Trig Road Primary School Notice of Requirement

Integrated Transport Assessment

Ministry of Education

MINISTRY OF EDUCATION
Te Tāhuhu o te Mātauranga

Insightful solutions. Empowering advice.

Trig Road Primary School Notice of Requirement

Integrated Transport Assessment

Ministry of Education

Quality Assurance Information

Prepared for:	Ministry of Education
Job Number:	MED-J021
Prepared by:	Liam Bramley, Graduate Transport Engineer; Kate Brill, Principal Transportation Planner
Reviewed by:	Jo Draper, Associate Transportation Planner

Date issued	Status	Approved by
		Name
14 April 2021	Draft	Kate Brill; Jo Draper
20 April 2021	Draft with revisions	Kate Brill
31 May 2021	Final (incorporating AT comments)	Kate Brill

T +64 9 486 0898 (Akld)
T +64 3 377 4703 (Chch)
E admin@abley.com

Auckland
Level 1, 70 Shortland Street
PO Box 613
Auckland 1140
New Zealand

Christchurch
Level 1, 137 Victoria Street
PO Box 36446
Christchurch 8146
New Zealand

www.abley.com

Contents

Tables

1. Introduction

The Ministry of Education (MOE) commissioned Abley Limited (Abley) to prepare an Integrated Transport Assessment (ITA) for the Notice of Requirement (NoR) for a full primary school (Years 0-8) on Trig Road in Whenuapai. The MOE serve NoRs to designate land for educational purposes and protect the land for future development. In the case of schools, the designation authorises the MOE to undertake property projects on designated school sites within the scope of 'education purpose'.

MOE acquired the site at 13-15 Trig Road many years ago with the intention of constructing a future primary school servicing the future growth in the Whenuapai area. It is located approximately 20km northwest of central Auckland.

The future urban area surrounding the Trig Road site is currently undergoing a Plan Change, with development likely to still be a few years away. However, there is a shortfall of schools in the surrounding areas that are currently undergoing development. The Trig Road site has been identified as a temporary solution to accommodate the shortfall of up to 600 students from Red Hills and the northern end of Whenuapai. It is therefore proposed that the school site will operate in two phases, as described below:

- Phase 1: Overflow school to serve a shortfall in the school network capacity in Whenuapai North, Redhills and Hobsonville.
- Phase 2: School and Early Childhood Education (ECE) to serve the long-term needs of the local adjacent school catchment as the adjacent area is live zoned and developed for urban purposes

Phase 1 of the school is expected to open in 2022 with a transition into Phase 2 of the school when the local area develops. It is anticipated that Phase 2 of the school will transition in around 2027, however this is dependent on the scale of residential growth in the area. It is expected that it will take some time for the school to build up to the masterplan roll.

The phases of the school described above will be referred to throughout this report as 'Phase 1' and 'Phase 2'.

The purpose of this ITA report is to evaluate and assess the transportation effects of both phases of the school development at this site.

1.1 School Overview

As discussed above, it is proposed that the school will operate in two phases, initially as an overflow school (Phase 1), with a transition to Phase 2 when the area surrounding Trig Road develops.

Phase 1 School

The Trig Road school site has been identified as a solution to accommodate the shortfall of up to 600 students residing in the new rapidly developing areas of Red Hills, Hobsonville and the northern end of Whenuapai. Phase 1 of the school will accommodate Years 0-8 primary school children, with no Early Childhood Centre (ECE) proposed. It is anticipated that Phase 1 will open in 2022.

Phase 2 School

The Whenuapai area where the school is located is currently rural with minimal development. The Whenuapai Structure Plan encourages future development with high to medium density housing to be built in the local area surrounding the proposed school. The need for a primary school in the area is based on this future residential growth.

The proposed school will have a masterplan roll of 1,000 Year 0-8 students, with a view of operating when urban development occurs in the local catchment area.

The school will require an assumed staff of 50 based on a 1:20 staff to pupil ratio[1], and an Early Childhood Centre (ECE) to accommodate up to 50 children.

As is typical for a school catering for Years 0 to 8, some or all of the following are expected to be developed on the site:

- Buildings; including classrooms, hall, library, administration office space, staff workspace, caretakers' facilities, sick bay etc.
- Playing fields, hardcourts, playground structures
- Vehicle accessways, parking space for staff and visitors; and temporary pick-up and drop-off areas
- Footpaths, landscaping and fencing
- Servicing; including water, sewer, stormwater, electricity, heating, telecommunications and outdoor lighting

[1] Milne, A, S Rendall and S Abley (2011) National travel profiles part B: Trips, trends and travel predictions. NZ Transport Agency research report 467.94pp.

2. Site Description

2.1 Site Location

The proposed school site is located at 13-15 Trig Road at the southern end of Whenuapai as shown in **Figure 2.1**, with a total site area of approximately 4 hectares. Westgate shopping and transport centre is located approximately 2-3km to the west of the site, on the other side of State Highway 16.

The site has a 120m frontage onto Trig Road. Trig Road is a sealed rural road, which has one lane in each direction. There is currently a footpath on the western side of Trig Road only, on the opposite side of where the school will be located. There are no cycle facilities or provision for on-street parking on Trig Road. The current speed limit outside the site is 80km/h. Trig Road is not currently identified as an arterial road, however this status is likely to change in the future as Trig Road begins to function as an arterial.

It is anticipated that Trig Road will be upgraded in the future. The Supporting Growth programme has proposed an upgrade of Trig Road between Hobsonville Road and SH18 that includes walking, cycling and public transport facilities, and to reduce the speed limit to 50km/h.

The upgrade of Trig Road may require widening of the existing road reserve which may necessitate some land take from the site's frontage. The design of the access will be relatively unaffected by any such land take and can be accommodated without a redesign of the access points.

Figure 2.1 Site Location

2.2 Zoning and Surrounding Land Use

The Trig Road primary school site is situated in a large Future Urban Zone which covers most of the Whenuapai area, in the Auckland Unitary Plan Operative in Part (AUPOP), as shown in **Figure 2.2.**

Whenuapai Structure Plan / Plan Change 5

Auckland Council has created the Whenuapai Structure Plan, which provides the vision for Whenuapai and identifies the goals and areas for future urban development. The proposed Plan Change 5 aims to rezone approximately 360 hectares of mostly Future Urban zoned land to a mix of business and residential zones. The area on Trig Road surrounding the school is largely proposed as medium density residential.

The Structure Plan is non-statutory until the Plan Change is in place. Details of the Structure Plan are used as a basis for our assessment and referred to throughout this ITA.

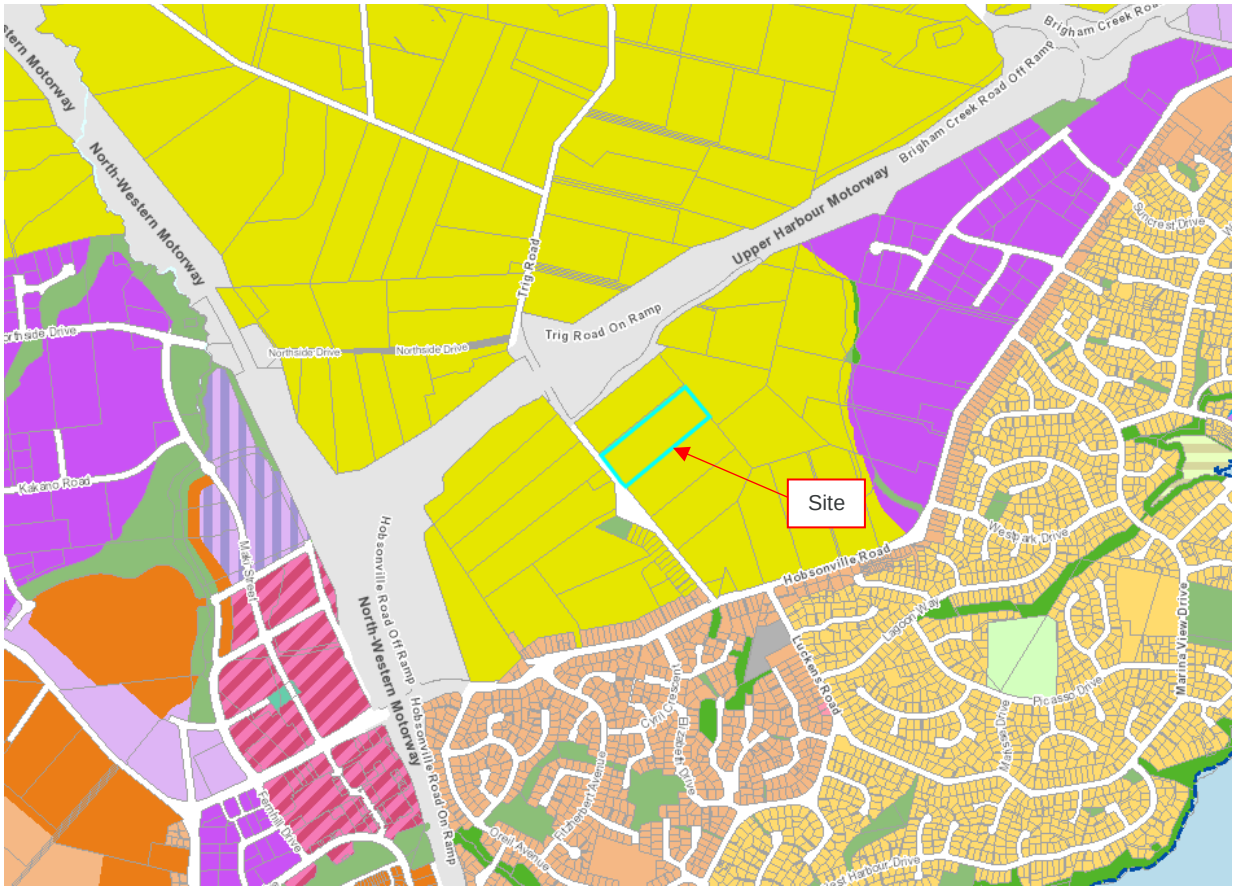


Figure 2.2 Zoning Map

3. Transport Environment

The application site is located in Whenuapai, approximately 20km northwest of Auckland Central. Trig Road and the roads north of the site are rural roads, with the exception of SH18, with limited footpaths and cycle facilities for the most part. Trig Road and the surrounding rural roads will change as development occurs in accordance with the proposed Plan Change 5.

3.1 Existing Road Network

Trig Road and most of the roads north of the site area are rural roads, with one lane in each direction and narrow shoulders. There is a footpath on the western side of Trig Road, but no cycleways, on-street parking or kerb and channel for the large part.

Trig Road

Trig Road generally runs north to south. It is connected to SH18 with an on-ramp for eastbound traffic, and an off-ramp for people travelling west. It is classified as a rural road in AUPOP. It is a sealed two-way road with centreline and edge line markings as seen in **Figure 3.1**. There is a footpath on the western side of the road only, and no cycle lanes or provision for on-street parking. The posted speed limit is 80km/h, which reduces to 50km/h where it intersects with Hobsonville Road.

Trig Road is long and straight with a total road reserve width of around 20 metres outside the site. The carriageway is approximately 7m wide with two 3.5m traffic lanes.

The most recent traffic volumes recorded for Trig Road outside the site are dated March 2018. The total traffic volumes in both directions are 784 vehicles in the morning peak hour. The average daily traffic was 6,632 over a 7-day week in March 2018.

Figure 3.1 Trig Road (looking south with the school site on the left side)

Trig Road / Hobsonville Road Intersection

The south eastern end of Trig Road intersects with Hobsonville Road, which is currently formed as a priority intersection. The intersection has slip lanes for both left turning movements with no pedestrian crossing facilities at the intersection, as seen in **Figure 3.2**.

Figure 3.2 Trig Road / Hobsonville Road Intersection

Walking and Cycling Facilities

The existing roads surrounding the school have very little provision for walking or cycling given the rural nature of the roads. There is an existing footpath on the western side along the length of Trig Road.

3.2 Proposed Road Network

Trig Road

The Supporting Growth programme has recommended an upgrade of Trig Road that includes walking, cycling and PT facilities. The Supporting Growth programme has undertaken investigations to support the route protection (designation) process for this upgrade. However, the planning and preparation to lodge the Notice of Requirement (NoR) for route protection is dependent on future funding decisions. This upgrade will include two traffic lanes, a protected contraflow cycle lane on the eastern side of Trig Road and a footpath on both sides of the road. Trig Road is also proposed to have a flush median to facilitate turning movements into accesses. The road will have a posted speed limit of 50km/h.

Figure 3.3 below shows a potential cross-section for Trig Road.

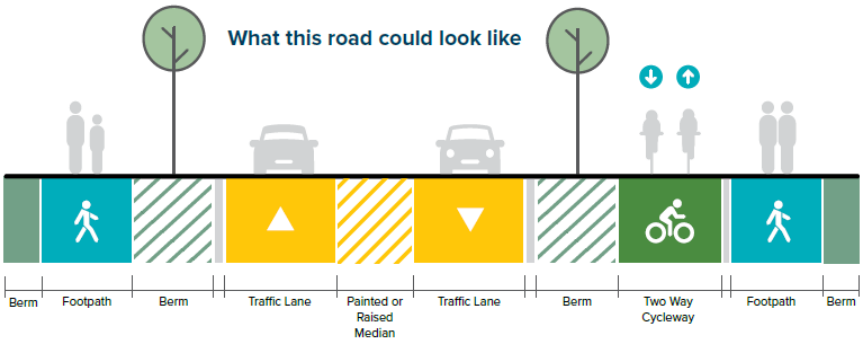


Figure 3.3 Potential future cross-section of Trig Road (Source: Supporting Growth's Planning Auckland Transport's Future Together)

The upgrade of Trig Road may require widening of the existing road reserve which may necessitate some land take from the site's frontage. The design of the school access will be relatively unaffected by any such land take and can be accommodated without a redesign of the access points.

