Hobsonville Primary School and Early Childhood Centre Designation

Integrated Transportation Assessment

IA262100-0000-CT-RPT-0001 | Revision 3.0

29 November 2021

Ministry of Education

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Executive Summary

Jacobs New Zealand Limited (Jacobs) has been commissioned by the Ministry of Education to undertake an Integrated Transportation Assessment (ITA) for the proposed designation for a new primary school and early childhood education (ECE) centre located in Hobsonville Point, Auckland.

The Hobsonville Point area has undergone large-scale residential redevelopment since 2011. The master-planned development has resulted in a higher residential population than originally forecast for Hobsonville Point. The existing network of primary schools within the area are already at capacity and a further 2,200 homes are to be constructed by approximately 2024.

The Ministry of Education has identified a need for a new primary school and early childhood education (ECE) facility to accommodate the student population from future proposed residential developments within the Hobsonville Point area. The assessment has been undertaken for a full primary school for Years 1 - 8 and a future masterplan school roll of 1,000 students and an estimated 58 full-time equivalent staff. The ECE will provide for 50 children and an estimated eight full-time staff members. This ITA considers the ability of the future transport network to accommodate the transport demand generated by the proposed school and ECE (at their masterplan rolls).

The school site is well-located within the existing and developing residential catchment to encourage walking and cycling and maximise accessibility of the site by active modes. No part of the student catchment zone is expected to be more than a 1.5km walking distance from the school which is considered an acceptable walking distance for school-aged children. The Hobsonville Point area has been designed to provide a safe, connected network of footpaths for pedestrians and school-aged children on bikes, and to encourage a low-speed traffic environment.

Based on the traffic modelling results for intersections surrounding the site, it is concluded that all intersections will have the spare capacity to accommodate the increased traffic volumes generated by the primary school and ECE at their future masterplan rolls. The traffic impacts resulting from the proposed school and ECE development are considered to be no more than minor.

The proposal is considered to align with the overarching objectives and outcomes sought by local and Auckland-wide transport plans and strategies. It is therefore concluded that there are no significant transportation or traffic effects which would preclude the redevelopment of the site to provide a primary school, ECE and associated facilities.

Overall, it is considered the future transport network can more than satisfactorily accommodate the proposed primary school and ECE with the recommendations and mitigation measures provided below:

- the Ministry of Education to engage with Auckland Transport on implementing a 40km/h variable speed limit along the road frontage to the site during school start and finish times
- two dedicated pedestrian/cyclist accessways to the school site are provided which are separated from the main vehicle accesses; one to the western site boundary on Hobsonville Point Road and one to the eastern site boundary on Wallace Road
- consideration of signalising the existing pedestrian crossing facility located on Hobsonville Road located opposite to a proposed pedestrian/cyclist accessway to the site
- provision of a zebra crossing located opposite a proposed pedestrian/cyclist accessway to the site on Wallace Road and implementation of a ‘Kea crossing’ or school patrol
- it is recommended that the location and form of pedestrian crossings (including supporting safety interventions such as raised platforms), which are directly attributed to support safe access to the school

and ECE will be investigated in further detail during the Outline Plan of Works (OPW) phase, in consultation with Auckland Transport

- development of a School Travel Plan to manage travel demand to and from the school and encourage measures such as implementing a Kea Crossing, Walking School Buses, walking and cycling, carpooling and public transport usage. The School Travel Plan is to be developed with Auckland Transport prior to the opening of the school and should align with the Travelwise Programme as a condition of the designation
- it is recommended that a Construction Traffic Management Plan (CTMP) is prepared by the contractors for the OPW stage, as required by Auckland Transport.

With the implementation of the mitigation measures and recommendations in this report, it is assessed that that the local transport network will be able to accommodate the levels of travel demand likely to be generated by the primary school and ECE. The implementation of any of these recommendations should involve consultation with Auckland Transport and Auckland Council. Based on this assessment of transportation impacts and recommendations, it is considered that Auckland Council should proceed with the Notice of Requirement (NOR) to designate the site for the proposed primary school and ECE centre.

Important note about your report

The sole purpose of this report and the associated services performed by Jacobs is to document the Integrated Transportation Assessment to support a Notice of Requirement for a proposed primary school and early childhood education facility located in Hobsonville Point, Auckland, in accordance with the scope of services set out in the contract between Jacobs and the Client (Ministry of Education). That scope of services, as described in this report, was developed with the Client.

In preparing this report, Jacobs has relied upon, and presumed accurate, any information (or confirmation of the absence thereof) provided by the Client and/or from other sources. Except as otherwise stated in the report, Jacobs has not attempted to verify the accuracy or completeness of any such information. If the information is subsequently determined to be false, inaccurate or incomplete then it is possible that our observations and conclusions as expressed in this report may change.

Jacobs derived the data in this report from information sourced from the Client (if any) and/or available in the public domain at the time or times outlined in this report. The passage of time, manifestation of latent conditions or impacts of future events may require further examination of the project and subsequent data analysis, and re-evaluation of the data, findings, observations and conclusions expressed in this report. Jacobs has prepared this report in accordance with the usual care and thoroughness of the consulting profession, for the sole purpose described above and by reference to applicable standards, guidelines, procedures and practices at the date of issue of this report. For the reasons outlined above, however, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this report, to the extent permitted by law.

This report should be read in full, and no excerpts are to be taken as representative of the findings. No responsibility is accepted by Jacobs for use of any part of this report in any other context. This report has been prepared on behalf of, and for the exclusive use of, Jacobs's Client, and is subject to, and issued in accordance with, the provisions of the contract between Jacobs and the Client. Jacobs accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this report by any third party.

1. Introduction

1.1 Background

Hobsonville Point is located on the peninsula adjacent to the State Highway (SH) 18 Upper Harbour Motorway approximately 25km north-west of the Auckland city centre. The Hobsonville Point area was previously the location of the Royal New Zealand Air Force's airbase and has undergone large-scale residential redevelopment since 2011.

Two new schools including Hobsonville Point Primary School and Hobsonville Point Secondary School have been provided within Hobsonville Point to meet the education demands within the area. The master-planned development has resulted in a higher residential population than originally forecast for Hobsonville Point and a further 2,200 homes are to be constructed by approximately 2024. Hobsonville Point Primary School is already at capacity and additional teaching spaces are required to increase the school's capacity in the short-term.

The Ministry of Education has identified a need for a new primary school and early childhood education (ECE) facility to accommodate the student population from future proposed residential developments within the Hobsonville Point area.

Twelve potential sites were initially identified within the Hobsonville Point network search area which were assessed against the Ministry of Education's key Stage 1 site assessment criteria. Four sites (as shown in Figure 1-1), progressed to the Stage 2 assessment phase for further assessment against more detailed assessment criteria. Based on the Stage 2 assessment, discussions with property developers within the study area and engagement with Auckland Council and Auckland Transport, it was determined that Site 5 located at 2 Waka Moana Drive was the preferred site from a school development perspective.

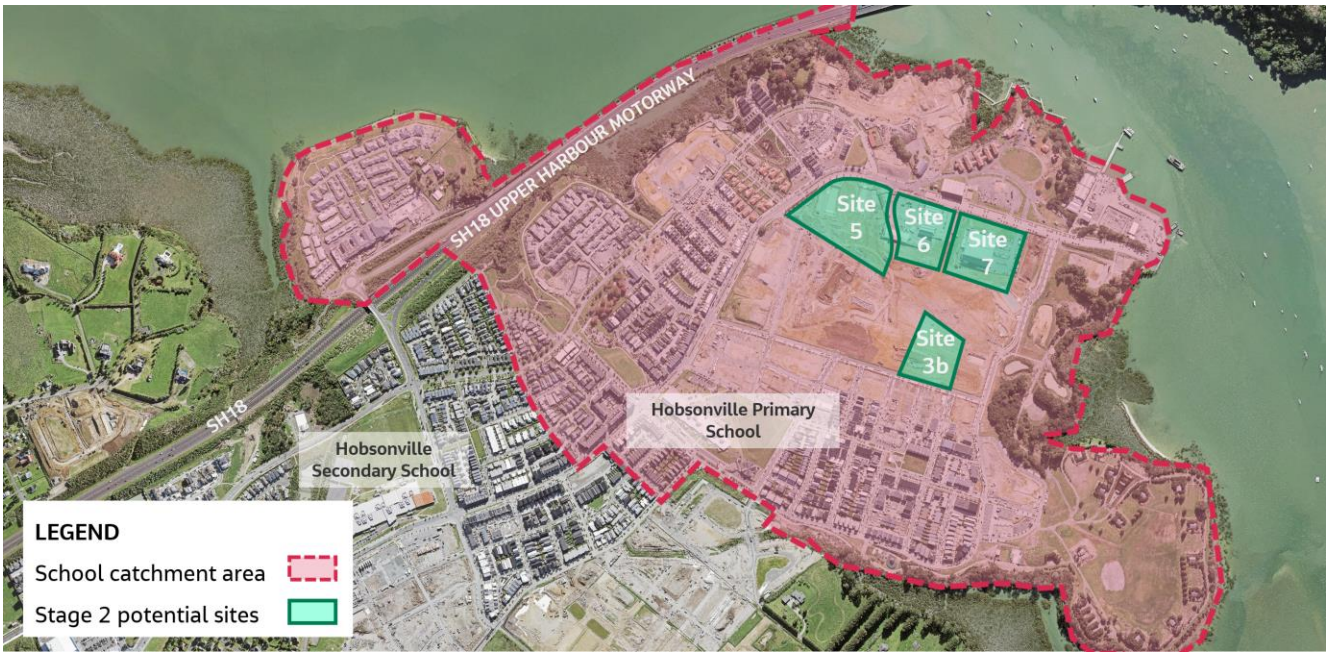


Figure 1-1 Stage 2 assessment site options within the network search area/school catchment area

The Ministry of Education has acquired the site located at 2 Waka Moana Drive to provide a new primary school and ECE facility, and it has been proposed that the site is progressed to the designation phase. The school is to be a full primary school serving students from Years 1 - 8 living within the catchment zone (shown in Figure 1-1)

and will be designed to accommodate a masterplan roll of 1,000 students. Analysis of the existing network of schools in the area estimates that the school will be required to open in approximately 2024 - 2025 with an opening school roll of 350 students. The masterplan roll numbers will be achieved as and when surrounding residential developments are completed.

The proposed school and ECE requirements are summarised in Table 1-1.

Table 1-1 Proposed Hobsonville Point Primary School requirements[1]

School requirements	Description
Type of school	Contributing primary school, years 1 - 8
Proposed opening date	Estimated at 2024 - 2025 (depending on generated demand)
Opening roll	Approximately 350 – 400 students
Masterplan roll	1,000 school students
ECE provision	Yes, accommodating 50 children

1.2 Purpose of this report

The Ministry has commissioned Jacobs to undertake an ITA for a proposed designation of land at 2 Waka Moana Drive for a new primary school and Early Childhood Education (ECE) centre in Hobsonville Point, Auckland. The purpose of this ITA is to assess the potential transport-related effects of the operation of the proposed new primary school. This report describes the existing transport environment surrounding the site, the proposed school and ECE developments and assesses the proposal against the relevant transport policies.

An ITA is required as it supports a Notice of Requirement (NOR) and designation of the site for the proposed primary school and has been prepared in accordance with Auckland Transport's ITA guidelines[2]. One of the key objectives for the Hobsonville Point area is that development is integrated with transport networks and supports walking, cycling and the use of public transport. Due to the location of the primary school and ECE within the developing Hobsonville Point area and the site's high level of accessibility by walking and cycling, a full ITA is considered more appropriate than a Transportation Assessment (TA).

This ITA should be read in conjunction with the following separate documents which refer to the recommendations of this assessment:

- *Notice of Requirement & Assessment of Environmental Effects Report*[3] as required under Section 168 of the *Resource Management Act 1991* (RMA) which assesses the proposed designation against Section 171 of the RMA
- *Form 18 Notice of Requirement*[4] which sets out any site-specific designation conditions.

It should be noted that the mitigation measures proposed as part of this ITA relating to the establishment Outline Plan of Works (OPW) phase, as per the conditions outlined in *Form 18*.

[1] Proposed school and ECE requirements provided by the Ministry of Education.
[2] Auckland Transport. *ITA Guidelines.* Site retrieved https://at.govt.nz/about-us/manuals-guidelines/integrated-transport-assessment-guidelines/when-to-use-these-guidelines/
[3] Incite Auckland Limited (2021) *Draft Notice of Requirement & Assessment of Environmental Effects Report for the Minister of Education for a New Designation under s168 of the RMA: Primary School (Years 0-8) and Early Childhood Education (ECE) at 2 Waka Moana Drive, Hobsonville Point, Auckland*
[4] Incite Auckland Limited (2021) *Draft Form 18 Notice of Requirement by Minister, Local Authority, or requiring authority for new designation of alteration of designation*

1.3 Report structure

This ITA report is structured as follows:

- Section 2 provides a description of the site location and development context of the Hobsonville Point area
- Section 3 describes the existing and future transport environments in the vicinity of the development site
- Section 4 describes the proposed development and estimates the trip generating potential of the primary school and ECE
- Section 5 provides an assessment of the transport effects of the primary school and ECE and outlines potential mitigation measures
- Section 6 considers the consistency of the proposed school with relevant transport plans and strategies
- Section 7 provides a summary of the assessment, including conclusions and recommendations.

1.4 Information sources

The development of this ITA has relied on the following information sources and guidelines:

- Ministry of Education school requirements including student numbers, estimated school and ECE opening years and school catchment/network area
- *Auckland Unitary Plan (Operative in Part)* (AUP(OP)) and *I605 Hobsonville Point Precinct Plan*
- ITA guidelines for the Auckland region
- Panuku Development residential development plans for Hobsonville Point
- Feasibility Study by Jasmax[5].

1.5 Engagement

Representatives from Auckland Council and Auckland Transport have been engaged during the project to discuss evaluation of potential sites, the site feasibility study and the approach for designating the site. The meetings which informed the identification of the preferred site and development of this ITA are summarised in Table 1-2.

Following on from the pre-application meeting, the *Hobsonville Point School and ECE Designation ITA Report and Appendices - Draft Revision 2.0* was shared with Auckland Transport, Auckland Council and the Auckland Forecasting Centre on 05-10-2021. Comments were received from technical specialists on 29-10-2021 and the responses and actions for each of the comments are summarised in and incorporated into the *Hobsonville Point School and ECE Designation ITA Report Final Revision 3.0*.

Table 1-2 Project team engagement

Meeting and date	Attendees	Meeting outcome
Stage 2 site assessment meeting 02-09-2019	Representatives from Auckland Transport, Incite and Jacobs	Project team briefing of project background and discussion of potential school/ECE sites to identify any issues and identify a preference for any of the sites
Project kick-off meeting 06-08-2020	Representatives from the Ministry of Education, Incite, Jasmax and Jacobs	Project team briefing of project background, scope of work and discussion of the draft architectural feasibility study

[5] Jasmax (2021). *Hobsonville Point Primary #2 Bulk and Location Siting Study - Revision A.*

Meeting and date	Attendees	Meeting outcome
Pre-application meeting 27-07-2021	Representatives from Auckland Council, Auckland Transport, the Ministry of Education, Incite, Traffic Planning Consultants and Jacobs	Meeting to discuss the proposed approach to designating the site and to identify any high-level issues with the site or proposed application process

2. Site description and development context

The residential and commercial development of the Hobsonville Point area is considerably progressed such that there are limited land options available for development as a school. The proposed site located at 2 Waka Moana Drive (legal description LOT 1005 DP 528384), is one of the few remaining greenfield land parcels within Hobsonville Point and is currently an unoccupied, grassed site as shown in Figure 2-1 and Figure 2-2.

The site is part of a larger mega lot (shown in Figure 2-3), which is approximately 2.478ha in size and the minimum size of the site required for the school and ECE is approximately 1.5ha with development potential for up to three stories. From discussions between the Ministry of Education and Panuku Development, the balance of the mega lot land parcel will be used for residential development.

Figure 2-1 Proposed site for school and ECE development (from southern boundary, facing north-east)

Figure 2-2 Proposed site for school and ECE development (from northern boundary, facing south-west)

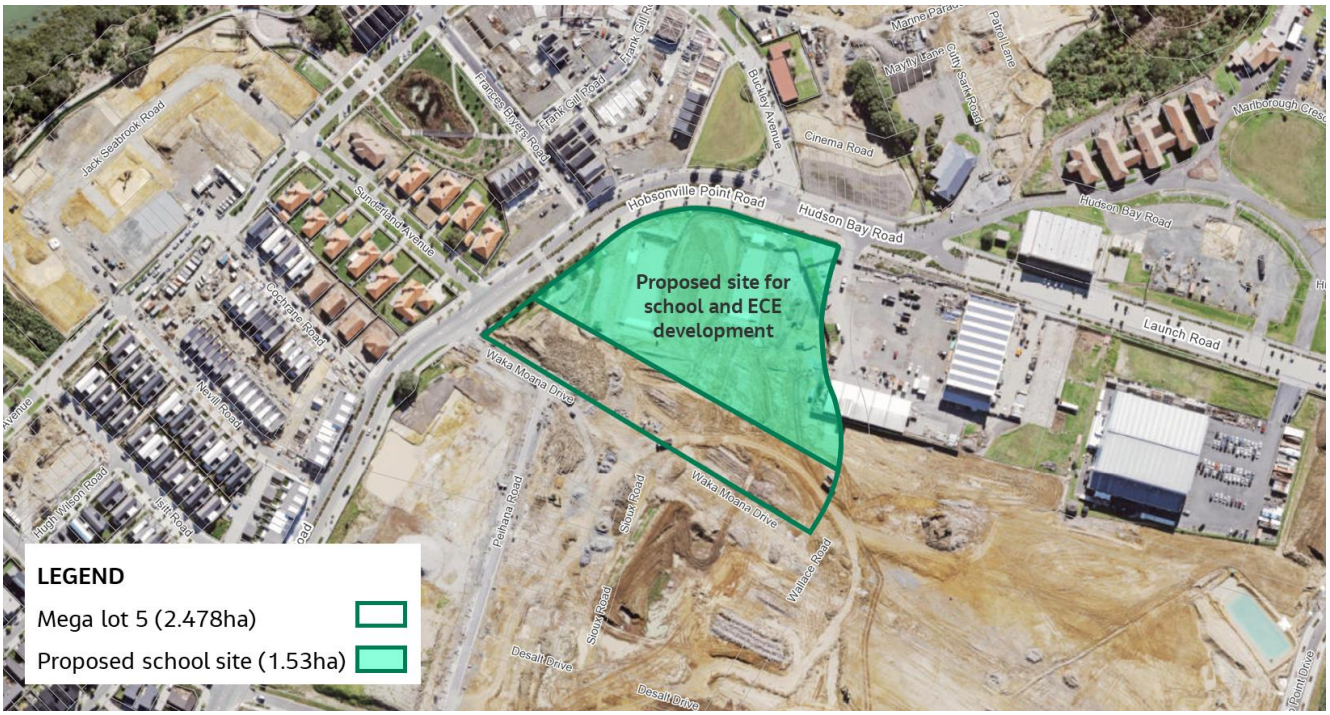


Figure 2-3 Proposed school and ECE development site within the mega lot land parcel

Hobsonville Point is a master-planned residential development in Auckland which is being led by Kāinga Ora - Homes and Communities with a number of projects within the area being undertaken by private property development groups. The proposed site lies within 'Panuku Development's Airfields Precinct' of the Hobsonville Point Masterplan which is shown in Appendix B.

The wider Hobsonville Point area and school catchment zone is predominantly zoned for 'Residential - Mixed Housing Urban' and 'Residential - Terrace Housing and Apartment Buildings' land uses by the Auckland Unitary Plan 0perative in Part (AUP(OP)), as shown in Figure 2-4. This zoning enables medium to higher-density housing development and an example of the resulting types of residential development is shown in Figure 2-5. The underlying zoning of the proposed development site is mostly 'Residential - Mixed Housing Urban' as shown in Figure 2-6, with the south-western corner zoned for 'Residential - Terrace Housing and Apartment Buildings'.

Development has delivered over 2,300 homes to date including a mix of new apartment buildings, terraced and standalone houses, and the current population of the Hobsonville Point area is approximately 6,250 people. An example of the type of development surrounding the site is shown in Figure 2-5. This development is expected to be completed in 2024 which will increase the total number of homes to 4,500 and the residential population to 11,000 people[6].

The proposed site lies within sub-precincts C and D of the Hobsonville Point Precinct as defined by the *I605 Hobsonville Point Precinct Plan*[7] shown in Appendix C. The main purpose of the *Hobsonville Point Precinct Plan* is to provide for a comprehensive and integrated redevelopment of the former airbase, to make efficient use of land and infrastructure and increase housing supply in the Hobsonville Point area. Assessments of the proposed development's alignment with overarching strategic plans (such as the *Hobsonville Point Precinct Plan*), are outlined in section 6.

[6] Kāinga Ora - Homes and Communities (2021) *Hobsonville Point* (site accessed on 03 August 2021 at https://hobsonvillepoint.co.nz/about/)
[7] Auckland Council (2016) *Auckland Unitary Plan Operative in Part - I605 Hobsonville Point Precinct Plan* (site accessed on 03 August 2021 at https://unitaryplan.aucklandcouncil.govt.nz/Images/Auckland%20Unitary%20Plan%20Operative/Chapter%20I%20Precincts/6.%20West/I605%20Hobsonville%20Point%20Precinct.pdf)

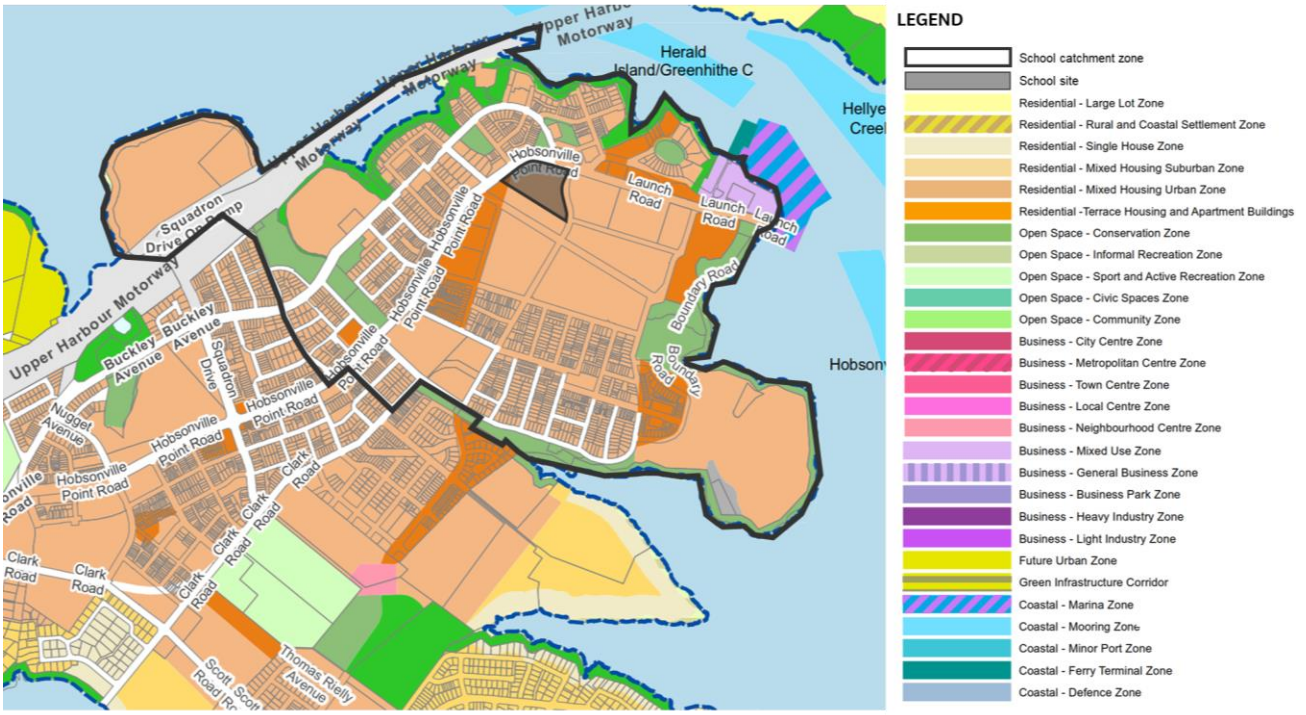


Figure 2-4 AUP(OP) zoning surrounding the proposed school site at 2 Waka Moana Drive, Hobsonville Point[8]

Figure 2-5 Example of development adjacent to the site along Hobsonville Point Road

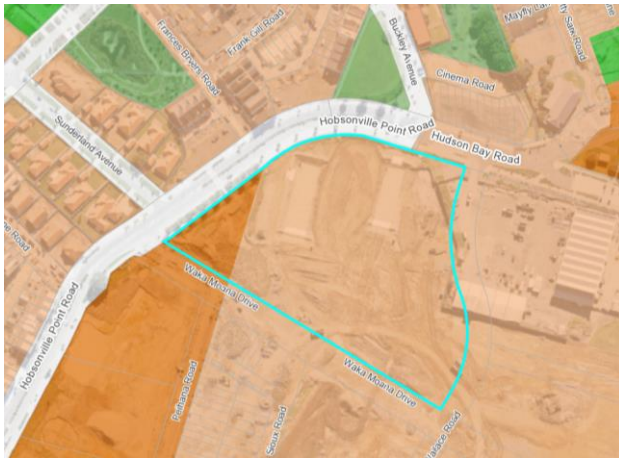


Figure 2-6 AUP(OIP) zoning of the mega lot site

[8] Auckland Council (2021) *Auckland Council – GeoMaps* (accessed on 20 July 2021 at https://geomapspublic.aucklandcouncil.govt.nz/viewer/index.html)

3. Existing and future transport environments

The following sections outline the existing and future transport environments for the area surrounding the development site. The effects of the development proposal on the future environment are detailed in section 5.

A site visit was undertaken by Jacobs staff to gain an understanding of the existing transport environment and observations relevant to the development of this ITA are noted in the following sections.

3.1 Road network and traffic environment

The road network surrounding the site and within the Hobsonville Point precinct has been developed to provide a highly interconnected system to reduce trip distances, improve accessibility and provide a safe network for all road users including pedestrians and cyclists.

The posted speed limit for all roads and streets within the school student catchment area is 50km/h. The Hobsonville Point road network has been constructed to align with the timeframes for adjacent residential development and construction of the local road network surrounding the proposed school site has largely been completed. No traffic counts or heavy commercial (HCV) percentages are available for the road network within the study area as a number of local roads are closed to traffic until adjacent residential development blocks have been constructed.

The network has been designed to encourage slow traffic speeds with relatively narrow local streets and tight corner radii at intersections. The majority of intersections throughout the surrounding road network are priority-controlled with traffic signals at larger intersections along Hobsonville Point Road toward the southern extent of the school catchment area. Typical road cross-sections and intersection arrangements within the study area are shown in Figure 3-1, Figure 3-2, Figure 3-3 and Figure 3-4.

The proposed site has road frontage to Wallace Road along the eastern boundary which is classified as a Local Road, and Hobsonville Point Road along the northern and western site boundaries which is classified as a Collector Road. The Hobsonville Point Road carriageway adjacent to the development site is approximately 27.7m wide boundary-to-boundary. This cross-section typically provides for one 3.2m-wide traffic lane in each direction, a planted median (or right-turn bay at intersections), parallel parking spaces, footpaths and uni-directional on-street painted cycle lanes on both sides of the road, and planting to provide separation between the footpath and traffic lanes.

The roads classified as Local Roads including Waka Moana Drive and Wallace Road provide for one traffic lane in each direction and have a kerb-to kerb width of approximately 6.2m. These roads are currently under development, but it is assumed that footpaths will be constructed along both sides of the road when construction is complete. Parallel parking spaces are provided along some sections and planting/tree pits provide separation between traffic lanes and the adjacent footpaths.

Figure 3-1 Wallace Road (under development) facing north

Figure 3-2 Typical local road cross-section

Figure 3-3 Hobsonville Point Road facing north

Figure 3-4 Typical priority-controlled intersection layout

Kite Road as shown in Figure 3-5 was initially proposed by Panuku Development's future road network development plan which would likely have a Local Road function. The school and ECE are proposed to occupy the northern section of the mega lot (refer to Figure 3-6), and the proposed alignment of Kite Road would dissect the required land taking into two land parcels. This road carriageway has not been constructed except for the road stubs located on Wallace Road and Waka Moana Drive. It is not anticipated that Kite Road would be required to support the access requirements of the school, or for the residential development proposed for the balance area to the south of the mega lot.

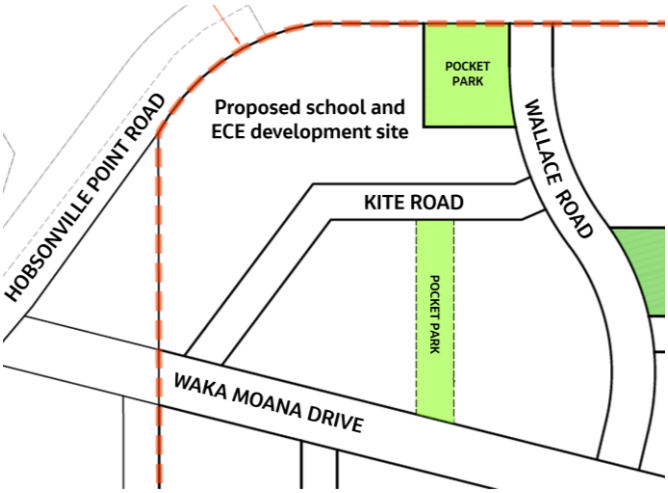


Figure 3-5 Panuku Development's initial road network plan

Figure 3-6 Kite Road in relation to the school site and mega lot

The future development of the Hobsonville Precinct road network is guided by *Hobsonville Point Precinct Plan 2 - Hobsonville Point features plan* (as shown in Figure 3-7). Precinct Plan 2 proposes a future road alignment which extends Peihana Road to the north to Hobsonville Point Road which runs alongside the corner of the development site that is zoned for higher intensification and Residential - Terrace Housing and Apartment Buildings. The proposed school and ECE development are inconsistent with this future road alignment and the potential network effects are assessed in section 5.1.

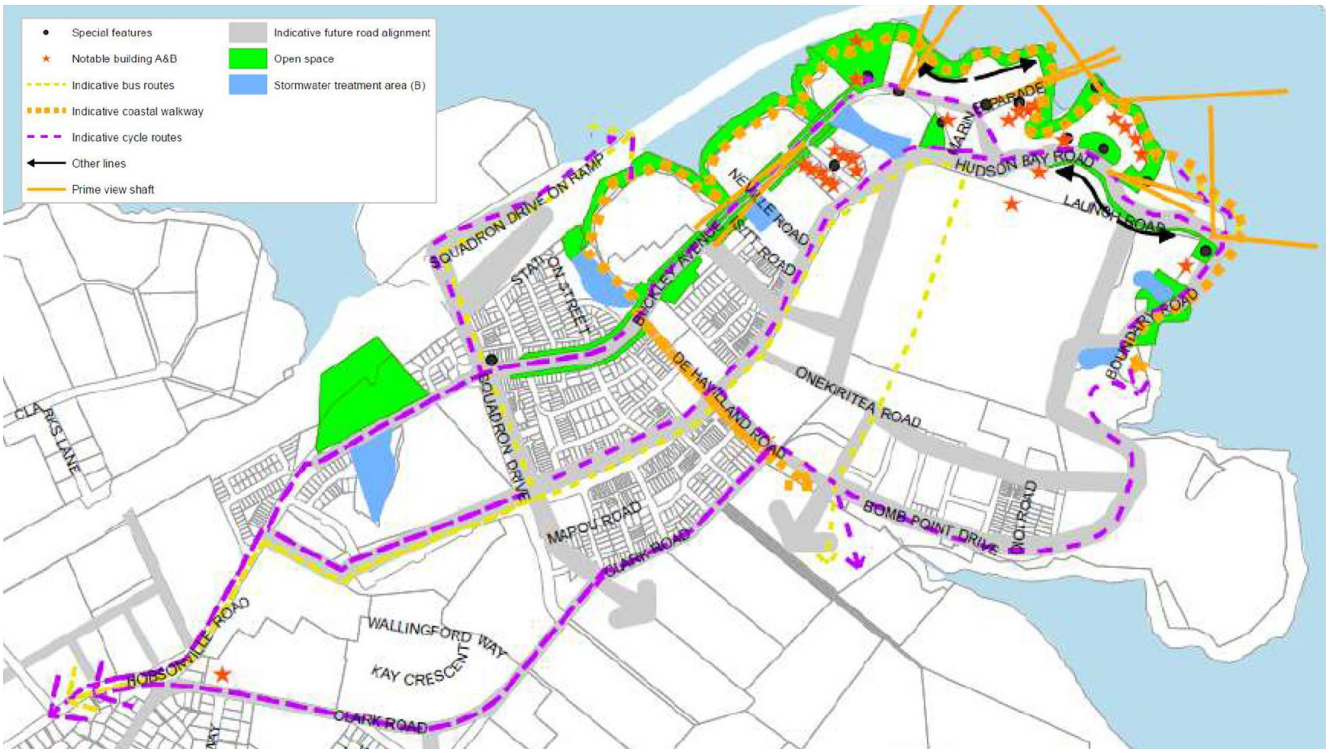


Figure 3-7 Proposed Precinct Plan 2 - Hobsonville Point features plan for future development

3.2 Road safety and crash history

Crash data would be typically be analysed for the surrounding road network and intersections adjacent to the development site to understand whether the proposed site access arrangement or additional traffic generated by the development was likely to result in safety issues.

Crash data from Waka Kotahi's Crash Analysis System (CAS) database[9] was analysed for the last five-year period between 2016 and 2020 (including early 2021), for the road network surrounding the development site. No crashes have been reported for this five-year period; however, it is noted that some local roads within the road network surrounding the school are currently closed to vehicle access while adjacent residential developments are under construction.

Crash data was extracted for the proposed school student catchment zone to understand potential safety issues within the wider road network. A total of 10 crashes have occurred over the five-year period including one serious injury, one minor injury and eight non-injury crashes (refer to Figure 3-8). The main factors which contributed to the crashes involved poor observation, incorrect lanes/positioning and poor judgment and rear end/obstruction was the most common crash type. One of the reported crashes involved a pedestrian who was struck by a vehicle as they stepped out from behind a row of parked vehicles to cross the road, resulting in serious injuries. No other crashes involved vulnerable road users (i.e., pedestrians, cyclists and motorcyclists). The site details crash report is attached in Appendix D.

Overall, the nature, location and number of reported crashes does not indicate any particular safety concerns with the road network surrounding the site under the existing context.

[9] NZ Transport Agency (2021) *Crash Analysis System (*site accessed on 06 August 2021 from https://cas.nzta.govt.nz/)

Figure 3-8 Reported crashes occurring within the wider road network between 2016 – 2020 (including early 2021)[10]

3.3 Active modes

Wide footpaths and on-street, uni-directional painted cycle lanes have been provided along Hobsonville Point Road (see Figure 3-9). Generous footpaths are provided on both sides of most streets within the vicinity of the development site as shown in Figure 3-13 which are typically separated from the adjacent traffic lane by planting or parallel carparking spaces. Footpaths have been constructed along the northern (Hudson Bay Road), eastern (Wallace Road), and western (Hobsonville Point Road) road frontages to the mega lot site. There is sufficient space to provide safe pedestrian facilities along the remaining southern road frontage to the mega-lot site as adjacent development is completed.

Typical pedestrian facilities at priority-controlled intersections within the local road network are shown in Figure 3-11. Existing crossing facilities surrounding the proposed development site and within the wider surrounding road network operate as 'courtesy crossings' for pedestrians.; however, these facilities are not official pedestrian crossings and vehicles should but are not required to stop for people on the footpath waiting to cross the road. Drivers must give way to people already crossing. These crossing points for pedestrians are marked using different paving materials and colours to delineate the courtesy pedestrian crossing points and tactile ground surface indicators and pram ramps are typically provided. Existing courtesy crossings provide access to the development site from areas to the west and north of the site as shown in Figure 3-12. No marked pedestrian (zebra) crossings are provided around the site or within the wider surrounding road network where vehicles are required to stop and give way to people walking on any part of the crossing, or waiting to cross.

[10] Waka Kotahi NZ Transport Agency (2021) *Crash analysis system* (site accessed on 04 July 2021 at https://cas.nzta.govt.nz/query-builder)

Figure 3-9 Existing walking and cycling facilities along Hobsonville Point Road

Figure 3-10 Typical footpaths adjacent to residential developments

Figure 3-11 Typical pedestrian facilities at intersections

Figure 3-12 Existing pedestrian courtesy crossing facility on Hobsonville Point Road at the northern boundary to the school site

3.4 Public transport

The Hobsonville Point area is served by two main bus routes including the 112 Connector service (Hobsonville Point ferry terminus to Westgate) and the 114 Local service (Hobsonville Point ferry terminus to Westgate via Whenuapai). Both bus routes operate along Hobsonville Point Road which is the main public transport route within the area as shown in Figure 3-13. There is a proposal to re-route the 112-bus service route via Scott Point which would involve shifting the bus route from operating along Hobsonville Point Road to Wallace Road. The delivery date for this re-routing is unknown at this time.

The Hobsonville Point area is also served by the Hobsonville Ferry terminal and services between Hobsonville Point, Beach Haven and the Auckland city centre. Further redevelopment of the Catalina Bay area has permanently closed the Park and Sail parking facilities at the Hobsonville Point ferry terminal as of 05 January

2021[11]. Vehicle access is retained for mobility card holders and buses and pick-up/drop-off zones at the terminal can be accessed from Hudson Bay Road.

