

transport and traffic assessment;

**New Primary School in
Edmondson Park**

For SINSW
11/06/2021

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traffic;
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Document Control

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1. Executive Summary

ptc. has been engaged by Richard Crookes Construction on behalf of School Infrastructure New South Wales to prepare a Transport and Traffic Assessment (TTA) report for the development of a new primary school in Edmondson Park at Buchan Avenue, Edmondson Park.

This State Significant Development Application (SSDA) seeks approval for a new core 35 primary school accommodating 1,012 students and a cold shell pre-school accommodating 40 students at Buchan Avenue, Edmondson Park. The primary school will employ 59 staff and the pre-school 7 staff.

Edmondson Park is a precinct still undergoing development, with some roads yet to be constructed. Relevant to this development is Buchan Avenue, which eventually will provide primary pedestrian access to the school as well as bus connectivity. This road is proposed to be used as main construction access, which will eliminate construction vehicle impact from surrounding local roads. Buchan Avenue is expected to be finalised by August 2021, prior to the expected commencement of construction.

An analysis has been undertaken of the adequacy of existing active and public transport facilities within the enrolment catchment of the proposed school. This information has been utilised to determine the future target mode share of the school, which in turn built the base for the proposed provision of pedestrian, cycling, public and private transport facilities. Measures proposed by the project include:

- Provision of three separate pedestrian gates to service the majority of pedestrians arriving from the north, students attending the Student Support Units (SSU) and students being pick-up and dropped-off in Faulkner Way.
- The school will implement staggered bell times to flatten the curve of the pick-up and drop-off arrival profile.
- The project will implement raised zebra crossings on Buchan Avenue and Faulkner Way to enable direct pedestrian connectivity to the school.
- Bicycle parking for students and staff as well as an End of Trip Facility have been provided to enable safe and convenient bicycle and scooter storage.
- Upon consultation with TfNSW, amendments to existing bus routes are underway to service areas where students would otherwise be reliant on being driven.
- Parking restrictions along Faulkner Way and Buchan Avenue will be implemented to establish pick-up and drop-off zones and a bus zone on the northern side of Buchan Avenue.
- A School Transport Plan has been prepared to promote active and public transport.
- Constrained provision of car parking spaces is expected to act as a deterrent for the use of cars.

The school will benefit from infrastructure improvements currently under investigation, such as the signalisation of the Soldiers Parade / Croatia Avenue intersection. This assessment also identified some walking and cycling improvement measures which ideally would be incorporated in Council's transport or upgrade plans.

Given that some of the relevant roads are yet to be constructed, the analysis of the traffic impact by the proposed school has been based on the latest traffic modelling and assessment for Edmondson Park, conducted by AECOM for Landcom. It has been found that the latest approved modelling incorporated a primary school based on a capacity of 1,000 students, which aligns with the here proposed. The transport

mode share assumptions of 50% car usage adopted in the model slightly exceed the proposed 46% private car utilisation. It is therefore concluded that the surrounding road network has been planned and will be constructed to accommodate traffic generated by the proposed school.

Construction traffic will access and exit the site mostly via Buchan Avenue, with smaller trucks potentially turning in and out of Faulkner Way. As the school building is proposed to be constructed using prefabricated DfMA modules, the maximum vehicle size (up to a 25m long Prime Mover) has been determined on the basis that the largest modules have been chosen. Traffic control will be required at the Buchan Avenue / Soldiers Parade intersection during the modules' delivery. Additional Traffic controllers will be located at the construction gates on Buchan Avenue.

2. Project Proposal

2.1 Background

ptc. has been engaged by Richard Crookes Construction on behalf of School Infrastructure New South Wales (SINSW) to prepare a TTA report for the development of a new primary School in Edmondson Park (the School) at Buchan Avenue, Edmondson Park.

The project is proposed to be submitted as a SSDA to the Department for Planning, Industry and Environment (DPIE). As the proposed site lies within the Liverpool City Council local government area, the project has considered the local controls.

This report sets out the methodology and findings of the study to assess the traffic, parking, accessibility and transport implications associated with the proposal.

The location of the proposed school is outlined in Figure 1.

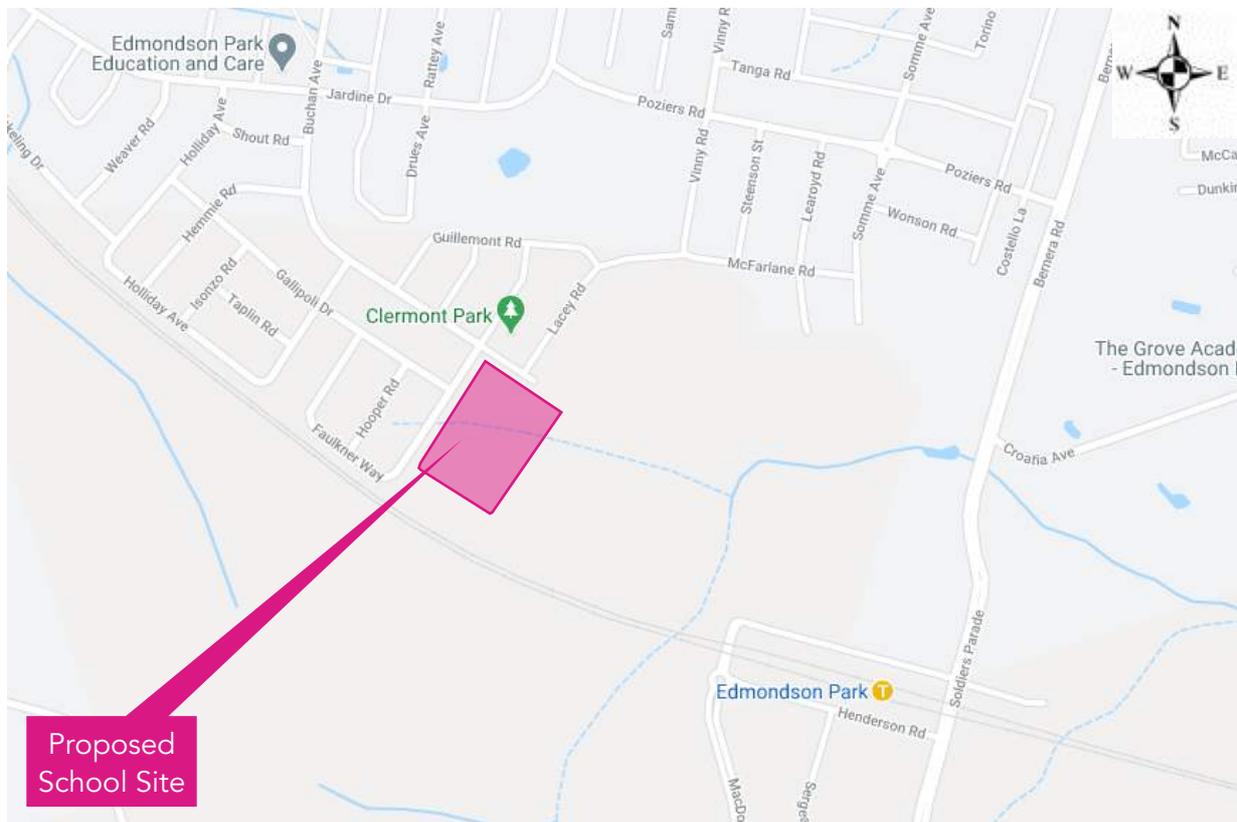


Figure 1 - Site Location (Source: Google Maps)

2.2 Response to SEARs – Item 6. Transport and Accessibility

SEARs Requirement	ptc. Response
<p>Indication of the potential extent of school catchment area to facilitate assessment of associated impact to the transport network</p>	<p>Section 2.4 and Section 3.6</p>
<p>Analysis of the existing transport network to at least the existing or proposed enrolment boundary, including:</p> <ul style="list-style-type: none"> • road hierarchy. • pedestrian, cycle and public transport infrastructure. • details of current daily and peak hour vehicle movements based on traffic surveys and / or existing traffic studies relevant to the locality. • existing performance levels of nearby intersections utilising appropriate traffic modelling methods (such as SIDRA network modelling). 	<p>Refer to Section 4.4</p> <p>Refer to Section 4.2 and Section 4.3</p> <p>Refer to Section 8</p> <p>Refer to Section 8</p>
<p>Details of the proposed development, including:</p> <ul style="list-style-type: none"> • a map of the proposed access which identifies public roads, bus routes, footpaths and cycleways. • vehicular access arrangements, including for, school buses, service and emergency vehicles and loading/unloading, including swept path analysis demonstrating the largest design vehicle entering and leaving the site and moving in each direction through intersections along the proposed transport routes. • car parking, bicycle parking and end-of-trip facilities. • drop-off / pick-zone(s) and arrival / departure bus bay (s). • pedestrian, public transport or road infrastructure improvements or safety measures. 	<p>Refer to Section 4.1</p> <p>Refer to Section 7, Attachment 3 and Student Transport Plan</p> <p>Refer to Section 7.2 and 7.3</p> <p>Refer to Section 7.5 and Section 7.7</p> <p>Refer to Section 6.2</p>
<p>Analysis of the impacts due to the operation of the proposed development, including:</p> <ul style="list-style-type: none"> • proposed modal split for all users of the development including vehicle, pedestrian, cyclist, public transport and other sustainable travel modes. • estimated total daily and peak hour vehicular trip generation. • a clear expansion and justification of the: <ul style="list-style-type: none"> ▪ assumed growth rate applied. 	<p>Refer to Section 6.2 and the School Transport Plan</p> <p>Refer to Section 8</p> <p>Refer to Section 8</p>

SEARs Requirement	ptc. Response
<ul style="list-style-type: none"> ▪ volume and distribution of proposed trips to be generated. ▪ type and frequency of design vehicles accessing the site. • details of performance of nearby intersections with the additional traffic generated by the development both at the commencement of operation and in a 10-year time period (using SIDRA network modelling) • consideration of the proposed signalisation of Buchan Avenue/Bernara Road in Edmondson Park South (MOD5 TMAP 2018) and impacts on the local road network and pedestrian safety with and without proposed traffic signals on the local road network. Note that the installation of traffic control signals is dependent on general warrants in accordance with TfNSW requirements for Traffic Signal Design – Section 2 Warrants. • cumulative traffic impacts from any surrounding approved development(s) and future planned developments such as the Frasers Town Centre and the proposed additional development within the Landcom Town Centre. • adequacy of pedestrian, bicycle and public transport infrastructure to accommodate the development • adequacy of car parking and bicycle parking provisions when assessed against the relevant car / bicycle parking codes and standards • adequacy of the drop-off / pick-up zone(s) and bus bay(s), including assessment of any related queuing during peak-hour access • adequacy of the existing / proposed pedestrian infrastructure to enable convenient and safe access to and from the site of all users. 	<p>Refer to Section 7</p> <p>Refer to Section 8</p> <p>Refer to Section 8</p> <p>Refer to Section 8</p> <p>Refer to Section 4</p> <p>Refer to Section 7.3 and Section 7.8</p> <p>Refer to Section 7.5 and Section 7.7</p> <p>Refer to Section 4, Section 6.2, Section 7.2, Section 7.5.2 and the School Transport Plan</p>
<p>Measures to ameliorate any adverse traffic and transport impacts due to the development based on the above analysis, including:</p> <ul style="list-style-type: none"> • travel demand management programs to increase sustainable transport (such as a School Transport Plan) • infrastructure improvements, including details of timing and method of delivery. 	<p>Refer to the School Transport Plan</p> <p>Refer to Section 6.2</p>
<p>A preliminary operation traffic and access management plan for the site, the drop-off / pick-up zone(s) and bus bay(s).</p>	<p>Refer to the School Transport Plan</p>

SEARs Requirement	ptc. Response
<p>Analysis of the impacts of the traffic generated during construction of the proposed development, including:</p> <ul style="list-style-type: none"> • construction vehicle routes, types and volumes. • construction program (duration and milestones). • on-site car parking and access arrangements for construction, emergency and construction worker vehicles. • cumulative impacts associated with other construction activities in the locality (if any). • road safety at identified intersections near the site due to conflicts between construction vehicles and existing traffic in the locality. • measures to mitigate impacts, including to ensure the safety of pedestrian and cyclists during construction. 	<p>Refer to Section 9</p>
<p>A preliminary Construction Traffic and Pedestrian Management Plan</p>	<p>Refer to Section 9</p>
<p>Plans depicting school zone signage and subsequent pavement marking locations.</p>	<p>Refer to Attachment 2</p>

2.3 Purpose of this Report

The purpose of this report is to present considerations relating to the Transport and Traffic Assessment (TTA) for the proposed new primary school in Edmondson Park. This report will form part of the SSDA for the School and will address the following:

- | | |
|-----------|---|
| Section 1 | Introduction and brief description of the proposal, including comments received as part of the SEARs application and references to responses to each individual point. |
| Section 2 | Review of local and state documents and an analysis of their adequacy in the wider context of the proposed development. A high-level gap analysis has been undertaken to determine if any amendments to these plans and programs would benefit the new school. |
| Section 3 | Review of the existing transport networks (pedestrian, cycling, bus and road) and an analysis of their adequacy in the context of the proposed development. A detailed gap analysis has been undertaken to determine what changes within the proposed enrolment catchment would benefit the prospective students. |
| Section 4 | Review of the existing travel patterns within the suburb to determine the behavioural baseline. Analysis of the potential travel demand based on walkability and cyclability. |
| Section 5 | Analysis of school transport scenarios depending on the level of facilities provided in and around the school. This section also provides an overview of proposed infrastructure improvements, which are expected to reduce car dependency. |
| Section 6 | Assessment of the required and proposed parking provisions for all user groups, including waste and emergency vehicles. Design assessment of the vehicular, cycling and pedestrian facilities at the proposed development. |
| Section 7 | Calculation of the traffic impact, which includes the likely trips generated by the proposed development and a cumulative assessment of the surrounding developments. |
| Section 8 | An analysis of a feasible construction traffic and pedestrian management during the construction of the proposed development. |
| Section 9 | Summary of input provided by various stakeholders and how the project responded. |

2.4 Development Proposal

This state significant development application seeks approval for a new core 35 primary school accommodating 1,012 students and a cold shell 40 place pre-school at Buchan Avenue, Edmondson Park. The works entail:

- Site preparation and excavation;
- Land use for the purpose of a new primary school;
- Construction of new buildings including:
 - A three storey building on the western portion of the site primarily addressing Faulkner Way comprising 36 homebases, 4 special support unit teaching spaces, staff room, administration office at the ground floor and library at the first floor addressing the corner of Buchan Avenue and Faulkner Way, and student amenities;
 - A coldshell of a single storey preschool for educational programs for children the year before they commence kindergarten, accommodating 40 places, connected at the southern end of the three storey building to be operated by Liverpool City Council; and
 - A single storey building on the eastern portion of the site comprising a communal hall, out of school hours care, 8 homebases and covered outdoor learning area.
- Landscaping and public domains works including tree planting, a sports court and creation of various assembly, play and learning zones;
- A drop-off and pick-up zone, and bus zone on Buchan Avenue;
- An at-grade staff carpark at the south of the site with ingress and egress provided off Faulkner Way at the south-west corner of the site;
- Primary pedestrian entrance from Buchan Avenue and an additional entrance on Faulkner Way for the ground floor support unit; and
- Other ancillary infrastructure and utilities works and digital signage.

A site plan of the proposed development is shown in Figure 2.

A plan showing the proposal, including access points, as well as the parking, pick-up & drop-off and bicycle spaces provision is shown in the below figures. More detailed, architectural plans are shown Attachment 1.

The proposed student enrolment catchment for the School extends to Camden Valley Way to the north, the Hume Motorway and Maxwells Creek North to the east, and extends just across the railway line to the south and west, as presented in Figure 3.

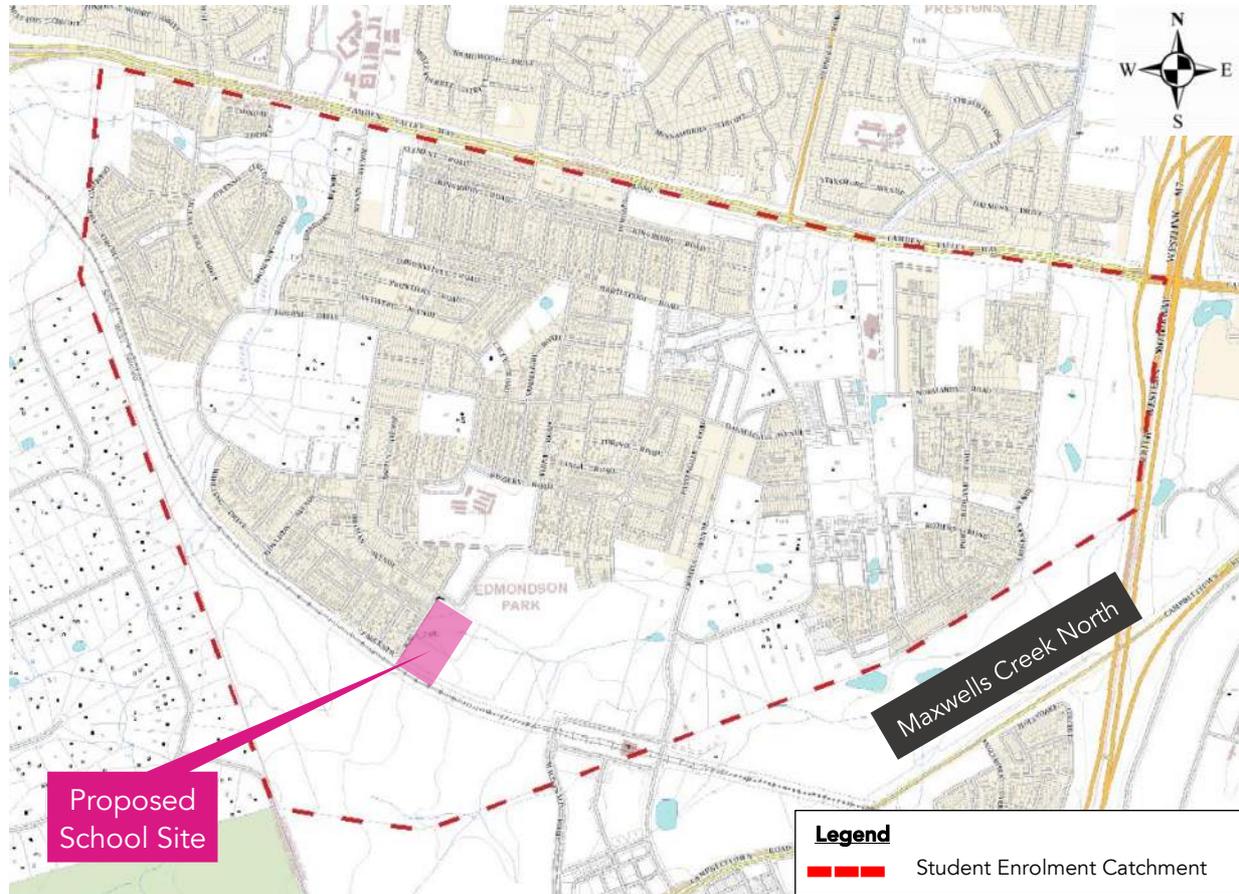


Figure 3 - School Enrolment Catchment

3. Site Context

This section provides an overview and discussion about the suitability of the existing state and local transport plans and identifies any gaps in these plans and strategies in view of the proposed school.

3.1 Site Location

The proposed school site is located in Buchan Avenue in Edmondson Park and is identified as Lot 1 in Deposited Plan 1257105. It is located approximately 43 kilometres southwest of Sydney CBD.

The site has a frontage to Buchan Avenue to the north and Faulkner Way to the west. To the east of the site is vacant land, which will likely be developed as a high school. A railway line is present towards the south; Landcom is currently planning a road to be constructed between the School and the railway line.

The aerial view of the subject site is shown in Figure 4.

