycle facilities and footpaths. Generally form part of either the Frequent Transit Network or Local Connector Network and may include bus priority. Parking and access generally controlled. Traffic volumes may be in excess of 25,000 vehicles per day.
Collector/Connector Road	Generally two vehicle lanes with traffic volumes up to 10,000 vehicles per day. Buffered cycle lanes and/or shared path depending on proximity to schools, on street parking and footpaths
Local Road	Two vehicle lanes, traffic calming, low volume, on street parking and footpaths

The dimensions of the various lanes will be in accordance with ATCoP, as is required under the Neighbourhood Design Guidance section of the PUAP.

4.6 Signalised Intersections

Figure 16 illustrates the anticipated signalised intersections within the structure plan area. In general, traffic signals are recommended to accommodate expected traffic volumes and where adjacent land uses generate high pedestrian volumes and signalised pedestrian crossings would facilitate and help encourage higher pedestrian travel, for example within the local centre, at the RTN stations and where schools are located on busy roads. This strategy aligns with the walking and cycling response of providing safe and convenient signalised crossings and appropriate cycle treatments on key corridors.

Figure 16: Signalised Intersections



A number of additional intersections may require traffic signals in order to ensure pedestrian connectivity is achieved safely. These intersections are envisaged to be located adjacent to schools and possibly parks. One location which has already been identified as needing further consideration is on Kauri Road connecting the primary school and the proposed road/shared path link from Sinton Road.

5 INTEGRATION WITH FUTURE TRANSPORT NETWORK

5.1 Auckland Regional Policy Statement

Chapter 4 (Transport) of Auckland Council's Regional Policy Statement (ACRPS)[26] states the following transport investment objectives:

- *"To develop a transport network that supports a compact sustainable urban form*
- *To avoid, remedy, or mitigate the adverse effects of transport on the environment and, in particular:*
  - *to avoid, remedy, or mitigate the adverse effects of transport on air quality, water quality and heritage;*
  - *to reduce the need for the transport system to use non-renewable fuels;*
  - *to avoid, remedy, or mitigate the adverse effects of the transport system on community well-being and amenity.*
- *To develop a transport network which provides an acceptable level of accessibility for all sections of the community within and across the region, by encouraging transport choices that are efficient, convenient or practical.*

[26] Regional Policy Statement; Auckland Council; 31 August 1999

- *To develop a transport network which is as safe as is practicable and which promotes better physical health for the community"*

The Whenuapai Structure Plan is considered consistent with the above objectives, in that it minimises the reliance on private car travel and adverse effects of the land use development. The Structure Plan does so by:

- Concentrating land use development close to RTN stations, bus routes and centres
- Providing frequent public transport services to RTN stations and onward to major destinations, supported by bus lanes where appropriate
- Integrating bus routes with the West Harbour and Hobsonville Point ferries
- Investing in a comprehensive network of footpaths with strong pedestrian links to centres, schools and RTN stations and a comprehensive arterial network as indicated in the structure plan that will be enhanced through subdivision planning to provide an easy to navigate grid-like layout
- Investing in appropriate cycling infrastructure throughout the structure plan and wider area, with a strategy of separated cycle routes on arterials through to slowed local streets suitable for sharing by all modes; strong connections to centres, schools, RTN stations, ferry wharves and between employment and residential areas
- Providing a combination of residential and business zoned land, in addition to local retail areas, green space and schools, supported by the above public transport, walking and cycling networks
- Providing additional traffic capacity only where required to meet the level of service criteria.

While private car travel is generally expected to be the dominant mode of travel to and from the structure plan area (60% estimated in 2046, see Section 6.5), this is significantly lower than the current Auckland average (83%, from 2013 Census data), and more so when considering Whenuapai's location on Auckland's urban edge.

5.2 Future Transport Network

As noted previously in Section 2, Auckland Transport, Auckland Council and the New Zealand Transport Agency are currently investigating future transport provisions through the Auckland Transport Alignment Project and those associated with future growth areas through the Transport for Future Growth project.

With two motorways bordering and passing through the Whenuapai Structure Plan area, there will undoubtedly be transport provisions that are required to support wider growth that will also support development within Whenuapai.

The SH16 and SH18 busways are in particular fundamental to the assessed land use pattern within the structure plan area and the travel behaviours expected of residents and employees. Conversely, development within the structure plan and its focus on increased density around RTN stations will be fundamental in optimising the investment in these busways.

6 TRIP GENERATION AND MODE SHARE

6.1 Land Use Characteristics

For the purposes of assessing trip generation and mode share, the provision of different transport facilities will affect trip generation and mode split. Until a frequent and efficient public transport service is provided for example, the proportion of public transport trips is likely to be lower with a corresponding higher proportion of private vehicle trips. Similarly with regard to land use, the provision of a new secondary school within Whenuapai is unlikely to occur until there are sufficient people living in the immediate area. Until that time, secondary school students are likely to travel to Hobsonville Point Secondary School, reducing the likelihood of them walking or cycling to school unless living in the Sinton Road area north of SH18, which has a walking and cycling bridge connecting it to the Hobsonville Village.

6.2 Public Transport Accessibility

During the very early stages of development at Whenuapai (pre 2021) the public transport system will probably be similar, if not the same as the proposed New Network shown in Section 3.4. This includes a feeder service traveling around the airbase, connecting to Westgate in the west and the Hobsonville ferry terminal in the east.

Ultimately, RTN along SH16 from the CBD to Kumeu and along SH18 from Henderson to the North Shore will provide fast and frequent routes past Whenuapai that will be attractive to residents and employees. The Structure Plan anticipates four RTN stations in the vicinity including two along SH18 and two along SH16, including one at Westgate that would provide an interchange between the two RTN routes. At what stage these RTN facilities will be provided depends on business cases that show their need. However, conversely, the reality of providing higher density development around RTN stations bordering Whenuapai may be compromised if the stations and RTN services are not provided as development within Whenuapai occurs. Accordingly, it is recommended that the staging proposed for land release around RTN stations tie in with the staging of the provision of the RTN along SH16 from Auckland CBD to SH16/Brigham Creek Road and along SH18 from Westgate to the North Shore.

FTN and Collector services will become increasingly important – before RTN is implemented, as the only source of viable public transport within Whenuapai, and after RTN is implemented to provide a comprehensive network of services that provide connections to the RTN stations as well as ferry wharves and other nearby destinations.

Accessing the ferry services at West Harbour and Hobsonville Point will be able to be made by FTN and or Collector bus services. In addition, cycling to them is considered achievable, with the Sinton Road peninsula, bordering SH18 and the Waiarohia Inlet, a 10 minute cycle to the wharf at Hobsonville Point and the wharf at West Harbour via an existing pedestrian and cyclist bridge that connects Clarks Lane to Ockleston Road. Nowhere in Whenuapai will be more than a 30 minute cycle from either of the wharves. The provision of a new bridge over SH18 midway between Trig Road and Brigham Creek Road will shorten the distance and time to cycle and allow cyclists to avoid the busy SH18/Brigham Creek Road interchange.

6.3 Walking and Cycling Accessibility

All roads within the Whenuapai Structure Plan area need to provide appropriate provision for safe walking and cycling. In relation to cycling, 'appropriate provision' does not necessarily mean dedicated cycling infrastructure; traffic calmed streets with lower traffic volumes and/or lower speed environments may not require dedicated cycling infrastructure but may provide associated amenity such as bicycle parking at appropriate locations. Walking and cycling provisions associated with the Structure Plan are defined in Section 4.3 above.

It is considered that there is significant opportunity to increase the mode share for walking and cycling within the wider area, including Whenuapai, through the implementation of appropriate quality pedestrian and cycling infrastructure and accompanying active mode amenity, provided that the destinations are within a reasonable distance. Accordingly, the spread of schools within the area is extremely important, as are local centres and community facilities including parks. The likely proximity of employment and residential areas provides an excellent opportunity to encourage travel by active modes.

Long term active travel mode shares of 20% are predicted for the Whenuapai Structure Plan area, with 15% walking and 5% cycling (see Section 6.5). To help achieve these mode shares for walking and cycling, provision for active modes will need to be safe, connected, continuous, coherent and direct. Ensuring appropriate provision will encourage and support accessibility for active modes. This will be especially important in relation to local trips that are particularly viable by foot or by cycle. In addition, connectivity to the wider Auckland Cycle Network will be required to cater for longer distance trips undertaken by cycle; especially important for commuter cyclists. Providing walking and cycling infrastructure in the short term is desirable so that single occupant vehicle use does not become the established travel behaviour for new residents and employees in the Structure Plan area.

Localised active mode trips to access education, public transport, retail, and community infrastructure should be both viable and desirable by foot or by cycle. If appropriate provision is not made and strong walking and cycling accessibility is not achieved, it is unlikely that local trips will be made by walking or cycling. This will put increased pressure on the local road network with additional capacity possibly required for private vehicles.

6.4 Vehicle Accessibility

The anticipated road network within the structure plan is intended to provide a comprehensive, mostly grid-like pattern of streets within Whenuapai, albeit with the airbase forming a barrier in the centre and motorways to the south and west resulting in only five locations for access to the wider network. Until the SH16/SH18 motorway connections are in place, Brigham Creek Road will continue to provide a regional through function for those driving between the North West and the North Shore, although the desirability of this route will lessen following the urbanisation of Brigham Creek Road. This should happen early to allow development to proceed without the need for redundant widening of Brigham Creek Road in the short term, other than the small section needed ultimately.

Freight and service vehicle accessibility to the industrial area will be important for its success. Motorway interchanges at Trig Road and Brigham Creek Road on SH18, and at Northside Drive and Brigham Creek Road on SH16 will provide links to these national routes.

The main road access provisions associated with the Structure Plan are identified in Figure 6. Local schools and shops are proposed to be co-located within Whenuapai with employment opportunities and residential dwellings, providing the ability to reduce distances travelled by vehicle where feasible. Destinations further afield need to be accessed by crossing or joining the adjacent motorways. Motorway interchanges are fairly frequent past Whenuapai, with SH18 Trig Road and Brigham Creek Road interchanges some 1.9 km apart and SH16 Northside Drive and Brigham Creek Road interchanges some 1.7 km apart. The Northside Drive interchange will likely have south facing ramps only, due to its proximity to Brigham Creek Road (north). An additional bridge over SH18 between Trig Road and Brigham Creek Road will reduce distances needed to travel to cross the motorway.

The timing for transport provisions is discussed in Section 7.7, and new roads are likely to require development contributions or be built as part of developments, therefore there is some uncertainty in the timing of the provision of the complete road network.

6.5 All Mode Trip Generation

The Whenuapai Structure Plan anticipates employment opportunities, schools and neighbourhood retail areas located centrally to residential development and the airbase. This land use pattern will allow a significant proportion of trips to be undertaken by active modes. Supporting this, individual streets will be designed to cater to active modes with a walkable grid-network of streets, connected footpaths and appropriate cycle facilities.

Similarly, the structure plan area will be bounded by RTN corridors on both SH16 and SH18, with RTN stations located on each. This will allow a significantly greater proportion of trips to be undertaken by public transport than seen in more traditional developments on the urban edge.

The former Auckland Regional Council carried out modelling to support the ITA for the proposed shift in the Metropolitan Urban Limit (MUL) as part of the Northern Strategic Growth Area[27]. This modelling determined the following mode splits for this growth area:

Table 4: Mode Split for Northern Strategic Growth Area

Mode	2001	2016
Walk and cycle	7.5%	9.7%
Public transport	5.9%	9.5%
Travel Demand Management	n/a	5.0%
Private Car	86.6%	75.8%

[27]Waitakere City Council Proposal to Shift the MUL in the Northern Strategic Growth Area, Waitakere: Integrated Transport Assessment. January 2007.

As a comparison, the Auckland Regional Land Transport Strategy states a target for a regional active mode share of 15.3% in 2040 (a 60% increase on the 2006 regional active mode share). The same document states a target public transport mode share of 10.3% in 2040 (a 160% increase on 2006 public transport mode share). Trips to and from the structure plan area are expected to exceed these long term regional targets, due to the quality RTN public transport infrastructure and integrated active travel facilities anticipated. As a result, the following average long term mode shares are anticipated across the Whenuapai Structure Plan area:

- 5% bicycle
- 15% walking[28]
- 20% public transport
- 60% private car

It is noted however that the public transport mode share within the structure plan area is dependent on the provision of quality public transport through the area, and more so, on the provision of a connected RTN network from Whenuapai to the city and the North Shore. During initial stages of development, this infrastructure and services are unlikely to be in place, and lower public transport mode shares would be expected.

Similarly, while most of the active travel trips will be catered for by the provision of infrastructure from the onset of the development, uptake of this mode will depend on the delivery of new schools, retail areas and employment. These developments may lag behind the initial residential development and as a result, active travel mode shares will initially be lower than the long term expectations above. The following mode shares have been estimated across a timeline from 2016 to 2046.

Table 5: Estimated Whenuapai Mode Shares

Mode	2016[29]	2026	2036	2046
Bicycle	1%	2%	3%	5%
Walk	3%	8%	11%	15%
Public transport	4%	13%	16%	20%
Private Car	91%	77%	70%	60%

The above predicted mode shares are reflected in the active mode, public transport and vehicle trip generation processes, discussed in the following sections.

The above trip generation rates have been developed on the expectation that improvements to the public transport network will take place in a staged manner, with:

- RTN provided between SH16/Brigham Creek Road and central Auckland by 2026, FTN services on Hobsonville Road, with connecting bus services within Whenuapai

[28]The existing split between walking and cycling trips to work in Auckland, from 2013 census data, is 20% cycling, 80% walking. With increasing investment in cycle infrastructure across Auckland, the cycling proportion is expected to increase

[29] Based on 2013 Census data for Upper Harbour

- RTN extended from Westgate to the North Shore by 2036, with frequent Collector services operating within Whenuapai
- Ongoing improvements to public transport frequencies to and beyond 2046.

The above investment in public transport infrastructure is expected to be matched by investment in public transport infrastructure elsewhere in Auckland, such as the City Rail Link. As a result, public transport is expected to become increasingly accessible at 'both ends' of trips.

Similarly, active modes are expected to steadily increase from existing levels to the projected 20% in 2046, due to increasing density within Whenuapai and the development of schools, shops, parks and areas of employment being located within reasonable active travel distances of residential areas. This would be matched by ongoing investment in walking and cycling networks, both within Whenuapai and to external destinations, to better connect these land uses.

If either the rollout of the RTN is significantly delayed beyond the dates listed above, or the development of schools, shops, parks and employment areas does not keep pace with residential development, the mode shares identified in Table 5 may be significantly different.

It is noted that the above estimated mode shares represent averages across the Whenuapai Structure Plan area. Variations are expected based on:

- Geography – higher public transport mode shares would be expected to and from areas close to RTN stations, and lower mode shares to and from more isolated areas
- Trip type – higher active mode shares are expected to and from schools, particularly primary schools which have a small, local enrolment zone
- Time of day – lower private car mode shares are expected during the commuter peak periods when general traffic congestion and increased public transport frequencies combine to encourage modes other than private car travel; during the day, and particularly to business areas, a greater portion of trips will be work related and by private car (or truck).

The long term private car mode share of 60% is equivalent to that currently observed in central Auckland suburbs such as Mt Eden, Kingsland and Grey Lynn, and is significantly lower than the Auckland average of 84%[30]. With the significant investment in public transport, walking and cycling infrastructure and the land use patterns proposed, this is considered a realistic long term mode share.

6.6 Active Mode Trip Generation

The Guide to Traffic Generating Developments[31] ("RTA") document provides an average trip rate of 11 daily person-trips per dwelling. It is further assumed that each Whenuapai employee generates two person-trips each day (ie home to work and the reverse). If applying the predicted active travel mode shares from Section 6.5, the following walking and cycling trip generation rates are estimated.

[30] Based on 2013 Census data for the Auckland region
[31] Guide to Traffic Generating Developments, Regional Transport Authority of New South Wales, October 2002

Table 6: Whenuapai Active Mode Daily Trip Generation Rates

Mode	2016	2026	2036	2046
Trips per Dwelling				
Bicycle	0.11	0.22	0.33	0.55
Walk	0.33	0.88	1.21	1.65
Trips per Employee				
Bicycle	0.02	0.04	0.06	0.10
Walk	0.06	0.16	0.22	0.30

6.7 Public Transport Trip Generation

The RTA guide provides an average trip rate of 1.2 peak hour person-trips per dwelling, and 11 daily trips as above. Again assuming that each Whenuapai employee generates two person-trips each day, and that 50% of employees travel during the peak hour, and also applying the predicted public transport mode shares from Section 6.5, the following public transport trip generation rates are estimated:

Table 7: Whenuapai Public Transport Trip Generation Rates

	2016	2026	2036	2046
Trips per Dwelling				
Peak Hour	0.05	0.16	0.19	0.24
Daily	0.44	1.43	1.76	2.20
Trips per Employee				
Peak Hour	0.04	0.07	0.08	0.10
Daily	0.16	0.26	0.32	0.40

6.8 Vehicle Trip Generation

6.8.1 Whenuapai Business Zone

It is anticipated that the land use within the Whenuapai Light Industry zone would mainly include warehousing and distribution centres, with some 8,020 jobs east of SH16 and some 1,120 jobs west of SH16, in the triangle area between Fred Taylor Drive, SH16 and Northside Drive.

Vehicle trip rates applicable to industrial areas have been obtained from the Institute of Traffic Engineering (ITE) Guide and the RTA Guide, as well as by interrogating the ART model. These sources have provided the following industrial/warehousing trip generation rates:

- ITE: 0.48 and 0.51 trips per employee, during the morning and evening peak hours, respectively
- RTA: 0.5 trips per 100 m^2 GFA in the morning peak hour

- ART: 0.54 and 0.65 trips per employee, during the morning and evening peak hours, respectively.

Taking the above into consideration, a trip rate of 0.5 trips per employee has been adopted for both the morning and evening peak hours. Of these trips, 10% have been assumed to be internal to the Whenuapai Plan Change area[32]; that is they relate to employees who will live and work within the area.

6.8.2 Centre Based Retail

The following retail land use is anticipated as part of the Structure Plan:

- One local centre expanding on the existing Whenuapai Local Centre to provide some 8,000 to 10,000 m^2 GFA
- Some 500 m^2 GFA at a neighbourhood centre around Trig Road south of SH18
- Some 500 m^2 GFA at a neighbourhood centre around the new Secondary and Primary schools on Riverlea Road
- Neighbourhood centres within or adjacent to the RTN stations, each with 500 m^2 GFA

Peak hour vehicle trip rates from the ITE Guide have been used for these land uses. It is assumed that 50% of the above developments will be specialty shops[33], and 50% will be occupied by supermarkets[34]. The resulting trip rate for the evening peak hour is calculated to be 9.2 trips per 100 m^2 GFA, while the morning peak trip rate is assumed to be 25% of the evening peak trip rate, to account for staff arriving early and minimal visits to retail during the morning peak period.

It is assumed that 90% of the above related retail trips will be internal to the Whenuapai Structure Plan area, as the retail proposed is relatively modest and will cater largely to local needs rather than destination retail. A 30% pass-by/diverted trip rate has also been assumed.

6.8.3 Schools

Four new schools and the expansion of the existing primary school on Tamatea Avenue are anticipated as part of the Structure Plan, and residential development will additionally increase the roll of two further existing schools outside the structure plan area, at Hobsonville Point Secondary School and Hobsonville Primary School. The vehicle trips rates applied were obtained from the ITE Guide. The trip generation rates, pass by rates and proportion of trips internal to the Structure Plan area applied to these schools are summarised in Table 8.

[32] Based on 2013 Census data for North Harbour Industrial Estate and surrounding residential catchments
[33] Evening Peak trip rate: 5.02 trips per 1000 square feet, or 5.40 per 100 m^2
[34] Evening Peak trip rate: 12.02 trips per 1000 square feet, or 12.94 per 100 m^2

Table 8: School Vehicle Trips (peak hour)

School	Anticipated School Roll	Trips per Pupil per Hour	Pass By Proportion	Proportion From Whenuapai
Primary Schools				
New Whenuapai North	800	0.4 morning peak 0.2 evening peak	50% (AM) 0% (PM)	95%
New Trig Road South	800			
New Whenuapai East	800			
Existing Whenuapai Centre	800			
Existing Hobsonville	800			20%
Secondary Schools				
New Whenuapai North	1,500	0.5 morning peak 0.2 evening peak	25% (AM) 0% (PM)	95%
Existing Hobsonville Point	800 (new students only)			100% of new trips

A higher proportion of pass by trips has been applied to the primary schools as these are reasonably likely to be short local trips able to be combined with other trips. By comparison, a lower proportion has been applied to the secondary schools, acknowledging that secondary schools have a wider catchment, and school trips are less likely to be able to be combined with other trips.

Each of the new schools, in addition to the existing Whenuapai School, will have enrolment zones internal to the Whenuapai Structure Plan area, and as a result 95% of trips have been assumed to be to and from the structure plan area. The existing Hobsonville Primary School sits near the boundary of the structure plan area, and most of its enrolment zone falls outside the area. As such, it has been assumed that 80% of trips will be generated externally from the structure plan area, and that 20% will be from within the structure plan area. A different approach has been used for the Hobsonville Point Secondary School, where the Whenuapai Structure Plan is estimated to contribute an additional 800 students to the school roll. All trips associated with these new pupils are expected to originate from within the Whenuapai area.

6.8.4 Residential

Residential vehicle trip rates have been developed first by considering the person-trip generating potential of typical low density residential dwellings. The RTA Guide provides a rate of 1.2 person-trips per dwelling, in both the morning and evening peak hours. The proportion of person-trips that then take place by private car will then depend on how well that dwelling is serviced by public transport, walking and cycling networks. The following table illustrates how this may differ, depending on the car mode share (and assuming an average car occupancy of 1.2 persons).

Table 9: Vehicle Trip Rate per Dwelling for Different Car Mode Shares (trips per peak hour)

Car Mode Share	40%	50%	60%	70%	80%	90%	100%
Vehicle Trips per Dwelling	0.4	0.5	0.6	0.7	0.8	0.9	1.0

It is assumed that vehicle trip generation rates at the lower end of the spectrum will be applicable to residential developments that are within a reasonable walking distance from RTN stations and FTN/Connector bus stops, and that rates at the higher end would apply to more isolated residential areas. In the short term however, it is acknowledged that residential development will occur prior to the RTN being completed and in this case, higher vehicle trip rates would apply irrespective of location.

The ITE and RTA guides recommend the following vehicle trip generation rates for residential dwellings.

Table 10: Vehicle Trip Rates from ITE and RTA (vehicle trips per peak hour)

Residential Land Use	**Morning Peak Hour**		**Evening Peak Hour**	
	ITE	RTA	ITE	RTA
Signal Family Detached/Low Density	0.75	0.95	1.01	0.99
Townhouse/Medium Density	0.44	0.4 to 0.65	0.52	0.4 to 0.65
Apartment/Higher Density	0.55	n/a[35]	0.67	n/a

Acknowledging that higher density residential development will generally be enabled close to public transport services and close to centres, and also that higher density dwellings also tend to generate fewer vehicle trips than low density dwellings, and with the anticipated provision of RTN along SH16 and SH18, the following vehicle trip generation rates have been applied to the assessment.

Table 11: Applied Vehicle Trip Rates for Whenuapai Structure Plan Traffic Model (vehicle trips per peak hour)

Land Use	**Morning Peak Hour**		**Evening Peak Hour**	
	2021 and 2026	2036 and 2046	2021 and 2026	2036 and 2046
Signal Family Detached/Low Density	0.85	0.65	1.0	0.8
Townhouse/Medium Density	0.65	0.50	0.65	0.50
Apartment/Higher Density	0.55	0.45	0.55	0.50
Apartment/Higher Density within approx. 800 m of RTN/FTN stop	0.45	0.40	0.55	0.50
Whenuapai Structure Plan average	**0.68**	**0.53**	**0.75**	**0.61**

Accordingly, the highest of the above vehicle trip rates correspond to a near 100% private car mode share, while the lowest trip rates correspond to an approximate 40% private car mode share during peak periods. The long term average trip rates of 0.53 and 0.61 in the morning and evening peaks,

[35] The RTA Guide provides rates for high density dwellings over six storeys high, which is not considered appropriate for application to Whenuapai

respectively, correspond to long term private car mode shares of approximately 60% during peak periods, which agrees with the estimated mode share from Section 6.5.

Sensitivity tests for early development stages (2021) have assumed higher vehicle trip rates for areas not in the vicinity of FTN or RTN stops. In these scenarios (1a to 1e), various development stages have been considered, as documented in Section 7.7 below, and vehicle trip rates of 0.85 per hour in the morning peak and 1.0 per hour in the evening peak in those areas not close to FTN or RTN have been assumed.

7 ASSESSMENT OF TRANSPORT EFFECTS

7.1 Effects of Walking Trips

Approximately 9,480 residential dwellings and 9,140 employees are anticipated within the Structure Plan area based on the land uses assumed. Applying the 2046 walking trip rates from Section 6.6 results in approximately 16,000 to 18,000 daily walking trips in 2046, having adjusted the numbers to account for those walking between residential and employment areas within the structure plan area.

The above assessment excludes walking legs as part of a public transport trip. Section 7.3 below estimates that there could be in the order of 28,000 daily public transport trips, each of which will have a pedestrian leg at each end. As a result, the total number of daily pedestrian trips generated by people living and working in Whenuapai is estimated to be in the order of 45,000 trips per day in 2046.

Whilst this appears to be a significant number of pedestrian trips, these will include trips to and from school, work, shops, restaurants, RTN stations and bus stops, visiting friends, relatives and recreational areas for sports or relaxation, with each one-way journey counted as a single trip. Just over 10% of these walking trips are anticipated to be trips to and from schools[36].

The above assessment illustrates the significant volume of pedestrian trips expected to be undertaken both within the Structure Plan area, and to external areas. The Structure Plan is anticipated to meet this demand, by providing:

- Where practicable, a grid-network street layout with footpaths on both sides of all streets within the structure plan area
- Regular, safe pedestrian crossing opportunities of the arterials and collector roads with signalised pedestrian crossings at all signal controlled intersections. Additional midblock signalised pedestrian crossings are recommended where pedestrian desire lines are not met by signalised intersections
- Facilities to provide safe routes to schools and local centres
- Safe pedestrian crossing opportunities across both SH16 and SH18, at:

[36] Based on 9,480 dwellings, average of 0.3 primary school children per dwelling, 50% walking mode share for primary school students, average of 0.24 secondary school children per dwelling, 40% walking mode share for secondary school students. Mode shares have been based on 2015 Auckland Transport travel to school mode data, for primary and secondary schools with high cycling mode share.

- Brigham Creek Road and Northside Drive across SH16
- Trig Road, Brigham Creek Road, a new north-south route to West Harbour across SH18 and a cycle/pedestrian bridge adjacent to the Hobsonville Village

- Appropriate pedestrian and cyclist facilities approaching and through all SH16 and SH18 interchanges
- A shared path or a new road between Kauri Road and Sinton Road via Rata Road, connecting the residential area to the west of the Waiarohia Inlet to the primary school on Kauri Road, the RTN station and Hobsonville Village, and onwards to Hobsonville Point Secondary School
- Pedestrian facilities through all green space areas, and a coastal shared path for recreational trips.

7.2 Effects of Cycling Trips

Using the same approach as applied to pedestrian trips to the 9,480 residential dwellings and the 9,140 employees anticipated within the Structure Plan area, in the order of 6,000 total daily cycle trips are predicted for 2046, excluding the double counting of cycle trips between dwellings and places of work within Whenuapai.

These trips will be of a similar type to the pedestrian trips listed previously, with a mixture of school, work, shopping and other trips, and a combination of internal trips within Whenuapai and external trips beyond it. Some 36 % of the cycling trips are anticipated to be trips to and from schools[37].

Destinations further afield become more accessible by cycling compared to walking. These might include cycling to the ferry wharves at Hobsonville Point and West Harbour and cycling to higher education, jobs or for shopping at for example Hobsonville Village and Westgate Town Centre; the majority of Whenuapai is no more than a 30 minute cycle from Hobsonville Village and 30 minute cycle from Westgate.

The above assessment illustrates the need for a comprehensive network of safe cycle routes within and to and from Whenuapai. This need will be met by applying an overarching cycle strategy to all streets within the Structure Plan area, with appropriate treatment for each street, such as:

- Separated, protected, or off street facilities on busier roads
- Managing traffic speeds on low volume slow speed streets, to allow cyclists to share road space with general traffic.

Taking into account internal trips to schools and places of employment and allowing for some internal trips to shops, parks, and for recreation and leisure, over 2,000 cycle trips per day are expected to be made that originate or end at locations external to the structure plan area, including some 860 trips to places of work outside Whenuapai, 825 trips from outside Whenuapai to employment within it, as well

[37] Based on 9,480 dwellings, average of 0.3 primary school children per dwelling, 30% cycling mode share for primary school students, average of 0.24 secondary school children per dwelling, 10% cycling mode share for secondary school students. Mode shares have been based on 2015 Auckland Transport travel to school mode data, for primary and secondary schools with high cycling mode share

as cycle trips to Hobsonville Point Secondary School, Westgate, Hobsonville Village, West Harbour and beyond.

This is a significant number of cyclist movements, and for the most part they will be concentrated on the available routes across SH16 and SH18. Brigham Creek Road, Trig Road, Northside Drive, the new road connection across SH18 to West Harbour and the cycle/pedestrian link adjacent to Hobsonville Village will be the only available routes and to meet these demands, each of these must provide safe and appropriate cycle facilities, both crossing the motorway and on the roads linking to them. Physical separation and protection from general traffic is expected on each of these routes.