The *Hobsonville Point Precinct Plan* indicates a future bus route on Wallace Road along the eastern boundary of the site as shown in Figure 3-7 (refer to section 3.1).

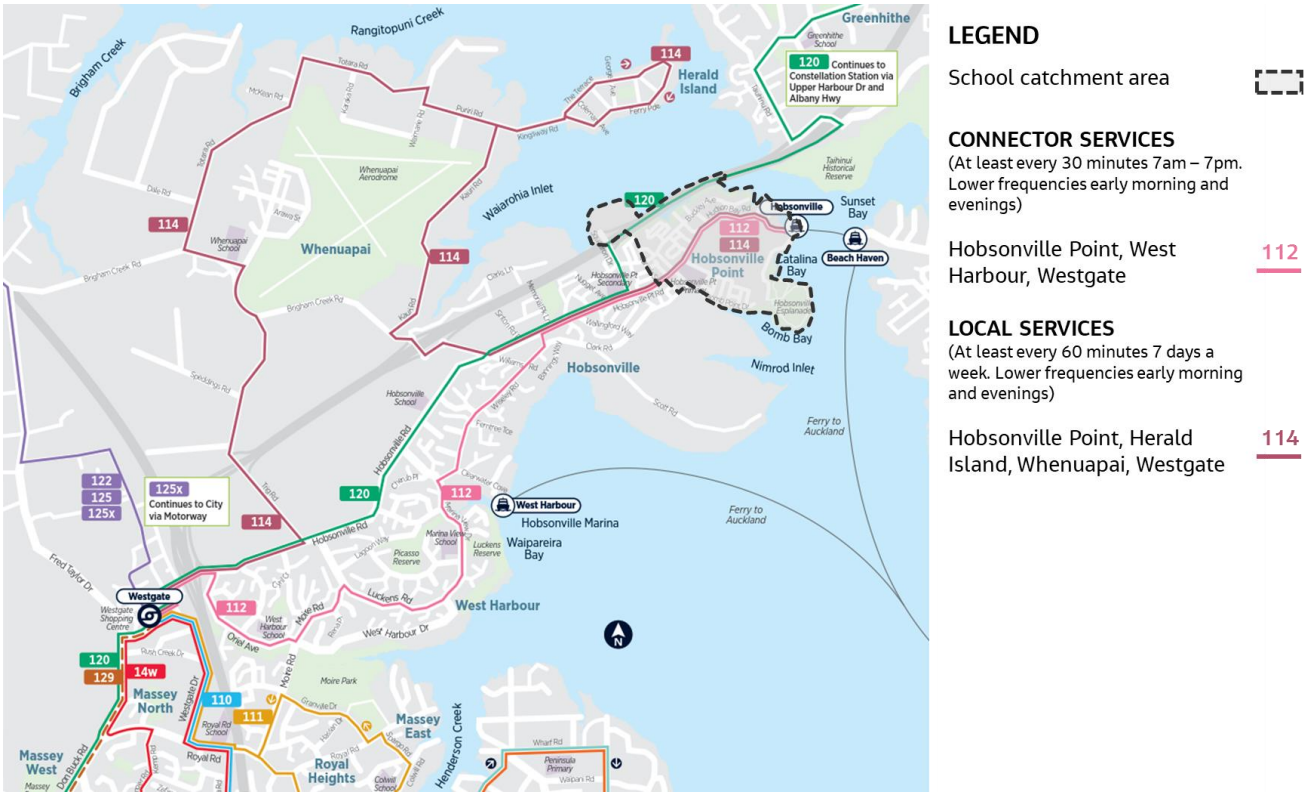


Figure 3-13 West Auckland New Bus Network map[12]

[11] Kāinga Ora - Homes and Communities (2020) *An even better Catalina Bay is on its way* (site accessed on 05 August 2021 at https://hobsonvillepoint.co.nz/community/news/development/an-even-better-catalina-bay-is-on-its-way/)

[12] Auckland Transport (2017) *West Auckland New Network map* (site accessed on 03 August 2021 at https://at.govt.nz/media/1973193/west-nn-implementation-map-march-2017.pdf)

4. Proposed development

4.1 Site size and layout

The proposed primary school is to be designed to accommodate an ultimate masterplan roll of 1,000 primary school students between years 1 – 8. The number of staff members has not been confirmed at this stage but based on a conservative teacher to student ratios, it is estimated that 58 full time equivalent (FTE) staff members will be required, which includes an allowance for support and management staff in addition to teaching staff.

An ECE centre will also be provided which will accommodate up to 50 children. Based on minimum adult-to-child ratios, it is estimated that eight FTE staff members will be required at any one time. The detailed assumptions used to estimate the staff requirements for the primary school and ECE are outlined in Appendix E.

A feasibility study was undertaken by Jasmax to develop the proposed form and layout of the primary school and ECE centre, as shown in Figure 4-1. The study shows a three-storey 'metro-style' school with three main separate buildings (primary school, hall and ECE), playing fields, hardcourts and outdoor learning spaces. Metro-style schools typically are located on smaller sized sites with multi-level development potential and have a more compact design than standard school models. Due to the high density and scale of redevelopment (combined with limited greenfield site development opportunities), a metro-style school is the preferred solution for Hobsonville Point.

Vehicle access to the site is currently shown from Wallace Road on the eastern boundary of the site. Vehicles then follow the proposed one-way system through the carpark area to exit onto Hobsonville Point Road (left-turn only). Carparking for school and ECE staff and visitors is proposed as part of the development and will be provided within the site boundary, including pick-up/drop-off spaces (PUDO). The carpark for the school and ECE has been developed to a concept level of design and to maximise the number of spaces provided within the site, as shown in Figure 4-1.

The assessment of the proposed school and ECE development is discussed in section 5.

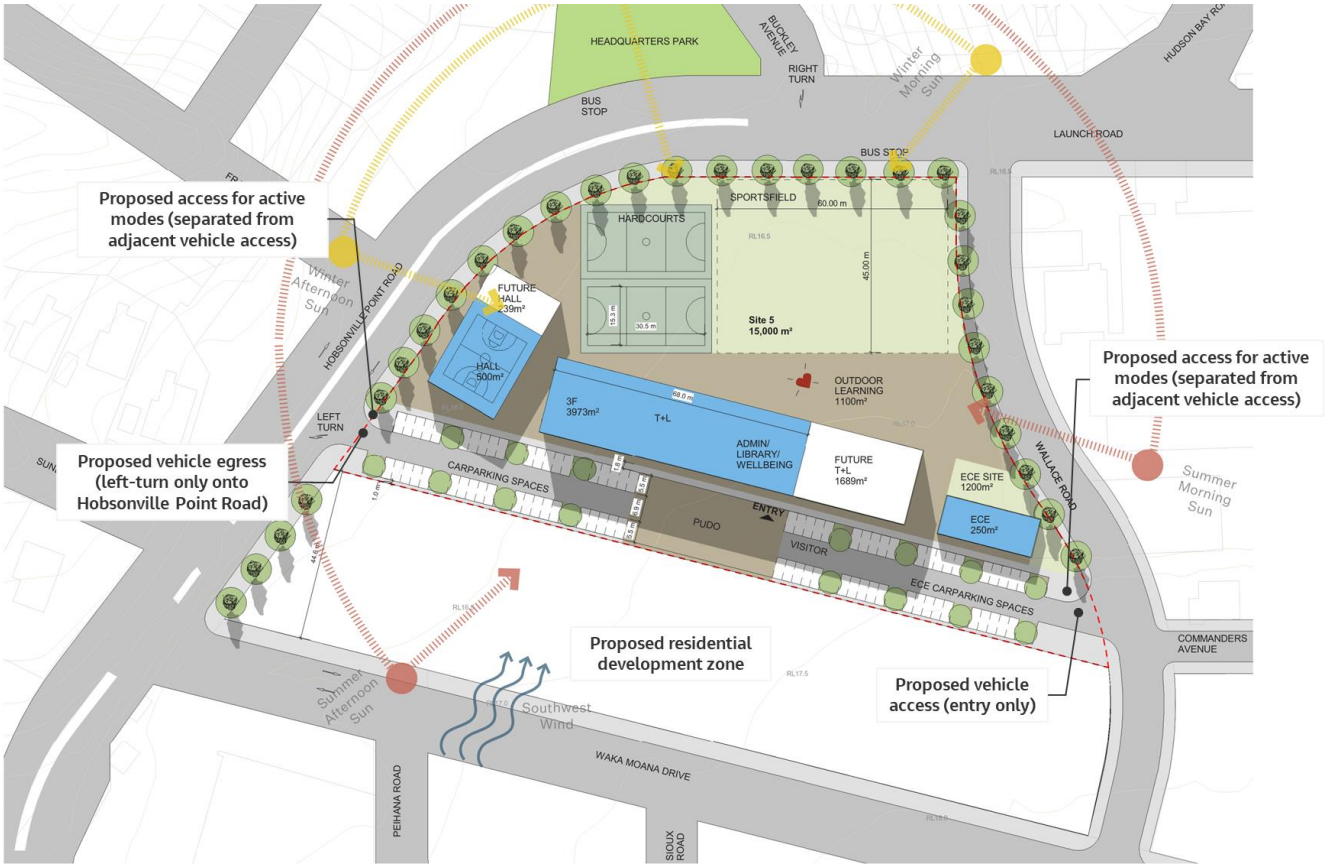


Figure 4-1 Hobsonville School and ECE bulk and siting study[13] showing proposed vehicle access/egress arrangements and access for active modes

4.2 Traffic generation

4.2.1 Existing site activity

A small show-home/information centre for the 'Airfields Quarters' development is currently occupying a small area of the site near the southern boundary of the mega lot (adjacent to the Hobsonville Point Road/Waka Moana Drive intersection). The northern area of the mega lot that has been purchased for the school and ECE is a greenfield site and is currently unoccupied. Overall, the existing land uses are likely to generate very few vehicle trips to and from the site.

4.2.2 Estimated trip generation and mode share

Annual school travel survey data for 2021 was requested from Auckland Transport's Community Transport team[14] to assess the likely and realistic proportion of students travelling to school by private vehicle and active/non-private vehicle modes. The schools requested included Hobsonville Point Primary School, Stonefields School and Whenuapai School located in Auckland. These schools were considered to be similar to the proposed Hobsonville Point School in terms of location and development context, with high-density residential developments in close proximity to the school and a focus on providing an integrated, sustainable transport

[13] Jasmax (2021) *Hobsonville School Bulk + Location Siting Study*
[14] Auckland Transport's Community Transport team was given permission by each of the school Principals to use this data for the purposes of developing this ITA

network. It is noted that the school zone catchment area for Hobsonville Point Primary School currently covers the catchment zone of the proposed school.

Stonefields School was considered the most similar to the proposed school development in terms of catchment size, therefore the surveyed mode share percentages have been adopted for the proposed primary school to estimate trip generation.

The annual travel survey results for 2021 for the AM and PM peak periods are summarised in Table 4-1 and shown in Figure 4-2, Figure 4-3 and Figure 4-4.

Table 4-1 Annual 2021 travel survey results for Auckland primary schools

Transport mode	Hobsonville Point Primary School		Whenuapai School		Stonefields School	
	AM - to school	PM - from school	AM - to school	PM - from school	AM - to school	PM - from school
Walking	15%	1%	22%	21%	30%	32%
Walking School Bus	0%	0%	0%	2%	2%	1%
Car/walk (400m)	14%	12%	0%	3%	8%	6%
Cycle	8%	7%	5%	6%	3%	4%
Scooter	2%	2%	2%	2%	5%	4%
Bus	11%	5%	3%	4%	0%	0%
Family car	59%	54%	64%	58%	51%	51%
Friend's car	1%	2%	3%	3%	1%	1%

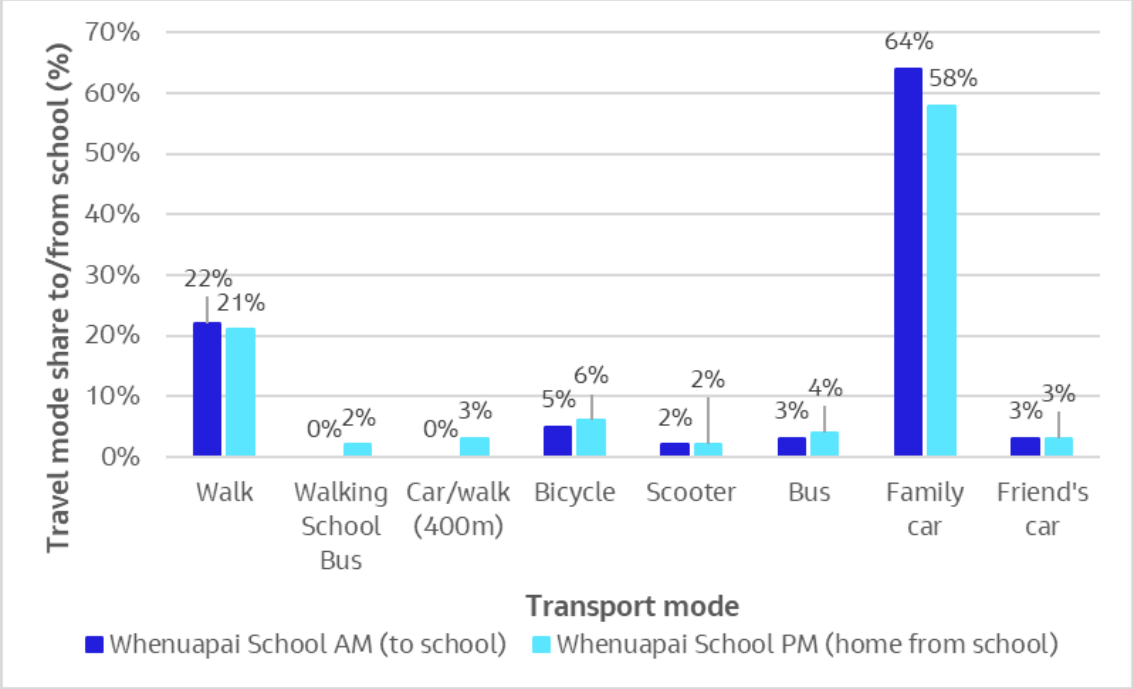


Figure 4-2 Annual travel survey data for 2021 - Whenuapai School

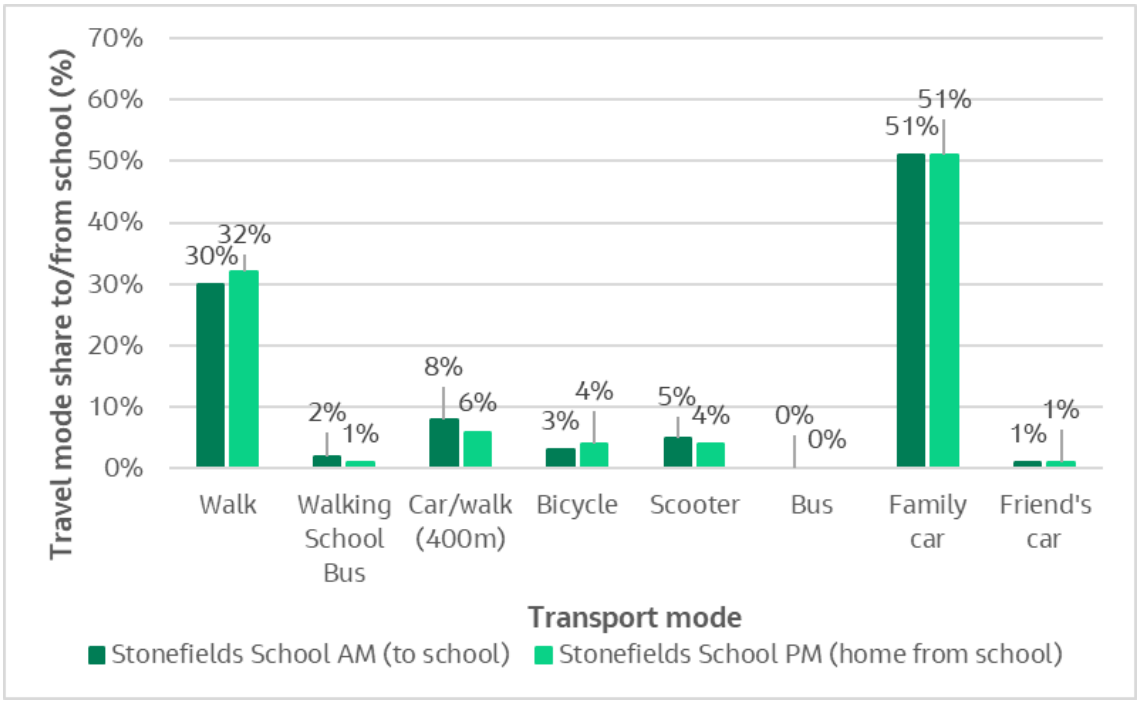


Figure 4-3 Annual travel survey data for 2021 - Stonefields School

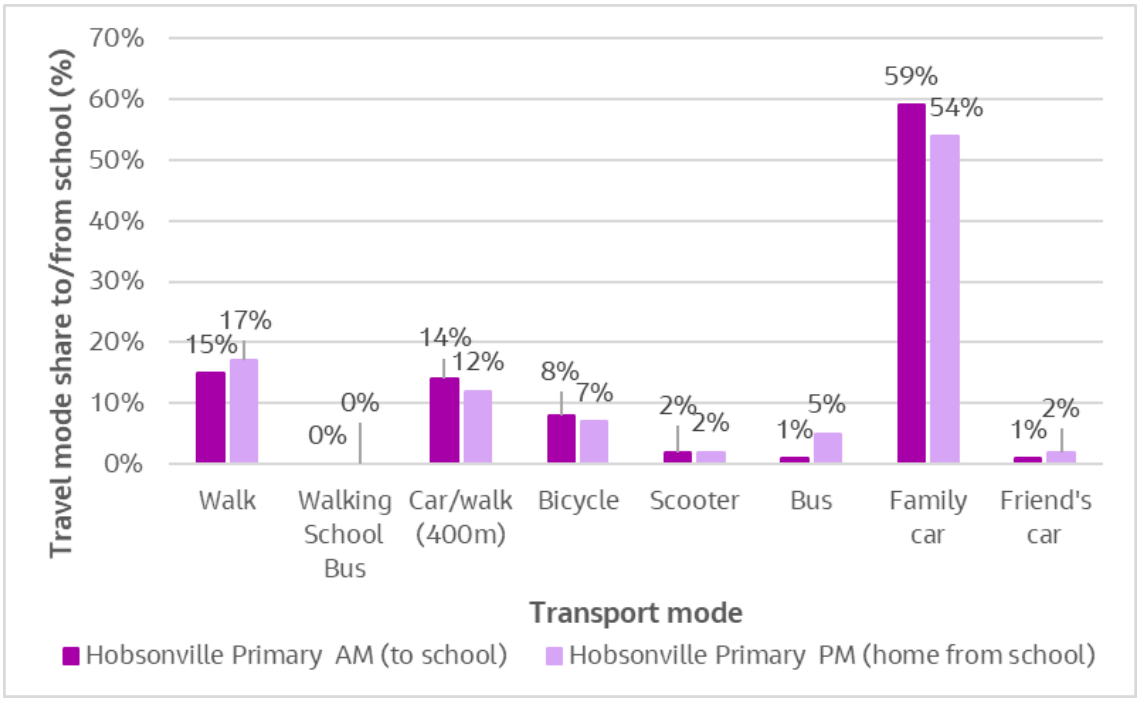


Figure 4-4 Annual travel survey data for 2021 - Hobsonville Primary School

Based on 2013 Census data for the Upper Harbour Local Board Area, approximately 77% of the population working within the 'education and training' ANZSIC06 industry division drove to work, 5% used public transport as their main means of travel to work and 4% walked or cycled. Approximately 14% of the industry population did not work that day or worked from home.

Based on Waka Kotahi NZ Transport Agency's *Research Report 467*: *National travel profiles part B - trips, trends and travel prediction*, the predominant mode of travel for preschool education-based trips for the Auckland region was by private vehicle which accounted for 80% of trips. Trips by active modes accounted for 17% and 2% of trips were made using public transport.

The desired future mode share outcomes for the school seek to have high percentages of staff and students travelling to school by non-private vehicle modes. It is considered that staff members are more likely to travel to the school or ECE by private vehicle as they will not necessarily live within the school catchment zone. Given the location of the school site, it is considered reasonable to assume that a higher active mode share for students could be achieved and that the private vehicle mode share could indeed be lower than used in this assessment. However, the mode share figures summarised in Table 4-1 for students and staff members have been adopted as a conservative estimate and are based on actual survey data.

Table 4-2 Mode share for main means of travel to school for students and staff members

Students	Private vehicle	Public transport	Active modes	Other
Primary school students	52%	0%	48%	0%
ECE children[15]	80%	2%	17%	1%
Primary school and ECE staff	77%	5%	4%	14%

It is assumed that each vehicle that drives children to the primary school and ECE has an average student/child occupancy of 1.2 in the AM peak[16] and 1.4 for the PM peak[17]. It is assumed that the vehicle occupancy for staff travelling to work is 1.0 for both peak periods. It is also noted that some of these trips may be linked, so the number of trips could be slightly less. Based on these assumptions, the numbers of vehicle trips generated by the school and ECE by students and staff during the AM and PM peaks are summarised in Table 4-3 and Table 4-4 respectively.

Table 4-3 Estimated trip generation for the masterplan primary school and ECE scenario – AM peak

Trip generation	Primary school students	ECE children	School/ECE staff
Number of students/children/staff	1,000 students	50 children	66 staff members
Estimated private vehicle %	51%	80%	77%
Car occupancy factor (AM peak)	1.2	1.2	1.0
AM peak trips in (in only, 50/50 split)	425 trips	33 trips	N/A
AM peak trips out (out only, 50/50 split)	425 trips	33 trips	N/A
AM peak trips in and out (in and out total, 50/50 split)	850 trips	67 trips	N/A
AM peak trips in (100% in only)	N/A	N/A	51 trips

Table 4-4 Estimated trip generation for the masterplan primary school and ECE scenario – PM peak

Trip generation	Primary school students	ECE children	School/ECE staff
Number of students/children/staff	1,000 students	50 children	66 staff members

[15] Abley Transportation Consultants Limited (2011) *NZ Transport Agency research report 467*: *National travel profiles part B - trips, trends and travel prediction* (site accessed on 06 August 2021 at https://www.nzta.govt.nz/assets/resources/research/reports/467/docs/467.pdf)
[16] Abley Transportation Consultants Limited (2011) *NZ Transport Agency research report 453*: *Trips and parking related to land use* (site accessed on 06 August 2021 at https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/unitary-plan/history-unitary-plan/docs339trafficincentres/Appendix-3.39.1.pdf)
[17] Abley Transportation Consultants Limited (2011) *NZ Transport Agency research report 453*: *Trips and parking related to land use* (site accessed on 06 August 2021 at https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/unitary-plan/history-unitary-plan/docs339trafficincentres/Appendix-3.39.1.pdf)

Trip generation	Primary school students	ECE children	School/ECE staff
Estimated private vehicle %	51%	80%	77%
Car occupancy factor (AM peak)	1.4	1.4	1.0
PM peak trips in (in only, 50/50 split)	364 trips	29 trips	N/A
PM peak trips out (out only, 50/50 split)	364 trips	29 trips	N/A
PM peak trips in and out (in and out total, 50/50 split)	729 trips	57 trips	N/A
PM peak trips out (100% out only)	N/A	N/A	51 trips

4.2.3 Predicted trip distribution

No traffic counts are available on existing roads in the vicinity of the school site as the study area is still under development, and existing traffic models do not provide sufficient detail to use for assessing existing or forecast traffic. Modelling outputs from the Macro Strategic Model (MSM) were provided by AFC for existing traffic volumes for the 2018 base year on main roads within the study area. Panuku Development's most recent residential development plan was then used to estimate future traffic volumes on the network generated by proposed houses/units/apartments for the future model year. The trip destinations and routes have been assumed based on local knowledge and context such as the ferry timetable/frequency and location of nearby amenities.

The trips generated by the school and ECE (as estimated in section 4.2.2), were divided between the precincts proportionally to the number of proposed units within each development precinct. The peak AM and PM trips to and from the school and ECE were proportioned and distributed across the network based on this population distribution. It was assumed that residents would take the most direct route to the site and this was factored into the distribution assumptions. The assumed trip distribution and traffic volumes generated by the school, along with background traffic, during the AM and PM peak hours for the three intersections adjacent to the school are shown in Figure 4-5 to Figure 4-10.

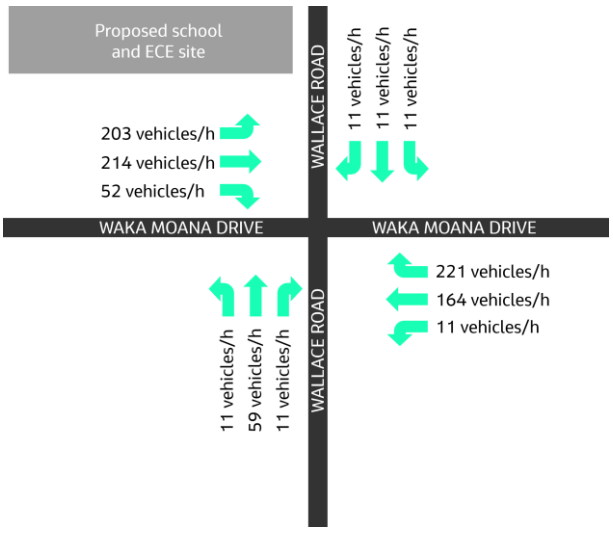


Figure 4-5 Wallace Road/Waka Moana Drive intersection trips distribution for the AM peak

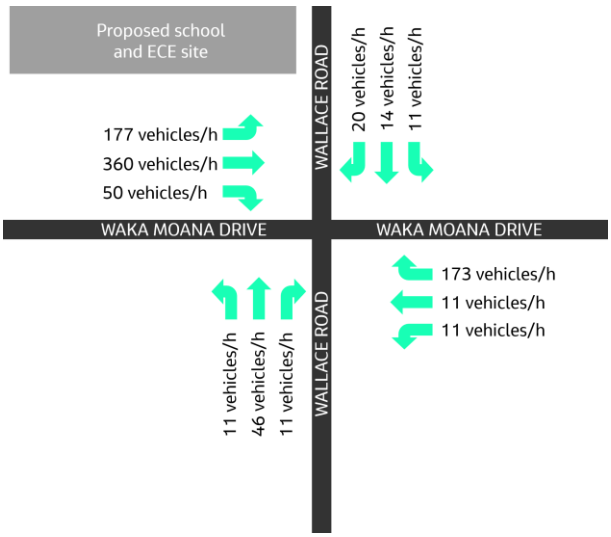


Figure 4-6 Wallace Road/ Waka Moana Drive intersection trips distribution for the PM peak

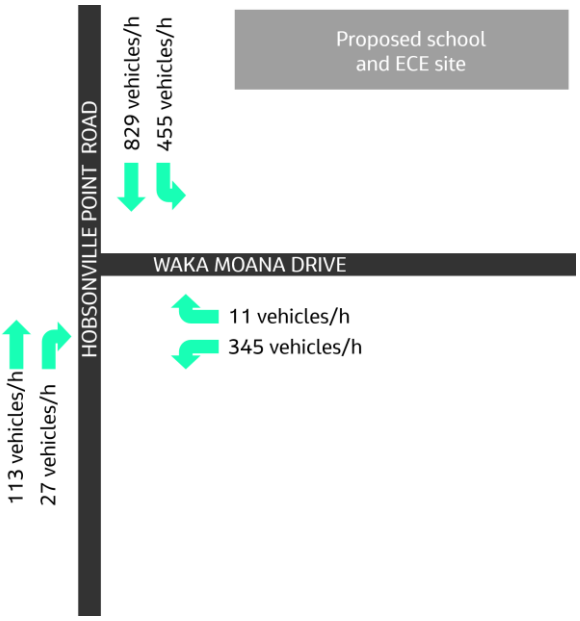


Figure 4-7 Hobsonville Point Road/Waka Moana Drive intersection trips distribution for the AM peak

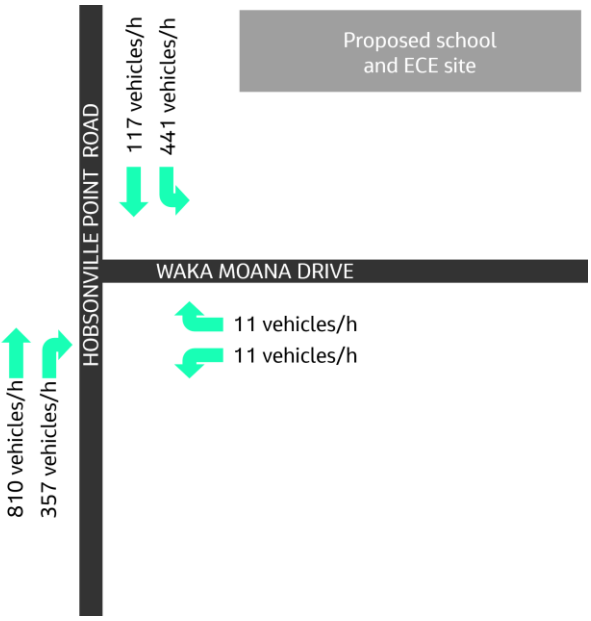


Figure 4-8 Hobsonville Point Road/Waka Moana Drive intersection trips distribution for the PM peak

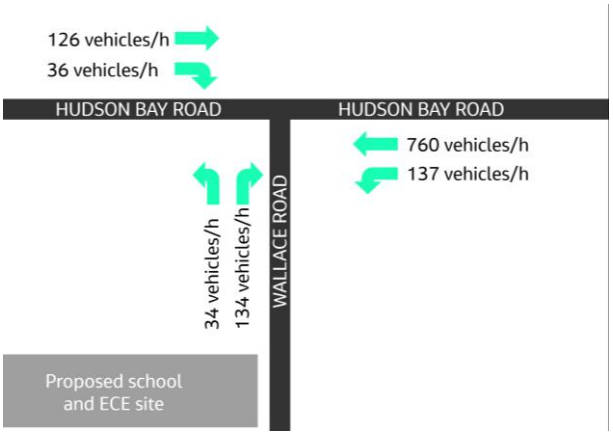


Figure 4-9 Hudson Bay Road/Wallace Road intersection trips distribution for the AM peak

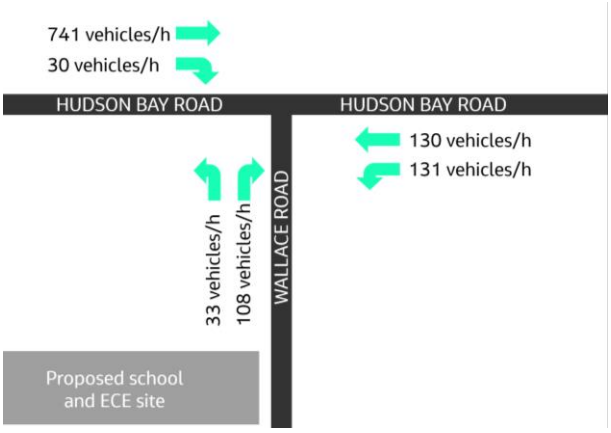


Figure 4-10 Hudson Bay Road/Wallace Road intersection trips distribution for the PM peak

5. Assessment of transportation effects

This section outlines the assessment of transportation effects and assessment of the proposal against relevant standards within Chapter E27 of the AUP(OP), addressing the following:

- provisions for public transport, walking and cycling facilities (refer to section 5.4)
- location, number and design of parking, loading and site access (refer to sections 5.5 and 5.6)
- provisions for public transport (refer to section 5.7)
- management of the effects of high trip-generating activities (refer to section 5.8).

5.1 Road network effects

Previous engagement with Auckland Transport and Auckland Council during the previous site evaluation phase indicates that there is a general preference to align with the Precinct Plan in order to provide a consistent planning approach across the wider Hobsonville Point Precinct.

As noted in section 3.1, the proposed school and ECE development does not completely align with the future road network outlined in the *Hobsonville Point Precinct Plan 2 - Hobsonville Point features plan*[18], which proposes to extend Peihana Road to the north. The function of this indicative future road would likely be to provide Local Road access to properties located in the land zoned for high-density residential terrace housing and apartment buildings, rather than providing vehicle access to properties directly from Hobsonville Point Road (which is classified as a Collector Road). By replacing the residential terrace housing and apartment buildings with the proposed school and ECE development, this indicative road alignment is considered to no longer serve the function for which it was intended. The southern section of the mega lot parcel is to be retained for residential development and the way in which the mega lot has been divided ensures that both sections have sufficient frontage to local roads.

The road network effects of removing the indicative future local road proposed by *Precinct Plan 2* are considered to be negligible.

[18] Auckland Council (2016) *Auckland Unitary Plan Operative in Part - I605 Hobsonville Point Precinct Plan* (site accessed on 03 August 2021 at https://unitaryplan.aucklandcouncil.govt.nz/Images/Auckland%20Unitary%20Plan%20Operative/Chapter%20I%20Precincts/6.%20West/I605%20Hobsonville%20Point%20Precinct.pdf)

Figure 5-1 Indicative future road alignment proposed by Precinct Plan 2[19]

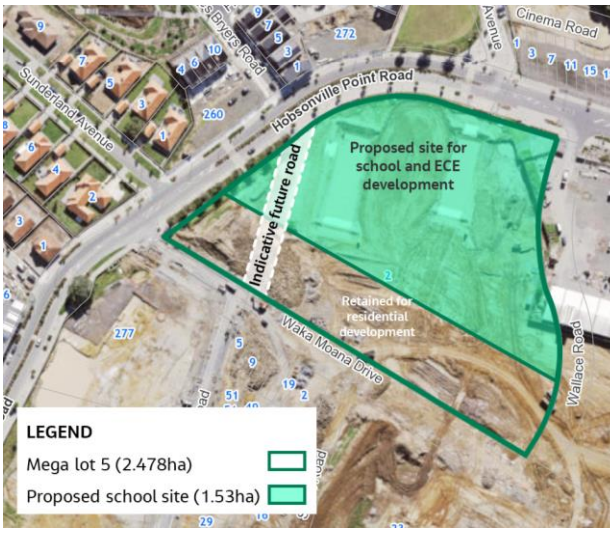


Figure 5-2 Indicative future road alignment in relation to the proposed school and ECE site

5.2 Operational traffic effects

A new school in this location will generate additional traffic, pedestrians and cyclists, during the school peak hours within the surrounding road network (compared to the existing uses within the site). All students within the catchment zone for the school and ECE will live within approximately 1.5km of the site and as such, walking to school is likely to be feasible for a large proportion of students. This has the potential to reduce school-related vehicular trips, traffic impacts and parking requirements.

5.2.1 Operational traffic intersection modelling

Intersection modelling was undertaken using SIDRA INTERSECTION (Version 9) for the following intersections surrounding the school site:

- Hobsonville Point Road/Waka Moana Drive intersection
- Waka Moana Drive/Wallace Road intersection
- Wallace Road/Hudson Bay Road intersection.

Two traffic scenarios have been modelled including the 'future base traffic' scenario and a future-year scenario at a time when the full school and ECE masterplan rolls are achieved. The future 'masterplan scenario' was modelled as it is the most conservative; representing the highest possible number of trips generated by the school and ECE. The trip generation and distribution assumptions outlined in section 4.2.2 and 4.2.3 were incorporated into the future masterplan modelling scenario.

Existing models within the study area are not at a sufficient level of detail to use for assessing current or future traffic; however, traffic volumes on the strategic road network from the MSM were provided by AFC for the current 2018 and future 2030 modelled years. It should be noted that the SIDRA models have not been calibrated to observed queue lengths to provide outputs that are reflective of actual traffic conditions on the

[19] Auckland Council (2016) *Auckland Unitary Plan Operative in Part - I605 Hobsonville Point Precinct Plan* (site accessed on 03 August 2021 at https://unitaryplan.aucklandcouncil.govt.nz/Images/Auckland%20Unitary%20Plan%20Operative/Chapter%20I%20Precincts/6.%20West/I605%20Hobsonville%20Point%20Precinct.pdf)

road network. A number of roads located around the school are currently closed to traffic with adjacent residential development under construction. For this reason, it is considered that observed traffic conditions would not be representative of the future base scenario (once surrounding residential development has been completed).

As noted in section 4.2, the future background traffic volumes for the AM and PM peak periods on the road network were estimated based on Panuku Development's development plan for the various precincts within Hobsonville Point and applying trip generation rates. A trip generation rate of 3.9 trips per day per household[20] was assumed to estimate background traffic volumes within the study area and peak hour traffic routing pattern assumptions informed the distribution of traffic across the local road network. The estimated traffic volumes were then compared to the modelled 2018 and 2030 traffic volumes for the AM and PM peak periods to benchmark the estimated traffic volumes across the network to MSM-modelled data.

For the purposes of traffic modelling, it has been assumed that the AM peak school traffic volumes would coincide with peak AM traffic volumes across the wider network. It is likely that the afternoon school peak traffic would be generated earlier than the wider network PM peak; however, the afternoon school traffic has been modelled to coincide with the wider network peak as a conservative estimate.

The key modelling findings are summarised in the following sections and the main performance parameters include 95th percentile queue lengths, average delay and level of service (LOS). Refer to the *ITA Traffic Modelling Memorandum* attached in Appendix F for further details on modelling assumptions, results and recommendations based on intersection modelling results.

5.2.1.1 Hobsonville Point Road/Waka Moana Drive intersection

The results for the Hobsonville Point Road/Waka Moana Drive intersection for the modelled AM and PM peak periods are summarised in Table 5-1 and Table 5-2, respectively.

The intersection is priority-controlled with Waka Moana Drive traffic required to give way to Hobsonville Point Road traffic. Modelling indicates that with the proposed school, maximum queue lengths of approximately 44m occur during the AM peak along Waka Moana Drive. This queue length does not block Peihana Road and this traffic has a delay of approximately 50s. Overall the intersection is modelled to operate with a LOS C for both scenarios in the AM peak.