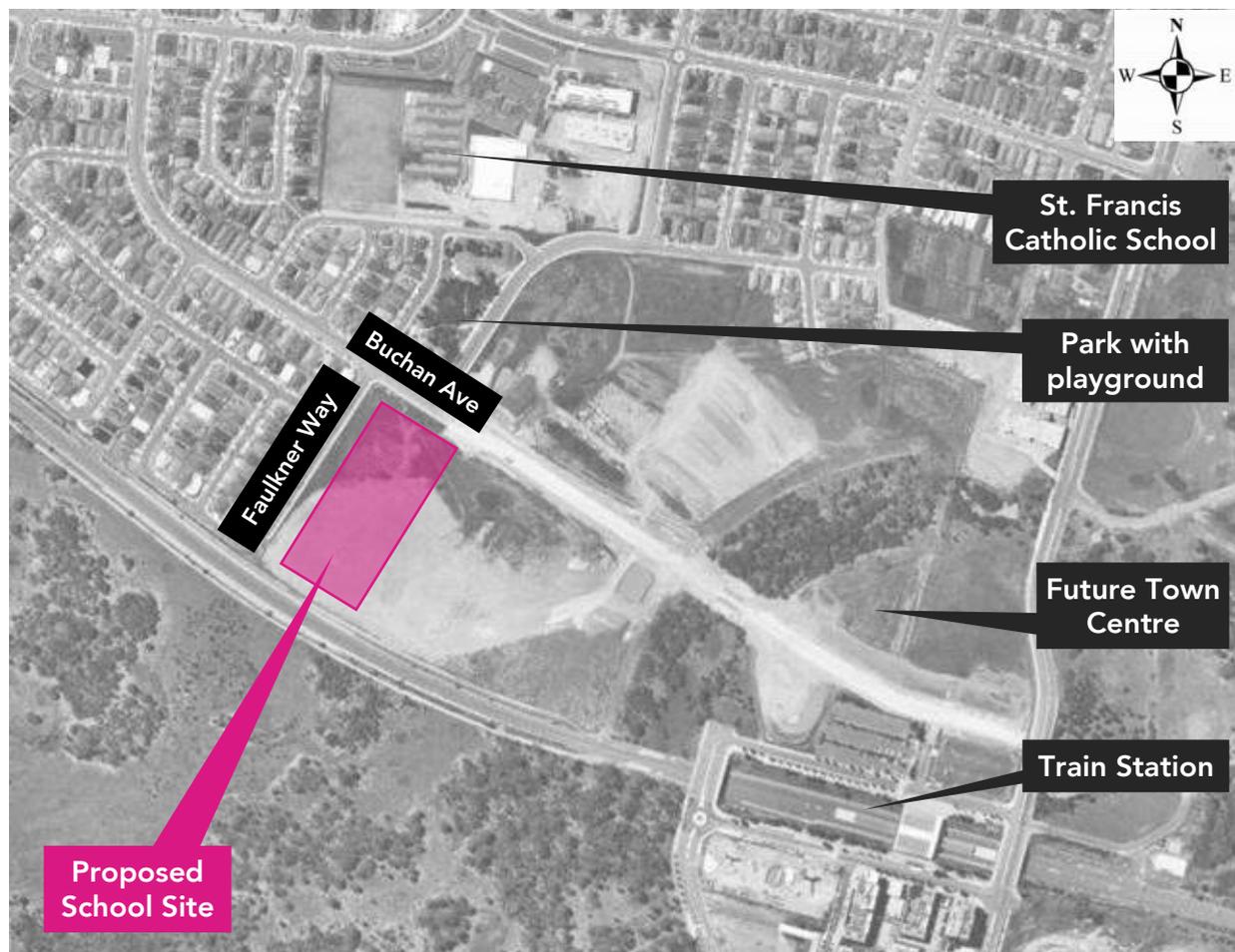


Figure 4 - Aerial View of the Subject Site (Source: Near Map)

3.2 Local Transport Plans

3.2.1 Local Strategic Plan

Connected Liverpool 2040 – Liverpool’s Local Strategic Planning Statement (March 2020) is aimed to set Liverpool City Council’s strategic planning vision for the next 20 years. This plan lists Liverpool City Council’s planning priorities across four areas: connectivity, productivity, liveability and sustainability.

To improve connectivity Council aims for the following:

- Investigate opportunities for a Western Sydney International Airport terminal interchange with the Northern Line, South-West Rail line and Fifteenth Avenue Smart Transit Corridor; and
- Investigate Link to provide direct rail connection from Liverpool City Centre to Sydney CBD via Holsworthy

The proposed transport improvement initiatives are shown in Figure 5 and Figure 6. The plan focuses on making Liverpool more liveable by providing safe, healthy and inclusive places. The plan also aims on increasing productivity within Liverpool by creating more job opportunities and targets to improve sustainability by protecting the native habitat.

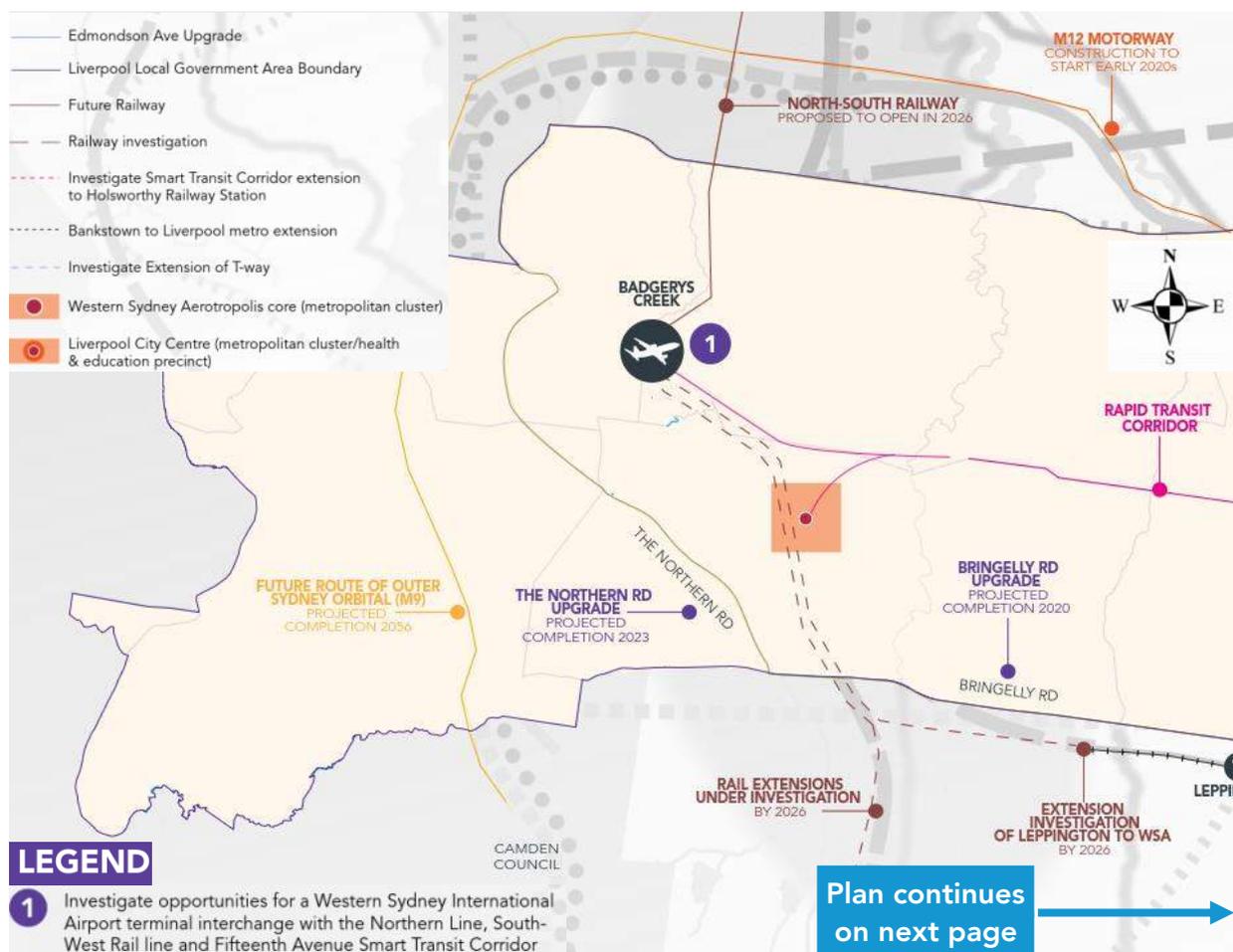


Figure 5 - Local Strategic Plan 1 (Source: *Connected Liverpool 2040 - Liverpool’s Local Strategic Planning Statement*)

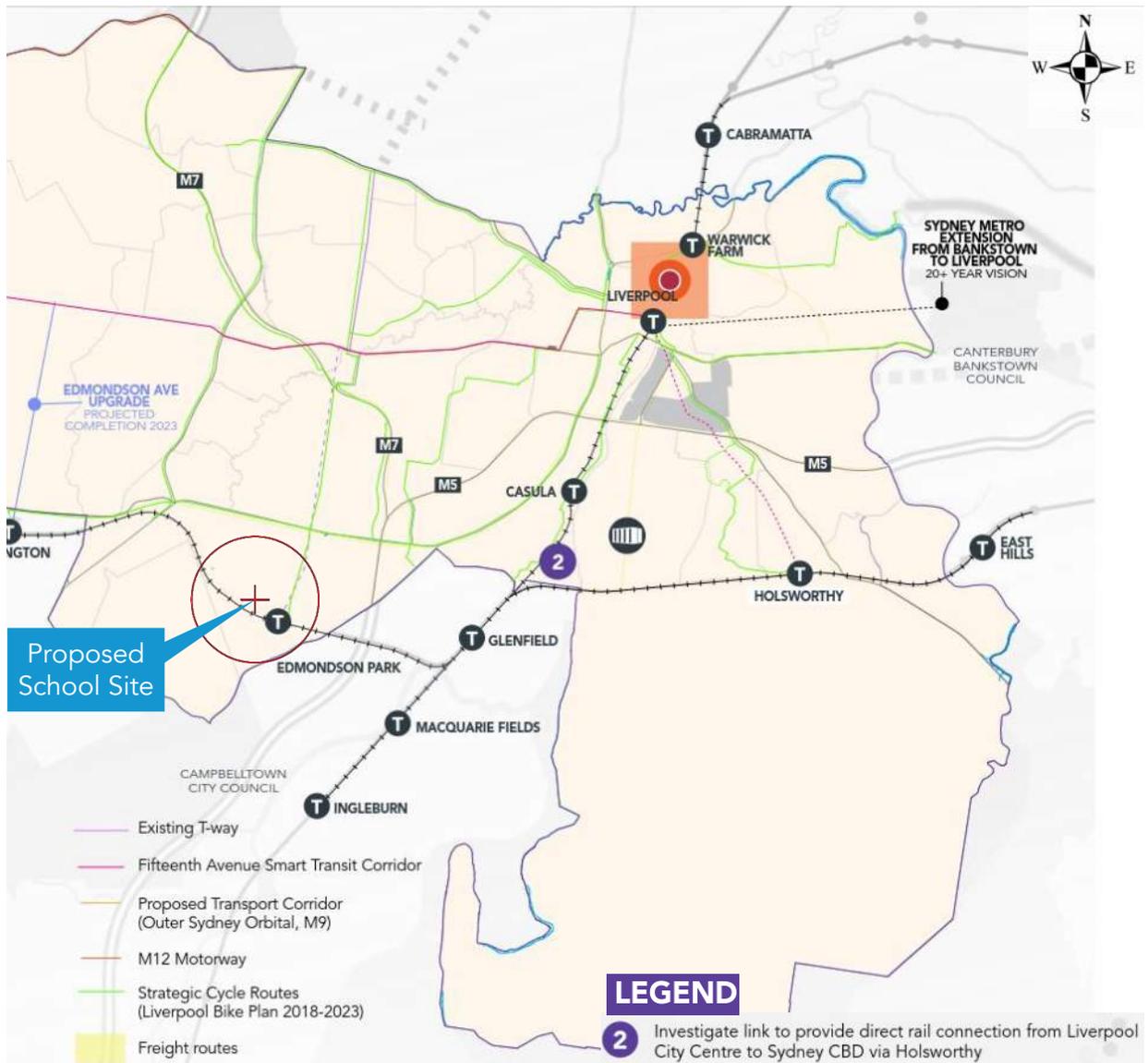


Figure 6 - Local Strategic Plan 2 (Source: Connected Liverpool 2040 - Liverpool's Local Strategic Planning Statement)

The strategic cycle route provides connectivity in the north-southbound direction between Edmondson Park train station and the rapid transit corridor which may improve onward journey to work for parents and staff.

The plan focuses on improving the entire Liverpool area. No update to this strategy is needed.

3.2.2 Community Strategic Plan

Our Home Liverpool 2027 – Community Strategic Plan (2017-2027) is a ten year overarching plan that sets direction to Council and stakeholders to work together and provide opportunities to keep Liverpool moving forward. The major directions of this plan are as follows:

- *Creating connection - This direction emphasises the importance of connections within Liverpool to create a harmonious community.*
- *Strengthening and protecting our environment - This direction is about planning high-quality, sustainable urban environments to create a great place to live, work and play.*
- *Generating opportunity - This direction underlines the need for Council to support economic growth, including employment and investment options.*
- *Leading through Collaboration - This direction highlights the importance of a Council proactively leading the community, while continually engaging the community to ensure an aligned vision.*

The document focuses on improving the community in general. No updates to this plan are needed.

3.2.3 Bicycle Plans

Liverpool Bike Plan 2018-2023 is a planning document that outlines the provision of bicycle-related infrastructure and is also a communication strategy designed to promote and increase the rates of cycling in Liverpool.

A major intention of the *Liverpool Bike Plan* project is to provide strategic action plan to improve cycleways and bicycle facilities, identify cycleway routes in the context of key trip generators and to establish a safe, well-connected and easy-to-use cycling environment within the timeframe of the plan and beyond.

Liverpool Bike Plan for Prestons Route is presented in Figure 12. The plan shows existing and proposed bicycle routes within the vicinity of the site, some of which appear to have already been constructed.

The following is noted:

- On-road facilities are not suitable for primary school students. As such, it is recommended to finetune the plan and to promote off-road bicycle paths along major desire lines.
- As marked in blue in Figure 12 a north south link is missing within Edmondson Park, which would benefit the School.

An update of this strategy is recommended.

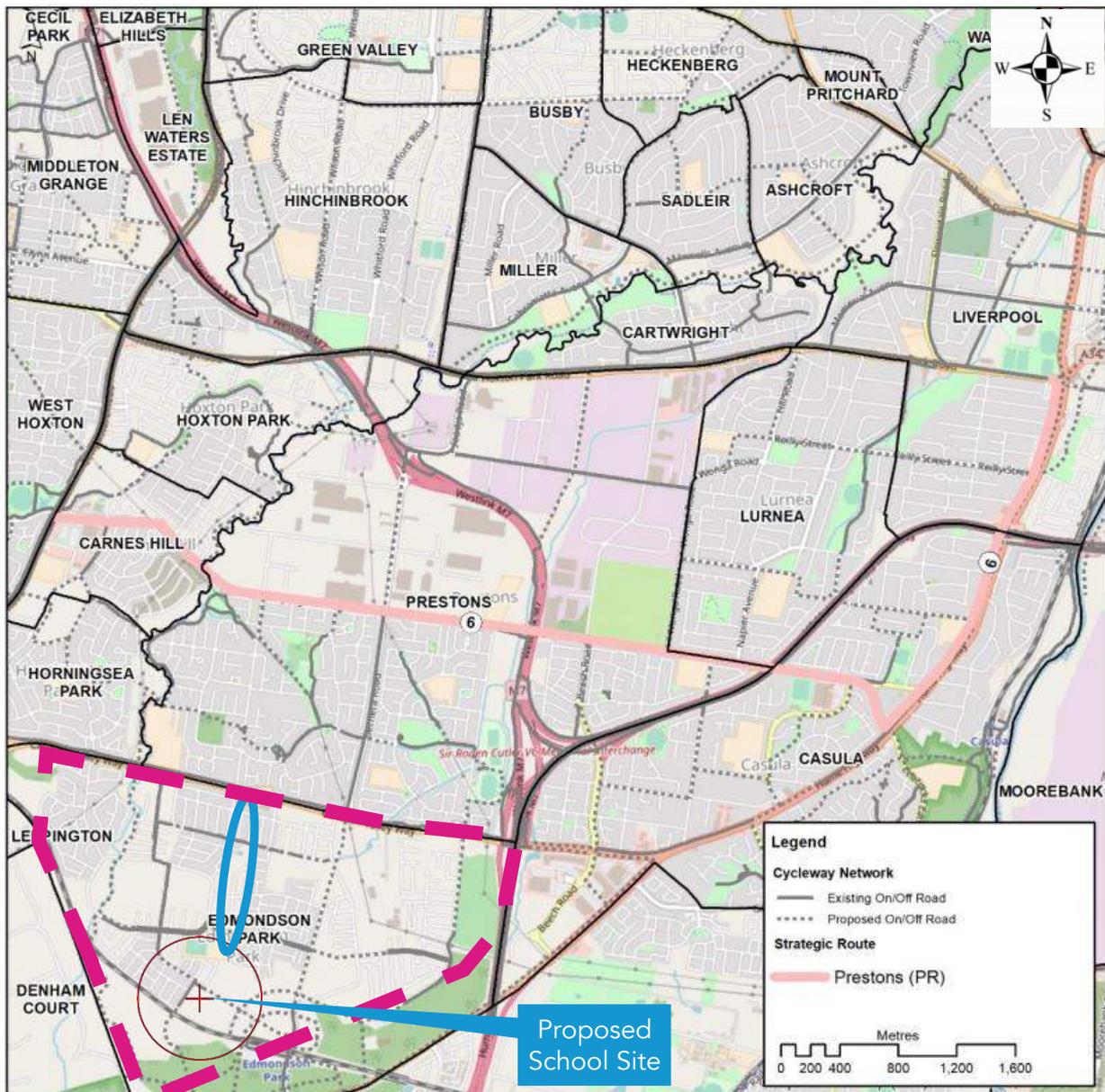


Figure 7 - Liverpool Bike Plan – Prestons Route

3.2.4 Smart Transit Corridor

The *Fifteenth Avenue Smart Transit Corridor (2020)* outlines Liverpool City Council’s vision to deliver a place-led transit corridor between Liverpool city centre and the Western Sydney International (Nancy-Bird Walton) Airport (WSIA). *The Fifteenth Avenue Smart Transit (FAST) corridor will support significant growth, improve regional transport connectivity and be guided by the existing landscape and character of South West Sydney.*

The *FAST Corridor* plan is presented in Figure 8 and it shows a transit corridor between Liverpool and Western Sydney Airport. Further south, a parallel railway connection between Liverpool Station and Western Sydney Airport via Edmondson Park is also planned to be provided. The plan aims to provide following transport opportunities:

- The 19km corridor along Fifteenth Avenue is the most direct route between Liverpool and the Airport and could be prioritised for fast and efficient public transport such as zero-emissions rapid buses, trackless trams, or light rail.
- The corridor would accommodate high speed public transport in a landscaped boulevard with low speed urban 'super stops' at centres.
- The corridor and stations would prioritise walking, cycling and micro-mobility with off-street cycle paths and promotion of alternative modes of transport such as carsharing.
- The corridor must balance speed with the number of stops, low speed areas and loading time at stations.
- The public transit corridor would improve Western Sydney's capacity to create a 30 minute city, with accessible jobs in Liverpool city and the Aerotropolis for future residents living along the corridor.
- The transit corridor will be low noise and significantly landscaped to cool the area, provide shade for people and strengthen the local ecology.
- A significant outcome of the corridor is the place-led approach. The corridor will adopt unique characteristics of the landscape and land uses in the local area. Stations will also serve a double purpose where placemaking opportunities will also be leveraged to create vibrant and community-focused town centres.

The document provides an improved connectivity in the overall Liverpool area and near the School site. No update of this strategy is needed.