Local road network around school site

The Whenuapai Structure Plan provides an indicative future road network as shown in **Figure 3.4**. The Structure Plan shows the southern end of Trig Road (between Hobsonville Road and the school site), realigned, with the southern end of Trig Road forming the fourth leg to the existing Hobsonville Road / Luckens Road intersection. However, it is understood from Supporting Growth that the realignment of Trig Road is no longer supported, and the preferred option is to retain the existing alignment of Trig Road. This preferred option of retaining the existing alignment of Trig Road will include an upgrade to the intersection of Trig Road and Hobsonville Road[2].

The Whenuapai Structure Plan also shows an indicative cross-roads intersection at the southern corner of the school site to include two future roads linking Trig Road to future development to the east and west. There is mention that this may be a signalised intersection in the future. The access road to the west of Trig Road is proposed to intersect with Hobsonville Road to the south.

[2] https://www.supportinggrowth.govt.nz/assets/North-West/Publications/NW-HIF-Project-Info-Sheets/58d010d539/Trig-Road-Upgrade-Project.pdf

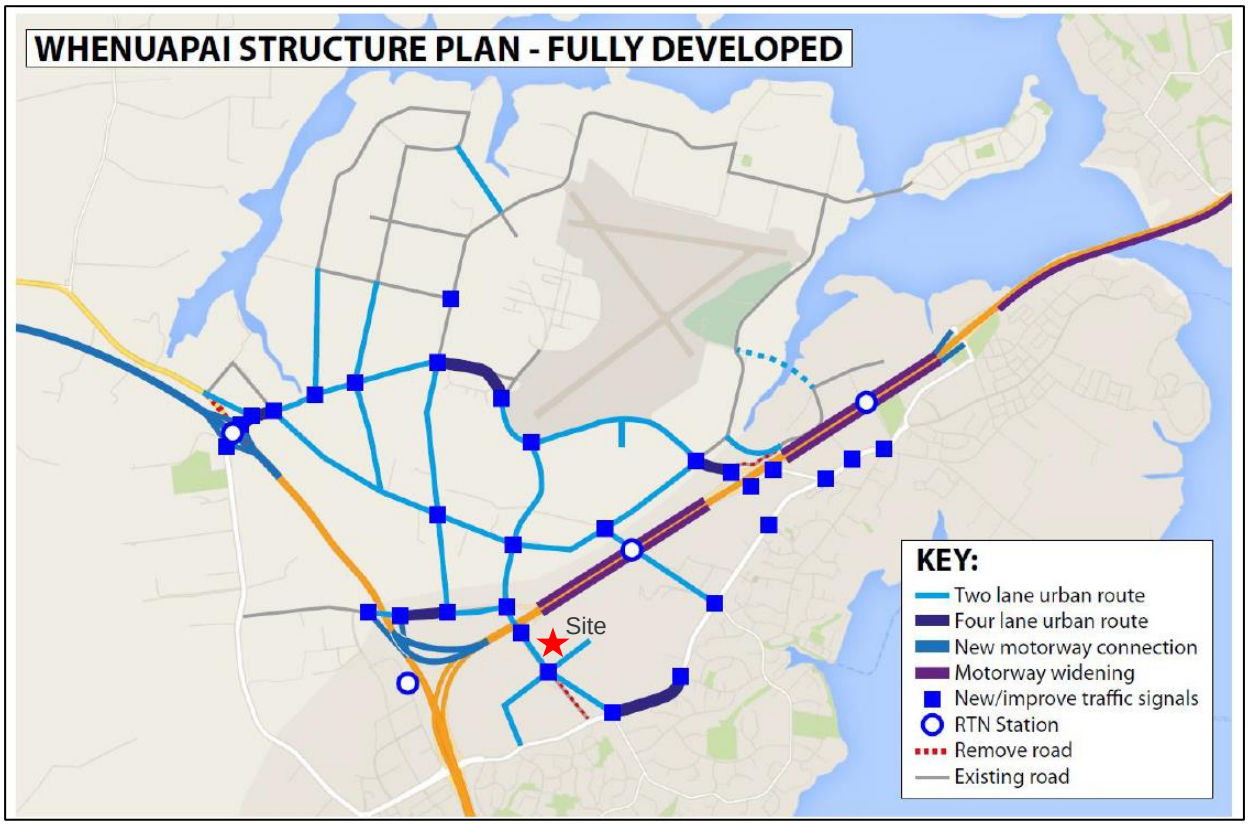


Figure 3.4 The proposed road network in the Whenuapai Structure Plan

Walking and Cycling Facilities

The Whenuapai Structure Plan indicates that key routes are to be improved with upgraded walking and cycling facilities. Trig Road is identified as being a future connector cycle route in the Auckland Cycle Network and is expected to have protected cycleways.

There are limited pedestrian facilities currently in the Whenuapai area, with the current land use being rural. Trig Road has a footpath on the western side of the road for most of its length. Future pedestrian facilities are anticipated to become more comprehensive as Whenuapai is developed. Due to the anticipated scale and type of land use, footpaths on both sides of the road, as well as a network of pedestrian facilities through parks and open spaces will be important for the area.

The future reduction in the speed limit to 50km/h on Trig Road will result in a safer environment for students to walk and cycle to school for Phase 2 of the school.

Trig Road is expected to remain at the current 80kmh speed limit until the road is urbanised. It is recommended that the Phase 1 of the school has a 40kmh school zone to ensure slower traffic speeds around the school.

When designing for walking, scooting and cycling the following key components need to be considered:

- **Desire lines –** children who travel by active modes are likely to follow their desire line. Crossing points and paths should be located on desire lines so that they are used. Desire lines can also assist with understanding where the pinch points may be.
- **Interactions with Other Modes –**The layout of a site needs to be designed so that interactions between children walking, scooting or cycling to school and motor vehicles are minimised. Crossing points and paths also need to be located so that no hazards are introduced along the route.
- **Path and Crossing Design –** Both within the site and outside the school gates, paths need to have the capacity to accommodate the expected flows and mix of uses.

3.3 Public Transport

There is currently one bus route that services Trig Road. Bus service 114 runs from Hobsonville Point Ferry terminal to Herald Island, around Whenuapai and finishes at Westgate. It runs a service at least every 60 minutes, seven days a week. There are no existing bus stops on Trig Road. This route can be seen in **Figure 3.5**.

The 120-bus route runs along Hobsonville Road nearby the proposed school site. It operates between Henderson and Constellation Station on the North Shore.

Figure 3.5 Bus Services in Whenuapai

3.4 Road Safety

To understand the existing safety performance of the road network in the vicinity of the site, crashes that were recorded within the last five years (2016 – 2021 inclusive) were obtained through the Waka Kotahi NZ Transport Agency Crash Analysis System (CAS) database. The extent of the crash search is shown in **Figure 3.6**. A total of two crashes were recorded, one serious and one non-injury crash.The serious crash occurred outside the proposed school site, involving an overtaking motorcyclist coliding with a turning vehicle. The non-injury crash was a rear end accident at the Trig Road / Ryans Road intersection. The CAS collision diagram is shown in **Figure 3.7**

Significant upgrades are proposed to the roading network before transitioning to Phase 2 of the school. The upgrade of Trig Road and a reduction in the speed limit will create a safer environment for a future school.

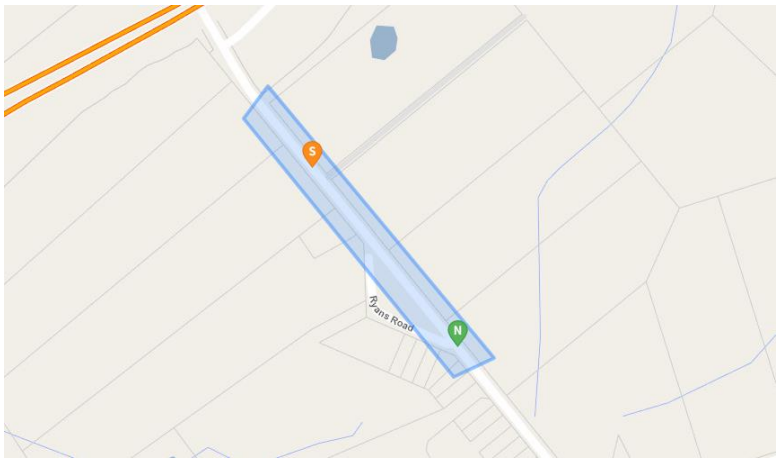


Figure 3.6 Crash Search Area

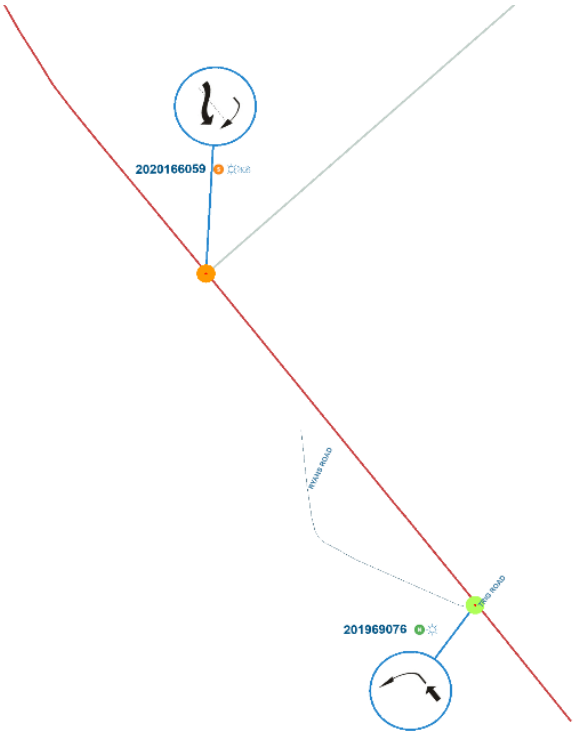


Figure 3.7 CAS Analysis - Collision Diagram

4. Strategic Context

4.1 Relevant Strategies and Policies

The following relevant regional and local plans need to be considered from a transport perspective to ensure consistency with outcomes.

Auckland Plan

A 30-year strategy to manage Auckland's growth and development. The plan identified three major challenges facing Auckland:

- Population growth and its implications
- Sharing prosperity with all Aucklanders
- Reducing environmental degradation

Some of the transport related focus areas of the plan include making walking, cycling and public transport preferred choices, reducing death and serious injuries on the road, and developing a sustainable and resilient transport network. The plan acknowledges that not many Aucklanders use their bikes to travel to school. Getting more children to cycle will ease congestion, reduce the environmental impact of travel, and improve the health of those that cycle. Auckland Council has indicated cycling infrastructure as an area for increased investment.

Auckland Regional Land Transport Plan

A 10-year transport investment programme for Auckland. The programme aims to encourage a move away from single-occupant vehicles as the dominant mode of travel, and toward public transport, walking, and cycling. It will lead Auckland towards being a city where there is growth without increased congestion and one with multiple and genuine travel choices. In order to address Auckland's challenges, the plan tracks the active and sustainable mode share at schools as a performance measure. The plan seeks to achieve 45% active and sustainable mode share by 2028.

The DRAFT RLTP for 2021-2031 has recently been released for submissions. It should be emphasised that it is in draft form and the final RLTP for 2021-2031 is understood to be finalised in mid-2021. However, it is worth noting that the draft indicates that Trig Road upgrade is categorised as highest priority and marked as '1 – Committed and Essential' and proposes funding for the delivery of Trig Road towards the end of the 10-year period, however this is still to be confirmed. Although indicative, this suggests that the Trig Road upgrade as potential to align with the transition to Phase 2 of the school.

Auckland Future Urban Land Supply Strategy

The Auckland Future Urban Land Supply Strategy sets out how and when new urban land is to be supplied for development. The Whenuapai area is split into various stages with the first stage tagged as 'Development Ready' and marked as a Live Zoned Area in the 2012-2017 time period. The Trig Road development is not referenced in this document due to early stage of the plan change process.

Supporting Growth Alliance

The Supporting Growth Alliance is a collaboration between Waka Kotahi and Auckland Transport to carry out the planning phase of the Supporting Growth Programme, with focus growth areas in Warkworth, North, Northwest and South Auckland. The Alliance provides route protection for preferred future transport networks.

The Supporting Growth programme proposes an upgrade of Trig Road that includes walking, cycling and PT facilities. This upgrade will include two traffic lanes and walking and cycling facilities on both sides of the road. The road will have a posted speed limit of 50km/h.

SGA proposes to upgrade the section of Trig Road between Hobsonville Road and SH18 first and the northern section of Trig Road to come later. However, Covid19 has suspended plans temporarily due to funding issues. At time of writing this report, there is uncertainty to the future timing and extent of SGA works in the area, including the urbanisation of Trig

Road. It is understood that further information will be available with the publication of the Auckland Regional Land Transport Plan (RLTP) in mid-2021.

Figure 4.1 North-west Auckland Indicative Strategic Transport Network

4.2 Engagement with Council

Engagement with key organisations has been undertaken as part of the preparation for this ITA and is expected to continue as the proposed school is developed. These are listed and summarised below in **Table 4.1**.