The above expectations will be met by the proposed cycle network presented in Section 4.3. Specifically, the network will provide:

- Physically separated cycle lanes on key roads including Brigham Creek Road, the southern section of Totara Road, Mamari Road, Northside Drive, Trig Road south of SH18 and Hobsonville Road. Where separated cycle lanes are provided there needs to be restrictions on driveway crossings (ie rear access only) and ideally few side roads
- Buffered cycle lanes on a number of the connector roads including the main roads in the industrial areas and roads linking to the RTN station at the new bridge across SH18 and links to Marina View Drive towards the West Harbour ferry
- Buffered cycle lanes and shared paths where residential catchments are close to schools, therefore providing for commuter cyclists as well as providing a safer environment for those wishing to cycle or scooter to school. Where shared paths are provided there needs to be restrictions on driveway crossings (ie rear access only) and ideally few side roads
- Pedestrian/cycle links through areas of land that may not necessarily (although could) provide a road connection
- Bicycle parking at key locations (schools, centres, parks)

7.3 Effects of Public Transport Trips

Applying the 2046 public transport trip generation rate of 0.24 trips per dwelling (Section 7.3) to the 9,480 residential dwellings anticipated, approximately 2,270 peak hour public transport trips are estimated in 2046. This includes only 'home-based' trips, that is those that originate or end at home.

For the new business areas, with 9,140 employees and a 2046 public transport trip generation rate of 0.1 trips per employee, approximately 900 peak hour public transport trips are estimated in 2046.

Some of the above trips will be internal trips within Whenuapai, and these are estimated to be:

- Approximately 300 high school trips in the morning peak hour (1,500 students at the Riverlea Road Secondary School with an assumed 20% mode share[38])
- Relatively negligible primary school trips

[38] Based on Auckland Transport travel to school mode data, 2015, for secondary schools with high cycling mode share

- Approximately 90 internal trips to the Whenuapai business area, corresponding to people who both live and work within Whenuapai, if assuming 10% of business trips are from within Whenuapai[39]
- Relatively negligible retail trips.

Removing internal public transport trips results in an estimated 2,800 external public transport trips generated by the Whenuapai residential area (generally outbound in the morning peak and the reverse in the evening). This might amount to 28,000 public transport trips per day, although it is noted that public transport mode share is unlikely to be constant throughout the day – if the daily average is to be 20%, peak hour public transport mode share is likely to be higher, and the above assessment may be underestimating peak hour public transport demands.

The above assessment demonstrates the significant volumes of trips expected to be catered for by public transport. As a simple analysis, an RTN corridor with 100 passenger capacity double decker buses at 5 minute frequencies is capable of carrying approximately 1,200 passengers an hour. An FTN route with 60 passenger capacity buses at 10 minute frequencies might carry 360 passengers per hour.

To meet the anticipated demand, both new Whenuapai bus services proposed (see Figure 15, Section 3.4) would have to be high frequency services, although they would operate at lower frequencies during the initial stages of development. To encourage the use of these bus services, bus priority will be required through key intersections to provide a reliable public transport travel time and viable alternative to car travel. Recommended locations for bus priority include:

- Through the Totara Road/Mamari Road intersection
- Through both Brigham Creek Road interchanges
- Through the Trig Road interchange

Targeted school bus services will in addition be required to connect residential areas with high schools, including the existing secondary school at Hobsonville Point.

7.4 Traffic Assessment Methodology

The traffic assessment has been largely based on a SATURN traffic model with traffic demands obtained from ART model scenarios of future years. The SATURN model is based on a model originally developed for the Transport for Future Urban Growth (TFUG) project for the northwest area, with traffic demands and road networks being refined about the Whenuapai area to reflect the land use anticipated by the Structure Plan. The methodology used to develop the Whenuapai Structure Plan model is documented in this section.

7.4.1 Modelled Network

The TFUG Northwest SATURN model was developed as a joint project involving Auckland Transport, the New Zealand Transport Agency and Auckland Council. The extent of this model is illustrated in Figure 17 below.

[39] Based on 2013 Census data for North Harbour Industrial Estate and surrounding residential catchments

Figure 17: Northwest TFUG SATURN Model Extent

The TFUG study provides a draft programme of transport investment to support future urban growth within the northwest (as detailed in Section 2.7 and 3.6 above). This programme includes investment in an RTN with its own dedicated rights of way from the Auckland CBD to Westgate, along SH16 to Kumeu and SH18 to the North Shore, as well as a package of general traffic network improvements on the strategic and local level. This network, together with projects identified in the NorSGA work (refer Section 2.6) have been used as the baseline against which the Whenuapai Structure Plan has been assessed and these transport investments have been considered in the staging assessment for development of land within Whenuapai.

The draft TFUG programme includes the following investments:

- RTN from Westgate to central Auckland
- RTN from Huapai and Kumeu to Westgate
- RTN on SH18 from Westgate to the North Shore
- Improvements to the SH16/Coatesville Riverhead Highway intersection
- New arterial alternative to SH16 from Brigham Creek Road interchange to Kumeu and Huapai
- Brigham Creek Road interchange
- SH16/SH18 connections
- Northside Drive bridge and south facing ramps to SH16
- Brigham Creek Road four lane arterial
- Coatesville Riverhead Highway transit lanes south of Riverhead
- Internal arterial networks at Redhills, Kumeu and Whenuapai, plus arterial from Coatesville Riverhead Highway to Redhills
- Squadron Drive west facing ramps

- West Harbour bridge across SH18

The NorSGA investigations identified the following transport provisions:

- Re-alignment of Trig Road so that it intersects Hobsonville Road at Hobsonville Road/Luckens Road intersection, including signalisation of this intersection
- Hobsonville Road widening to four lanes between Trig Road and Marina View Road
- Signalisation of the following intersections:
    - Hobsonville Road/Marina View Road intersection.
    - Hobsonville Road/Westpark Drive intersection.
    - Hobsonville Road/Suncrest Drive Intersection
    - Hobsonville Road/Brigham Creek Road intersection
    - Hobsonville Road/Clark Road intersection
- An internal road network within PC 14, including a new road parallel to Hobsonville Road between Trig Road and Brigham Creek Road, with side roads connecting Hobsonville Road and the new road

The traffic model developed for the Whenuapai Structure Plan assessment was used to test the above TFUG and NorSGA transport assumptions in and around the Whenuapai area and the resulting changes to the above 2046 provisions include the following.

- Localised widening of Brigham Creek Road rather than the provision of a four lane arterial along its whole length
- Additional lanes on SH18 between Trig Road and Squadron Drive in the eastbound direction and between Tauhinu Road and Trig Road in the westbound direction to accommodate peak hour expected traffic volumes at a level of service D

7.4.2 Future Traffic Demands

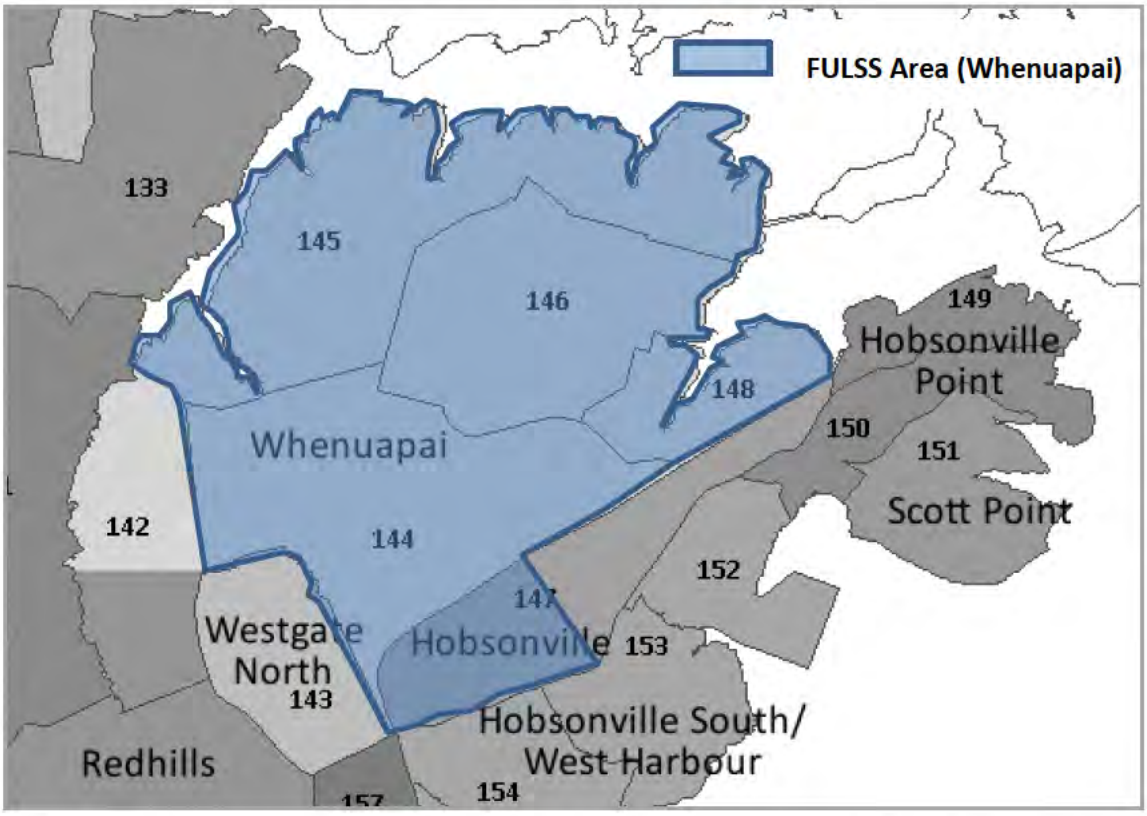
The demands used in the SATURN modelling assessment were obtained from an ART model scenario that represents a land use scenario termed “I9”, which is consistent with the Future Urban Land Supply Strategy (FULSS). In terms of the transport network, the ART scenario used contains the “Common Elements Enhanced” (CEE) network. This relatively low investment network differs from the higher investment draft programme from the TFUG study, but a comparison of the 2046 ART model demand outputs between the CEE and TFUG networks show no significant differences in demands. ART model outputs were readily available for the CEE network for other years of interest to this study (2012, 2026 and 2036), while only 2046 outputs were available for the TFUG network. As a result, outputs from the CEE ART scenario have been used.

Within the Whenuapai Structure Plan area however, traffic demands from the ART model have been refined, to better reflect the land use and transport network anticipated by the Structure Plan and growth in surrounding areas, and to provide a greater level of detail.

7.4.3 Demand Adjustments Due to Whenuapai Land Use

The Whenuapai Structure Plan area is represented by five zones within the ART model. Figure 18 below illustrates the zone boundaries in the ART model, while also illustrating the location of the Whenuapai Structure Plan area in relation to these ART zones (zones 144 to 148). ART zone 147 includes part of the Whenuapai area as well as the Plan Change 14 Hobsonville Corridor and Hobsonville Village areas. ART zone 145 includes Herald Island.

Figure 18: Whenuapai Structure Plan Area as in ART



The Scenario I9 land use applied to each of the above zones in the ART model is summarised and compared against the FULSS predictions for Whenuapai in Table 1 below. The anticipated Whenuapai Structure Plan residential yield is also identified, together with the rest of land in ART zones 145 and 147.

Table 12: ART Land Use Summary – Dwellings (2046)

ART Zone	Scenario I9 (2046)	FULSS Whenuapai	Whenuapai Structure Plan	Other areas included in ART zones
144	600	Proposed dwelling capacity 8,100 – 9,600 (**8,600 – 10,100** including PC14 and Herald Island)	220	
145	6,500		6,090	260 (Herald Island)
146	850		60	
148	1,550		1,400	
147	1,600		1,400	245 (PC14)
Total	**11,100**		**9,925**	

In general, the total number of dwellings in Scenario I9 is higher than that anticipated by the Whenuapai Structure Plan. It is noted that the ART zones include a slightly larger area than that included in either the FULSS or the Structure Plan, such as:

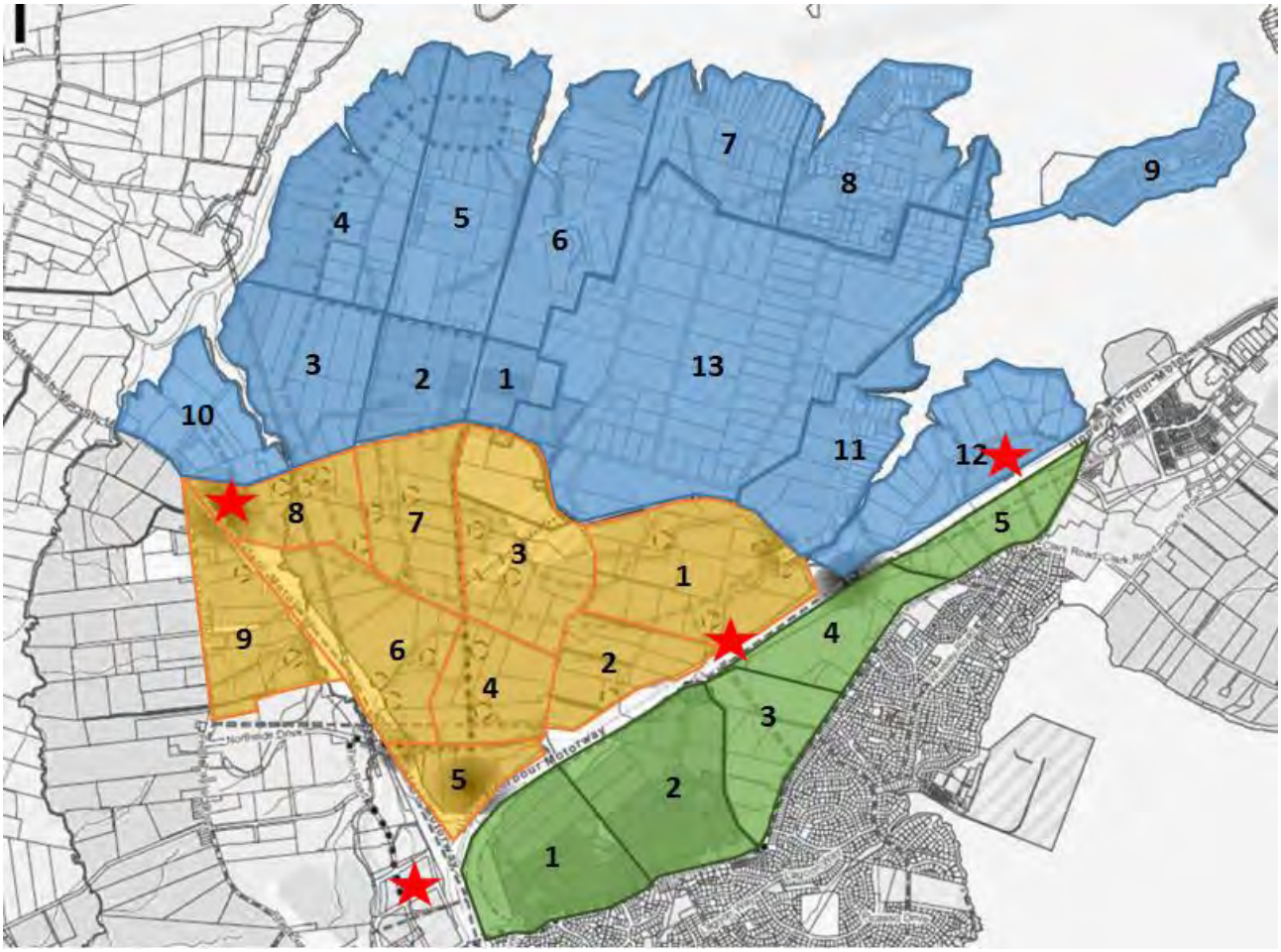
- Herald Island (within ART zone 145) , where there are 260 existing dwellings[40] outside the Structure Plan area
- The Plan Change 14 area (ART zone 147), which proposes 245 dwellings outside the Structure Plan area
- A portion of ART zone 144 to the west of SH16, where little residential development is proposed.

Even when considering the above differences, the forecast dwellings under Scenario I9 are greater than anticipated under the Whenuapai Structure Plan. To ensure that the SATURN model reflects the yield anticipated by the Whenuapai Structure Plan, and to distribute the land use more logically, the forecast traffic demands from the ART model have been adjusted to better reflect the anticipated number of dwellings in the Structure Plan, as well as the forecast school rolls and employment. The trip distributions however have been retained.

The traffic model zones from the ART model have been disaggregated into a more refined zone structure, and these zones are shown in Figure 19 below. The approximate location of RTN stations are shown starred in this figure.

[40] From 2013 census data

Figure 19: Whenuapai Structure Plan Model – Zone Structure[41]



The anticipated dwellings, schools and employment within each of the above zones are summarised in Table 13. It is noted that the schools within the Structure Plan area will not fully accommodate the number of students expected to live in Whenuapai. Hobsonville Point Secondary School and Hobsonville Primary School are both likely to be attended by students living in Whenuapai.

[41] Orange zone 9, blue zone 9 and green zones 3, 4, 5 are outside the Whenuapai Structure Plan area

Table 13: Proposed 2046 Whenuapai Land Use

Area	Zone	Dwellings	School Roll	FTE	GFA[42]	Comments
Blue	1	565*	800 primary	0	10,000	Whenuapai local centre Existing Whenuapai School anticipated to grow to roll of 800
	2	585*	0	0		
	3	610**	0	0		
	4	915	0	0		
	5	915	800 primary, 1,500 secondary	0	250	New Whenuapai schools New neighbourhood retail centre
	6	800	0	0		
	7	915	0	0		
	8	610	0	0	250	Existing neighbourhood retail centre
	9	260	0	0		
	10	430*	0	0		
	11	530**	800 primary	0		New primary school
	12	870*	0	0	500	New neighbourhood retail centre
	13	60	0	0		
Orange	1	45#	0	1,930	250	New neighbourhood retail centre
	2	0	0	825		
	3	35#	0	525		
	4	0	0	810		
	5	0	0	790		
	6	0	0	790	250	New neighbourhood retail centre
	7	35#	0	790		
	8	110#	0	1,580	250	New neighbourhood retail centre
Green	1	530**	0	0		
	2	870**	800 primary	0		New Trig Road primary school
Total		**9,480**	**3,200 primary, 1,500 secondary**	**9,140**	**11,750**	

Notes * Intensive housing density due to location in Whenuapai centre or close proximity to RTN station

**Moderate housing density due to moderate proximity to RTN station

Intensive housing within industrial zone, close to either Whenuapai centre or RTN stations

[42] Retail employment unknown, estimated GFA values have been provided instead

As noted above, some secondary school students will attend Hobsonville Point Secondary School (east of green zone 5) and some primary school students will attend the existing Hobsonville Primary School (green zone 4).

Differing densities of housing have been applied to the various residential zones in the Structure Plan. The following housing typologies have been applied:

- More intensive housing within Whenuapai centre and close to RTN stations: 80% high density, 10% medium density, 10% low density (proportions by number of dwellings)
- Moderate density housing within reasonable walking distance of RTN stations: 40% high density, 30% medium density, 30% low density
- Moderate density housing close to Trig Road corridor: 40% high density, 30% medium density, 30% low density
- Low density elsewhere: 5% high density, 40% medium density, 55% low density.

Differing vehicle trip rates have been applied to each of the housing typologies, as documented in Section 6.8.4.

In addition to the above adjustments, the land use and traffic demands associated with the PC 14 area have also been updated in the Whenuapai Structure Plan model, due to its proximity to the Whenuapai Area, and also because it shares an ART3 zone with the Whenuapai South (Trig Road) area. The modelled land use in the PC 14 area is as follows.

- Residential – 245 Dwellings
- Business – 1,890 Full Time Equivalent Employees (FTEs).

The above land use is in line with the ART3 assumptions for zone 147, which includes some 1,600 dwellings and 1,850 FTEs in 2046. However, it is noted that assumptions regarding the PC 14 land use in a Paramics traffic model developed by Waitakere City Council as part of the NorSGA investigations, results in more than double the number of vehicle trips being generated than predicted in the ART and Whenuapai Structure Plan models. It appears that this is due to the Paramics model including a higher trip generation rate for the industrial activity than might otherwise be assumed. Given that PC 14 includes mainly industrial rather than office activity, it is assumed that the ART model assumptions are more appropriate. However, if higher trip generating activities eventuate, this could have an impact on the transport provisions determined in the area.

7.5 Traffic Effects

7.5.1 Assessment Criteria

The Whenuapai Structure Plan SATURN traffic models have been used to assess the predicted operation of the road network in the vicinity of the Structure Plan area based on the land use anticipated and associated trip generation assumptions, and to understand what future network improvements may be needed if and when development occurs.

Levels of service criteria (LOS) based on predicted peak hour traffic flows for mid-block links and on average delay at intersections have been evaluated to guide the recommendations for any network

improvements. Other considerations relating to access and network connectivity have also been considered in determining what transport provisions are required. The assessment has involved an iterative process where the operation of road and intersection layouts have been assessed and altered to provide sufficient lanes to accommodate the expected traffic volumes. The models have then been re-run as the capacity of the network has an effect on the routes that traffic is assigned to. While this process appears to address vehicular traffic only, inherent assumptions regarding trip generation mean that appropriate public transport services need to be provided when assumed; otherwise higher vehicle trip rates need to be applied. Equally, assumptions regarding land use and the ability to walk and cycle rather than drive also affect the vehicle trip rate assumptions.

LOS is typically used to qualitatively describe the operating conditions of a traffic network, based on factors such as speed, delay, degree of saturation or a combination of these. The level of service is designated with a letter A to F, where "A" represents the best operating conditions, and "F" represents the worst operating conditions.

7.5.1.1 Road Midblock Level of Service

The RTA Guide[43] provides Levels of Service (LOS) for differing traffic flows on urban roads, which range from LOS A (free flow) to LOS F (very congested). The number of lanes required for each section of road has been developed in order to meet a target LOS of D during the peak hour. As a result, additional traffic lanes will be required when peak traffic volumes exceed 900 vehicles per hour per direction for a two lane road and 2,200 vehicles per hour per direction for a four lane road. For highways, the Highway Capacity Manual[44] (HCM) suggests that a multilane highway exceeds LOS D at around 1,920 vehicles per hour per lane.

Table 14: Road Midblock Level of Service

Level of Service	Two Lane Urban Road (RTA Guide) veh/hr/lane	Four Lane Urban Road (RTA Guide) veh/hr/two lanes	Multilane Highways (HCM) veh/hr/lane
A	0 to 200	0 to 900	0 to 670
B	201 to 380	901 to 1,400	671 to 1,050
C	381 to 600	1,400 to 1,800	1,051 to 1,500
D	601 to 900	1,801 to 2,200	1,501 to 1,920
E	901 to 1,400	2,201 to 2,800	1,920 to 2,100
F	>1,400	>2,800	>2,100

Section 4 of the Draft Auckland Transport Code of Practice (ATCoP) also provides general guidance on the number of lanes required on all roads within the Auckland Region. It suggests that for a Local or Collector Road, a two lane road can generally support an Annual Average Daily Traffic (AADT) of 5,000 vehicles per day (500 per hour during the commuter peaks) and a four lane road can accommodate up

[43] Table 4.4, Urban Road Peak Hour Flows Per Direction, Guide to Traffic Generating Developments (RTA), October 2002
[44] Exhibit 21-2, LOS Criteria for Multilane Highways, Highway Capacity Manual

to 10,000 vehicles per day (1,000 vehicles per hour in peak). For an Arterial Road, it suggests that a four lane road can support up to 25,000 vehicles per day, which is approximately 2,500 vehicles per peak hour. The suggested maximum volumes from ATCoP would result in a LOS C (two lane) and LOS B (four lane) on local roads and LOS E on four lane arterial roads.

7.5.1.2 Intersection Level of Service

For intersections, LOS criteria differs, depending on the intersection treatment. The LOS ranges that have been used in the assessment of the modelled road network are based on delay as shown in Table 15.

Table 15: Level of Service associated with Average Intersection Delay per Vehicle in Seconds[45]

LOS	Signals and Roundabouts	Give-Way and Stop
A	delay ≤ 10	delay ≤ 10
B	10 < delay ≤ 20	10 < delay ≤ 15
C	20 < delay ≤ 35	15 < delay ≤ 25
D	35 < delay ≤ 55	25 < delay ≤ 35
E	55 < delay ≤ 80	35 < delay ≤ 50
F	80 < delay	50 < delay

Intersection LOS plots from the SATURN models have been generated using the above colour scheme.

7.6 Structure Plan Traffic Assessment

A base model "strawman" was assessed to understand any mitigation required for the assessed Structure Plan. The process followed is documented below, with the final interventions those included in the amended Structure Plan Model.

7.6.1 Base Model

The 2046 "Base" model includes the anticipated land uses in the Whenuapai Structure Plan area outlined in Section 4, together with the predicted land use assumed by ART (Scenario I9), in the wider area. The road network investments recommended by the NorSGA and TFUG studies have been incorporated into the model, together with key roads within Whenuapai, as shown in Figure 6. In addition basic network assumptions for the Whenuapai Structure Plan have been included, including the following:

- Traffic signals at the Riverlea Road/Brigham Creek Road intersection
- Traffic signals at the intersection of Mamari Road, Totara Road and Brigham Creek Road, using the layout provided in the Whenuapai Village West SHA Plan Variation ITA[46]
- Traffic signals at the intersection of Trig Road/Brigham Creek Road intersection

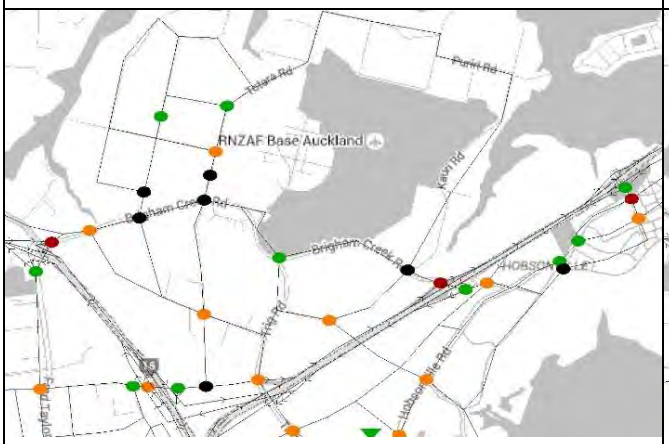
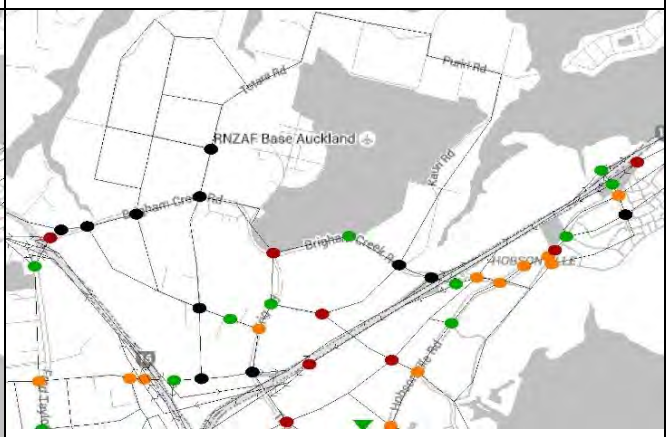
[45] Source: Highway Capacity Manual, Transport Research Board (TRB), 2010
[46] Figure 21, Page 58 of Whenuapai Village West SHA Plan Variation Integrated Transportation Assessment Report (August 2014)

- Traffic signals at the intersection of the Spedding Road/Brigham Creek Road/Kennedys Road link intersection

All other intersections within Whenuapai were assumed to be priority controlled in the Base model.

The intersection overall LOS for the 2046 Base model is provided in the figures below. As outlined above, the plots illustrate the intersections that have an overall LOS of C (Green), D (Orange), E (Red) and F (Black) in the morning peak and evening peak periods respectively.

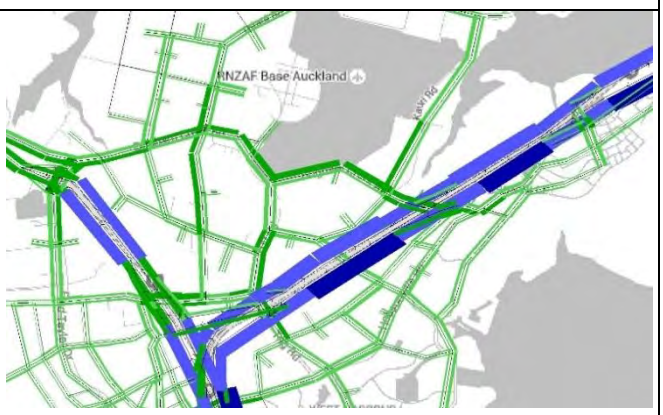
Figure 20: 2046 Base Model – Overall Intersection LOS Plots

Morning Peak Hour	Evening Peak Hour
	

The above figures indicate that with the transport provisions assumed in the Base Model a number of intersections would experience unsatisfactory performance (LOS E to F).

The predicted traffic flows on key roads about the Whenuapai Structure Plan area within the 2046 Base model are provided as follows.

Figure 21: 2046 Base Model – Predicted Traffic Flows (vehicles per hour)

Morning Peak Hour	Evening Peak Hour
	

Traffic on SH18 is predicted to experience LOS E between the Trig Road interchange and Upper Harbour Bridge in the eastbound direction in the morning peak and between Tauhinu Road and Trig Road interchanges in the westbound direction in the evening peak.

7.6.2 Amended Structure Plan Model

The performance of the Base Model is not considered satisfactory, and network changes are recommended to mitigate the predicted traffic effects at or before 2046. Equally some transport provisions included in the Base model are not needed, including widening Brigham Creek Road to four lanes along its entire length, although localised widening and urbanisation of the route is needed, along with several signalised intersections.