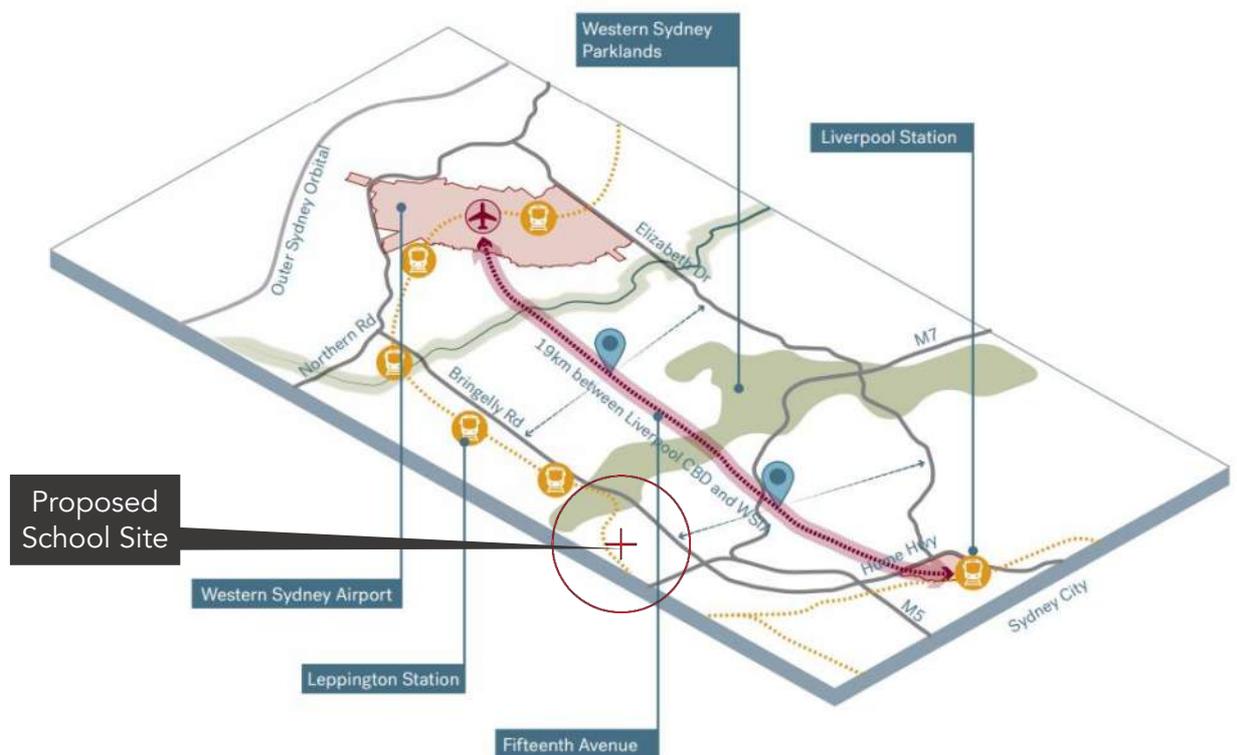


Figure 8 - Fifteen Avenue Smart Transit Corridor (Source: Liverpool City Council)

3.3 State Transport or Infrastructure Plans

3.3.1 Future Transport 2056

The Greater Sydney City Shaping Network 2056 is aimed to provide high capacity and high frequency services to the metropolitan centres.

This project does not directly affect the existing arrangements, but the potentially improved frequency of trains would serve staff who live within the wider area of Sydney to commute to school.

No amendments are needed to this plan.

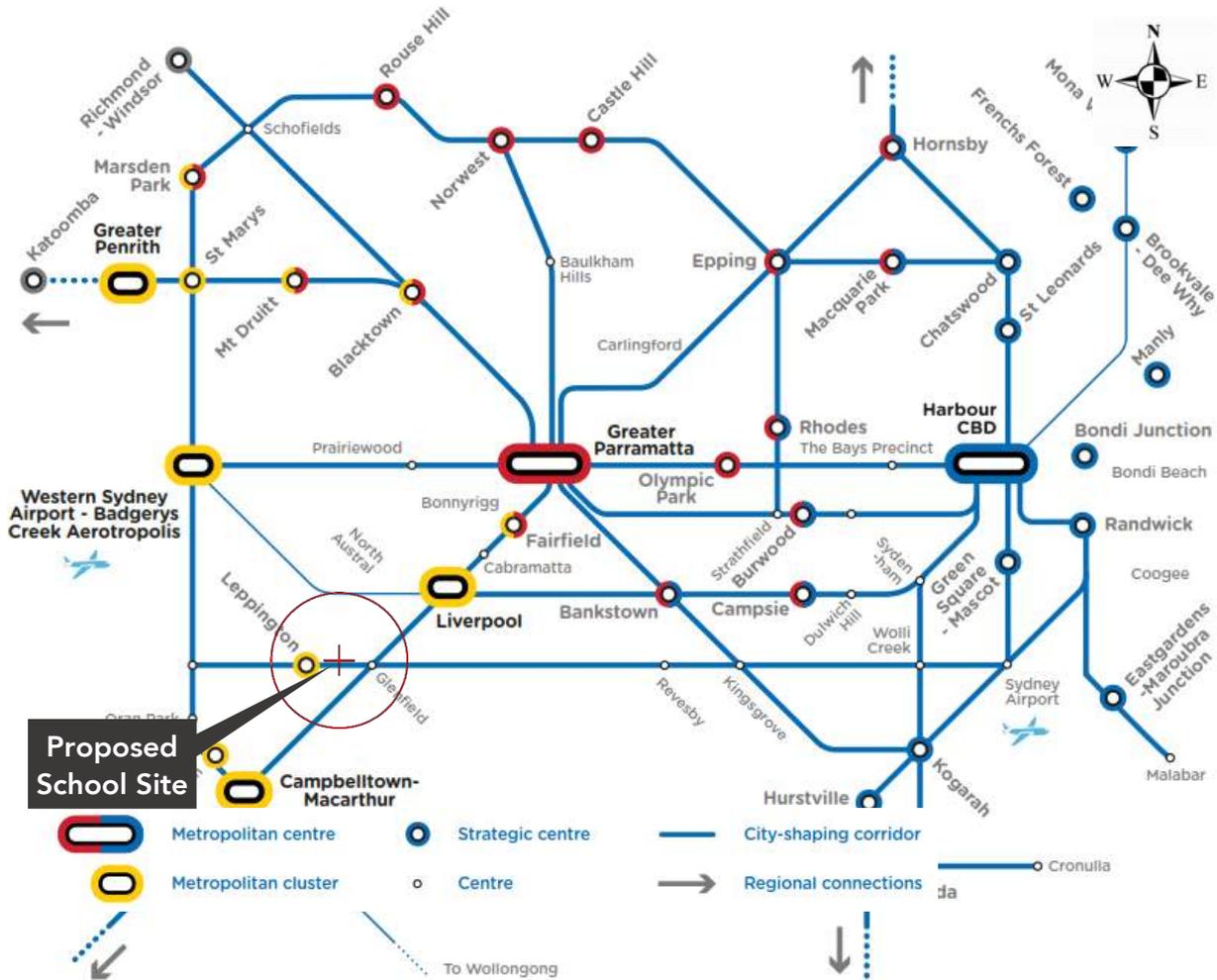


Figure 9 - Greater Sydney Mass transit / train network (visionary) (Source: Future Transport 2056 Strategy)

The Future Transport 2056 Strategy has the vision to construct a safe cycleway network within 10km of Greater Liverpool area. This document appears to address a broader vision and is aimed to provide connectivity on a larger scale. This plan, if implemented, may benefit teachers and staff who travel from Leppington or Liverpool.

An update to this strategy is not seen as needed, as the majority of students live in a localised area. However, a local connection to the parallel Liverpool – Campbelltown and Liverpool – Narellan routes would be beneficial for staff.

Growing Sydney’s visionary bicycle network is shown in Figure 10.

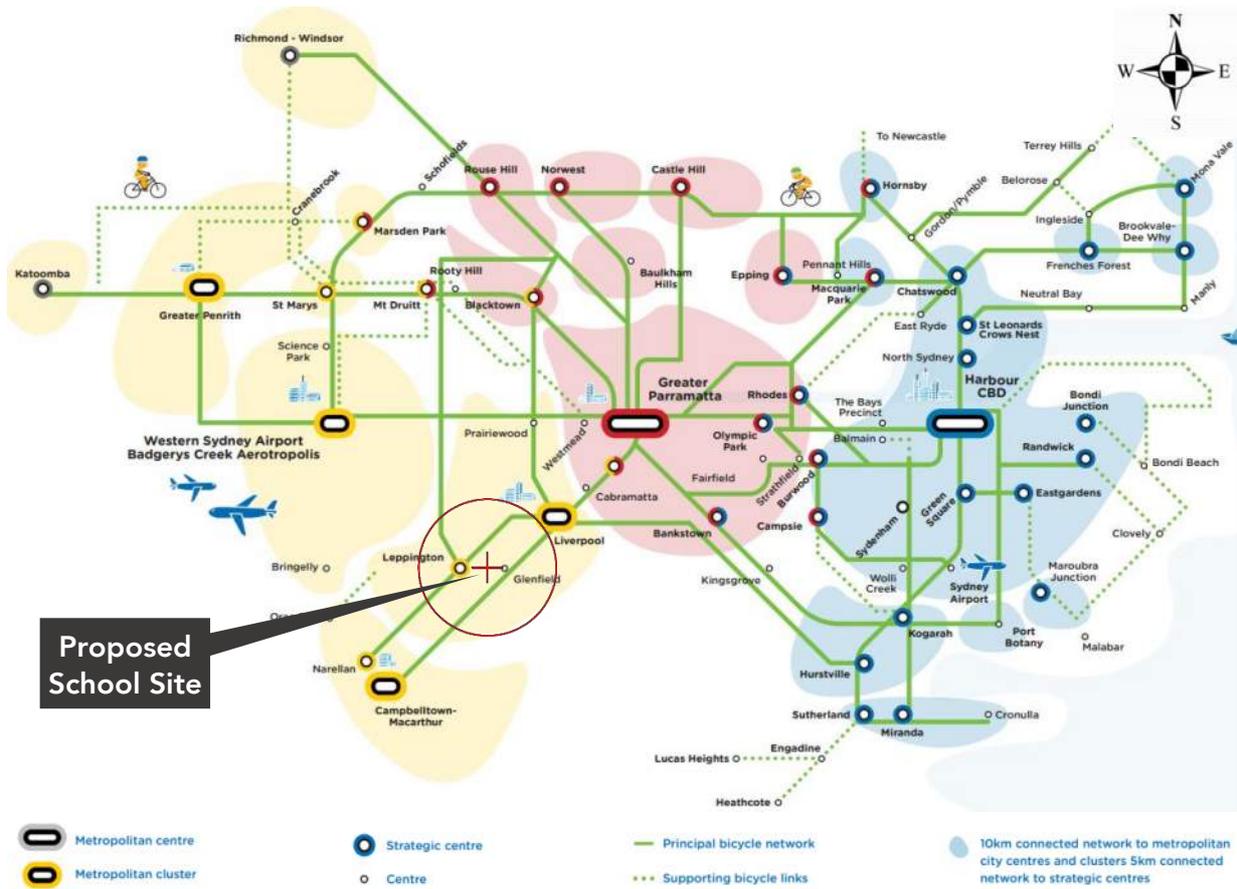


Figure 10 - Growing Sydney’s bicycle network (visionary) (Source: Future Transport 2056 Strategy P.119)

3.3.2 Future Western Sydney Corridor – NSW Government

A rail line is proposed between St Mary’s and Western Sydney Airport. The updates to transport line and tunnels will improve the north-south connectivity within the western suburbs.

The corridor project will not have a direct impact on the proposed school site, although it may serve potential teachers and staff who live west outside Edmondson Park.

An update to this strategy is not seen as required, as the majority of students live in a localised area.

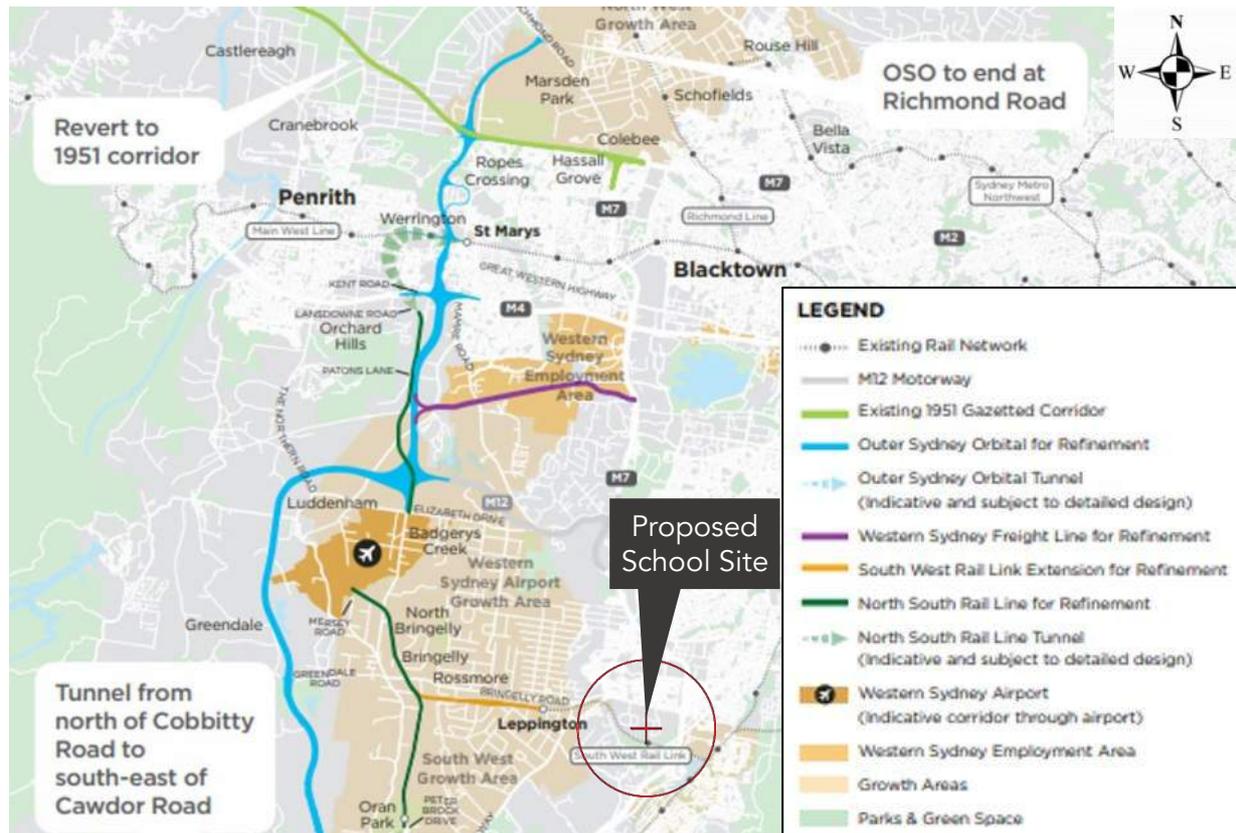


Figure 11 - Future Western Sydney Corridors Map (Source: NSW Government)

3.3.3 Greater Sydney Commission – Western City District Plan

This document states the following regarding improvement of walking and cycling:

*‘Walking is a fundamental part of the transport system and most journeys start and end with walking. Creating pleasant and safe environments for walking and cycling contribute to great places. Prioritising safe cycling for short trips to centres, transport interchanges and local services such as schools and health services will free capacity for people who need to travel further by road and public transport. Transport for NSW is establishing a bicycle network hierarchy in collaboration with councils. The Principal Bicycle Network will establish high quality, high-priority routes to facilitate safe and direct connections to centres. **This network will form the transport layer of the Greater Sydney Green Grid. Regional and local routes identified in local government bike plans, will connect to the Principal Bicycle Network to facilitate a seamless and connected network within urban areas.** Local streets will connect to these routes to provide door-to-door access for cycling. Secure bicycle parking and end-of-trip facilities should be provided in centres to support cycling throughout the District.’*

While this policy does not address the surroundings of the proposed site, it highlights the necessity to connect local areas to the greater bicycle network. This may benefit teachers and staff who live outside the Liverpool LGA.

An update to this strategy is not seen as required, as the majority of students live in a localised area.

3.4 Local Land Use Planning

3.4.1 LEP

The proposed school site is currently zoned R1 (General Residential), where the surrounds are predominantly R1 as well. The site is bound by a railway corridor to the south. South of this railway corridor is a large E1 (National Parks and Nature Reserves) zone. East of the site is a B4 (Mixed Use) and some RE1 (Public Recreation) zones.

A large RE1 (Public Recreation) zone is located to the west, with some E3 (Environmental Management) zones adjacent to them. A B6 (Enterprise Corridor) zone is located along Camden Valley Way.

This is presented in Figure 12.

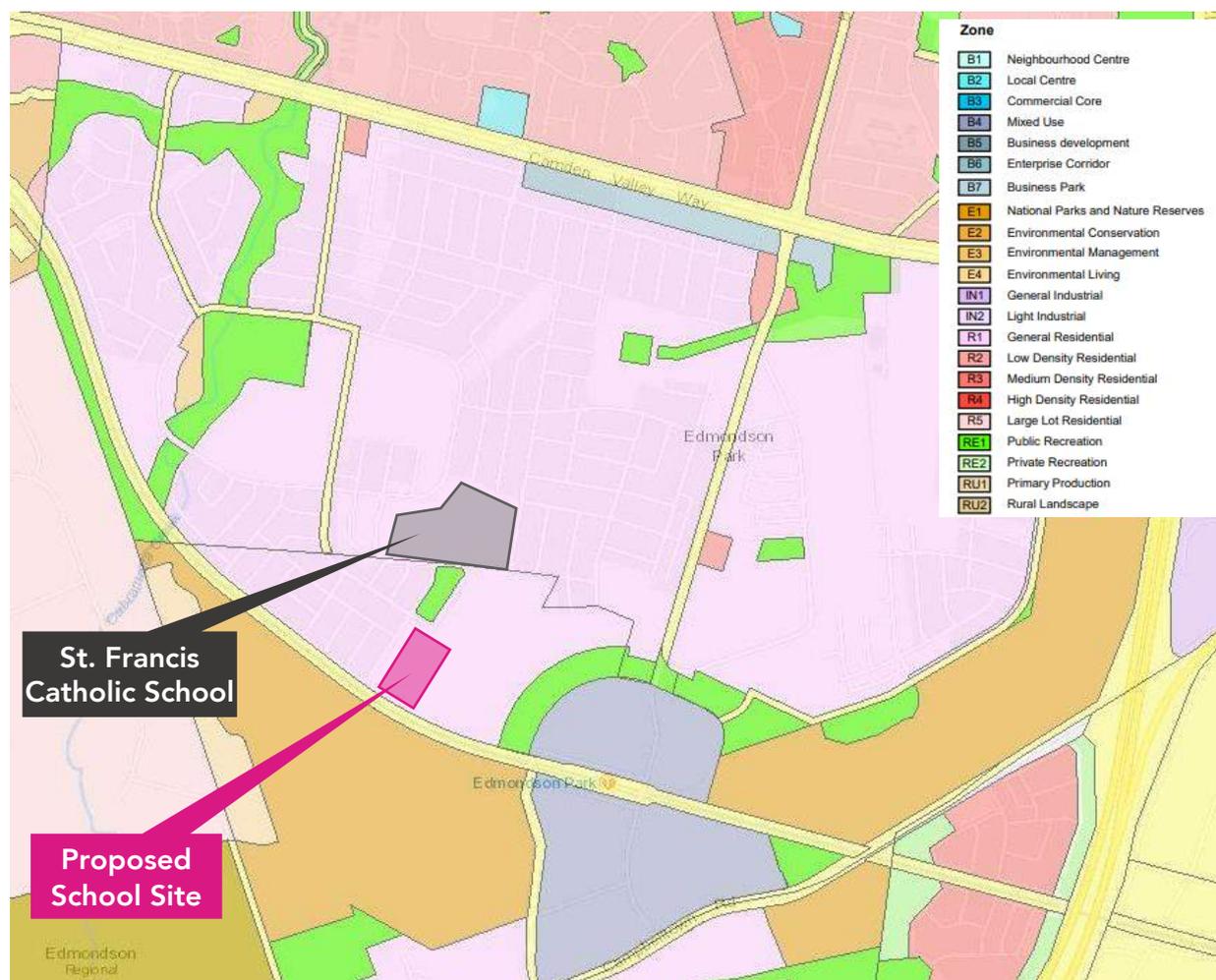


Figure 12 - Local Land Use Map (Source: NSW Planning Viewer)

While the proposed site lies within a residential zoning, it is allocated for an educational facility in Council's documents and the Landcom concept plan (MP10_0118).