Table 4.1 Summary of engagement

Organisation	Engagement	Feedback
Auckland Transport (AT) and Supporting Growth Alliance (SGA)	24 February 2021 Initial meeting with Liam Burkhardt - Planner; Rory Power - Planner; Lorraine Stone SGA	Main discussion was the location of school access points given the area is currently undeveloped and the local road network is unknown. Refer Appendix A for detailed comments on AT feedback. SGA confirmed that the timeframe for the upgrade of Trig Road has been put on hold due to Covid19. The RLTP will provide more information on its release in mid-2021 (It should be noted that the Draft RLTP (March 2021) indicates the Trig Road upgrade project has High Priority in terms of funding). SGA confirmed that the preferred option for the southern end of Trig Road is to retain the *existing* alignment, that is, not proceed with the realignment of Trig Road to join up with Luckens Road intersection.
Auckland Council (Council)	15 April 2021 Preapplication meeting with Eryn Shields (AC); Liam	Auckland Council were generally supportive of the school proposal. No major issues or concerns were raised from Council at this stage.

	Burkhardt (AT); Rory Power (AT)	Auckland Transport raised matters such as safety of students and the efficient operation of Trig Road.

4.3 Summary

From the review of the strategies and plans the following transport aspects need to be considered in the development of the site for use as a school.

- **Accessibility** – The school site needs to have a high level of accessibility by all modes to support travel choice. This means that access by modes that encourage active modes and reduce dependence on private vehicles are provided for through a site that is well connected with the surrounding transport network.
- **Safety** – Access to the school is developed with safety as a key consideration. This means measures such as suitable road crossings and safe pick up and drop off area. It is important that safe vehicle speeds around the school site be encouraged through road design, monitored, and enforced.
- **Efficiency** – The traffic generated by the site should not have an unacceptable adverse impact on the surrounding road network in terms of travel time. Fewer vehicle trips will lead to reduced environmental degradation.

Over the next 10 years, Auckland is expected to grow by 300,000 people, and existing and new transportation challenges will grow with it. The Whenuapai development and Trig Road Primary School will help to support that growth. The planned school can comply with the objectives of the listed plans and strategies.

5. Proposal

The new school will be a full primary school (Years 0-8) that will develop in two phases. Phase 1 will operate an overflow school to serve a shortfall in the school network capacity in Whenuapai, Redhills and Hobsonville. Phase 1 is expected to cater for a maximum of 600 students with an opening date in 2022.

As residential development occurs in the vicinity of Trig Road, the school will transition into Phase 2 which will service the local catchment area. The school will cater for 1000 students and also accommodate an Early Childcare Centre (ECE) for up to 50 children. It is anticipated that Phase 2 of the school will transition in around 2027, however this is dependent on the scale of residential growth in the area. It is expected that it will take some time for the school to build up to the masterplan roll.

5.1 Site Layout and Access

The existing site only has road frontage onto Trig Road. Phase 1 is proposed to open in 2022 and will therefore have to take access from Trig Road as there will not be any other road frontage at the time of opening. The Whenuapai Structure Plan shows an indicative future road along the south-eastern boundary of the site. Auckland Transport have confirmed that the timing and potential for this road to proceed is dependent on development (by private developers) to the southeast of the site. A Structure Plan is a non-statutory document and as such there is no assurance that this road will proceed. There is also a wetland that straddles the south eastern boundary of the site which may create challenges for the construction of a future road in this location.

Given the uncertainties of a future road on the school boundary, we have assumed access to both phases of the school will be off Trig Road. In the event that a future road is constructed prior to the opening of Phase 2, it is recommended that access options are reassessed to allow, if considered reasonable, further access off the minor road. The feasibility plan for Phase 2 of the school has shown an indicative area where access could be catered for.

If a future minor road does proceed along the southeastern boundary of the site, the Whenuapai Structure Plan has indicated that this intersection adjacent to the school may be a signalised intersection. Whether signals will be appropriate at this intersection will likely depend on if it will be a cross-roads intersection across Trig Road; and future traffic and pedestrian volumes. The intersection is unlikely to warrant signalisation if it is a three-leg intersection only.

The site layout will likely change between the phases of the school to include the addition of new teaching spaces, however the primary access is proposed to remain the same. The Phase 1 school feasibility site plan is shown in **Figure 5.1**, with the Phase 2 school feasibility plan displayed in **Figure 5.2**.

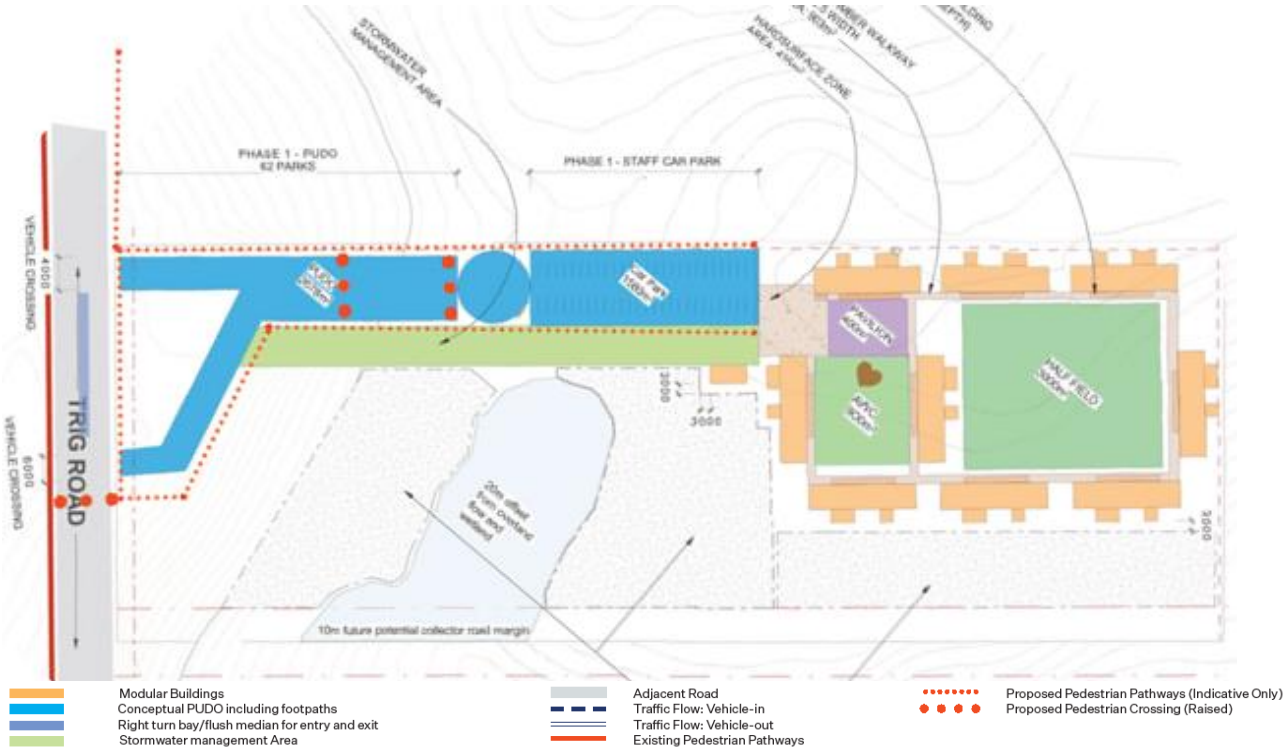


Figure 5.1 Phase 1 School Feasibility Plan

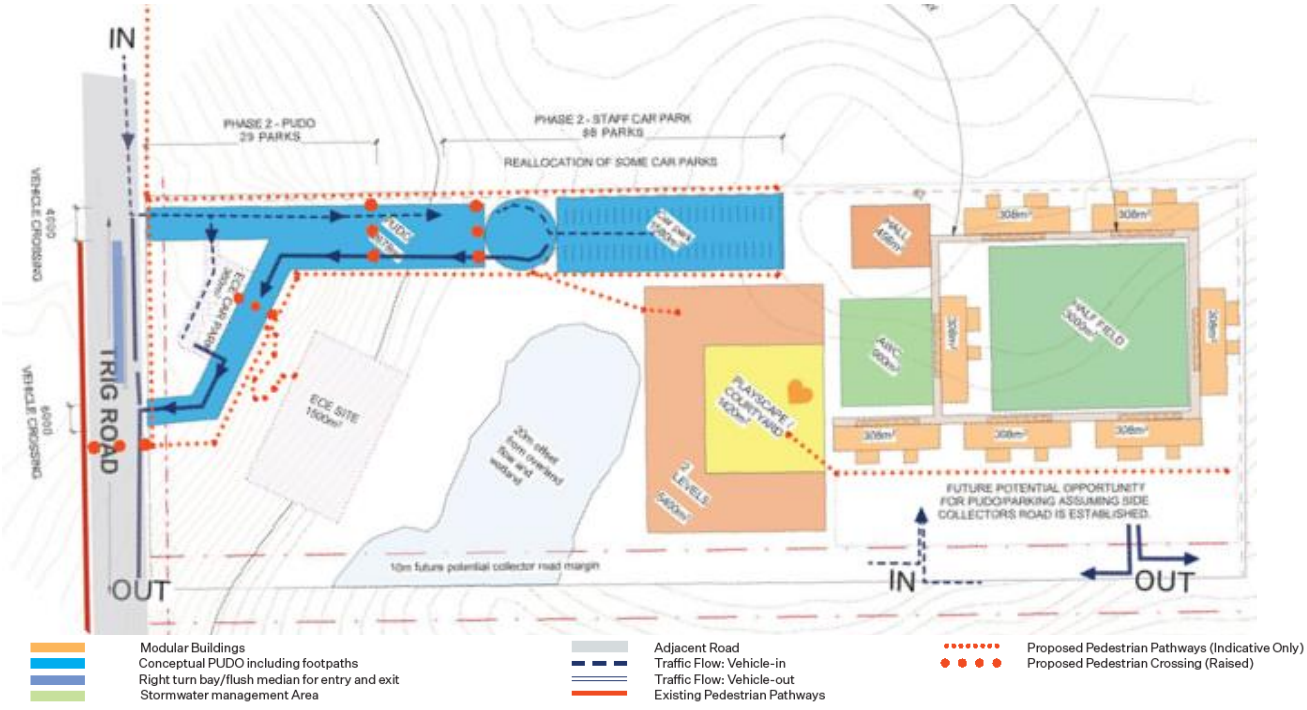


Figure 5.2 Phase 2 School Feasibility Plan

The catchment area for the future Trig Road school is currently rural with development expected to start in the coming years. Until such time that development occurs, the site will be used to accommodate a shortfall of students from

surrounding growth areas such as Red Hills, Hobsonville and further north in Whenuapai. The catchment of the school is discussed further in Section 5.5.

The PUDO will be a one-way system with two vehicle crossings, an entry only access at the northern end of the site and an exit only, approximately 60 metres further south. The one-way operation of the access results in fewer conflict points and a safer access. The PUDO will be discussed in more detail in Section 5.3.

The access will be designed to accommodate tracking for buses, service vehicles and emergency vehicles. Trig Road is straight and relatively flat resulting in good sight lines in both directions. An assessment showing more than adequate visibility from both access points has been undertaken in Section 5.2.

Pedestrian and cycle access will be separated from the vehicle access allowing for a separation between vehicles and school children entering and exiting the school grounds on foot. Further design of the pedestrian and cyclist access points will be developed at Outline Plan of Works (OPW) stage taking into account accessibility, safety and desire lines.

It should be noted that the location of the pedestrian crossing in the Feasibility Plan Layout is indicative only and the final location of the crossing will be determined by the queueing requirements needed for the access points, and the location of the main pedestrian entrance to the school. The SIDRA assessment demonstrates that the maximum queue experienced in all scenarios on Trig Road is 19m, factoring in the long frontage of 120 metres means that adequate separation between the pedestrian crossing and the access points can be comfortably achieved.

5.2 Visibility Assessment

Appropriate sight distance between drivers exiting the site and approaching drivers on the frontage road should be provided at all accessways. The Austroads Guide to Road Design Part 4A provides the types of sight distance to consider when designing intersections. The Safe Intersection Sight Distance (SISD) has been adopted which is the distance for a driver on a major road to observe a vehicle on a minor approach moving into a collision situation and to decelerate to a stop before reaching the collision point.

The guidelines on the SISD are based on Austroads 2017, Guide to Road Design Part 4A (Unsignalised and Signalised Intersections). The minimum sight distance should be provided on the major road at any intersection. The existing (80km/h) and proposed (50km/h) speed limits have been used at two locations on Trig Road. The first location is the PUDO entry, where visibility for the right turners into the site needs to meet the minimum sight lines. The second location is the PUDO exit, where vehicles exiting the site to turn either left or right have adequate visibility.

The access is proposed to be the same for both phases of the school, therefore the visibility assessment is the same for all stages of the school.

The scenario where the greatest sight distance is required is a design speed of 80km/h, where Austroads recommends a minimum SISD of 181m. The sight distance from both the entry and the exit both exceed the minimum recommended SISD requirement, as shown in **Table 5.1**.

Table 5.1 Safe Intersection Site Distance along the site frontage on Trig Road

Direction on Trig Road	Speed limit (km/h)	Recommended Sight Distance	Available Sight Distance (from PUDO Exit)	Available Sight Distance (from PUDO Entry for right turn)
North approach	80	181 metres	>280 metres	>200 metres
South approach	80	181 metres	>200 metres	>200 metres
North approach	50	97 metres	>280 metres	>200 metres
South approach	50	97 metres	>200 metres	>200 metres

5.3 Pick Up Drop Off (PUDO) Area

The relatively large site has the benefit of providing a generous PUDO area for both phases of the school.

Phase 1 is anticipated to have a higher demand for on-site PUDO due to a higher vehicle modal share and limited on-street parking available prior to the development of the road network. As shown on Figure 5.1, the PUDO will have the potential capacity of approximately 60 parking spaces which is likely to be more than adequate for caregivers to pick up and drop off their children.