Waka Moana Drive traffic turning right onto Hobsonville Point Road has a similar delay during the PM peak. Overall, the intersection operates at a LOS A for both modelled scenarios during the PM peak; however, it is noted that school traffic would likely occur outside of the wider network PM peak and modelling represents the 'worst case' scenario.

Modelling results indicate that the intersection will operate well with the additional traffic volumes generated by the school with spare capacity. Other than the minor queuing and delay mentioned above during the school peak, there is no significant increase to 95th percentile queue lengths, average delay or level of service (LOS) for the Hobsonville Point Road/Waka Moana Drive intersection as a result of the additional traffic from the school development.

[20] Waka Kotahi NZ Transport Agency (2011) *Research Report 453: Trips and Parking Related to Land Use* (site accessed on 03 August 2021 at https://www.nzta.govt.nz/assets/resources/research/reports/453/docs/453.pdf (Survey of Christchurch inner city apartments (pre-earthquake, 2000) found a trip rate of 3.9 vehicle trips/day. The report also provided a trip rate of 9.5 trips per day per household for inner-city suburbs in Auckland, but this trip rate was considered too high for Hobsonville based on local knowledge)

5.2.1.2 Wallace Road/Hudson Bay Road intersection

The results for the Hudson Bay Road/Wallace Road intersection for the modelled AM and PM peak periods are summarised in Table 5-3 and Table 5-4, respectively.

The modelling results indicate that the intersection would operate at LOS A overall with the addition of school traffic in both peak periods. Modelling results indicate that the intersection will operate well with the additional traffic volumes generated by the school with spare capacity. There is no significant increase to 95th percentile queue lengths, average delay or level of service (LOS) for the Wallace Road/Hudson Bay Road intersection as a result of the additional traffic from the school development.

5.2.1.3 Waka Moana Drive/Wallace Road intersection

The results for the Waka Moana Drive/Wallace Road intersection for the modelled AM and PM peak periods are summarised in Table 5-5 and Table 5-6, respectively.

The modelling results indicate that the intersection would operate at LOS A overall, even with the addition of school traffic for both peak periods. There is sufficient capacity to allow for the additional traffic without significantly increasing delays on any approach.

Modelling results indicate that the intersection will operate well with the additional traffic volumes generated by the school with spare capacity. There is no significant increase to 95th percentile queue lengths, average delay or level of service (LOS) for the Waka Moana Drive/Wallace Road intersection as a result of the additional traffic from the school development.

5.2.2 Operational traffic modelling sensitivity testing

Based on review comments and feedback received from Auckland Transport, further SIDRA intersection modelling was undertaken assuming a higher trip rate of 6.5 trips per day per household.

The use of a higher trip rate was undertaken as a sensitivity test as it is considered to represent a very conservative traffic modelling scenario. This corresponds to the New South Wales Roads and Traffic Authority (RTA) 2002 *Guide to Traffic Generating Developments*[21] traffic generation rate for a 'medium density residential flat building'. All other modelling assumptions (including vehicle routing patterns, peak hour factors and intersection layouts), remained the same for the purposes of sensitivity testing.

5.2.2.1 Hobsonville Point Road/Waka Moana Drive

Modelling results for the sensitivity testing analysis indicates that the higher trip rate will have a significant impact on the performance of the Hobsonville Point Road/Waka Moana Drive intersection under the Base scenario conditions. The increased background traffic volumes on Hobsonville Point Road result in significant delays for traffic exiting Waka Moana Drive and this approach operates over capacity during the AM peak. Overall, the intersection operates at a LOS F during the AM peak prior to the addition of school-related traffic. The congestion that is forming under the Base scenario is exacerbated with the addition of school traffic, resulting in significant queuing developing along Waka Moana Drive and Hobsonville Point Road with the intersection operating at an overall LOS F.

[21] New South Wales Roads and Traffic Authority (2002) *Guide to Traffic Generating Developments Version 2.2*

The intersection operates at an overall LOS A during the PM Base scenario and a LOS C with the addition of school traffic. The Waka Moana Drive approach is approaching capacity under the Base modelling scenario but operates over capacity with school traffic added.

5.2.2.2 Wallace Road/Hudson Bay Road intersection

The higher trip rate results in higher traffic volumes on Hobsonville Point Road, making it difficult to turn from Wallace Road. Under the Base scenario, this approach has over one minute delay and a LOS F during the AM peak period. With school traffic added, the queue would increase significantly, with a maximum queue of 600m. During the PM peak, the addition of school traffic is modelled to result in 260m queue lengths in the PM peak and significant delays on the Wallace Road approach.

5.2.2.3 Waka Moana Drive/Wallace Road intersection

The modelling results indicate that the intersection would operate at LOS A overall during the AM and PM peak periods, even with the higher trip rate. There is sufficient capacity to allow for the additional background traffic and trips generated by the school without significantly increasing delays on any approach.

5.2.3 Operational traffic modelling summary

The lower trip rate of 3.9 trips per day per household is considered appropriate within the context of Hobsonville Point. Traffic modelling adopting this rate is considered a conservative scenario as school-related trips were modelled in addition to the wider network peak traffic volumes whereas in reality, the network peak periods are likely to occur outside of school peak times. Due to the distance from the city centre, the AM network peak is likely to be earlier than the estimated 8:00am - 9:00am school morning peak and the PM network peak is likely to occur later than the 2:30pm - 3:30pm school afternoon peak.

In summary, the trips generated by the school and ECE have resulted in additional traffic flows on the network relative to the existing use of the site and contributed to minor increases in queue lengths, delays and LOS for the surrounding intersections. Based on the modelling results, it is concluded that all intersections will have the spare capacity to accommodate the increased traffic volumes generated by the proposal, noting that these traffic volumes have been analysed as a 'worst case' or conservative scenario.

On this basis, the traffic impacts resulting from the proposed school and ECE development are considered to be no more than minor.

Table 5-1 Traffic modelling results for the Hobsonville Point Road/Waka Moana Drive intersection - AM peak

Approach	Direction	Base future year modelling scenario				Future year scenario + masterplan school and ECE roll			
		Volume	Degree of saturation	Average delay	Max queue	Volume	Degree of saturation	Average delay	Max queue
Hobsonville Point Road (south approach)	Through	113 veh/h	0.06 (LOS A)	0 seconds (LOS A)	0.0m	113 veh/h	0.06 (LOS A)	0 seconds (LOS A)	0m
	Right	11 veh/h	0.02 (LOS A)	11 seconds (LOS B)	0.6m	27 veh/h	0.19 (LOS A)	30 seconds (LOS D)	4.2m
Waka Moana Drive (east approach)	Left	345 veh/h	0.76 (LOS C)	20 seconds (LOS C)	40.1m	345 veh/h	0.81 (LOS C)	23 seconds (LOS C)	47.1m
	Right	11 veh/h	0.76 (LOS C)	34 seconds (LOS D)	40.1m	11 veh/h	0.81 (LOS C)	59 seconds (LOS F)	47.1m
Hobsonville Point Road (north approach)	Left	11 veh/h	0.47 (LOS A)	5 seconds (LOS A)	0.0m	455 veh/h	0.72 (LOS C)	5 seconds (LOS A)	0.0m
	Through	829 veh/h	0.47 (LOS A)	0 seconds (LOS A)	0.0m	829 veh/h	0.72 (LOS C)	0 seconds (LOS A)	0.0m
Intersection total	**N/A**	**1320 veh/h**	**0.76 (LOS C)**	**6 seconds (LOS A)**	**40.1m**	**1780 veh/h**	**0.81 (LOS C)**	**7 seconds (LOS A)**	**47.1m**

Table 5-2 Traffic modelling results for the Hobsonville Point Road/Waka Moana Drive intersection - PM peak

Approach	Direction	Base future year modelling scenario				Future year scenario + masterplan school and ECE roll			
		Volume	Degree of saturation	Average delay	Max queue	Volume	Degree of saturation	Average delay	Max queue
Hobsonville Point Road (south approach)	Through	810 veh/h	0.46 (LOS A)	0 seconds (LOS A)	0.0m	810 veh/h	0.46 (LOS A)	0 seconds (LOS A)	0.0m
	Right	345 veh/h	0.24 (LOS A)	5 seconds (LOS A)	9.1m	357 veh/h	0.41 (LOS A)	9 seconds (LOS A)	18.2m
Waka Moana Drive (east approach)	Left	11 veh/h	0.11 (LOS A)	5 seconds (LOS A)	2.5m	11 veh/h	0.16 (LOS A)	5 seconds (LOS A)	3.5m
	Right	11 veh/h	0.11 (LOS A)	35 seconds (LOS D)	2.5m	11 veh/h	0.16 (LOS A)	51 seconds (LOS F)	3.5m
Hobsonville Point Road (north approach)	Left	11 veh/h	0.07 (LOS A)	5 seconds (LOS A)	0.0m	441 veh/h	0.32 (LOS A)	5 seconds (LOS A)	0.0m
	Through	117 veh/h	0.07 (LOS A)	0 seconds (LOS A)	0.0m	117 veh/h	0.32 (LOS A)	0 seconds (LOS A)	0.0m
Intersection total	**N/A**	**1305 veh/h**	**0.46 (LOS A)**	**2 seconds (LOS A)**	**9.1m**	**1747 veh/h**	**0.46 (LOS A)**	**3 seconds (LOS A)**	**18.2m**

Table 5-3 Traffic modelling results for the Hudson Bay Road/Wallace Road intersection - AM peak

Approach	Direction	Base future year modelling scenario				Future year scenario + masterplan school and ECE roll			
		Volume	Degree of saturation	Average delay	Max queue	Volume	Degree of saturation	Average delay	Max queue
Wallace Road (south approach)	Left	11 veh/h	0.16 (LOS A)	10 seconds (LOS A)	3.9m	34 veh/h	0.68 (LOS B)	20 seconds (LOS C)	25.2m
	Right	34 veh/h	0.16 (LOS A)	18 seconds (LOS C)	3.9m	134 veh/h	0.68 (LOS B)	33 seconds (LOS D)	25.2m
Hudson Bay Road (east approach)	Left	11 veh/h	0.43 (LOS A)	4 seconds (LOS A)	0.0m	137 veh/h	0.50 (LOS A)	4 seconds (LOS A)	0.0m
	Through	760 veh/h	0.43 (LOS A)	0 seconds (LOS A)	0.0m	760 veh/h	0.50 (LOS A)	0 seconds (LOS A)	0.0m
Hudson Bay Road (west approach)	Through	126 veh/h	0.07 (LOS A)	0 seconds (LOS A)	0.0m	126 veh/h	0.07 (LOS A)	0 seconds (LOS A)	0.0m
	Right	11 veh/h	0.02 (LOS A)	10 seconds (LOS A)	0.5m	36 veh/h	0.08 (LOS A)	11 seconds (LOS B)	2.0m
Intersection total	**N/A**	**953 veh/h**	**0.43 (LOS A)**	**1 second (LOS A)**	**3.9m**	**1227 veh/h**	**0.61 (LOS B)**	**5 seconds (LOS A)**	**25.2m**

Table 5-4 Traffic modelling results for the Hudson Bay Road/Wallace Road intersection - PM peak

Approach	Direction	Base future year modelling scenario				Future year scenario + masterplan school and ECE roll			
		Volume	Degree of saturation	Average delay	Max queue	Volume	Degree of saturation	Average delay	Max queue
Wallace Road (south approach)	Left	11 veh/h	0.05 (LOS A)	5 seconds (LOS A)	1.4m	33 veh/h	0.47 (LOS A)	9 seconds (LOS A)	15.7m
	Right	11 veh/h	0.05 (LOS A)	18 seconds (LOS C)	1.4m	108 veh/h	0.47 (LOS A)	24 seconds (LOS C)	15.7m
Hudson Bay Road (east approach)	Left	34 veh/h	0.09 (LOS A)	4 seconds (LOS A)	0.0m	131 veh/h	0.15 (LOS A)	4 seconds (LOS A)	0.0m
	Through	130 veh/h	0.09 (LOS A)	0 seconds (LOS A)	0.0m	130 veh/h	0.15 (LOS A)	0 seconds (LOS A)	0.0m
Hudson Bay Road (west approach)	Through	741 veh/h	0.42 (LOS A)	0 seconds (LOS A)	0.0m	741 veh/h	0.42 (LOS A)	0 seconds (LOS A)	0.0m
	Right	11 veh/h	0.01 (LOS A)	5 seconds (LOS A)	0.3m	30 veh/h	0.02 (LOS A)	6 seconds (LOS A)	0.7m
Intersection total	**N/A**	**938 veh/h**	**0.42 (LOS A)**	**1 second (LOS A)**	**1.4m**	**1173 veh/h**	**0.47 (LOS A)**	**3 seconds (LOS A)**	**15.7m**

Table 5-5 Traffic modelling results for the Waka Moana Drive/Wallace Road intersection - AM peak

Approach	Direction	Base future year modelling scenario				Future year scenario + masterplan school and ECE roll			
		Volume	Degree of saturation	Average delay	Max queue	Volume	Degree of saturation	Average delay	Max queue
Wallace Road (south approach)	Left	11 veh/h	0.02 (LOS A)	5 seconds (LOS A)	0.6m	11 veh/h	0.05 (LOS A)	5 seconds (LOS A)	0.6m
	Through	14 veh/h	0.02 (LOS A)	0 seconds (LOS A)	0.6m	59 veh/h	0.05 (LOS A)	0 seconds (LOS A)	0.6m
	Right	11 veh/h	0.02 (LOS A)	5 seconds (LOS A)	0.6m	11 veh/h	0.05 (LOS A)	5 seconds (LOS A)	0.6m
Waka Moana Drive (east approach)	Left	11 veh/h	0.16 (LOS A)	5 seconds (LOS A)	4.8m	11 veh/h	0.54 (LOS A)	6 seconds (LOS A)	27.8m
	Through	164 veh/h	0.16 (LOS A)	4 seconds (LOS A)	4.8m	164 veh/h	0.54 (LOS A)	5 seconds (LOS A)	27.8m
	Right	11 veh/h	0.16 (LOS A)	5 seconds (LOS A)	4.8m	221 veh/h	0.54 (LOS A)	12 seconds (LOS B)	27.8m
Wallace Road (north approach)	Left	11 veh/h	0.02 (LOS A)	5 seconds (LOS A)	0.5m	11 veh/h	0.02 (LOS A)	5 seconds (LOS A)	0.6m
	Through	11 veh/h	0.02 (LOS A)	0 seconds (LOS A)	0.5m	11 veh/h	0.02 (LOS A)	0 seconds (LOS A)	0.6m
	Right	11 veh/h	0.02 (LOS A)	5 seconds (LOS A)	0.5m	11 veh/h	0.02 (LOS A)	5 seconds (LOS A)	0.6m
Waka Moana Drive (west approach)	Left	20 veh/h	0.04 (LOS A)	5 seconds (LOS A)	1.0m	203 veh/h	0.39 (LOS A)	5 seconds (LOS A)	14.4m
	Through	11 veh/h	0.04 (LOS A)	4 seconds (LOS A)	1.0m	214 veh/h	0.39 (LOS A)	4 seconds (LOS A)	14.4m
	Right	11 veh/h	0.04 (LOS A)	6 seconds (LOS A)	1.0m	52 veh/h	0.39 (LOS A)	7 seconds (LOS A)	14.4m
Intersection total	**N/A**	**297 veh/h**	**0.16 (LOS A)**	**4 seconds (LOS A)**	**4.8m**	**979 veh/h**	**0.54 (LOS A)**	**6 seconds (LOS A)**	**27.8m**

Table 5-6 Traffic modelling results for the Waka Moana Drive/Wallace Road intersection - PM peak

Approach	Direction	Base future year modelling scenario				Future year scenario + masterplan school and ECE roll			
		Volume	Degree of saturation	Average delay	Max queue	Volume	Degree of saturation	Average delay	Max queue
Wallace Road (south approach)	Left	11 veh/h	0.02 (LOS A)	5 seconds (LOS A)	0.5m	11 veh/h	0.04 (LOS A)	5 seconds (LOS A)	0.6m
	Through	11 veh/h	0.02 (LOS A)	0 seconds (LOS A)	0.5m	46 veh/h	0.04 (LOS A)	0 seconds (LOS A)	0.6m
	Right	11 veh/h	0.02 (LOS A)	5 seconds (LOS A)	0.5m	11 veh/h	0.04 (LOS A)	5 seconds (LOS A)	0.6m
Waka Moana Drive (east approach)	Left	11 veh/h	0.03 (LOS A)	5 seconds (LOS A)	0.8m	11 veh/h	0.32 (LOS A)	6 seconds (LOS A)	12.3m
	Through	11 veh/h	0.03 (LOS A)	4 seconds (LOS A)	0.8m	11 veh/h	0.32 (LOS A)	5 seconds (LOS A)	12.3m
	Right	11 veh/h	0.03 (LOS A)	6 seconds (LOS A)	0.8m	173 veh/h	0.32 (LOS A)	12 seconds (LOS B)	12.3m
Wallace Road (north approach)	Left	11 veh/h	0.03 (LOS A)	5 seconds (LOS A)	0.8m	11 veh/h	0.03 (LOS A)	5 seconds (LOS A)	0.8m
	Through	14 veh/h	0.03 (LOS A)	0 seconds (LOS A)	0.8m	14 veh/h	0.03 (LOS A)	0 seconds (LOS A)	0.8m

Approach	Direction	Base future year modelling scenario				Future year scenario + masterplan school and ECE roll			
		Volume	Degree of saturation	Average delay	Max queue	Volume	Degree of saturation	Average delay	Max queue
	Right	20 veh/h	0.03 (LOS A)	5 seconds (LOS A)	0.8m	20 veh/h	0.03 (LOS A)	5 seconds (LOS A)	0.8m
Waka Moana Drive (west approach)	Left	11 veh/h	0.16 (LOS A)	5 seconds (LOS A)	4.8m	177 veh/h	0.49 (LOS A)	5 seconds (LOS A)	21.1m
	Through	164 veh/h	0.16 (LOS A)	4 seconds (LOS A)	4.8m	360 veh/h	0.49 (LOS A)	4 seconds (LOS A)	21.1m
	Right	11 veh/h	0.16 (LOS A)	5 seconds (LOS A)	4.8m	50 veh/h	0.49 (LOS A)	6 seconds (LOS A)	21.1m
Intersection total	**N/A**	**297 veh/h**	**0.16 (LOS A)**	**4 seconds (LOS A)**	**4.8m**	**895 veh/h**	**0.49 (LOS A)**	**6 seconds (LOS A)**	**21.1m**

5.3 Construction traffic effects

Traffic generated by the construction of the school and ECE development will be mitigated as Auckland Transport requires the implementation of a *Construction Traffic Management Plan* (CTMP) during the construction phase. All construction-related traffic movements to and from the site would need to adhere to the performance and/or control standards that would be prescribed in the CTMP as a binding document. The CTMP should also consider maintaining safe access for pedestrian and cyclist during the construction period.

It is assumed that the expected construction traffic volumes to and from the site will be much lower than the operational traffic that is estimated to be generated by the site. As the construction traffic volumes are less than the predicted volumes anticipated to use the site during normal operations, it is assessed that the effects of the construction traffic can be easily controlled and supported (subject to the implementation of sound traffic management controls).

5.4 Active modes effects

The school site is well-located within the existing and developing residential catchment to encourage walking and cycling and maximise accessibility of the site by active modes. No part of the student catchment zone is expected to be more than a 1.5km walking distance from the school which is approximately a 20-minute walk and considered an acceptable walking distance for school-aged children. Much of the proposed catchment will be in mid to high-density blocks located even closer to the school.

The school and ECE concept design have been developed to be consistent with the future cycle routes set out in the *Hobsonville Point Precinct Plan 2 - Hobsonville Point features plan*[22] and as shown in Figure 3-7. The features plan proposes an indicative cycle route along Hobsonville Point Road which has been constructed in the form of an on-street cycle facility. This cycling facility may be appropriate for older, more confident students and/or school and ECE staff members to cycle to school but not appropriate for younger or less confident cyclists due to the lack of physical separation between the cycle lane and the traffic lane. However, less confident and younger school students or children attending the ECE are able to cycle or scooter to school on the footpath.

Although residential developments have not yet been constructed, the road network surrounding the school and ECE site has largely been completed, including the construction of the road carriageway, footpaths and pedestrian facilities, drainage, rain gardens/planting and parallel parking spaces. It is considered that while desirable, opportunities to retrofit the road carriageway to provide a safe, separated cycling facility that is suitable for school-aged children are limited at this stage of development of the area. Facilities for active modes have not yet been constructed along the north side of Waka Moana Road, to the south of the school site. The balance of the mega lot land parcel directly adjacent to Waka Moana Drive (refer to Figure 2-3), is understood to be developed as residential buildings. Delivering a safe and separated cycling facility may require consultation and negotiations between Auckland Council, Auckland Transport, Panuku Development and/or private developers.

Wide footpaths have been constructed along Hobsonville Point Road and there is sufficient space to provide safe pedestrian facilities along the remaining surrounding road frontages as development progresses. These facilities provide a high level of connectivity between the site and surrounding residential and commercial areas.

An existing pedestrian crossing on Hobsonville Point Road provides access to the site at the western boundary and a crossing over Hudson Bay Road providing access to the northern boundary of the site. These crossings are

[22] Auckland Council (2016) *Auckland Unitary Plan Operative in Part - I605 Hobsonville Point Precinct Plan* (site accessed on 03 August 2021 at https://unitaryplan.aucklandcouncil.govt.nz/Images/Auckland%20Unitary%20Plan%20Operative/Chapter%20I%20Precincts/6.%20West/I605%20Hobsonville%20Point%20Precinct.pdf)

not marked as zebra crossings and pedestrians are required to give way to vehicles. Pram ramps and tactile indicators are provided and both crossings include a refuge area to cross the road in two stages. The crossings use different paving materials to delineate the pedestrian area and align with the urban design principles of the area.

It is considered that these courtesy crossings are not appropriate for all ages and abilities, and it is recommended that signalising the Hobsonville Point Road crossing should be considered by Auckland Transport as the crossing will be located near one of the proposed pedestrian/cyclist access points to the school (refer to Figure 4-1 in section 4.1 for the proposed locations of accessways for active modes).

A zebra crossing on Wallace Road is recommended which should be located opposite any future main pedestrian access and desire line to the school. This type of facility is considered appropriate as pedestrian demands on this crossing will likely be linked to the school start and finish times, with lower levels of demand outside of the periods. It is also recommended that a 'Kea crossing' or temporary school patrol pedestrian crossing (refer to Figure 5-3), is implemented.

Providing pedestrian crossings to support safe access to the school and ECE are strongly supported and new crossings located on roads adjoining the school are considered to be directly linked to the proposed development of the site. It is considered that new marked crossing facilities and safety improvements located further from the school within the surrounding road network will be of benefit to the wider community; however, these improvements may not be reasonably linked to the school development and responsibility of the Ministry of Education.

Overall, it is considered that the school is well placed to achieve high numbers of students walking, cycling and scootering as a viable travel mode to school. It is recommended that the location and form of pedestrian crossings (including supporting safety interventions such as raised platforms as shown in Figure 5-4), which are directly attributed to support safe access to the school and ECE will be investigated in further detail during the OPW phase, in consultation with Auckland Transport. Any crossing facilities would be designed to Auckland Transport standards during future design phases.

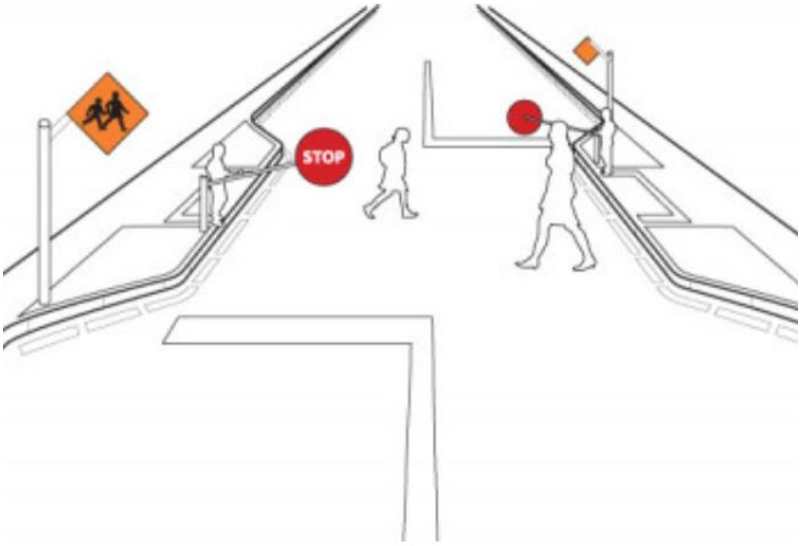


Figure 5-3 Typical Kea crossing[23]

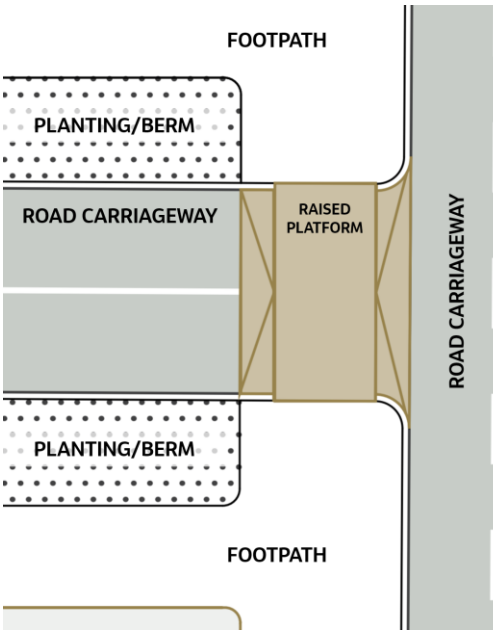


Figure 5-4 Typical raised platform layout[24]

5.5 Access strategy and effects

Vehicle, pedestrian and cyclist access must provide for safe, effective and efficient movement to and from the site and minimise potential conflicts between vehicles, pedestrians, and cyclists on the adjacent road network. It should be noted that the school and ECE design has been developed to a feasibility or concept design level only and this design has been used as the basis for this assessment.

All parking spaces must have driveways and aisles for entry and exit of vehicles to and from the road network, and for vehicle manoeuvring within the site. It is recommended that the main vehicle access to the school/ECE staff and visitor carpark is provided from Wallace Road as shown in the *Hobsonville School Bulk + Location Siting Study*.

Wallace Road is classified as a Local Road and although it is not currently open to traffic, it is considered likely to have low traffic volumes (outside of peak school times) and will not have a significant through-traffic function. A one-way traffic circulation arrangement is proposed to improve safety within the carpark so vehicles would enter the carpark from Wallace Road and then exit onto Hobsonville Point Road. The existing road carriageway has a planted median and only left-turn vehicle movements would be permitted, simplifying movements for exiting vehicles. As the Wallace Road access is proposed to be entry only, it is not considered to introduce a significant safety conflict with Commanders Avenue located opposite. If the main vehicle access is provided from Wallace Road it is recommended that the vehicle access is located directly opposite Commanders Avenue to provide greater visibility, rather than being slightly offset a very short distance.

Previous engagement and feedback received from Auckland Transport confirmed that an access located on Hobsonville Point Road would also be suitable for the school/ECE. At this level of design, it is considered that

[23] Waka Kotahi NZ Transport Agency (2021) *New Zealand Road Code - crossings* (accessed on 01 November 2021 at https://www.nzta.govt.nz/roadcode/code-for-cycling/intersections/crossings/)
[24] Auckland Transport (2020) *Transport Design Manual - Urban Streets and Roads Design Guide* (accessed on 01 November 2021 at https://at.govt.nz/media/1980686/urban-street-and-road-design-guide.pdf)

Wallace Road is preferred from a traffic circulation point of view. It is assumed that most vehicle-based trips would be generated from residential areas to the south of the school site given the very close proximity of residential areas located north of the site. To access the site from Hobsonville Point Road from the south (assuming its current arrangement with a raised planted median), vehicles would be required to access Hobsonville Point Road via Wallace Road or Bomb Point Drive to then turn left into the school accessway.

Footpaths are provided (or assumed to be provided), on both sides of the road surrounding the school site and there is a need for pedestrians and cyclists to safely cross the road and access the school/ECE. It is recommended that a separate access for active modes is provided adjacent to the proposed vehicle access points on Wallace Road and Hobsonville Point Road (refer to Figure 5-5 for the proposed locations of accessways for active modes).

The final location and design of the vehicle access will be developed during the OPW stage; however, it is considered that the site can provide safe vehicle access and access for active modes. Overall, it is not anticipated that the proposed site access points will have an adverse effect on the safe and efficient operation of the surrounding road network.

The assessment of the proposed development against AUP(OP) Chapter E27 relating to access is summarised in Table 5-7.

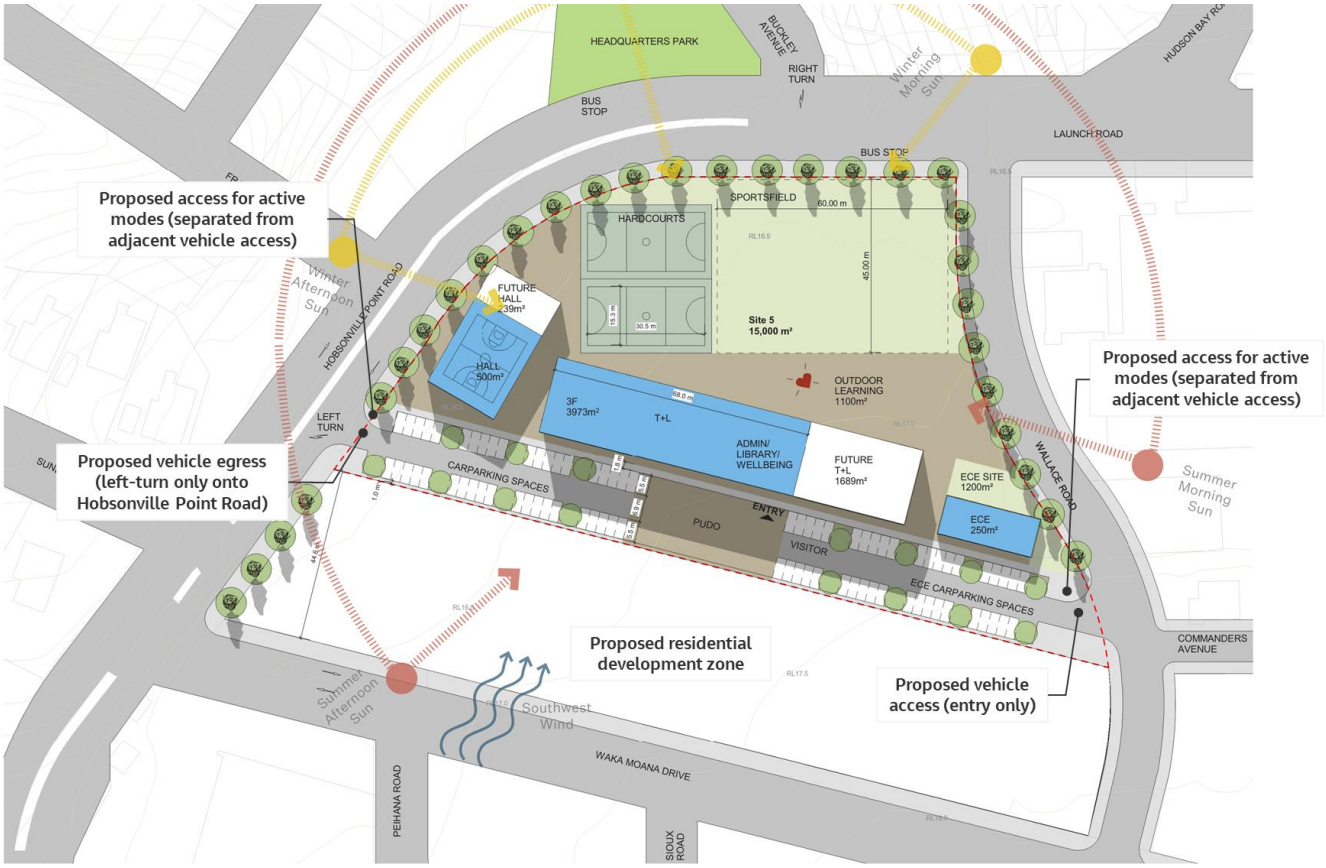


Figure 5-5 Proposed school/ECE access arrangement for active modes and vehicles

Table 5-7 Summary of proposed carpark design against AUP(OP) Chapter E27 standards relating to access

AUP(OP) E27 assessment criterion	Compliance / non-compliance description
E27.6.3.3 Access and manoeuvring	Every parking space must have driveways and aisles for entry and exit of vehicles to and from the road, and for vehicle manoeuvring within the site. Access and manoeuvring areas will be designed to accommodate the 85th percentile car tracking curves during the next stage of design.
E27.6.3.4 Reverse manoeuvring	The proposed carpark complies with E27.6.3.4 as the one-way traffic circulation and existing two-way access road onto the wider road network mean that vehicles are not required to reverse off site.
E27.6.3.5 Vertical clearance	At this stage of design, it is not anticipated that a carpark structure will be provided. Therefore, this requirement is not relevant to the proposal.
E27.6.3.6 Formation and gradient	The gradients of access and manoeuvring areas must not be steeper than 1:8 (12.5%) as per E27.6.4.4. The proposed access and manoeuvring areas will be designed to comply with this requirement at the next stage of design.
E27.6.4.1 Vehicle access restrictions	Vehicle access restrictions apply to a site boundary subject to a Vehicle Access Restriction – General Control, Key Retail Frontage Control or has frontage to an Arterial road. None of these restrictions or controls apply to the proposed site, therefore the proposal complies with these requirements.
E27.6.4.2 Width and number of vehicle crossings	The maximum number of vehicle crossings permitted for any site and separation distance between crossings is 1 per 25m of frontage (or part thereof), and 2m separation distance from

AUP(OP) E27 assessment criterion	Compliance / non-compliance description
	crossings serving adjacent sites or 6m minimum separation between crossings serving the same site.
E27.6.4.3 Width of vehicle access and queuing requirements	It is assumed that the width and queueing requirements of vehicle accesses will be designed to meet these requirements during the Outline Plan stage.
E27.6.4.4 Gradient of vehicle access	The maximum permitted gradient of a vehicle access serving all other activities (T159) is 1 in 6 or 16.7%. The existing curved ramp site access is to be maintained. It is assumed that vehicle accesses will be designed to meet these standards during the Outline Plan stage.

5.6 Parking and loading effects

5.6.1 Vehicle parking and loading

As the site is to be designated, it is not required to meet the requirements of the parking standards outlined in the AUP(OP). However, these are discussed in this section as a useful reference for assessment.

Parking is typically a contentious issue for new school designations in Auckland. The site is to be designated, and therefore is not bound by the requirements of the parking standards and requirements in the AUP(OP). The Ministry of Education sets out standard conditions which apply to all school designations unless they are modified for a particular designation.

The Ministry of Education's Standard Conditions include the following:

- **on-site carparking – schools:**
  Additional on-site car parking shall be provided at the rate of two carparks per new classroom or classroom equivalent, except where the Council accepts, on the basis of a specifically commissioned parking study by an appropriately qualified engineer and/or transportation planner, that a lesser level is appropriate. For the avoidance of doubt, this condition shall only apply where there is a net increase in the number of classrooms or classroom equivalents.
- **on-site carparking – ECE:**
  In addition to any car parking required for the school, on-site car parking for early childhood education (preschool) shall be provided at the rate of one car park per every 10 children the facility is licensed or designed to accommodate, plus one per each full time equivalent staff member required for the license or design capacity of the centre, except where the Council accepts, on the basis of a specifically commissioned parking study by an appropriately qualified engineer and/or transportation planner, that a lesser level is appropriate.

Applying the standard designation conditions for parking would result in the parking rates summarised in Table 5-8.

Table 5-8 Estimated parking requirements applying the standard Ministry of Education designation conditions

Facility	Standard designation parking rate	Requirement	Total parking provision
Primary school	Two carparks per new classroom	▪ 43 teaching spaces	86 standard parking spaces (excluding accessible spaces)
ECE	One car park per every 10 children the facility is licensed or designed to accommodate, plus one per each FTE staff member required	▪ 50 children ▪ Eight staff members required at all times	13 standard parking spaces (excluding accessible spaces)

Representatives from the Ministry of Education have confirmed that applying this standard parking condition to a designation should be considered on a site-specific basis and support providing a reduced number of carparking spaces to prioritise available land for students, if appropriate.

To provide a vehicle parking rate for the site, the following principles have been taken into consideration:

- all parking requirements for the school and ECE must be provided within the site
- the size of the site is relatively small at approximately 1.53ha. Auckland Transport, Auckland Council and the Ministry of Education have indicated a preference to prioritise available space for students/children over large numbers of carparking spaces. Allocating a large proportion of the site to carparking spaces would compromise on the quality of school/ECE facilities that can be delivered
- it is considered that parking should not be provided to the extent that it compromises on supporting transport demand management measures and/or the quality of school/ECE facilities that can be delivered within the site by oversupplying carparking
- it is reasonable to assume that the parking spaces would most likely be used by staff members (rather than caregivers of students/children), who may live outside of the school catchment zone and be required to travel greater distances
- parking spaces would typically be long-stay parking for staff members; therefore, it is considered that the number of spaces supplied should align with the number of proposed school teaching spaces. It is considered that short-stay pick-up and drop-off zones are more appropriate for students/ECE children
- provision of large numbers of carparking spaces is likely to induce demand for parking spaces and encourage travelling to school via private vehicle. This does not align with the objective of the underlying land zoning and relevant transport plans and strategies
- development and implementation of a comprehensive School Travel Plan is considered to have high potential for managing vehicle-based travel demand and encouraging active modes
- active modes are considered to be a viable mode choice for the large majority of students travelling to and from school. The location of the proposed site relative to areas of mid- to high-density development is advantageous for maximising accessibility of the site for active modes.