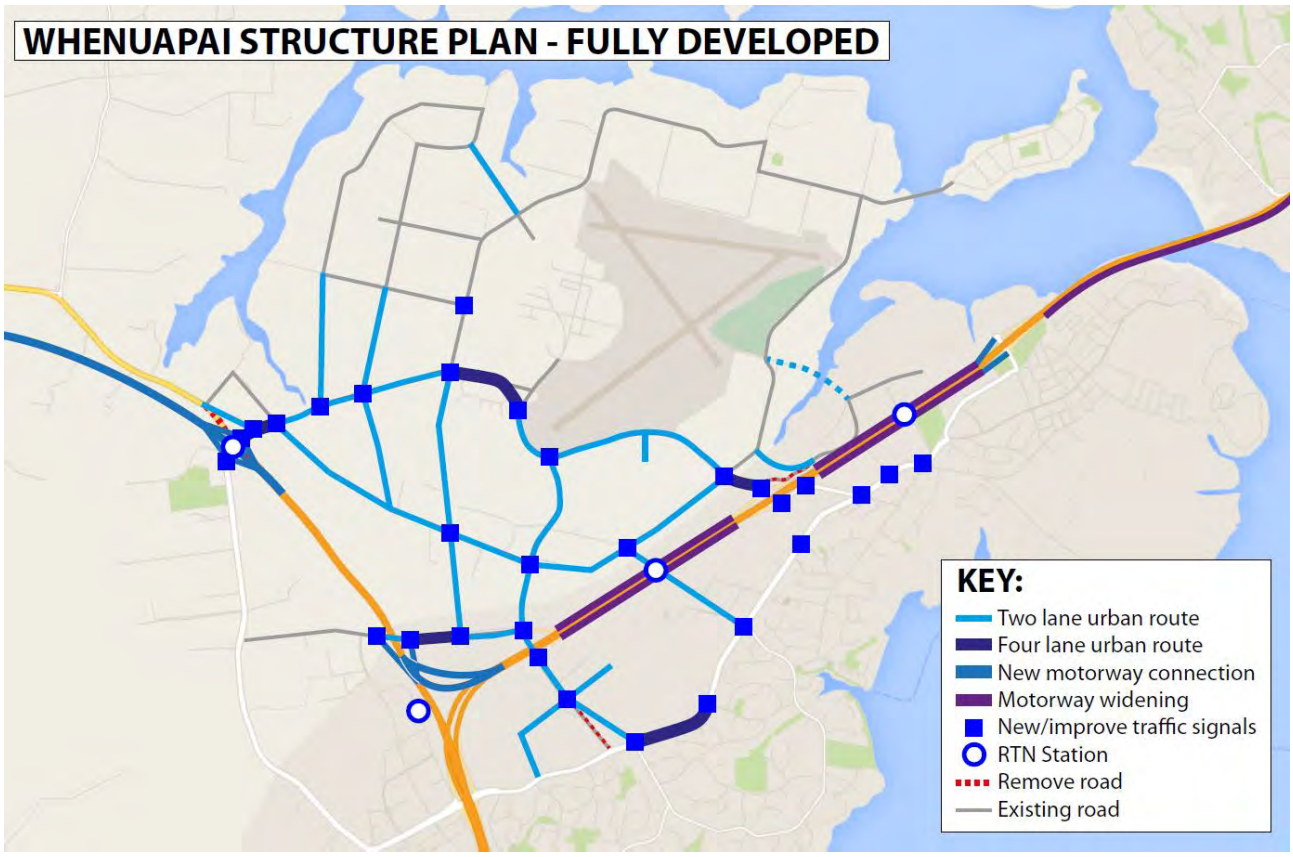
A series of projects have been identified that will help to better accommodate traffic associated with the anticipated land use activities within the Structure Plan area. Through the iterative modelling process, the following changes to the NorSGA and TFUG projects are recommended:

- Brigham Creek Road urbanisation between SH16 and SH18 (50 kph speed limit, footpaths, cycle facilities), plus widening to four lanes between Totara Road and Tamatea Road, between SH16 and Spedding Road Extension and between SH18 and Kauri Road. Depending on the proximity of signalised intersections, widening of Brigham Creek Road may practically extend from SH16 to Tamatea Road rather than having short sections of two lanes.
- Traffic signals at the Brigham Creek Road/old SH16 intersection
- Capacity improvements at the Brigham Creek Road/Spedding Road North/Kennedys Road link intersection
- Extension of Bristol Road to Brigham Creek Road and signalising this intersection
- Capacity improvements at the Riverlea Road/Brigham Creek Road intersection
- Capacity improvements at the Mamari Road/Totara Road/Brigham Creek Road intersection
- Traffic signals at the Totara Road/Dale Road intersection
- Traffic signals at the Brigham Creek Road/Tamatea Avenue intersection
- Capacity improvements at the Trig Road/Brigham Creek Road intersection
- Traffic signals at the Spedding Road East/Brigham Creek Road/Kauri Road intersection
- Traffic signals at the Spedding Road/Mamari Road intersection
- Traffic signals at the Spedding Road/Trig Road intersection
- Traffic signals at the Northside Drive/Mamari Road intersection
- Traffic signals at the intersection of the local connection crossing SH18 and Spedding Road Extension
- Closure of the Sinton Road approach to the Brigham Creek Road/SH18 east facing ramps intersection and realign Sinton Road to join Kauri Road
- New road or shared pedestrian/cyclist path between Sinton Road and Kauri Road via Rata Road for accessibility, connectivity and resilience given nature of peninsula with one access road (this link was not included in the model)

- Traffic signals at the intersection of the access roads with Trig Road south of SH18
- Disconnection of access road on eastern side of Trig Road with PC 14 spine road parallel to Hobsonville Road (to prevent any rat running of industrial traffic through residential areas and past the primary school)
- Widening of SH18 eastbound between Trig Road interchange and Upper Harbour Bridge, to three lanes
- Widening of SH18 westbound between Tuahinu Road and Trig Road interchanges to three lanes
- Widening of Northside Drive between the SH16 Interchange and Mamari Road to two lanes per direction

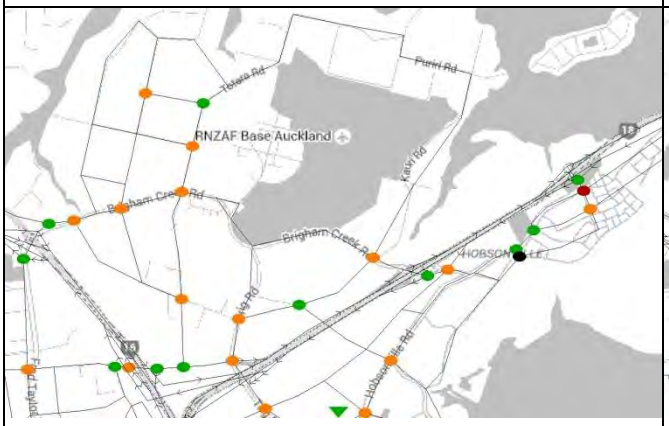
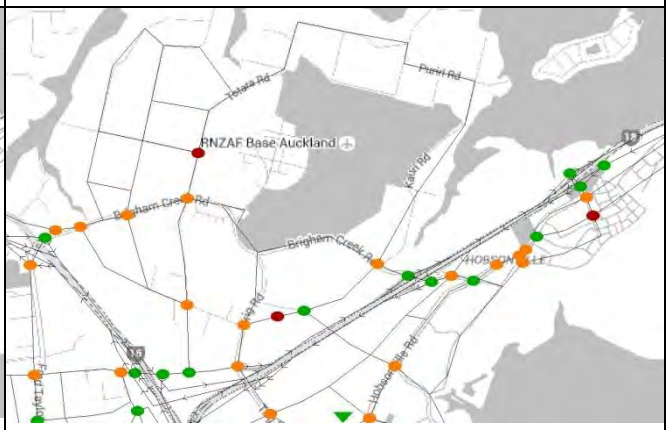
The above infrastructure works together with those included in the NorSGA and TFUG studies that are anticipated to still be required are illustrated in the figure below.

Figure 22: Network Provision in 2046 Model relative to existing network



The LOSs predicted at Whenuapai intersections are depicted in the figures below.

Figure 23: 2046 Model with Network Changes for Structure Plan – Overall Intersection LOS Plots

Morning Peak Hour	Evening Peak Hour
	

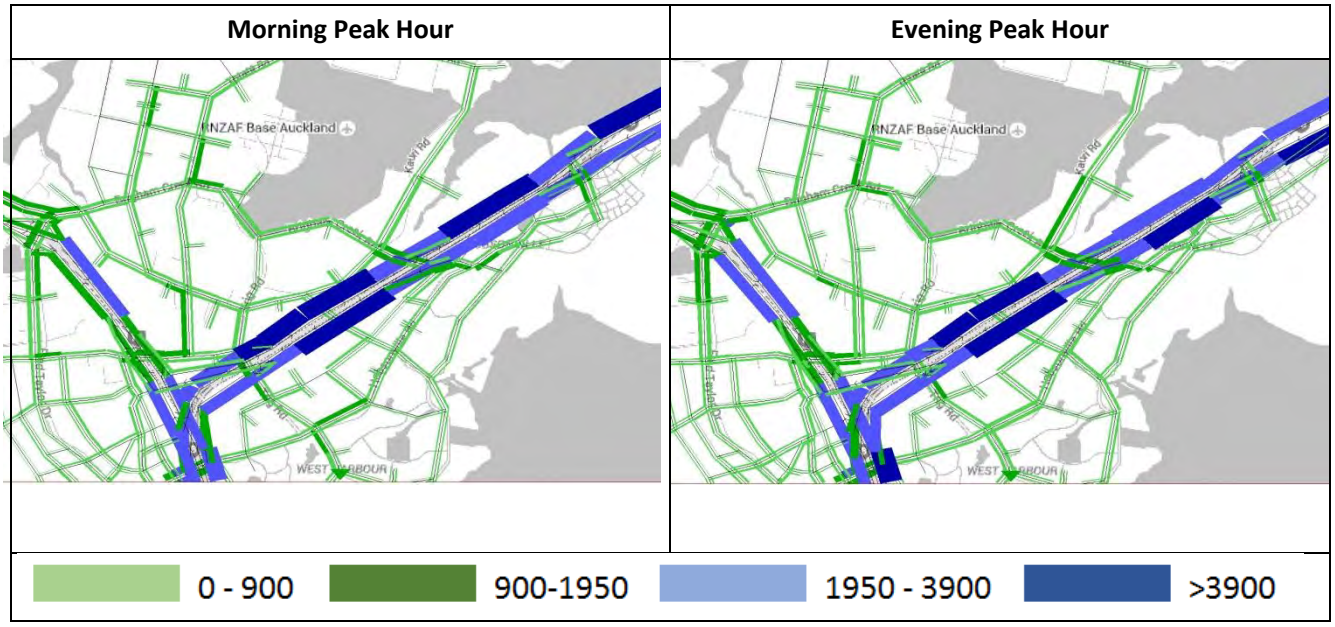
The above LOS plots indicate that with the full development of the anticipated Whenuapai Structure Plan area and the proposed network improvements, intersections are predicted to operate within the LOS D threshold.

An exception is the Totara Road intersection with Dale Road during the evening peak, when LOS E is predicted. While signalised, the layout of the intersection has been kept relatively small (two lanes at each limit line with single exit lane on each approach). In this instance, the intersection is located at the edge of the local centre and close to schools, and the need to provide safe (and relatively short) pedestrian connections is considered greater than the need to provide LOS D for vehicular traffic.

The proposed traffic signals at the Brigham Creek Road/SH18 interchange are predicted to result in LOS B to C during the commuter peaks. This is a result of the proposed Sinton Road realignment to Kauri Road, which enables this intersection to operate more efficiently (otherwise predicted LOS is E/F).

The predicted traffic flows associated with the above proposed network changes when the Whenuapai Structure Plan is fully developed are provided in the figures below.

Figure 24: 2046 Model with Suggested Network Changes – Predicted Traffic Flows (vehicles per hour)



7.7 Staging Assessment

To determine the proposed staging of the transport provisions a series of modelling tests were undertaken to help determine what infrastructure would be required based on different land use developments. While there are many scenarios that could be considered, it is intended that these can be used as a base to help determine what transport provisions would need to be assessed by developers. The scenarios considered for the assessed Whenuapai Structure Plan are outlined below.

- Scenario 1a: 3,400 dwellings in Whenuapai, including some 850 existing dwellings, 1,150 dwellings in the consented Whenuapai SHAs, and 1,400 new dwellings in the Trig Road area south of SH18. This scenario has been modelled using 2021 ART background traffic and adjusted future urban growth based on building consent and land supply inventory data from Auckland Council
- Scenario 1b: 4,100 dwellings in Whenuapai, including dwellings as per Scenario 1a plus 700 dwellings in the Kauri Road area, north of Brigham Creek Road. This scenario has been modelled using 2021 ART background traffic and adjusted future urban growth based on building consent and land supply inventory data from Auckland Council
- Scenario 1c: 4,300 dwellings in Whenuapai, including dwellings as per Scenario 1b plus 200 dwellings in the area northwest of the SH18/Brigham Creek Road interchange. This scenario has been modelled using 2021 ART background traffic and adjusted future urban growth based on building consent and land supply inventory data from Auckland Council
- Scenario 1d: 5,190 dwellings in Whenuapai, including dwellings as per Scenario 1c plus 890 dwellings in the Sinton Road area. This scenario has been modelled using 2021 ART background traffic and adjusted future urban growth based on building consent and land supply inventory data from Auckland Council

- Scenario 1e: 6,190 dwellings in Whenuapai, including dwellings as per Scenario 1d plus 1,000 dwellings in the Kennedys Road area. This scenario has been modelled using 2021 ART background traffic and adjusted future urban growth based on building consent and land supply inventory data from Auckland Council
- Scenario 2: 6,550 dwellings in Whenuapai, including dwellings as per Scenario 1e plus 360 new dwellings in the Brigham Creek Road/Mamari Road area, plus 1,000 FTEs in the industrial area, assumed to be along Brigham Creek Road and Trig Road, with side roads providing access to the development areas. This scenario has been modelled using 2026 ART background traffic and adjusted future urban growth
- Scenario 3: 7,400 dwellings in Whenuapai, including 850 existing dwellings, 1,150 consented SHA dwellings, 3,300 dwellings in Whenuapai north and east, 700 dwellings between Waiarohia Inlet and SH18, 1,400 dwellings in the Trig Road area south of SH18 and 6,500 FTEs in the industrial area. This scenario has been modelled using 2036 ART background traffic and adjusted future urban growth

The background growth in each of the above scenarios has been determined using adjusted growth rates derived from Scenario I9 predictions. Some of the growth rates proposed in Scenario I9 appear to be somewhat ambitious, and therefore adjustments have been made to defer some land use development and ensure a more even growth profile over the 30 year development of the wider area. The unadjusted growth predicted by Scenario I9 and the adjusted, balanced growth assumptions are shown in Figure 25 and Figure 26 respectively.

Figure 25: Scenario I9 Predicted Growth

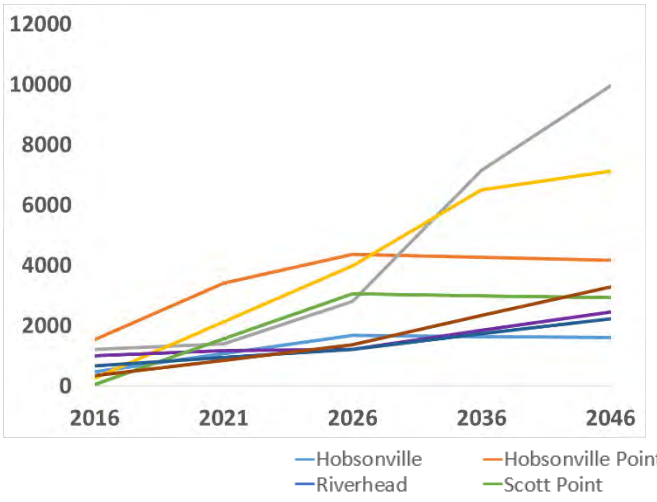
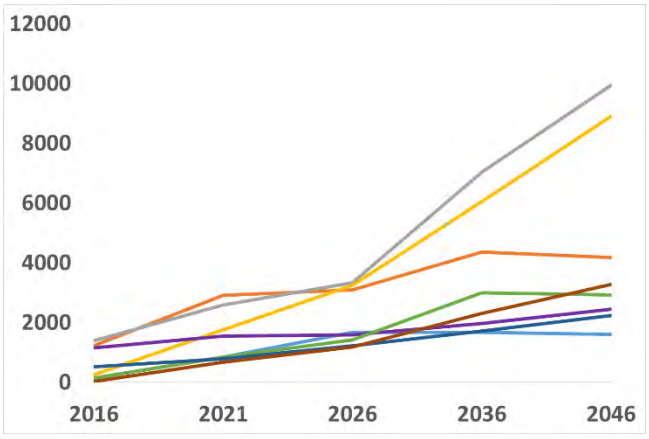


Figure 26: Balanced Growth



It is important when adjusting housing growth that similar adjustments are made to employment growth otherwise this affects the balance of the overall employment to dwelling ratio for the Auckland Region and changes the trip distributions that have been obtained from the ART model and applied to the SATURN model. Accordingly, the results obtained from the staging assessments need to be considered with a little caution, although the 2046 scenario has not been adjusted and therefore the ultimate level of transport provisions should match that required in time. If a scenario is proposed

that results in a significant difference in the balance of residential and employment land or growth, then an additional ART model scenario would need to be run to test the resulting demands and effects in the SATURN traffic model.

A case in point is Hobsonville Point. The ART I9 land use scenario was developed prior to the Marine Industry Precinct in Hobsonville Point being considered for 890 dwellings rather than some 1,400 FTEs. Accordingly in order to better understand the trip origins and destinations in the Whenuapai area and the effects on the wider network, the ART model should be re-visited to allow a more robust analysis of the above changes.

Detailed staging test outputs are provided in the following sections.

7.7.1 Scenario 1a

The proposed network and land use proposed in Scenario 1a has been assessed using 2021 background traffic, adjusted from the predictions in the ART model as discussed previously. A total of 3,400 dwellings are anticipated in the Whenuapai Structure Plan area, these include:

- 850 existing outside future urban zone
- 1,150 consented dwellings located either side of Totara Road between Brigham Creek Road and Dale Road
- 1,400 new dwellings around Trig Road south of SH18

No new industrial land use activity within Whenuapai has been assumed in this scenario, however a new primary school is assumed to be provided in the south Trig Road area to help accommodate students living in this area. Secondary school students from this area are assumed to travel to the Hobsonville Point Secondary School.

For the purposes of modelling and vehicle trip generation, it has been assumed that no RTN services operate to or within Whenuapai; however FTN services along Hobsonville Road, bus shoulder running on SH16 and an interchange at Westgate and increased frequency of existing services within Whenuapai are assumed to be provided.

The modelling indicates that with the land uses assumed to have occurred by 2021 in Whenuapai and in the wider area, the following external network improvements will be needed within the northwest area:

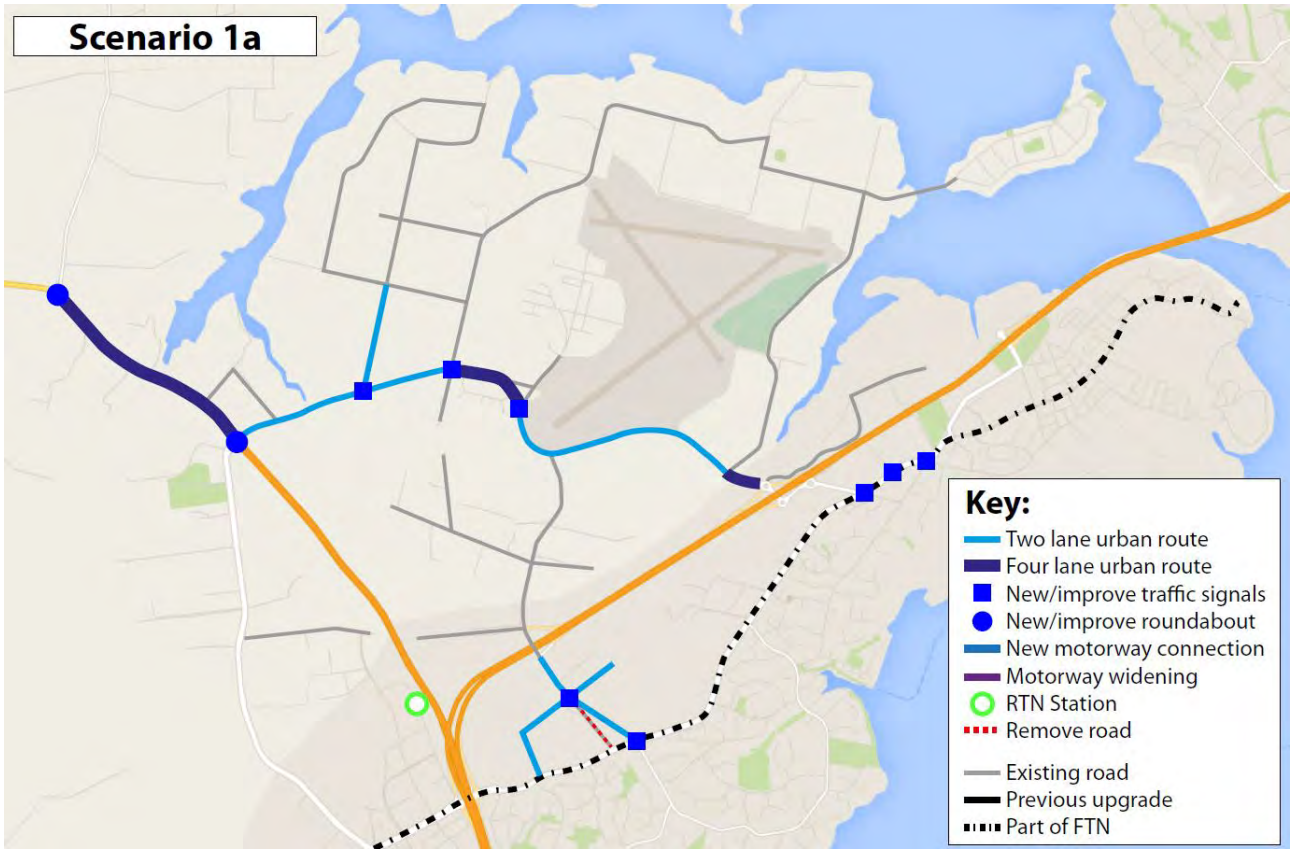
- FTN on Hobsonville Road with possible widening of Hobsonville Road to facilitate bus priorty
- FTN from Brigham Creek Road to Kumeu
- Bus shoulder running Auckland CBD to Westgate
- SH16 widening between Hobsonville Road and Lincoln Road
- Re-alignment and urbanisation (50 km/hr) of Trig Road south of SH18 to connect to Luckens Road and traffic signals at the Trig Road/Hobsonville Road/Luckens Road intersection
- Widening of SH16 between Brigham Creek Road and Coatesville-Riverhead Highway to provide two lanes in each direction

- SH16/Brigham Creek Road roundabout improvements comprising a signalised roundabout or three lanes on the SH16 northbound approach and three lanes around the western side of the roundabout
- New roundabout at SH16/Coatesville-Riverhead Highway intersection
- Traffic signals at:
  - Hobsonville Road/Sinton Road
  - Hobsonville Road/Brigham Creek Road
  - Hobsonville Road/Clark Road

The proposed transport provisions associated with the Scenario 1a land use within the Whenuapai area are shown in Figure 27 below. These include:

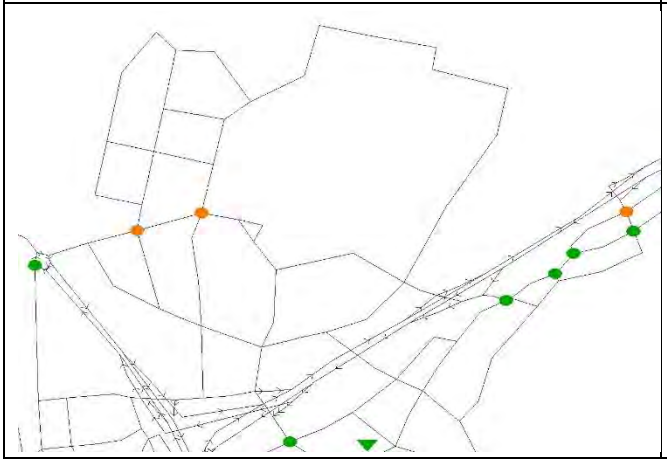
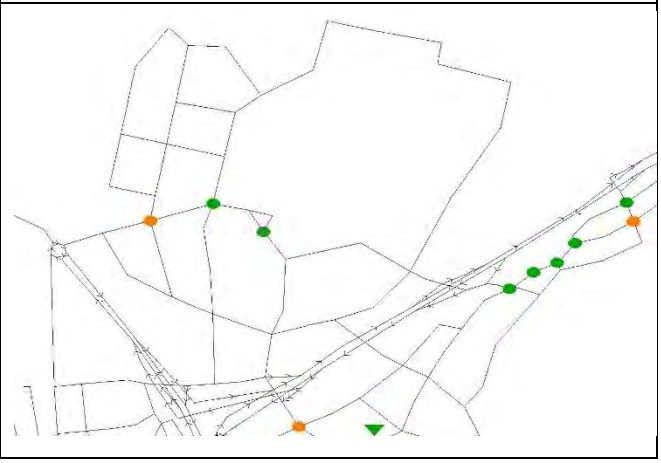
- A comprehensive network of pedestrian footpaths and appropriate cyclist infrastructure commensurate with development but in line with ultimate provisions
- Bus connector network within Whenuapai connecting to Westgate FTN/RTN and FTN along Hobsonville Road
- Brigham Creek Road urbanisation with 50 km/hr speed restriction between SH16 and SH18 interchanges
  - Widening of Brigham Creek Road to four lanes between Totara and Tamatea roads, and between Kauri Road and SH18/Brigham Creek Road interchange. Depending on the proximity of signalised intersections, widening of Brigham Creek Road may practically extend from SH16 to Tamatea Road rather than having short sections of two lanes.
- Extension of Riverlea Road to meet Brigham Creek Road
- Traffic signals at:
  - Brigham Creek Road/Riverlea Road
  - Brigham Creek Road/Totara Road/Mamari Road
  - Brigham Creek Road/Tamatea Avenue
- New local road west of Trig Road between Trig Road and Hobsonville Road
- New local road east of Trig Road, south of SH18
- Traffic signals at Trig Road/Local Road between SH18 and Hobsonville Road intersection

Figure 27: Proposed Roading Network Investments in Scenario 1a (including adjacent investments)



The predicted intersection performance in relation to the proposed transport investments is provided in the figures below.

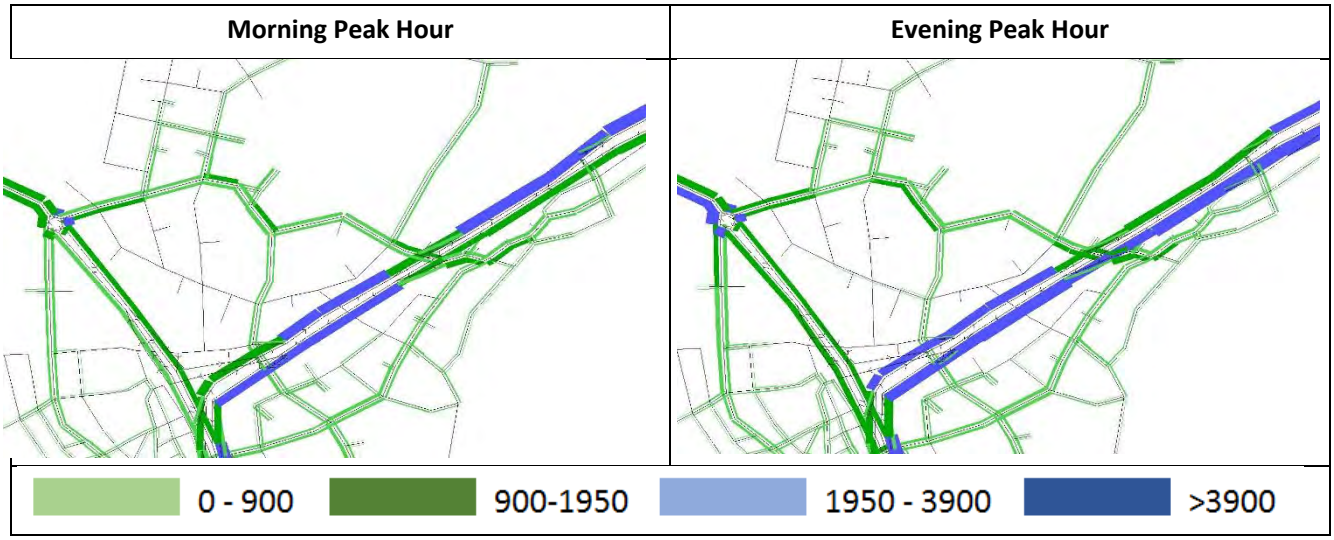
Figure 28: Overall Intersection LOS Plots – Scenario 1a

Morning Peak Hour	Evening Peak Hour
	

The intersections within Whenuapai are predicted to operate within acceptable levels of service, with LOS C or D predicted for all intersections in this development scenario.

The following figures identify predicted traffic flows on mid-block links.

Figure 29: Scenario 1a – Predicted Traffic Flows (vehicles per hour)



The TFUG study recommended that Brigham Creek Road would need to be widened to four lanes to accommodate the expected through traffic between SH16 and SH18 prior to the SH16/SH18 motorway connections being constructed. The modelling of Scenario 1 indicates that the majority of Brigham Creek Road is predicted to carry fewer than 900 vehicles per hour, which indicates that a LOS D or better can be achieved with one traffic lane per direction on these sections. While the section of Brigham Creek Road between Tamatea Road and Trig Road is expected to experience volumes just over 900 vph in the early stages, given that these volumes are predicted to reduce once the SH16-SH18 connections are constructed and because it passes the end of the runway, this section of Brigham Creek Road is not proposed to be widened initially. Accordingly widening to four lanes is only proposed on the section between Totara Road and Tamatea Road, and between Kauri Road and the SH18 eastbound ramps intersection, which is no more than that required in the ultimate 2046 scenario. It is also noted that the section of Brigham Creek Road between Tamatea Road and Trig Road is subject to occasional closures when large aircraft are landing or taking off.