At the time that Phase 1 transitions to Phase 2 of the school, there will be less of a demand for on-site PUDO as the catchment narrows down to the local residential area. More students will be walking and cycling to school and the vehicle modal share will reduce. However, the provision for staff and visitor car parks will increase with the growth in the school roll. It is therefore proposed to retain the same footprint of the car park, with an increase in staff/visitor parks and a reduction in the PUDO parks. The number of PUDO parking spaces for Phase 2 of the school is expected to be approximately 30 car parks.

Design options will be worked through at OPW stage which may include opportunities for access via other roads, that may be constructed in the future in accordance with the structure plan. However, a rough sketch has been provided in **Figure 5.3** as a preliminary design. There will be an entry aisle with parking on both sides of the traffic lane. Vehicles will proceed around the turning head towards an exit aisle that will also have parking on both sides of the lane. Children will be encouraged to always exit on the footpath side of the vehicle and cross at the designated crossing points. There are options for the PUDO to cater for pick up and drop off (where caregivers are not permitted to exit the vehicle); and P5 to allow for caregivers to escort their children into the school grounds. The PUDO can also be used during the school day for visitors, service vehicles and buses for field trips etc.

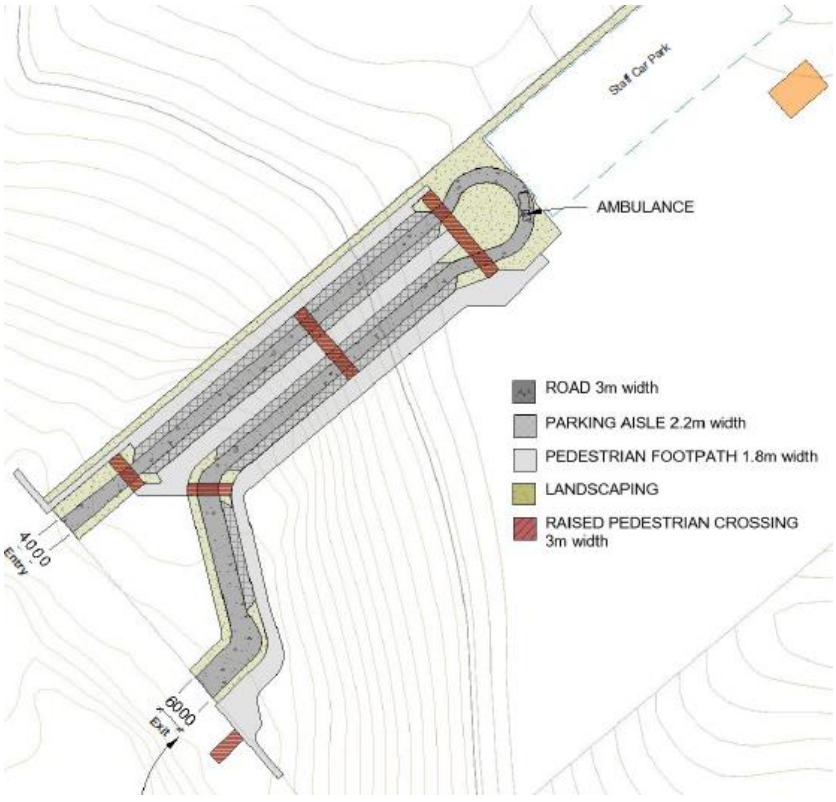


Figure 5.3 Sketch of PUDO layout

5.4 School Roll

The school roll will differ for the two phases of the school.

Phase 1 is expected to accommodate a maximum of 600 students (Years 0-8), with an opening date of 2022. This phase will be taking up the shortfall from surrounding areas which are developing at a fast rate, including Red Hills, Hobsonville and Whenuapai to the north. There will not be an ECE at Phase 1 of the school.

Phase 2 will have a masterplan roll of 1,000 students (Years 0-8), which is expected to operate once development growth occurs in the local area.. The school will have an on-site Early Childhood Centre (ECE) accommodating up to 50 children.

ECE Facility

An Early Childhood Education (ECE) centre is to be included with Phase 2 of the school and understood to accommodate up to 50 pre-school children and up to 13 staff. The opening hours of the ECE are likely to be 7.30am – 6pm, with the peak drop off and pick up times expected to differ from the school start and finish times. The layout of the school will be confirmed at OPW stage. The ECE will have dedicated parking across from the centre, with a shared access with school traffic. The access arrangements may change with a future road layout which will covered in the NOR conditions.

5.5 School catchment

The catchment will be different for the different phases of the school, as described below.

Phase 1 School

Phase 1 school is anticipated to be in operation from approximately 2022 – 2027 and will take students from further afield This is to cater for the estimated shortfall of 600 students from Red Hills, Whenuapai (north) and possibly Hobsonville.

Phase 2 School

The core school catchment anticipated for the Trig Road Primary School is expected to be the future residential development planned to the west and east of Trig Road. This area is depicted in the Whenuapai Structure Plan ITA as Zones 1 and 2, as shown in **Figure 5.4.**

The Whenuapai Structure Plan ITA deduced from Council's ART Land use model that Zones 1 and 2 is forecasted to house 1,400 dwellings at full development. Using MOE's formula for calculating the number of primary aged school children from the number of dwellings, it is anticipated that approximately 420 students (years 0-8) will reside in zones 1 and 2, or within a 1km walk to school. The ITA also states that there is likely to be a portion of residential in the business zones (depicted as orange in the map below) centred around public transport routes.

As the area develops and new schools are opened to service the Whenuapai area, it is likely the zones of existing schools may reform to incorporate more walkable catchment areas. The Trig Road school catchment may therefore extend into the existing residential areas of West Harbour and Hobsonville. The maximum masterplan roll of 1,000 students also allows for the event of more intensive residential housing than what the proposed plan change anticipates.

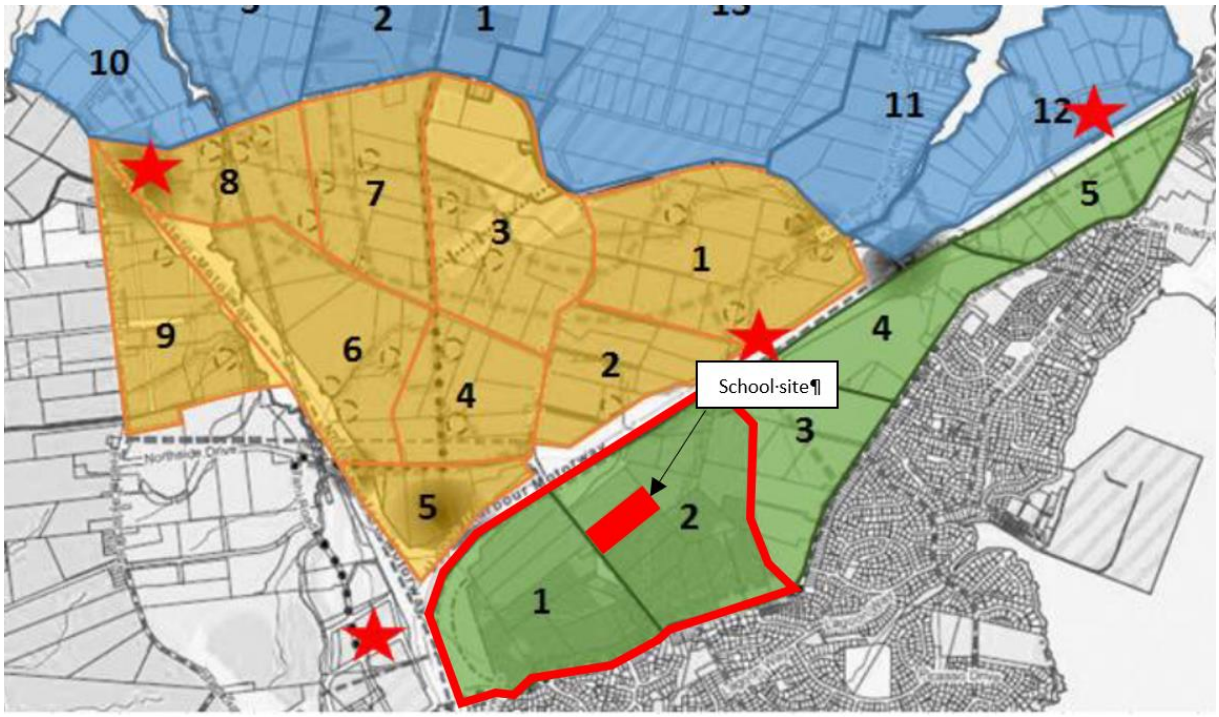


Figure 5.4 Core school catchment area based on the ART Land use zones (extract from the *Whenuapai Structure Plan ITA*).

5.6 Modal Share

The modal share will be very different for the different phases of the school due to the different catchments.

Phase 1 School

Phase 1 of the school is likely to experience a much higher car modal share due to students coming further afield. The Trig Road area will not be developed at this stage and infrastructure will not be in place to allow for walking and cycling to school. The majority of students are anticipated to come from Red Hills, Hobsonville and the northern Whenuapai area. The main mode of travel will likely be by private vehicle or Park & Walk.

There are many opportunities for caregivers to drop their children off on Trig Road, Hobsonville Road (Park & Walk) and Ryans Road where the student walks the final leg to school on foot. This is a desirable outcome for caregivers of older children as they avoid getting caught up in school traffic.

The modal share adopted for Phase 1 includes 85% driving to the school grounds with 15% of students using a park and walk method in the mornings. The afternoon peak assumes 100% of students get picked up by car at school finish time. A sensitivity test has also been undertaken showing 100% of school traffic using the access during the morning peak.

Phase 2 School

The school roll is expected to be a maximum of 1000 students with an additional 50 pupils for ECE. The school will require an assumed staff of 50 staff based on a 1:20 staff to pupil ratio.

Auckland Transport have provided Abley with the average modal share for Primary and Intermediate TravelWise schools for 2020. Primary schools had an average car modal share of 49% in the morning peak and intermediate schools had an average of 37% arriving by car. The future Trig Road school will be a full primary combining primary and intermediate years, resulting in an average car modal share of 46%.

The Travelwise modal share data is only collected in the mornings. However, it is well understood that car use is significantly reduced in the afternoons for several reasons such as after school programmes, extra-curricular classes at

school or going home with friends. The New Zealand Household Travel Survey (NZHTS)[3] indicates that primary school (Years 0-6) children in Auckland experience a 5% reduction in car trips in the afternoons, with Intermediate schools (Years 7-8) having a 13% reduction in afternoon car use. For a full primary (Years 0-8) this averages out to a 7% reduction in car modal share in the afternoons. The car mode share assumed for a future Trig Road school is 46% in the mornings and 39% in the afternoons, as shown in **Table 5.2**.

It is not known at this stage if the school will have allocated school buses. Given the school will include Intermediate age children (Years 7-8), a proportion of students are assumed to travel to school by public transport.

Table 5.2 Modal split

	Walk/Cycle/Scooter	Public Transport	Vehicle	Car/Walk (>400m)	Other
Auckland average Travelwise Primary schools (Yrs 0-6)	32%	3%	49%	14%	2%
Auckland average Travelwise Intermediate schools (Yrs 7-8)	30%	16%	37%	15%	2%
Trig Road (Phase 2) School - Mornings	33%	5%	46%	14%	2%
Trig Road (Phase 2) School - Afternoons	38%	7%	39%	14%	2%

5.7 Walking and Cycling Provision

Phase 1 School

Phase 1 of the school is expected to open in 2022 which will not have upgraded walking and cycling infrastructure in place. An existing footpath on the western side of Trig Road and a safe crossing point outside the school frontage is considered adequate to accommodate the small proportion of school students that may be dropped off and walk the last leg to school on Trig Road. The majority of school students will be travelling by private vehicle and driving into the school grounds.

The posted speed limit of Trig Road is likely to remain at 80km/h until the upgrade occurs. It is recommended that the Phase 1 school applies for a 40km/h School Speed Zone to ensure a safer road environment in proximity to the school. Alternatively, there may be opportunity for the speed limit on Trig Road to be permanently reduced to 50km/h prior to the upgrade. The preferred approach for reducing the speed limit will be determined in consultation with Auckland Transport.

Phase 2 School

Phase 2 of the school will be encouraging active modes to school including walking, cycling and scooting. As the Trig Road area develops, the roads will be urbanised with new facilities for walkers and cyclists as discussed in Section 3.2. Protected cycleways are proposed on Trig Road, with a footpath on both sides of the road.

Phase 2 will be opening when development has occurred in the area, when there are school children living in the area to attend the school. This will also likely coincide with the road upgrades which will be needed to support the residential growth in the area.

[3] https://www.nzta.govt.nz/resources/research/reports/467/

New developments in Auckland are generally planned and constructed to a design speed of 30 km/h, which is also expected in the design of Whenuapai. This expectation is outlined Auckland Transport's TDM (Chapter 4 of the Urban Street Road Design Guide) which provides target speeds for the design of new roads, as shown in **Figure 5.5** below. Trig Road will function as an arterial road and likely be categorised as a Mixed-Use Arterial which are designed to a 30-40km/h speed near schools as seen in **Figure 5.5**. The slower speed around the school provides a safer road environment for students walking and cycling to school.

Desired speed	Appropriate location
10 km/h	Shared spaces
30 km/h	Main street Arterial or Collector. Local Streets. Some Mixed-Use Arterials in centres. Also any type near schools or other major pedestrian destinations. Points of conflict with vulnerable people (crossings, intersections).
40 km/h*	Neighbourhood or Mixed-Use Collectors. Some Mixed-Use Arterials in centres. Any School Zones that have not been reduced to 30 km/h. *Prefer 30 km/h for safety, unless protected crossings provide good accessibility.
50 km/h	Single Use Arterials. Mixed-Use Arterials with extended urban lengths. These streets must be provided with suitable safe crossing points with speed reduced locally.
>50 km/h	Single use arterials with limited access, Urban expressways and motorways. Safe crossings should be grade-separated or at intersections with speed reduced locally.