Taking these considerations into account, the following revised parking rate and condition is proposed for the school:

- **on-site carparking – schools:**
  *Additional on-site car parking shall be provided at the rate of **one** carpark per new classroom or classroom equivalent, except where the Council accepts, on the basis of a specifically commissioned parking study by an appropriately qualified engineer and/or transportation planner, that a lesser level is appropriate. For the avoidance of doubt, this condition shall only apply where there is a net increase in the number of classrooms or classroom equivalents.*

It is recommended that on-site pick-up and drop-off (short-stay) spaces are provided for the primary school. The number of spaces allocated as short-stay pick-up and drop-off zones should be further investigated during the OPW stage.

Given the observed transport mode share for trips to ECE facilities in the Auckland region[25], the standard designation parking rates for the ECE are considered appropriate for the number of children and staff members.

[25] Abley Transportation Consultants Limited (2011) *NZ Transport Agency research report 467*: *National travel profiles part B - trips, trends and travel prediction* (site accessed on 06 August 2021 at https://www.nzta.govt.nz/assets/resources/research/reports/467/docs/467.pdf)

- **on-site carparking – ECE:**
  *In addition to any car parking required for the school, on-site car parking for early childhood education (preschool) shall be provided at the rate of **one car park per every 10 children the facility is licensed or designed to accommodate, plus one per each full time equivalent staff member required** for the license or design capacity of the centre, except where the Council accepts, on the basis of a specifically commissioned parking study by an appropriately qualified engineer and/or transportation planner, that a lesser level is appropriate.*

Accessible carparking spaces will be required in addition to the number of standard carparking spaces provided for the school and ECE in accordance with *AS/NZS 2890.6:2009 Parking Facilities Part 6: Off-street parking for people with disabilities*[26]. Based on the accessible parking rates in *AS/NZS 2890.6:2009* and the proposed number of standard spaces, the accessible parking requirements for the school and ECE are summarised in Table 5-9.

Table 5-9 Provision of accessible parking spaces for people with disabilities

Facility	Total number of standard parking spaces	Rate of accessible parking spaces	Number of accessible parking spaces
Primary school	43 standard spaces	▪ Not less than 1 for 1-20 spaces ▪ Not less than 2 for 21 - 50 spaces ▪ Not less than 1 for every additional 50 car spaces or part thereof	Not less than 2 accessible spaces
ECE	13 standard spaces		Not less than 1 accessible space

The carpark as shown in the *Hobsonville School and ECE bulk and siting study*[27] (refer to section 4) has been developed up to a concept level of design. It should be noted that the number of parking spaces shown in the *Hobsonville School and ECE bulk and siting study* would accommodate the minimum required by the proposed conditions. Further development of the design is required to meet Auckland Transport's Transport Design Manual (TDM) guidelines, AUP(OP) requirements and to accommodate the required design vehicles including vehicle tracking of required standard vehicle types such as private vehicles, service vehicles and buses. At this level of design, it is not anticipated that vehicles manoeuvring in and out of the pick-up/drop-off zone will affect proposed vehicle crossings located directly adjoining to the school.

The detailed design of the carpark will be undertaken during the OPW phase and any proposed parking facilities would be designed to Auckland Transport standards.

The assessment of the proposed development against the AUP(OP) requirements for parking and loading is summarised in Table 5-10.

Table 5-10 Summary of proposed carpark design against AUP(OP) Chapter E27 standards relating to carparking and loading

AUP(OP) E27 assessment criterion	Compliance / non-compliance description
E27.6.2 Number of parking and loading spaces	A revised designation condition has been proposed for the school and the standard Ministry of Education designation parking condition has been applied to the ECE. The number of accessible spaces proposed complies with *AS/NZS 2890.6:2009*
E27.6.3. Design of parking and loading spaces	It is assumed that parking spaces will be designed to meet these requirements during the Outline Plan stage.

[26] Standards New Zealand (2009) *Australian / New Zealand AS / NZS 2890.6:2009 Parking Facilities Part 6: Off-street parking for people with disabilities*
[27] Jasmax (2021) *Hobsonville School Bulk + Location Siting Study*

AUP(OP) E27 assessment criterion	Compliance / non-compliance description
E27.6.2.7 Minimum loading space requirements	As the gross floor area (GFA) of the proposal is less than 5,000m^2, no loading spaces are required as per Table E27.6.2.7.
E27.6.3.1. Size and location of parking spaces	It is assumed that the size and location requirements of vehicle parking spaces will be designed to meet these requirements during the Outline Plan stage.

5.6.2 Bicycle parking

Based on the minimum bicycle parking rate requirements, it is recommended that four short-stay and 49 long-stay bicycle spaces are provided for the primary school, and two short-stay and one long-stay spaces are required for the ECE as summarised in Table 5-11 and Table 5-12.

Table 5-11 Bicycle parking rates and requirements for the primary school

Parking type	Number of staff/students	Rate	Bicycle parking requirement
Visitor short-stay parking	▪ 1,000 students ▪ 58 FTE staff members	1 space plus 1 space per 400 students and FTE employees	4 short-stay spaces
Years 1-5 long-stay parking	625 students	1 per 30 students	21 long-stay spaces
Years 6-8 long-stay parking	375 students	1 per 15 students	25 long-stay spaces
Staff long-stay parking	58 FTE staff members	1 per 20 employees	3 long-stay spaces

Table 5-12 Bicycle parking rates and requirements for the ECE

Parking type	Number of staff/children	Rate	Bicycle parking requirement
Visitor short-stay parking	50 children	1 space plus 1 space per 50 people to be accommodated	2 short-stay spaces
Staff long-stay parking	8 FTE staff members	1 space per 10 FTE employees	1 long-stay space

The assessment of the proposed development against the AUP(OP) requirements for bicycle parking is summarised in Table 5-13.

Table 5-13 Summary of proposed carpark design against AUP(OP) Chapter E27 standards relating to bicycle parking

AUP(OP) E27 assessment criterion	Compliance / non-compliance description
E27.6.2 Number of parking and loading spaces	The number of proposed bicycle parking spaces for the primary school and ECE complies with the minimum requirements specified by Table E27.6.2.5 Required bicycle parking rates.

5.7 Public transport effects

It has been assumed that the school will not be providing a dedicated school bus route as confirmed by the Ministry of Education. Not providing a dedicated school bus route when the school opens is considered acceptable as the small student catchment lends itself to students travelling to school by other modes including walking and cycling. A bus may be required on occasion for school trips and it is expected that the bus would utilise the pick-up/drop-off (PUDO) zone within the school carpark outside of peak school start/end times.

The *Hobsonville Point Precinct Plan 2 - Hobsonville Point features plan*[28] proposes a future bus route indicatively along Wallace Road and the eastern boundary of the school site. This proposal has been confirmed by Auckland Transport but the timing for implementation is not known. As the roll grows the catchment zone may be extended and older students may catch a public bus service to school. Based on the observed travel mode share for primary schools within similar residential development areas, less than 1% of students are estimated to use public transport to get to school. It is considered that the additional trips made by public transport will be negligible and that the proposed development should not preclude this bus route from being implemented in the future.

5.8 Recommended mitigation of transportation effects

5.8.1 Pedestrian crossings

The active modes assessment identified a need for crossing facilities to facilitate the safe pedestrian crossing of Wallace Road to the eastern boundary of the site and of Hobsonville Point Road to the western boundary of the site.

It is recommended that the signalisation of the existing pedestrian crossing facility on Hobsonville Road should be considered to improve safety for all users. A zebra crossing (and implementation of a 'Kea crossing' or school patrol), is recommended on Wallace Road to provide access to the site from the east. This crossing should be located opposite a proposed pedestrian/cyclist accessway into the site.

It is recommended that the type of pedestrian crossing, the design and the location should be agreed with Auckland Transport at the OPW stage.

5.8.2 Variable speed limits

The road network has been developed to encourage a low-speed traffic environment and the posted speed limit for all roads within the study area are currently set at 50km/h. It is recommended that the Ministry of Education will engage with Auckland Transport as the road controlling authority on implementing a 40km/h variable speed limit at the OPW stage.

5.8.3 Travel demand management measures

It is recommended that a School Travel Plan to manage travel demand to and from the school and encourage measures such as implementing a Kea Crossing, Walking School Buses, walking and cycling as viable modes of travel, carpooling and public transport usage (particularly for staff members). The School Travel Plan is to be developed with Auckland Transport prior to the opening of the school and should align with Auckland Transport's school-based Travelwise Programme.

5.8.4 CTMP

It is recommended that a CTMP is developed for the future construction phase with Auckland Transport and submitted with any OPW.

[28] Auckland Council (2016) *Auckland Unitary Plan Operative in Part - I605 Hobsonville Point Precinct Plan* (site accessed on 03 August 2021 at https://unitaryplan.aucklandcouncil.govt.nz/Images/Auckland%20Unitary%20Plan%20Operative/Chapter%20I%20Precincts/6.%20West/I605%20Hobsonville%20Point%20Precinct.pdf)

6. Consistency with overarching plans and transportation strategies

6.1 AUP(OP)

The AUP(OP) is a statutory planning document which sets out how the natural and physical resources of Auckland will be managed while enabling growth and sustainable development and provides the regulatory framework to make Auckland a quality place to live. Section 5 outlined the assessment of the proposal against E227 of the AUP(OP) which specifically relates to transport whereas this section considers the alignment of the development with higher level objectives and policies of the AUP(OP).

The school is located within sub-precincts C and D as defined by the *Hobsonville Point Precinct Plan*[29], and educational facilities are a 'restricted discretionary activity' within these precincts. Education facilities are a 'discretionary activity' within a Residential - Mixed Housing Urban and Residential - Terrace Housing and Apartment Building zones under the AUP(OP).

The policies relating to both AUP(OP) residential zones recognise the need to provide for non-residential activities within these areas that achieve the following:

- support the social and economic well-being of the community
- are keeping in with the scale and intensity of development anticipated within the zone
- avoid, remedy or mitigate adverse effects on residential amenity
- will not detract from the vitality of the Business – City Centre Zone, Business – Metro Centre Zone and Business – Town Centre Zone.

Although the Ministry of Education has adopted a designation approach, the objectives of the underlying zoning provide context which is considered to support this as an appropriate location for a school and ECE.

The existing network of schools within the Hobsonville Point area is currently overutilised, with Hobsonville Point Primary School already at 107% capacity. An additional school is under construction in the adjacent Scott Point suburb to serve growth immediately south of Hobsonville Point. Further demand for education facilities will be generated as residential developments are completed in the area and the proposed school and ECE are required in order to achieve the development potential of Hobsonville Point. The proposed school and ECE development will also support the social well-being of the community.

The proposed site is centrally located within the school student catchment zone. The school and ECE have the potential to achieve a high active mode share for school-related trips due to the small size of the school catchment zone combined with the safe and high-quality pedestrian facilities. A high private vehicle mode share for school-related trips is likely to have adverse impacts on residential amenity including impacts on on-street parking, increased traffic volumes (and potentially speeds), road safety and traffic noise.

[29] Auckland Council (2016) *Auckland Unitary Plan Operative in Part - I605 Hobsonville Point Precinct Plan* (site accessed on 03 August 2021 at https://unitaryplan.aucklandcouncil.govt.nz/Images/Auckland%20Unitary%20Plan%20Operative/Chapter%20I%20Precincts/6.%20West/I605%20Hobsonville%20Point%20Precinct.pdf)

Refer to the planning assessment as part of the *Notice of Requirement & Assessment of Environmental Effects Report*[30] for further details on the alignment of the proposal with the overarching AUP(OP) objectives and policies.

6.2 Auckland Plan 2050

The *Auckland Plan 2050*[31] is a high-level strategic local government document that sets the direction for addressing the key issues facing Auckland.

The *Auckland Plan* identifies development areas where significant housing growth is expected over the next 30 years, acknowledging that these development areas may require further planning and investment in community facilities. Although Hobsonville Point is not identified as a development area by the Plan, the proposed school and ECE development are consistent with the outcomes sought by the Plan. Providing accessible community services and facilities enables a quality and compact urban form which can accommodate anticipated growth.

The proposed school catchment and location of the school and ECE within the catchment aligns with the *Auckland Plan* from a transport and accessibility perspective as walking and cycling have the potential to be the preferred modes of travel to school for both students and staff.

6.3 Auckland Regional Land Transport Plan

The *Draft Auckland Regional Land Transport Plan 2021-2031* (RLTP)[32] sets out the land transport objectives, priorities and measures over the next 10 years. It includes a 10-year programme of priority transport interventions in response to Auckland's current transport challenges and growth forecasts to enable an accessible, well-connected, safe and sustainable Auckland region.

The key challenges identified by the Draft RLTP include the following:

- **climate change and the environment** – emissions and other consequences of transport are harming the environment and contributing to the transport system becoming increasingly susceptible to the impacts of climate change
- **travel options** - a lack of competitive travel options and high car dependency as the city grows is limiting the ability to achieve the quality compact urban approach for Auckland
- **safety** – the transport system has become increasingly harmful and does not support better health outcomes
- **access and connectivity** – existing deficiency in the transport system and an inability to keep pace with increasing travel demand is limiting improved and equitable access to employment and social opportunities.

A school and ECE development in the proposed location encourages active modes as a viable travel option for students and staff travelling short distances to and from school. There is potential for the school to generate a low private vehicle mode share which will reduce transport-related emissions and contribute to a safer transport network that supports improved community health.

[30] Incite Auckland Limited (2021) *Draft Notice of Requirement & Assessment of Environmental Effects Report for the Minister of Education for a New Designation under s168 of the RMA: Primary School (Years 0-8) and Early Childhood Education (ECE) at 2 Waka Moana Drive, Hobsonville Point, Auckland*

[31] Auckland Council (2018) *Auckland Plan 2050* (site accessed on 06 August 2021 at https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/auckland-plan/about-the-auckland-plan/docsprintdocuments/auckland-plan-2050-print-document.pdf)

[32] Auckland Transport (2021) *Draft Auckland Regional Land Transport Plan 2021-2031* (site accessed on 06 August 2021 at https://at.govt.nz/media/1985273/attachment-1_draft-rltp-2021-31.pdf)

To achieve objectives related to providing alternative travel options, the RLTP supports the development and implementation of School Travel Plan to encourage more people to use active transport. As noted in section 5.8, a recommendation of this ITA is to develop a comprehensive Travel Plan for the school which aligns with RLTP-recommended actions for this objective.

7. Conclusions and recommendations

The proposed site at 2 Waka Moana Drive, Hobsonville Point, is considered to be highly appropriate for developing as a primary school and ECE. The school site is well-located within the existing and developing medium to high-density residential catchment which encourages walking and cycling and maximises the accessibility of the site by active modes. All students within the catchment zone for the school and ECE will live within approximately 1.5km of the site and as such, walking to school is likely to be feasible for a large proportion of students. This has the potential to reduce school-related vehicular trips, traffic impacts and parking requirements.

Based on the traffic modelling results for intersections surrounding the site, it is concluded that all intersections will have the spare capacity to accommodate the increased traffic volumes generated by the primary school and ECE at their future masterplan rolls. The traffic impacts resulting from the proposed school and ECE development are considered to be no more than minor.

The proposal is considered to align with the overarching objectives and outcomes sought by local and Auckland-wide transport plans and strategies. It is therefore concluded that there are no significant transportation or traffic effects which would preclude the redevelopment of the site to provide a primary school, ECE and associated facilities.

7.1 Transport recommendations and mitigation summary

The following transport recommendations are identified for the subsequent OPW phase:

- it is considered that the site can provide a suitable vehicle access arrangement and it is proposed that vehicle accessways are provided from Wallace Road and/or Hobsonville Point Road
- two dedicated pedestrian/cycle accessways to the school are provided from Wallace Road and Hobsonville Point Road which are separated from the proposed vehicle accessways. It is recommended that the location and form of pedestrian crossings (including supporting safety interventions such as raised platforms), which are directly attributed to support safe access to the school and ECE will be investigated in further detail during the OPW phase, in consultation with Auckland Transport .
- given the high level of accessibility of the site by walking and cycling, reduced vehicle parking rates (relative to the Ministry's standard designation conditions for educational purposes), are considered appropriate
- carparking is provided on-site at a rate of one carpark per teaching space for the primary school as a site-specific condition and that the standard Ministry of Education parking designation conditions are applied for the ECE to provide 13 standard parking spaces
- a short-stay pick-up and drop-off zone is to be provided within the site and the level of spaces to be investigated during the OPW phase
- further development of the feasibility study concept design plan for the carpark to comply with *Auckland Transport's Transport Design Manual - Parking Design Engineering Code* guidelines and the *AUP(OP) Chapter E27 – Transport.*

It is recommended that the following mitigation measures are considered by the Ministry of Education, Auckland Transport, Auckland Council and the school/ECE. The mitigation measures proposed in this ITA are to be further assessed in the OPW phase, as per the conditions outlined in *Form 18 Notice of Requirement*. Overall, it is considered the future transport network can more than satisfactorily accommodate the proposed primary school and ECE with the recommendations and mitigation measures provided below:

- the Ministry of Education to engage with Auckland Transport on implementing a 40km/h variable speed limit along the road frontage to the site during school start and finish times
- consideration of signalising the existing pedestrian crossing facility located on Hobsonville Road opposite a proposed pedestrian/cyclist accessway into the school site
- provision of a zebra crossing located opposite a proposed pedestrian/cyclist accessway to the site on Wallace Road and implementation of a 'Kea crossing' or school patrol
- development of a School Travel Plan to manage travel demand to and from the school and encourage measures such as implementing a Kea Crossing, Walking School Buses, walking and cycling, carpooling and public transport usage. The School Travel Plan is to be developed with Auckland Transport prior to the opening of the school and should align with the Travelwise Programme as a condition of the designation
- it is recommended that a Construction Traffic Management Plan (CTMP) is prepared by the contractors for the OPW stage, as required by Auckland Transport.

7.2 Conclusions

With the application of the mitigation measures and recommendations made in this report, it is assessed that the local transport network will be able to accommodate the levels of demand likely to be generated by the school and ECE. The mitigation measures proposed in this ITA are to be further assessed in the OPW phase, as per the conditions outlined in *Form 18 Notice of Requirement.* The implementation of any of these recommendations should involve consultation with Auckland Transport and Auckland Council.

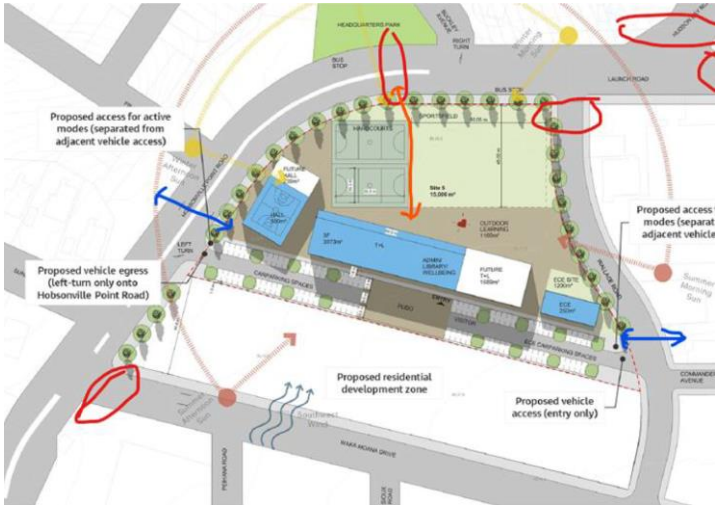
It is therefore concluded that there are no significant transportation or traffic effects which would preclude the redevelopment of the site to provide a primary school, ECE and associated facilities. Based on this assessment of transportation effects and recommendations, it is considered that the Ministry of Education and Auckland Council should proceed with the NOR to designate the site for the proposed primary school and ECE centre.

Appendix A. ITA report review comment register and responses

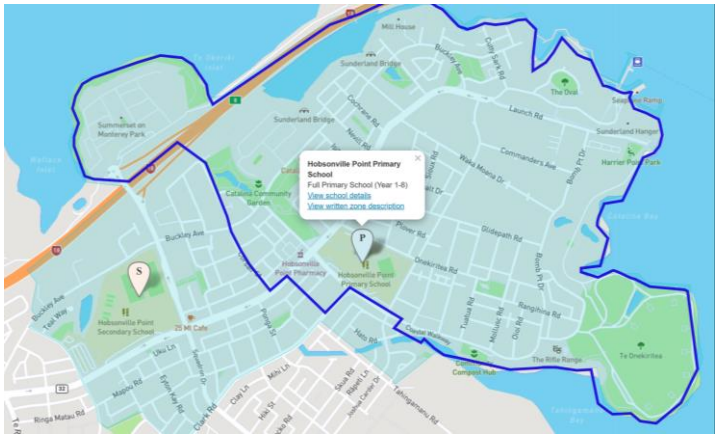
Subject	ITA report and appendices - review comment register	**Project Name**	Hobsonville Primary School and Early Childhood Centre Designation
From	Auckland Transport, Auckland Council and Auckland Forecasting Centre		
Date Received	29 October 2021		
Revision	Comments provided on ITA report and appendices Draft Revision 2.0		

Table A-1 ITA report and appendices (Draft Revision 2.0) review comments register

No.	Topic	Review comment	Response	Action
1	Public transport	It should be noted there is a proposal to re-route the #112 bus service via Scott Point, which would mean the service would travel along Wallace Road. The delivery date for this re-routing is unknown at this time.	▪ Noted.	▪ Updated in ITA Revision 3.0, section 3.4.
2	Public transport	On some occasions, it is expected buses will be chartered by the school for trips and events. Both Hobsonville Point Road and Wallace Road do not currently have a suitable place for a chartered bus to stop. Please provide further assessment on whether the site will be able to accommodate charter buses.	▪ A bus may be required on occasion for school trips. It is expected that the bus would utilise the pick-up/drop-off (PUDO) zone outside of peak school start/end times.	▪ Updated in ITA Revision 3.0, section 5.7.
3	Active modes	The comments below reflect the need for safe active mode infrastructure in light of the fact that the ITA has assumed 48% mode share for active modes among primary-aged students.	▪ Noted.	▪ No action required.
4	Active modes	Support the need for an additional crossing on Wallace Road as well as upgrading the existing crossing near the proposed pedestrian access on Hobsonville Point Road.	▪ Noted.	▪ No action required.
5	Active modes	There are areas south-east and north-east of the site that are zoned Terrace Housing and Apartment Buildings zone (THAB), which will likely result in a significant amount of walking trips coming from these locations. Additional pedestrian crossing points and upgrades to existing pedestrian facilities should be considered.	▪ Noted. The design of the school area and carparking (including accessway locations) has been developed to a feasibility level of design which will be further developed and refined during the OPW phase. ▪ Providing pedestrian crossings to support safe access to the school and ECE are supported. ▪ New crossings located on roads adjoining the school are considered to be directly linked to the proposed school development and the requirement to provide for safe access for students, staff and visitors. ▪ It is noted that marked pedestrian crossings (such as zebra crossings), are not provided at intersections across the wider road network in Hobsonville Point where residential development has been completed. Different paving materials and markings have been used to delineate crossing points at intersections as shown in the figure below, which is typical across the wider road network.	▪ Updated in ITA Revision 3.0, sections 3.3 and 5.4.
6	Active modes	The existing pedestrian crossing on Waka Moana Drive, along Hobsonville Point Road, has wide kerb radii and crossing distance of approximately 15 meters. Safety improvements to this crossing should be considered to accommodate children, such as raised tables, pedestrian priority and/or a tighter kerb radii.		
7	Active modes	Pedestrian crossing opportunities near Launch Road and Hudson Bay Road and the northern end of Wallace Road are all >10m without pedestrian priority. Some children will have to cross at these points on their journey to school. Improvements to these pedestrian crossings should be considered to safely accommodate children, such as raised tables, pedestrian priority and/or a tighter kerb radii.		
8	Active modes	The existing pedestrian crossing directly north of the school site (near 'Headquarters Memorial park') could provide an additional entrance point to the school. Improvements to this crossing should be considered, as it		

No.	Topic	Review comment	Response	Action
		provides a direct walking path for students travelling north of the site and is close to bus stops 1551 and 1600.	 	
9	Active modes	The map below shows the pedestrian crossings proposed in the ITA marked blue. The red circles illustrate the additional pedestrian crossings that should be considered, as outlined above. 	▪ It is considered that new crossing facilities/improvements located further afield from the school will have a benefit to the wider community; however, these may not be reasonably directly linked to the school development and responsibility of MOE. ▪ Propose that the location and form of pedestrian crossings which are directly attributed to support safe access to the school/ECE will be investigated in further detail during the OPW phase, in consultation with Auckland Transport. Any crossing facilities would be designed to Auckland Transport standards during future design phases.	
10	Active modes	Raised pedestrian crossings should be considered on either side of the school access. The ITA should also state whether cars reversing out of the angle parks in the PUDO area will impact on the pedestrian crossing on Hobsonville Road.	▪ Propose that the location and use of raised safety platforms for crossings to support direct access to the school will be investigated in further detail during the OPW phase, in discussion with Auckland Transport. ▪ It is not anticipated that vehicles manoeuvring in and out of the PUDO zone will affect the pedestrian crossing on Hobsonville Point Road. ▪ The detailed design of the carpark will be undertaken during the OPW phase, including vehicle tracking of required standard vehicle types. Any parking facilities would be designed to Auckland Transport standards during future design phases.	▪ Updated in ITA Revision 3.0, sections 5.4 and 7.1.

No.	Topic	Review comment	Response	Action
11	Active modes	The footpaths identified in the PUDO area as illustrated on Figure 4-1, should be 2.4 metres wide as recommended in the Auckland Transport Design Manual.	▪ Noted. The design of the school area and carparking has been developed to a feasibility level of design. ▪ The design of the school will be developed during the OPW phase and footpath widths are to be designed to meet TDM standards.	▪ Updated in ITA Revision 3.0, section 5.4.
12	Active modes	The existing cycling infrastructure is not separated and is not safe and appropriate for young children. The ITA should consider upgrading cycling infrastructure in order to provide safe cycling routes (including crossing points) for children travelling to the school. This would help to achieve the proposed mode share.	▪ Although residential buildings have not yet been constructed, the road network surrounding the school/ECE site (including footpaths, drainage, rain gardens, driveways, planting and parallel parking), has largely been completed. ▪ The ITA has been developed to be consistent with any future cycle routes indicated in the Hobsonville Point Precinct Plan. ▪ It is noted that opportunities to retrofit the road carriageway to include a safe, separated cycleway facility that is suitable for school-aged children would be limited at this stage of development of the area. ▪ Propose that the location of crossing points (and supporting safety treatments), which are directly attributed to support safe access to the school/ECE will be investigated in further detail during the OPW phase, in consultation with Auckland Transport. Any crossing facilities would be designed to Auckland Transport standards during future design phases.	▪ Updated in ITA Revision 3.0, section 5.4.
13	Transport modelling	The ITA assumes a trip generation rate of 3.9 vehicle trips per day per household for background traffic. This trip generation rate seems relatively low, given it was based on a survey for apartment residents in central Christchurch. The analysis used in the Christchurch context (as identified in Table 4.3 of the background traffic analysis) is not applicable to the Hobsonville context based on size and type of dwellings. While the ITA notes that "there was insufficient information about the types of units in all precincts of the development", it is more reasonable to base assumptions on current development patterns and future development proposals in the area. The majority of units will be medium-density and terraced housing with only a small number of apartments in areas like Catalina Bay.	▪ It is noted that the trip generation rate of 6.5 trips per dwelling per day for a medium density residential flat building from the *New South Wales RTA Guidelines* is based on a dwelling with '3 bedrooms or more'. Based on development plans received from Panuku Development Auckland, approximately 48% of proposed dwellings will be 3+ bedrooms with the remaining being 1-bedroom or 2-bedroom dwellings. Dwellings of up to 2 bedrooms have a trip generation rate of 4 - 5 trips per day from the *RTA Guidelines*. ▪ Further SIDRA modelling of the three intersections with a trip generation rate of 6.5 vehicle trips per day per dwelling has been undertaken as a sensitivity test. This is considered a very conservative estimate for trip generation/background traffic volumes during the peak hour periods, particularly for a master-planned residential development area such as Hobsonville Point which has aimed to reduce dependence on private vehicles, has access to public transport and is highly walkable. A large number of key destinations and amenities which typically generate high numbers of vehicle-based trips (such as	▪ Updated in ITA section 5.2 and traffic modelling memorandum (Appendix F).
14	Transport modelling	Based on the comment provided above, the trip generation rate should be revised. The RTA 2022 indicates a daily vehicle trip rate for a medium-density residential flat building of 5 - 6.5 per dwelling. The background traffic analysis should consider a trip generation rate of 6.5 vehicle trips per day per household.		

No.	Topic	Review comment	Response	Action
			schools, shops, parks, etc), are located within walking distance of residential development. ▪ Propose to retain the modelling results based on the 3.9 trips per day per household - it is noted that the traffic modelling is already considered a conservative scenario with 30% of total daily traffic volumes allocated to the AM and PM peak periods, and school-related trips have been modelled in addition to the wider network peak traffic volumes. In reality the network peak periods are likely to occur outside of school peak times. Due to the distance from the CBD, the AM network peak is likely to be earlier than the estimated 8:00am - 9:00am school morning peak and the PM network peak is likely to occur later than the 2:30pm - 3:30pm school afternoon peak. ▪ Sensitivity testing of the 6.5 trips per day per dwelling (assuming previous trip routing and 30% all-day to peak-hour factors), results in very high traffic volumes during the peak hours, particularly Hobsonville Point Road with modelled volumes exceeding 1,200 vehicles/h in the peak direction (typical of high-volume arterial corridors across the Auckland isthmus).	
15	Transport modelling	Section 4.2.2 of the ITA states that "Stonefields School was considered the most similar to the proposed school development in terms of catchment size". However, the proposed school is in the same catchment for the existing Hobsonville Point Primary School. The Hobsonville Point Primary School would provide a good basis for how students in the area are currently travelling to school, rather than a school in the eastern part of the Auckland isthmus (regardless of any similarities in catchment size). The mode share for Stonefields School is significantly different, with the walking mode share (30%) twice as high as Hobsonville Point Primary School (15%). Consequently, the vehicle-based trips for Hobsonville Point Primary School are noticeably higher (~60%) compared to Stonefields School (~50%). As a result, the number of vehicle trips generated by the proposed school have likely been underestimated and should be revised accordingly.	▪ The catchment for the existing Hobsonville Point Primary School extends to the north from Nugget Avenue (southmost point). The catchment for the proposed school is considerably more compact, covering just the northern half of the existing school's catchment (as shown in the figure below). 	Updated in ITA Revision 3.0, section 5.4.

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<tr><th>No.</th><th>Topic</th><th>Review comment</th><th>Response</th><th>Action</th></tr>
<tr><td></td><td></td><td></td><td>

Walking is considered to be a viable mode of transport for a large proportion of students given the small catchment size, with no students expected to live more than 1.2km from the school.
A high proportion of students travelling to school by active modes (48%) is considered a realistic estimate given the small catchment size and highly walkable environment.
The overall mode share and individual mode share splits for Stonefield School are considered more appropriate for estimating the future mode share % of the new Hobsonville School. It is also noted that a relatively large proportion of students use public transport to Hobsonville Point Primary School (11% in the AM and 5% in the PM), and a dedicated bus service is provided in the afternoons - it is not anticipated that a dedicated bus service will be provided for the proposed school, given the considerably smaller catchment area.
Propose to retain the current mode share assumptions based on Stonefields School travel survey results, given the size of the proposed new Hobsonville Point School catchment size and high level of walkability surrounding the site.

<table>
<tr><th rowspan="2">Transport mode</th><th colspan="2">Hobsonville Point Primary</th><th colspan="2">Stonefields</th></tr>
<tr><th>AM</th><th>PM</th><th>AM</th><th>PM</th></tr>
<tr><td>Walking</td><td>15%</td><td>1%</td><td>30%</td><td>32%</td></tr>
<tr><td>Walking School Bus</td><td>0%</td><td>0%</td><td>2%</td><td>1%</td></tr>
<tr><td>Car/walk (400m)</td><td>14%</td><td>12%</td><td>8%</td><td>6%</td></tr>
<tr><td>Cycle</td><td>8%</td><td>7%</td><td>3%</td><td>4%</td></tr>
<tr><td>Scooter</td><td>2%</td><td>2%</td><td>5%</td><td>4%</td></tr>
<tr><td>Bus</td><td>11%</td><td>5%</td><td>0%</td><td>0%</td></tr>
<tr><td>Family car</td><td>59%</td><td>54%</td><td>51%</td><td>51%</td></tr>
<tr><td>Friend’s car</td><td>1%</td><td>2%</td><td>1%</td><td>1%</td></tr>
</table>
</td><td></td></tr>
<tr><td>16</td><td>Transport modelling</td><td>Section 5.2.1 should be revised to consider the feedback outlined above.</td><td>▪ Agreed and updated.</td><td>▪ Updated in ITA Revision 3.0.</td></tr>
</table>

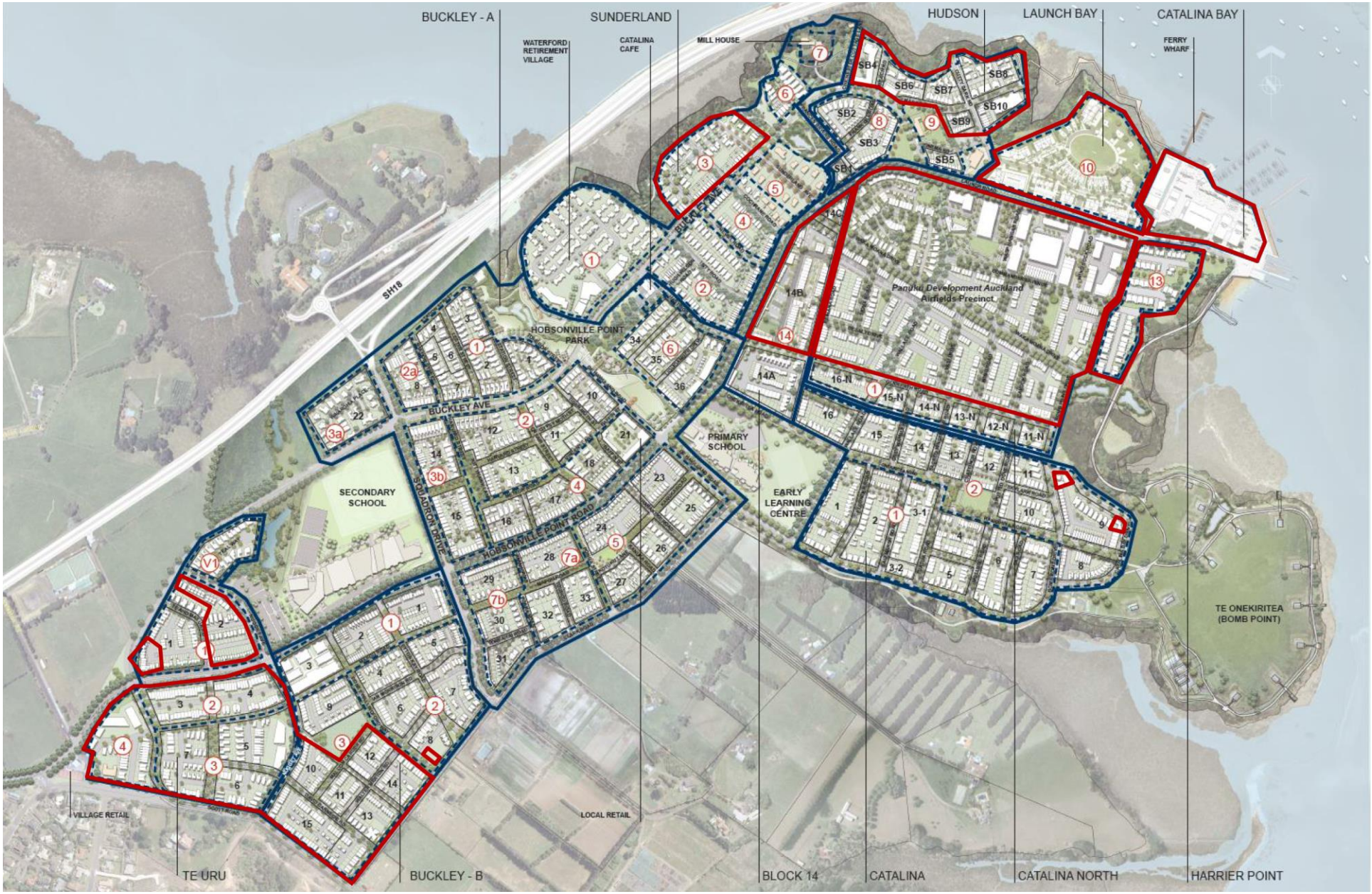
No.	Topic	Review comment	Response	Action
17	Transport modelling	Appendix A of the ITA identifies Route Maps for the proposal. School Traffic Maps 2, 3 and 4 indicate that vehicles travelling from the school site to Catalina Bay, Hudson, Launch Bay and Harrier Point developments will turn right on Hobsonville Point Road. Based on the proposed access arrangements identified in Figure 4-1 of the ITA, this movement is not permitted. Vehicles exiting the school site and travelling to these areas will need to be diverted via Waka Moana Drive and Wallace Road accordingly. The trip distribution and flows should be updated to reflect this.	▪ Trip distribution and flows updated in revised memorandum, appendices and ITA reporting.	▪ Updated in ITA Revision 3.0.