It is noted that a catholic K-12 school (St Francis) is located just north of the proposed school. The site to the east is currently being investigated for a potential high school.

3.4.2 Development Control Plans

The Liverpool City Council separated the area around Edmondson Park into two documents – Edmondson Park and Edmondson Park South. The School is located in the southern part of the area, whereas the student enrolment catchment spans both regions of Edmondson Park. Therefore, both documents need to be read in conjunction to address planning requirements. The two plans relevant to the development site include:

- Liverpool Development Control Plan 2008 Part 2.11 – Land Subdivision and Development in Edmondson Park (Liverpool DCP)
- Edmondson Park South Development Control Plan 2012 (Edmondson Park South DCP)

3.4.2.1. Residential Distribution

The proposed school in Edmondson Park is a new school development which anticipates the enrolment of up to 1,012 students in the future. Currently, 346 students live within the school's enrolment catchment area as described in Section 2.4, but are enrolled in other schools. The school would potentially have an initial spare capacity of approximately 650 students.

The proposal also makes provision for a cold shell pre-school, intended to accommodate 40 students, the operation and fit-out of which will be the subject of a separate planning approval process. Further, the pre-school is not covered by the same enrolment catchment as the primary school. Therefore, pre-school students are not included in the mode share analysis.

Edmondson Park still consists of some greenfield areas which are currently being developed into new residential properties. It is assumed that the remainder of the students will be new residents of the upcoming properties.

In order to determine the future student distribution, the locations and density of the new residential developments have been analysed using the Liverpool and Edmondson Park South DCPs.

Figure 13 shows the combined land zonings for developments within the enrolment area from the two DCPs.

Near Maps imagery was used to compare completed developments and those which are yet to be constructed. Following this, using depersonalised student data, the initial 346 enrolments were identified to live in distinct areas. The 666 remainder of potential student enrolments were distributed based on the density of the anticipated developments within each land zone.

Figure 13 highlights the distribution of student enrolment, black numbers being existing enrolments at other schools and red being the overall proposed due to new developments.

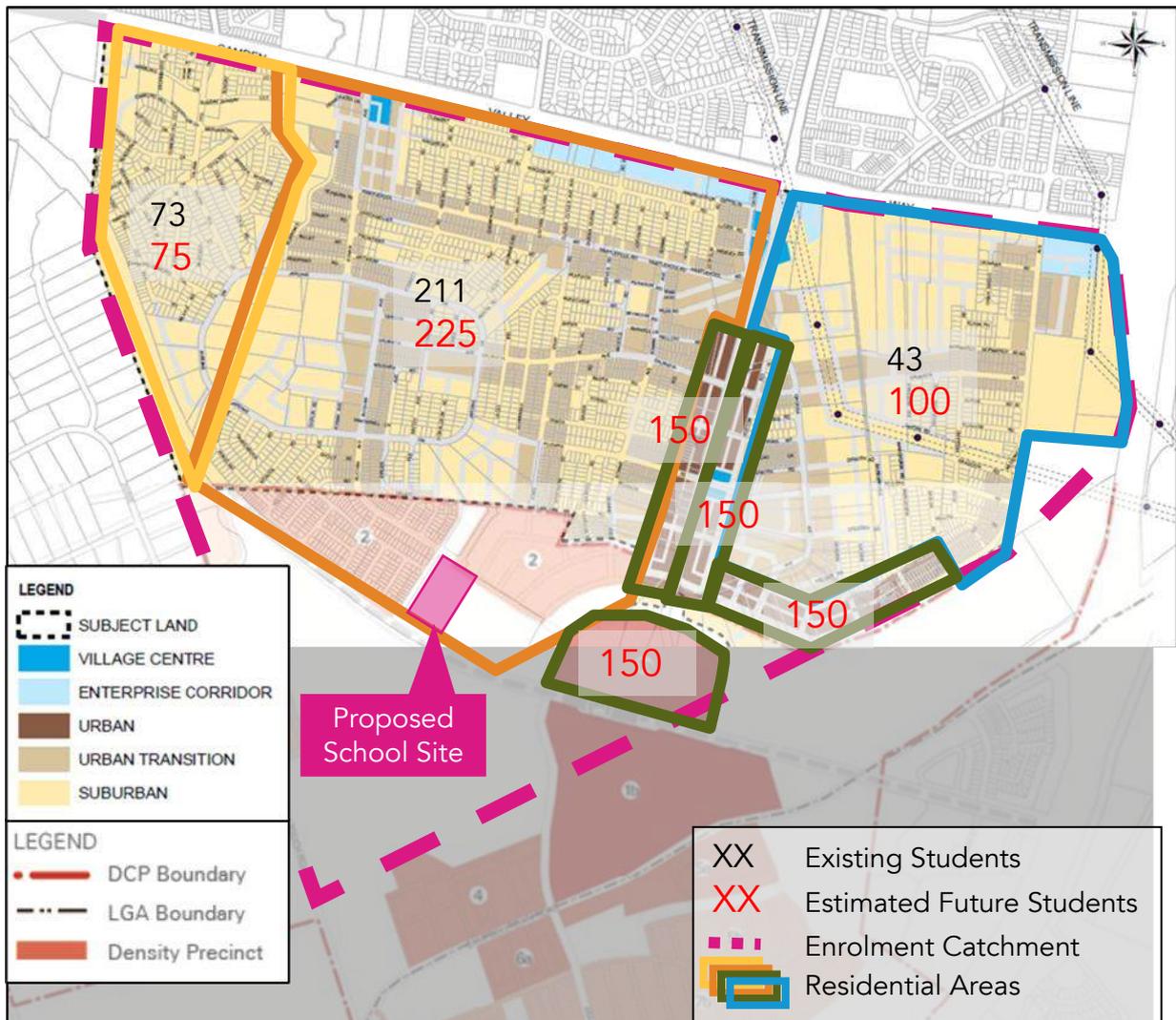


Figure 13 - Residential Areas (Source: Fig 5, Liverpool DCP and Fig 4, Edmondson Park South DCP)

3.4.2.2. Walking and Cycling

Figure 14 shows the bicycle network within Edmondson Park and Edmondson Park South proposed by Council.

The blue circle highlights missing bicycle connectivity along Vinny Road. This route was not part of the precinct’s planning according to the DCP; However, it would benefit students living to the north of the school. It is recommended that this be incorporated in Council’s local planning to provide better walking and cycling connectivity.

Rynan Avenue was planned and has been constructed to provide an on-street cycle path, which is not acceptable for primary school students. In addition, the orange circled area highlights a gap in connectivity around the corner. The yellow highlighted section has not been constructed yet. An investigation by Council is recommended if this link can be upgraded to an off-road facility in the future.

The orange highlighted section in Buchan Avenue was planned to provide a shared path, but only a footpath was constructed. This is a gap, as students potentially coming from west and north-west have a

less convenient school route. It should be ensured that the remaining section of Buchan Avenue is constructed with a shared path.

A positive upgrade of the planned infrastructure has been found in Bernera Road, where a shared path instead of an on-street bicycle path has been constructed (highlighted in green). This will benefit students living east of the school.

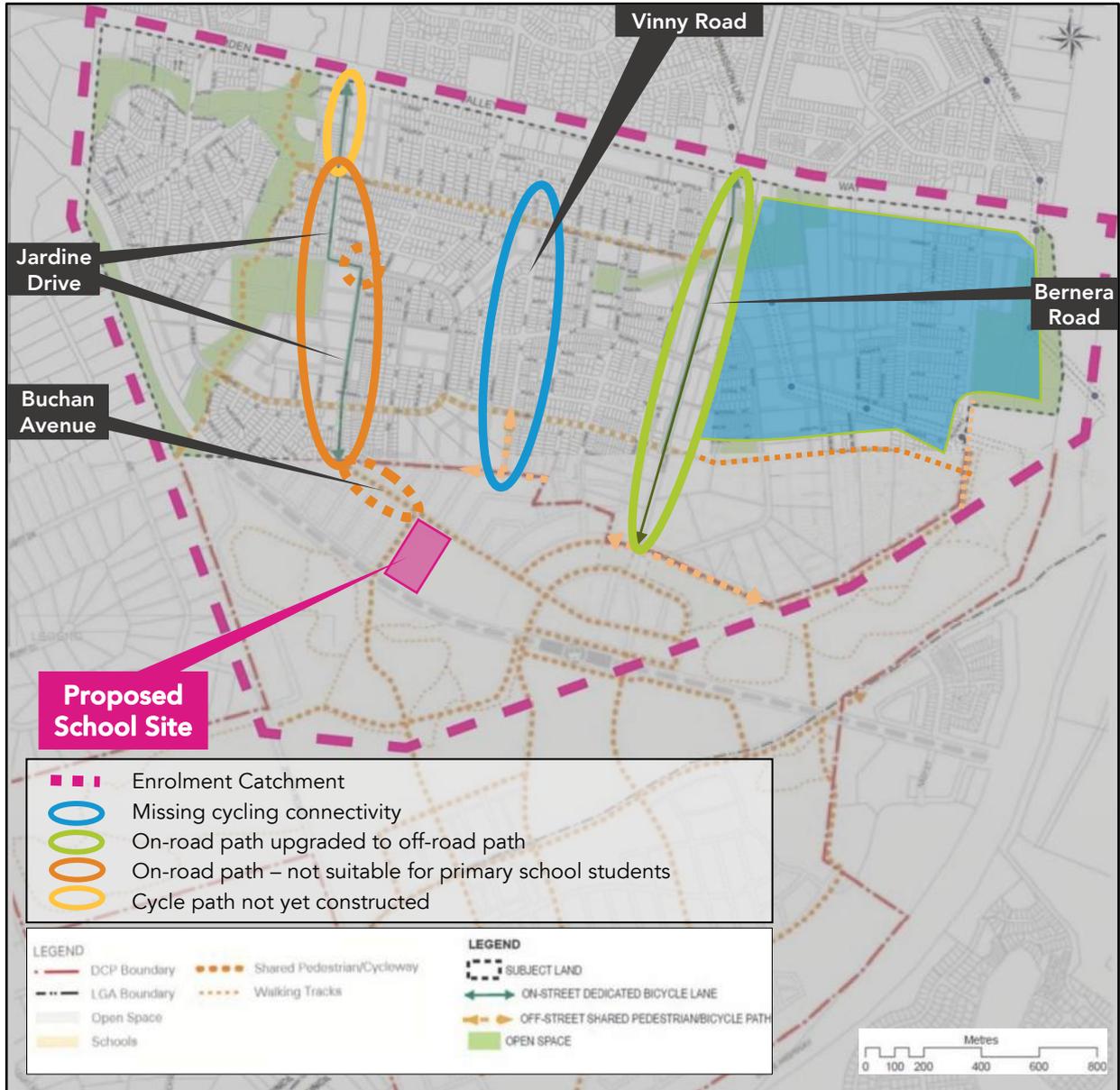


Figure 14 - Bicycle Network (Source: Liverpool DCP 2008, Part 2.11)

3.4.2.3. Bus Routes

Figure 15 shows the proposed bus route coverage within the enrolment catchment.

Buchan Avenue is planned to accommodate buses providing connectivity to the train station. This is convenient, as Buchan Avenue is a frontage road for the school and all buses from the northern area would pass the school.

Barnera Road is likely to be a major barrier for students living to the east; Therefore, the proposed bus route in the blue area will provide a much-needed connection to the school.

The DCP did not plan any bus connectivity in the area highlighted in yellow.

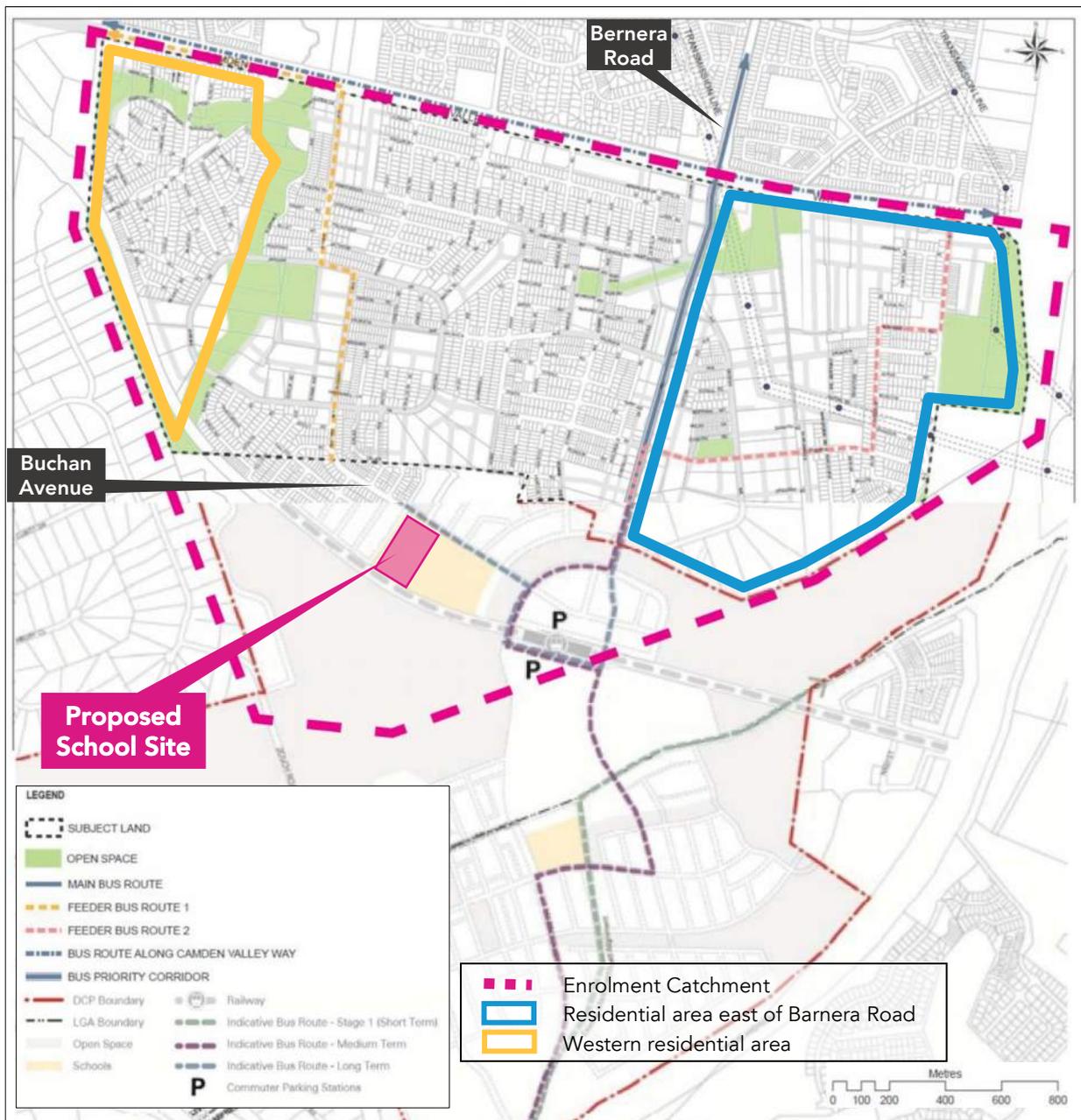


Figure 15 - Public Transport Use Map (Source: Liverpool DCP 2008, Part 2.11 and DCP 2012)

3.4.2.4. Road Hierarchy

The road hierarchy for the proposed School frontage roads is presented in Figure 16.

As shown in Figure 16, Buchan Avenue as a typical collector road should provide a 2.5m wide shared path on one side and 1.2m wide footpath on the other side of the carriageway. Faulkner Way as a typical urban street should provide 1.2m wide footpaths on both sides of the carriageway.

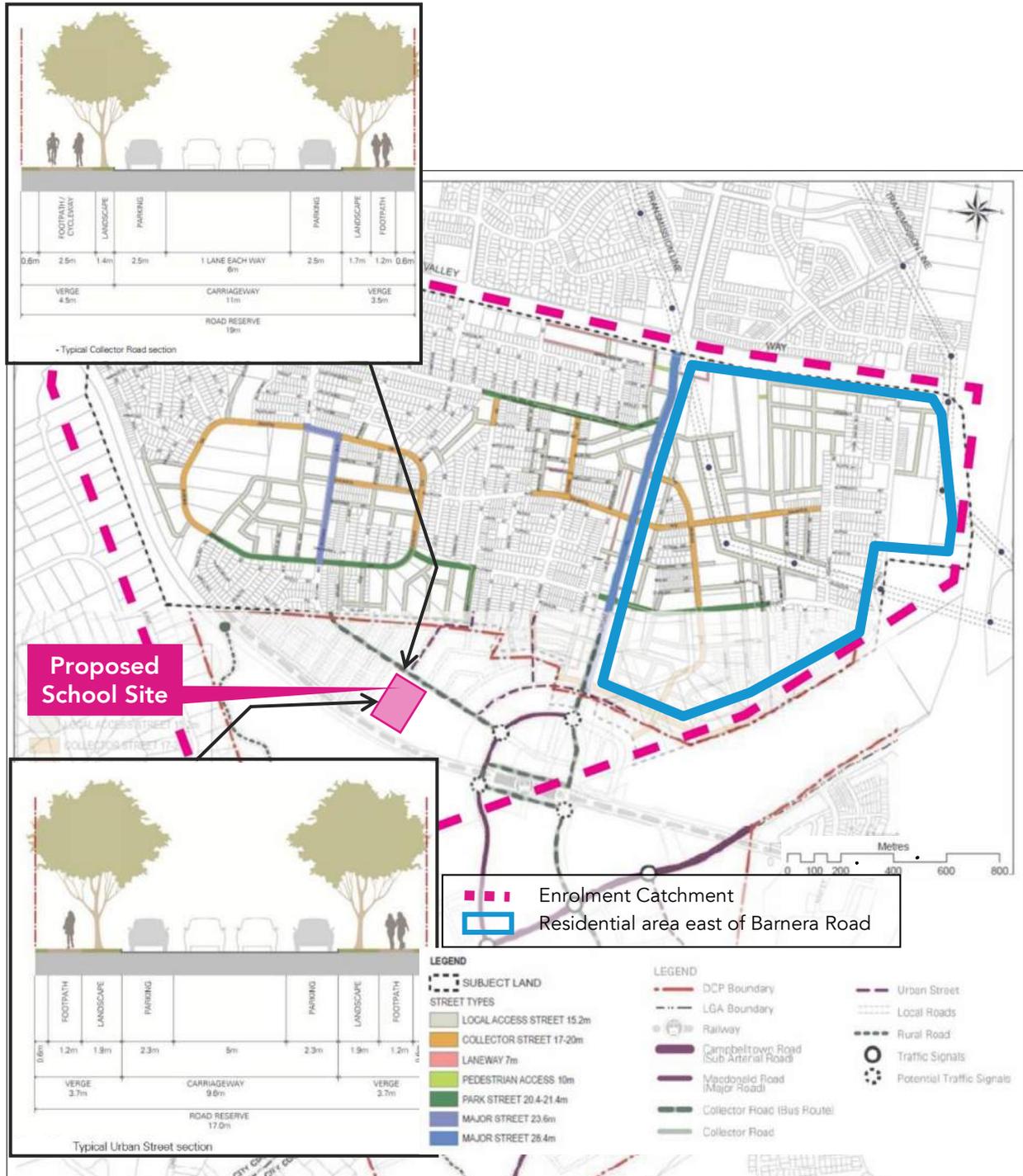


Figure 16 - Road Hierarchy (Source: Liverpool DCP 2008, Part 2.11 and DCP 2012)

Buchan Avenue as a collector road and a bus corridor requires appropriate pedestrian crossings for students to reach the school safely.

The area highlighted in blue in Figure 16 is separated from the school by Bernera Road, which is classified as a major road. Students living within this area would need to cross this road, therefore a safe pedestrian crossing facility prioritising students during school peak periods is required. It is understood that this is currently under investigation by other stakeholders.

Figure 17 shows intersection treatments along Bernera Road, with purple dots representing signalised intersections. It is noted that the pink and green highlighted intersections have not been upgraded yet. The northern intersection is currently a priority controlled three-arm intersection. The intersection further south (future Buchan Avenue / Soldiers Parade) has not been constructed yet, but will be operational upon commencement of the school and will initially allow left-in / left-out movements only.