Figure 5.5 Speed Targets table (AT's Transport Design Manual)

Safe crossing points outside the school and footpaths of an appropriate width along the school frontage are supported to ensure safe routes to school. Pedestrian and cycle access at the school frontage will be separated from the vehicle access allowing for adequate separation between vehicles and school children entering and exiting the school grounds. Further design of the pedestrian and cyclist access points will be developed at OPW stage taking into account accessibility, safety and desire lines outside the school.

Provision of adequate on-site cycle/scootering facilities within the school grounds is important to encourage a high level of active travel.

5.8 Public Transport

Public Transport or a school bus may be a consideration for Phase 2 of Trig Road School. Provision for school buses can be accommodated within the design at OPW stage if deemed necessary.

School buses required for field trips etc for both phases of the school can utilise the PUDO area during the school day. Tracking for buses accessing the PUDO area will be provided at detailed design stage.

5.9 Travel Planning – School and ECE

A School Travel Plan (STP) is proposed to be developed prior to the school opening. The STP will be produced in conjunction with Auckland Transport's TravelWise programme. Engagement with Auckland Transport and the Council will help to support an overall integrated transport plan that covers the needs of all educational facilities in the area.

The STP will provide measures to encourage and incentivise safety for active travel to school and reduce vehicle dependence for students and staff. The Travel Plan is envisaged to be a live document that addresses traffic-related and road safety concerns from school activities on an ongoing basis.

There may be an opportunity and benefits of developing a joint travel plan for the school and the ECE facility. The travel plan will also consider measures to manage pick up and drop off behaviours and safe practices for the ECE.

5.10 Parking

The 'AUPOP Chapter K – Designations - Minister of Education' standard conditions for all education designations require that:

- 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.
- 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.

Phase 1 School

There are 27 teaching spaces / classrooms proposed for Phase 1 of the school. At a rate of two car parks per teaching space as per the standard designation condition in the AUPOP, the requirement for parking would be 54 car parks for staff and visitors, with 54 car parks proposed as shown on the site plan and in **Table 5.3**. The PUDO parks are also available to visitors during the day resulting in a generous supply of car parking.

Phase 2 School

An additional 17 teaching spaces will be provided for Phase 2 of the school resulting in a total of 44 teaching spaces / classrooms. At a rate of two car parks per teaching space as per the standard designation condition in the AUPOP, the requirement for parking would be 88 car parks for staff and visitors, with 88 car parks proposed as shown on the site plan and in **Table 5.3**. The PUDO parks are also available to visitors during the day, again resulting in a generous supply of car parking.

ECE facility (Phase 2 School only)

The ECE centre will have separate parking across from the facility. An area of 1,500m^2 for the ECE centre and an additional area for parking has been provided within the school feasibility plan layout. This is ample space to provide sufficient space for the centre and associated parking. MoE's designation conditions require parking at the rate of one car park for every 10 children the facility is licensed or designed to accommodate, plus one for each full time equivalent staff member. For a ECE roll of 50 children, five car parks are to be provided for pick up and drop off. It is recommended that the pick up and drop off parks are provided close to the centre and separate from the school pick up and drop off. A further 13 car parks may be required for staff, however these can either be provided in the main school car park or outside the ECE facility. The design of the ECE centre and associated parking will be detailed at the next stage of development.

Table 5.3 Staff / Visitor Parking Demand and Supply

School facility	Parking Demand / Requirement	Parking Supply
Phase 1 School	54	54
Phase 2 School	88	88
ECE Facility	18	Can comply

6. Transport Effects

6.1 Forecast traffic volumes

Phase 1 School

Traffic volumes for Phase 1 of the school will be similar to existing traffic volumes. Traffic volumes on Trig Road between Ryans Road and SH18 on-ramp has been extracted from Auckland Transport's website, with the most recent entry being 2018. A 2% traffic growth per annum has been applied as per usual practice, to represent traffic volumes in 2022 as shown in **Table 6.4**.

The morning peak hour on Trig Road is understood to occur earlier than the average peak hour likely due to its distance from Auckland CBD and consequent longer journey times to work/study. All of the entries of Trig Road traffic counts on AT's website show that the peak demand is between 6.45–7.15am. Traffic flows at the school start time (between 8.45-9.00am) will therefore be lower than the peak hour and have been estimated at 75% of the peak demand. It should be noted here that 75% of the AM peak hour is still over 25% higher than interpeak traffic volumes.

The interpeak traffic counts for Trig Road have been utilised for the school finish time. School finish time at 3pm in Whenuapai is not thought to coincide with evening peak volumes.

Phase 2 School

Forecasted traffic volumes for full development of the Trig Road area have been extrapolated from the Whenuapai Structure Plan's ITA prepared by Flow in August 2016. The ITA refers to a 2046 Base Model which includes the anticipated landuse in Whenuapai and the predicted landuse assumed by the ART model, and include the new roading improvements proposed by the Supporting Growth Programme (known as TFUG in 2016). Flow modelled several stages of development of the surrounding area.

Table 6.4 Current and Forecasted Traffic Volumes

Source	Year	AM Both directions Veh/hr	Interpeak Both directions Veh/hr
Phase 1 School			
AT Website	2018	784 (75% - 588)	466
2018 vols + 2% growth p.a.	2022	831 (75% - 623)	494
Phase 2 School			
Structure Plan	Full development at 2046	1,350 (estimated) (75% - 1,015)	810

Morning forecasted traffic volumes

The model output from the full development scenario for the area showed Trig Road experiencing between 0-900 vehicles in the peak hour, in each direction as shown in **Figure 6.1**. The model output shows that northbound traffic (towards the motorway intersection with SH18) on Trig Road is heavier in the morning peak and vice versa in the evening peak, as expected. In the interest of taking a conservative approach, we have assumed the maximum end of the range of 900 vehicles travel north in the mornings, with an estimated (assumed 50%) 450 vehicles travelling southbound.

As above, we have assumed that school start time will occur at the tail end of the morning peak and have therefore assumed 75% of the peak hour traffic. It is generally recognised that a large proportion of school traffic is pass-by traffic

where students are being dropped off by caregivers on the way to work or study. We have not allowed for any pass-by trips in our assessment, to again ensure a conservative approach.

Afternoon forecasted traffic volumes

There is no model output for the interpeak i.e. the school finish time. To estimate the forecasted traffic volumes for the interpeak, we have applied the percentage difference between the AM peak and the Interpeak based on existing traffic count data for 2018. Currently, the interpeak experiences 60% of the morning traffic volumes. We have therefore used 60% of the AM Peak model outputs to estimate the traffic volumes on Trig Road at school finish time, which is approximately 810 vehicles, or 405 vehicles in each direction.

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

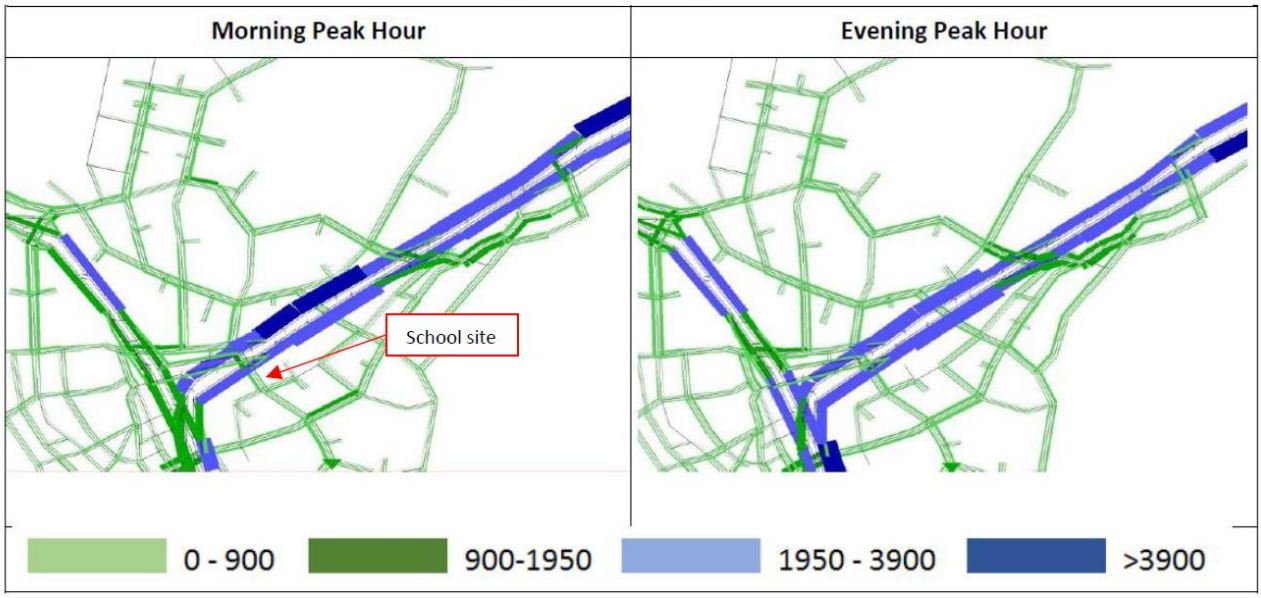


Figure 6.1 Flow's model output at full development of area (Image taken from the Whenuapai Structure Plan 2016 Figure 47, Page 79)

6.2 Trip Generation and Distribution

Trip Generation

The number of vehicle trips generated by Phase 1 of the school is estimated at 728 (364 vehicles) at school start and finish times, as shown in **Table 6.5**. The number of vehicle trips generated by Phase 2 of the school is 658 (329 vehicles) in the mornings and 558 (279 vehicles) in the afternoons.

The number of vehicle trips is estimated based on the anticipated modal split for the school and the average number of students per vehicle.

Table 6.5 Number of school vehicle trips for Phase 1 and Phase 2 School

School start/finish time	Maximum School Roll	Vehicle use	Ave students per vehicle	No. of Vehicles / Trips
Phase 1 School (Mornings)	600	85% Drive (15% Park & Walk)	1.4	364 / 728
Phase 1 School (Afternoons)	600	100% Drive	1.4	428 / 728
Phase 2 School (Mornings)	1000	46% Drive	1.4	329 / 658

Phase 2 School (Afternoons)	1000	39% Drive	1.4	279 / 558

Trip Distribution

For the purpose of modelling the operation of the school access, school traffic trip distribution has assumed an equal distribution from each direction on Trig Road, with 50% assumed to come from the North and 50% from the South. This distribution has been applied for both phases of the school.

Trip Generation of ECE

The vehicular trip generation has been predicted for the proposed ECE facility. The rates have been sourced from the NZ Trips Database Bureau and RTA guidelines and an average has been used in this assessment as shown in **Table 6.6.**

The ECE facility is expected to generate 40 trips in the mornings and 34 trips in the afternoon. The peak times for the ECE facility are not expected to occur at the same time as the primary school, for the following reasons:

- The opening hours of the childcare facility are likely to be 7.30am-6pm, with the peaks likely to be 7.30-8.30 and 5-6pm which differ from the school travel times.
- Users of the ECE facility that do not have children at the school will likely avoid travelling to the ECE at the school peak times and wait until the area is less busy to make their journey.

Table 6.6 Trip Generation Rates – Early Childhood Education

Source	Morning Peak Trip Rates	Afternoon Peak Trip Rates
Early Childhood Education facilities		
RTA Guidelines	1.4 trips/child (2 hour)	0.8 trips/child (1.5 hour)
New Zealand Trips Database Bureau (TDB)	0.9 trips/child (1 hour)	0.8 trips/child (1 hour)
Average	**0.8 trips /child / hr**	**0.67 trips/child / hr**

6.3 SIDRA Modelling

The school access has been modelled with SIDRA for both phases of the school , with the results and assumptions provided below.

As discussed in Section 5, the PUDO will operate with two access points off Trig Road with an entry only and an exit only, separated by a distance of approximately 60m. This is illustrated in **Figure 6.2**.

A right turn bay on Trig Road is proposed to ensure school traffic does not affect the operation of Trig Road.

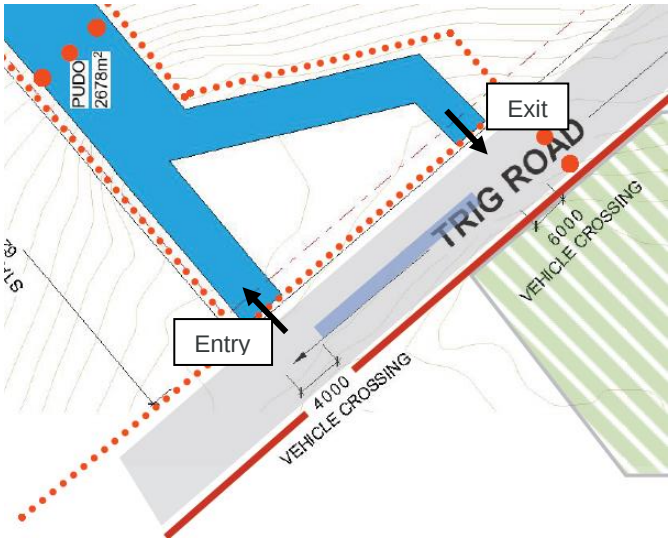


Figure 6.2 PUDO access

Assumptions for Sidra Modelling

The following assumptions and inputs were adopted for the Sidra models:

- The morning peak for school drop off has been modelled over a 30 minute period. This is based on the knowledge that schools typically allow students into the classrooms/school grounds at 30 minutes before the start of school.
- As per the Structure Plan, the upgrade of Trig Road will include a median/turning bays. This will facilitate right turning movements into and out of the site.
- Staff and ECE trips are outside of the peak school pick up/ drop off period and have therefore not been included in the SIDRA peak model. However there may be a proportion of shared trips where school students have siblings that attend the ECE.
- The full development roll of 600 for Phase 1 and 1000 students for Phase 2 has been modelled.
- The forecasted volumes have been taken from the model output from the Whenuapai Structure Plan ITA. The maximum of the range of forecasted volumes has been used in the SIDRA model which ensures a very conservative approach.
- The modal split provided in **Table 5.2** shows a vehicle use of 46% and 39% in the mornings and afternoons respectively for Phase 2 of the school , and an average of 1.4 students per vehicle. Phase 1 is assumed to have a much higher vehicle use of 85% driving and 15% park and walk in the mornings and 100% driving in the afternoons. A sensitivity test showing 100% school traffic using the school access in the mornings has also been undertaken.
- School drop off is assumed to occur between 8.15-8.45am or 8.30-9am depending on school start time. The hour of peak demand is 6.45-7.45am in Whenuapai as discussed in **Section 6.1**. By 8.15am the peak demand is expected to have dropped off and therefore 75% of the peak hour volumes are used for the SIDRA models. This 75% traffic volumes of the AM Peak are still higher than the interpeak, reflecting the tail end of the morning peak time.
- The PUDO was modelled assuming every car trip enters the PUDO/school grounds. This is again considered a conservative approach as it is likely that a proportion of vehicles may park on-street and walk their children into the school grounds.