Table A-2 Form 18 Conditions review comments register

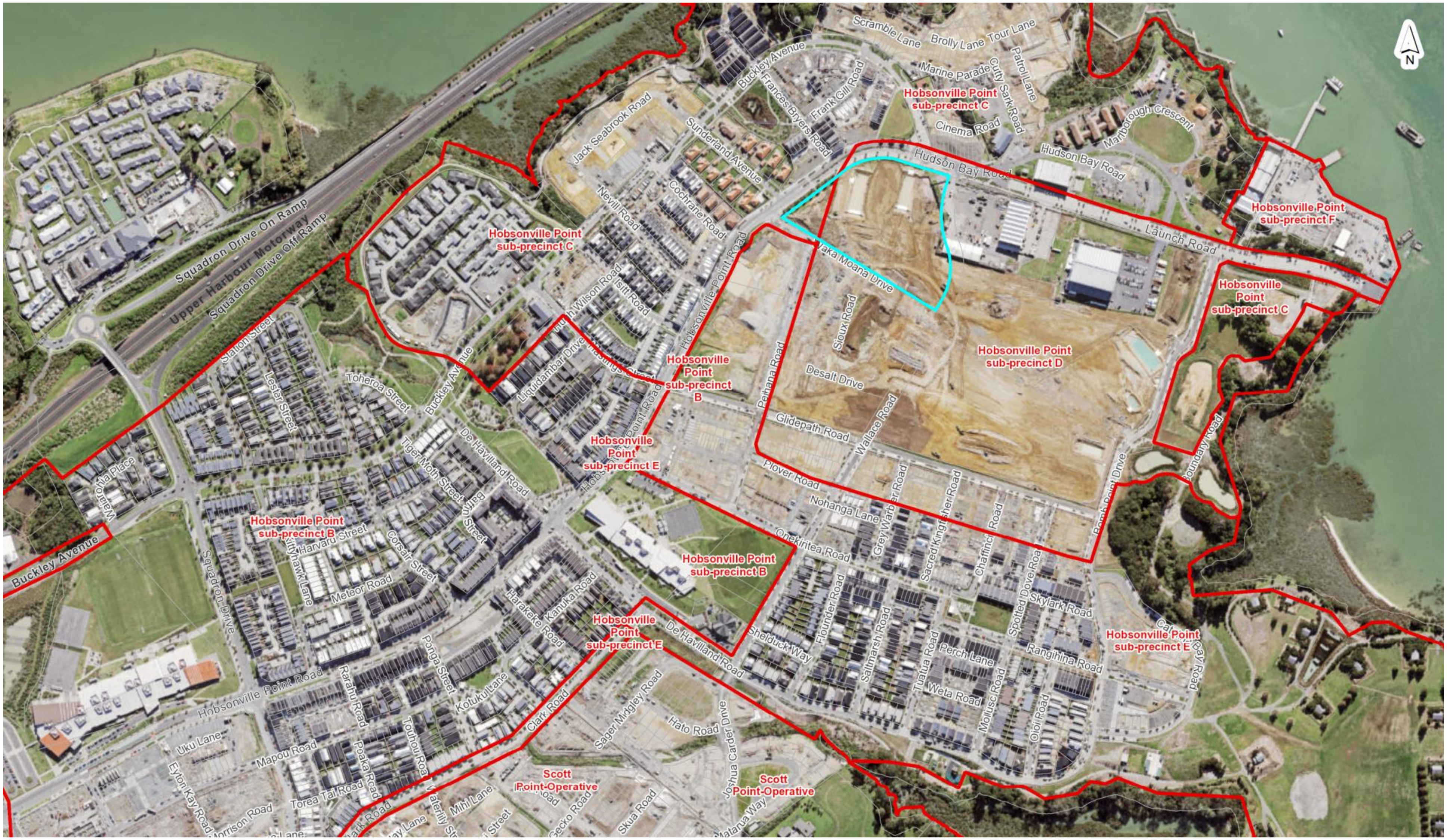
No.	Topic	Review comment	Response	Action
1	Condition 3 - on-site car parking	Section 5.6.1 of the ITA states that the standard MoE parking conditions will be considered on a site-specific basis. This is in light of the NPS-UD direction to remove carparking minima. How has the rate of one carpark per classroom been derived?	The carparking rate of 1 standard space per classroom has been developed based on the following planning and design principles: ▪ it is considered that parking should not be provided to the extent that it compromises on supporting transport demand management measures and/or the quality of school/ECE facilities that can be delivered within the site by oversupplying carparking ▪ it is reasonable to assume that the parking spaces would most likely be used by staff members (rather than caregivers of students/children), who may live outside of the school catchment zone and be required to travel greater distances ▪ parking spaces would typically be long-stay parking for staff members; therefore, it is considered that the number of spaces supplied should align with the number of proposed school teaching spaces. It is considered that short-stay pick-up and drop-off zones are more appropriate for students/ECE children ▪ provision of large numbers of carparking spaces is likely to induce demand for parking spaces and encourage travelling to school via private vehicle. This does not align with the objective of the underlying land zoning and relevant transport plans and strategies ▪ development and implementation of a comprehensive School Travel Plan is considered to have high potential for managing vehicle-based travel demand and encouraging active modes ▪ active modes are considered to be a viable mode choice for the large majority of students travelling to and from school. The location of the	▪ Updated in ITA Revision 3.0, section 3.4.

No.	Topic	Review comment	Response	Action
			proposed site relative to areas of mid- to high-density development is advantageous for maximising accessibility of the site for active modes. It is noted that the number of parking spaces shown in the concept design would accommodate the minimum required by the proposed conditions.	

Appendix B. Hobsonville Point Masterplan


BUCKLEY - A
SUNDERLAND
HUDSON
LAUNCH BAY
CATALINA BAY
WATERFORD RETIREMENT VILLAGE
CATALINA CAFE
MILL HOUSE
FERRY WHARF
SH18
HOBSONVILLE POINT PARK
BUCKLEY AVE
SECONDARY SCHOOL
PRIMARY SCHOOL
EARLY LEARNING CENTRE
HOBSONVILLE POINT ROAD
SOUTDRON DRIVE
Panuku Development Auckland Airfields Precinct
TE ONEKIRITEA (BOMB POINT)
VILLAGE RETAIL
LOCAL RETAIL
TE URU
BUCKLEY - B
BLOCK 14
CATALINA
CATALINA NORTH
HARRIER POINT

Appendix C. I605 Hobsonville Point Precinct Plan sub-precincts


N
Hobsonville Point sub-precinct C
Hobsonville Point sub-precinct C
Hobsonville Point sub-precinct F
Hobsonville Point sub-precinct C
Hobsonville Point sub-precinct B
Hobsonville Point sub-precinct D
Hobsonville Point sub-precinct E
Hobsonville Point sub-precinct B
Hobsonville Point sub-precinct B
Hobsonville Point sub-precinct E
Hobsonville Point sub-precinct E
Scott Point-Operative
Scott Point-Operative
Upper Harbour Motorway
Squadron Drive On Ramp
Squadron Drive Off Ramp
Hudson Bay Road
Launch Road
Waka Moana Drive
Buckley Avenue
Hobsonville Point Road
De Havilland Road
Squadron Drive
Glidepath Road
Onekiritea Road
Marlborough Crescent
Scramble Lane
Brolly Lane
Tour Lane
Marine Parade
Cinema Road
Jack Seabrook Road
Sunderland Avenue
Cochrane Road
Nevill Road
Desalt Drive
Sioux Road
Wallace Road
Plover Road
Nohanga Lane
Harvard Street
Meteor Road
Corsair Street
Tiger Moth Street
Toheroa Street
Station Street
Clark Road
Hato Road
Skua Road
Rangihina Road
Skylark Road
Weta Road
Perch Lane
Shelduck Way

Appendix D. Crash Analysis System - site details report

Untitled query

Saved sites

Hobsonville Point Road_Draft 19-08-2020

Crash year

2016 — 2021

Crash severity

Fatal Crash, Serious Crash, Minor Crash, Non-Injury Crash

Site details report

Fatal crashes: 0 | **Injury crashes:** 2 | **Non-injury crashes:** 8 | **Total crashes:** 10

Overall crash statistics

Crash severity

Crash severity	Number	%	Social cost $(m)
Fatal	0	0	0
Serious	1	10.00	0.00
Minor-injury	1	10.00	0.10
Non-injury	8	80.00	0.17
TOTAL	10	100	0.27

Crash numbers

Year	Fatal	Serious	Minor	Non-injury
2016	0	0	0	1
2017	0	0	0	3
2018	0	0	1	0
2019	0	0	0	3
2020	0	0	0	1
2021	0	1	0	0
TOTAL	0	1	1	8
Percent	0	10	10	80

Crash type and cause statistics

Crash type

Crash type	Crash numbers	% All crashes
Overtaking crashes	0	0
Straight road lost control/head on	2	20
Bend - lost control/Head on	1	10
Rear end/obstruction	4	40
Crossing/turning	2	20
Pedestrian crashes	1	10
Miscellaneous crashes	0	0
TOTAL	10	100

Crash factors

Crash factors	Crash numbers	% All crashes
#N/A	5	50.00
Alcohol	1	10.00
Disabled, old age or illness	0	0.00
Failed to give way or stop	2	20.00
Fatigue	0	0.00
Incorrect lanes or position	3	30.00
Miscellaneous factors	0	0.00
Overtaking	0	0.00
Pedestrian factors	1	10.00
Poor handling	1	10.00
Poor judgement	3	30.00
Poor observation	4	40.00
Position on Road	0	0.00
Road factors	2	20.00
Travel Speed	2	20.00
Unknown	0	0.00
Vehicle factors	0	0.00
Weather	0	0.00
TOTAL	24	240.00

Crashes with:

Factor groups	Crash numbers	% All crashes
All road user factors	6	60.00
Driver only factors	9	90.00
Pedestrian factors	1	10.00
Vehicle factors	0	0.00
Road factors	2	20.00
Environment factors	0	0.00
No identifiable factors	0	0.00
Retired codes - no future use	0	0.00
TOTAL	18	180.00

Notes: Factors are counted once against a crash - i.e. two fatigued drivers count as one fatigue crash factor.

Driver/vehicle factors are not available for non-injury crashes for Northland, Auckland, Waikato and Bay of Plenty before 2007. This will influence numbers and percentages.

% represents the % of crashes in which the cause factor appears.

Number of parties in crash

Party type	All crashes	% All crashes
Single party	4	40.00
Multiple party, including pedestrian	1	10.00
Multiple party, excluding pedestrian	5	50.00
TOTAL	10	100

Overall casualty statistics

Injury severity

Injury severity	Number	% all casualties
Fatal	0	0.00
Serious Injured	1	50.00
Minor Injured	1	50.00
TOTAL	2	100.00

Casualty numbers

Year	Fatal	Serious Injured	Minor Injured
2016	0	0	0
2017	0	0	0
2018	0	0	1
2019	0	0	0
2020	0	0	0
2021	0	1	0
TOTAL	0	1	1
Percent	0.00	50.00	50.00

Note: Last 5 years of crashes shown (unless query includes specific date range).

Casualty types

Casualty types	Fatalities	Serious injuries	Minor injuries
Cyclists	0	0	0
Drivers	0	0	0
Motorcycle pillions	0	0	0
Motorcycle riders	0	0	1
Passengers	0	0	0
Pedestrians	0	1	0
Other	0	0	0
TOTAL	0	1	1

Note: Motorcycle stats include Mopeds.

Driver and vehicle statistics

Drivers at fault or part fault in injury crashes - by age

Age	Male	Female	Unknown	Total	Percentage (%)
0-4	0	0	0	0	0.00
5-9	0	0	0	0	0.00
10-14	0	0	0	0	0.00
15-19	0	0	0	0	0.00
20-24	1	0	0	1	100.00
25-29	0	0	0	0	0.00
30-34	0	0	0	0	0.00
35-39	0	0	0	0	0.00
40-44	0	0	0	0	0.00
45-49	0	0	0	0	0.00
50-54	0	0	0	0	0.00
55-59	0	0	0	0	0.00
60-64	0	0	0	0	0.00
65-69	0	0	0	0	0.00
70-74	0	0	0	0	0.00
75-79	0	0	0	0	0.00
80-84	0	0	0	0	0.00
85-89	0	0	0	0	0.00
90-94	0	0	0	0	0.00
95-99	0	0	0	0	0.00
100+	0	0	0	0	0.00
Unknown	0	0	0	0	0.00
TOTAL	1	0	0	1	–
Percent	100.00	0.00	0.00	100.00	–

Note: Driver information is not calculated for non-injury crashes.

Drivers at fault or part fault in injury crashes - by licence

Licence	Male	Female	Unknown	Total	Percentage (%)
Full	0	0	0	0	0.00
Learner	1	0	0	1	100.00
Restricted	0	0	0	0	0.00
Overseas	0	0	0	0	0.00
Wrong class	0	0	0	0	0.00
Never Licensed	0	0	0	0	0.00
Unknown	0	0	0	0	0.00
Forbidden	0	0	0	0	0.00
TOTAL	1	0	0	1	–
Percent	100.00	0.00	0.00	100.00	–

Note: Driver information is not calculated for non-injury crashes.

Vulnerable road users

Crash types	Number	Percentage (%)
Cyclist crashes	0	0.00
Pedestrian crashes	1	10.00
Motorcycle crashes	1	10.00
All other crashes	8	80.00

Note: Some crashes involve more than one vulnerable road user type.

Note: Motorcycle stats include Mopeds.

Road environment statistics

Road type

Road type	State highway	Local road	Unknown	N/A	Total	Percentage (%)
Urban	0	10	0	0	10	100.00
Open	0	0	0	0	0	0.00
Unknown	0	0	0	0	0	0.00
TOTAL	0	10	0	0	10	–
Percent	0.00	100.00	0.00	0.00	100.00	–

Natural light conditions

Conditions	Injury	Non-injury	Total	%
Light/overcast	2	6	8	80.00
Dark/twilight	0	2	2	20.00
Unknown	0	0	0	0.00
TOTAL	2	8	10	100

Conditions

Conditions	Injury	Non-injury	Total	%
Dry	1	8	9	90.00
Ice or Snow	0	0	0	0.00
Wet	1	0	1	10.00
Null	0	0	0	0.00
TOTAL	2	8	10	100

Intersection/midblock

Intersection/mid-block	Total	%
Intersection	9	90.00
Midblock	1	10.00
TOTAL	10	100

Objects struck

Objects struck	Injury crashes	%	Non-injury crashes	%
Crashes w/obj struck	0	0.00	6	60.00

Object struck	Injury crashes	%	Non-injury crashes	%
Animals	0	0.00	0	0.00
Bridges/Tunnels	0	0.00	0	0.00
Cliffs	0	0.00	0	0.00
Debris	0	0.00	0	0.00
Embankments	0	0.00	0	0.00
Fences	0	0.00	0	0.00
Guide/Guard rails	0	0.00	0	0.00
Houses	0	0.00	0	0.00
Traffic Islands	0	0.00	1	10.00
Street Furniture	0	0.00	0	0.00
Kerbing	0	0.00	0	0.00
Landslips	0	0.00	0	0.00
Parked vehicle	0	0.00	2	20.00
Trains	0	0.00	0	0.00
Sight Rails	0	0.00	0	0.00
Poles	0	0.00	1	10.00
Stationary Vehicle	0	0.00	0	0.00
Roadwork	0	0.00	0	0.00
Traffic Sign	0	0.00	0	0.00
Trees	0	0.00	1	10.00
Drainage Structures	0	0.00	0	0.00
Ditches	0	0.00	1	10.00
Other	0	0.00	0	0.00
Thrown or dropped objects	0	0.00	0	0.00
Water	0	0.00	0	0.00
TOTAL	0	–	6	–

Note: % represents the % of crashes in which the object is struck.

Vehicles involved in injury crashes (vehicle count)

Vehicle type	No. of vehicles	% of vehicles in injury crashes
Unknown	0	0.00
Car/Wagon	1	50.00
SUV	0	0.00
Van	0	0.00
Ute	0	0.00
Truck	0	0.00
Truck HPMV	0	0.00
Bus	0	0.00
Motorcycle	1	50.00
Moped	0	0.00
Train	0	0.00
Cycle	0	0.00
Other	0	0.00
Unknown	0	0.00
50 Max	0	0.00
Left scene	0	0.00
Uncoupled towed vehicle	0	0.00
TOTAL	2	100.00

Vehicles involved in injury crashes (crash count)

Vehicle type	Injury crashes	% of injury crashes
Unknown	0	0.00
Car/Wagon	1	50.00
SUV	0	0.00
Van	0	0.00
Ute	0	0.00
Truck	0	0.00
Truck HPMV	0	0.00
Bus	0	0.00
Motorcycle	1	50.00
Moped	0	0.00
Train	0	0.00
Cycle	0	0.00
Other	0	0.00
Unknown	0	0.00
50 Max	0	0.00
Left scene	0	0.00
Uncoupled towed vehicle	0	0.00
TOTAL	2	100.00

Vehicle usage in injury crashes

Vehicle usage	Fatal Crash	Serious Crash	Minor Crash	Total	Percentage (%)
Private	0	1	0	1	50.00
Attenuator Truck	0	0	0	0	0.00
Agricultural	0	0	0	0	0.00
Ambulance	0	0	0	0	0.00
Campervan	0	0	0	0	0.00
Concrete mixer	0	0	0	0	0.00
Fire	0	0	0	0	0.00
Logging truck	0	0	0	0	0.00
Mobile crane	0	0	0	0	0.00
Police	0	0	0	0	0.00
Rental	0	0	0	0	0.00
Road Working	0	0	0	0	0.00
Scheduled service Bus	0	0	0	0	0.00
School bus	0	0	0	0	0.00
Tanker	0	0	0	0	0.00
Taxi	0	0	0	0	0.00
Tour Bus	0	0	0	0	0.00
Trade person	0	0	0	0	0.00
Work travel	0	0	0	0	0.00
Work vehicle	0	0	0	0	0.00
Other	0	0	0	0	0.00
Null	0	0	1	1	50.00
TOTAL	0	1	1	2	–
Percent	0.00	50.00	50.00	100.00	–

Time period statistics

Month by injury/ non-injury crashes

Month	Injury crashes	%	Non-injury crashes	%	Total	%
Jan	0	0	1	12.5	1	10
Feb	0	0	0	0	0	0
Mar	0	0	1	12.5	1	10
Apr	0	0	1	12.5	1	10
May	0	0	2	25	2	20
Jun	0	0	1	12.5	1	10
Jul	0	0	1	12.5	1	10
Aug	1	50	0	0	1	10
Sep	1	50	0	0	1	10
Oct	0	0	0	0	0	0
Nov	0	0	1	12.5	1	10
Dec	0	0	0	0	0	0
TOTAL	2	100	8	100	10	100

Day/period

Day/Period	All crashes	% All crashes
Weekday	8	80
Weekend	2	20
TOTAL	10	100

Day/period by hour

Day/Period	00:00 - 02:59	03:00 - 05:59	06:00 - 08:59	09:00 - 11:59	12:00 - 14:59	15:00 - 17:59	18:00 - 20:59	21:00 - 23:59	Total
Weekday	0	0	0	2	3	2	0	1	8
Weekend	0	0	0	0	0	0	1	1	2
TOTAL	0	0	0	2	3	2	1	2	10

Day/period by hour DOW

Day/Period	00:00 - 02:59	03:00 - 05:59	06:00 - 08:59	09:00 - 11:59	12:00 - 14:59	15:00 - 17:59	18:00 - 20:59	21:00 - 23:59	Total
Mon	0	0	0	1	0	1	0	0	2
Tue	0	0	0	0	1	1	0	0	2
Wed	0	0	0	0	1	0	0	1	2
Thu	0	0	0	1	0	0	0	0	1
Fri	0	0	0	0	1	0	0	1	2
Sun	0	0	0	0	0	0	1	0	1
TOTAL	0	0	0	2	3	2	1	2	10

Appendix E. Primary school and ECE staff member requirements

E.1 Primary school staff requirements

The number of staff/employees and teaching spaces are required to estimate the parking rates and requirements for the primary school. Forty-three teaching spaces have been assumed based on the architectural site evaluation study[33] which refers to the Ministry of Education's School Property Guide (SPG) calculator. Staff requirements are calculated based on the number of school students at each year level and the roll type (Māori immersion and non-immersion rolls), as set out in Table E-1. This level of detail is unknown at this stage; therefore, the following assumptions have been made to estimate the number of full-time employees (FTE) for the primary school:

- the staff and carparking requirements are estimated for a full masterplan roll of 1,000 primary school students
- the numbers of students are evenly distributed between Years 1 - 8
- the Māori immersion roll type teacher to student ratios have been adopted for all year level groups as a conservative estimate which provides some allowance for full-time support and management staff.

Based on the teacher to student ratios as summarised in Table B-1, it is estimated that approximately 58 FTE staff will be required for the primary school which includes some allowance for support and management staff members.

Table E-1 Ministry of Education's teacher to student ratios by year levels and roll type[34]

Year	Number of students	Māori immersion roll type teacher to student ratio	Non-Māori immersion roll type teacher to student ratio	Number of FTE staff
Year 1	125 students	1:15	1:15	9 FTE staff
Years 2 - 3	250 students	1:18	1:18	14 FTE staff
Years 4 - 8	625 students	1:18	1:29	35 FTE staff
Total	**1,000 students**	-	-	**58 FTE staff**

E.2 ECE staff requirements

The number of staff/employees is required to estimate the parking rates and requirements for the ECE. It has been assumed that the ECE has capacity for up to 50 children at any one time. The staff requirements are based on the adult to child ratios for the children attending the ECE which varies for different age groups.

Based on the adult to student ratios as summarised in Table E-2, it is estimated that approximately eight FTE staff will be required for the ECE at any one time.

Table E-2 Adult to children ratios by age and number of children attending[35]

Age of children attending ECE	Number of children attending	Minimum staffing requirement
Under 2 years old	1 - 5 children	1 FTE staff

[33] Jasmax (2020) *Hobsonville Point Primary #2 - Stage 2 Site 5 (revised)*
[34] Ministry of Education. *Teacher to student ratios for calculating curriculum staffing* (accessed on 03 August 2021 at https://www.education.govt.nz/school/funding-and-financials/resourcing/school-staffing/entitlement-staffing/#Curr)
[35] NZ Government (2008) *Education (Early Childhood Services) Regulations 2008: Schedule 2 – Adult-to-child ratios (minimum)* (accessed on 03 August 2021 at https://www.legislation.govt.nz/regulation/public/2008/0204/latest/DLM1412637.html#DLM1412637)

Age of children attending ECE	Number of children attending	Minimum staffing requirement
	6 - 10 children	2 FTE staff
	11 - 15 children	3 FTE staff
	16 - 20 children	4 FTE staff
	21 - 25 children	5 FTE staff
2 years old and over	1 - 6 children	1 FTE staff
	7 - 20 children	2 FTE staff
	21 - 30 children	3 FTE staff
	31 - 40 children	4 FTE staff
Total	**50 children**	**8 FTE staff**

Appendix F. ITA traffic modelling memorandum

Jacobs

Memorandum

Carlaw Park
12-16 Nicholls Lane, Parnell
Auckland 1010
PO Box 9806, Newmarket
Auckland 1149
New Zealand
T +64 9 928 5500

Subject	**Traffic generation and SIDRA modelling**	**Project Name**	Hobsonville Point School ITA
Attention	Brontë Pierson	**Project No.**	IA262100
From	Amanda Klepper		
Date	29 November 2021		
Copies to	James Puketapu, Emma Howie, Steph Taylor, Chris Horne		

1. Introduction

Jacobs has undertaken an integrated transport assessment (ITA) to support the notice of requirement to designate a site for a new primary school and Early Childhood Education (ECE) centre at 279 Hobsonville Road. The purpose of the ITA is to assess the potential transport-related effects of the operation of the proposed new primary school. As part of the assessment, intersection modelling has been undertaken to estimate the impacts of school traffic on the three intersections adjacent to the school site: Hobsonville Point Road / Waka Moana Drive, Hudson Bay Road / Wallace Road, and Waka Moana Drive / Wallace Road.

The purpose of this memo is to do the following:

- set out the assumptions used to estimate background traffic on the network when the school opens, in approximately 2030
- describe how school traffic is assumed to be distributed on the network
- provide the inputs and results of the intersection modelling.

2. Background traffic

To model the intersections, the background traffic on the network around the school must be input along with the school's generated traffic. However, no traffic counts are available on existing roads in the vicinity of the school, and much of the surrounding network is part of the new development, and therefore does not currently generate traffic.

In addition to the lack of counts, there is also a lack of modelling in the area in sufficient detail to use for current or forecast traffic. While Hobsonville Point Road is included in the Auckland Macro Strategic Model (MSM), the network is represented at a very high level and has not been calibrated to local counts in Hobsonville. The Auckland Dynamic Traffic Assignment (DTA) model also does not have a detailed network in this area. Therefore, background traffic at the time of school opening has been projected based on available sources.

The following sources of information were used to inform traffic projections:

- The MSM model was used for existing traffic on Hobsonville Point Road
- The development plan from Panuku Development Auckland with the number of units in each precinct was used to add future traffic
- Information about the Hobsonville Point / Auckland ferry was used to estimate northbound traffic
- Waka Kotahi NZ Transport Agency's *Research Report 453: Trips and parking related to land use*, November 2011
- Auckland CBD Paramics Model (for peak hour factors).

To develop an assumed background traffic pattern, assumptions were first made about existing traffic on the network to create a base. As there were no current counts within the school catchment, the existing traffic on Hobsonville Point Road was assumed to be equal to the traffic flow in the 2018 MSM model.[1] It was assumed that Wallace Road and Waka Moana Drive have no existing traffic, only traffic from the new development.

To construct future traffic, vehicle trips generated by the new development were added on top of this existing traffic base. A trip generation rate of **3.9 vehicle trips per day per household** was assumed, based on a Waka Kotahi NZ Transport Agency research report[2]. This trip rate was applied to all the units in the new development. In reality, different trip rates would apply for apartments, stand-alone homes, and retirement units; however, there was insufficient information about the types of units in all precincts of the development to use that level of detail. Figure 1 shows the development plan with precinct boundaries and the number of vehicle trips (in and out) generated by each precinct.

[1] Comparison with 2018 count data further south on Hobsonville Road shows that MSM under-represents 2018 traffic on this road.

[2] Waka Kotahi NZ Transport Agency (November 2011) *Research Report 453: Trips and Parking Related to Land Use* (accessed at https://www.nzta.govt.nz/assets/resources/research/reports/453/docs/453.pdf). Survey of Christchurch inner city apartments (pre-earthquake, 2000) found a trip rate of 3.9 vehicle trips/day. Report also provided a trip rate of 9.5 for inner suburbs in Auckland, but based on local knowledge that was considered too high for Hobsonville Point.

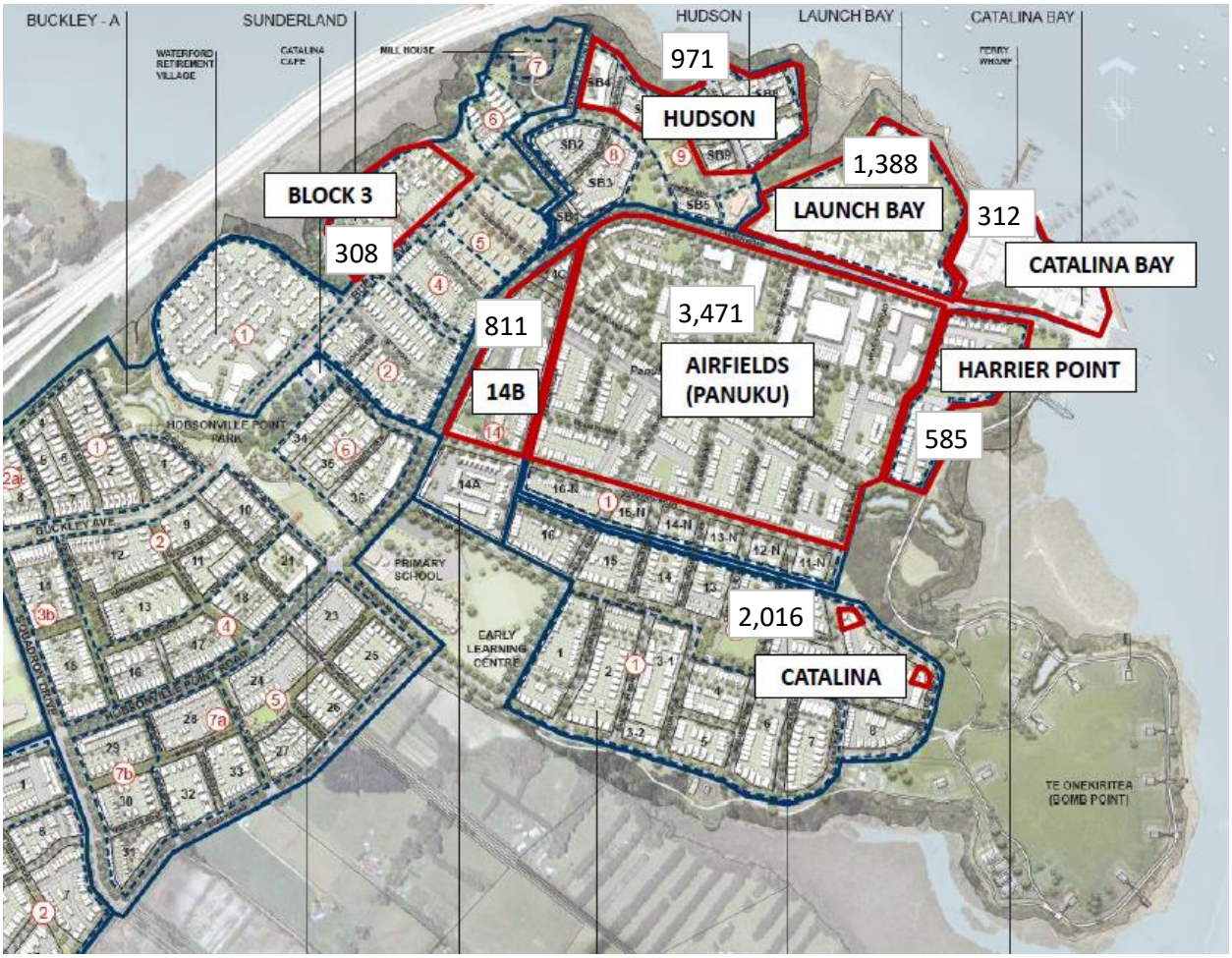


Figure 1: Development plan with vehicle trips generated per day per precinct (in and out)

To explore how different values of trip rate might affect the results, a sensitivity analysis was carried out assuming the trip generation rate of **6.5 vehicle trips per day per household** (see Section 5). This trip rate is based on the Roads and Traffic Authority 2002[3] trip rate for a 'medium-density residential flat building'.

[3] Roads and Traffic Authority New South Wales (2002) *Guide to Traffic Generating Developments* (accessed at https://roads-waterways.transport.nsw.gov.au/business-industry/partners-suppliers/documents/guides-manuals/guide-to-generating-traffic-developments.pdf)

Of the resulting trips generated, it was assumed that 50% would be trips in and 50% would be trips out. A **peak hour factor of 30%** was applied to trips in and out, i.e., 30% of trips out are during the morning peak hour (AM peak), and 30% of trips in are during the evening peak hour (PM peak)[4].

Once a total number of trips was generated for the AM and PM peaks from each precinct in the development, routes were assumed for those trips to follow to determine which intersections, approaches, and movements to apply them to. It was assumed that in the AM peak, **10%** of the trips would be northbound to the ferry and Catalina Bay, and **90%** of trips would be southbound. In the PM peak, routes would be reversed. Appendix 1 shows maps of the assumed routes for northbound and southbound traffic from each precinct.

For the purposes of SIDRA modelling, because turning movements cannot have zero traffic, a default value of **10 trips** was used for any movement that had no traffic after all background traffic had been applied.

Finally, heavy commercial vehicles (HCVs) were calculated assuming that all new development and MSM traffic is light vehicles and using a 5.5% share of HCVs, based on counts along Hobsonville Road / Hobsonville Point Road.

3. School traffic

The estimated trip generation and mode share for the school and ECE are detailed in Section 4.2.2 of the ITA. The resulting total vehicle trips generated were divided between the precincts proportionally to the number of proposed units within each development precinct as summarised in Table 1. The peak AM and PM trips to and from the school and ECE were proportioned and distributed across the network based on this population distribution. It was assumed that residents would take the most direct route to the site and this was factored into the distribution assumptions.

Morning school trips are assumed to occur during the AM peak. Afternoon school trips have been modelled along with PM peak traffic; however, in reality, the school peak would likely occur earlier than the commuter peak, so this is a conservative assumption.

Table 1: School trips by precinct

Precinct	Units at completion	Proportion	AM trips in	AM trips out	PM trips in	PM trips out
Block 14B	208	8.3%	42	38	32	37
Sunderland Block 3	79	3.1%	16	14	12	14
Catalina Bay	80	3.2%	16	15	12	14
Catalina	517	20.5%	105	94	81	91
Harrier Point	150	6.0%	30	27	23	26

[4] The 30% peak hour factor is based on the Auckland CBD Paramics model, which has 4-hour AM and PM peaks and approximately 30% of traffic during the peak hour in the general profile.

Precinct	Units at completion	Proportion	AM trips in	AM trips out	PM trips in	PM trips out
Hudson	249	9.9%	50	45	39	44
Launch Bay	343	13.6%	69	62	54	60
Airfields	890	35.4%	180	162	139	157
Total	2,516	100%	509	458	393	444

4. SIDRA intersection modelling

4.1 Model assumptions – overall

Three intersections adjacent to the school site were modelled in SIDRA Intersection (version 9).

- Hobsonville Point Road / Waka Moana Drive
- Hudson Bay Road / Wallace Road
- Waka Moana Drive / Wallace Road.

The intersections were modelled with their existing layouts. There are currently no pedestrian crossings at any of these intersections.

The traffic volumes calculated for background and school traffic were used as input volumes to the SIDRA models. Two scenarios were modelled: Base, with only the background traffic, and School, with the background traffic and school traffic.

The models have not been calibrated, as a number of roads located around the school are currently closed to traffic with adjacent residential development under construction. For this reason, it is considered that observed traffic conditions would not be representative of future traffic conditions on the network.

4.2 Hobsonville Point Road / Waka Moana Drive

Figure 2 shows the SIDRA model layout and an aerial view of the Hobsonville Point Road / Waka Moana Drive intersection. Waka Moana Drive is still under construction in this aerial view; however, the road has now been completed and its finished layout is reflected in the model.

Figure 2: Hobsonville Point Road / Waka Moana Drive SIDRA layout and aerial view

Note that there is an entrance to another side road, Sunderland Avenue, just to the north of the Waka Moana Drive entrance. The proximity of this entrance may have an impact on the Waka Moana Drive intersection. However, due to limitations of SIDRA, the intersection has been modelled in isolation, so any impacts of the nearby entrance on the Waka Moana Drive intersection are not known. As Sunderland Avenue is expected to be a low volume road, it is not anticipated that it will have a significant effect on the operation of the intersection.

The input traffic volumes are shown in Figure 3 (AM peak) and Figure 4 (PM peak).