Upon consultation with Council, it is understood that one of these two intersections will eventually be signalised by other stakeholders. However, a decision on which one has not yet been made.

The preferred intersection is the one circled in pink, as most of the students using it would travel from the north and this intersection provides a shorter route.

The traffic lights will need to incorporate a pedestrian crossing on each approach and ideally provide a longer pedestrian phase time during school peak periods.

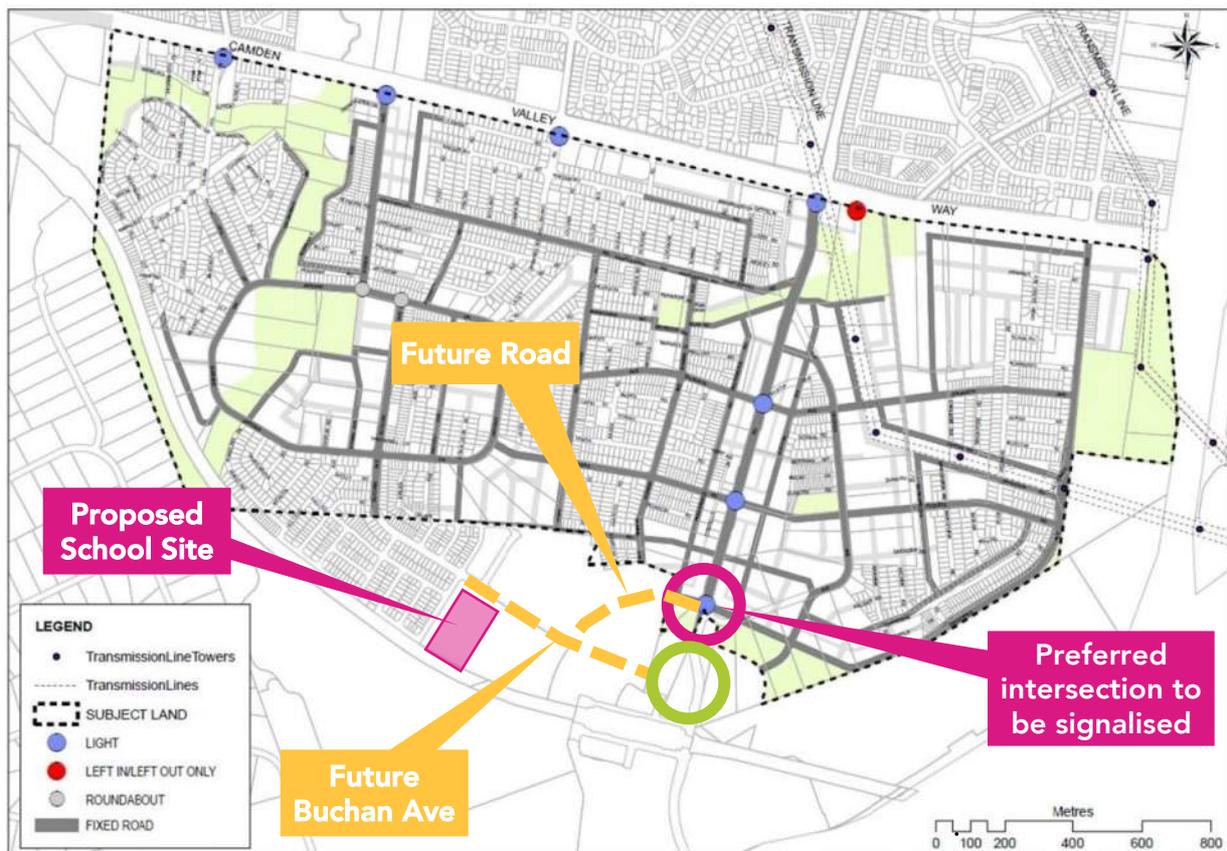


Figure 17 - Fixed Roads, North Zone Edmondson Park (Source: Liverpool DCP 2008, Part 2.11)

3.4.3 Open Space Plans

Open space areas are provided for recreational facilities and are presented in Figure 18.

As marked by the orange line, future pedestrian path with an overpass over the railway corridor is proposed to connect the School and parklands.

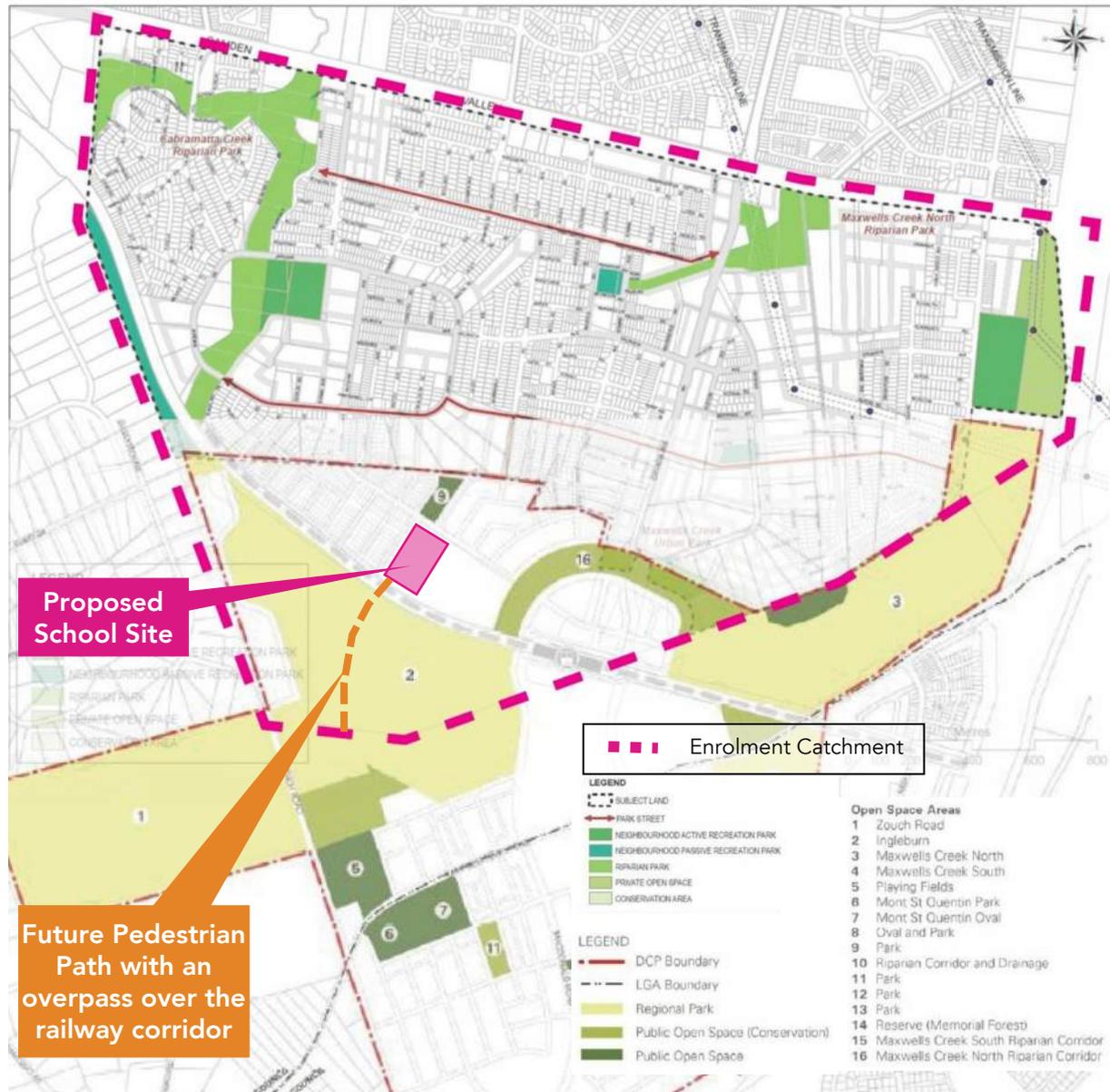


Figure 18 - Open Space Plans (Source: Liverpool DCP 2008, Part 2.11 and Edmondson Park South DCP 2012)

3.5 Programs

3.5.1 Subsidised School Transport Scheme and School Term Bus Pass

Figure 19 presents the enrolment catchment and the SSTS exclusion zone. Almost the entire school enrolment catchment lies within the SSTS zone, meaning that almost no students are eligible for the free or subsidised school travel pass.

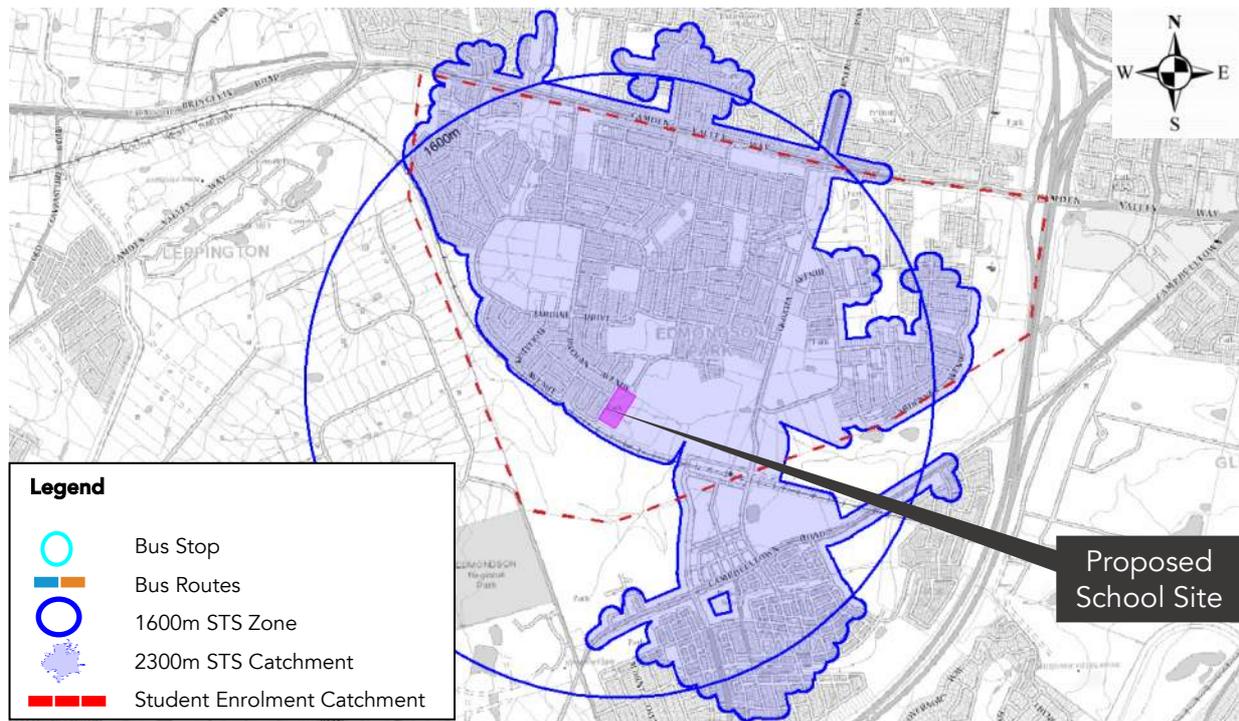


Figure 19 - SSTS Exclusion Zone

3.6 Existing Nearby Public Schools

Existing primary schools near the proposed new School are shown in Figure 20. The green lines show the existing primary schools' enrolment catchments and the pink dotted line represents the proposed new School's catchment.

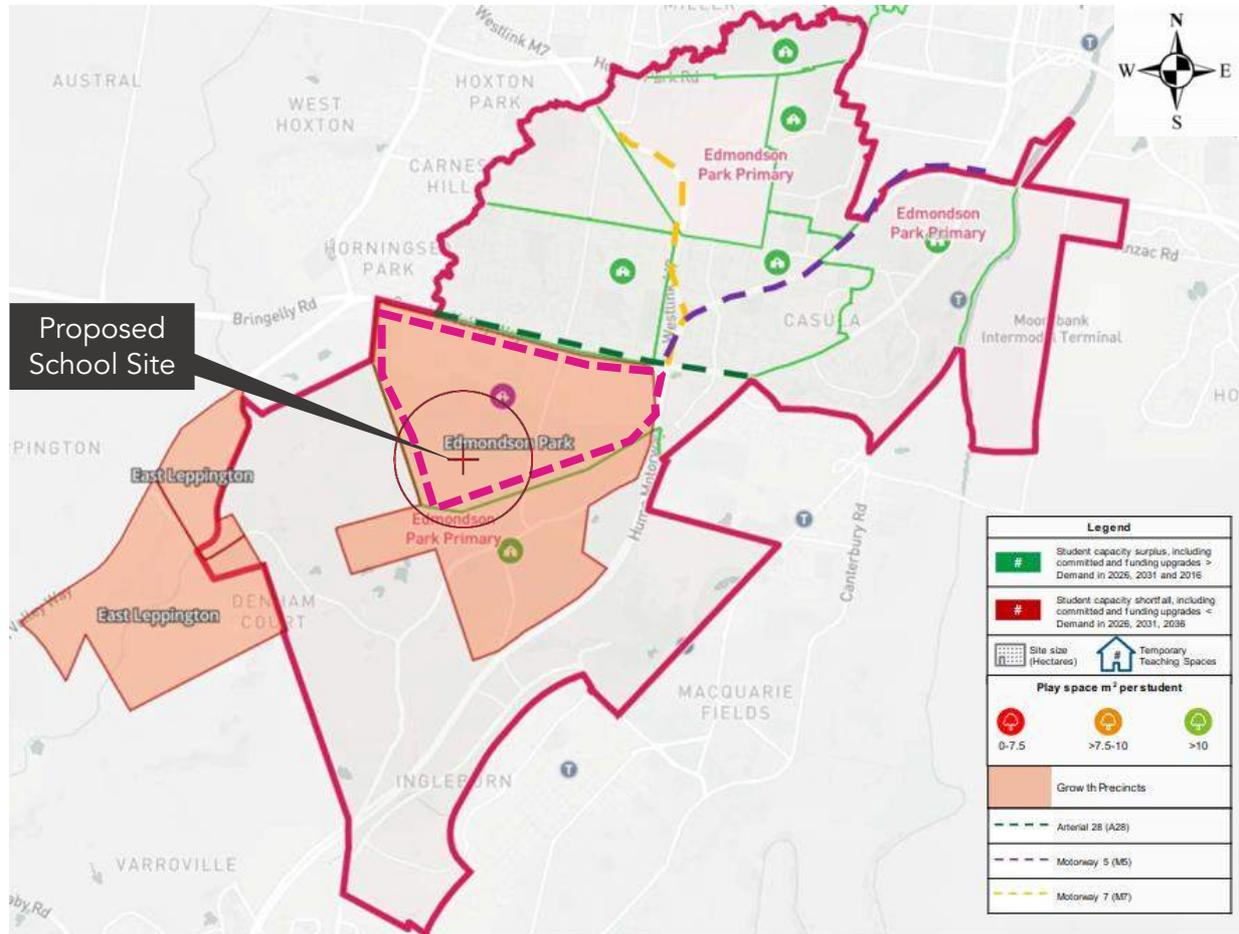


Figure 20 - Nearby Schools (Source: NSW Department of Education)

4. Transport Networks and Operations

4.1 School Access

The school has a frontage to Buchan Avenue to the north and Faulkner Way to the west. Another frontage road to the south will be constructed by Landcom prior to commencement of the school.

There are 3 pedestrian gates, two off Faulkner Way in the west and one, the main entry, off Buchan Avenue in the north.

Car park access is in the southwest of the site off Faulkner Way, combined with service / waste collection vehicle driveway. A second waste collection access will be provided off the future South Road.

Bus stops A, which is currently under construction, is located on the southern side of Buchan Avenue and bus stop B is proposed to be on the northern side of Buchan Avenue.

A map showing the access points, car parks, pick-up / drop-off areas and the bus stop locations is illustrated in Figure 21.

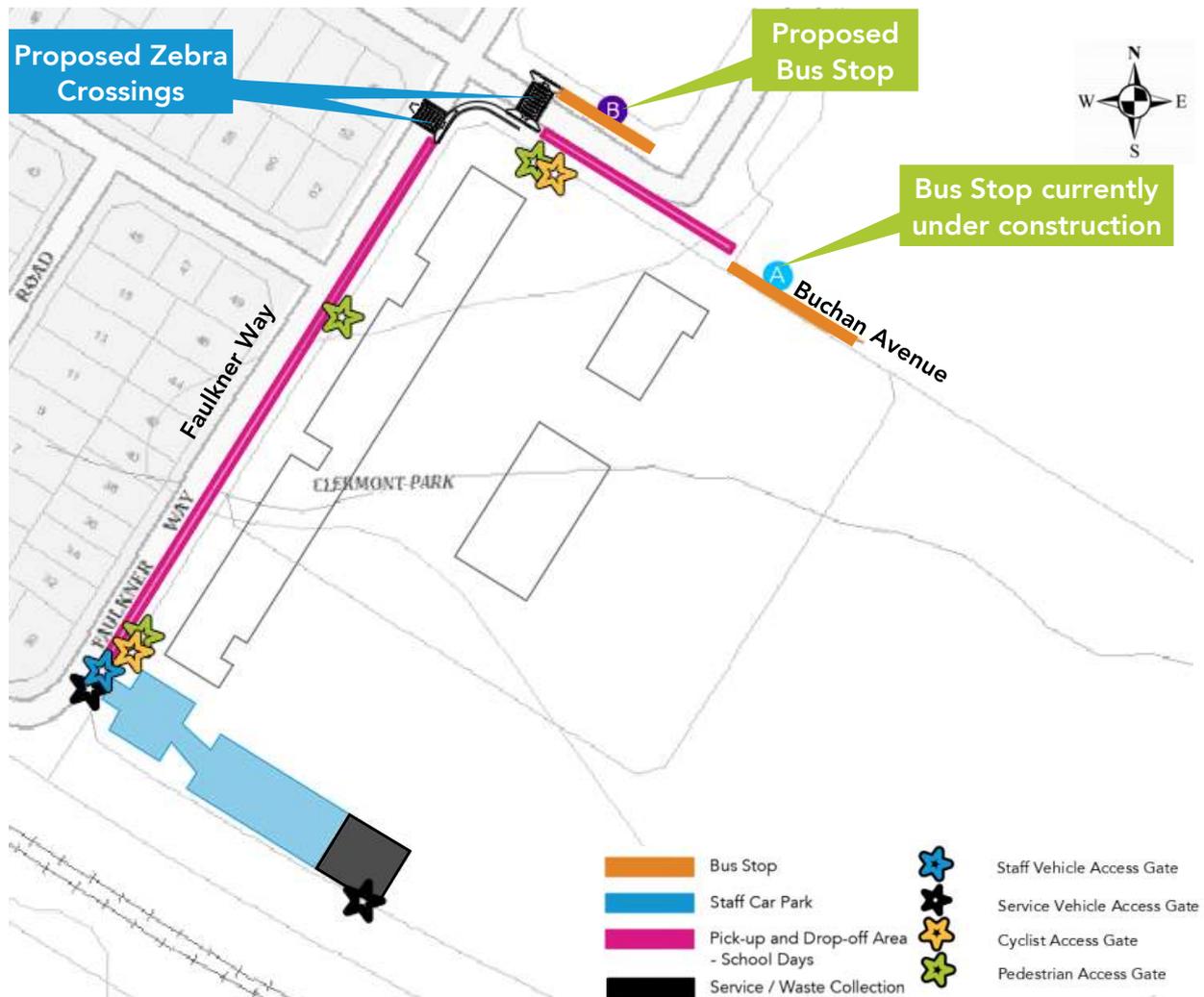


Figure 21 - School Access Plan

4.2 Active Transport

The locality was reviewed for features that would attract active transport trips (walking and cycling), with reference to the NSW Guidelines for Walking and Cycling (2004). The NSW Guidelines to Walking & Cycling (2004) suggests that 400-800m is a comfortable walking distance when considering the distance to public transport, which equals a 5-10 minute walk. A 15 minute walk, or 1.2km distance is seen as acceptable if walking is the only mode of transport.

The comfortable cycling distance is defined by the Guide to be between 800m-1.5km, which equals a 5-10 minute cycle. Distances of up to 2.4km and 3.6km are seen as acceptable if cycling is the only mode of transport for primary and secondary school students, respectively.