- It is expected that the future cross-section of Trig Road will have a median for vehicles to use when exiting the school access with a right turn. The provision of a flush median has not been included in the SIDRA model as it is not required for the access to operate at a good level of service. The provision of a flush median will only improve how the access will work.

Phase 1 School: PUDO access off Trig Road

The SIDRA model for the **entry only** access for Phase 1 of the school, in the morning and afternoon peak, operates very efficiently with a Level of Service (LOS) A on every movement other than the right turn into the site which operates at a Level of Service of B. A proposed right turn bay for vehicles turning right into the school entry will experience a maximum queue length of 19m. A summary of the SIDRA results are provided in **Table 6.7** with more detailed results in Appendix B.

The SIDRA model for the **exit only** access for Phase 1 of the school, in the morning and afternoon peak, also operates very efficiently with a LOS A for each movement, other than the right turn out of the site which operates at a Level of Service of B. A summary of the SIDRA results are provided in **Table 6.8** with more detailed results in Appendix B.

A sensitivity test was undertaken for the morning peak, with the SIDRA model assuming 100% of school traffic driving through the school access, in comparison to the adopted scenario of 85% driving and 15% park and walk. The SIDRA model for the entry only, continues to operate very efficiently with a LOS A on every movement other than the right turn into the site which operates at a LOS B. A proposed right turn bay for vehicles turning right into the school entry will experience a maximum queue length of 28m. A summary of the SIDRA results are provided in **Table 6.9** with more detailed results in Appendix B. The SIDRA model for the exit only also continues to operate efficiently with a LOS A for each movement, other than the right turn out of the site which operates at a Level of Service of B, as shown in **Table 6.10**. The sensitivity test shows that the access will continue to operate very efficient in the unlikely event that 100% of the school traffic uses the school access.

Table 6.7 Sidra results for Phase 1 School Access: Entry only

Approach	Movement	AM Peak Hour			Inter-Peak Hour		
		Flow (vph)	Avg Delay (seconds)	LOS	Flow (vph)	Avg Delay (seconds)	LOS
Trig Rd South	Through	335	0.1	A	265	0	A
	Right	364	10.2	B	428	10.9	B
Trig Rd North	Through	335	0.1	A	265	0.1	A
	Left	364	4.7	A	428	4.7	A

Table 6.8 Sidra results for Phase 1 School Access: Exit only

Approach	Movement	AM Peak Hour			Inter-peak Hour		
		Flow (vph)	Avg Delay (seconds)	LOS	Flow (vph)	Avg Delay (seconds)	LOS
Trig Rd North	Though	335	0	A	265	0	A
Trig Rd South	Through	335	0	A	265	0	A
School Access Exit	Left	364	6	A	428	5.7	A
	Right	364	11.1	B	428	9.7	A

Table 6.9 Sensitivity Test - Sidra results for Phase 1 School Access: Entry only, 100% School traffic using access

Approach	Movement	AM Peak Hour			Inter-Peak Hour		
		Flow (vph)	Avg Delay (seconds)	LOS	Flow (vph)	Avg Delay (seconds)	LOS
Trig Rd South	Through	335	0.1	A	N/A – previously modelled (Table 6.7)		
	Right	428	12.5	B			
Trig Rd North	Through	335	0.2	A			
	Left	428	4.7	A			

Table 6.10 Sensitivity Test - Sidra results for Phase 1 School Access: Exit only, 100% School traffic using access

Approach	Movement	AM Peak Hour			Inter-peak Hour		
		Flow (vph)	Avg Delay (seconds)	LOS	Flow (vph)	Avg Delay (seconds)	LOS
Trig Rd North	Though	335	0	A	N/A – previously modelled (Table 6.7)		
Trig Rd South	Through	335	0	A			
School Access Exit	Left	428	6.2	A			
	Right	428	12.2	B			

Phase 2 School: PUDO access off Trig Road

The SIDRA model for the **entry only** access on Trig Road in the morning and afternoon peak operates very efficiently with a Level of Service (LOS) A on every movement but the right turn movement on Trig Road South which operates at LOS B. A flush median or right turn bay will facilitate right turn movements into the site. A summary of the SIDRA results are provided in **Table 6.11**.

The SIDRA model for the **exit only** access on Trig Road, in the morning and afternoon peak, operates at an acceptable level with a LOS A for all movements except for the right turn out of the site which operates at a Level of Service of D in the AM peak, with an average delay of 32 seconds. The upgrade of Trig Road will have a flush median to facilitate the right turn movement out of the site. This has not been modelled in SIDRA as it operates at an acceptable level without the flush median. Therefore the addition of the flush median is only going to improve on the model. A summary of the SIDRA results are provided in **Table 6.12** with more detailed results in Appendix B.

Table 6.11 Sidra results for Phase 2 School Access: Entry only

Approach	Movement	AM Peak Hour			Inter-Peak Hour		
		Flow (vph)	Avg Delay (seconds)	LOS	Flow (vph)	Avg Delay (seconds)	LOS
Trig Rd South	Through	711	0.1	A	568	0.1	A

	Right	330	9.7	A	278	12.1	B
Trig Rd North	Through	358	0.1	A	568	0.2	A
	Left	330	4.7	A	278	4.7	A

Table 6.12 Sidra results for Phase 2 School Access: Exit only

Approach	Movement	AM Peak Hour			Inter-peak Hour		
		Flow (vph)	Avg Delay (seconds)	LOS	Flow (vph)	Avg Delay (seconds)	LOS
Trig Rd North	Though	358	0.1	A	426	0.1	A
Trig Rd South	Through	711	0.1	A	426	0.1	A
School Access Exit	Left	330	6.1	A	330	6.6	A
	Right	330	32.4	D	330	14.2	B

7. Infrastructure Requirements

The following infrastructure requirements are supported for the two school phases.

Phase 1 School

- Safe crossing point across Trig Road, outside school entrance
- Localised widening of Trig Road to include a right turn bay for entry to school.
- No Stopping Lines At All Times (NSAAT) lines along school frontage (if deemed necessary by Auckland Transport)
- Footpath linking Trig Road pedestrian crossing to pedestrian entrance to school
- Installation of 40km/ph school speed zone

Phase 2 School

- Footpaths on both sides of road and cycle facilities as per upgrade proposed by SGA and identified for funding in Auckland Transport's draft RLTP
- Right turn bay / flush median as per Trig Road upgrade
- Speed reduction of 50km/h as per Trig Road upgrade
- Safe crossing point across Trig Road, outside of school entrance

8. Conclusions

It is considered that the land to be designated for educational purposes and the existing surrounding roading network can accommodate the anticipated traffic from both phases of the proposed school and can provide adequate access arrangements. It is also considered that a school on this site can satisfy the outcomes sought by the regional and local transport strategies and plans. Some key findings have been summarised below:

- The local road network in the Trig Road area is not confirmed at this stage. However the traffic generated by both phases of the school at this location can be accommodated on the existing road network without the reliance on future roads.
- The proposed access for both school scenarios are modelled with a separate entry and exit access point. The SIDRA models show all scenarios and time periods work at an acceptable level of service.
- The site can cater for the required parking demand for staff and visitors, student pick up and drop off and separate parking for an ECE facility.
- Detail of car and cycle parking, access arrangements and pedestrian crossings will be considered further during the OPW stage.
- A Travel Plan for the school and the ECE centre will be developed prior to the school opening to promote road safety and encourage active modes for travel to/from school.
- The infrastructure requirements for Phase 1 of the school include
  - A safe crossing point on Trig Road, including a footpath to link the crossing to the school entrance
  - Localised road widening and a right turn bay for access to school
  - No Stopping Lines At All Times (NSAAT) lines along school frontage (if deemed necessary by Auckland Transport)
  - Installation of a 40km/h school zone OR a permanent speed reduction to 50km/h
- The infrastructure requirements for Phase 2 of the school are primarily catered for by the Trig Road upgrade proposed by Supporting Growth and identified for funding in AT's draft RLTP (which is still to be confirmed).

This assessment concludes that Auckland Council can recommend confirmation of the NoR to designate the land for education purposes.

Appendix A
AT Feedback from (i) Inception meeting and (ii) Feedback on Draft ITA (May 2021)

Memorandum

Auckland Transport
An Auckland Council Organisation

To:	Kate Brill, Abley Chris Horne, Incite
From:	Sam McGough, Assistant Planner, Auckland Transport Liam Burkhardt, Planner, Auckland Transport
Date:	11 March 2021
Subject:	Auckland Transport's (AT) comments on a future school proposed by the Ministry of Education (MOE) at 13-15 Trig Road, Whenuapai

MOE has stated that a temporary primary school and early childhood education facility (ECE) will likely be required at 13-15 Trig Road as early as next year to account for a deficit in facilities in the north-west of Auckland. The temporary school will likely cater for up to 600 students.

MOE has also stated that by 2026, a permanent primary school and ECE will be opened on the same site. The permanent school will cater for 1,000 students or possibly more.

The table below sets out AT's preliminary comments on the proposed school at 13-15 Trig Road, Whenuapai. Please note that these comments are provided on a 'without prejudice' basis.

Topic	Comment
General	• Regardless of the access option chosen by MOE, road widening and/or improvements to sections of Trig Road will be required as part of this proposal to ensure safe, effective and efficient movement to and from the site and to minimise conflicts between vehicles, pedestrians and cyclists on the adjacent road network. • Given that the temporary school will have a wider catchment area than the permanent school, it is likely that the temporary school will create more vehicle movements than the permanent school. Therefore, any temporary vehicle access to the school will likely need to be permanent.
Supporting Growth's Notice of Requirement for Trig Road	• In future, Trig Road is intended to function as an arterial road. Supporting Growth (SGA) has identified that Trig Road will need to be widened in future and has undertaken some design work to inform a future Notice of Requirement (NOR) to protect the corridor for future widening/upgrade works. This SGA NOR will cause some conflict with the Ministry's NOR, given that a small amount of land will need to be taken from the front of the site. • MOE will have to engage with SGA to view the proposed alignment plan.

Topic	Comment
	• The school and ECE should not undermine AT's ability to widen and upgrade Trig Road in future.
Ryans Road Access	• MOE has suggested providing access from Ryans Road to the southwest of the school site. Based on feedback received internally, AT opposes the use of Ryans Road as an access to the school for the reasons outlined below. • Trig Road is an arterial road with a posted speed limit of 80km/h. The road has a semi-rural character with heavy vehicle traffic. The use of Ryans Road as an access will result in a greater volume of right turning traffic onto Trig Road. • There is a significant safety concern with large numbers of primary-aged students having to crossing an arterial road from the pick-up-and-drop-off area (PUDO) to access the school. • Ryans Road has limited parking availability. It is envisioned that most first journeys will be by private vehicle, which is likely to cause congestion at the PUDO area. • Trig Road is intended to be widened and improved as per SGA's future NOR outlined above. Ryans Road may be required to support these works which would cause conflict with PUDO activities. • Ryans Road is the sole access for the residents at this location. A PUDO would therefore create access issues for the existing residents.
Trig Road Access	• Improvements to Trig Road will be required as part of this proposal. Trig Road has a narrow traffic lane and no road shoulder. Traffic turning into the school site from Trig Road would have to stop in the traffic lane to turn, causing concerns for safety with potential for head-on-overtaking or rear-end crashes. In the last 5-year period, there has been one serious injury crash involving overtaking a vehicle at this location. • In reference to the above point, there is also a safety risk to the footpath on the western side of Trig Road. • A right turn bay will be required due to the potential for a high number of right-turning vehicles accessing the school at peak times. A right turn bay provides a safe access option while also mitigating some queuing on Trig Road. Road widening of sections of Trig Road will be required to accommodate a right turn bay. • Widening of Trig Road along the school road frontage to provide a limited car parking area for PUDO activities may still prove problematic for both through traffic and turning traffic. It is likely this area would encourage vehicles to reverse and