Scenario 1a requires that Brigham Creek Road be urbanised, in order to provide access to developing areas and to reduce the attractiveness of this route for through traffic. This will include traffic signals, footpaths, separated cycle lanes (with associated driveway restrictions), landscaping and a speed limit of 50 km/hr. The urbanisation of this route will need to carefully balance the opposing requirements of local development and through traffic, and urbanisation efforts which dramatically slow traffic on this route may result in unwanted consequences such as traffic rerouting through inappropriate alternative routes. Conversely, it would be preferable not to widen sections of Brigham Creek Road to accommodate both functions during this stage, investment that would be redundant once the SH16 to SH18 links are constructed.

In the initial years of Whenuapai's development, it is unlikely that there will be significant demand for on street car parking on Brigham Creek Road, or many local street intersections and accesses that would otherwise slow traffic. This will represent a design challenge for this route, in the interim years.

7.7.2 Scenario 1b

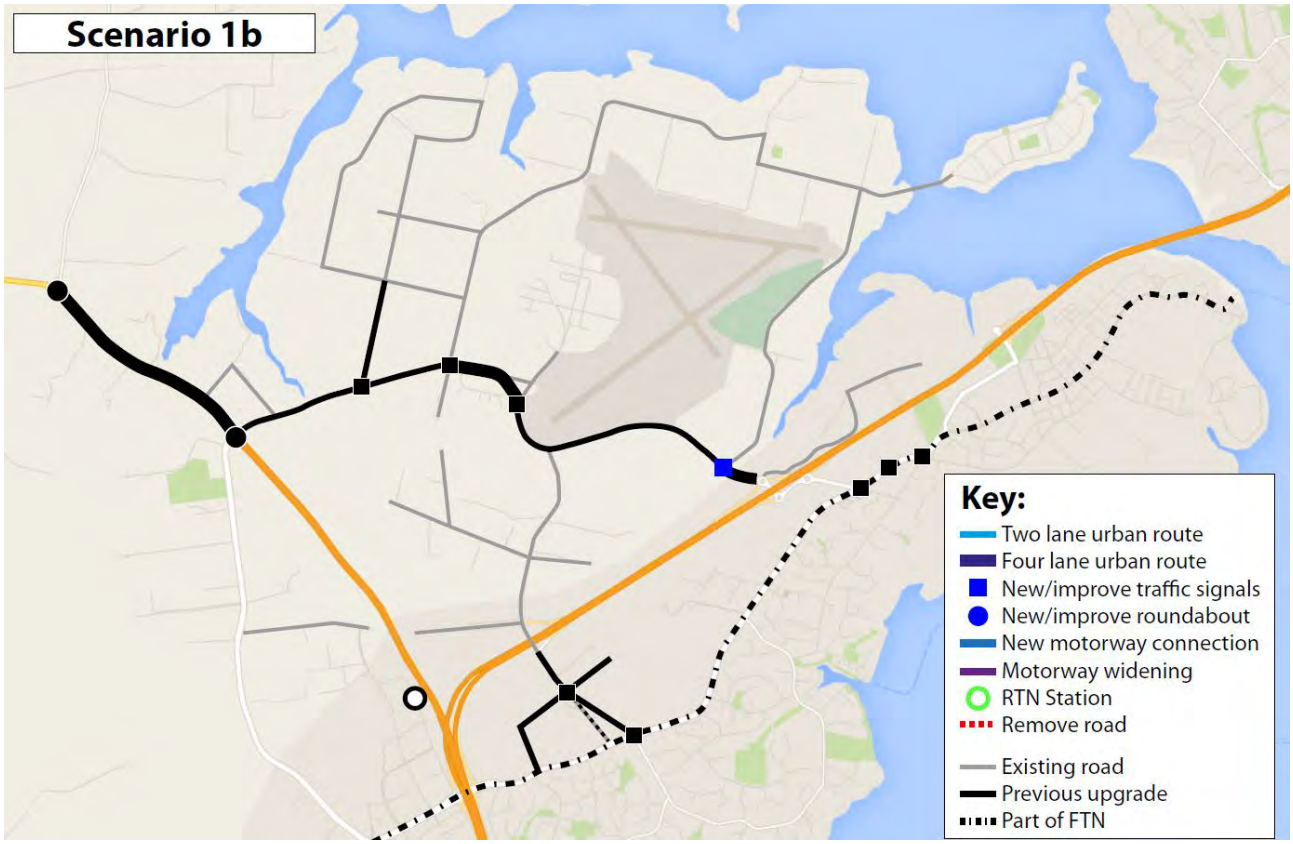
Scenario 1b is based on 2021 land use growth predictions and has the same residential development profile as Scenario 1a but it includes an additional 700 dwellings in the Kauri Road area.

A new secondary school at Riverlea Road is assumed to have been built. Primary school students are assumed to attend Trig Road south, Whenuapai and Hobsonville primary schools.

The additional transport provisions associated with the Scenario 1b land use and growth assumptions include:

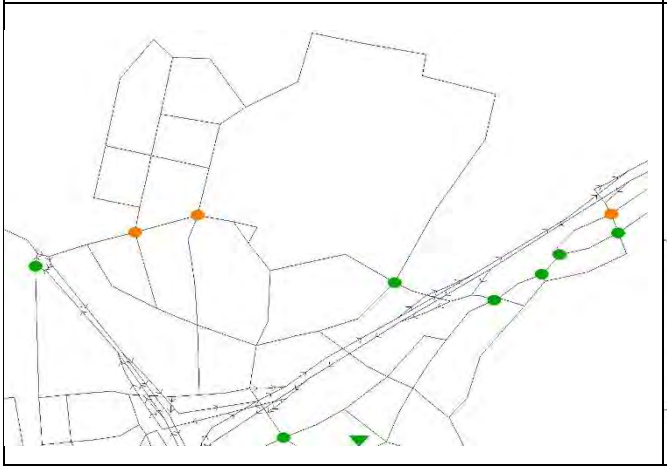
- Signalisation of the Kauri Road/Brigham Creek Road intersection.

Figure 30: Proposed Additional Road Network Investments in Scenario 1b



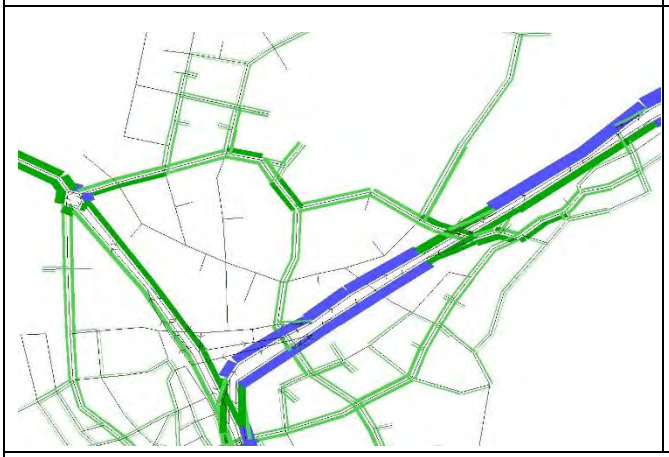
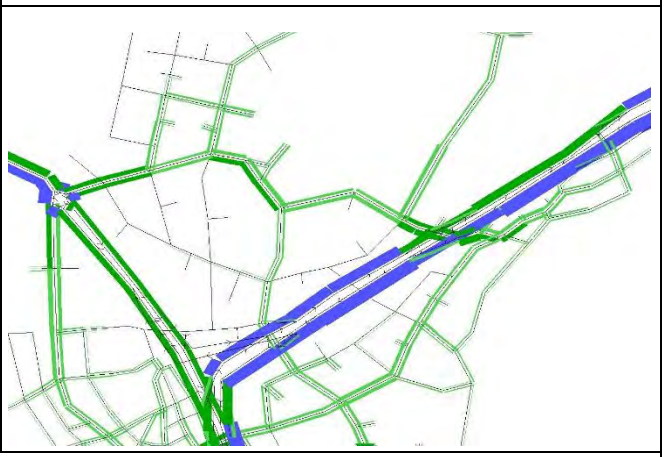
The figures below provide the predicted LOS at intersections within and around the Structure Plan area in Scenario 1b, showing that LOS C and D are predicted at intersections within the development area.

Figure 31: Overall Intersection LOS Plots: Scenario 1b

Morning Peak Hour	Evening Peak Hour
	

The following figures provide an indication of the predicted demand flows on the traffic network about the Whenuapai Structure Plan area.

Figure 32: Scenario 1b – Predicted Traffic Flows (vehicles per hour)

Morning Peak Hour	Evening Peak Hour
	

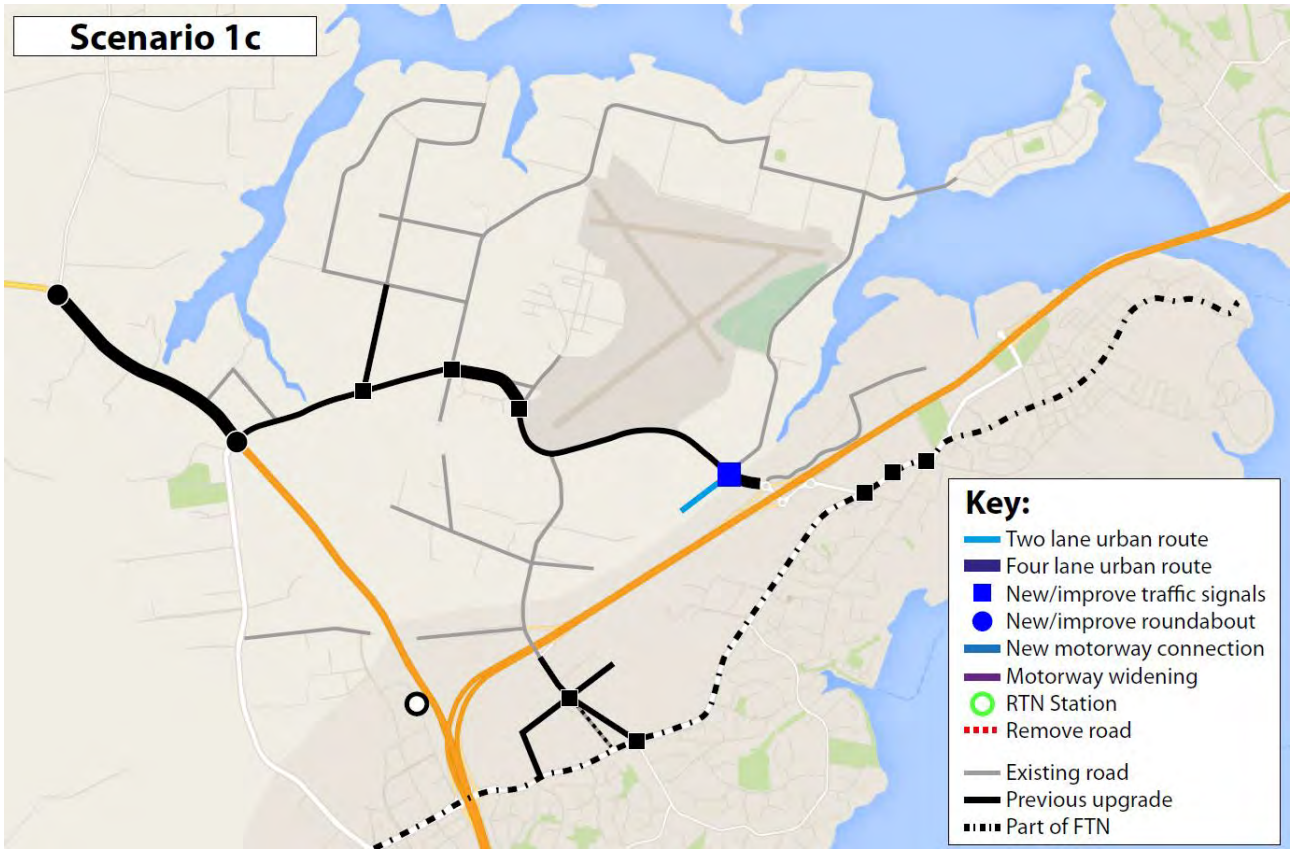
7.7.1 Scenario 1c

In addition to the development assumed with Scenario 1b, Scenario 1c includes an additional 200 households in the area northwest of the SH18/Brigham Creek Road interchange.

It is assumed that the Kauri Road/Brigham Creek Road intersection will have a fourth approach from the development area (which will eventually join with Spedding Road). The modelling indicates that the following changes are needed to the transport network:

- Addition of fourth leg to Kauri Road/Brigham Creek Road intersection and include two right turn lanes from Brigham Creek Road to Kauri Road.

Figure 33: Proposed Additional Road Network Investments in Scenario 1c



The predicted intersection performance and the predicted demand flows on the traffic network about Whenuapai Structure Plan area are provided as follows:

Figure 34: Overall Intersection LOS Plots: Scenario 1c

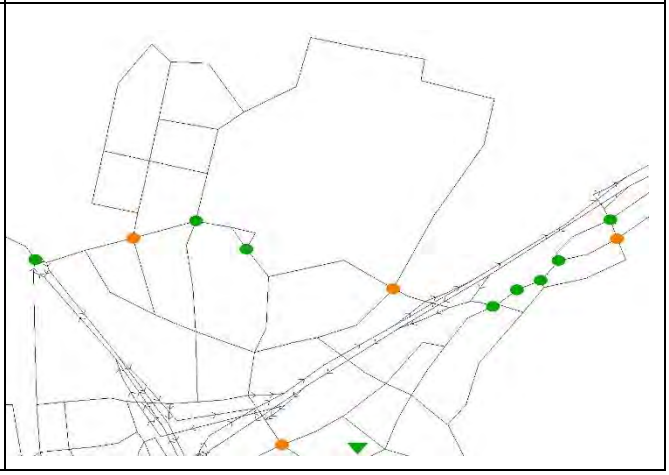
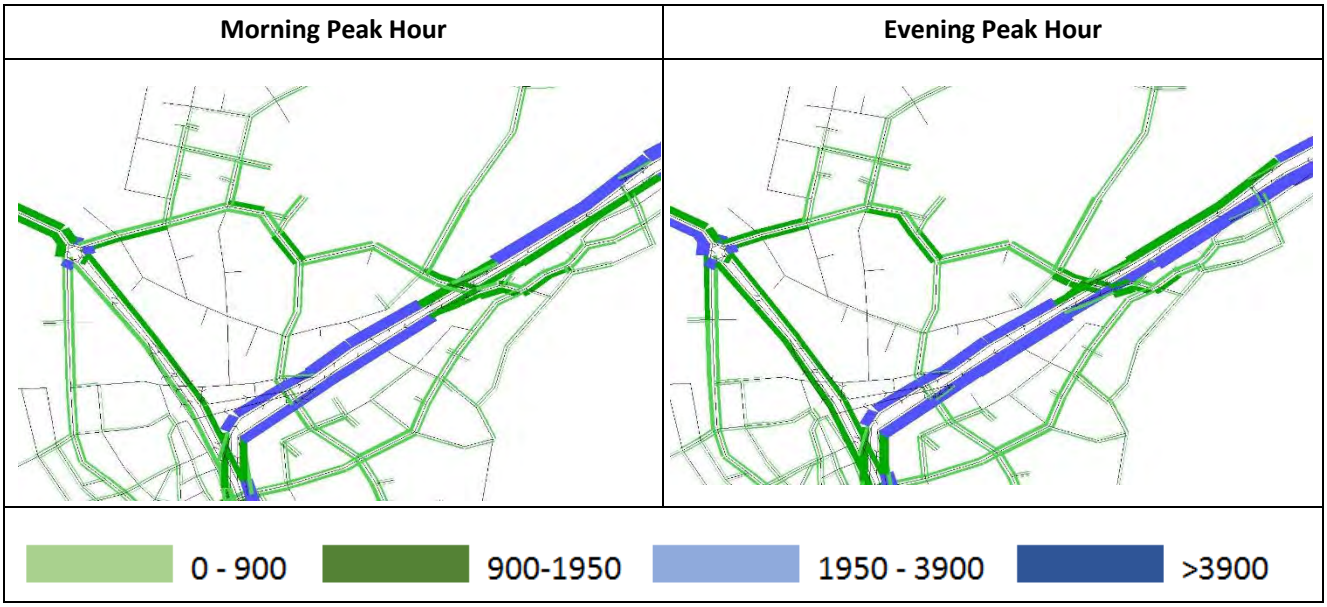
Morning Peak Hour	Evening Peak Hour
	

Figure 35: Scenario 1c – Predicted Traffic Flows (vehicles per hour)



7.7.1 Scenario 1d

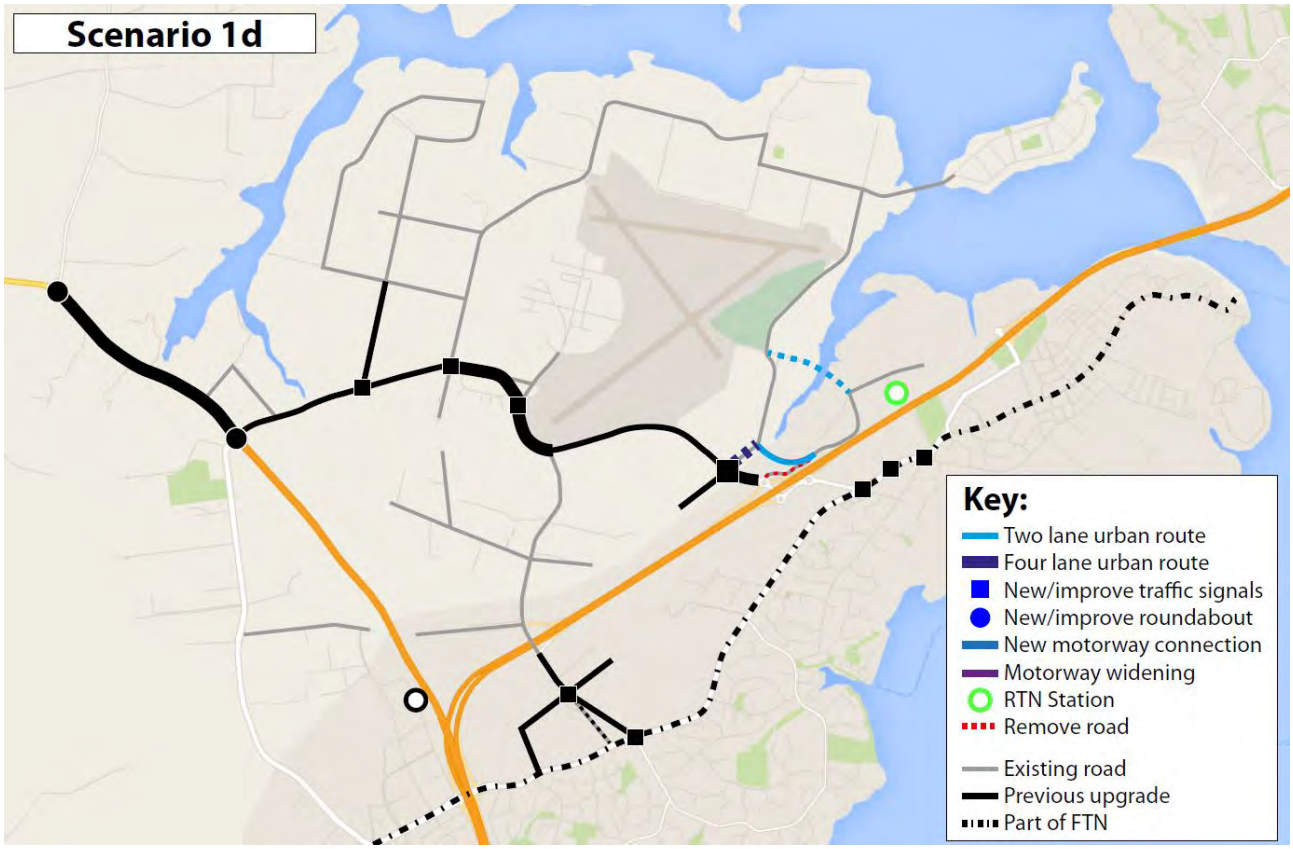
Scenario 1d is based on 2021 land use growth predictions and has the same residential development profile as Scenario 1c but includes an additional 890 dwellings in the Sinton Road area between SH18 and the Waiarohia Inlet.

An RTN station is proposed adjacent to SH18 in this area and given the potential for reducing vehicle trip rates and providing a transit orientated development, it has been assumed that FTN or RTN with a station adjacent to the existing pedestrian/cyclist footbridge across SH18 to Ockelston Road will be provided when this area is developed. Vehicle trip rates have also been assumed to be lower for the Kauri Road development based on good connector services being provided to the RTN station.

Based on the lower vehicle trip rates, the traffic modelling indicates that the improvements necessary to the road network would include the following:

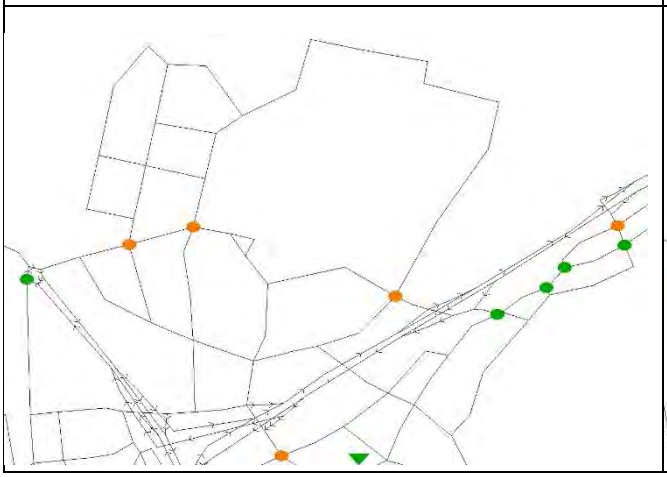
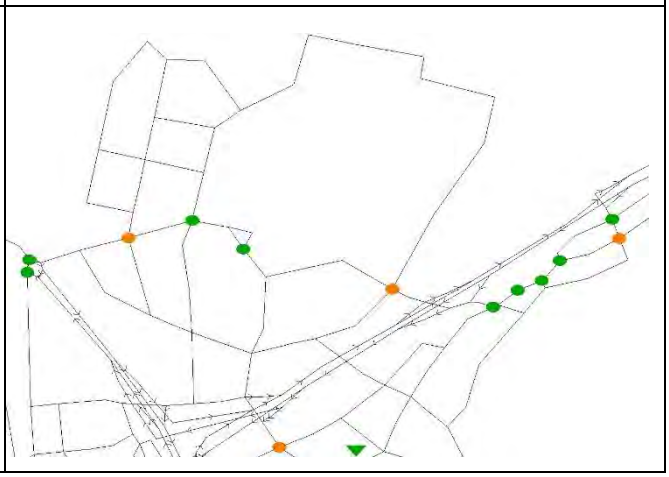
- RTN/FTN along SH18 with a station at the Clarks Lane/Ockelston Road pedestrian/cycle bridge over SH18
- Removal of the existing Sinton Road connection to the Brigham Creek Road/SH18 Northbound Ramps intersection, with a new local connection between Sinton Road and Kauri Road
- Kauri Road widening may be required between Brigham Creek Road and Sinton Road

Figure 36: Proposed Additional Road Network Investments in Scenario 1d



The predicted intersection performance associated with the Scenario 1d land use is presented in the figures below.

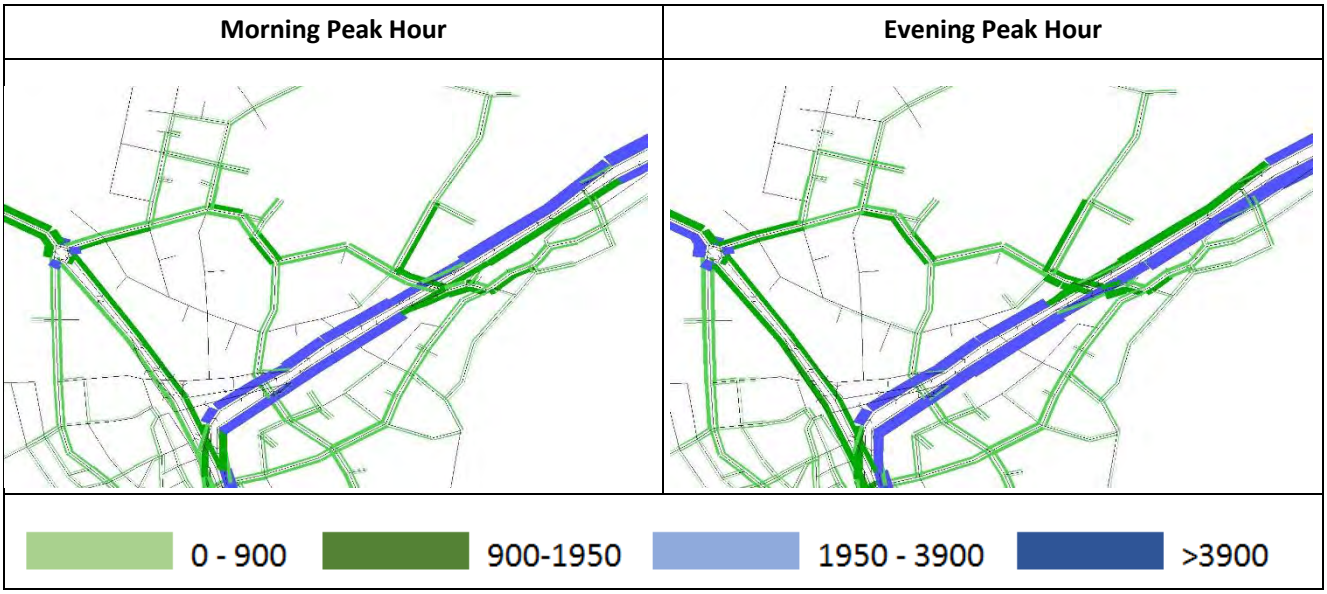
Figure 37: Overall Intersection LOS Plots: Scenario 1d

Morning Peak Hour	Evening Peak Hour
	

With the proposed network in Scenario 1d, intersections within the Whenuapai Structure Plan will operate with LOS D or better.

The figures below provide the predicted traffic volumes around the Whenuapai Structure Plan area. No further widening other than that suggested above is predicted to be needed.

Figure 38: Scenario 1d – Predicted Traffic Flows (vehicles per hour)



If RTN/FTN services are not provided and higher vehicle trip rates are assumed, the transport network is likely to require the following:

- Removal of the existing Sinton Road connection to the Brigham Creek Road/SH18 Northbound Ramps intersection, with a new local connection between Sinton Road and Kauri Road
- Kauri Road widening between Brigham Creek Road and Sinton Road
- Additional left turn lane from Kauri Road north to Brigham Creek Road east at the Brigham Creek Road/Kauri Road signalised intersection.
- Additional eastbound lane on the Brigham Creek Road west approach at the Brigham Creek Road/SH18 Southbound Ramps intersection.

7.7.2 Scenario 1e

In addition to the land uses assumed with Scenario 1d, Scenario 1e includes an additional 1,000 households in the Kennedys Road area between SH16 and Brigham Creek Road. It is assumed that access to this area would be provided from Brigham Creek Road at a signalised intersection, with no access to SH16 directly.

An additional primary school is likely to be required, and it is assumed this would be near to the new secondary school on Riverlea Road.

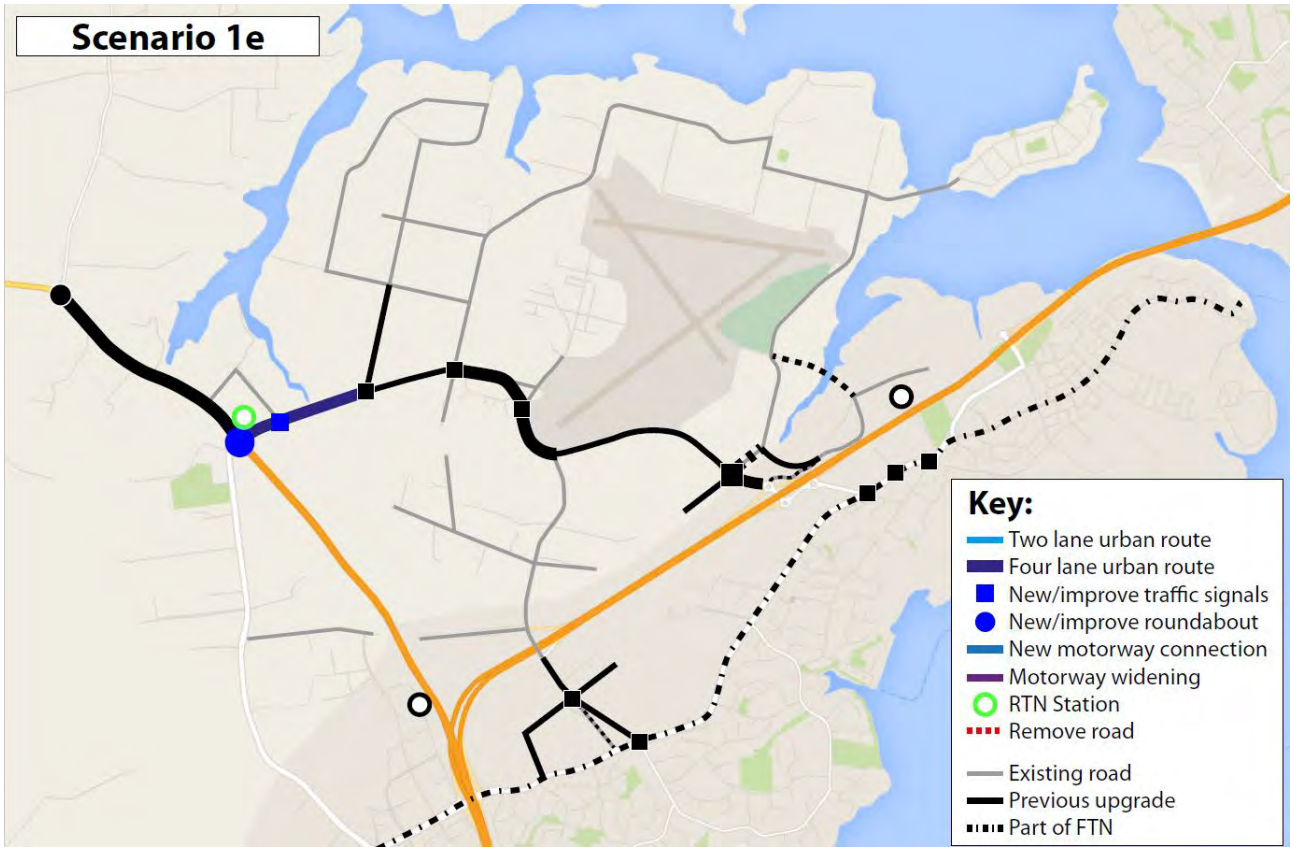
It is assumed that FTN or RTN would be provided to Brigham Creek Road with a station in the vicinity of the Kennedys Road area, in close proximity to the development and therefore low vehicle trip rates have been assumed for the residential development proposed in the area. Low vehicle trip rates associated with an RTN along SH18 serving the Sinton Road development have also been assumed.