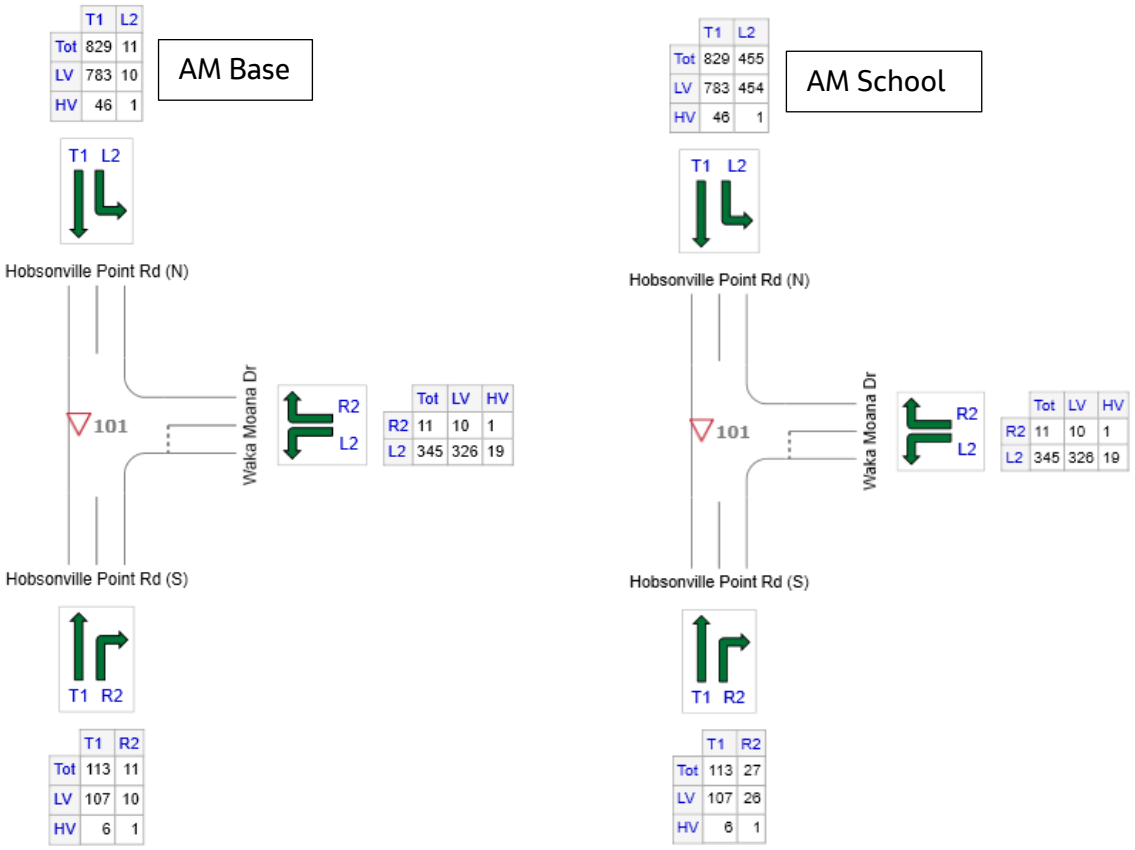


Figure 3: Input volumes for AM peak, Base and School traffic scenarios

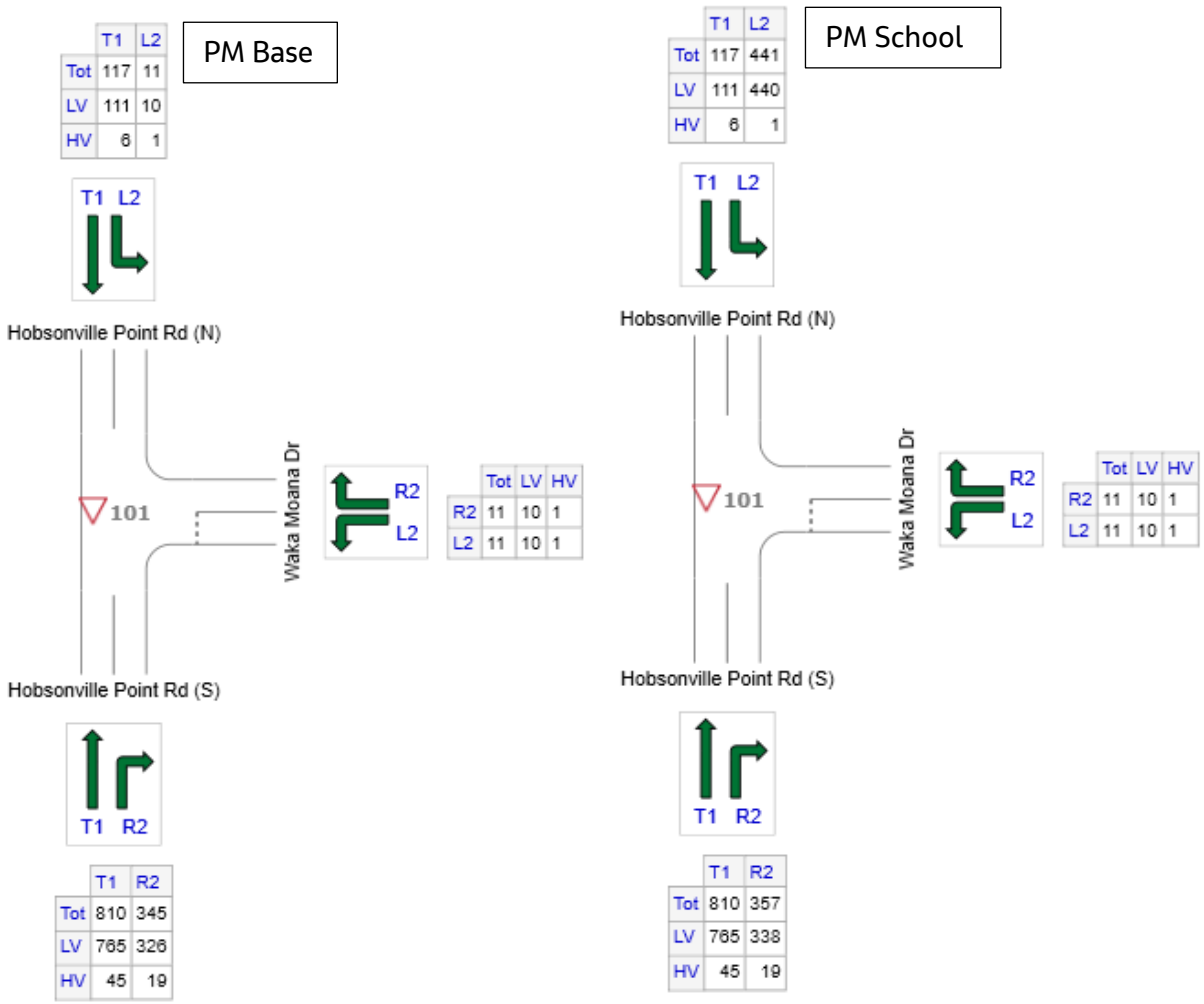


Figure 4: Input volumes for PM peak, Base and School traffic scenarios

Table 2 shows the modelling results for the Base and School scenarios.

In the Base scenario, the intersection operates with an overall average level of service (LOS) A in both the AM and PM peak hours and. During the AM peak, right-turning vehicles on Waka Moana Drive are estimated to have delays of 34 seconds on average and develop queues of approximately 40m in length.

The modelling results indicate that this intersection continues to operate at LOS A with the addition of school traffic. The Waka Moana Drive approach, which must give way to traffic on Hobsonville Point Road, has delays of up to 59 seconds during the AM peak and 51 seconds during the PM peak for the right-turn movement onto Hobsonville Point Road; however, the demand for this movement is expected to be low. The maximum queue length is modelled to be approximately 47m in the AM peak which does not develop

back to block Peihana Road. If queueing were to become more significant, it would be likely for traffic to reroute among the many other route options in the area.

Based on the modelling results, the impacts of the traffic generated by the school on the performance of the Hobsonville Point Road/Waka Moana Drive intersection are considered to be no more than minor.

Table 2: Modelling results for Hobsonville Point Road / Waka Moana Drive

Approach		Base scenario					School scenario			
		Volume (veh)	Degree of Saturation (LoS)	Average Delay (LoS)	Max Queue (m)		Volume (veh)	Degree of Saturation (LoS)	Average Delay (LoS)	Max Queue (m)
Weekday morning peak										
South: Hobsonville Point Road (S)	T	113	0.06 (A)	0 (A)	0.0		113	0.06 (A)	0 (A)	0
	R	11	0.02 (A)	11 (B)	0.6		27	0.19 (A)	30 (D)	4.2
East: Waka Moana Drive	L	345	0.76 (C)	20 (C)	40.1		345	0.81 (C)	23 (C)	47.1
	R	11	0.76 (C)	34 (D)	40.1		11	0.81 (C)	59 (F)	47.1
North: Hobsonville Point Road (N)	L	11	0.47 (A)	5 (A)	0.0		455	0.72 (C)	5 (A)	0
	T	829	0.47 (A)	0 (A)	0.0		829	0.72 (C)	0 (A)	0
Intersection Total		1320	0.76 (C)	6 (A)	40.1		1780	0.81 (C)	7 (A)	47.1
Weekday evening peak										
South: Hobsonville Point Road (S)	T	810	0.46 (A)	0 (A)	0.0		810	0.46 (A)	0 (A)	0
	R	345	0.24 (A)	5 (A)	9.1		357	0.41 (A)	9 (A)	18.2
East: Waka Moana Drive	L	11	0.11 (A)	5 (A)	2.5		11	0.16 (A)	5 (A)	3.5
	R	11	0.11 (A)	35 (D)	2.5		11	0.16 (A)	51 (F)	3.5
North: Hobsonville Point Road (N)	L	11	0.07 (A)	5 (A)	0.0		441	0.32 (A)	5 (A)	0
	T	117	0.07 (A)	0 (A)	0.0		117	0.32 (A)	0 (A)	0
Intersection Total		1305	0.46 (A)	2 (A)	9.1		1747	0.46 (A)	3 (A)	18.2

A sensitivity test was carried out for the AM peak[5] which increased school traffic volumes by 50% at this intersection (see Appendix 2). The majority of school traffic at this intersection is on the north approach turning left onto Waka Moana Drive. Therefore, if school traffic volumes are increased by 50%, the greatest impact would be on the right turn from the south approach, which must give way to the left turn. The model indicates that this movement would have delays over 2 minutes. Delays would also increase for

[5] Sensitivity tests were carried out for only the AM peak, as the PM peak had better performance overall, and school traffic would not likely occur at the same time as the commuter peak in the afternoon.

the right turn from Waka Moana Road, but school traffic is not expected to make that movement and therefore the queue length does not increase.

4.3 Hudson Bay Road / Wallace Road

Figure 5 shows the SIDRA model layout and an aerial view of the Hudson Bay Road / Wallace Road intersection. Wallace Road is still under construction in this aerial view; however, the road has now been constructed and its finished layout is reflected in the model.

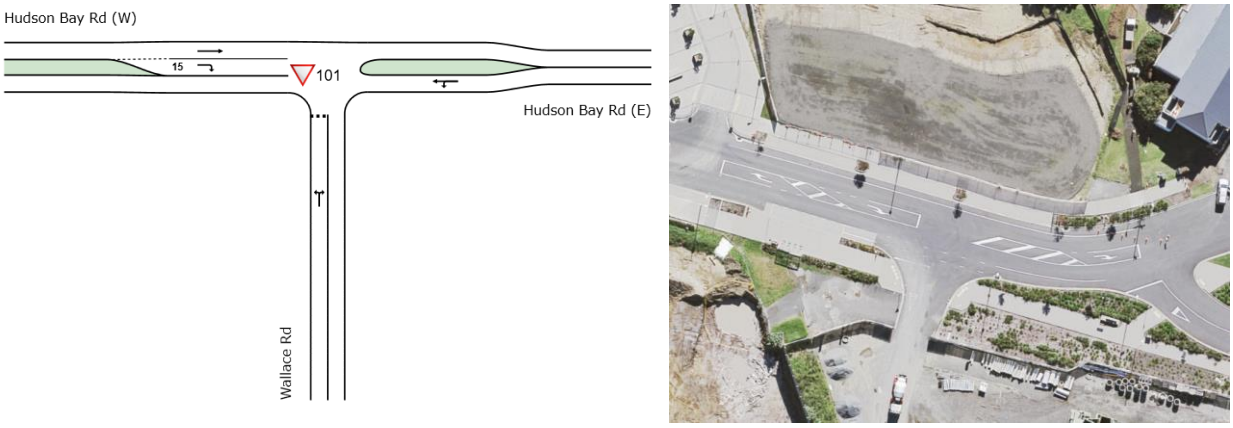


Figure 5: Hudson Bay Road / Wallace Road SIDRA layout and aerial view

The input traffic volumes are shown in Figure 6 (AM peak) and Figure 7 (PM peak).

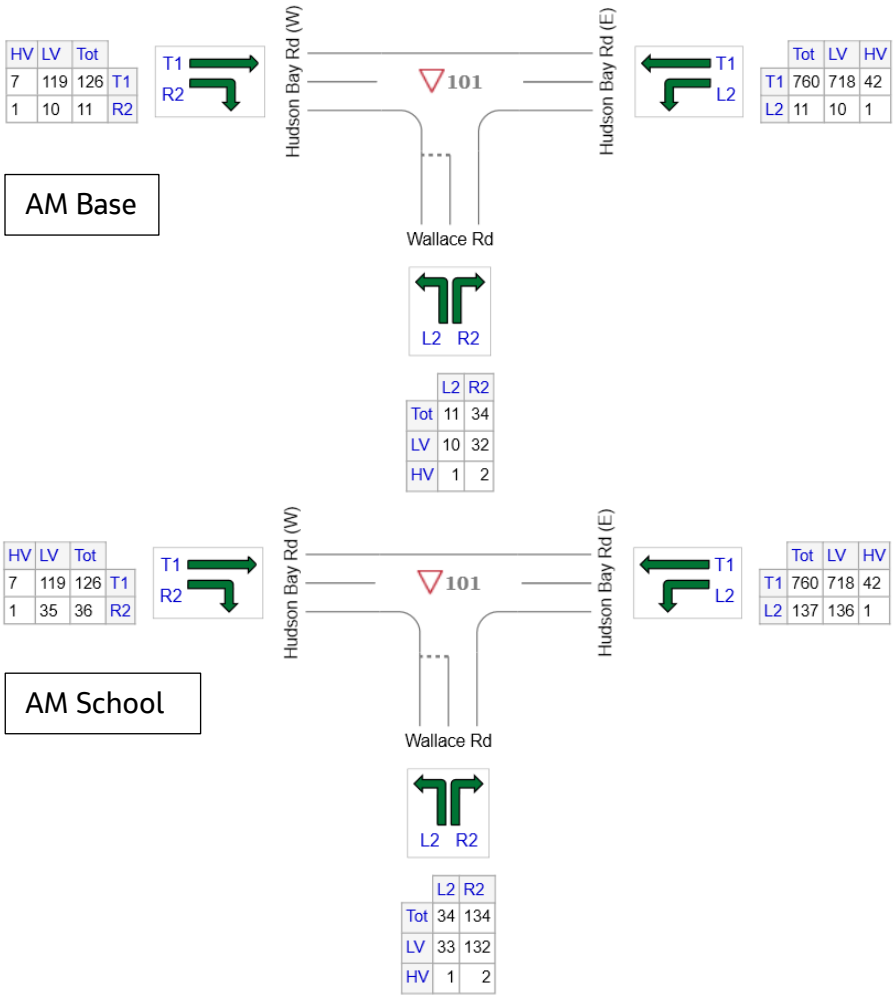


Figure 6: Input volumes for AM peak, Base and School traffic scenarios

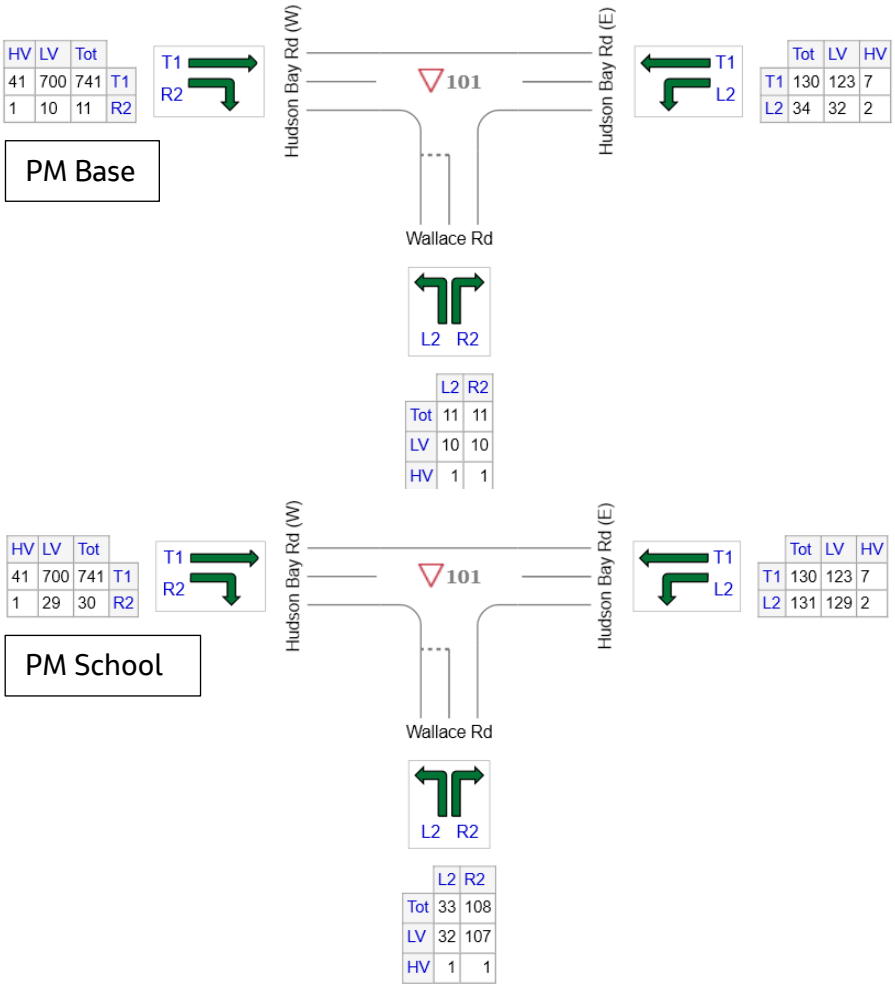


Figure 7: Input volumes for PM peak, Base and School traffic scenarios

Table 3 shows the modelling results for the Base and School scenarios.

In the Base scenario, the intersection operates at an overall average LOS A in both the AM and PM peak hours.

With the addition of traffic generated by the school, the modelling results indicate that the intersection would still operate at LOS A overall during the AM and PM peaks. There is sufficient intersection capacity to allow for the additional traffic without creating unacceptable delays on any approach.

Based on the modelling results, the impacts of the traffic generated by the school on the performance of the Hobsonville Point Road/Waka Moana Drive intersection are minor.

Table 3: Modelling results for Hudson Bay Road / Wallace Road

Approach		Base scenario					School scenario			
		Volume (veh)	Degree of Saturation (LoS)	Average Delay (LoS)	Max Queue (m)		Volume (veh)	Degree of Saturation (LoS)	Average Delay (LoS)	Max Queue (m)
Weekday morning peak										
South: Wallace Road (S)	L	11	0.16 (A)	10 (A)	3.9		34	0.68 (B)	20 (C)	25.2
	R	34	0.16 (A)	18 (C)	3.9		134	0.68 (B)	33 (D)	25.2
East: Hudson Bay Road (E)	L	11	0.43 (A)	4 (A)	0.0		137	0.5 (A)	4 (A)	0
	T	760	0.43 (A)	0 (A)	0.0		760	0.5 (A)	0 (A)	0
West: Hudson Bay Road (W)	T	126	0.07 (A)	0 (A)	0.0		126	0.07 (A)	0 (A)	0
	R	11	0.02 (A)	10 (A)	0.5		36	0.08 (A)	11 (B)	2
Intersection Total		953	0.43 (A)	1 (A)	3.9		1227	0.68 (B)	5 (A)	25.2
Weekday evening peak										
South: Wallace Road (S)	L	11	0.05 (A)	5 (A)	1.4		33	0.47 (A)	9 (A)	15.7
	R	11	0.05 (A)	18 (C)	1.4		108	0.47 (A)	24 (C)	15.7
East: Hudson Bay Road (E)	L	34	0.09 (A)	4 (A)	0.0		131	0.15 (A)	4 (A)	0
	T	130	0.09 (A)	0 (A)	0.0		130	0.15 (A)	0 (A)	0
West: Hudson Bay Road (W)	T	741	0.42 (A)	0 (A)	0.0		741	0.42 (A)	0 (A)	0
	R	11	0.01 (A)	5 (A)	0.3		30	0.02 (A)	6 (A)	0.7
Intersection Total		938	0.42 (A)	1 (A)	1.4		1173	0.47 (A)	3 (A)	15.7

A sensitivity test was carried out for the AM peak which increased school traffic volumes by 50% at this intersection (see Appendix 2). The modelling results show that if school traffic volumes are increased by 50%, the overall intersection performance is LOS C, with delays on the Wallace Road approach up to 90 s (LOS F) and queue lengths of nearly 100 m. Therefore, if school traffic is 50% more than anticipated, there may be more than minor effects on vehicle movements for the Wallace Road approach.

4.4 Wallace Road / Waka Moana Drive

Figure 8 shows the SIDRA model layout and an aerial view of the Wallace Road / Waka Moana Drive intersection.

Figure 8: Waka Moana Drive / Wallace Road SIDRA layout and aerial view

The input traffic volumes are shown in Figure 9 (AM peak) and Figure 10 (PM peak).

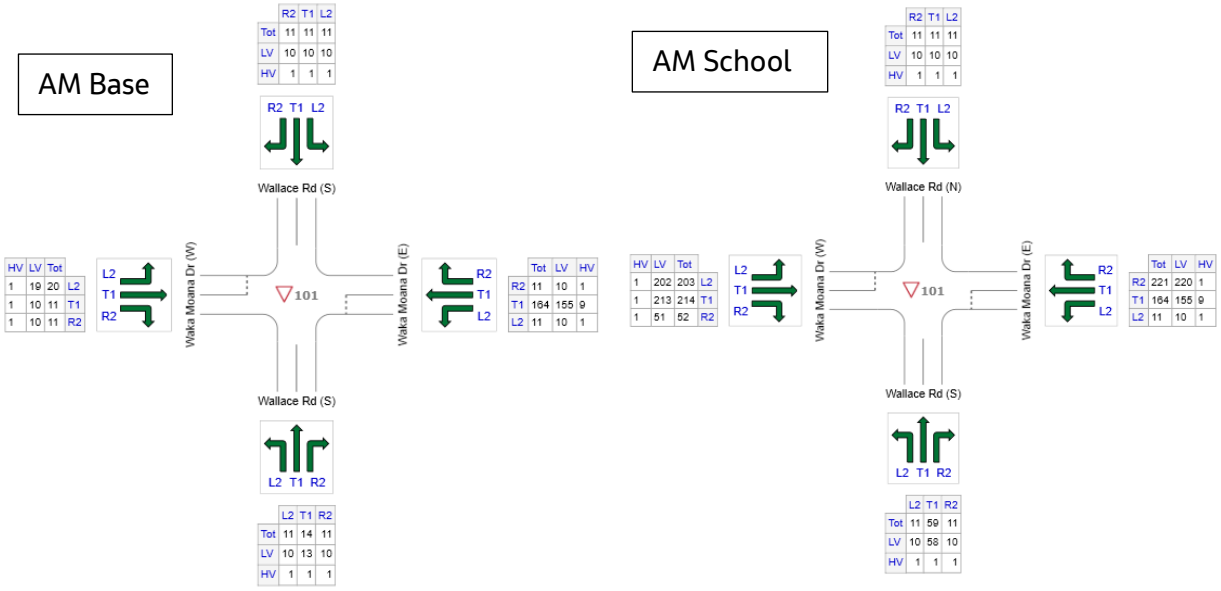


Figure 9: Input volumes for AM peak, Base and School traffic scenarios

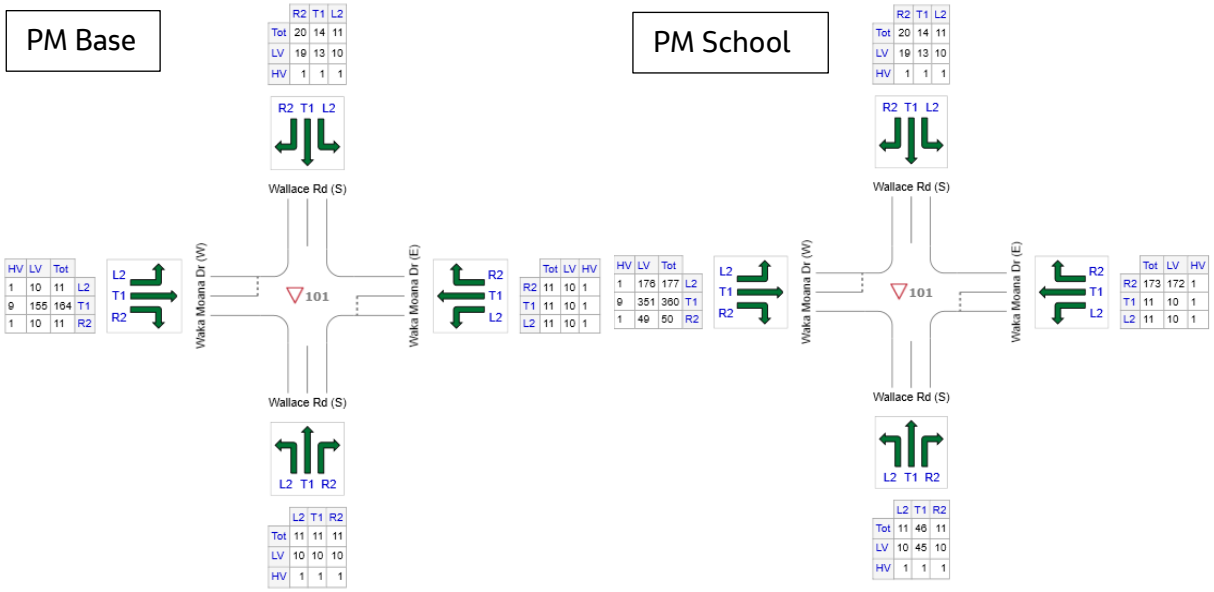


Figure 10: Input volumes for PM peak, Base and School traffic scenarios

Table 4 shows the modelling results for the Base and School scenarios.

The modelling results indicate that the intersection would operate at a LOS A overall and on all approaches during the AM and PM peaks. Queue lengths and delays on all approaches are minimal and the intersection operates with spare capacity during both peak hours.

There is sufficient capacity to allow for the additional traffic generated by the school without significantly increasing delays on any approach, and the intersection continues to operate at an overall LOS A during both peaks.

Based on the modelling results, the impacts of the traffic generated by the school on the performance of the Waka Moana Drive/Wallace Road intersection are not considered to be significant.

Table 4: Modelling results for Waka Moana Drive / Wallace Road

Approach		Base scenario					School scenario			
		Volume (veh)	Degree of Saturation (LoS)	Average Delay (LoS)	Max Queue (m)		Volume (veh)	Degree of Saturation (LoS)	Average Delay (LoS)	Max Queue (m)
Weekday morning peak										
South: Wallace Road (S)	L	11	0.02 (A)	5 (A)	0.6		11	0.05 (A)	5 (A)	0.6
	T	14	0.02 (A)	0 (A)	0.6		59	0.05 (A)	0 (A)	0.6
	R	11	0.02 (A)	5 (A)	0.6		11	0.05 (A)	5 (A)	0.6
	L	11	0.16 (A)	5 (A)	4.8		11	0.54 (A)	6 (A)	27.8

Approach		Base scenario					School scenario			
		Volume (veh)	Degree of Saturation (LoS)	Average Delay (LoS)	Max Queue (m)		Volume (veh)	Degree of Saturation (LoS)	Average Delay (LoS)	Max Queue (m)
East: Waka Moana Drive (E)	T	164	0.16 (A)	4 (A)	4.8		164	0.54 (A)	5 (A)	27.8
	R	11	0.16 (A)	5 (A)	4.8		221	0.54 (A)	12 (B)	27.8
North: Wallace Road (S)	L	11	0.02 (A)	5 (A)	0.5		11	0.02 (A)	5 (A)	0.6
	T	11	0.02 (A)	0 (A)	0.5		11	0.02 (A)	0 (A)	0.6
	R	11	0.02 (A)	5 (A)	0.5		11	0.02 (A)	5 (A)	0.6
West: Waka Moana Drive (W)	L	20	0.04 (A)	5 (A)	1		203	0.39 (A)	5 (A)	14.4
	T	11	0.04 (A)	4 (A)	1		214	0.39 (A)	4 (A)	14.4
	R	11	0.04 (A)	6 (A)	1		52	0.39 (A)	7 (A)	14.4
Intersection Total		297	0.16 (A)	4 (A)	4.8		979	0.54 (A)	6 (A)	27.8
Weekday evening peak										
South: Wallace Road (S)	L	11	0.02 (A)	5 (A)	0.5		11	0.04 (A)	5 (A)	0.6
	T	11	0.02 (A)	0 (A)	0.5		46	0.04 (A)	0 (A)	0.6
	R	11	0.02 (A)	5 (A)	0.5		11	0.04 (A)	5 (A)	0.6
East: Waka Moana Drive (E)	L	11	0.03 (A)	5 (A)	0.8		11	0.38 (A)	6 (A)	12.3
	T	11	0.03 (A)	4 (A)	0.8		11	0.38 (A)	5 (A)	12.3
	R	11	0.03 (A)	6 (A)	0.8		173	0.38 (A)	12 (B)	12.3
North: Wallace Road (S)	L	11	0.03 (A)	5 (A)	0.8		11	0.03 (A)	5 (A)	0.8
	T	14	0.03 (A)	0 (A)	0.8		14	0.03 (A)	0 (A)	0.8
	R	20	0.03 (A)	5 (A)	0.8		20	0.03 (A)	5 (A)	0.8
West: Waka Moana Drive (W)	L	11	0.16 (A)	5 (A)	4.8		177	0.49 (A)	5 (A)	21.1
	T	164	0.16 (A)	4 (A)	4.8		360	0.49 (A)	4 (A)	21.1
	R	11	0.16 (A)	5 (A)	4.8		50	0.49 (A)	6 (A)	21.1
Intersection Total		297	0.16 (A)	4 (A)	4.8		895	0.49 (A)	6 (A)	21.1

A sensitivity test was carried out for the AM peak which increased school traffic volumes by 50% at this intersection (see Appendix 2). The model indicated that if school traffic is 50% higher at this intersection, the overall intersection performance would be LOS C. The most impacted movement is the right turn from the East approach of Waka Moana Drive, which would have a delay of about 40 seconds and a queue length of 140m, blocking some accesses but not extending as far as Bomb Point Drive. While this may be considered more than a minor impact, it is likely in reality that traffic would reroute to Wallace Road to avoid turning right to access the school entrance.

5. SIDRA modelling sensitivity analysis – high trip rate

5.1 Model assumptions

Auckland Transport, Auckland Council and the Auckland Forecasting Centre provided initial review comments on the *Hobsonville Point Primary School and ECE Integrated Transportation Assessment* and the supporting *Traffic generation and SIDRA modelling memorandum (Revision 2.0).*

As requested by Auckland Transport, further SIDRA intersection modelling was undertaken to assess the impact of a higher household trip rate on traffic performance. Sensitivity analysis was carried out for each intersection assuming a trip rate of **6.5 vehicle trips per day per household,** as recommended by Auckland Transport to align with the Road and Traffic Authority (RTA) *Guide to Traffic Generating Development*[6] trip rates for a 'medium-density residential flat building'. This rate is considerably higher than the previously assumed trip rate of 3.9 trips per day per HH as reported in Section 4**.** The intersection layout and other assumptions remain the same as in Section 4.

[6] Roads and Traffic Authority New South Wales (2002) *Guide to Traffic Generating Developments* (accessed at https://roads-waterways.transport.nsw.gov.au/business-industry/partners-suppliers/documents/guides-manuals/guide-to-generating-traffic-developments.pdf)

5.2 Hobsonville Point Road / Waka Moana Drive

The input traffic volumes are shown in Figure 11 (AM peak) and Figure 12 (PM peak).

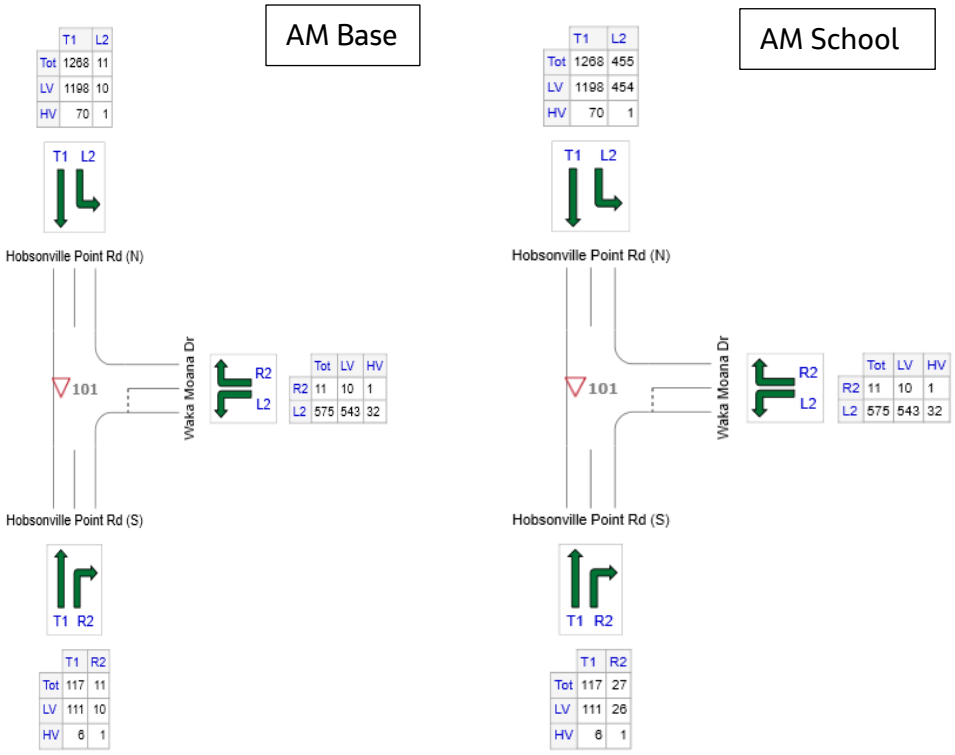


Figure 11: Input volumes for AM peak, Base and School traffic scenarios

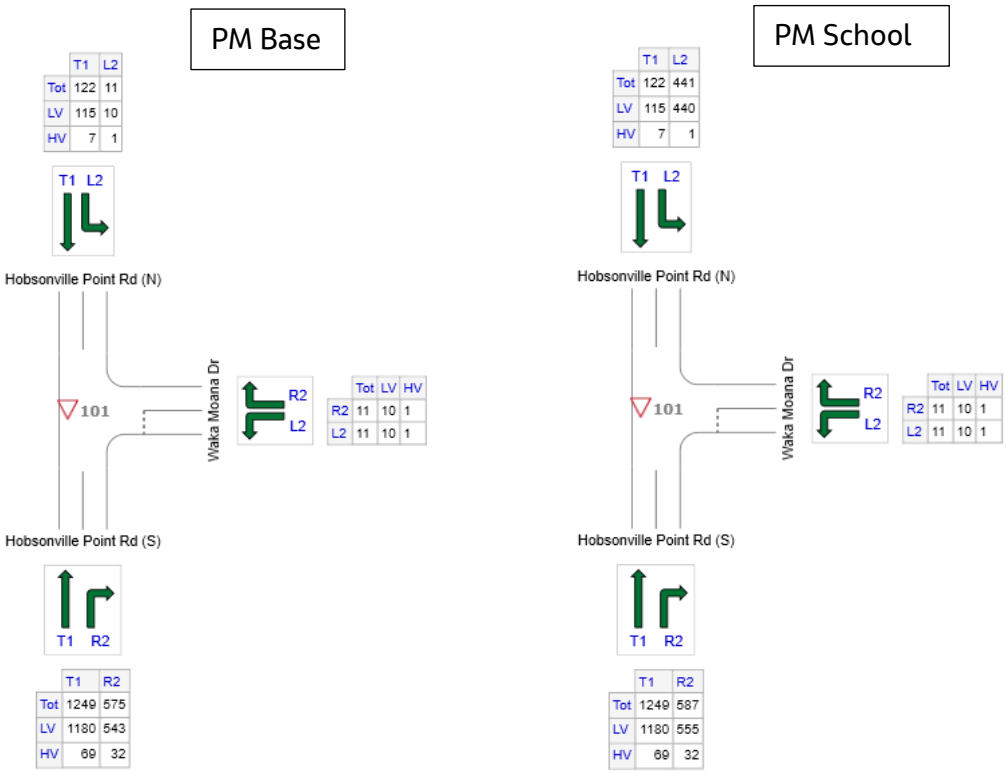


Figure 12: Input volumes for PM peak, Base and School traffic scenarios

Table 5 shows the modelling results for the Base and School scenarios. The sensitivity testing indicates that the higher trip rate has a significant impact on the performance of this intersection.

In the Base scenario, the increased background traffic volumes on Hobsonville Point Road result in significant delays for traffic exiting Waka Moana Drive, which must give way. In addition, traffic turning right from the southern Hobsonville Point Road approach experience average delays of 32 seconds. Although the volumes of vehicles turning right from Waka Moana Road is low, these vehicles are subject to significant delays, which also results in significant delays to left-turning vehicles on that approach, as these movements share one lane. This approach is over capacity in the AM peak and nearly at capacity in the PM peak in the Base scenario.

With the addition of school traffic, the congestion that was forming in the Base scenario is exacerbated. The right-turn movement on the southern approach exceeds capacity at LOS F during the AM peak. The modelled queue lengths develop back past the available length of the right-turning bay to block the northbound through movement along Hobsonville Point Road. Significant queuing along Waka Moana Drive is expected under this scenario with queue lengths extending back past the intersection with Wallace Road, further obstructing school traffic.

The intersection operates at a LOS C in the PM peak. In both the Base and School scenarios, there is less southbound traffic in the PM peak on Hobsonville Point Road, making the right turn from the south

approach into Waka Moana Drive easier. Traffic volumes on the Waka Moana Drive approach are lower in the PM peak as well, so while average delays are significant, the volumes of traffic are low on this approach.

Note that in this high trip rate scenario, the Waka Moana Drive approach is at LOS F even without school traffic.

Table 5: Modelling results for Hobsonville Point Road / Waka Moana Drive

Approach		Base scenario					School scenario			
		Volume (veh)	Degree of Saturation (LoS)	Average Delay (LoS)	Max Queue (m)		Volume (veh)	Degree of Saturation (LoS)	Average Delay (LoS)	Max Queue (m)
Weekday morning peak										
South: Hobsonville Point Road (S)	T	117	0.07 (A)	0 (A)	0.0		117	3.2 (F)	3477 (F)	864
	R	11	0.09 (A)	32 (D)	2.0		27	4.74 (F)	3768 (F)	177.7
East: Waka Moana Drive	L	575	4.59 (F)	3247 (F)	2306.3		575	5.05 (F)	3662 (F)	2369.9
	R	11	4.59 (F)	3259 (F)	2306.3		11	5.05 (F)	3700 (F)	2369.9
North: Hobsonville Point Road (N)	L	11	0.72 (C)	5 (A)	0.0		455	0.97 (E)	7 (A)	0
	T	1268	0.72 (C)	0 (A)	0.0		1268	0.97 (E)	3 (A)	0
Intersection Total		1993	4.59 (F)	955 (F)	2306.3		2453	5.05 (F)	1085 (F)	2369.9
Weekday evening peak										
South: Hobsonville Point Road (S)	T	1249	0.7 (C)	1 (A)	0.0		1249	0.92 (D)	4 (A)	100
	R	575	0.39 (A)	5 (A)	18.0		587	0.68 (B)	12 (B)	49.3
East: Waka Moana Drive	L	11	0.97 (E)	355 (F)	31.9		11	1.68 (F)	1011 (F)	80.4
	R	11	0.97 (E)	628 (F)	31.9		11	1.68 (F)	1297 (F)	80.4
North: Hobsonville Point Road (N)	L	11	0.08 (A)	5 (A)	0.0		441	0.32 (A)	5 (A)	0
	T	122	0.08 (A)	0 (A)	0.0		122	0.32 (A)	0 (A)	0
Intersection Total		1979	0.97 (E)	7 (A)	31.9		2421	1.68 (F)	16 (C)	100

5.3 Hudson Bay Road / Wallace Road

The input traffic volumes are shown in Figure 13 (AM peak) and Figure 14 (PM peak).