Topic	Comment
	undertake U-turn manoeuvres, as well as potentially causing queueing at peak times on Trig Road • Any direct access along the school frontage at Trig Road should not undermine AT's ability to widen and upgrade Trig Road in the future as per the previous SGA NOR comments.
Internal Private Road Access	• Based on the internal feedback received by specialists, AT suggests an access option whereby MOE could construct a PUDO area internal to the site away from the Trig Road frontage. This would mitigate queuing issues on Trig Road for PUDO activities by providing more space for vehicles within the site. • A right turn bay will still be required due to a potentially high number of right-turning vehicles accessing the school at peak times. A right turn bay provides a safe access option while also mitigating some queuing on Trig Road. Road widening to sections of Trig Road will be required to accommodate a right turn bay.
Future Collector Road Access	• Plan Change 5: Whenuapai (PC5) is a proposed Plan Change seeking to rezone land from mostly Future Urban to a mix of business and residential zones. The Plan Change seeks to add a new precinct to the Auckland Unitary Plan – Whenuapai 3 Precinct. • Precinct Plan 2 of the proposed Whenuapai 3 Precinct identifies a collector road adjacent to the school site. The collector road provides another possible opportunity for access to the school site in the long term. • The funding and construction of collector roads are the responsibility of the relevant developer.
Safety	• A 50km/h speed environment should extend north of the proposed site. A school speed zone should also be considered along the school frontage for safety of active modes along Trig Road.
Public Transport	• Bus access and manoeuvring space will need to be considered. A bus parking area should be designated within the school site. • The 114 bus service operates along Trig Road and provides services between Westgate and Whenuapai. Any school on the site should provide bus stops and a safe crossing facility so that staff and students can use this service.
Active Modes	• SH16 and SH18 are regional routes on the strategic cycle network and Hobsonville Road is a major route. SGA's indicative cross-section for re-development of Trig Road includes separated cycle lanes. In the long term, a school at

Topic	Comment
	this location will be well served by safe and convenient active modes connections. • Existing facilities for active modes on Trig Road and in the immediate area are not appropriate for a primary school. There is a narrow footpath on the western side of Trig Road with no footpath on the eastern side. There are also no crossing facilities on Hobsonville Road near the Trig Road intersection. Safe pedestrian routes should be considered in the context of the local catchment. • Pedestrian crossing points should be considered, such as a Kea crossing. Pedestrian crossings should comply with TDM standards and be located near the school frontage and separate to the main vehicle access. • AT suggests that an analysis is carried out around how safety concerns for vulnerable road users accessing the site can be mitigated if a temporary primary school is to be established in the near future.
Parking	• Staff parking should be provided to mitigate possible spill-over onto neighbouring streets. Staff will not be eligible for on-street reserved parking or permits. • Mobility parking spaces and loading bays should be allocated within the school parking area.
Lighting	• Street lighting should be considered. Activities occurring at the school in the evenings will generate traffic in hours of darkness.

AUCKLAND TRANSPORT FEEDBACK ON DRAFT ITA REPORT DATED 24 MAY 2021		
Topic	**Comment**	**Client Response**
General	Section 1.1: The ITA should note the assumed timing for Phase 2 of the school. This is useful for AT to understand timing in relation to the potential Trig Road upgrade. At this stage the draft Regional Land Transport Plan 2021-2031 (RLTP) identifies funding for delivery of the upgrade toward the end of the 1st decade, but this is still to be confirmed.	It is anticipated that Phase 2 of the school may be required around 2027, however this is entirely led by the scale of residential growth in the area. It is expected that it will take some time for the school to build up to the masterplan roll. This is noted in the ITA.
	Section 4.2: Table 4.1 states the following "Auckland Council and Auckland Transport were generally supportive of the school proposal. No major issues or concerns were raised at this stage." This statement is not entirely correct, as there are issues to be addressed as part of this proposal. AT has previously raised issues that centred on the safety of students and the efficient operation of Trig Road.	Noted and reworded in the ITA.
	Section 5: As mentioned above, the proposal should state the indicative timing for phase 2 of the school.	As above and noted in the ITA.
	Section 7: Indicates the infrastructure requirements for the two phases of the school. The ITA should specify whose responsibility these are. If infrastructure is required to mitigate the effects of the school, then this should be the responsibility of MOE. AT is willing to enter into a side agreement with MOE instead of conditions, to identify the infrastructure responsibilities of MOE and timing of required upgrades.	MoE accepts they will need to provide the infrastructure required if other parties (such as adjacent developers) haven't undertaken the works prior to the site being developed. Abley understands that the MoE is open to entering into a side agreement on necessary works to be implemented by the MoE to open Phase 1 of the school.
Supporting Growth's Notice of Requirement for Trig Road	The wording in the ITA does not clearly identify the role of Supporting Growth with respect to the upgrade of the Trig Road corridor. Supporting Growth is an alliance between Auckland Transport and Waka Kotahi to identify and route protect strategic networks for future growth. Supporting Growth is a planning mechanism and has no specific function in terms of implementation of upgrades. The latter is AT's	Noted. Wording has been changed in the revised ITA.

	responsibility. The following bullet points identify specific sections of the ITA where the language should be corrected: Section 2.1: states “The Supporting Growth Programme has proposed to upgrade…” This should be amended to “The Supporting Growth programme has proposed an upgrade of Trig Road that includes….” Section 3.2: states “It is understood that Trig Road will be upgraded in accordance with the Supporting Growth Programme. Supporting Growth proposes to upgrade Trig Road to include walking, cycling and PT facilities.” This should be amended to “The Supporting Growth programme has recommended an upgrade of Trig Road that includes walking, etc…. The Supporting Growth programme has undertaken investigations to support the route protection (designation) process for this upgrade. However, the planning and preparation to lodge the Notice of Requirement (NoR) for route protection is dependent on future funding decisions.” Section 3.2: For information on the Trig Road/Hobsonville Road intersection, it is suggested to add a reference to the latest SGA newsletter on Trig Road. Link attached below: o https://www.supportinggrowth.govt.nz/assets/North-West/Publications/NW-HIF-Project-Info-Sheets/58d010d539/Trig-Road-Upgrade-Project.pdf Section 4.1: The ITA should note that the draft RLTP proposes funding for the delivery of Trig Road towards the end of the 10-year period, and that this is still to be confirmed. Section 4.1: states “The Supporting Growth Programme proposes to upgrade Trig Road…” This should be amended to “The Supporting Growth programme proposes an upgrade of Trig Road that includes….”, to clarify SGA’s role.	

	Section 5.7: The ITA assumes that the Trig Road upgrade will be implemented by phase 2 of the school. Please indicate whether phase 2 of the school relies on the Trig Road upgrade being in place, as this will rely on AT funding being confirmed for the project and the timing of delivery. Section 6.1: states "new roading improvements anticipated by the Supporting Growth Programme". This should be amended to "new roading improvements proposed by the Supporting Growth Programme". Section 7: notes infrastructure improvements for phase 2 of the school and states "…. as per Trig Road upgrade undertaken by Supporting Growth". This should be amended to "….as per upgrade proposed by SGA and identified for funding in Auckland Transport's draft RLTP", to make it clear that Supporting Growth will not be delivering the Trig Road upgrade. Section 8: states "The infrastructure requirements for Phase 2 of the school are primarily catered for by the Trig Road upgrade which will be undertaken by Supporting Growth". This should be amended to "the Trig Road upgrade proposed by Supporting Growth and identified for funding in AT's draft RLTP, which is still to be confirmed".	The full masterplan roll of Phase 2 school will rely on the upgrade of Trig Road. However, as the transition into Phase 2 begins, there will still be ample car parking on-site to cater for students being driven to school. It should be noted that the masterplan roll of Phase 2 will rely on a full buildout of the residential development in the area. This is unlikely to occur without the upgrade of Trig Road.
Modal Share	Section 5.6 modal share: for phase 1 of the school, the ITA assumes 85% of students will be driven to the school grounds while 15% will be dropped off externally and walk. Ryans Road may be used for pick-up and drop-off (PUDO) but this	Ample parking has been provided on the school grounds for phase 1 and the SIDRA model shows that the school access will work well with minimal delay. It is unlikely that caregivers will use Ryans Road when they can easily drop within the school grounds. The

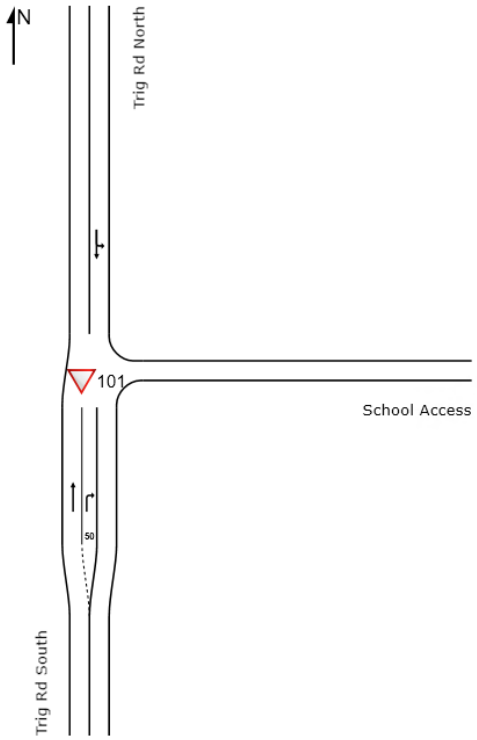
	should be discouraged due to safety issues associated with vehicles manoeuvring and the need to cross Trig Road. It will also impact the operation of Trig Road which functions as an arterial.	15% park and walk has been taken from the Travelwise modal share results where vehicles park more than 400m from the school and walk the final leg.
Active Modes	AT supports the provision for safe crossing points outside the school. Figure 5.2: indicates a raised pedestrian crossing facility across Trig Road. This pedestrian crossing is located close to the vehicle crossing exit for the PUDO area. The pedestrian crossing may need to be relocated further south on Trig Road to ensure there is adequate visibility and stopping distance for vehicles turning left onto Trig Road out of the PUDO. The pedestrian facility should remain as a raised crossing and comply with AT's Transport Design Manual (TDM) standards. The pedestrian crossing facility will need to be designed so that it can accommodate heavy vehicle traffic.	Agreed. The location of the pedestrian crossing on the plan is indicative only. The final location of the crossing will be determined at detailed design stage in consultation with AT. The crossing will be designed to AT's standards.
	The ITA should make clear the pedestrian crossing is the responsibility of MOE to mitigate the effects of this proposal.	The MoE accepts they will be responsible for construction of the pedestrian crossing before Phase 1 of the school opens. Abley understands that the MoE is open to entering into a side agreement on necessary works to be implemented by the MoE to open Phase 1 of the school.
	The proposal for the Trig Road upgrade includes implementing a footpath along the school road frontage. AT's TDM indicates the footpath width alongside schools should be 2.4 metres+. Figure 5.3: indicates a 1.8 metre pedestrian footpath width for the PUDO layout. This access will likely be used by cyclists and pedestrians for phase 2 of the school. For consistency with the footpath along the school frontage, the internal pedestrian footpath should also be 2.4 metres minimum.	This level of detail has not been considered at NOR stage – this matter will be addressed at Outline Plan of Works stage. However, wide pedestrian paths within the school site are supported.
	The footpath on the Western side of Trig Road adjacent to the pedestrian crossing should be upgraded to AT TDM standards, to provide for current and future pedestrian flows.	It is understood that this point refers to the footpath platform at the pedestrian crossing to allow for sufficient pedestrian to wait at the crossing. This is supported and will form part of the pedestrian crossing design.

Public Transport	Section 3.2: notes the Trig Road upgrade will include a bus frequency of every 15 minutes in peak times. The operational decisions regarding buses are the responsibility of Auckland Transport and there is currently no funding allocated to upgrade the bus service along Trig Road in the next 10-year period. Section 5: notes the initial school catchment is intended to serve Whenuapai, Redhills and Hobsonville. There are currently no direct public transport services from Red Hills and Hobsonville to the school site. The 114 bus service operates along Trig Road and provides services between Westgate and Whenuapai. A bus parking area should be designated within the school site. This should be future proofed to enable space for multiple buses accessing and manoeuvring within the area.	Noted and changed. Noted. As a conservative approach, the ITA assumes that all students will be driven to school in Phase 1 and does not rely on public transport. There will be addressed at OPW stage. There is plenty of room on-site to provide for bus parking.
Parking	Broken yellow lines should be marked along Trig Road to prevent unwarranted parking. Mobility parking spaces and loading bays should be allocated within the school parking area.	No Stopping lines are supported if determined appropriate by Auckland Transport and have been added to the ITA. This can be addressed during Engineering Approval Stage of the localised widening design on Trig Road. There will be addressed at OPW stage. There is plenty of room on-site to provide for mobility parking spaces and loading bays.
Safety	A 50km/h speed environment should extend north of the proposed site. Section 5.7: recommends the phase 1 school apply for a 40km/h school speed zone. There is a cost in changing speed limits due to a required consultation process and supporting signage and road calming measures. Where speed reduction forms part of the measures to mitigate the effects of the proposal, the costs should be borne by MOE. The speed will need to be reduced along the school frontage prior to the school opening.	The MOE supports a reduced speed limit for the operation of Phase 1 and accepts responsibility for the cost of the supporting signage for the reduced speed zone.
Modelling	Section 6.3: AT suggests that the ITA includes a sensitivity test where more than 85% of students are picked up and dropped off on the school grounds.	A sensitivity test has been undertaking by modelling 100% of school traffic using the proposed access to enter and exit the school grounds. The school access (entry and exit) continue to

		operate at a very good level of service (A-B). The sensitivity testing has been included in the revised ITA.