This scenario is predicted to include the following transport provisions:

- RTN/FTN between Westgate and SH16/Brigham Creek Road with a station in the Kennedys Road area

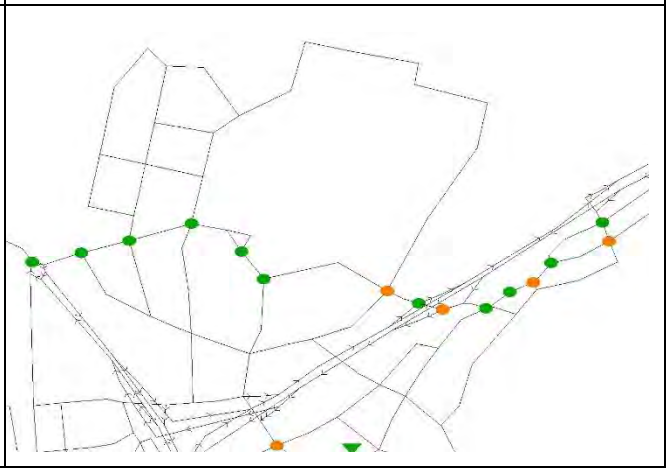
- Signalisation of the intersection of Brigham Creek Road and the local road serving the Kennedys Road development
- Widening of Brigham Creek Road between SH16 and Riverlea Road
- Capacity improvements at the SH16/Brigham Creek Road roundabout comprising signalising the roundabout and increasing the number of lanes on the SH16 approaches and around the roundabout

Figure 39: Proposed Additional Road Network Investments in Scenario 1d



The figures below illustrate the predicted intersection performance associated with the proposed land use and traffic network in Scenario 1e.

Figure 40: Overall Intersection LOS Plots – Scenario 1e

Morning Peak Hour	Evening Peak Hour
	

The predicted traffic flows in Scenario 1e in the morning and evening peak hours are provided in the figures below.

Figure 41: Scenario 1e – Predicted Traffic Flows (vehicles per hour)

Morning Peak Hour	Evening Peak Hour
	

7.7.3 Scenario 2a

Scenario 2a is also based on 2026 land use growth predictions and has the same residential development profile in Whenuapai as Scenario 1e but includes an additional 360 dwellings in the Brigham Creek Road/Mamari Road area and an additional 1,000 FTEs within Whenuapai and 1,000 FTEs within PC 14 area between SH18 and Hobsonville Road. For the purposes of assessment, it has been assumed that the industrial development will occur along the length of Brigham Creek Road and Trig Road, with side roads providing rear access to the development areas. The modelled industrial land use distribution in Scenario 2a is provided in Table 16 below.

Table 16: Anticipated Industrial Development – Scenario 2a (number of employees)

SATURN Model Zone (Orange)	FTE	Comments
1	200	No access permitted from Brigham Creek Road due to separated cycle lanes. Therefore driveway accesses will be from Spedding Road Extension from Brigham Creek Road and from a new link extending into the industrial area between Trig Road and Kauri Road
2	100	Limited driveway accesses from Trig Road between Brigham Creek Road and SH18 Interchange due to buffered cycle lanes along industrial sections of Trig Road
3	100	No access permitted from Brigham Creek Road or Mamari Road due to separated cycle lanes. Therefore rear accesses will need to be from side roads
4	100	Assume access from Spedding Road via Trig Road
5	0	
6	100	Assume driveway accesses from Trig Road through Spedding Road
7	100	Assume driveway accesses from Riverlea Road extension as no access permitted from Brigham Creek Road
8	200	Assume driveway accesses from Spedding Road North as no access permitted from Brigham Creek Road
9	100	Assume driveway accesses from Fred Taylor Drive
Total	**1,000**	

The transport provisions considered necessary to develop the Scenario 2a land use, in addition to those identified for Scenario 1e are illustrated in Figure 42 and include the following about the regional network:

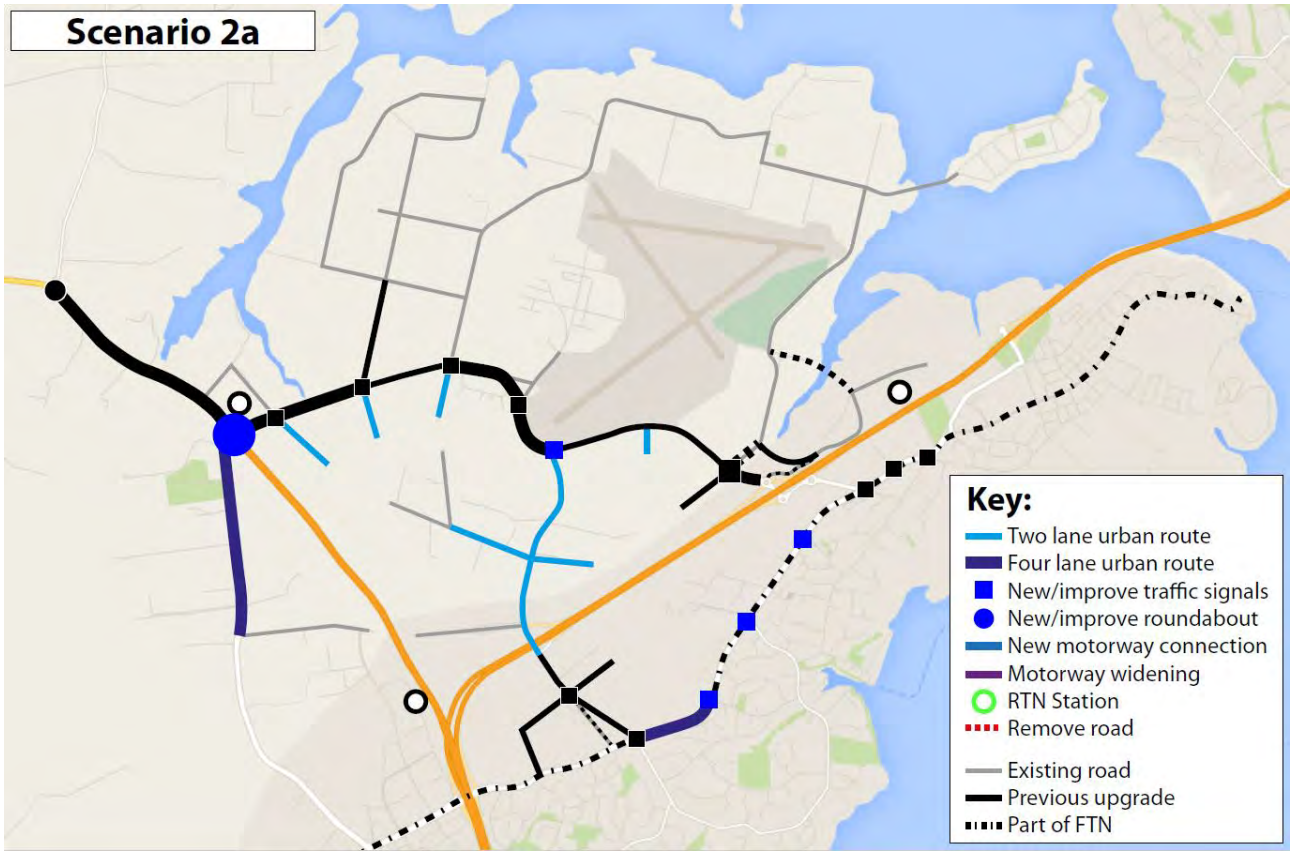
- Capacity improvements at the SH16/Brigham Creek Road roundabout comprising signalising and increasing the number of lanes on all approaches and around the roundabout
- Hobsonville Road widening between Trig Road and Marina View Road
- Traffic signals on Hobsonville Road at:
  - Marina View Road
  - Westpark Drive
  - Suncrest Drive

In addition, the following is considered necessary within the Whenuapai Structure Plan area:

- Frequent service Whenuapai Structure Plan proposed bus routes
- Additional fourth leg at signalised intersection at Brigham Creek Road/Spedding Road Extension/Kennedys Road link intersection
- Extend/widen Mamari Road to provide access to industrial area

- Construct new road opposite Riverlea Road south of Brigham Creek Road into industrial area
- Upgrade existing sections of Spedding Road and Mamari Road, and their intersections, to be suitable for industrial traffic, including footpaths, cyclist facilities
- Construct Spedding Road Extension south from Brigham Creek Road, east of SH16 into industrial area
- Construct new road into industrial area from Brigham Creek Road east of Trig Road
- Urbanisation of Trig Road between Brigham Creek Road and SH18 Interchange
- Widen Fred Taylor Drive between SH16/Brigham Creek Road and Northside Drive
- Traffic signals at the Brigham Creek Road/Trig Road intersection

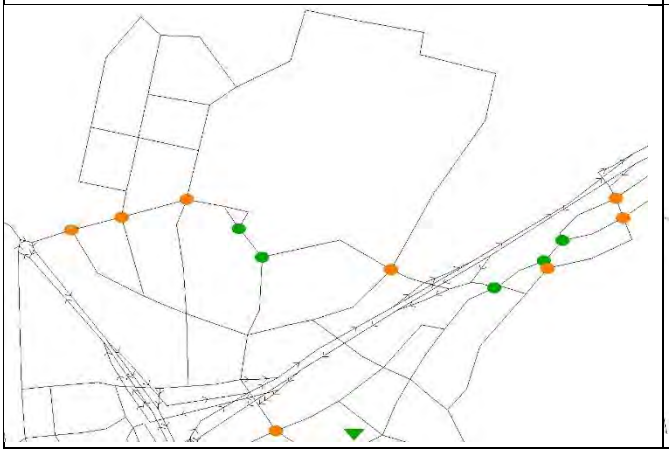
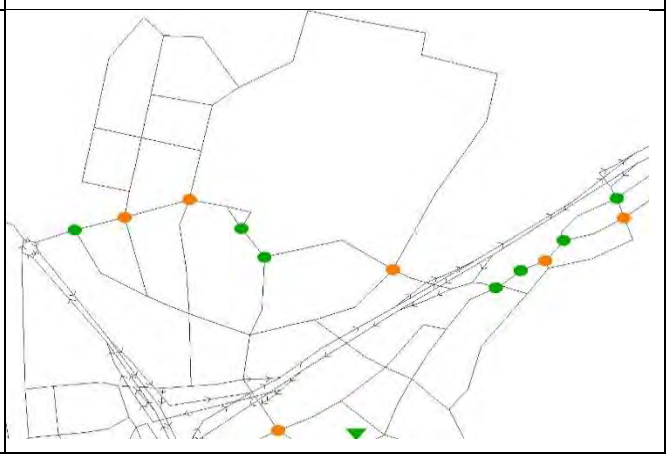
Figure 42: Proposed Additional Road Network Investments in Scenario 2a



Side roads from Brigham Creek Road and Mamari Road are necessary as Brigham Creek Road and Mamari Road will have separated cycle lanes on both sides of the road, which will prevent driveway accesses being provided. Where development is proposed from existing roads, their ultimate form, including provision for footpaths and cycle facilities should be constructed at this stage.

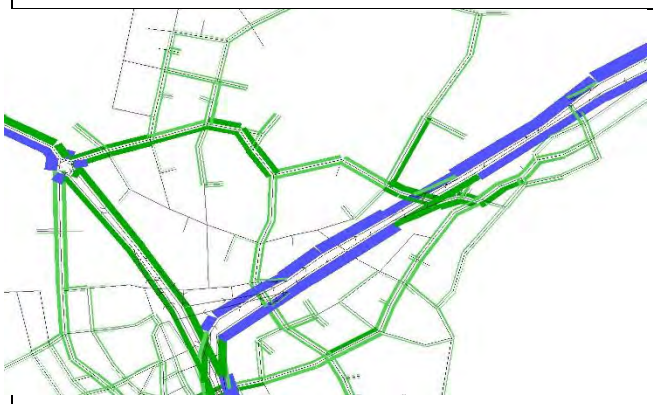
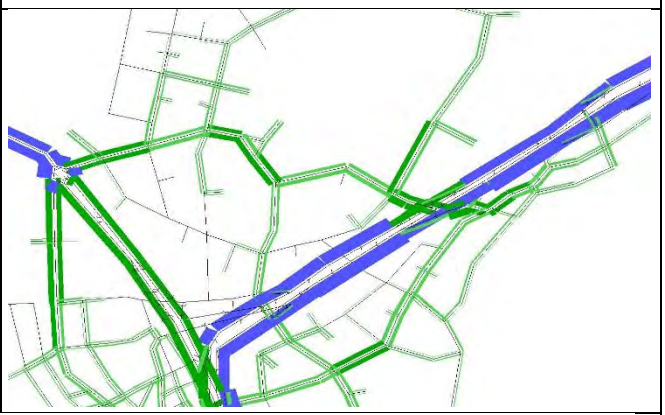
The intersections within Whenuapai are predicted to operate with LOS D or better in both morning and evening peak hours, as shown in the following figures.

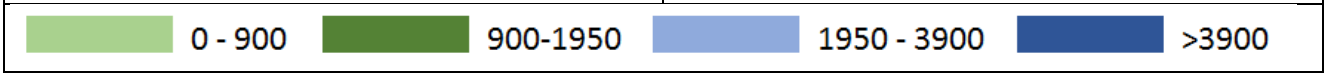
Figure 43: Overall Intersection LOS Plots – Scenario 2a

Morning Peak Hour	Evening Peak Hour
	

The predicted traffic flows in Scenario 2a in both morning and evening peak hours are provided in the figures below.

Figure 44: Scenario 2a – Predicted Traffic Flows (vehicles per hour)

Morning Peak Hour	Evening Peak Hour
	



7.7.4 Scenario 3

Background land use and growth has been assumed from the adjusted 2036 ART models. For the purposes of modelled vehicle trip generation assumptions, it has been assumed that the SH16 RTN extension to Kumeu, RTN services between Westgate and the North Shore, a new RTN station close to the Hobsonville Village and pedestrian/cycle bridge over SH18, a new RTN station between Trig Road and Brigham Creek Road, as well as new FTN bus services within Whenuapai have all been provided.

Within Whenuapai, a total of 7,400 dwellings including the residential Trig Road area south of SH18, and 6,500 FTEs, are anticipated with this scenario. The residential developments include the following.

- 7,400 dwellings in Whenuapai including:
  - 850 existing outside future urban zone

- 1,150 consented SHA dwellings located either side of Totara Road between Brigham Creek Road and Dale Road
- 3,300 new dwellings in the north and east
- 700 new dwellings between Waiarohia Inlet and SH18
- 1,400 new dwellings around Trig Road south of SH18

The distribution of the industrial development and the associated network connections are provided in the table below.

Table 17: Proposed Industrial Development – Scenario 3 (number of employees)

SATURN Model Zone (Orange)	FTEs	Comments
1	1,200	No access permitted from Brigham Creek Road due to separated cycle lanes. Therefore driveway accesses will be from Spedding Road Extension from Brigham Creek Road and from a new link extending into the industrial area between Trig Road and Kauri Road.
2	600	Limited driveway accesses from Trig Road between Brigham Creek Road and SH18 Interchange due to buffered cycle lanes along industrial sections of Trig Road. Driveways accesses along Spedding Road extension to Trig Road.
3	500	No access permitted from Brigham Creek Road or Mamari Road due to separated cycle lanes. Therefore rear accesses will need to be from side roads.
4	600	Assume access from Spedding Road via Trig Road and Northside Drive.
5	300	Assume driveway accesses from Northside Drive
6	600	Assume driveway accesses from Trig Road through Spedding Road, from Northside Drive via Mamari Road extension. No access from Brigham Creek Road.
7	600	Assume driveway accesses from Riverlea Road extension as no access permitted from Brigham Creek Road
8	1,200	Assume driveway accesses from Spedding Road North as no access permitted from Brigham Creek Road
9	900	Assume driveway accesses from Fred Taylor Drive
Total	**6,500**	Assumes connection through Spedding Road and Kauri Road, as well as new local connection crossing SH18 to Marina View Road

The SATURN modelling indicates that additional regional transport provisions are needed to accommodate traffic anticipated with the land use and growth assumed with Scenario 3. These include the following on the wider network:

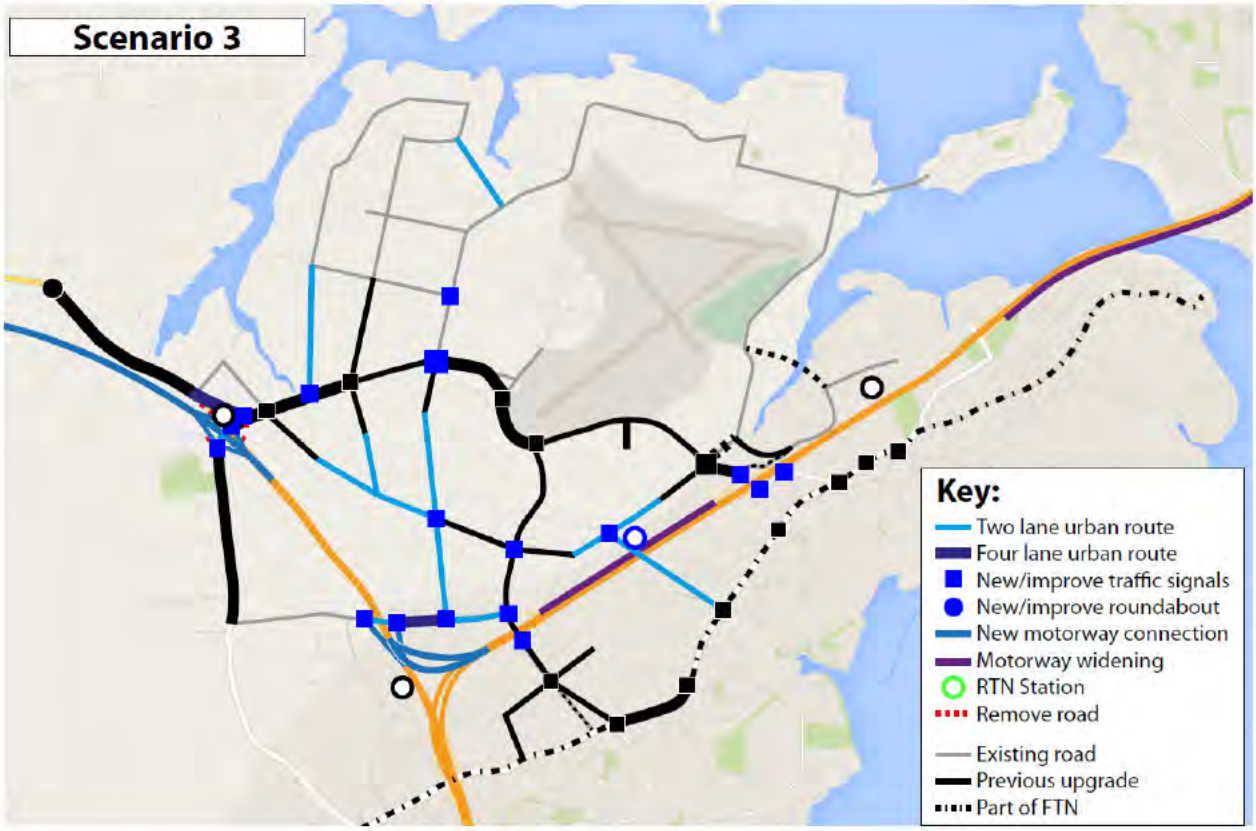
- RTN from Westgate to the North Shore (as per Scenario 1d) with an additional station along SH18 at a new bridge over SH18 between Trig Road and Brigham Creek Road interchange

- New arterial road alternative to SH16 between Brigham Creek Road and Kumeu (initially a two lane road)
- Interchange at realigned SH16/Brigham Creek Road with signalised intersections
- Investigation of realignment of "old" SH16 to provide appropriate separation from new SH16/Brigham Creek Road interchange, and future Kennedy's Road link intersection with Brigham Creek Road. Traffic signals would be required on Brigham Creek Road if intersection is feasible
- Traffic signals at SH18/Trig Road interchange
- Northside Drive connection to Trig Road interchange and SH16/Northside Drive south facing ramps with four lanes between Northside Drive and Mamari Road
- SH16/SH18 motorway connections[7]
- Additional lane SH18 eastbound between Trig Road and Brigham Creek Road
- Additional lane SH18 westbound between Tauhinu Road and Squadron Drive
- Traffic signals at the SH18/Brigham Creek Road interchange

Additional transport provisions associated with the structure plan and access to the RTN station include the following:

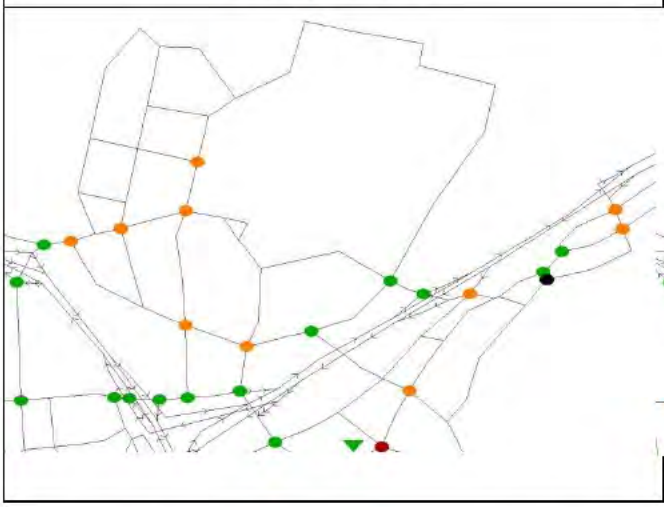
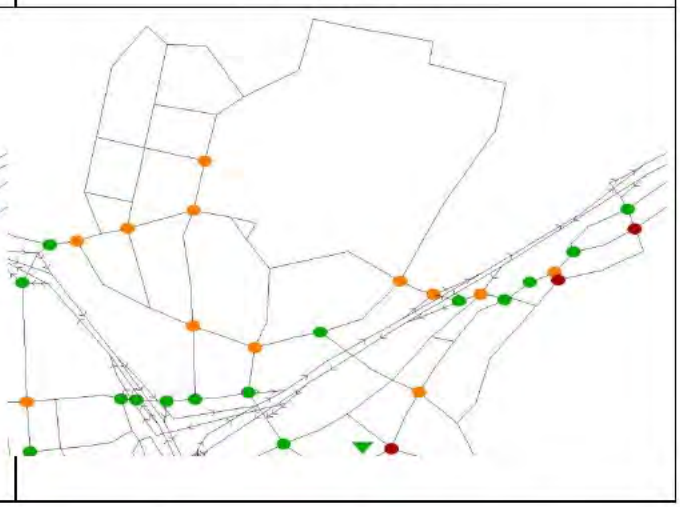
- Additional lanes at the Brigham Creek Road/Totara Road/Mamari Road intersection
- Upgrades to existing roads within industrial areas and provision of new roads as necessary to avoid driveways onto Brigham Creek Road, Mamari Road and Northside Drive
- Local road connection between Riverlea Road and Totara Road near Rarawara Creek
- Capacity improvements at the Brigham Creek Road/Totara Road/Mamari Road intersection
- Mamari Road extension to Northside Drive, plus traffic signals at the Mamari Road/Northside Drive intersection and Mamari Road/Spedding Road intersection
- Spedding Road connection between Brigham Creek Road and Trig Road
- Signals at Totara Road/Dale Road intersection
- Traffic signals at the Spedding Road/Trig Road/Spedding Road extension intersection
- A new bridge between Marina View Drive and Spedding Road extension, with signals on Spedding Road Extension[7]
- Extension of Bristol Road to meet Brigham Creek Road, and traffic signals at the intersection of these roads

Figure 45: Proposed Additional Road Network Investments in Scenario 3



The predicted intersection performance associated with the Scenario 3 land use is presented in the figures below.

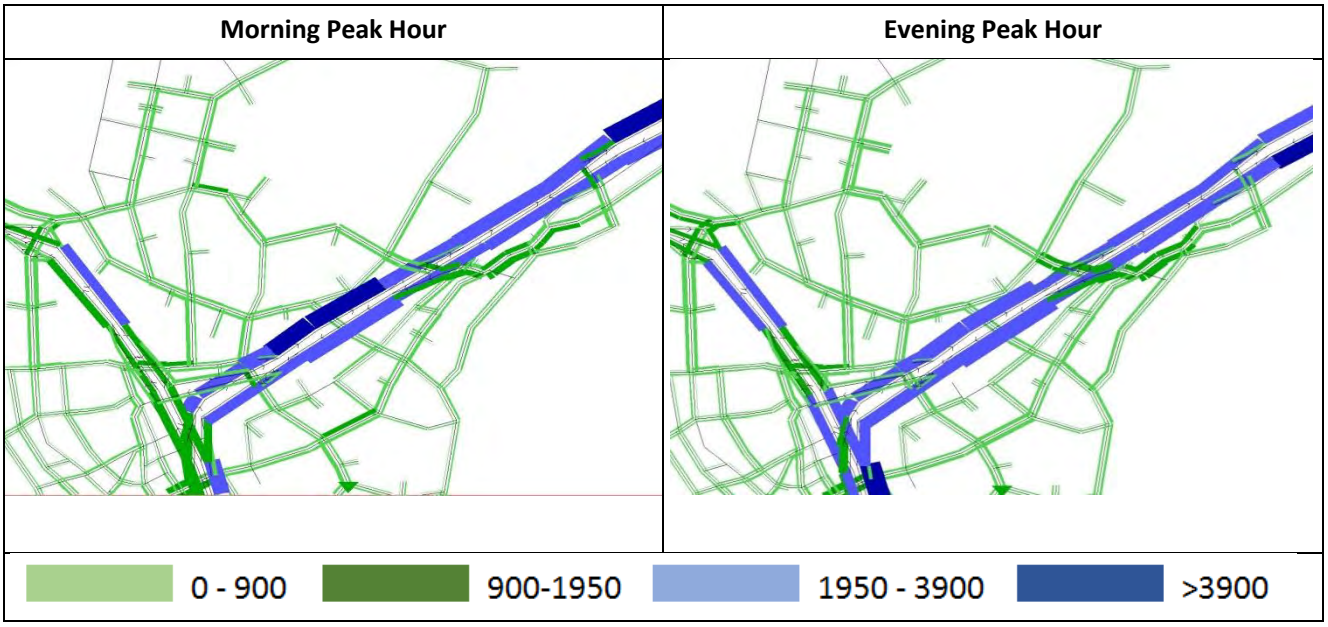
Figure 46: Overall Intersection LOS Plots: Scenario 3

Morning Peak Hour	Evening Peak Hour
	

It can be seen that with the proposed network in Scenario 3, intersections within the Whenuapai Structure Plan will operate with LOS D or better.

The figures below provide the predicted traffic volumes around the Whenuapai Structure Plan area. No further widening other than that suggested above is needed.

Figure 47: Scenario 3 – Predicted Traffic Flows (vehicles per hour)



8 CONSIDERATION OF ALTERNATIVES AND MITIGATION OF ADVERSE IMPACTS

The assessed Structure Plan in terms of the assumed land use, scale, location and staging are likely change to reflect other opportunities and requirements (eg water, urban design, as well ae market forces). The inter-relationship between land use and transport provisions is a key factor in the assessment, particularly in relation to travel mode trip generation assumptions, which has a direct impact on the resulting transport provisions required. It is recognised that the structure plan will continue to evolve with changes in land use mix, scale and location resulting in different transport responses.

It is anticipated that further alternatives will be considered after the first draft review of this document is completed. These are likely to incorporate the needs of other infrastructure components in order to provide an integrated Structure Plan solution. The workshop undertaken on May 26 2016 identified that the water infrastructure staging prefers development focused around the western areas about SH18 in the short term, with the northern section of the structure plan area developing in the longer term. As mentioned above this loosely aligns with the assumptions made in the transport assessment; however some additional testing may be required.

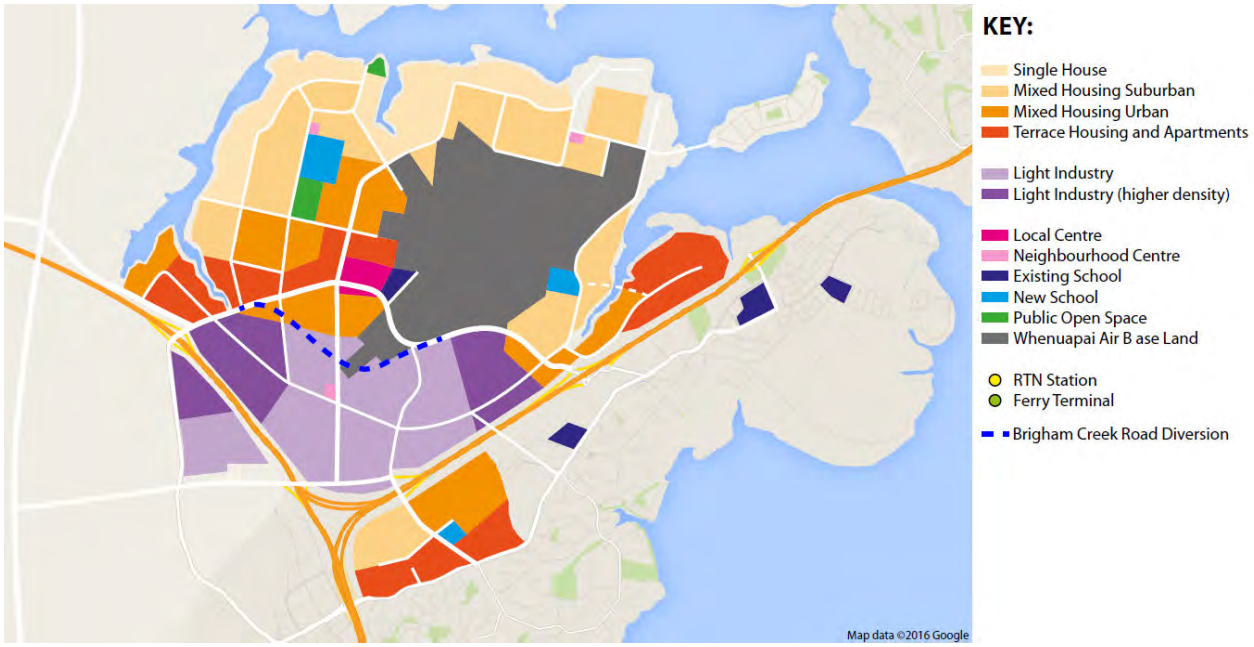
One transport network alternative includes the relocation of Brigham Creek Road in order to divert traffic from the conflict point between the road traffic and the air traffic. This is discussed below.