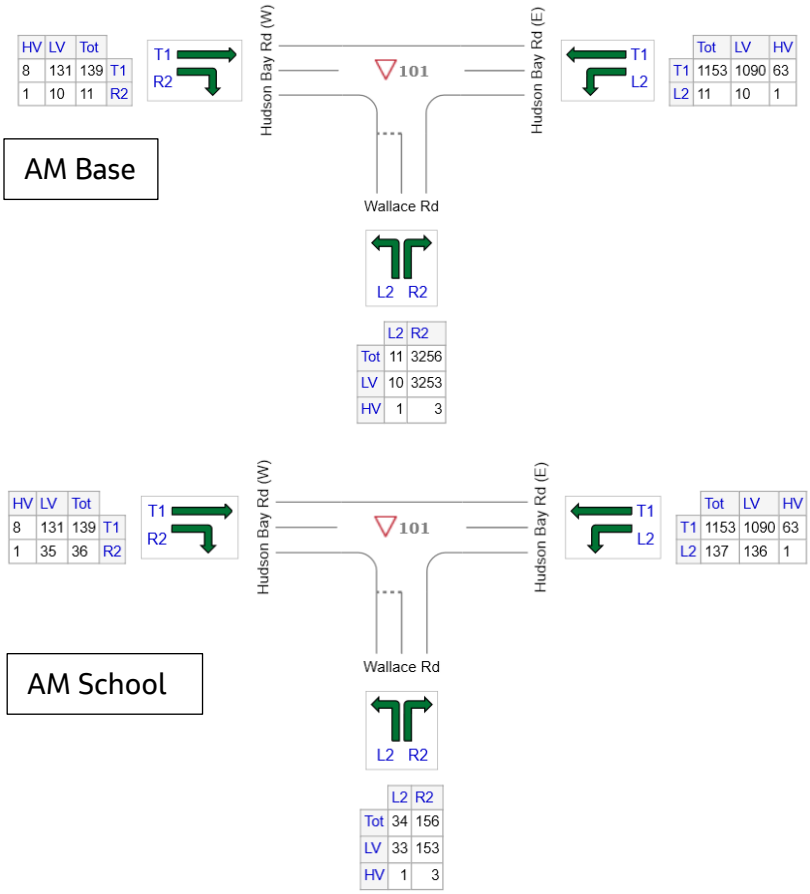


Figure 13: Input volumes for AM peak, Base and School traffic scenarios

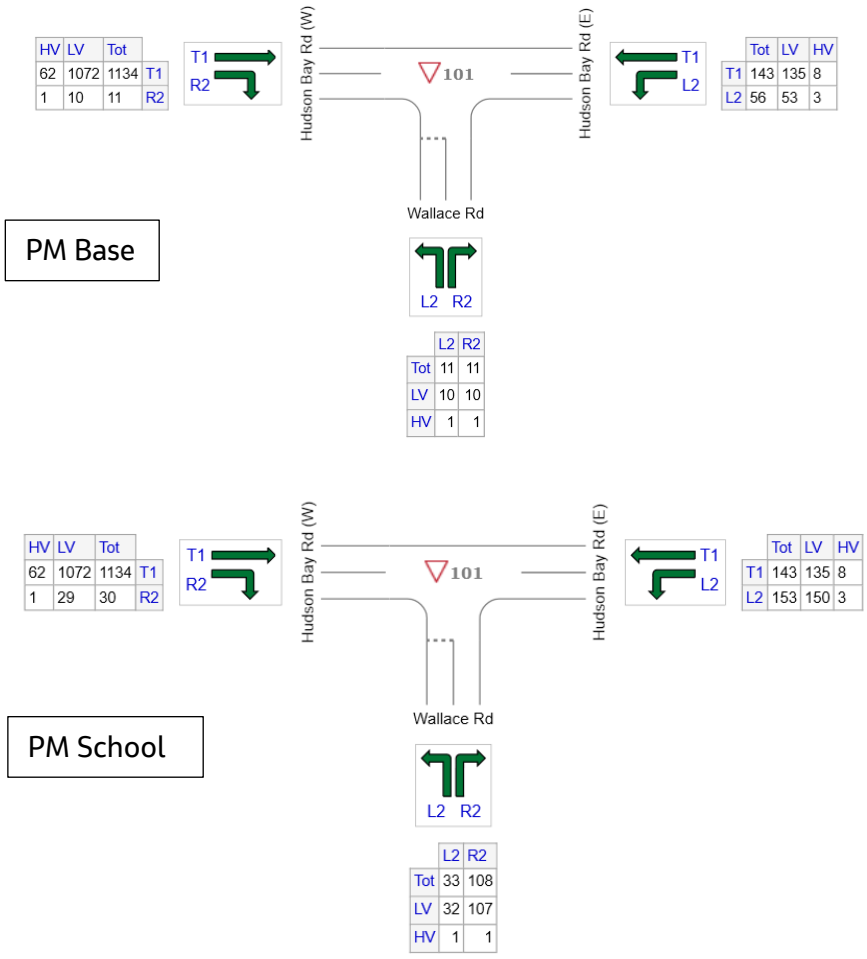


Figure 14: Input volumes for PM peak, Base and School traffic scenarios

Table 6 shows the modelling results for the Base and School scenarios.

The results show that with a higher trip rate, more traffic is generated on the main road, making it difficult to turn from Wallace Road. Even without school traffic, this approach has over one minute delay. With school traffic added, the queue would increase significantly, with a maximum queue of 600m in the AM peak, and 260m in the PM peak. In reality, in these conditions it would be likely for traffic to reroute to another intersection.

Table 6: Modelling results for Hudson Bay Road / Wallace Road

Approach		Base					School			
		Volume (veh)	Degree of Saturation (LoS)	Average Delay (LoS)	Max Queue (m)		Volume (veh)	Degree of Saturation (LoS)	Average Delay (LoS)	Max Queue (m)
Weekday morning peak										
South: Wallace Rd	L	11	0.79 (C)	70 (F)	24.1		34	2.66 (F)	1522 (F)	612.2
	R	56	0.79 (C)	100 (F)	24.1		156	2.66 (F)	1538 (F)	612.2
East: Hudson Bay Rd (E)	L	11	0.65 (B)	4 (A)	0.0		137	0.72 (C)	4 (A)	0
	T	1153	0.65 (B)	0 (A)	0.0		1153	0.72 (C)	0 (A)	0
West: Hudson Bay Rd (W)	T	139	0.08 (A)	0 (A)	0.0		139	0.08 (A)	0 (A)	0
	R	11	0.06 (A)	22 (C)	1.3		36	0.27 (A)	34 (D)	6
Intersection Total		1381	0.79 (C)	5 (A)	24.1		1655	2.66 (F)	177 (F)	612.2
Weekday evening peak										
South: Wallace Rd	L	11	0.16 (A)	5 (A)	3.5		33	1.49 (F)	491 (F)	262.9
	R	11	0.16 (A)	52 (F)	3.5		108	1.49 (F)	529 (F)	262.9
East: Hudson Bay Rd (E)	L	56	0.11 (A)	4 (A)	0.0		153	0.17 (A)	4 (A)	0
	T	143	0.11 (A)	0 (A)	0.0		143	0.17 (A)	0 (A)	0
West: Hudson Bay Rd (W)	T	1134	0.64 (B)	1 (A)	0.0		1134	0.64 (B)	1 (A)	0
	R	11	0.01 (A)	5 (A)	0.3		30	0.02 (A)	6 (A)	0.7
Intersection Total		1366	0.64 (B)	1 (A)	3.5		1601	1.49 (F)	47 (E)	262.9

5.4 Wallace Road / Waka Moana Drive

The input traffic volumes are shown in Figure 15 (AM peak) and Figure 16 (PM peak).

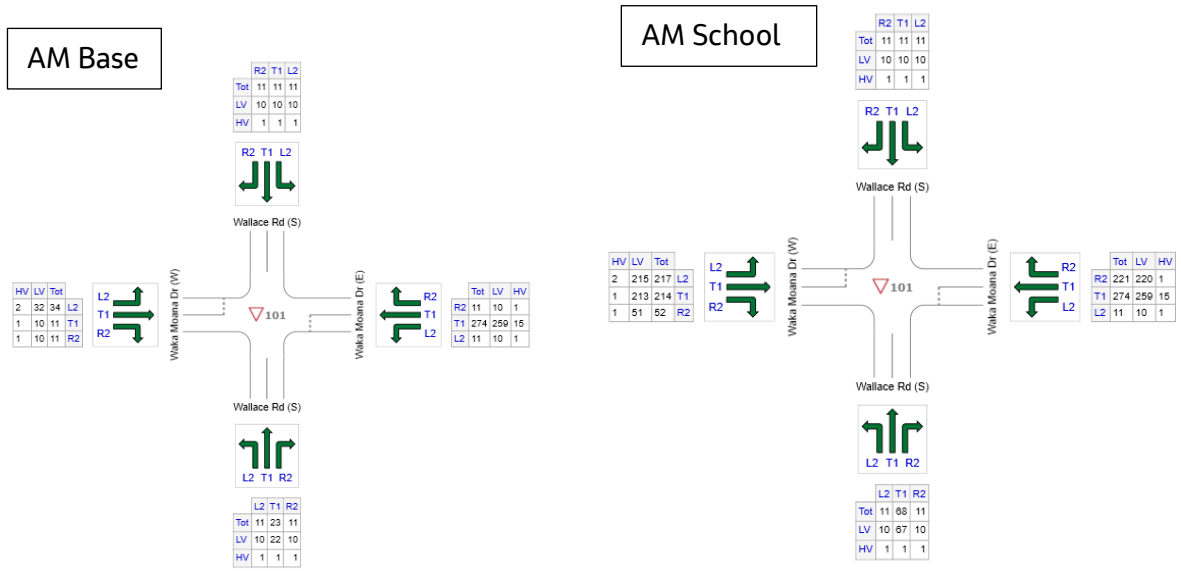


Figure 15: Input volumes for AM peak, Base and School traffic scenarios

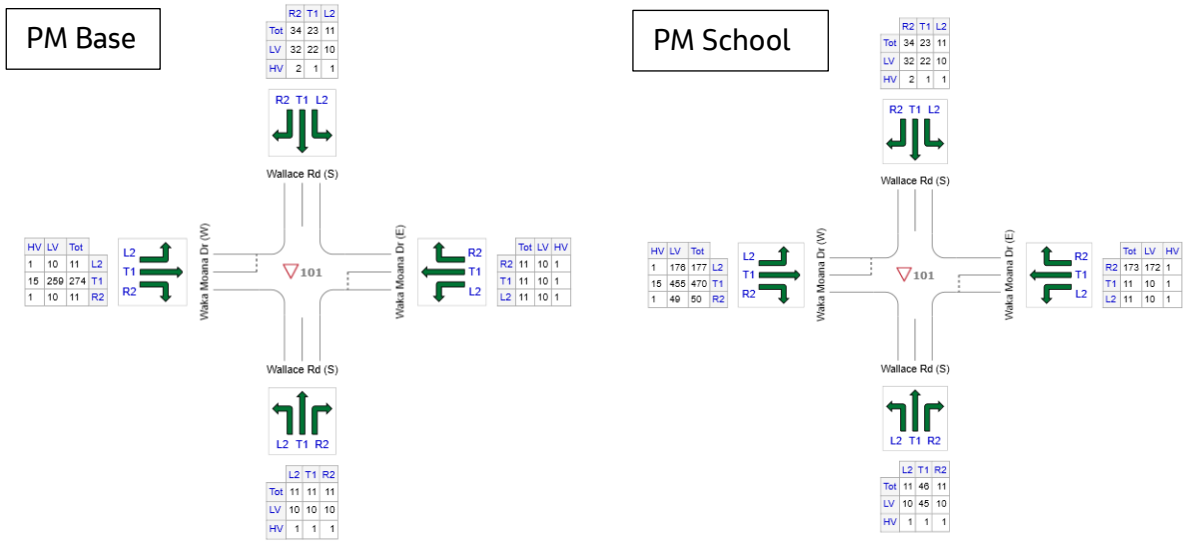


Figure 16: Input volumes for PM peak, Base and School traffic scenarios

Table 7 shows the modelling results for the Base and School scenarios.

The modelling results indicate that the intersection would operate at LOS A overall, even with the higher trip rate. There is sufficient capacity to allow for the additional traffic without significantly increasing delays on any approach.

Table 7: Modelling results for Hobsonville Point Road / Wallace Road

Approach		Base scenario					School scenario			
		Volume (veh)	Degree of Saturation (LoS)	Average Delay (LoS)	Max Queue (m)		Volume (veh)	Degree of Saturation (LoS)	Average Delay (LoS)	Max Queue (m)
Weekday morning peak										
South: Wallace Road (S)	L	11	0.03 (A)	5 (A)	0.6		11	0.05 (A)	5 (A)	0.6
	T	23	0.03 (A)	0 (A)	0.6		68	0.05 (A)	0 (A)	0.6
	R	11	0.03 (A)	5 (A)	0.6		11	0.05 (A)	5 (A)	0.6
East: Waka Moana Drive (E)	L	11	0.26 (A)	5 (A)	8.4		11	0.66 (B)	7 (A)	46.6
	T	274	0.26 (A)	4 (A)	8.4		274	0.66 (B)	7 (A)	46.6
	R	11	0.26 (A)	5 (A)	8.4		221	0.66 (B)	14 (B)	46.6
North: Wallace Road (S)	L	11	0.02 (A)	5 (A)	0.5		11	0.02 (A)	5 (A)	0.6
	T	11	0.02 (A)	0 (A)	0.5		11	0.02 (A)	0 (A)	0.6
	R	11	0.02 (A)	5 (A)	0.5		11	0.02 (A)	5 (A)	0.6

Approach		Base scenario					School scenario			
		Volume (veh)	Degree of Saturation (LoS)	Average Delay (LoS)	Max Queue (m)		Volume (veh)	Degree of Saturation (LoS)	Average Delay (LoS)	Max Queue (m)
West: Waka Moana Drive (W)	L	34	0.05 (A)	5 (A)	1.4		217	0.42 (A)	5 (A)	15.5
	T	11	0.05 (A)	4 (A)	1.4		214	0.42 (A)	4 (A)	15.5
	R	11	0.05 (A)	7 (A)	1.4		52	0.42 (A)	9 (A)	15.5
Intersection Total		430	0.26 (A)	4 (A)	8.4		1112	0.66 (B)	7 (A)	46.6
Weekday evening peak										
South: Wallace Road (S)	L	11	0.02 (A)	5 (A)	0.5		11	0.04 (A)	5 (A)	0.6
	T	11	0.02 (A)	0 (A)	0.5		46	0.04 (A)	0 (A)	0.6
	R	11	0.02 (A)	5 (A)	0.5		11	0.04 (A)	5 (A)	0.6
East: Waka Moana Drive (E)	L	11	0.03 (A)	5 (A)	0.9		11	0.48 (A)	7 (A)	15.9
	T	11	0.03 (A)	4 (A)	0.9		11	0.48 (A)	6 (A)	15.9
	R	11	0.03 (A)	7 (A)	0.9		173	0.48 (A)	15 (B)	15.9
North: Wallace Road (S)	L	11	0.04 (A)	5 (A)	1.3		11	0.04 (A)	5 (A)	1.3
	T	23	0.04 (A)	0 (A)	1.3		23	0.04 (A)	0 (A)	1.3
	R	34	0.04 (A)	5 (A)	1.3		34	0.04 (A)	5 (A)	1.3
West: Waka Moana Drive (W)	L	11	0.26 (A)	5 (A)	8.6		177	0.6 (B)	5 (A)	37.9
	T	274	0.26 (A)	4 (A)	8.6		470	0.6 (B)	5 (A)	37.9
	R	11	0.26 (A)	5 (A)	8.6		50	0.6 (B)	7 (A)	37.9
Intersection Total		430	0.26 (A)	4 (A)	8.6		1028	0.6 (B)	7 (A)	37.9

6. Conclusions

In summary, the model results indicate that using the lower trip rate of 3.9 trips per household per day, trips generated by the school and ECE have contributed to minor increases to queue lengths and delays for the intersections surrounding the school site. However, the models indicate that all three intersections will have the spare capacity to accommodate the increased traffic volumes generated by the proposal. Sensitivity tests of school traffic show that increasing school traffic by 50% would exceed capacity create more than minor impacts, particularly on the Wallace Road approach to Hudson Bay Road, and the eastern Waka Moana Drive approach to Wallace Road.

The sensitivity analysis using a higher background trip rate of 6.5 vehicle trips per day per household indicates that the performance at Hobsonville Point Road/Waka Moana Drive intersection and Hudson Bay

Road/Wallace Road intersection perform significantly worse under the Base scenario conditions, prior to the addition of school-related traffic. With the addition of school traffic, Waka Moana Drive and Wallace Road would have long queues that exceed the intersection capacity and block other intersections. The Wallace Road/Waka Moana Drive intersection would operate well even with higher trip rate. This test highlights the need to plan for and encourage alternative transport modes as the Hobsonville Point area develops.

It is recommended that this analysis be revisited when more information becomes available about background traffic from the new development.

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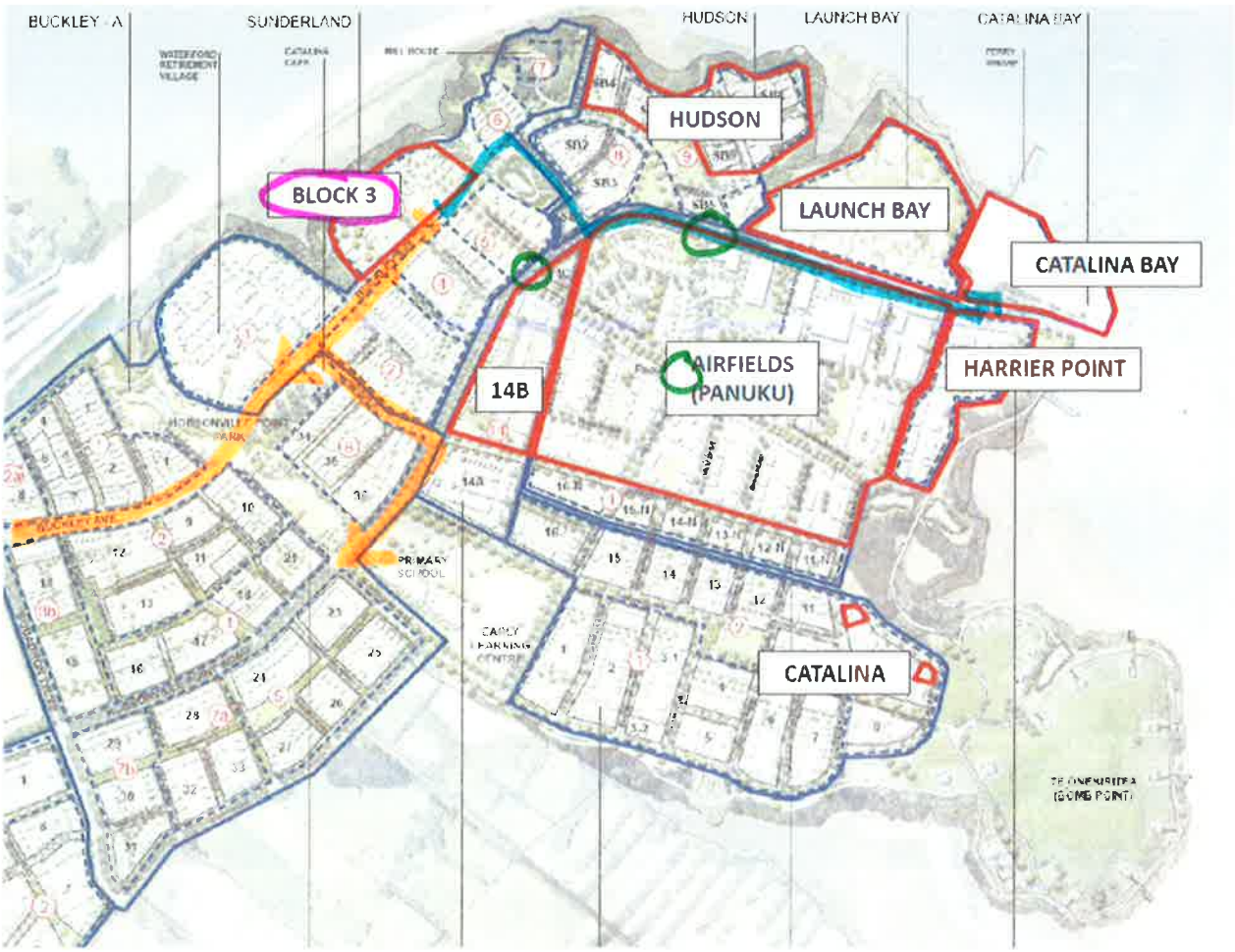
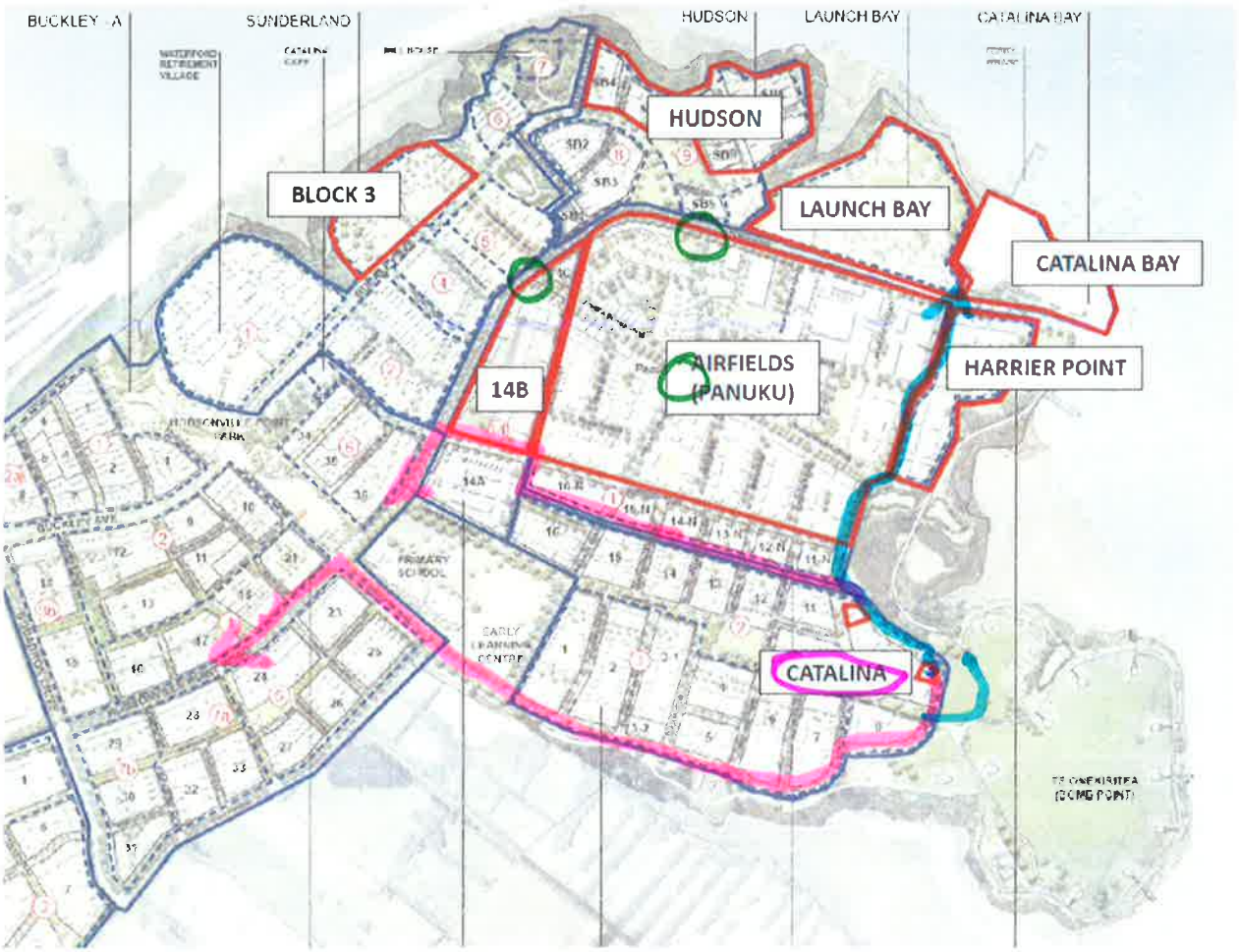
Appendix 1: Traffic distribution route maps