The following sections describe the existing pedestrian and cycling infrastructure within the proposed school enrolment catchment. Based on these findings, a gap analysis has been undertaken and ways to improve walkability and cyclability are suggested.

4.2.1 Walking

Walking is a viable transport option for distances at around one kilometre (approximately 15min walk) and is often quicker for short trips door to door. Walking is also the most space efficient mode of transport for short trips and presents the highest benefits. Co-benefits where walking replaces a motorised trip include improved health for the individual, reduced congestion on the road network and reduced noise and emission pollution.

Figure 22 shows the “as crow flies” and the actual 400m, 800m and 1200m walking catchments from the proposed school. Approximately 40% of the enrolment catchment lies within walking distance.



Figure 22 - 400m, 800m and 1200m Walking Catchment

Considering that Edmondson Park has recently undergone major development, pedestrian network in the locality of the proposed school site provides a reasonable level of amenities. Most of the roads within the School catchment have footpaths on both sides of the carriageway.

Pram ramps are generally provided at each end of a footpath; however, there is a lack of formalised crossings within the enrolment catchment of the school, making walking and cycling inconvenient and less safe.

A gap analysis of pedestrian infrastructure is provided in Section 4.2.3.

4.2.2 Cycling

Two sources have been analysed regarding cycling infrastructure, the Open Data website and Council's DCP.

Based on the Open Data website a limited amount of cycling infrastructure is provided within the enrolment catchment of the proposed school, and some on-road cycling paths and shared paths are provided along the northern boundary of the School catchment (refer to Figure 23). The data does not provide any information on any proposed future bicycle paths in the area.

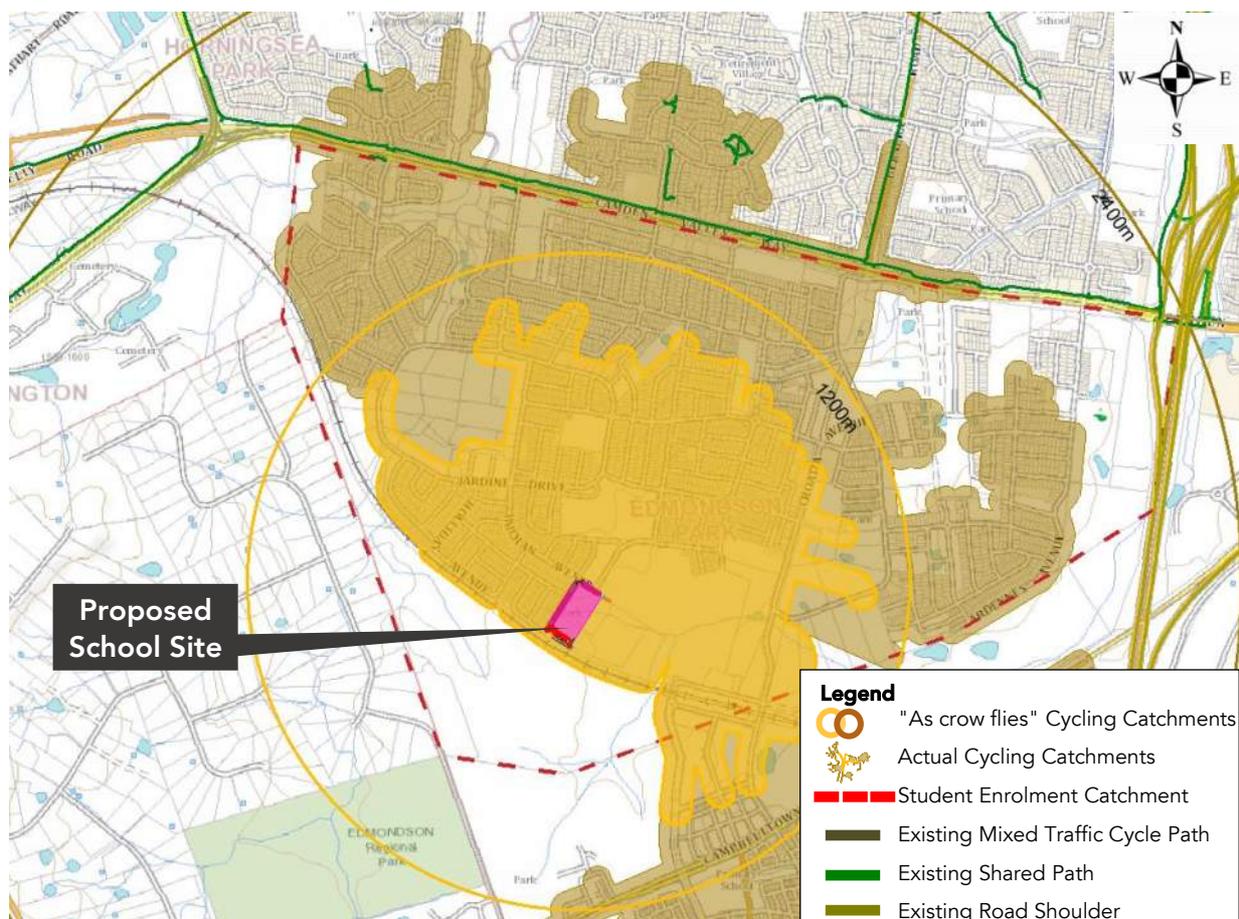


Figure 23 - Existing Cycling Infrastructure

An analysis of the DCP has been undertaken in Section 3.4.2.2, and compared with NearMap imagery most of the areas already constructed provide cycling infrastructure according to the DCP. Only a section on the western end of Buchan Avenue was constructed as a footpath rather than a shared path, which can potentially reduce the convenience of students wanting to cycle to school from the western side.

It is noted that children up to the age of 15 are legally allowed to cycle on footpaths. Nevertheless, an investigation into upgrading some of the footpaths into shared paths would not only benefit the proposed school, but also other schools in the area and the community in general.

A gap analysis of the existing cycling infrastructure is described in Section 4.2.3, and an analysis of the future infrastructure is presented in Section 4.2.4.

4.2.3 Walking and Cycling Gap Analysis

Based on the analysis of the DCPs and the existing infrastructure, a number of gaps within the walking and cycling infrastructure has been identified, as presented in Figure 24. Enrolment wide improvements to the infrastructure have been suggested, which would benefit the prospective students.

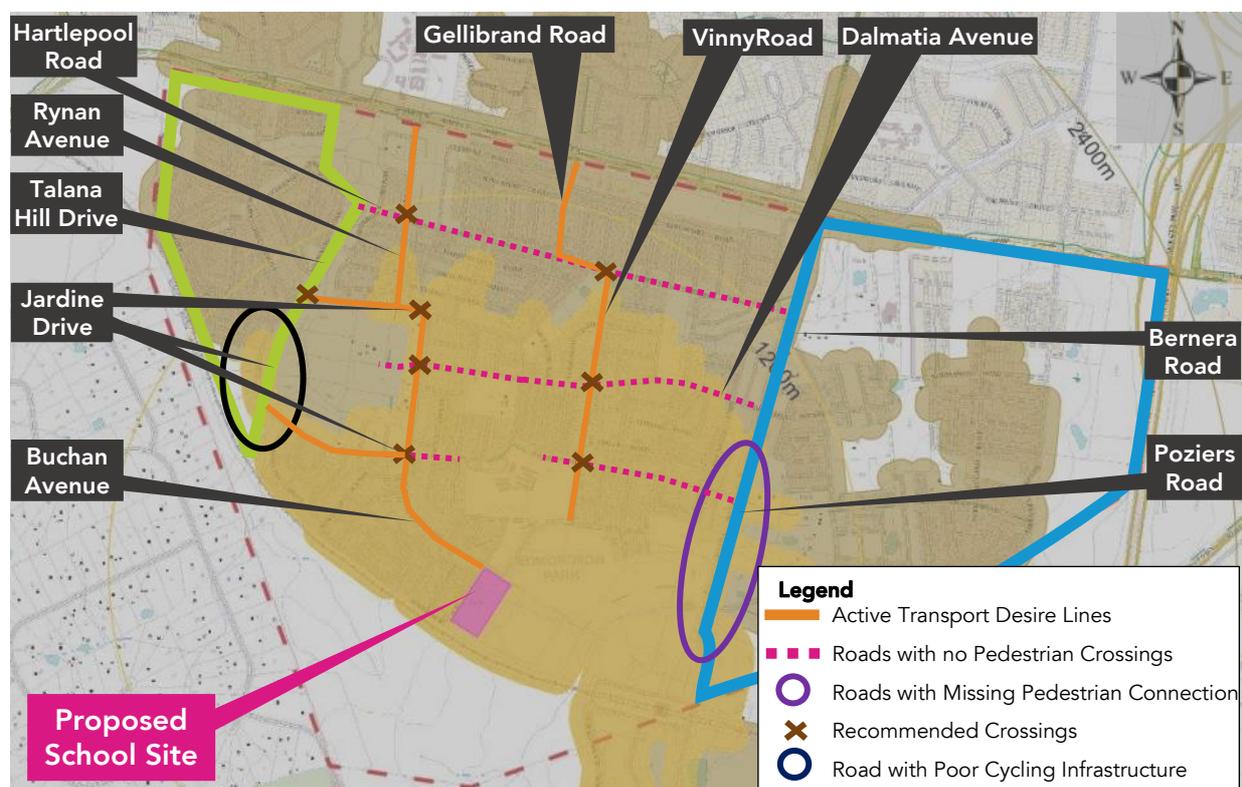


Figure 24 - Walking and Cycling Route and Crossing Network Gaps

Due to the Edmondson Park precinct still undergoing development, there is a lack of safe pedestrian crossings across the southern section of Bernera Road / Soldiers Parade, which makes the area east of Bernera Road as highlighted in blue unsuitable for walking and cycling. Some students may choose to cycle if a safe bicycle connectivity is provided all the way to the school.

As shown in Figure 24 in orange lines, Ryman Avenue / Buchan Avenue and Gellibrand Road / Vinny Road are the desire lines for students walking or cycling from the north, and Jardine Drive is the desire line for students travelling from the west. Pink dotted lines represent road sections along Hartlepool Road, Dalmatia Avenue, Poziers Road and Jardine Drive with no formal pedestrian crossings. Ideally, pedestrian crossings

would be provided at the crossing points between the north-south desire lines and the east-west aligned road at the following intersections, and as marked in Figure 24:

- Ryman Avenue / Hartlepool Road
- Vinny Road / Hartlepool Road
- Jardine Drive / Buchan Avenue
- Vinny Road / Dalmatia Avenue
- Buchan Avenue / Dalmatia Avenue
- Vinny Road / Poziers Road
- Buchan Avenue / Jardine Drive
- Talana Hill Drive / Jardine Drive

Ideally, all crossings would be constructed as raised zebra crossings; however, an analysis of warrants and swept paths would be required to determine the viability of these measures.

The area marked by a black circle in Figure 24 highlights a road section that would be an ideal connection for students living in the western area (highlighted in green in Figure 24); However, it is currently unsuitable to use by primary school students. As shown in Figure 25, there is no formalised pedestrian and cycling infrastructure, the road is only approximately 7m wide, which is too narrow to accommodate 2-lane traffic with bicycle and pedestrian movements, and there appears to be no lighting.

It is understood that this area is subject to flooding and further investigation is underway.



Figure 25 - Jardine Drive view, Diamond Hill Cct towards Wakeling Drive

4.2.4 Future Cycling Infrastructure

Liverpool Development Control Plan 2008, Part 2.11. and *Edmondson Park South, Development Control Plan 2012* indicates that shared paths would be provided within the vicinity of the school, as shown in Figure 26.

Some roads within the vicinity of the site are still under construction. It is important to ensure that shared paths are provided along Buchan Avenue and the future road connecting Buchan Avenue and Bernera Road (as shown in yellow dotted lines in Figure 26). As direct links to the school, these facilities will provide walking and cycling connectivity for students coming from the east and west.

Appropriate crossing opportunities will have to be provided across Bernera Road and Buchan Avenue as highlighted by circles in Figure 26. Ideally, the crossing on Bernera Road (blue circle) would be signalised and provide a pedestrian friendly phase time (longer pedestrian phase time) during school peak periods.

The crossing across Buchan Avenue (pink circle) would ideally be either a raised zebra crossing or a signalised crossing.

As marked in orange dotted line, future shared path with an overpass over the railway corridor is proposed to connect the School and parklands.

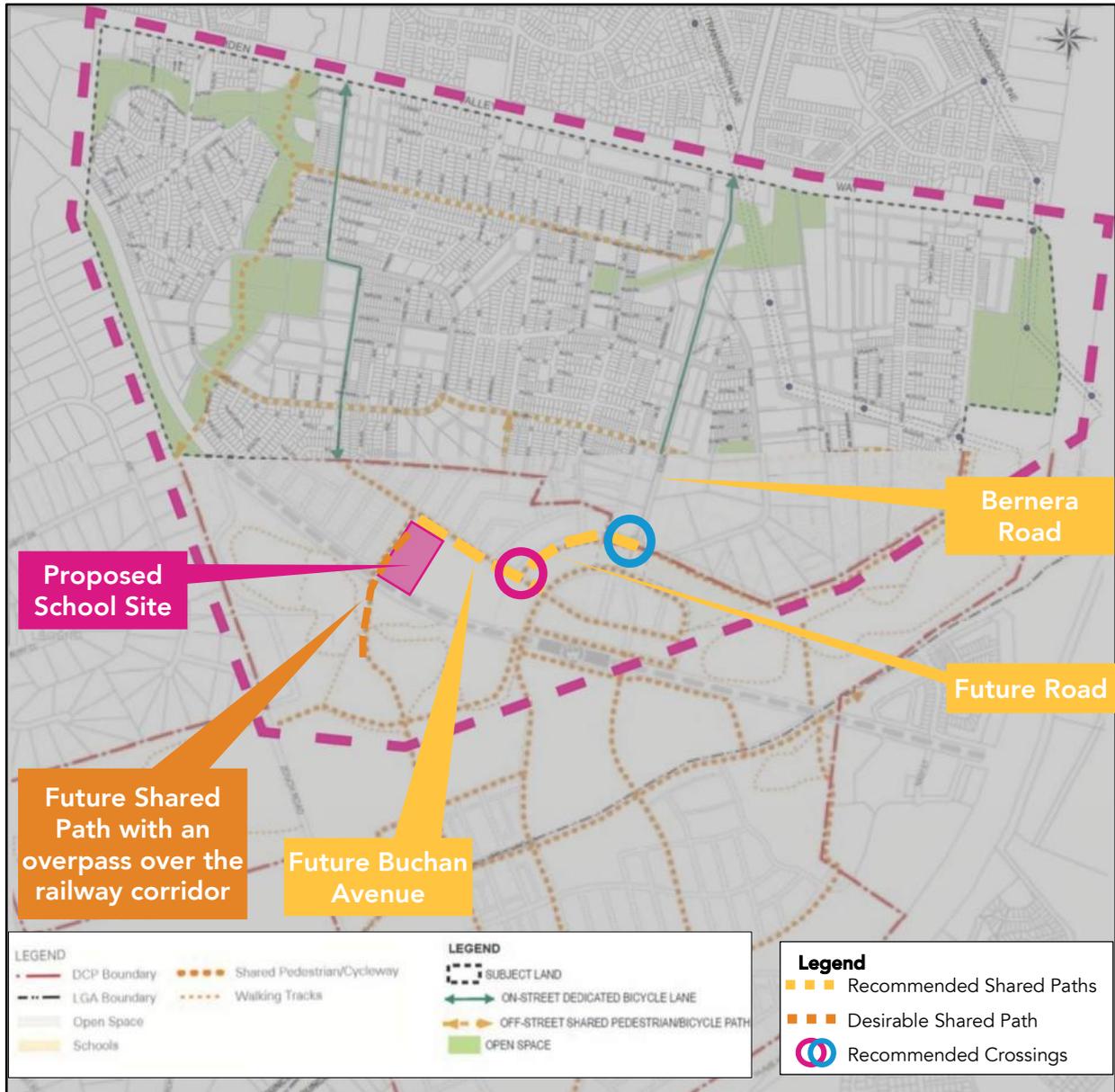


Figure 26 - Recommended Pedestrian and Cycle Connectivity (Source: Liverpool DCP 2008, Part 2.11 and DCP 2012)

4.3 Public Transport

The locality of the site has been assessed in the context of available forms of public transport that may be utilised by prospective staff and students. When defining accessibility, the *NSW Planning Guidelines for Walking & Cycling (2004)* suggests that 400m-800m is a comfortable walking distance to access public transport and local amenities.

4.3.1 Eligibility and Potential Usage

Figure 27 illustrates the SSTS exclusion catchment from the proposed School site, which covers almost the entire enrolment catchment. This means that only 4% of the prospective School students living towards the north-east are eligible for a free or discounted student travel pass.

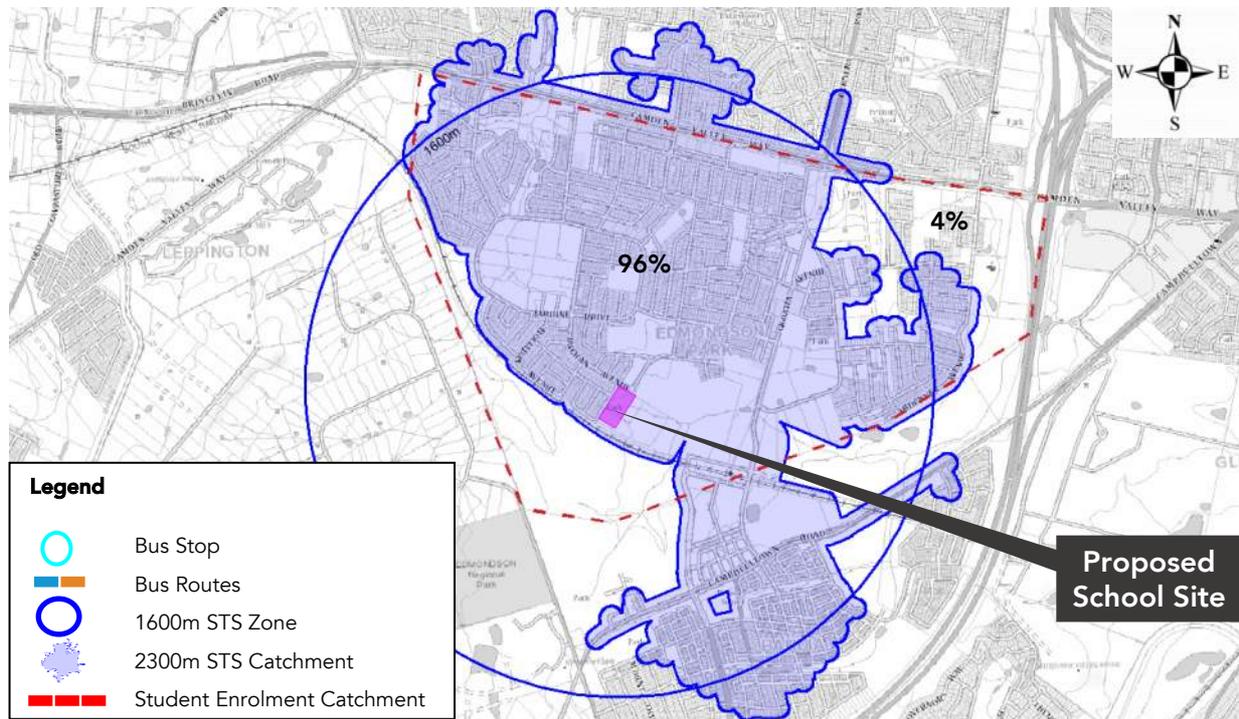


Figure 27 - SSTS Exclusion Zone

Figure 28 presents the SSTS zone and major barriers.

The area highlighted in orange in Figure 28 represents 17% of students who are more likely to be reliant on either public or private transport. This is because the areas lack proper connectivity across Bernara Road and Soldiers Parade on the east and Cabramatta Creek on the west are not ideal from a student safety perspective (refer to the pink line in Figure 28).

For this reason, convenient public transport connectivity would be beneficial for these students.