8.1 Alternative Brigham Creek Road location

A small section of Brigham Creek Road west of Trig Road is infrequently closed to traffic while large planes land or take off from the runway. A bypass of this section of Brigham Creek Road could be provided by diverting Brigham Creek Road towards the SH16 and SH18 interchange as shown in Figure

48. In realigning Brigham Creek Road some land uses may also require relocation, with the local centre likely to be most influenced and potentially located further south to encourage pass-by shopping trips.

Figure 48: Possible Diversion of Brigham Creek Road to avoid section that gets closed to traffic



Ultimately, the alignment of Brigham Creek Road will be determined however by the TFUG study.

8.2 Additional Residential Development

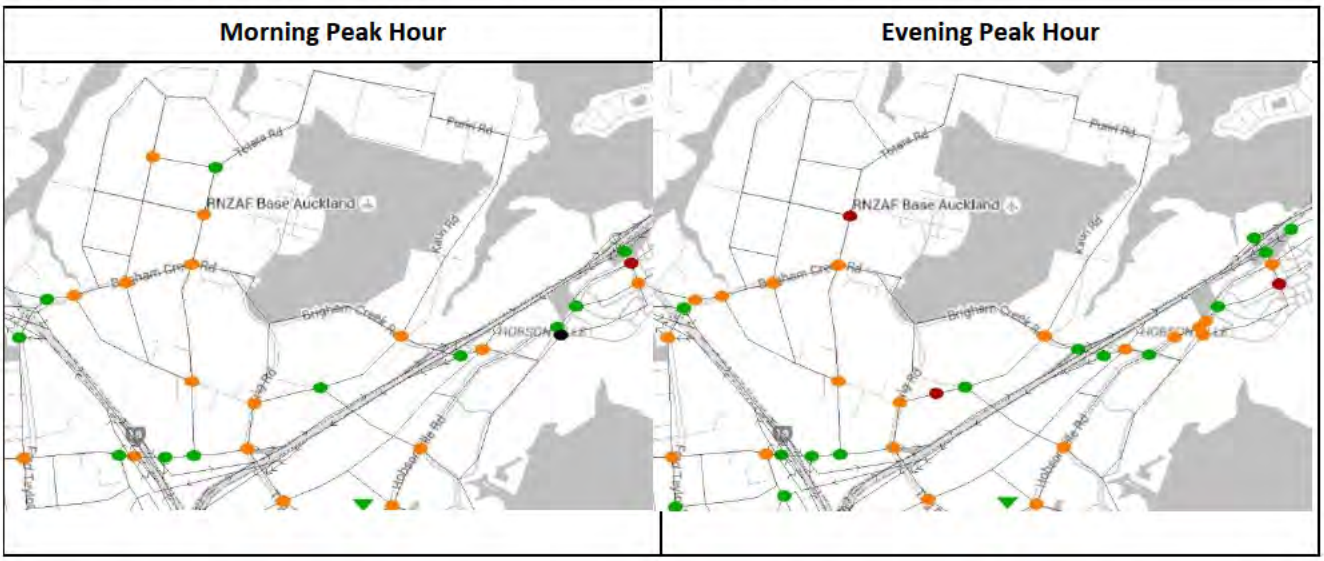
An alternative scenario has been mooted where there are 1,000 additional households to the south of Brigham Creek Road, replacing industrial zoned land. It has been assumed that these additional households would be split, with 500 at the western end of Brigham Creek Road, and 500 at the eastern end. These locations generally correspond to land zoned as higher density light industry (dark purple) in Figure 48 above.

Changing industrial land to residential land would change the vehicle trip distributions to and from Whenuapai, and to correctly understand these changes, a new ART model scenario would normally be run as there would be less residential development somewhere else but equally, there would be more employment land identified somewhere else. Due to time constraints this has not been practicable however, and in lieu of this a sensitivity test has been run in SATURN whereby the vehicle trips associated with the 1,000 additional households have been added, and the overall level of employment within the remaining industrial zoned land has remained unchanged (ie the industrial land is assumed to be more dense).

The additional 1,000 households would result in increased numbers of school children, of which 300 primary children and 200 secondary children are estimated. It has been assumed that to accommodate this increase, a new primary school would be constructed to the west of SH16 and north of Northside Drive. It is assumed that the additional secondary pupils could be accommodated at the proposed new Whenuapai secondary school (increasing this school roll to an estimated 1,700).

The predicted intersection performance in 2046 with this scenario is shown in the figures below.

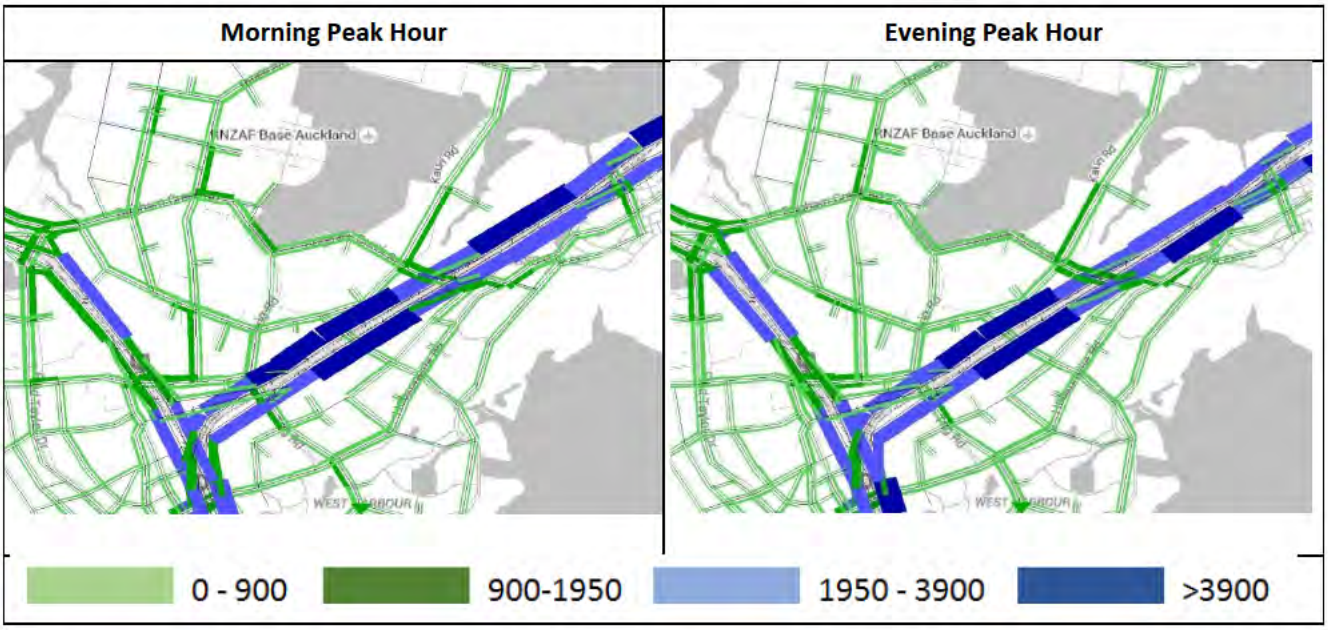
Figure 49: Overall Intersection LOS Plots – Additional Residential Development



The intersections within Whenuapai are predicted to operate within acceptable levels of service, with LOS C or D generally predicted. The exception is the intersection of Totara Road and Dale Road in the evening peak, where LOS E is predicted. This is consistent with the default full build out scenario documented in Section 7.6.2.

The following figures identify predicted traffic flows on mid-block links.

Figure 50: Predicted Traffic Flows (vehicles per hour) – Additional Residential Development



The sensitivity test has demonstrated that, with the transport investments proposed to support the Structure Plan, there is some spare capacity within the road network that could potentially accommodate a further 1,000 residential dwellings.

9 CONSULTATION SUMMARY AND IMPLEMENTATION PLAN

9.1 Scoping

The land use assumptions with regard to type, scale, location and staging for the Whenuapai Structure Plan have been developed through a process involving:

- a workshop attended by representatives from Auckland Council, Auckland Transport, the New Zealand Transport Agency, Watercare, Ministry of Education and related consultants on 21 April 2016
- consideration of scale based on the Whenuapai Redhills Strategic Framework, Auckland Council, March 2015 (Confidential Report) and
- liaison with Auckland Council planners in relation to density
- Auckland Model (ART/ASP) land use and staging for future years 2021, 2026, 2036 and 2046
- Cognisance of the transport provisions included in the Transport for Future Growth and NorSGA studies
- Adjustments based on more balanced and realistic growth than might have been included in the Auckland Models

A future workshop was held on 26 May 2016; however this occurred too late to influence the assumptions included within the Structure Plan anticipated in this integrated transport assessment.

It is recognised that alternative scenarios with regard to the land use and staging assumptions will be required before the Whenuapai Structure Plan is confirmed.

9.2 Implementation Plan

One of the most important aspects of a complete ITA is outlining how necessary infrastructure upgrade or mitigation projects will be implemented in a sequence that aligns with the staging of development. The ITA for the Whenuapai Structure Plan is extremely complex with not just land use assumptions within Whenuapai affecting the timing of transport provisions, but growth in the wider area, including new growth areas having a significant influence. Conversely, the provision of transport infrastructure and services, particularly in relation to the proposed RTN corridors along SH16 and SH18 has a major bearing on how people will travel and what transport provisions are needed. Without the RTN, not only will development be stifled, but other large scale transport infrastructure will be needed, not just for Whenuapai but for the whole west and northwest areas.

The staging developed in Section 7.7 provides a realistic logical sequencing of transport provisions. However, as noted above, it is also influenced by and influences development elsewhere. Accordingly, rather than being seen as dates when development and transport provisions are aligned, it is recommended that it be used as a tool to be considered when wider growth and development in Whenuapai is anticipated.

10 CONSISTENCY WITH RELEVANT TRANSPORT STRATEGIES

10.1 The Auckland Plan 2012

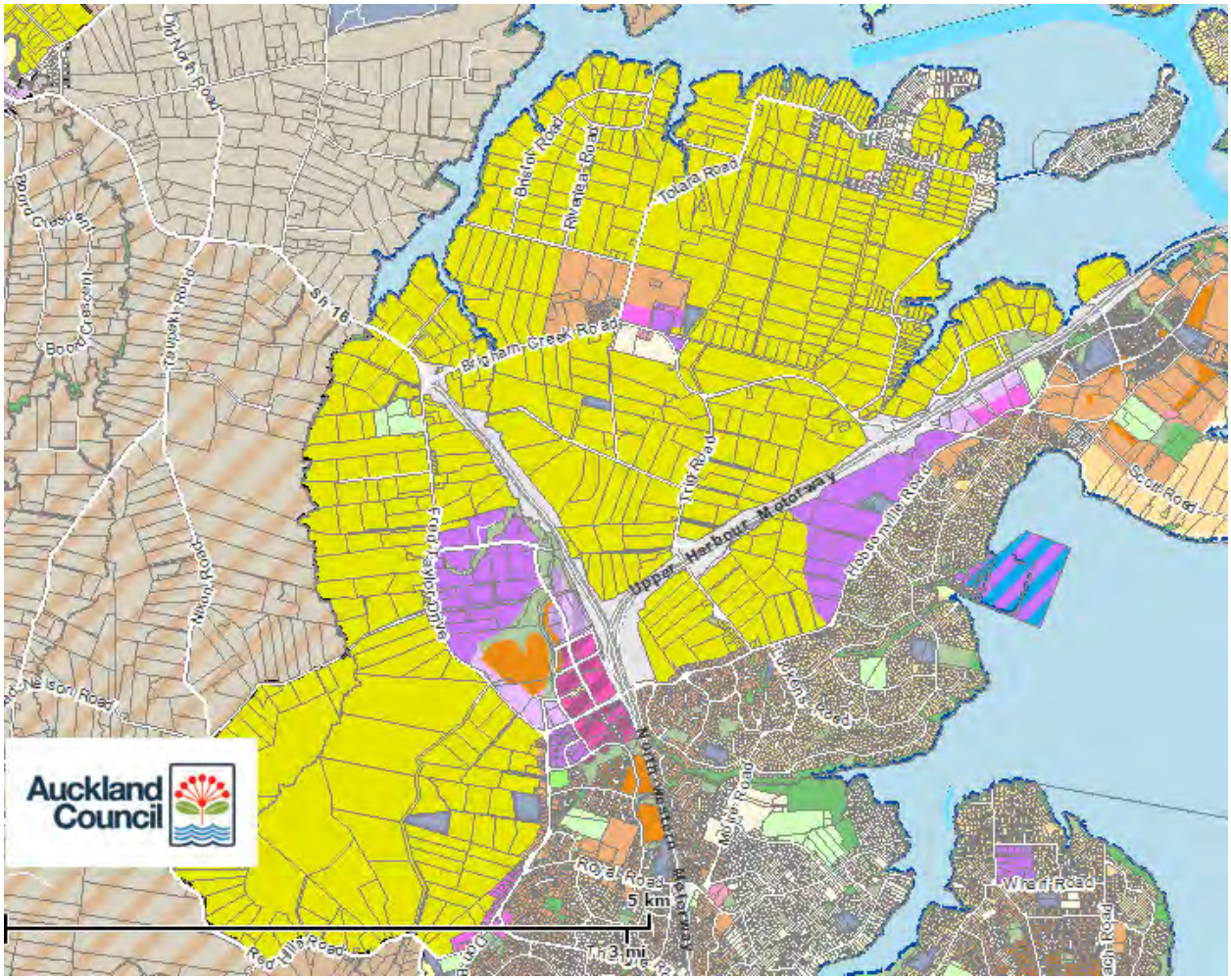
The Auckland Plan is a strategy set by Auckland Council with the aim of making Auckland the most liveable city. The document aims to provide for 30 years of growth capacity which includes providing 95,000 new dwellings in the urban north and west Auckland area. Whenuapai is defined in the plan as a greenfield area for investigation as urban land.

One of the outcomes of the plan is for Auckland to be well connect and accessible. The congestion on Auckland's transport network will only get worse as the population occurs. The plan aims to address this through a transformational shift, increasing the attractiveness and use of public transport. It aims to achieve an integrated transport system which is affordable, safe and integrated in terms of land use.

10.2 The Proposed Auckland Unitary Plan

Whilst the Proposed Auckland Unitary Plan (PAUP) is still a draft document it is anticipated to come into effect later this year with potentially only minor changes made to the draft document. Under the PAUP the Whenuapai area is predominantly classified as Future Urban for New Growth as shown below in Figure 51. The Rural Urban Boundary under the PUAP encompasses Whenuapai, finishing on the periphery of the area.

Figure 51: PAUP zoning



A Structure Plan and Plan Change process is required by the PAUP[47] to enable urban zonings to be applied to land zoned future urban. Appendix 1.1 of the PAUP provides requirements regarding structure plans for future urban zoned greenfield and brownfield land. These requirements include an integrated transport assessment as a supporting document[48].

Section 3e of PAUP Appendix 1.1 specifically relates to movement networks, and requires that the structure plan identify, investigate and address the following:

> *i." Integration of land use and the local and strategic transport network.*
>
> *ii. The layout of the transport network and facilities (roads, public transport, cycle and pedestrian networks, parking) that are safe, direct, legible, attractive and well connected with a choice of routes to public transport, local facilities and amenities, that are integrated with land uses and the surrounding area.*

[47] PAUP September 2013, Chapter B: Regional Policy Statement, Section 2.3 Policy 2
[48] PAUP September 2013, Appendix 1.1 Section 4a.iii

iii. The road network and hierarchy to support multi modal transport and accessibility that is interconnected and includes the location of connections to ensure a number of access points to and from the area.

iv. The transport related effects of the scale, intensity, mix and distribution of land uses and the mitigation and management of these effects."

The Whenuapai Structure Plan anticipated in this ITA report integrates proposed land use and transport networks, by encouraging greater intensity land uses to be located close to public transport hubs and local centres. A mixture of residential areas, industrial areas, schools, local centres and green space will provide a good balance of land uses, reducing the need for residents to travel further afield for essential services.

The proposed transport network is to include comprehensive networks for both walking and cycling, focussing on connections to schools, local centres, public transport hubs, employment, parks and onward connections across SH16 and SH18. The Structure Plan area needs to be supported by RTN services on both SH16 and SH18, complimented by frequent Connector bus routes through the Structure Plan area itself, with bus priority provided at key locations.

Capacity and safety improvements are required for the general traffic network to provide reliable access to business and residential areas. Where general traffic may inhibit pedestrian and cycle trips, such as on major arterials, treatments are proposed to mitigate this, such as signalised pedestrian crossings that align with pedestrian desire lines, and appropriately separated cycle routes.

10.3 Auckland Regional Land Transport and Public Transport Plans

Section 2.5 of this report identifies relevant aspects of Auckland Transport's Regional Land Transport Plan (October 2015) with regard to Whenuapai.

The Auckland Regional Public Transport Plan 2013 outlines the proposed public transport improvements over a ten year period. The document is a supporting document to the Auckland Plan, aiming to make Auckland the world's most liveable city. Whenuapai is identified as a greenfield area for investigation in this document, with the plan highlighting Westgate/Massey North as an emerging centre.

Whenuapai fits with the specific transport policies and strategies, including the existing and future transport networks as being developed through wider studies including NorSGA and Transport for Future Urban Growth.

flow
TRANSPORTATION SPECIALISTS

5 March 2021

Eryn Shields
Auckland City Council
AUCKLAND

Via email: s 9(2)(a)
cc: Warren Maclennan s 9(2)(a)
Todd Elder s 9(2)(a)
Wayne Siu s 9(2)(a)

Dear Eryn

WHENUAPAI PROPOSED PLAN CHANGE 5– TRANSPORT ALTERATIONS

Thank you for approaching Flow Transportation Specialists Limited (Flow) with respect to providing transport planning and traffic engineering advice in relation to potential changes to Whenuapai Proposed Plan Change 5.

We have completed the analysis as discussed in our letter proposal of 3 September 2020, along with consideration of the proposed land use by the Neil Group in relation to 2-10 Kauri Road. These matters are addressed in the order presented in your memo of 21 August 2020.

1 TRIG ROAD ALIGNMENT AND AREA 1A EASTERN COLLECTOR ROADS

Previously, Trig Road between SH18 and Hobsonville was proposed to be re-aligned, with the existing intersection of Trig Road and Hobsonville Road being aligned with the existing Hobsonville Road/Luckens Road intersection, forming a cross-road intersection (as shown in the figure below).

Figure 1: Proposed Plan Change 5 - Trig Road Re-alignment and Collector Roads

Work undertaken by the Supporting Growth Alliance (SGA) has identified that the proposed re-alignment would require significant earthworks due to steep topography and the Waiarohia Stream east of Trig Road. The SGA assessment also identifies that the existing Trig Road alignment could be retained, provided that the existing Hobsonville Road/Trig Road and Hobsonville Road/Luckens Road intersections were signalised and road sections between and on the approaches to the intersections were widened.

Figure 2: Auckland Council GEOMAPS extract[1]

As such, the proposed Collector Road layout east of Trig Road has been re-considered, along with retaining the current Trig Road alignment.

Trig Road alignment

Our high level assessment of the staggered T arrangement of Trig/Hobsonville and Hobsonville/Luckens is that this layout would be acceptable with future traffic volumes provided that both intersections were signal controlled and provided a safe layout for pedestrians, people cycling, bus priority and vehicles. Coordination between the signal phasing and timings would be necessary to minimise queuing between the intersections. Access to properties in the vicinity of the intersections may need to be left in/left out only and driveways connecting at the intersections would need to be appropriately controlled.

The proposed staggered T layout will accommodate a large north-south movement between Trig Road and Luckens Road (and vice versa), resulting in lane changing behaviour on Hobsonville Road between the two roads. We however note that the SGA assessment indicates that with proper signal co-ordination, the dog-leg movements are unlikely to cause significant delays/queuing on Hobsonville Road.

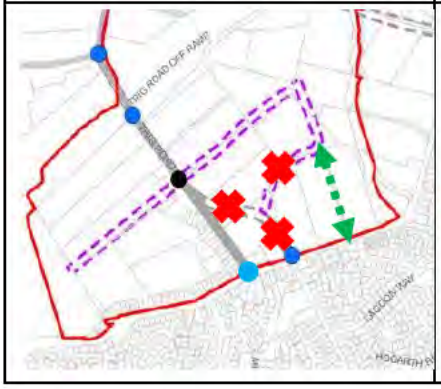
Collector roads east of Trig Road

Three options have been considered for the Collector roads east of Trig Road:

[1] Source: https://geomapspublic.aucklandcouncil.govt.nz/viewer/index.html

- Option 1: proposes to extend the Collector Road south and connect to Hobsonville Road east of the Hobsonville Road/Luckens Road intersection, possibly with a Left In Left Out (LILO) layout, instead of the southern east-west connection back to Trig Road
- Option 2: has a similar intent to the alignment in proposed PC5, and includes a connection back onto Trig Road north of Hobsonville Road
- Option 3: proposes to extend the Collector Road south and connect to Hobsonville Road at the Hobsonville Road/Luckens Road intersection, noting the intersection will be signalised in future

Table 1: Suggested Collector Road Alignments

Option 1	Option 2	Option 3
		

Our assessment in relation to transport planning matters is as follows:

- **Option 1**
  - The proposed north-south alignment in Option 1 would provide access to areas east of Trig Road and resilience to the Collector Road network but with access via Hobsonville Road and Trig Road rather than just Trig Road.
  - The proposed LILO arrangement with Hobsonville Road would have limited adverse impacts on Hobsonville Road however its function of providing access within the Trig Road area would therefore also be limited and would mean that any local bus service for the area east of Trig Road using the Collector Road could be compromised by not being able to turn right to or from Hobsonville Road.
  - This option would involve crossing the stream network that runs east west through the properties at 80 and 82 Hobsonville Road.
  - A review of the traffic modelling indicates that the majority of traffic generated by development in this area (Area 1A) is to/from the west and will travel towards the SH16/Hobsonville Road interchange. The proposed LILO intersection on Hobsonville Road would not enable this traffic to turn right onto Hobsonville Road and instead travel a longer distance back via Trig Road.
  - An additional intersection on Hobsonville Road close to the Hobsonville Village development proposed north of Area 1A may attract rat-run traffic from the SH18/Trig Road interchange

- **Option 2**
  - Option 2 has a similar alignment to the existing proposed PC5 layout, but with the southern end of the Collector Road being extended west to intersect the existing Trig Road north of Hobsonville Road (rather than a realigned Trig Road).
  - The 'loop' layout could provide for a local bus service, which would pass near the proposed school.
  - We note that SGA has identified that the proposed layout would likely require significant engineering effort to overcome the steepness and would also impact on a permanent wetland and intermittent stream
- **Option 3**
  - Connecting the Collector Road as an additional arm at the Hobsonville Road/Luckens Road intersection will impact on the operation of the Hobsonville/Trig-Hobsonville/Luckens staggered T arrangement because of the way that the signal phasing at these two intersections needs to be co-ordinated
  - Extra queuing could also affect the operation and safety along Hobsonville Road and at adjacent intersections
  - The additional access point on Hobsonville Road, allowing all movements, is likely to introduce rat-running traffic through Area 1A (between SH18 and Hobsonville Village)

Overall, from a transport planning point of view, we consider that Option 2 would be preferable if Trig Road is not realigned to meet Luckens Road.

2 CHANGES TO COLLECTOR ROADS AROUND AREAS 1B, 1C, 1D

2.1 What we've investigated

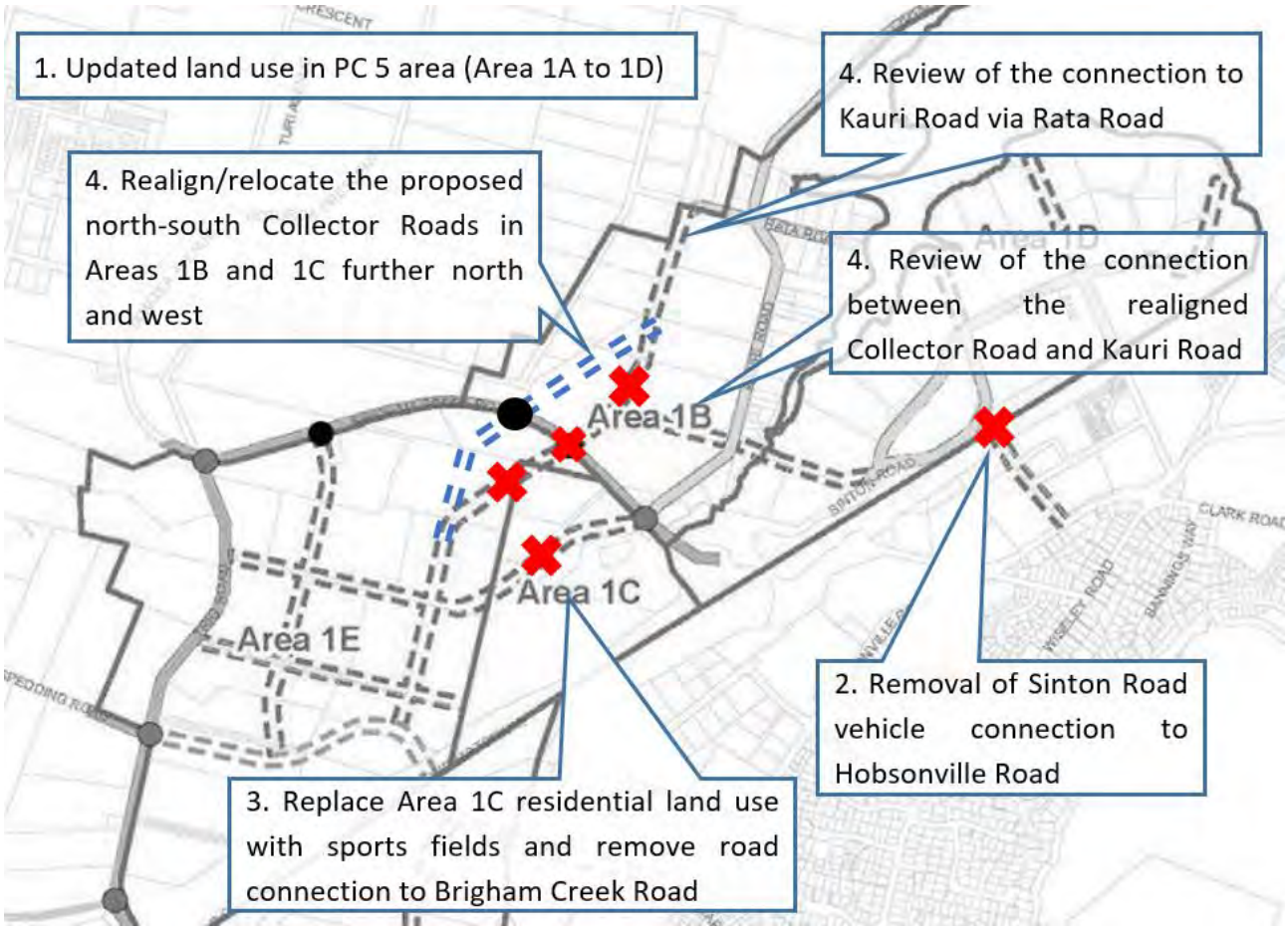
We have considered the transport effects of the following changes based on the information provided (by Auckland Council), relative to what we have assessed previously.

1. An updated land use in the PC5 area, based on advice from Auckland Council where light industry/business development could be developed in Area 1E and Area 1B west of Kauri Road, except the land owned by NZRAF, which is assumed will not be developed. A total of some 5,710 households and 3,890 Full Time Employees (FTE) have been included in the traffic modelling, as advised by Council (compared to the previously assumed 6,050 households and 3,720 FTEs)
2. Removal of the proposed Sinton Road connection for vehicles between the Sinton Road area (Area 1D) and Hobsonville Road.
3. Replacing residential development in the area west of Brigham Creek Road (Area 1C) with sports fields, and removal of the vehicle connection to the Brigham Creek Road/Kauri Road intersection
4. Changes to the Collector Road network including:
   - Realign/relocate proposed north-south Collector Roads in Areas 1B and 1C further north and west
   - Review of the realigned Collector Road connection to Kauri Road via Rata Road

- Review of the need for the Collector Road connection between Kauri Road and the realigned northern Collector Road

The above changes are illustrated in Figure 3.