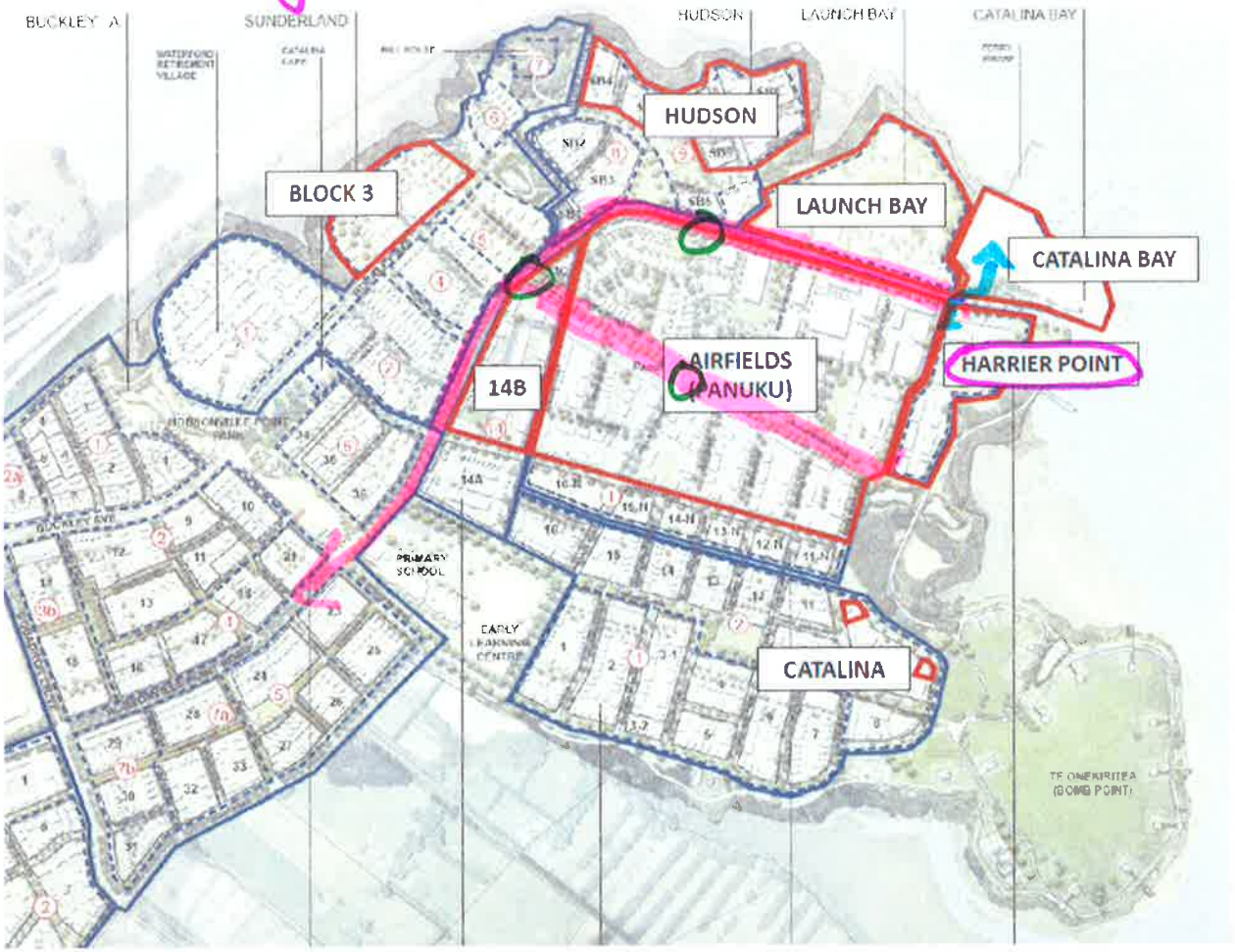
Background Traffic 1 of 4



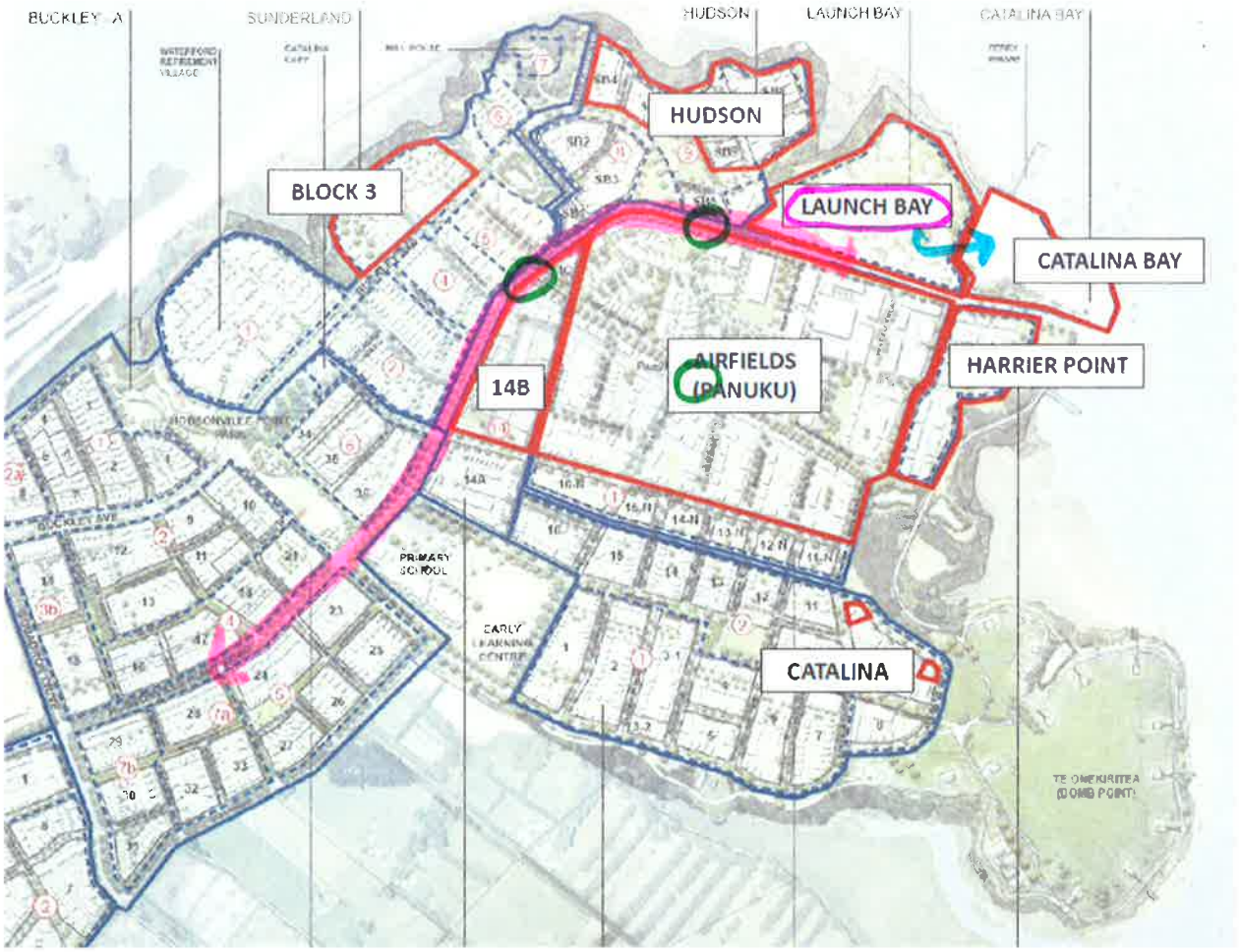
Background Traffic 2 of 4

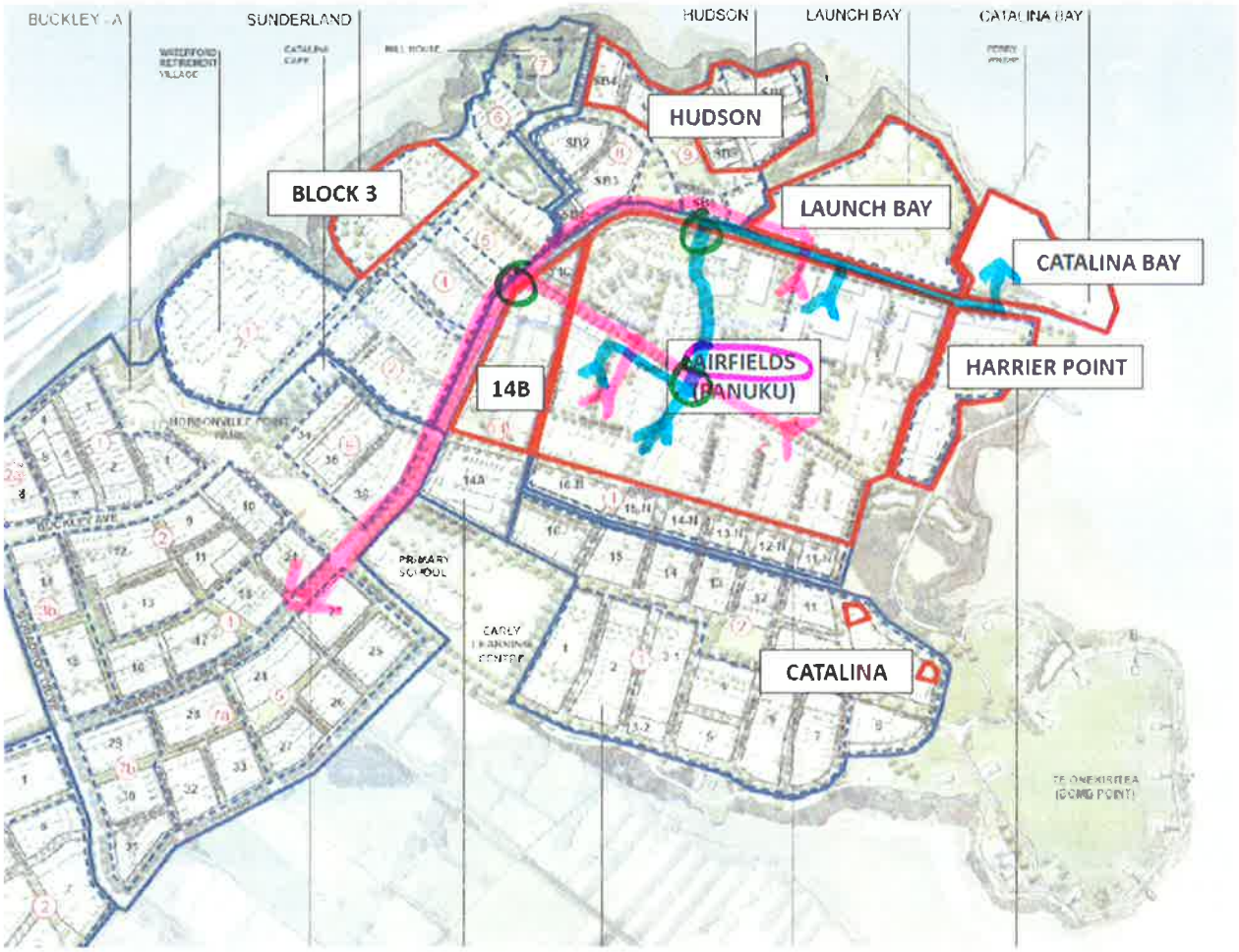


Background Traffic 3 of 4

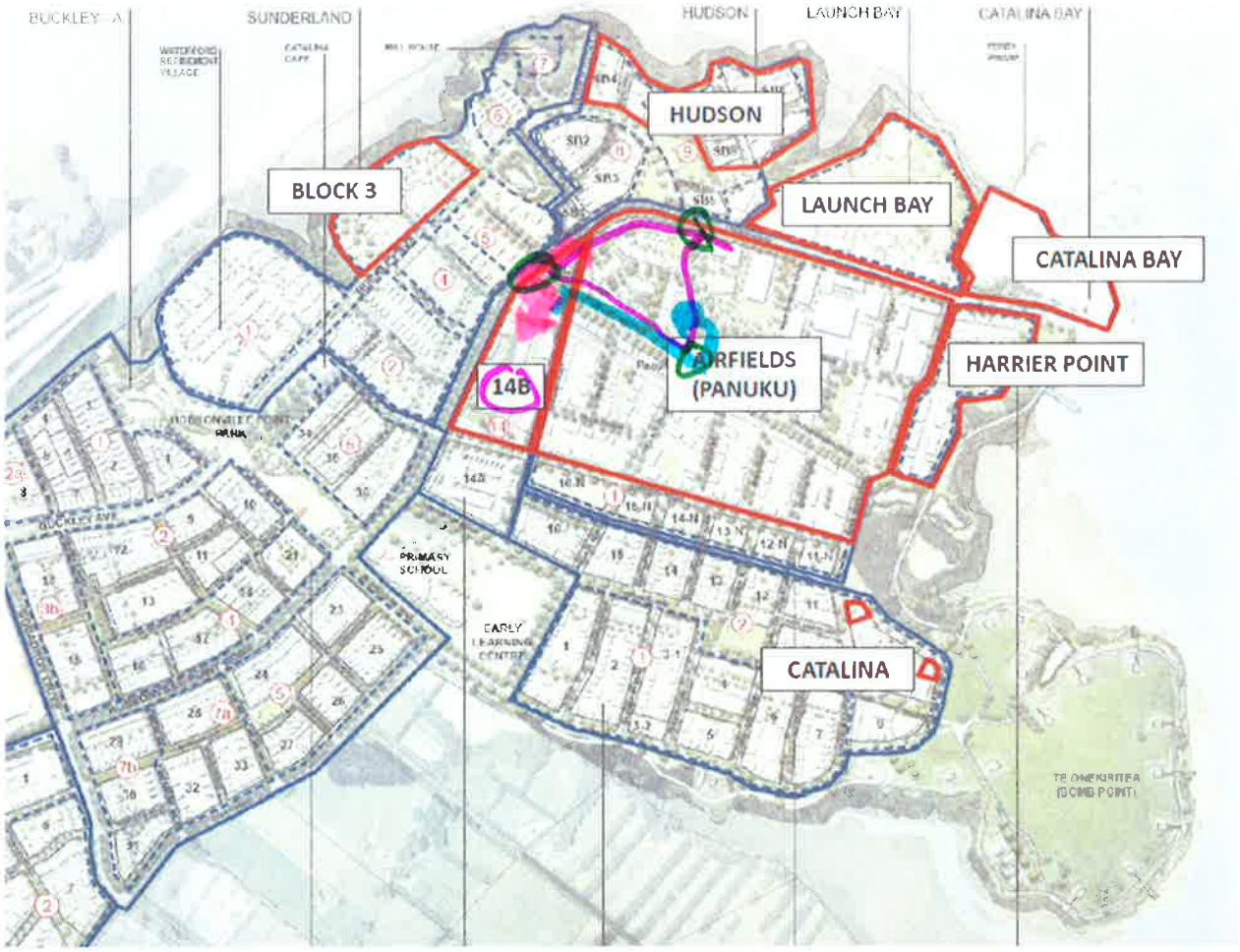


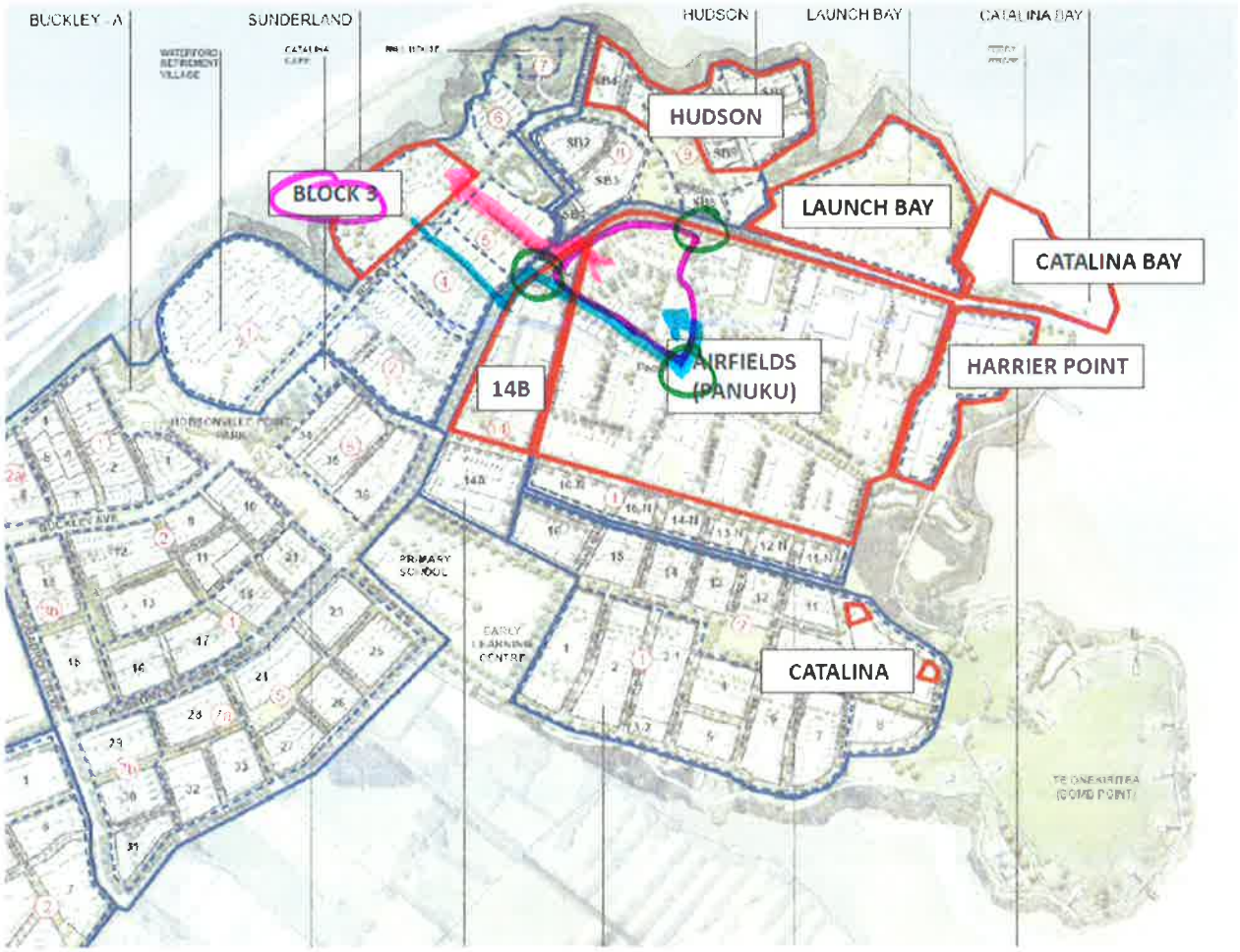
Background Traffic 4 of 4



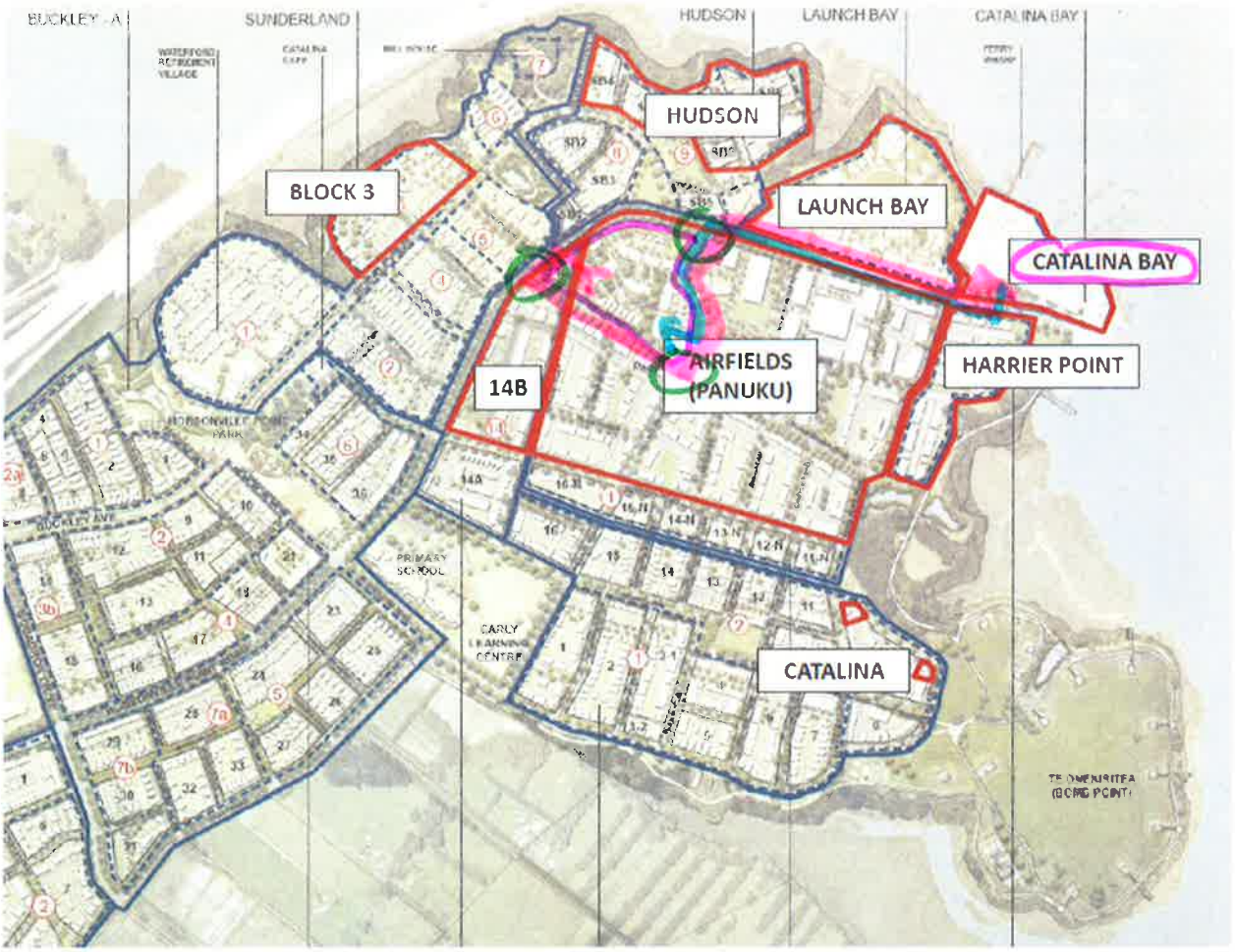


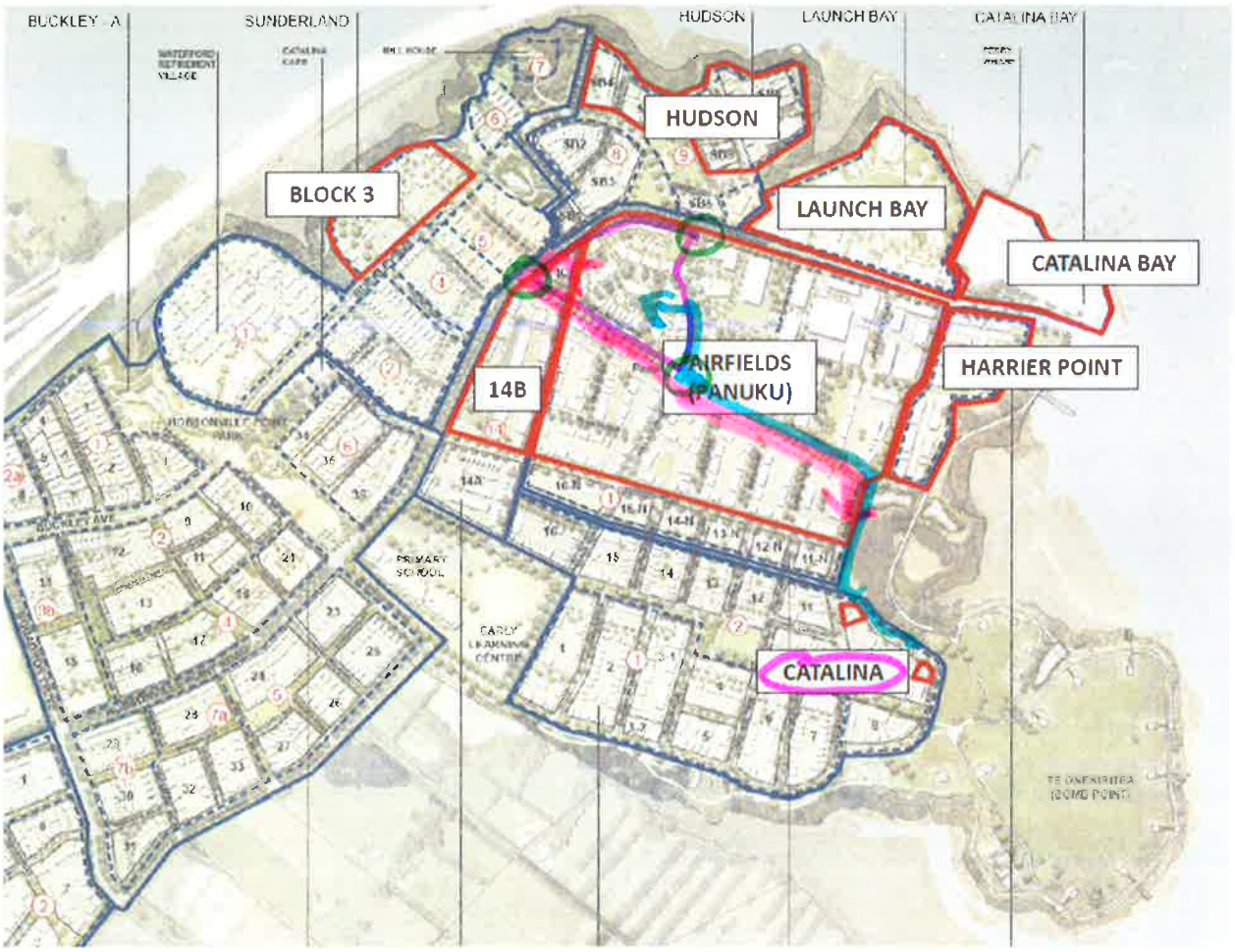
School Traffic 1 of 4



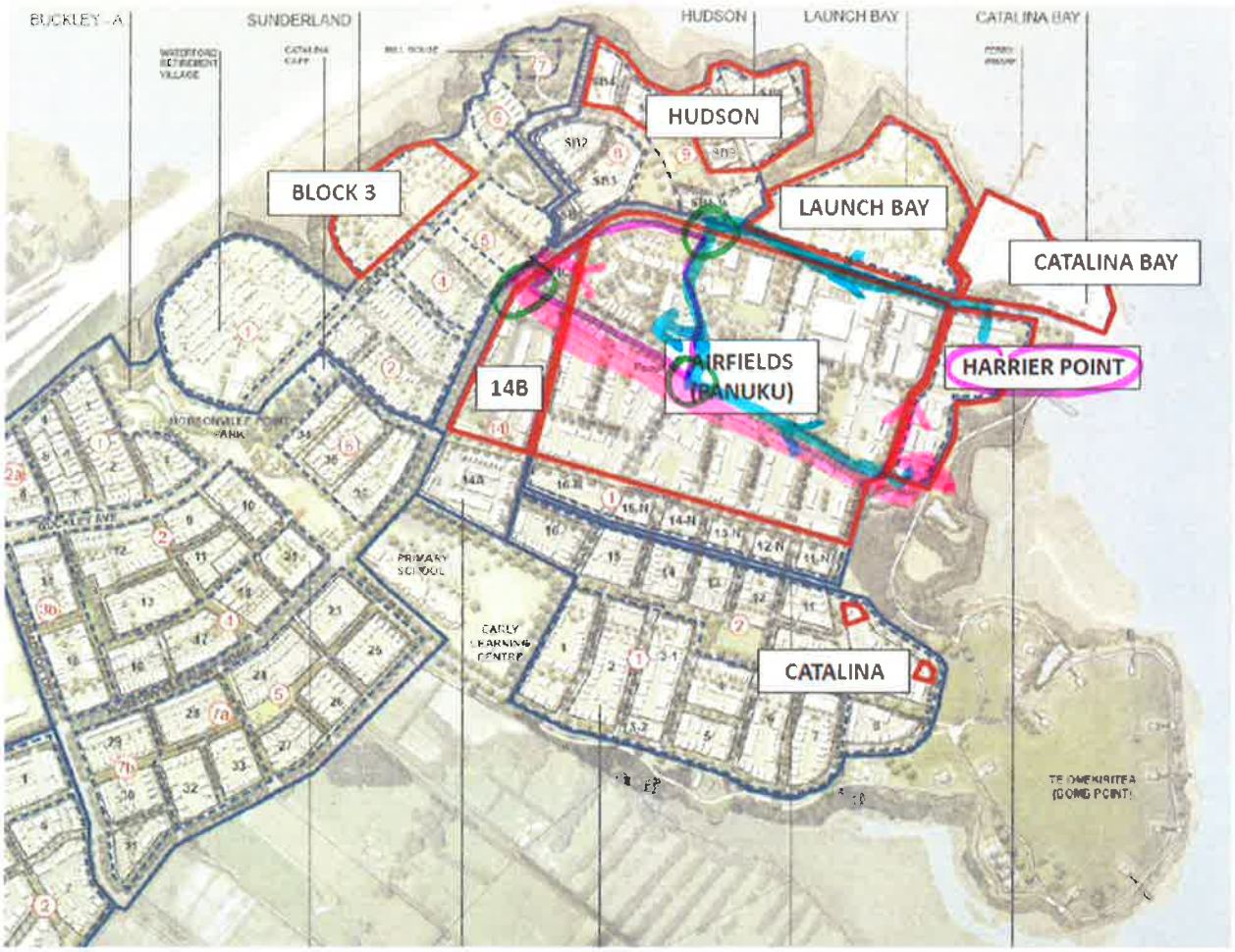


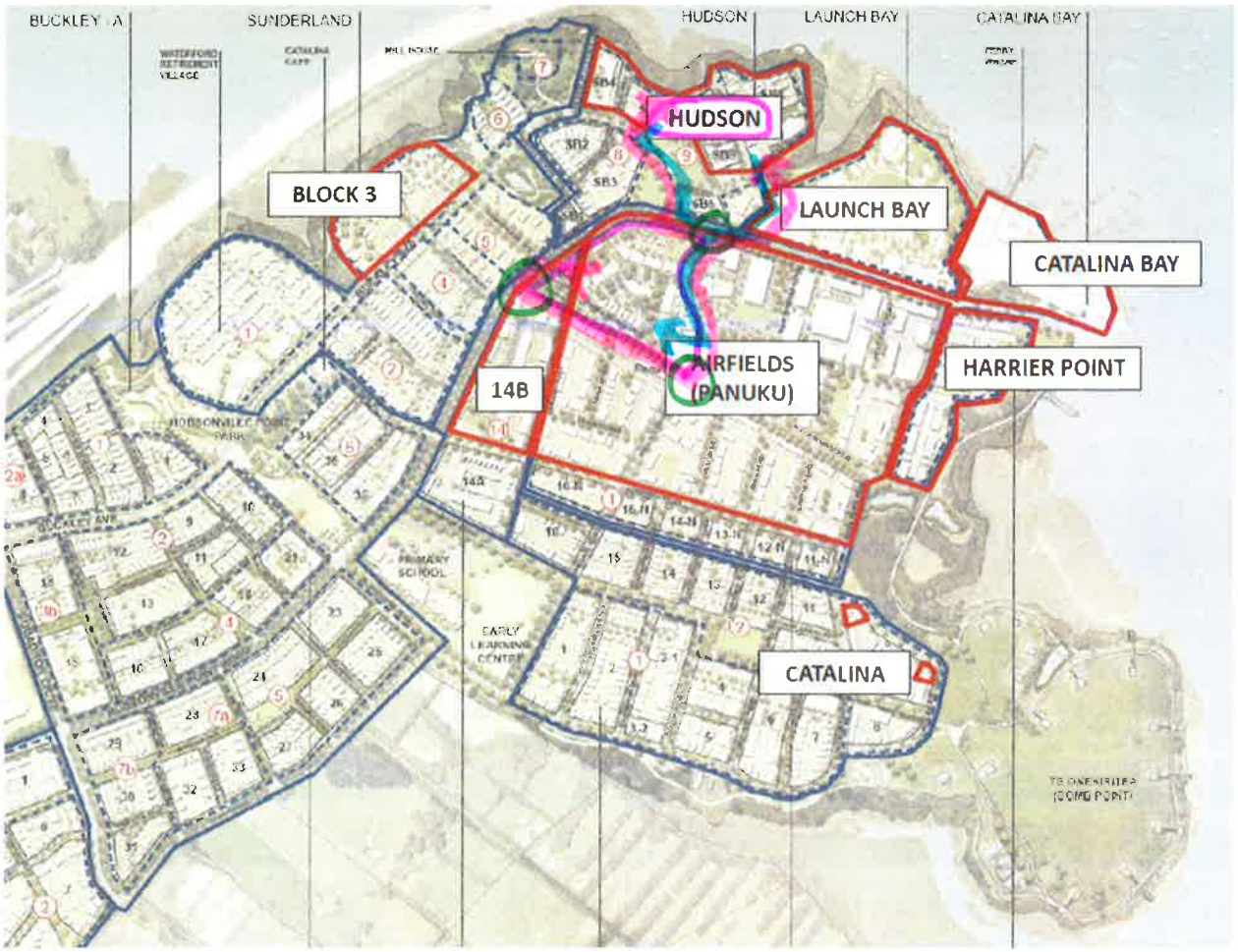
School Traffic 2 of 4



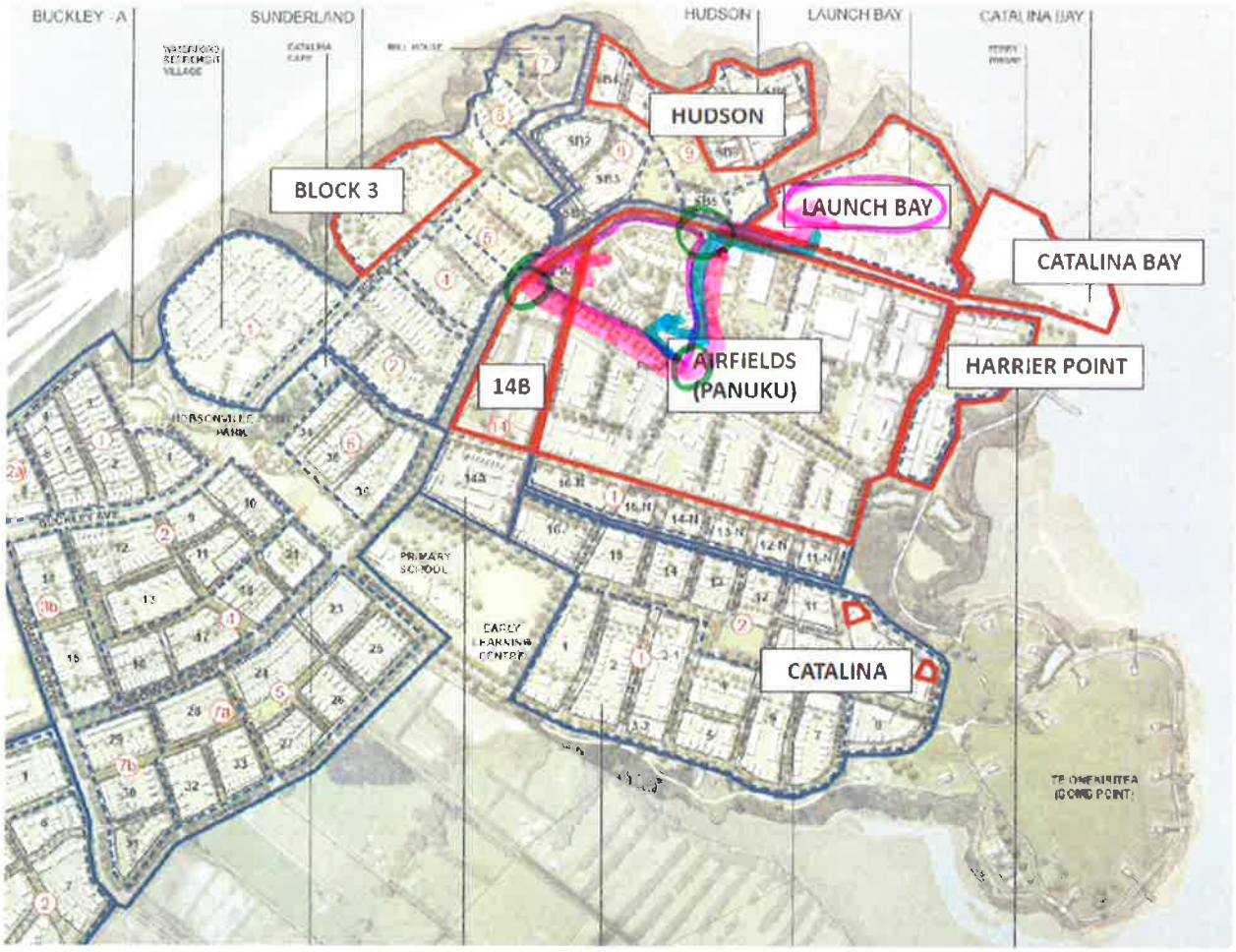


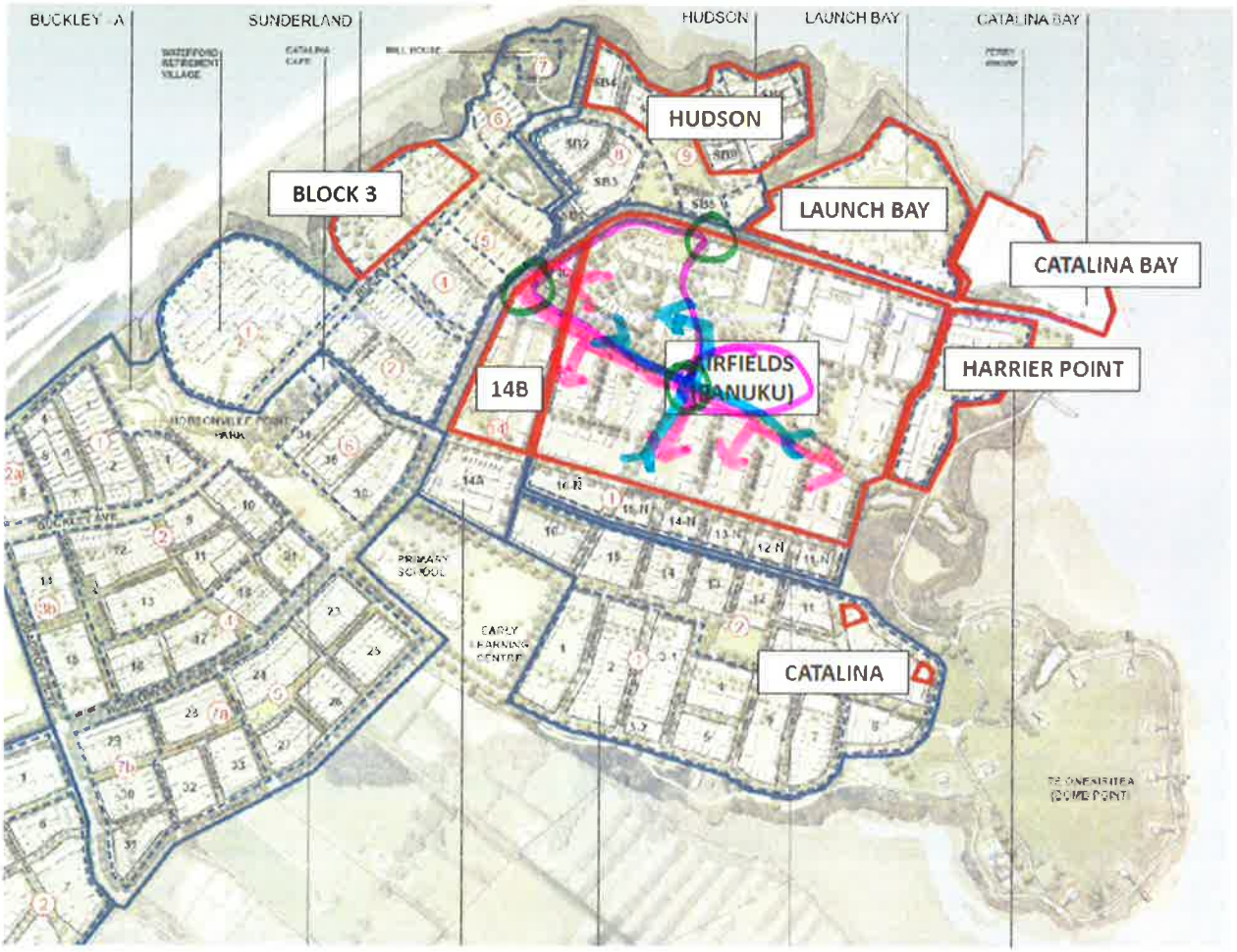
School Traffic 3 of 4





School Traffic 4 of 4





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Appendix 2: School traffic generation sensitivity test analysis

Appendix 2.1: Hobsonville Point Road / Wallace Road – 50% school traffic increase

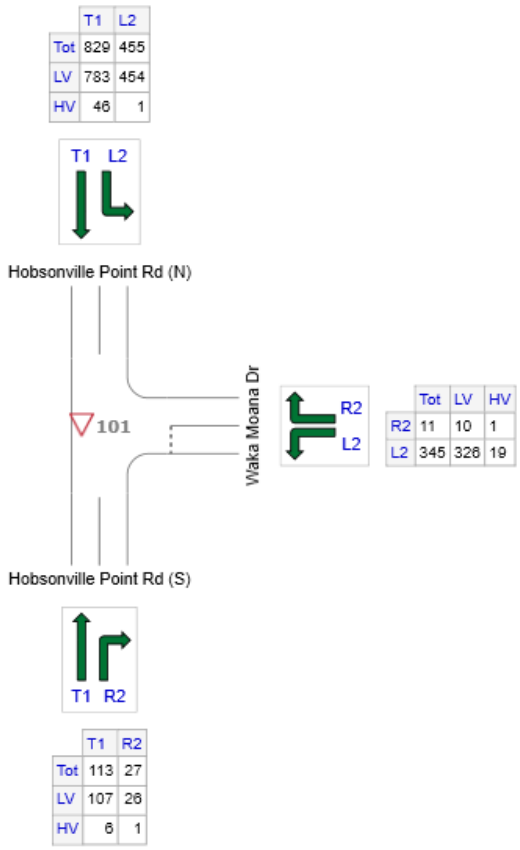

Figure 17: Input volumes with 50% increase in school traffic for the AM peak

Table 8: SIDRA test results - 50% increase in school traffic

Approach		Base scenario					School scenario			
		Volume (veh)	Degree of Saturation (LoS)	Average Delay (LoS)	Max Queue (m)		Volume (veh)	Degree of Saturation (LoS)	Average Delay (LoS)	Max Queue (m)
Weekday morning peak										
South: Wallace Road	L	11	0.16 (A)	10 (A)	3.9		45	1 (E)	78 (F)	96.3
	R	34	0.16 (A)	18 (C)	3.9		183	1 (E)	94 (F)	96.3

East: Hudson Bay Road (E)	L	11	0.43 (A)	4 (A)	0.0		200	0.54 (A)	4 (A)	0
	T	760	0.43 (A)	0 (A)	0.0		760	0.54 (A)	0 (A)	0
West: Hudson Bay Road (W)	T	126	0.07 (A)	0 (A)	0.0		126	0.07 (A)	0 (A)	0
	R	11	0.02 (A)	10 (A)	0.5		49	0.12 (A)	13 (B)	3
Intersection Total		953	0.43 (A)	1 (A)	3.9		1363	1 (E)	16 (C)	96.3

Appendix 2.2: Hudson Bay Road / Wallace Road – 50% school traffic increase

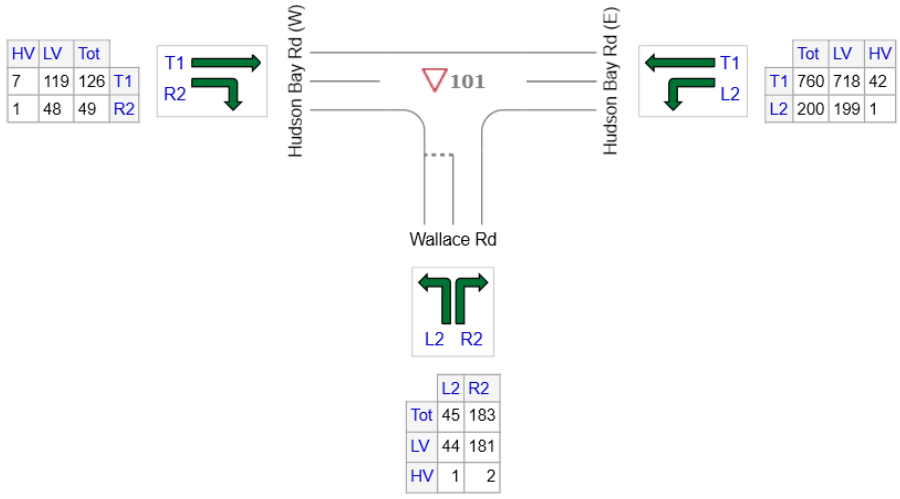

Figure 18: Input volumes with 50% increase in school traffic for the AM peak

Table 9: SIDRA test results - 50% increase in school traffic

Approach		Base scenario					School scenario			
		Volume (veh)	Degree of Saturation (LoS)	Average Delay (LoS)	Max Queue (m)		Volume (veh)	Degree of Saturation (LoS)	Average Delay (LoS)	Max Queue (m)
Weekday morning peak										
South: Wallace Road	L	11	0.16 (A)	10 (A)	3.9		45	1 (E)	78 (F)	96.3
	R	34	0.16 (A)	18 (C)	3.9		183	1 (E)	94 (F)	96.3
East: Hudson Bay Road (E)	L	11	0.43 (A)	4 (A)	0.0		200	0.54 (A)	4 (A)	0
	T	760	0.43 (A)	0 (A)	0.0		760	0.54 (A)	0 (A)	0
West: Hudson Bay Road (W)	T	126	0.07 (A)	0 (A)	0.0		126	0.07 (A)	0 (A)	0
	R	11	0.02 (A)	10 (A)	0.5		49	0.12 (A)	13 (B)	3
Intersection Total		953	0.43 (A)	1 (A)	3.9		1363	1 (E)	16 (C)	96.3

Appendix 2.3: Wallace Road / Waka Moana Drive – 50% school traffic increase

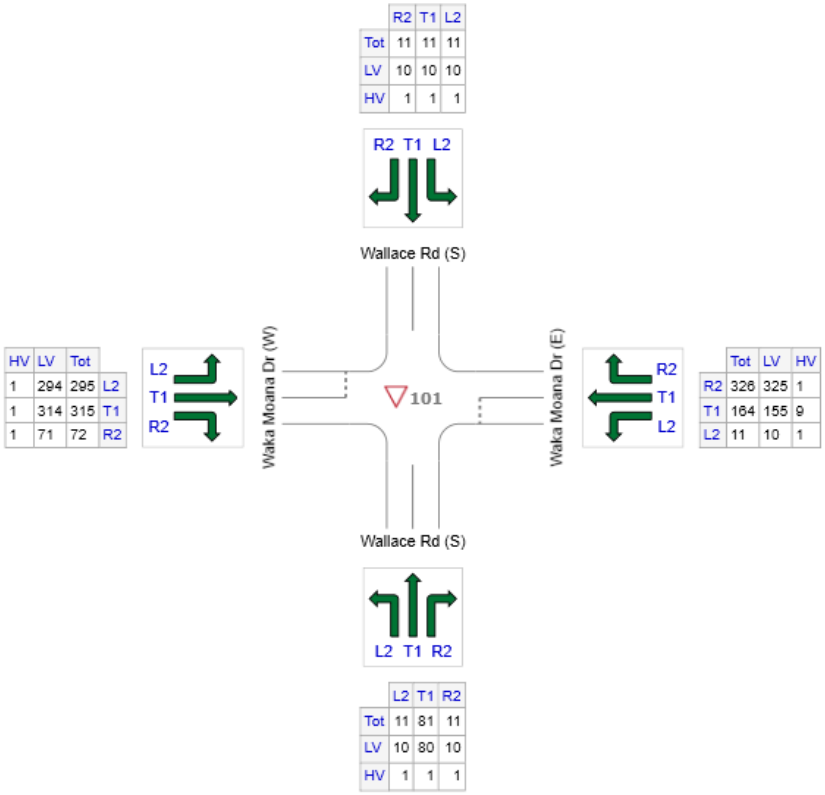

Figure 19: Input volume with 50% increase in school traffic for AM peak

Table 10: 50% increase in school traffic

Approach		Base scenario					School scenario			
		Volume (veh)	Degree of Saturation (LoS)	Average Delay (LoS)	Max Queue (m)		Volume (veh)	Degree of Saturation (LoS)	Average Delay (LoS)	Max Queue (m)
Weekday morning peak										
South: Wallace Road (S)	L	11	0.02 (A)	5 (A)	0.6		11	0.06 (A)	5 (A)	0.6
	T	14	0.02 (A)	0 (A)	0.6		81	0.06 (A)	0 (A)	0.6
	R	11	0.02 (A)	5 (A)	0.6		11	0.06 (A)	5 (A)	0.6
East: Waka Moana Drive (E)	L	11	0.16 (A)	5 (A)	4.8		11	0.95 (E)	30 (D)	141
	T	164	0.16 (A)	4 (A)	4.8		164	0.95 (E)	30 (D)	141
	R	11	0.16 (A)	5 (A)	4.8		326	0.95 (E)	42 (E)	141
	L	11	0.02 (A)	5 (A)	0.5		11	0.02 (A)	5 (A)	0.6

North: Wallace Road (S)	T	11	0.02 (A)	0 (A)	0.5		11	0.02 (A)	0 (A)	0.6
	R	11	0.02 (A)	5 (A)	0.5		11	0.02 (A)	5 (A)	0.6
West: Waka Moana Drive (W)	L	20	0.04 (A)	5 (A)	1		295	0.58 (A)	6 (A)	35.1
	T	11	0.04 (A)	4 (A)	1		315	0.58 (A)	5 (A)	35.1
	R	11	0.04 (A)	6 (A)	1		72	0.58 (A)	9 (A)	35.1
Intersection Total		297	0.16 (A)	4 (A)	4.8		1319	0.95 (E)	17 (C)	141