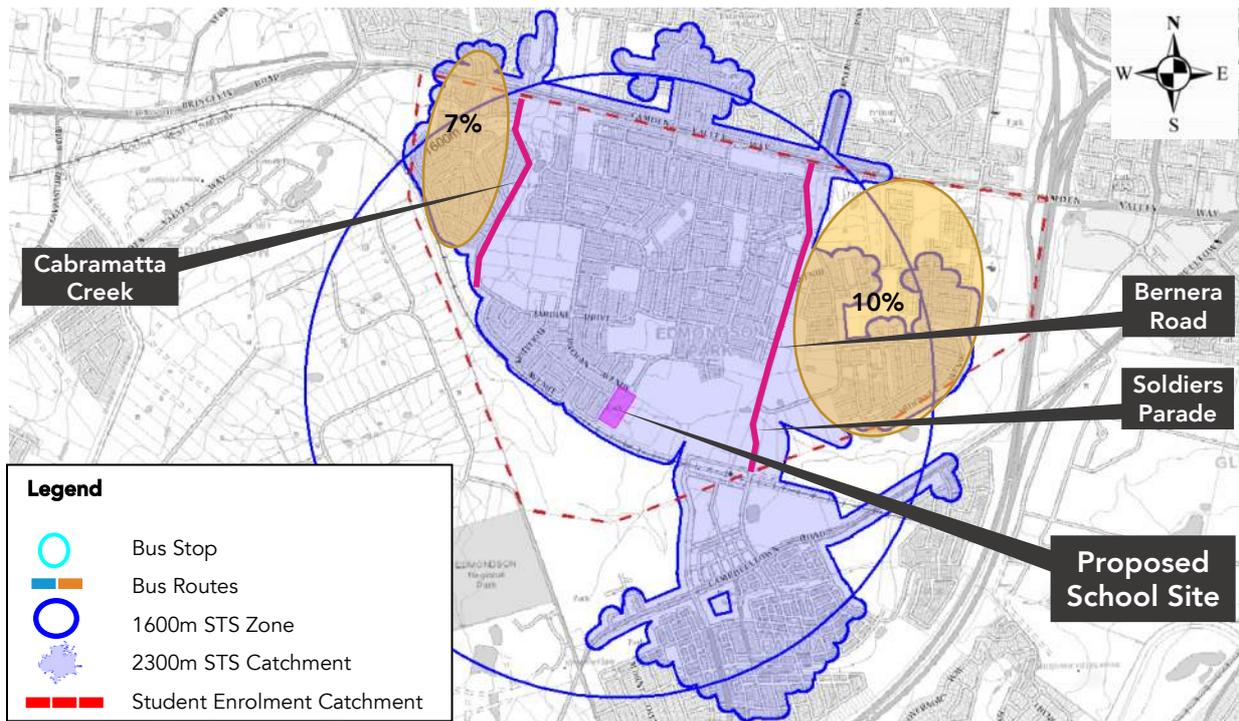


Figure 28 - SSTS Exclusion Zone and Barriers

4.3.2 Bus Network for Students

The locality of the site has been assessed in the context of available forms of public transport that may be utilised by prospective staff and students. When defining accessibility, the *NSW Planning Guidelines for Walking & Cycling (2004)* suggests that 400m-800m is a comfortable walking distance to access public transport and local amenities.

Public transport services within the enrolment catchment are shown in Figure 29.

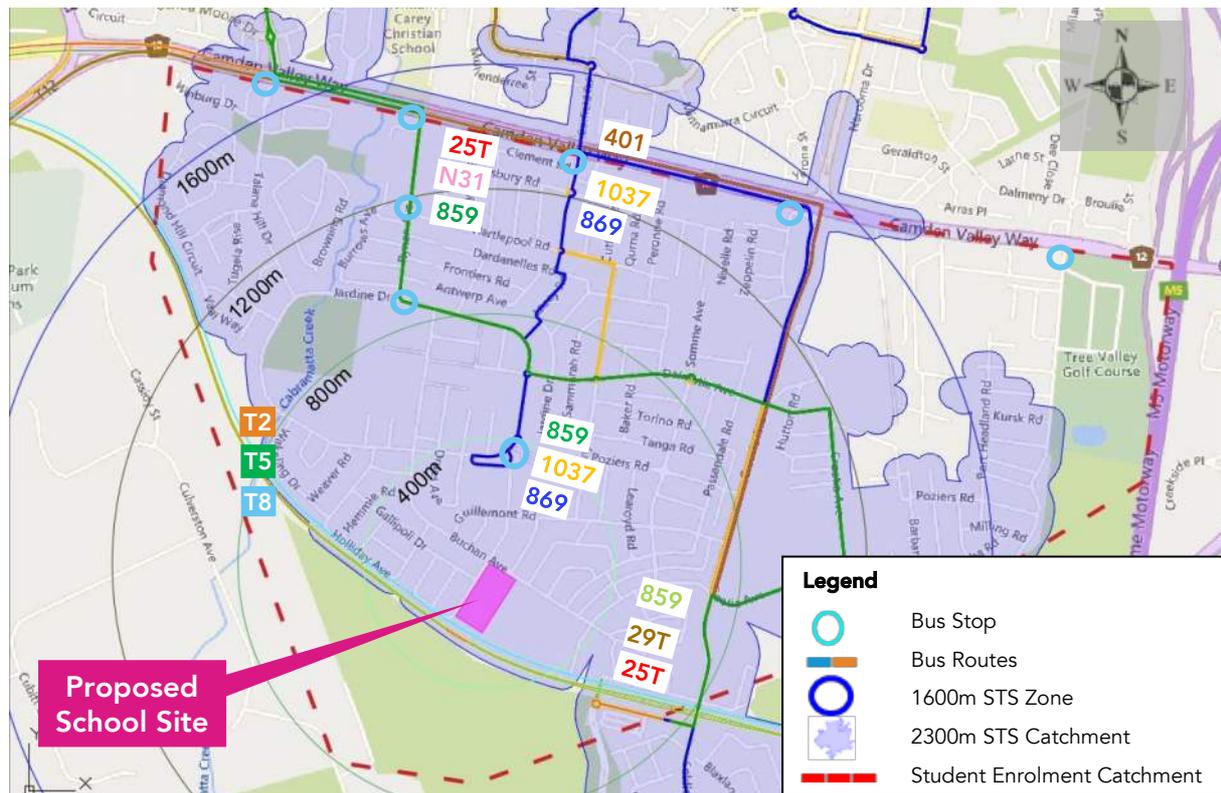


Figure 29 - Public Transport within Enrolment Catchment

It is noted that those areas needing public transport the most, as discussed in 4.3.1, are currently not serviced by any buses. It would therefore be required to change or provide additional services. Proposed and ideal changes are discussed below and shown in Figure 30.

Extend the current bus route from St. Francis Catholic School to continue on and pass the School. This is in accordance with the DCP.

However, the following needs to be considered:

- Buchan Avenue needs to be constructed prior to implementing the bus routes (which is planned to be completed by the end of August 2021).
- Either of the following needs to be provided in order to enable access to Soldiers Parade:
 - The green circled road segment in Figure 30, including signalised intersection treatment, or
 - The Buchan Avenue / Soldiers Parade intersection (circled in orange in Figure 30) needs to allow right turn movements.

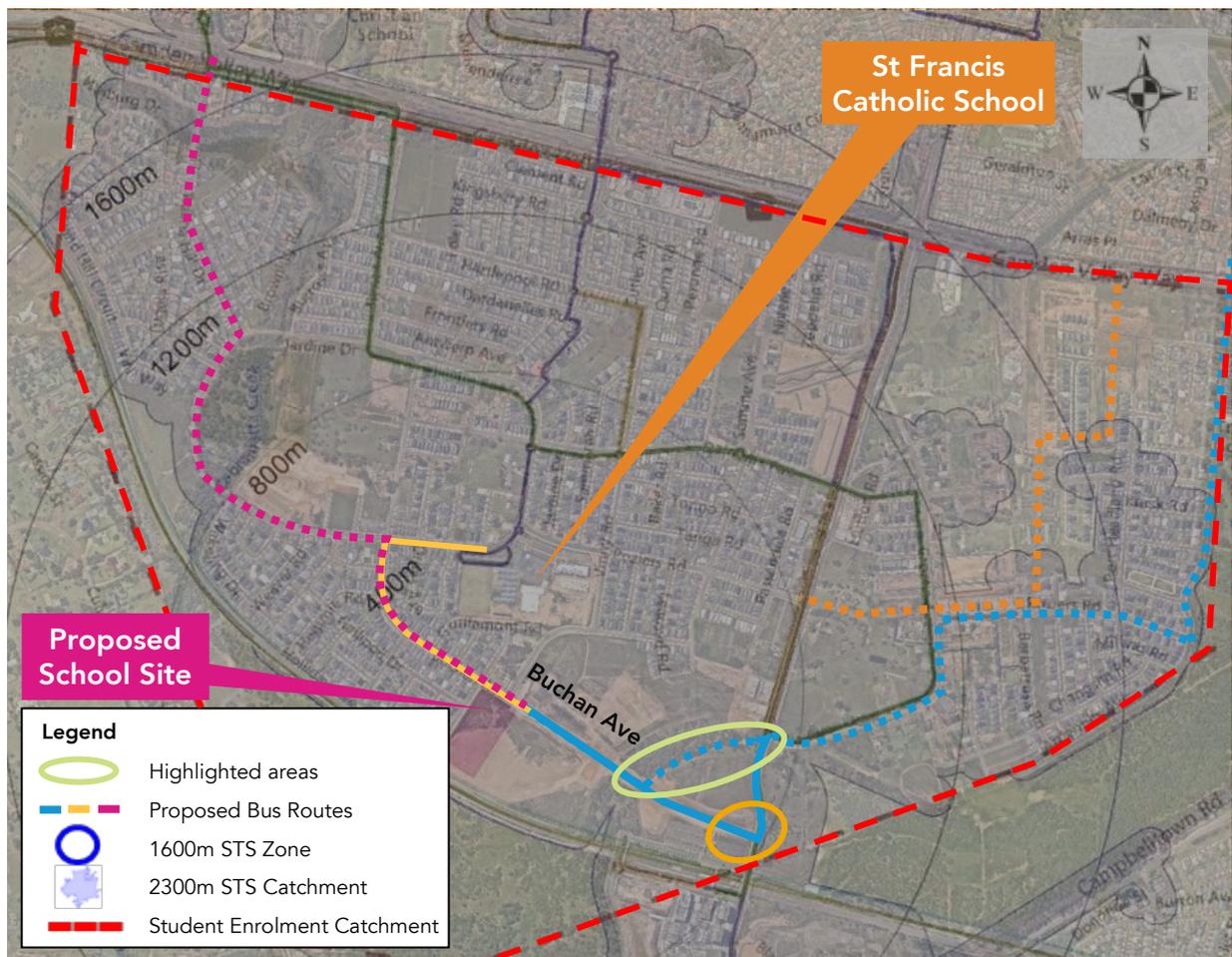


Figure 30 - Proposed bus routes

The blue route would service students living east of Soldiers Parade. It is noted that a route through this area was part of planning incorporated in the DCP. This route is important for the following reasons:

- Students living east of Bernera Road have limited pedestrian and cycling connectivity, hence they are reliant on either public or private transport. A bus route would provide an alternative transport mode to cars.
- The north-eastern area of the enrolment catchment lies outside of the SSTS exclusion zone, meaning that students would be eligible for a free bus pass. Therefore, it is more likely that public transport will be utilised.

The yellow route is a proposed extension of bus routes that currently stop at the St Francis Catholic School. This extension would provide bus connectivity for students living north of the school.

The pink dotted line shows a proposed bus route which would service students from the west of the enrolment catchment. Currently there is a gap in cycling connectivity towards the north-west of the enrolment catchment and the proposed bus route would provide an alternative transport option to driving.

4.3.3 Bus Stops at the School

Currently a bus stop is being constructed by Landcom on the southern side of Buchan Avenue (at the north-east edge of the School). This bus stop services students/parents/staff travelling from the east. Another bus stop needs to be provided on the northern side of Buchan Avenue (across the School) to service students/parents/staff travelling from the west. Different bus stop provision options are mentioned in the following sub sections.

4.3.3.1. Bus Stop Option 1 (Recommended)

As presented in Figure 31, bus stop option 1 can be located on the northern side of Buchan Avenue between Faulkner Way and Lacey Road.

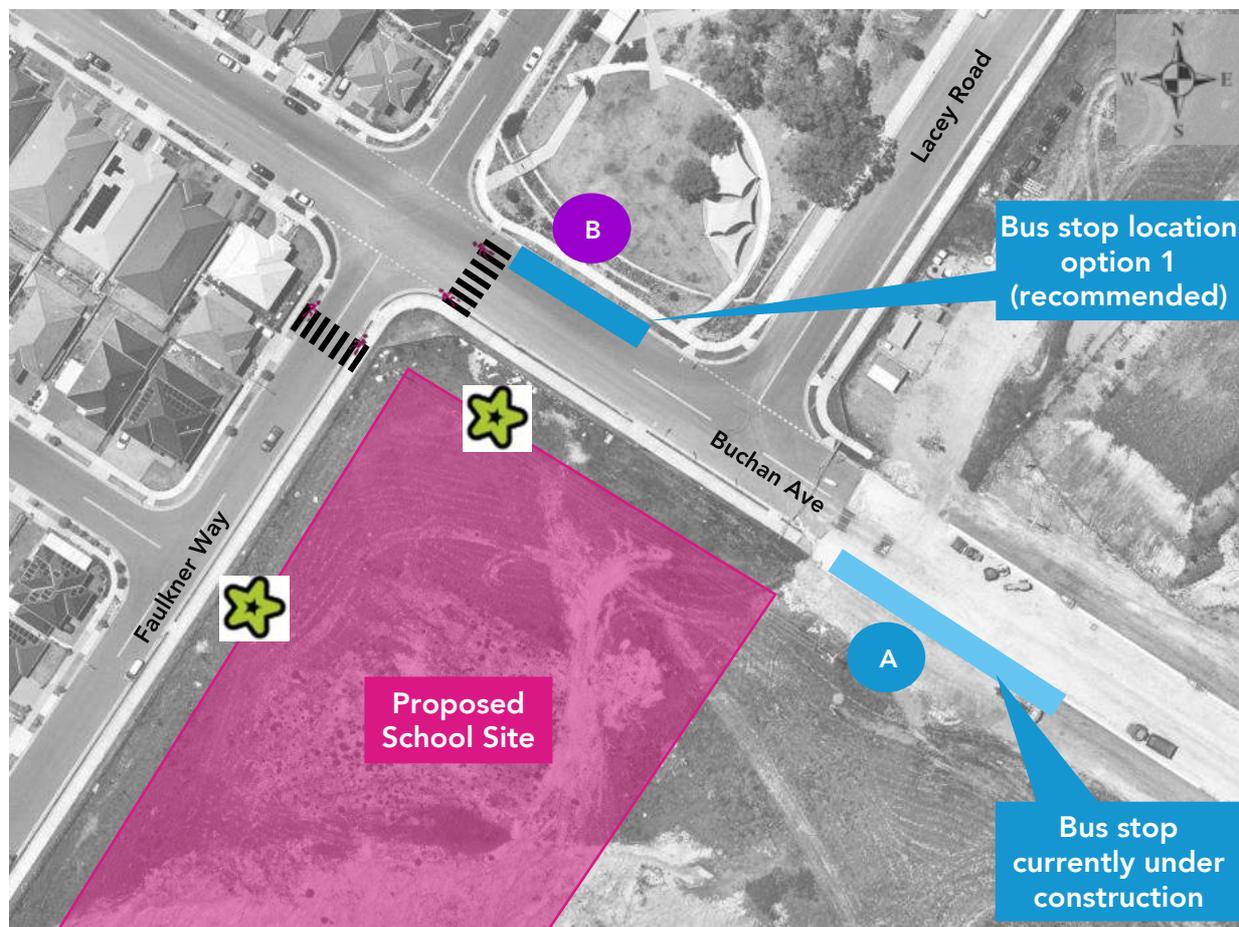


Figure 31 - Bus stop location Option 1 (Recommended)

Following considerations are made for the location of this bus stop:

- Only one bus can be accommodated at this location; however, this can be operationally managed through an appropriate timetable;
- This option prioritises public and school transport use by locating the bus bay as close to the main entry as possible;
- This location option removes the possibility for informal pick-up and drop-off across Buchan Avenue which reduces the possibility of conflict between vehicles and pedestrians and is therefore beneficial.

4.3.3.2. Bus Stop Option 2 and Pedestrian Connectivity Option 1

As presented in Figure 31, in this option the bus stop is located on the northern side of Buchan Avenue east of Lacey Road, and a zebra crossing is located on the eastern arm of Buchan Avenue / Lacey Road intersection.

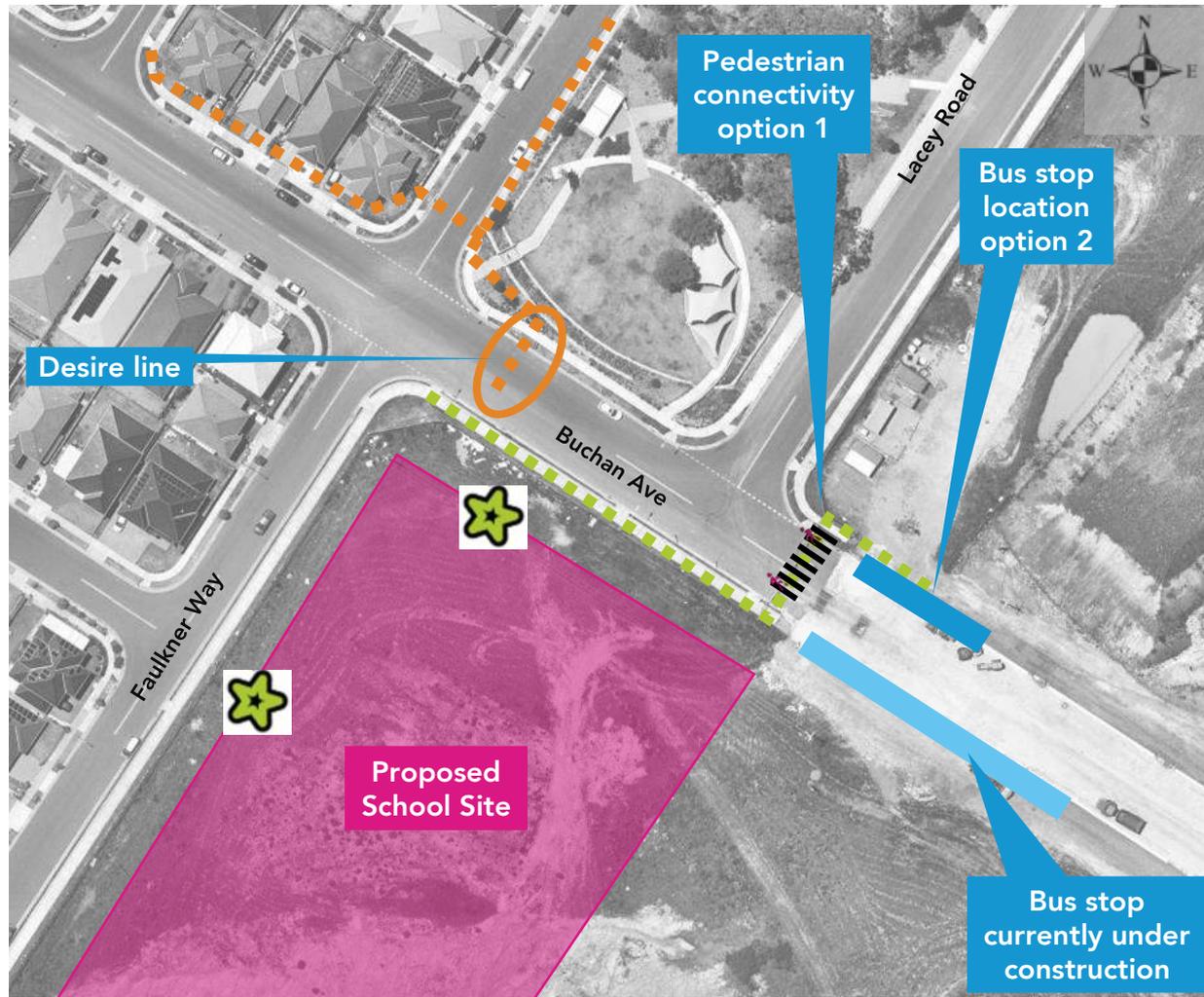


Figure 32 - Bus Stop Option 2 and Pedestrian Connectivity Option 1

Following considerations are made for the location of this bus stop and zebra crossing:

- This option allows separation of traffic, avoiding conflict between students pick-up and drop-off and the bus in between;
- This location creates an informal pick up area on the north side of Buchan Avenue between Faulkner Way and Lacey Road, and therefore, this may create potential conflict;
- The kerb allows for space for more than one bus, which would futureproof the design in the event a secondary school is constructed on the adjoining parcel;
- The zebra crossing does not align with the desire line for students coming from the north and north-west, hence making a pedestrian journey less attractive; and

- Unless the road section across the school entry has “No stopping” restrictions, parents are likely to undertake pick-up and drop-off at this location thus increasing activity and conflicts between vehicles and pedestrians. Even if these restrictions are imposed, policing on an ongoing basis would be required. Alternatively, a kerb build-out could be constructed to reduce the width of the road and therefore to remove a possible parking lane.