Figure 3: Proposed Plan Change 5 Variation (Area 1B to 1E)



In addition to the above changes (termed "Scenario 1"), we have considered a further two scenarios to help understand the transport effects of different land use/access for the Neil Group owned land at 2-10 Kauri Road

- Scenario 2: same background traffic/land use assumptions in the Kauri Road and Sinton Road area as Scenario 1, but with residential development in the land owned by Neil Group. Vehicle access is assumed to be onto Kauri Road, with no vehicle access to Brigham Creek Road
- Scenario 3: same as Scenario 2, but with vehicle access to 2-10 Kauri Road being provided via the realigned Collector Road to the north of the site, with no vehicle access onto Kauri Road nor Brigham Creek Road

We have used SATURN traffic model outputs to inform further testing in SIDRA traffic models to help understand the likely future operation of the intersections along Brigham Creek Road and the SH18/Brigham Creek Road interchange intersections.

We developed the SATURN model for the earlier PC 5 transport assessment. We have updated it with the latest background forecast demands predicted by Auckland Forecast Centre's Macro Strategic Model (MSM) with land use predictions as per Auckland Council's Scenario I11.6 and the transport

infrastructure included in the Auckland Transport Alignment Project (August 2019). The modelled forecast year for our assessment has changed from 2026 to 2028 to align with the regional model. The MSM model update has resulted in changes in background traffic demands in the northwest area, with slightly lower traffic demands on SH18 and higher traffic demands in the Kumeu/Huapai area compared to the previous MSM demands used in the earlier PC5 assessment.

An inherent and important assumption in this, and our previous work was that existing local schools could accommodate extra students and that new local schools would be provided to accommodate students living within Whenuapai. These assumptions are important as school trips form a significant part of peak time traffic, particularly during the morning peak and if local schools are not able to accommodate local residents, there will be a greater demand for travel to locations further afield. Schools assumed to accommodate students living in Whenuapai include:

- Existing primary schools in Whenuapai and Hobsonville
- A new primary school in the Trig Road area south of SH18
- New primary and secondary schools in Whenuapai (Riverlea Road)
- A new primary school in Whenuapai (Kauri Road)

The anticipated future transport provisions rely on the above schools being provided and if these do not eventuate, there will likely be the need for more transport investment.

Likewise, employment areas within Whenuapai help to reduce the number and length of private vehicle trips and are an assumption relied upon in this and previous studies.

2.2 Our assessment

2.2.1 Kauri Road/Brigham Creek Road Intersection

For all three scenarios, the removal of the Sinton Road vehicle connection (#2 in the list above) will result in additional traffic volumes through the Kauri Road/Brigham Creek Road and the Brigham Creek Road/SH18 Eastbound Ramps intersections compared to the earlier proposed PC5 assumptions.

We note that a pedestrian/cyclist connection should still be provided to connect to the proposed RTN station in the Sinton Road area, which will also be used as a connection to/from local schools and local amenities. The existing pedestrian/cyclist bridge connection at Clark Road/Memorial Park lane (some 320 m east of the previously anticipated Sinton Road bridge) is narrow and unlikely to be adequate to serve future pedestrian/cyclist demand.

All traffic travelling to and from the Sinton Road area will need to travel via the new Collector Road that will connect to Kauri Road across several properties and the Waiarohia Inlet. Our earlier work on staging suggests that up to 550 dwellings could be developed in the Sinton Road area before the connection to the SH18 Eastbound Ramps roundabout would need to be stopped, and a new connection provided to Kauri Road. (Waka Kotahi may require earlier closure of this connection to the roundabout if it makes significant changes to the State Highway interchange)

The removal of the Collector road west of Brigham Creek Road (#3 in the list above) changes the Kauri Road/Brigham Creek Road intersection from a future crossroad intersection to remain as a T-intersection, operating as a signalised intersection. The predicted northbound queue lengths on

Brigham Creek Road in the evening peak are summarised in Table 1 below (the summary model outputs are provided in Appendix A of this technical note). We have assumed that a fourth leg would not be connected (eg a local road to the sports fields), as this would affect the phasing and therefore adversely affect the operation of the intersection.

Table 2: Predicted 95th percentile right turn queues length (metres) from Brigham Creek Road/Kauri Road, assuming modelled 2028 evening peak traffic

Land Use Scenario	Evening Peak Queue Length
Scenario 1	235 m
Scenario 2	305 m
Scenario 3	215 m

We note:

- For both Scenarios 1 and 2, the northbound queue lengths on Brigham Creek Road are predicted to extend beyond the distance available between the roundabout at the SH18 Eastbound Ramps and the Brigham Creek/Kauri Road intersection (225 metres). This may adversely affect the operation of the SH18 Eastbound off ramp, more so with Scenario 2
- With Scenario 3, 95th percentile queues of 215 metres are predicted on Brigham Creek Road, indicating that they are unlikely to affect the operation of the motorway off-ramp most of the time
- Based on our assessment, if the Neil Group development proceeds, we recommend that vehicle access for 2-10 Kauri Road not be permitted to/from Kauri Road and Brigham Creek Road (ie as assumed in Scenario 3), but pedestrian and cycle connections should be permitted, to facilitate access to the transport network, and in particular, public transport.

2.2.2 Relocated Collector Roads

We have reviewed the proposed Collector Road connections and support relocation of the northern Collector roads between areas 1B and 1C.

With regard to the connection at the northern end to Kauri Road via Rata Road, we understand that a wetland has been identified on the property of 2 Rata Road (shown in the below figure), and that it is not possible to provide the Collector Road connection through the property to Rata Road. While traffic volumes on this section of the Collector Road are predicted to be only some 2,000 vehicles per day based on the model outputs, we consider a Collector Road connection important in this vicinity to provide resilience to the transport network, particularly because of the exclusion of the Sinton Road bridge connection to Hobsonville Road. The connection could either be to Kauri Road (depending on where safe intersection sight distance requirements can be met), or further north on Rata Road.

Figure 4: Collector Road connection to Rata Road

With regard to the need for the Collector Road connection between Kauri Road and the realigned northern Collector Road, we consider that this connection is not necessary as part of the Collector Road network, and it would be preferable to remove it to reduce the amount of traffic attracted to Kauri Road from the northern parts of Area 1B, therefore preserving the capacity of the Kauri Road/Brigham Creek Road intersection.

2.2.3 Brigham Creek Road/Relocated Collector Road intersection

We have investigated the performance of the relocated Brigham Creek Road/Collector Road intersection (further north) using the predicted traffic volumes in Scenario 3 above, including the re-routed traffic that would have previously accessed Brigham Creek Road at the Brigham Creek Road/Kauri Road intersection. The intersection will be located approximately 300 metres north of Kauri Road and some 500 metres away from the next intersection along Brigham Creek Road.

Traffic signals would be necessary and modelling indicates a layout could be provided that would operate as an overall LOS C for the intersection for the morning and evening peak hours.

We have investigated queuing between this intersection and the Brigham Creek Road/Kauri Road intersection. The predicted 95th percentile queue lengths on Brigham Creek Road are provided in the following table (the assumed intersection layouts and summary model outputs are provided in Appendix A of this technical note).

Table 3: Predicted 95th percentile queue length (metres) on Brigham Creek Road between the relocated Connector crossroads and Kauri Road, assuming modelled 2028 peak period traffic

Approach	Morning Peak	Evening Peak
Brigham Creek Road south, approaching relocated Connector crossroads	180	210
Brigham Creek Road north, approaching Kauri Road T intersection	210	210

2.2.4 SH18/Brigham Creek Road interchange

Eastbound Ramps Roundabout

We have investigated the predicted operation of the roundabout at the SH18 Eastbound Ramps/Brigham Creek Road intersection using the layouts previously assumed to support the original proposed PC5 land use, including

- an additional dedicated left-turn lane on the SH18 eastbound off-ramp to Brigham Creek Road (north)
- widening of Brigham Creek Road beneath SH18
- removal of Sinton Road connection to the roundabout.

With all three land use scenarios, degrees of saturation above 94% are predicted on the Brigham Creek Road southbound approach, as summarised in Table 4 below. These indicate that the roundabout will operate close to its theoretical capacity, and variances in traffic flows at the roundabout may result in significant increases in traffic congestion. The summary SIDRA outputs of the roundabout operation and the modelled layout are provided in the appendix of this technical note.

Table 4: Brigham Creek Road southbound approach at the SH18 Eastbound Ramps/Brigham Creek Road roundabout, assuming modelled 2028 morning peak period traffic

Land Use Scenarios	Degree of Saturation
Scenario 1	94%
Scenario 2	99%
Scenario 3	98%

Our assessment indicates that further capacity improvements will be required at the roundabout, and our assessment using SATURN and SIDRA modelling suggests this can be achieved by providing an additional lane as a dedicated left turn lane from Brigham Creek Road (southbound approach) onto the SH18 Eastbound on ramp. With this additional lane, the modelling predicts that the Brigham Creek Road southbound approach would operate with at much lower degree of saturation (63% to 65%) for all three scenarios, with an overall intersection degree of saturation of 65% to 83%.

Westbound Ramps Roundabouts

We have also investigated the performance of the SH18 Westbound Ramps roundabouts with Brigham Creek Road with the traffic flows associated with the new PC5 land use/network. Previously, we had

suggested that the following layout changes would be needed at these intersections (in addition to the layout changes proposed at the SH18 Eastbound Ramps/Brigham Creek Road intersection above):

- Double right turn lanes on the SH18 westbound off-ramp and a dedicated left turn lane from the southbound off-ramp to Brigham Creek Road
- Widening of Brigham Creek Road between the roundabouts to include two lanes per direction
- Additional dedicated left turn lane from Brigham Creek Road (mid-roundabout section) to SH18 westbound on-ramp

Our assessment indicates that the above infrastructure changes would still be required, except that the first item, the additional dedicated left turn lane from the SH18 westbound off ramp, would not be necessary. This is due to the removal of the proposed Sinton Road connection across SH18, which is anticipated to result in a lower left turn demand from the SH18 Westbound off-ramp for traffic heading towards the Sinton Road bridge via Hobsonville Road, albeit that instead, right turn movements from the Westbound off-ramp will increase. Without the dedicated left turn lane from the SH18 westbound off ramp to Brigham Creek Road south, the left turn movement can be accommodated by a shared left turn/right turn lane on the SH18 westbound off-ramp.

3 SUMMARY

Based on our assessment, we summarise our conclusions and recommendations as follows.

Transport Alteration 1 - Trig Road Alignment

- The proposed staggered-T layout of Hobsonville Road/Trig Road and Hobsonville Road/Luckens Road is acceptable provided that both intersections are signal controlled with signal phasing/timings coordinated to minimise queueing between the intersections and that the design provides a safe facility for pedestrians, people cycling, bus priority and vehicles (including access to affected driveways).
- For the Collector Road network within Area 1A east of Trig Road, we recommend a loop that connects back to Trig Road

Transport Alterations 2 to 4 - Collector Roads in Areas 1B, 1C, 1D

- The Sinton Road vehicle connection to Hobsonville Road can be removed as a Collector Road if:
    - Vehicle access for 2-10 Kauri Road is not permitted from Kauri Road nor Brigham Creek Road (pedestrian and cycle connections to these roads should be encouraged to facilitate access to the pedestrian, cycle and public transport network)
    - The Brigham Creek Road/Kauri Road intersection be a T-intersection with no vehicle access to the west
    - Additional changes over those already identified for Proposed PC5 to the SH18 Eastbound Ramps Roundabout include an additional lane as a dedicated left turn lane from Brigham Creek Road (southbound approach) onto the SH18 Eastbound on ramp
    - Changes to those already identified for Proposed PC5 for the SH18 Westbound Ramps Roundabouts include not needing an additional left turn lane on the westbound off ramp, with the existing two lanes providing a shared left/right and right turn lane

- The Collector roads north/west of Kauri Road can be realigned further north with a signalised crossroads some 300 m north of Kauri Road/Brigham Creek Road
- We consider a Collector Road connection to Kauri Road in the vicinity of or via Rata Road important to provide resilience to the transport network, particularly because of the exclusion of the Sinton Road bridge connection to Hobsonville Road. The connection could either be to Kauri Road (depending on where safe intersection sight distance requirements can be met), or further north on Rata Road
- A Collector Road between Kauri Road and the realigned northern Collector Road is not necessary as part of the Collector Road network, and it would be preferable to remove it to reduce the amount of traffic attracted to Kauri Road from the northern parts of Area 1B, therefore preserving the capacity of the Kauri Road/Brigham Creek Road intersection.

It is important to note that we have implicitly assumed in the traffic modelling that as well as schools being provided locally, that an RTN station will be provided in the Sinton Road area to support lower private vehicle trip generation rates in the Sinton Road and Kauri Road areas and provide accessibility for those living in the area.

Yours sincerely

Qing Li
PRINCIPAL TRANSPORTATION ENGINEER

Angie Crafer
DIRECTOR

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APPENDIX A SIDRA Model Results

Figure A1: Modelled Intersection Layout – Kauri Road/Brigham Creek Road

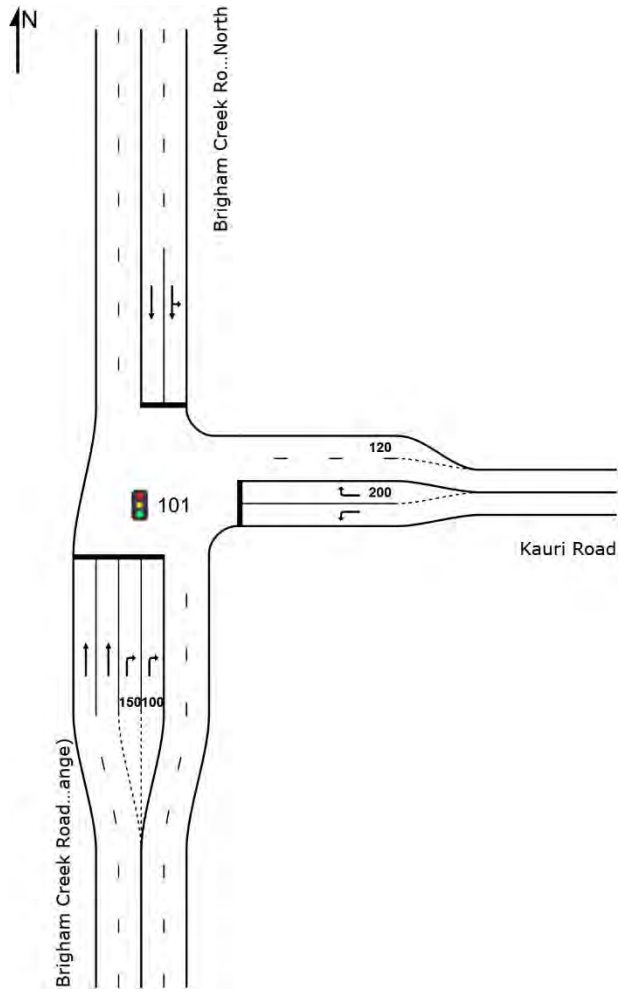

Figure A2: Predicted Intersection Performance – Kauri Road/Brigham Creek Road Scenario 1, AM Peak

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Brigham Creek Road South												
5	T1	1325	5.0	0.462	4.7	LOS A	11.7	85.7	0.40	0.36	0.40	47.0
6	R2	362	5.0	0.284	24.0	LOS C	6.9	50.4	0.68	0.74	0.68	37.3
Approach		1687	5.0	0.462	8.8	LOS A	11.7	85.7	0.46	0.44	0.46	44.5
East: Kauri Road												
7	L2	991	5.0	0.891	32.2	LOS C	49.0	357.3	0.92	0.96	1.04	34.5
9	R2	71	5.0	0.281	47.3	LOS D	3.2	23.2	0.94	0.75	0.94	30.2
Approach		1061	5.0	0.891	33.2	LOS C	49.0	357.3	0.92	0.94	1.04	34.1
North: Brigham Creek Road North												
10	L2	63	5.0	0.890	54.0	LOS D	26.2	191.0	1.00	1.07	1.26	29.5
11	T1	875	5.0	0.890	49.4	LOS D	26.3	192.2	1.00	1.08	1.26	29.8
Approach		938	5.0	0.890	49.7	LOS D	26.3	192.2	1.00	1.08	1.26	29.8
All Vehicles		3686	5.0	0.891	26.2	LOS C	49.0	357.3	0.73	0.75	0.83	36.7

Figure A3: Predicted Intersection Performance – Kauri Road/Brigham Creek Road Scenario 1, PM Peak

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Brigham Creek Road South												
5	T1	1116	5.0	0.349	1.8	LOS A	6.0	44.1	0.23	0.21	0.23	48.8
6	R2	1165	5.0	0.906	30.4	LOS C	32.3	236.1	0.92	0.92	1.05	35.0
Approach		2281	5.0	0.906	16.4	LOS B	32.3	236.1	0.58	0.57	0.65	40.6
East: Kauri Road												
7	L2	720	5.0	0.680	20.3	LOS C	25.0	182.4	0.74	0.81	0.74	38.8
9	R2	51	5.0	0.493	60.4	LOS E	2.7	19.8	1.00	0.74	1.00	27.2
Approach		771	5.0	0.680	22.9	LOS C	25.0	182.4	0.76	0.81	0.76	37.8
North: Brigham Creek Road North												
10	L2	96	5.0	0.920	60.0	LOS E	33.6	245.6	1.00	1.11	1.31	28.1
11	T1	992	5.0	0.920	55.3	LOS E	33.9	247.5	1.00	1.12	1.31	28.4
Approach		1087	5.0	0.920	55.7	LOS E	33.9	247.5	1.00	1.12	1.31	28.4
All Vehicles		4139	5.0	0.920	28.0	LOS C	33.9	247.5	0.73	0.76	0.84	36.0

Figure A4: Predicted Intersection Performance – Kauri Road/Brigham Creek Road Scenario 2, AM Peak

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Brigham Creek Road South												
5	T1	1218	5.0	0.422	3.7	LOS A	8.6	63.1	0.37	0.34	0.37	47.6
6	R2	426	5.0	0.340	22.0	LOS C	7.2	52.7	0.70	0.75	0.70	38.1
Approach		1644	5.0	0.422	8.4	LOS A	8.6	63.1	0.46	0.44	0.46	44.7
East: Kauri Road												
7	L2	1055	5.0	0.980	63.1	LOS E	68.8	502.2	1.00	1.16	1.50	26.7
9	R2	73	5.0	0.344	43.6	LOS D	2.9	21.2	0.96	0.76	0.96	31.1
Approach		1127	5.0	0.980	61.9	LOS E	68.8	502.2	1.00	1.14	1.46	26.9
North: Brigham Creek Road North												
10	L2	40	5.0	0.950	62.3	LOS E	28.8	210.4	1.00	1.28	1.52	27.7
11	T1	972	5.0	0.950	57.7	LOS E	28.9	211.1	1.00	1.28	1.52	27.9
Approach		1012	5.0	0.950	57.9	LOS E	28.9	211.1	1.00	1.28	1.52	27.9
All Vehicles		3783	5.0	0.980	37.6	LOS D	68.8	502.2	0.76	0.88	1.04	32.9

Figure A5: Predicted Intersection Performance – Kauri Road/Brigham Creek Road Scenario 2, PM Peak

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Brigham Creek Road South												
5	T1	1111	5.0	0.350	1.9	LOS A	6.0	43.9	0.24	0.22	0.24	48.7
6	R2	1265	5.0	0.965	40.7	LOS D	41.6	303.4	0.92	0.99	1.19	31.9
Approach		2376	5.0	0.965	22.6	LOS C	41.6	303.4	0.60	0.63	0.75	38.0
East: Kauri Road												
7	L2	782	5.0	0.703	18.3	LOS B	25.5	186.0	0.73	0.81	0.73	39.7
9	R2	39	5.0	0.362	56.9	LOS E	2.0	14.3	1.00	0.73	1.00	27.9
Approach		821	5.0	0.703	20.1	LOS C	25.5	186.0	0.74	0.81	0.74	38.9
North: Brigham Creek Road North												
10	L2	93	5.0	0.964	73.9	LOS E	34.1	248.9	1.00	1.25	1.51	25.4
11	T1	922	5.0	0.964	69.2	LOS E	34.4	251.0	1.00	1.27	1.51	25.6
Approach		1015	5.0	0.964	69.7	LOS E	34.4	251.0	1.00	1.27	1.51	25.6
All Vehicles		4212	5.0	0.965	33.4	LOS C	41.6	303.4	0.73	0.82	0.93	34.2

Figure A6: Predicted Intersection Performance – Kauri Road/Brigham Creek Road Scenario 3, AM Peak

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Brigham Creek Road South (to SH18 Interchange)												
5	T1	1197	5.0	0.407	3.6	LOS A	8.8	64.4	0.35	0.32	0.35	47.7
6	R2	448	5.0	0.342	22.8	LOS C	8.2	60.2	0.68	0.74	0.68	37.8
Approach		1645	5.0	0.407	8.8	LOS A	8.8	64.4	0.44	0.43	0.44	44.5
East: Kauri Road												
7	L2	1044	5.0	0.954	51.7	LOS D	65.0	474.4	1.00	1.08	1.32	29.1
9	R2	69	5.0	0.335	48.0	LOS D	3.1	22.6	0.96	0.76	0.96	30.0
Approach		1114	5.0	0.954	51.4	LOS D	65.0	474.4	1.00	1.06	1.30	29.2
North: Brigham Creek Road North												
10	L2	33	5.0	0.927	59.5	LOS E	29.0	211.4	1.00	1.17	1.39	28.3
11	T1	961	5.0	0.927	54.9	LOS D	29.0	212.0	1.00	1.18	1.39	28.5
Approach		994	5.0	0.927	55.1	LOS E	29.0	212.0	1.00	1.18	1.39	28.5
All Vehicles		3753	5.0	0.954	33.7	LOS C	65.0	474.4	0.75	0.82	0.94	34.1

Figure A7: Predicted Intersection Performance – Kauri Road/Brigham Creek Road Scenario 3, PM Peak

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Brigham Creek Road South (to SH18 Interchange)												
5	T1	1198	5.0	0.378	2.0	LOS A	6.7	48.9	0.25	0.23	0.25	48.7
6	R2	1164	5.0	0.893	27.8	LOS C	29.8	217.3	0.92	0.91	1.04	35.9
Approach		2362	5.0	0.893	14.7	LOS B	29.8	217.3	0.58	0.57	0.64	41.4
East: Kauri Road												
7	L2	783	5.0	0.728	19.8	LOS B	26.9	196.4	0.77	0.83	0.77	39.0
9	R2	38	5.0	0.352	56.8	LOS E	1.9	13.9	0.99	0.73	0.99	28.0
Approach		821	5.0	0.728	21.5	LOS C	26.9	196.4	0.78	0.82	0.78	38.3
North: Brigham Creek Road North												
10	L2	93	5.0	0.894	53.6	LOS D	28.3	206.3	1.00	1.07	1.26	29.5
11	T1	916	5.0	0.894	48.9	LOS D	28.5	208.0	1.00	1.08	1.26	29.9
Approach		1008	5.0	0.894	49.3	LOS D	28.5	208.0	1.00	1.08	1.26	29.9
All Vehicles		4192	5.0	0.894	24.4	LOS C	29.8	217.3	0.72	0.74	0.82	37.4

Figure A8: Modelled Intersection Layout –Brigham Creek Road/Collector Road Intersection

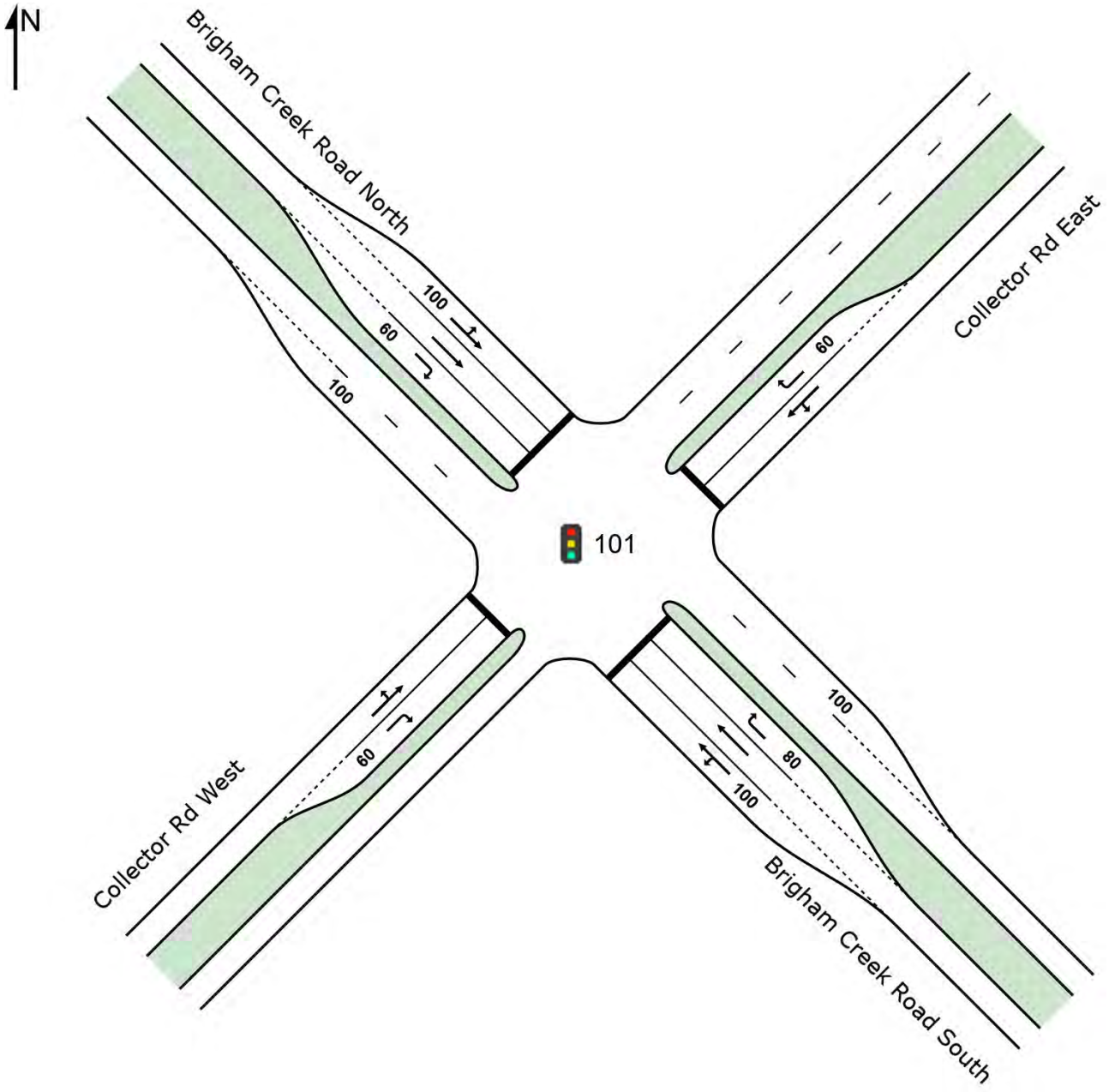

Figure A9: Predicted Intersection Performance – Brigham Creek Road/Collector Road Scenario 3, AM Peak

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Brigham Creek Road South												
4	L2	701	5.0	0.709	21.6	LOS C	24.5	179.2	0.78	0.83	0.78	38.3
5	T1	317	5.0	0.300	12.3	LOS B	8.1	58.9	0.57	0.49	0.57	42.8
6	R2	249	5.0	0.696	46.5	LOS D	11.8	86.2	0.98	0.85	1.03	30.4
Approach		1267	5.0	0.709	24.2	LOS C	24.5	179.2	0.77	0.75	0.78	37.3
NorthEast: Collector Rd East												
7	L2	105	5.0	0.279	38.3	LOS D	4.7	34.3	0.86	0.76	0.86	32.7
8	T1	12	5.0	0.279	33.7	LOS C	4.7	34.3	0.86	0.76	0.86	33.0
9	R2	68	5.0	0.477	54.9	LOS D	3.4	24.8	1.00	0.76	1.00	28.5
Approach		185	5.0	0.477	44.2	LOS D	4.7	34.3	0.91	0.76	0.91	31.0
NorthWest: Brigham Creek Road North												
10	L2	101	5.0	0.385	26.1	LOS C	10.1	73.7	0.74	0.68	0.74	37.7
11	T1	742	5.0	0.694	24.3	LOS C	21.5	157.2	0.84	0.75	0.84	37.4
12	R2	12	5.0	0.108	55.3	LOS E	0.6	4.1	0.97	0.68	0.97	28.3
Approach		855	5.0	0.694	25.0	LOS C	21.5	157.2	0.83	0.74	0.83	37.2
SouthWest: Collector Rd West												
1	L2	26	5.0	0.399	51.1	LOS D	3.8	28.0	0.97	0.76	0.97	30.0
2	T1	55	5.0	0.399	46.5	LOS D	3.8	28.0	0.97	0.76	0.97	30.2
3	R2	93	5.0	0.646	56.5	LOS E	4.7	34.6	1.00	0.82	1.10	28.1
Approach		174	5.0	0.646	52.6	LOS D	4.7	34.6	0.99	0.79	1.04	29.0
All Vehicles		2481	5.0	0.709	27.9	LOS C	24.5	179.2	0.81	0.75	0.82	36.0

Figure A10: Predicted Intersection Performance – Brigham Creek Road/Collector Road Scenario 3, PM Peak