Appendix B
SIDRA Results

SIDRA RESULTS – PHASE 1 SCHOOL ACCESS ENTRY ONLY – MORNING AND AFTERNOON



MOVEMENT SUMMARY

Site: 101 [Trig Road School TEMP AM Peak Entry only w RT bay (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Trig Rd South														
2	T1	318	0.0	335	0.0	0.173	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
3	R2	182	0.0	364	0.0	0.443	10.2	LOS B	2.7	18.6	0.69	0.98	0.98	38.1
Approach		500	0.0	699	0.0	0.443	5.3	NA	2.7	18.6	0.36	0.51	0.51	44.7
North: Trig Rd North														
7	L2	182	0.0	364	0.0	0.368	4.7	LOS A	0.0	0.0	0.00	0.28	0.00	25.0
8	T1	318	0.0	335	0.0	0.368	0.1	LOS A	0.0	0.0	0.00	0.28	0.00	48.2
Approach		500	0.0	699	0.0	0.368	2.5	NA	0.0	0.0	0.00	0.28	0.00	35.7
All Vehicles		1000	0.0	1397	0.0	0.443	3.9	NA	2.7	18.6	0.18	0.40	0.26	39.7

MOVEMENT SUMMARY

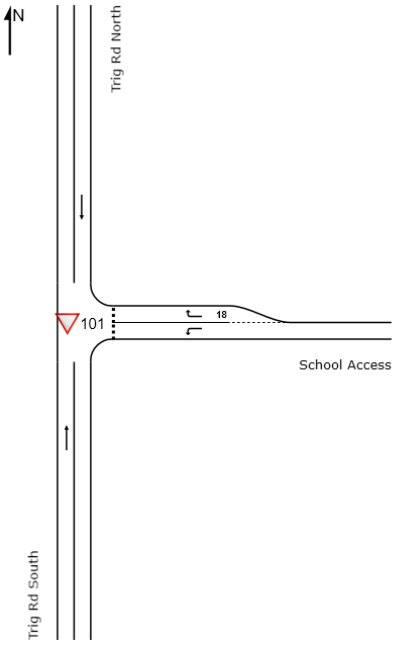
Site: 101 [Trig Road School TEMP PM Peak Entry only w RT bay (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Trig Rd South														
2	T1	252	0.0	265	0.0	0.137	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
3	R2	214	0.0	428	0.0	0.516	10.9	LOS B	3.5	24.3	0.71	1.04	1.12	37.7
Approach		466	0.0	693	0.0	0.516	6.7	NA	3.5	24.3	0.44	0.64	0.69	43.3
North: Trig Rd North														
7	L2	214	0.0	428	0.0	0.366	4.7	LOS A	0.0	0.0	0.00	0.33	0.00	24.9
8	T1	252	0.0	265	0.0	0.366	0.1	LOS A	0.0	0.0	0.00	0.33	0.00	48.0
Approach		466	0.0	693	0.0	0.366	2.9	NA	0.0	0.0	0.00	0.33	0.00	33.4
All Vehicles		932	0.0	1387	0.0	0.516	4.8	NA	3.5	24.3	0.22	0.49	0.35	37.7

SIDRA RESULTS – PHASE 1 SCHOOL ACCESS EXIT ONLY – MORNING AND AFTERNOON



MOVEMENT SUMMARY

▽ Site: 101 [Trig Road School TEMP AM Peak Exit only (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Trig Rd South														
2	T1	318	0.0	335	0.0	0.172	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		318	0.0	335	0.0	0.172	0.0	NA	0.0	0.0	0.00	0.00	0.00	49.9
East: School Access														
4	L2	182	0.0	364	0.0	0.303	6.0	LOS A	1.4	9.8	0.46	0.65	0.46	43.1
6	R2	182	0.0	364	0.0	0.543	11.1	LOS B	3.1	21.8	0.67	1.01	1.07	38.8
Approach		364	0.0	728	0.0	0.543	8.6	LOS A	3.1	21.8	0.56	0.83	0.76	40.8
North: Trig Rd North														
8	T1	318	0.0	335	0.0	0.172	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		318	0.0	335	0.0	0.172	0.0	NA	0.0	0.0	0.00	0.00	0.00	49.9
All Vehicles		1000	0.0	1397	0.0	0.543	4.5	NA	3.1	21.8	0.29	0.43	0.40	45.9

MOVEMENT SUMMARY

▽ Site: 101 [Trig Road School TEMP PM Peak Exit only (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Trig Rd South														
2	T1	252	0.0	265	0.0	0.136	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		252	0.0	265	0.0	0.136	0.0	NA	0.0	0.0	0.00	0.00	0.00	49.9
East: School Access														
4	L2	214	0.0	428	0.0	0.331	5.7	LOS A	1.6	11.4	0.42	0.61	0.42	43.2
6	R2	214	0.0	428	0.0	0.546	9.7	LOS A	3.5	24.2	0.62	0.97	0.96	39.7
Approach		428	0.0	856	0.0	0.546	7.7	LOS A	3.5	24.2	0.52	0.79	0.69	41.4
North: Trig Rd North														
8	T1	252	0.0	265	0.0	0.136	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		252	0.0	265	0.0	0.136	0.0	NA	0.0	0.0	0.00	0.00	0.00	49.9
All Vehicles		932	0.0	1387	0.0	0.546	4.8	NA	3.5	24.2	0.32	0.49	0.42	45.3

SIDRA RESULTS – PHASE 1 SCHOOL ACCESS ENTRY MORNING ONLY – 100% SCHOOL TRAFFIC USING SCHOOL ACCESS (SENSITIVITY TEST)

MOVEMENT SUMMARY

▽ **Site: 101 [Trig Road School TEMP AM Peak Entry only w RT bay 100% School traffic (Site Folder: General)]**

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Trig Rd South														
2	T1	318	0.0	335	0.0	0.173	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
3	R2	214	0.0	428	0.0	0.576	12.5	LOS B	4.0	27.8	0.77	1.11	1.32	36.6
Approach		532	0.0	763	0.0	0.576	7.0	NA	4.0	27.8	0.43	0.62	0.74	43.4
North: Trig Rd North														
7	L2	214	0.0	428	0.0	0.402	4.7	LOS A	0.0	0.0	0.00	0.30	0.00	25.0
8	T1	318	0.0	335	0.0	0.402	0.2	LOS A	0.0	0.0	0.00	0.30	0.00	48.1
Approach		532	0.0	763	0.0	0.402	2.7	NA	0.0	0.0	0.00	0.30	0.00	34.7
All Vehicles		1064	0.0	1525	0.0	0.576	4.9	NA	4.0	27.8	0.22	0.46	0.37	38.6

SIDRA RESULTS – PHASE 1 SCHOOL ACCESS EXIT MORNING ONLY – 100% SCHOOL TRAFFIC USING SCHOOL ACCESS (SENSITIVITY TEST)

MOVEMENT SUMMARY

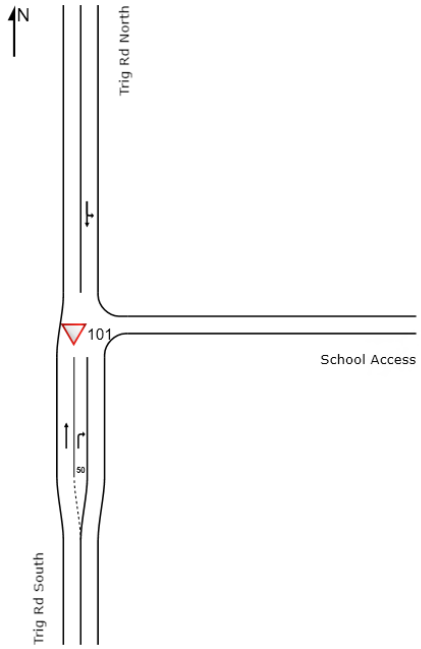
▽ **Site: 101 [Trig Road School TEMP AM Peak Exit only 100% school traffic (Site Folder: General)]**

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Trig Rd South														
2	T1	318	0.0	335	0.0	0.172	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		318	0.0	335	0.0	0.172	0.0	NA	0.0	0.0	0.00	0.00	0.00	49.9
East: School Access														
4	L2	214	0.0	428	0.0	0.356	6.2	LOS A	1.8	12.9	0.48	0.67	0.50	43.0
6	R2	214	0.0	428	0.0	0.638	12.2	LOS B	4.3	30.1	0.72	1.10	1.31	38.0
Approach		428	0.0	856	0.0	0.638	9.2	LOS A	4.3	30.1	0.60	0.89	0.90	40.3
North: Trig Rd North														
8	T1	318	0.0	335	0.0	0.172	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		318	0.0	335	0.0	0.172	0.0	NA	0.0	0.0	0.00	0.00	0.00	49.9
All Vehicles		1064	0.0	1525	0.0	0.638	5.2	NA	4.3	30.1	0.33	0.50	0.51	45.2

SIDRA RESULTS – PHASE 2 SCHOOL ACCESS ENTRY ONLY – MORNING AND AFTERNOON



MOVEMENT SUMMARY

Site: 101 [Trig Road School PERM AM Peak Entry only w RT bay (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Trig Rd South														
2	T1	675	0.0	711	0.0	0.368	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.8
3	R2	165	0.0	330	0.0	0.395	9.7	LOS A	2.2	15.5	0.67	0.95	0.89	38.5
Approach		840	0.0	1041	0.0	0.395	3.2	NA	2.2	15.5	0.21	0.30	0.28	47.0
North: Trig Rd North														
7	L2	165	0.0	330	0.0	0.361	4.7	LOS A	0.0	0.0	0.00	0.26	0.00	25.1
8	T1	340	0.0	358	0.0	0.361	0.1	LOS A	0.0	0.0	0.00	0.26	0.00	48.4
Approach		505	0.0	688	0.0	0.361	2.3	NA	0.0	0.0	0.00	0.26	0.00	36.8
All Vehicles		1345	0.0	1728	0.0	0.395	2.8	NA	2.2	15.5	0.13	0.28	0.17	42.5

MOVEMENT SUMMARY

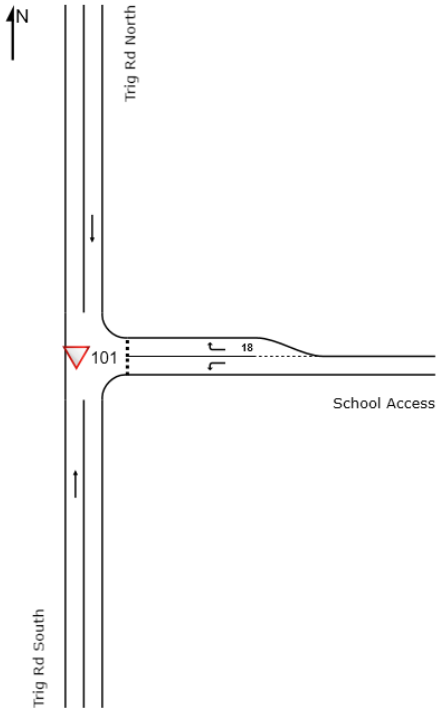
Site: 101 [Trig Road School PERM PM Peak Entry only w RT bay (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Trig Rd South														
2	T1	540	0.0	568	0.0	0.293	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
3	R2	139	0.0	278	0.0	0.432	12.1	LOS B	2.3	15.9	0.76	1.01	1.07	36.8
Approach		679	0.0	846	0.0	0.432	4.0	NA	2.3	15.9	0.25	0.33	0.35	46.4
North: Trig Rd North														
7	L2	139	0.0	278	0.0	0.441	4.7	LOS A	0.0	0.0	0.00	0.18	0.00	25.2
8	T1	540	0.0	568	0.0	0.441	0.2	LOS A	0.0	0.0	0.00	0.18	0.00	48.7
Approach		679	0.0	846	0.0	0.441	1.7	NA	0.0	0.0	0.00	0.18	0.00	40.7
All Vehicles		1358	0.0	1693	0.0	0.441	2.9	NA	2.3	15.9	0.12	0.25	0.18	43.3

SIDRA RESULTS – PHASE 2 SCHOOL ACCESS EXIT ONLY – MORNING AND AFTERNOON



MOVEMENT SUMMARY

▽ Site: 101 [Trig Road School PERM AM Peak Exit only (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Trig Rd South														
2	T1	675	0.0	711	0.0	0.364	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.8
Approach		675	0.0	711	0.0	0.364	0.1	NA	0.0	0.0	0.00	0.00	0.00	49.8
East: School Access														
4	L2	165	0.0	330	0.0	0.281	6.1	LOS A	1.3	8.9	0.46	0.65	0.46	43.0
6	R2	165	0.0	330	0.0	0.887	32.4	LOS D	7.5	52.7	0.96	1.65	3.15	28.2
Approach		330	0.0	660	0.0	0.887	19.3	LOS C	7.5	52.7	0.71	1.15	1.81	34.1
North: Trig Rd North														
8	T1	340	0.0	358	0.0	0.184	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		340	0.0	358	0.0	0.184	0.1	NA	0.0	0.0	0.00	0.00	0.00	49.9
All Vehicles		1345	0.0	1728	0.0	0.887	7.4	NA	7.5	52.7	0.27	0.44	0.69	44.3

MOVEMENT SUMMARY

▽ Site: 101 [Trig Road School PERM PM Peak Exit only (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Trig Rd South														
2	T1	405	0.0	426	0.0	0.219	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		405	0.0	426	0.0	0.219	0.1	NA	0.0	0.0	0.00	0.00	0.00	49.9
East: School Access														
4	L2	165	0.0	330	0.0	0.303	6.6	LOS A	1.4	9.8	0.51	0.71	0.53	42.9
6	R2	165	0.0	330	0.0	0.615	14.2	LOS B	3.5	24.5	0.78	1.11	1.38	36.7
Approach		330	0.0	660	0.0	0.615	10.4	LOS B	3.5	24.5	0.65	0.91	0.96	39.6
North: Trig Rd North														
8	T1	405	0.0	426	0.0	0.219	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		405	0.0	426	0.0	0.219	0.1	NA	0.0	0.0	0.00	0.00	0.00	49.9
All Vehicles		1140	0.0	1513	0.0	0.615	4.6	NA	3.5	24.5	0.28	0.40	0.42	46.1