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Brigham Creek Road South												
4	L2	316	5.0	0.434	22.3	LOS C	12.1	88.2	0.69	0.74	0.69	38.3
5	T1	738	5.0	0.781	22.3	LOS C	26.4	192.6	0.84	0.78	0.86	38.2
6	R2	96	5.0	0.254	40.6	LOS D	4.0	28.9	0.88	0.76	0.88	31.9
Approach		1149	5.0	0.781	23.8	LOS C	26.4	192.6	0.80	0.77	0.81	37.6
NorthEast: Collector Rd East												
7	L2	227	5.0	0.779	49.0	LOS D	14.3	104.3	1.00	0.92	1.13	30.0
8	T1	59	5.0	0.779	44.4	LOS D	14.3	104.3	1.00	0.92	1.13	30.2
9	R2	62	5.0	0.289	49.4	LOS D	2.9	20.9	0.95	0.75	0.95	29.8
Approach		348	5.0	0.779	48.3	LOS D	14.3	104.3	0.99	0.89	1.10	30.0
NorthWest: Brigham Creek Road North												
10	L2	69	5.0	0.393	31.7	LOS C	9.3	67.6	0.81	0.71	0.81	35.7
11	T1	622	5.0	0.707	29.7	LOS C	18.7	136.8	0.89	0.78	0.89	35.4
12	R2	20	5.0	0.186	55.9	LOS E	1.0	7.2	0.98	0.70	0.98	28.2
Approach		712	5.0	0.707	30.7	LOS C	18.7	136.8	0.88	0.77	0.88	35.2
SouthWest: Collector Rd West												
1	L2	13	5.0	0.328	47.7	LOS D	3.7	27.2	0.94	0.74	0.94	31.1
2	T1	69	5.0	0.328	43.1	LOS D	3.7	27.2	0.94	0.74	0.94	31.3
3	R2	166	5.0	0.773	55.6	LOS E	8.6	62.9	1.00	0.90	1.19	28.2
Approach		248	5.0	0.773	51.7	LOS D	8.6	62.9	0.98	0.85	1.11	29.2
All Vehicles		2458	5.0	0.781	32.1	LOS C	26.4	192.6	0.87	0.79	0.90	34.7

Figure A11: Modelled Intersection Layout –Brigham Creek Road/SH18 Northbound Ramps Intersection

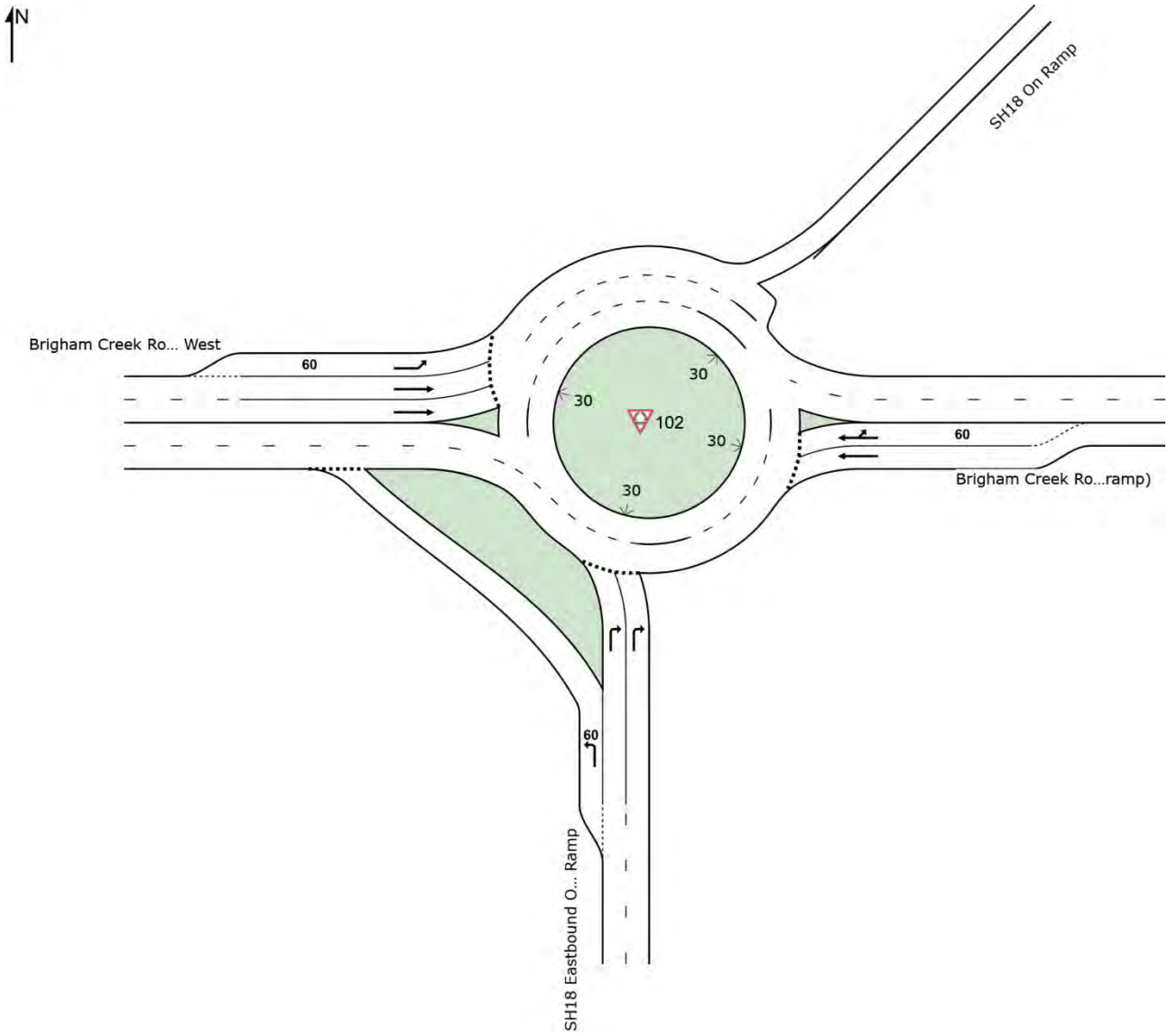

Figure A12: Predicted Intersection Performance – Brigham Creek Road/SH18 Northbound Ramps Scenario 3, AM Peak

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH18 Eastbound Off Ramp												
1	L2	743	5.0	0.551	5.8	LOS A	3.8	27.7	0.66	0.81	0.80	46.8
3	R2	344	5.0	0.152	9.8	LOS A	0.6	4.6	0.55	0.78	0.55	46.4
Approach		1087	5.0	0.551	7.0	LOS A	3.8	27.7	0.63	0.80	0.72	46.7
East: Brigham Creek Road East (to southbound on ramp)												
5	T1	881	5.0	0.349	2.0	LOS A	0.0	0.0	0.00	0.31	0.00	50.1
6b	R3	262	5.0	0.349	8.5	LOS A	0.0	0.0	0.00	0.48	0.00	49.9
Approach		1143	5.0	0.349	3.5	LOS A	0.0	0.0	0.00	0.35	0.00	50.0
West: Brigham Creek Road West												
10a	L1	883	5.0	0.648	4.9	LOS A	5.7	41.4	0.71	0.71	0.85	47.6
11	T1	1076	5.0	0.524	5.2	LOS A	3.5	25.4	0.67	0.64	0.76	48.0
Approach		1959	5.0	0.648	5.1	LOS A	5.7	41.4	0.69	0.67	0.80	47.8
All Vehicles		4189	5.0	0.648	5.2	LOS A	5.7	41.4	0.49	0.62	0.56	48.1

Figure A13: Predicted Intersection Performance – Brigham Creek Road/SH18 Northbound Ramps Scenario 3, PM Peak

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH18 Eastbound Off Ramp												
1	L2	1020	5.0	0.828	13.4	LOS B	11.5	84.1	0.86	1.32	1.80	42.6
3	R2	522	5.0	0.261	11.3	LOS B	1.3	9.7	0.69	0.86	0.69	45.8
Approach		1542	5.0	0.828	12.7	LOS B	11.5	84.1	0.80	1.17	1.42	43.7
East: Brigham Creek Road East (to southbound on ramp)												
5	T1	1341	5.0	0.487	2.0	LOS A	0.0	0.0	0.00	0.30	0.00	50.2
6b	R3	255	5.0	0.487	8.5	LOS A	0.0	0.0	0.00	0.42	0.00	50.6
Approach		1596	5.0	0.487	3.1	LOS A	0.0	0.0	0.00	0.32	0.00	50.2
West: Brigham Creek Road West												
10a	L1	548	5.0	0.602	6.5	LOS A	4.6	33.5	0.78	0.92	0.98	47.3
11	T1	1151	5.0	0.535	5.4	LOS A	4.0	29.1	0.74	0.67	0.85	47.8
Approach		1699	5.0	0.602	5.7	LOS A	4.6	33.5	0.76	0.75	0.89	47.6
All Vehicles		4837	5.0	0.828	7.1	LOS A	11.5	84.1	0.52	0.74	0.77	47.1

Figure A14: Modelled Intersection Layout –Brigham Creek Road/SH18 Southbound On Ramp Intersection

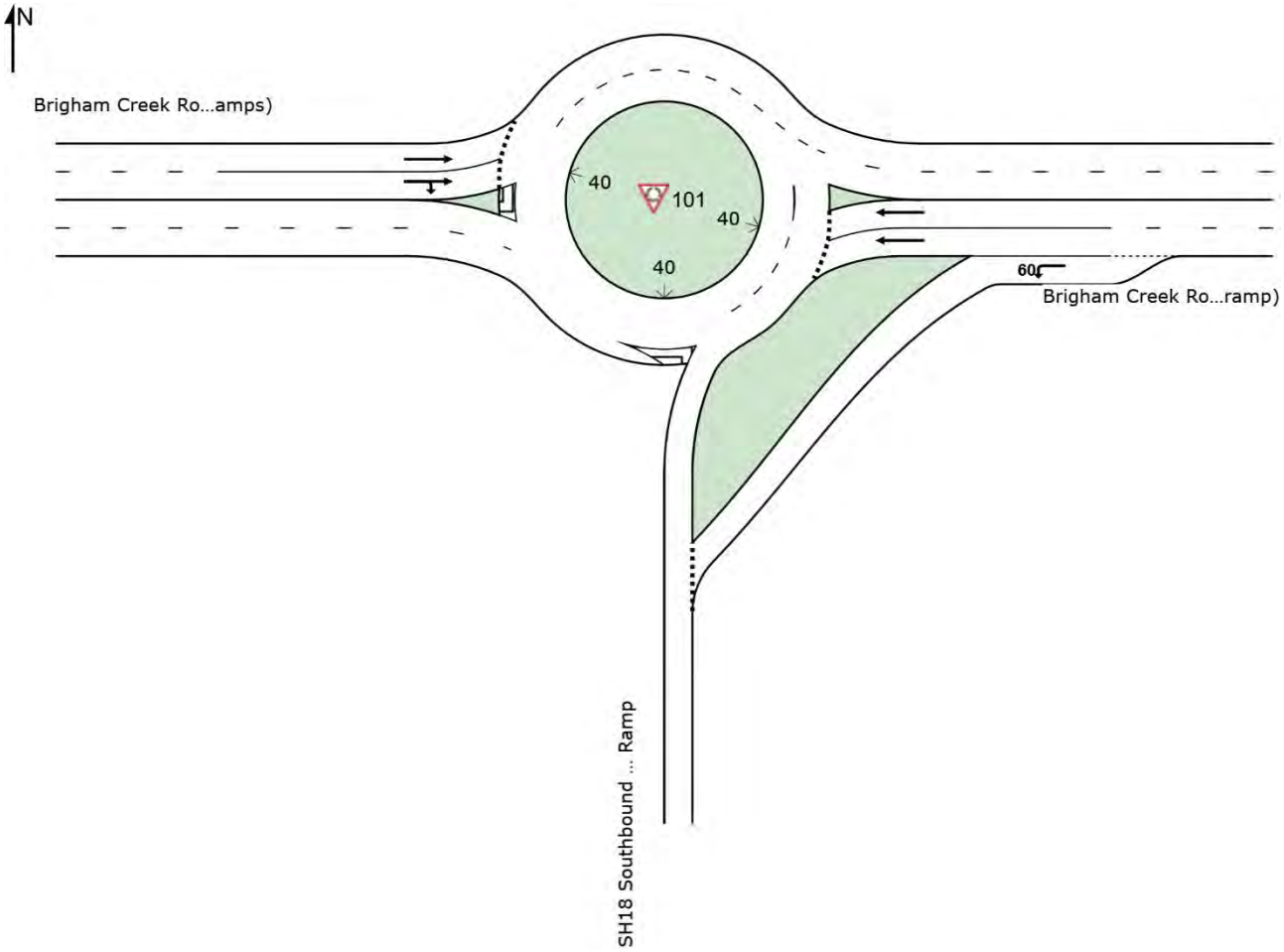

Figure A15: Predicted Intersection Performance – Brigham Creek Road/SH18 Southbound On Ramp Scenario 3, AM Peak

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Brigham Creek Road (to southbound off ramp)												
4	L2	631	5.0	0.485	6.0	LOS A	3.7	27.0	0.73	0.73	0.76	46.8
5	T1	1144	5.0	0.508	6.0	LOS A	4.1	29.9	0.74	0.75	0.84	48.1
Approach		1775	5.0	0.508	6.0	LOS A	4.1	29.9	0.74	0.74	0.81	47.6
West: Brigham Creek Road (to northbound ramps)												
11	T1	701	5.0	0.410	0.4	LOS A	0.0	0.0	0.00	0.09	0.00	52.0
12	R2	719	5.0	0.410	7.5	LOS A	0.0	0.0	0.00	0.56	0.00	49.0
Approach		1420	5.0	0.410	4.0	LOS A	0.0	0.0	0.00	0.33	0.00	50.4
All Vehicles		3195	5.0	0.508	5.1	LOS A	4.1	29.9	0.41	0.56	0.45	48.8

Figure A16: Predicted Intersection Performance – Brigham Creek Road/SH18 Southbound On Ramp Scenario 3, PM Peak

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Brigham Creek Road (to southbound off ramp)												
4	L2	312	5.0	0.232	4.6	LOS A	1.4	10.1	0.59	0.59	0.59	47.4
5	T1	1608	5.0	0.687	8.2	LOS A	8.3	60.2	0.81	0.93	1.13	47.1
Approach		1920	5.0	0.687	7.7	LOS A	8.3	60.2	0.78	0.87	1.04	47.1
West: Brigham Creek Road (to northbound ramps)												
11	T1	1061	5.0	0.497	0.4	LOS A	0.0	0.0	0.00	0.11	0.00	51.9
12	R2	660	5.0	0.497	7.5	LOS A	0.0	0.0	0.00	0.54	0.00	49.4
Approach		1721	5.0	0.497	3.1	LOS A	0.0	0.0	0.00	0.27	0.00	50.9
All Vehicles		3641	5.0	0.687	5.5	LOS A	8.3	60.2	0.41	0.59	0.55	48.8

Figure A17: Modelled Intersection Layout –Brigham Creek Road/SH18 Southbound Off Ramp Intersection

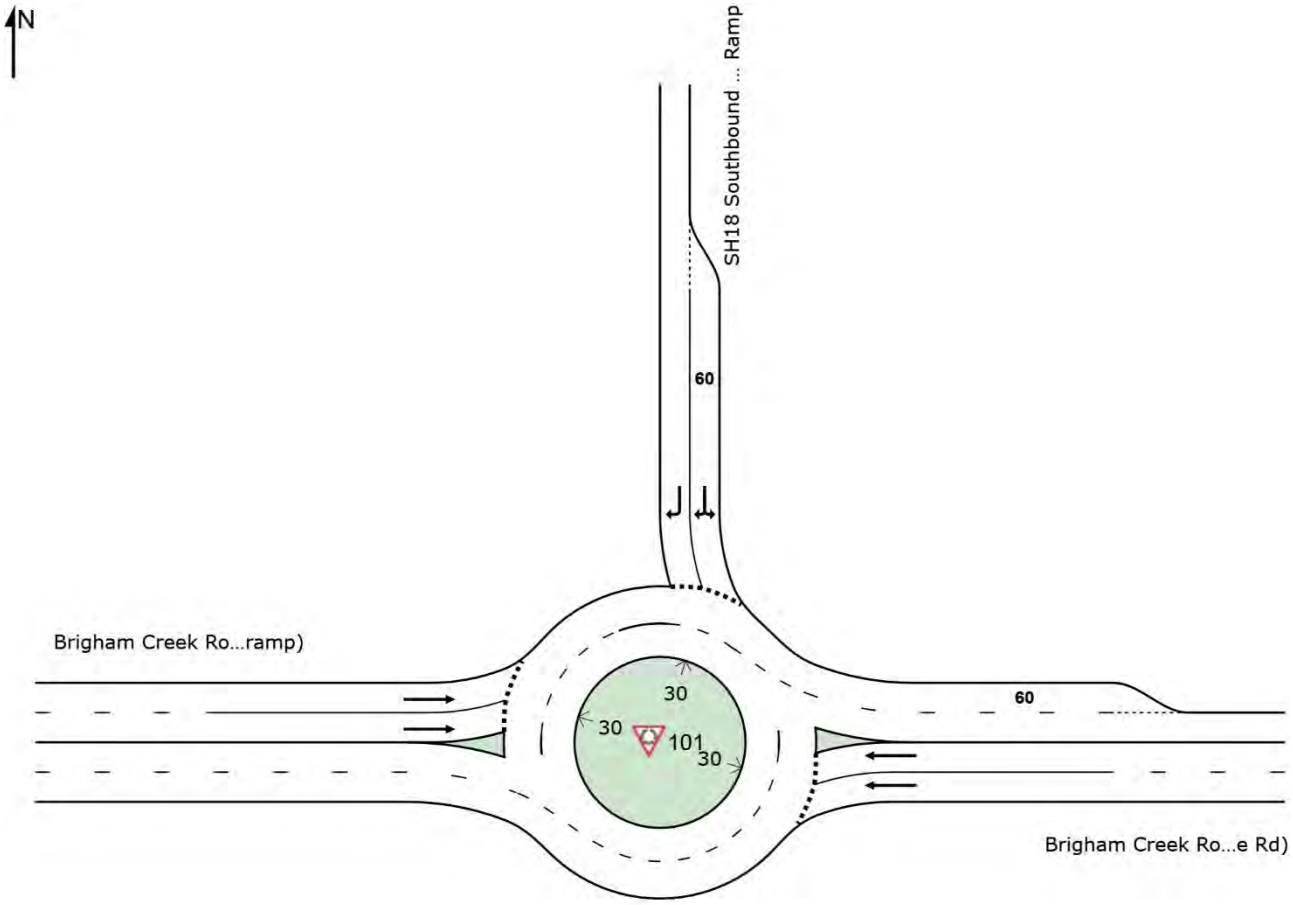

Figure A18: Predicted Intersection Performance – Brigham Creek Road/SH18 Southbound Off Ramp Scenario 3, AM Peak

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Brigham Creek Road East (to Hobsonville Rd)												
5	T1	1361	5.0	0.636	4.3	LOS A	5.1	37.5	0.69	0.62	0.79	48.3
Approach		1361	5.0	0.636	4.3	LOS A	5.1	37.5	0.69	0.62	0.79	48.3
North: SH18 Southbound Off Ramp												
7	L2	131	5.0	0.271	4.7	LOS A	1.2	8.7	0.53	0.72	0.53	45.8
9	R2	412	5.0	0.271	10.0	LOS A	1.2	8.7	0.54	0.76	0.54	46.9
Approach		542	5.0	0.271	8.7	LOS A	1.2	8.7	0.54	0.75	0.54	46.6
West: Brigham Creek Road West (to southbound on ramp)												
11	T1	701	5.0	0.288	2.2	LOS A	0.0	0.0	0.00	0.25	0.00	50.4
Approach		701	5.0	0.288	2.2	LOS A	0.0	0.0	0.00	0.25	0.00	50.4
All Vehicles		2604	5.0	0.636	4.7	LOS A	5.1	37.5	0.47	0.55	0.53	48.5

Figure A19: Predicted Intersection Performance – Brigham Creek Road/SH18 Southbound Off Ramp Scenario 3, PM Peak

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Brigham Creek Road East (to Hobsonville Rd)												
5	T1	1081	5.0	0.677	6.7	LOS A	5.3	39.0	0.83	0.94	1.09	47.6
Approach		1081	5.0	0.677	6.7	LOS A	5.3	39.0	0.83	0.94	1.09	47.6
North: SH18 Southbound Off Ramp												
7	L2	148	5.0	0.574	8.3	LOS A	4.1	29.6	0.74	1.00	1.01	43.6
9	R2	840	5.0	0.574	14.1	LOS B	4.1	29.6	0.75	1.01	1.03	44.6
Approach		988	5.0	0.574	13.2	LOS B	4.1	29.6	0.75	1.01	1.03	44.5
West: Brigham Creek Road West (to southbound on ramp)												
11	T1	1061	5.0	0.436	2.2	LOS A	0.0	0.0	0.00	0.25	0.00	50.4
Approach		1061	5.0	0.436	2.2	LOS A	0.0	0.0	0.00	0.25	0.00	50.4
All Vehicles		3131	5.0	0.677	7.2	LOS A	5.3	39.0	0.52	0.73	0.70	47.4

s 9(2)(f)(ii), s 9(2)(g)(i)

s 9(2)(f)(ii), s 9(2)(g)(i)

s 9(2)(f)(ii), s 9(2)(g)(i)

s 9(2)(f)(ii), s 9(2)(g)(i)

s 9(2)(f)(ii), s 9(2)(g)(i)

s 9(2)(f)(ii), s 9(2)(g)(i)

Comments on applications for referral under the COVID-19 Recovery (Fast-track Consenting) Act 2020

This form is for persons requested by the Minister for the Environment to provide comments on an application to refer a project to an expert consenting panel under the COVID-19 Recovery (Fast-track Consenting) Act 2020.

Organisation providing comment	Waka Kotahi
Contact person (if follow-up is required)	Sonya McCall – Waka Kotahi, Team Lead, Environmental Planning
	s 9(2)(a)
	Click or tap here to enter text.

Comment form

Please use the table below to comment on the application.

Project name	Whenuapai Development
General comment	The site is zoned for future urbanisation purposes (FUZ). To release this land for urban development, structure plan/s and a publicly notified plan change process is required. Without the assessment and implementation plan that underpins a plan change process, there is not enough information to support recommending this project to the Fast Track process.
Other considerations	This site proposes to develop four separately located sites that are zoned for future urban purposes. This would normally require a structure plan and publicly notified plan change process to be undertaken prior to being released for urban development. Without the wider assessment and implementation plan that would underpin a plan change process, there is insufficient information to support recommending this project to the Fast-track process. Allowing urban development in the absence of this broader strategic exercise would result in piecemeal development and may result in isolated, car-dependent communities. An integrated approach to land use and infrastructure, including the transport network, is critical to ensuring a quality, accessible development. Waka Kotahi notes that it is unclear how the proposed developments will take place without a planned transport network, correlate with the wider development that will occur and how cumulative demand will be assessed and addressed particularly at the State Highway 18 Brigham Creek Road interchange roundabout, which presents a single entry and entry point for the residential development. Waka Kotahi recommends that it is essential to have an integrated approach to the wider land use and transport network, with an implementation plan, prior to development to ensure a community that has inclusive accessibility with good access to public transport and active modes.
[Insert specific requests for comment]	Click or tap here to insert responses to any specific matters the Minister is seeking your views on.

Note: All comments, including your name and contact details, will be made available to the public and the applicant either in response to an Official Information Act request or as part of the Ministry's proactive release of information. Please advise if you object to the release of any information contained in your comments, including your name and contact details. You have the right to request access to or to correct any personal information you supply to the Ministry.

Comments on applications for referral under the COVID-19 Recovery (Fast-track Consenting) Act 2020

This form is for persons requested by the Minister for the Environment to provide comments on an application to refer a project to an expert consenting panel under the COVID-19 Recovery (Fast-track Consenting) Act 2020.

Organisation providing comment	Watercare Services Ltd.
Contact person (if follow-up is required)	Shane Lawton, Head of Developer Services, s 9(2)(a)
	Mark Iszard, Head of Major Developments, s 9(2)(a)
	Ameya Bhiwapurkar, Development Engineer, s 9(2)(a)

Comment form

Please use the table below to comment on the application.

Project name	Whenuapai Development Project
General comment	**Overall Summary:** The proposed development is in the Whenuapai area proposing to develop under the COVID19 fast track consenting process at various locations. These properties are listed below, along with the development proposals: • 15 Clarks Lane, Whenuapai (Lot 2 DP 92753) – Residential Subdivision • 10 Sinton Road, Whenuapai (Allot 2 PSH of Waipareira) – Residential Subdivision • 16 Sinton Road, Whenuapai (Lot 9 DP 57408) – Residential Subdivision • 90 Trig Road, Whenuapai (Lot 4 DP 55087) – Light Industrial Subdivision It is proposed to construct and subdivide 15 Clarks Lane and 10 and 16 Sinton Road, Whenuapai into approximately 227 standalone and terraced dwellings and to construct and subdivide 90 Trig Road, Whenuapai to provide at-grade industrial storage yard and two warehouse buildings. **Watercare's comments on the proposal** Water supply • For the proposed development @15 Clarks LN Hobsonville 0618 The existing network (100 mm pipe) has the capacity to provide the required demand as well as the fire flow of FW2.

- For the proposed development @90 Trig Road, Whenuapai

The existing network (150 mm pipe) has the capacity to provide the required demand as well as the fire flow of FW2.

- For the proposed developments @10 &16 Sinton Road, Whenuapai

The rider main doesn't have the capacity to supply the developments, so we would recommend upgrading the rider main to a pipe with an internal diameter of 100mm, see snip below.

Figure 1: Proposed watermain required to proceed with the development

Wastewater

Watercare confirms that, in principle, the servicing proposal meets with Watercare's expectations. There is a significant lack of detail preventing approval of the scheme, particularly regarding the sizing of the pumping stations for the full proposed catchment and subsequent capacity assessment of the downstream network.

Clark Lane is considered at high risk of requiring an alternative discharge location due to capacity availability in the network downstream of the proposed connection location. The developer needs to resolve this during the further stages.

- 15 Clarks Lane, Whenuapai – The proposed development would require a pump station which is not just for the proposed development but for the entire catchment (needs to meet the long-term needs of the catchment). This pumping station will need to be constructed by the developer at no cost to Watercare. Please note the currently proposed connection to the 150mm may not be the

	connection point for the proposed development due to network capacity, as this will depend on the final determined flow rate of the pumping station. • 90 Trig Rd, Whenuapai - The developer needs to ensure the proposed drainage design is sufficient for the wider catchment and not only the proposed development. The sizing and position should be considered properly to convey flows from upstream sites reasonably. • 10 and 16 Sinton Rd, Whenuapai - The developer must coordinate with the developments around this site rather than having another pump station. The solution should be optimized to meet long-term catchment needs.
Other considerations	
[Insert specific requests for comment]	

Note: All comments, including your name and contact details, will be made available to the public and the applicant either in response to an Official Information Act request or as part of the Ministry's proactive release of information. Please advise if you object to the release of any information contained in your comments, including your name and contact details. You have the right to request access to or to correct any personal information you supply to the Ministry.

Comments on applications for referral under the COVID-19 Recovery (Fast-track Consenting) Act 2020

This form is for persons requested by the Minister for the Environment to provide comments on an application to refer a project to an expert consenting panel under the COVID-19 Recovery (Fast-track Consenting) Act 2020.

Organisation providing comment	New Zealand Defence Force
Contact person (if follow-up is required)	Mr Mark Brunton
	Head of Defence Estate and Infrastructure, New Zealand Defence Force
	s 9(2)(a)

Comment form

Please use the table below to comment on the application.

Project name	Whenuapai Development
General comment	The New Zealand Defence Force (NZDF) is a significant stakeholder in the Whenuapai area. The location of the Whenuapai Development proposal is proximate to Royal New Zealand Air Force (RNZAF) Base Auckland. The proposed residential development sites are proximate to an aircraft engine testing location on Taxiway F (adjacent the main runway) at RNZAF Base Auckland. Those sites are exposed to noise from aircraft engine testing, which is an essential part of aircraft maintenance. The NZDF wishes to highlight the national, regional and local significance and strategic importance of RNZAF Base Auckland, and to ensure that the Whenuapai Development proposal does not undermine the NZDF's capability, operations and the ongoing viability of RNZAF Base Auckland. As one example of its strategic importance, RNZAF Base Auckland was used as an Emergency Coordination Centre, delivering around the clock outputs, during the National State of Emergency following Cyclone Gabrielle. It was also utilised as a staging post in another National State of Emergency following the Christchurch Earthquake in 2011. RNZAF Base Auckland is nationally significant defence infrastructure. National defence facilities are included in the definition of "infrastructure" in the Auckland Unitary Plan - Operative in Part (AUP). The AUP includes various protections for infrastructure and specifically for RNZAF Base Auckland, including Minister of Defence designations 4310 (Whenuapai Airbase) and 4311 (Whenuapai Airfield Approach and Departure Path Protection), and strong policy direction for the protection of infrastructure. Key risks to Defence in relation to the Whenuapai Development proposal are: a) Reverse sensitivity arising from noise from Defence operations ; b) Risks to flight operations and safety, including lighting and glare; c) Bird strike risk; and d) Structure and obstacle heights. Noise from aircraft engine testing on Taxiway F has been modelled by the NZDF's expert acoustic consultant. The modelled engine testing noise contours represent an average noise exposure over

	a seven-day noisy week, however, peak noise levels experienced during individual engine tests are significantly greater than the seven-day average. Modelling shows that all three residential sites are exposed to short-term peak noise from engine testing. Two of the residential sites are partly within the contour depicting average noise exposure, and one is outside but adjacent. The residential component of the Whenuapai Development proposal may not be compatible with noise from aircraft engine testing that is experienced within the residential development sites. There is a risk of complaints from new residents expecting levels of amenity which do not exist within the proposed residential development sites which could constrain Defence operations and ultimately undermine the viability of RNZAF Base Auckland. However, risks to Defence operations may be able to be mitigated through specific conditions, including no-complaints covenants on all new development lots. The NZDF considers that the Whenuapai Development proposal should be subject to the usual resource consent process under the Resource Management Act 1991. However, if the proposal is referred to an Expert Consenting Panel under the FTCA, specific conditions, including no-complaints covenants on all new development lots, are required in order to mitigate risks to Defence operations. The Minister of Defence has also provided comments, which complement the NZDF's comments above.
Other considerations	As above.
[Insert specific requests for comment]	Click or tap here to insert responses to any specific matters the Minister is seeking your views on.

Note: All comments, including your name and contact details, will be made available to the public and the applicant either in response to an Official Information Act request or as part of the Ministry's proactive release of information. Please advise if you object to the release of any information contained in your comments, including your name and contact details. You have the right to request access to or to correct any personal information you supply to the Ministry.