4.3.3.3. Bus Stop Option 2 and Pedestrian Connectivity Option 2

As presented in Figure 33, in this option the bus stop is located on the northern side of Buchan Avenue east of Lacey Road, with two zebra crossings. One of the zebra crossings is located on the northern arm of Buchan Avenue / Lacey Road intersection and the other on the eastern arm of Buchan Avenue / Faulkner Way.

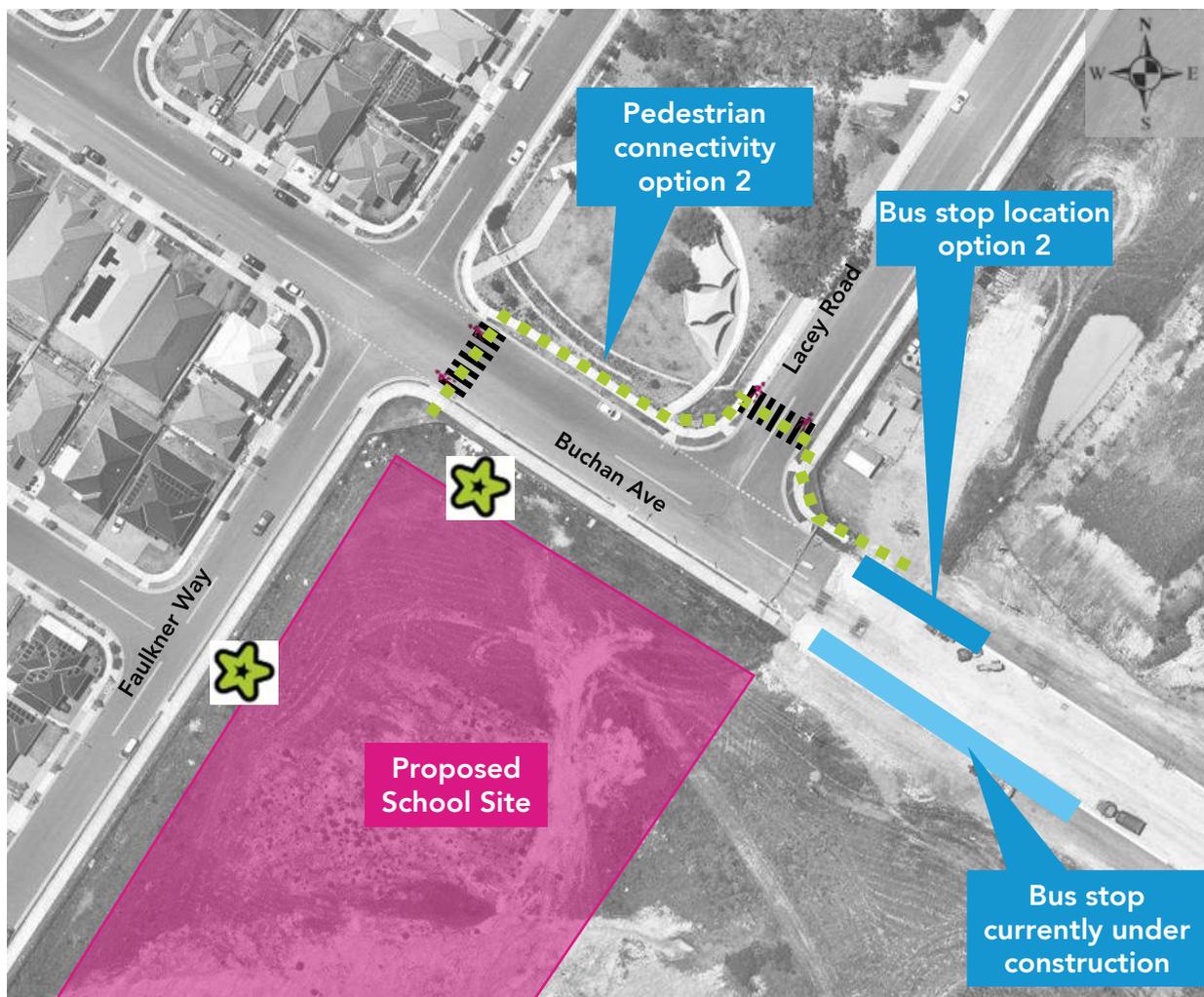


Figure 33 - Bus Stop Option 2 and Pedestrian Connectivity Option 2

The following considerations are made for the location of this bus stop and zebra crossing:

- Students will have to cross two streets while approaching and leaving the school;
- An additional crossing will be required;
- The kerb allows for space for more than one bus, which would futureproof the design in the event a secondary school is constructed on the adjoining parcel, and;

- Unless the curve across the school entry has “No stopping” restrictions parents are likely to undertake pick-up and drop-off at this location thus increasing activity and conflicts between vehicles and pedestrians. Even if these restrictions are imposed, policing on an ongoing basis would be required. Alternatively, a kerb build-out could be constructed to reduce the width of the road and therefore to remove a possible parking lane.

4.3.3.4. Conclusion

Option 1 described in Section 4.3.3.1 is recommended, as the location of the bus stop prioritises public transport use and provides the most direct access to the bus.

Bus arrival times will need to be scheduled such that only one bus services the bus stop at a time.

4.3.4 Connectivity to the Nearest Bus Stop and Train Station

As shown in Figure 34, the school will be located just 780m from the train station, making an onward journey for parents by train a viable option once Buchan Avenue is constructed. The nearest existing bus stop is located at St Francis Catholic College and is in 800 metres distance from the proposed school.

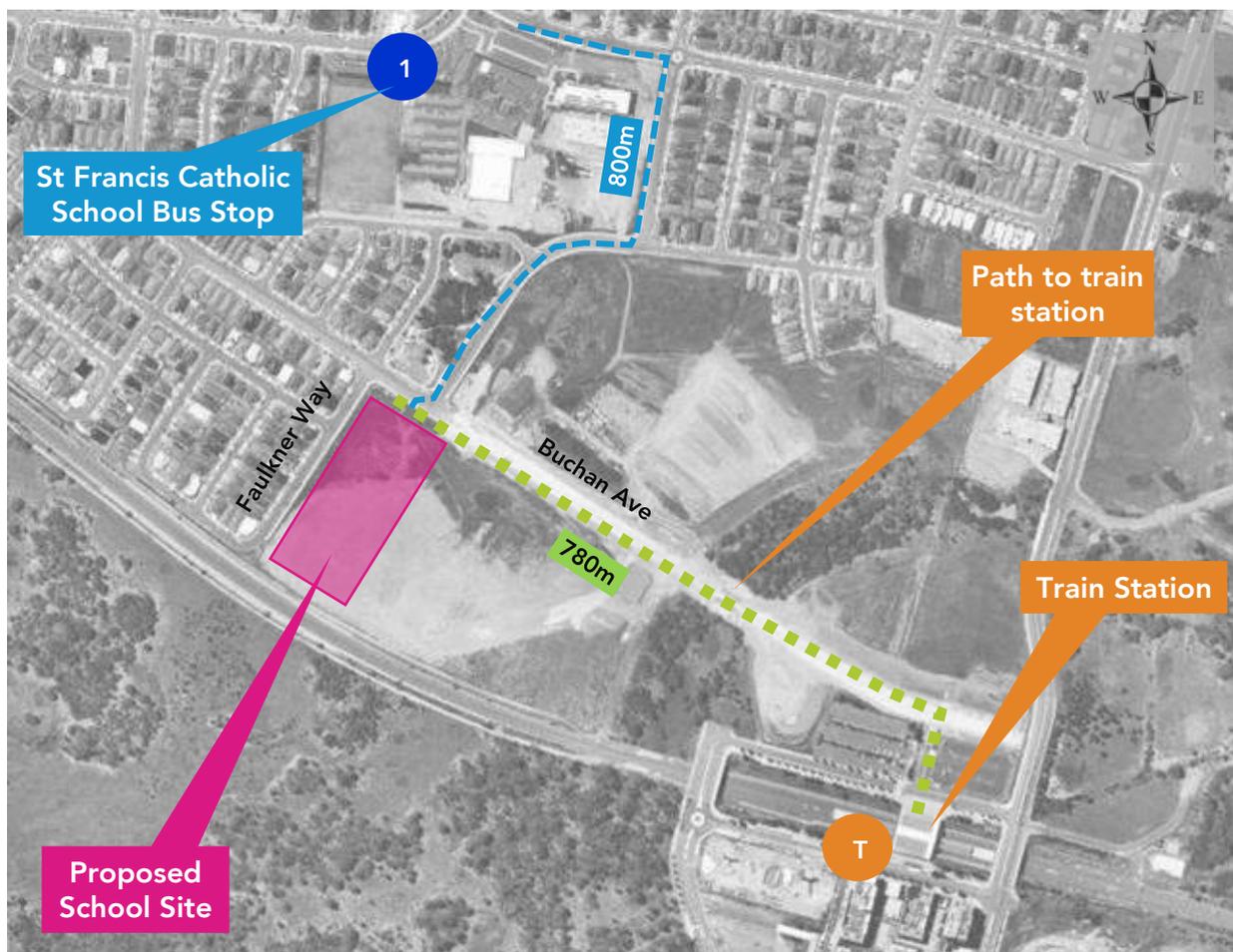


Figure 34 - Aerial View of the Subject Site (Source: Near Map)

4.3.5 Public Transport for Parents

Parent onward journey can be achieved if appropriate public transport infrastructure is provided in the vicinity of the school. Public transport services near the proposed School site including the railway and bus services are shown in Figure 35 and Figure 36.

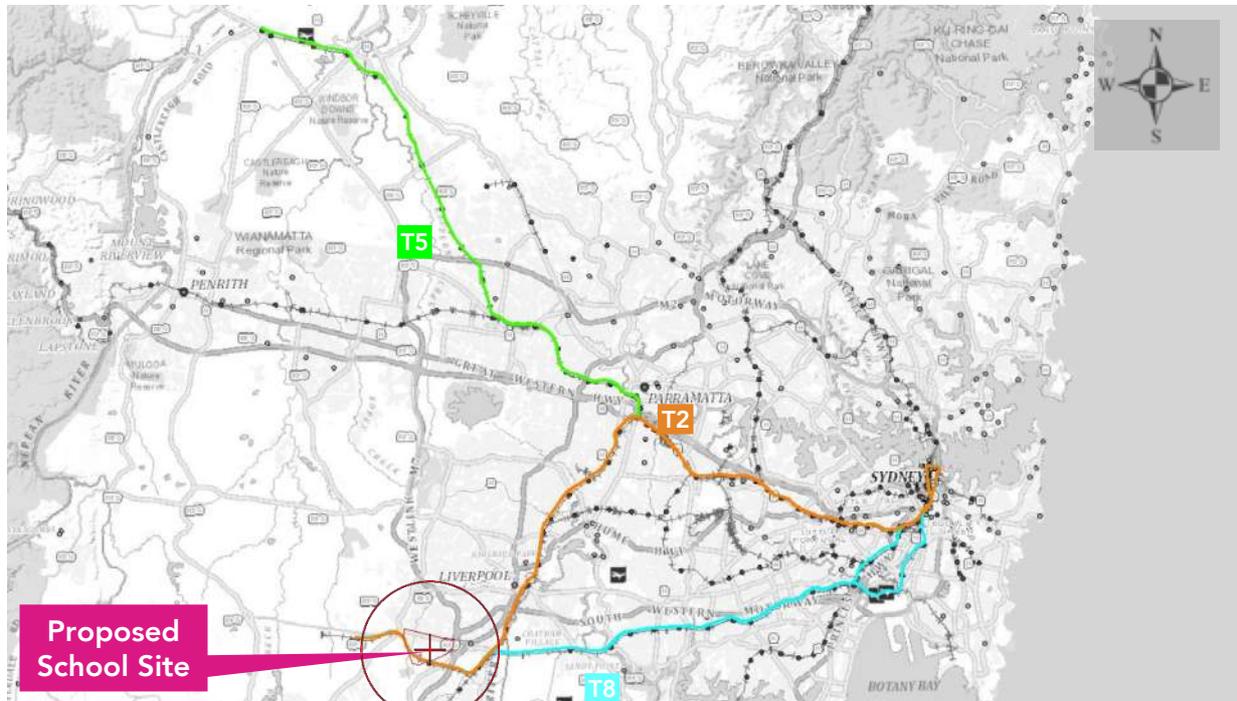


Figure 35 - Railway Routes in Edmondson Park

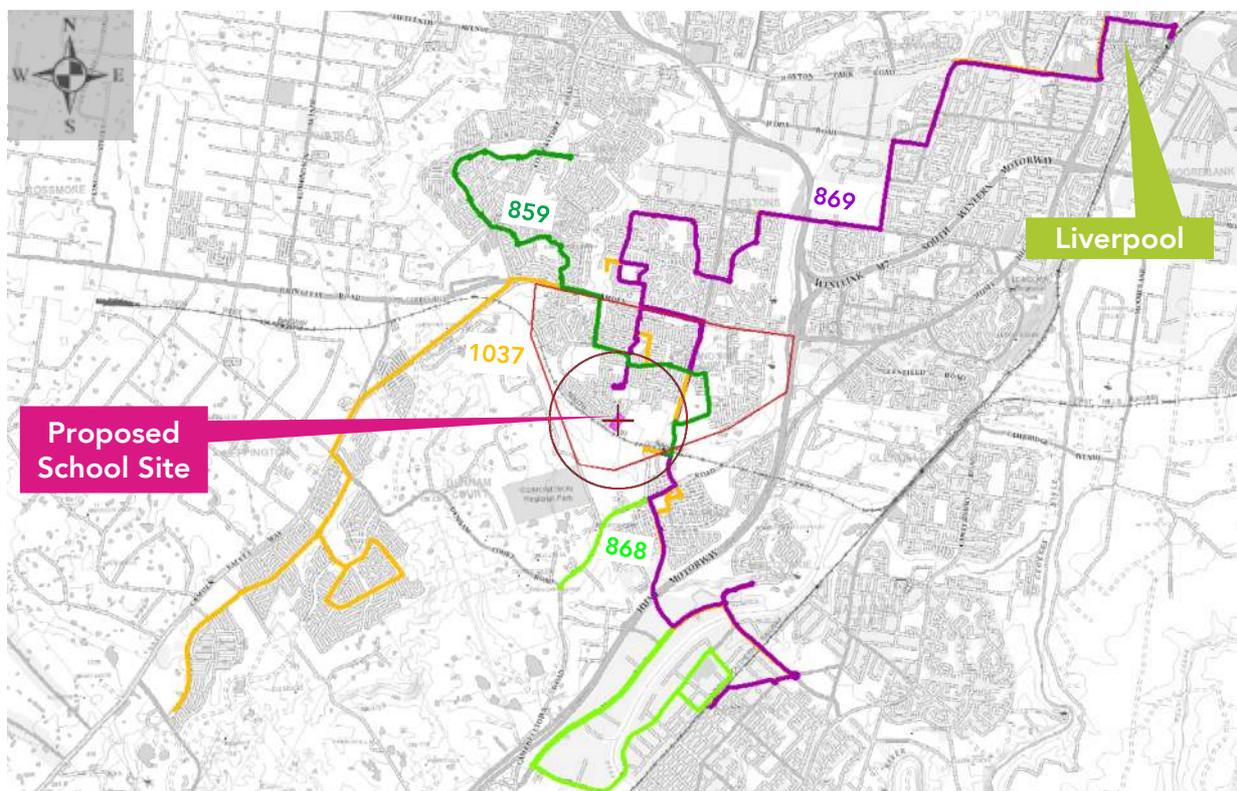


Figure 36 - Public Buses near the proximity of Proposed School Site

The services provided appear sufficient to attract parents to travel to work in any suburb along the railway lines and within the local area, which can be accessed by buses. Appropriate information should be provided to parents to raise the awareness of these transport options.

4.3.6 Bus and Railway Services

The nearest bus stop and railway services, including coverage, approximate operation times and frequency, are summarised in Table 1 and Table 2.

Table 1 - Existing Bus Service Summary (Source: Transport NSW)

Bus Route	Coverage	Bus Stop	Morning Peak	Bus Stop	Afternoon Peak
1037	From: Emerald Hills, Willowdale, Edmondson Park	1	07:40	1	-
4036	To: Prestons, Edmondson Park, Willowdale, Emerald Hills	1	-	1	15:10
869	Liverpool to Ingleburn via Prestons & Edmondson Park	1	07:58	1	14:50
	Ingleburn to Liverpool via Edmondson Park & Prestons	1	08:06	1	14:58, 15:28
859	Edmondson Park Station to Carnes Hill	1	07:52	1	15:17
	Carnes Hill to Edmondson Park Station	1	07:57	1	14:57

Table 2 - Existing Train Services Summary (Source: Transport NSW)

Train	Coverage	Morning Peak	Afternoon Peak
T2	City to Edmondson Park	06:02 06:15 06:30 06:45 07:00 07:15 07:30 07:44 07:59 08:17 08:32 08:44 08:59 09:19 09:34	13:49 14:05 14:19 14:34 14:49 15:04 15:19
	- Merrylands to Edmondson Park	- 07:28 07:40 07:54 07:58 08:09 08:24 08:30 08:40 08:55 08:59 09:10 09:25 09:29	- 13:57 14:12 14:27 14:42 14:57 15:12
	Edmondson Park to City	07:29 07:37 07:46 07:59 08:14 08:29 08:44 08:59	14:29 14:44 14:59 15:14 15:27 15:44 15:59 16:14 16:29
	- Edmondson Park to Merrylands	- 07:42 08:08 08:38 09:08 09:38	- 14:38 15:08 15:38 16:08 16:38
T5	Schofields to Edmondson Park	08:24 08:54 09:22 09:52	13:51 14:29 14:58
	- Blacktown to Edmondson Park	- 07:31 08:07 08:34 09:04 09:32 10:02 10:31	- 14:01 14:43 15:13 15:43 16:13
	Edmondson Park to Blacktown	08:08 08:38 09:08 09:38 10:08 10:38	15:08 15:38 16:08 16:38
	- Edmondson Park to Schofields	- 07:12 07:42	- 14:08 14:38

A recommended bus timetable for a 8:40am / 9:00am and 2:40pm / 3:00pm bell times is illustrated in Table 3.

Based on the residential assumptions discussed in Section 3.4.2.1 and the infrastructure constraints, the proposed bus routes may require more than one bus to service the number of students. Taking into account the proposed staggered bell times, the proposed bus timetable is shown in Table 3.

It is noted that some roads are still under construction; the finalisation date of all roads and intersection treatments is unknown at the time of writing. Therefore, the below proposed timetable assumes an anti-clockwise route servicing only the northern side of Buchan Avenue. Which could be implemented straight away. Upon completion of all roads within the precinct, an optimised bus route network should be established utilising the bus stop on the southern side of Buchan as well.

Table 3 - Recommended Bus Services

Coverage	Bus Stop	Morning Peak	Bus Stop	Afternoon Peak
New Primary School in Edmondson Park to / from: East of Soldiers Parade, West of Cabramatta Creek	B	OOSH Services 6:50 6:55 7:50 7:55 Bell Time 1 (8:40) 8:21 8:23 8:25 Bell Time 2 (9:00) 8:41 8:43 8:45	B	Bell Time 1 (2:40) 2:50 2:52 2:54 Bell Time 2 (3:00) 3:10 3:12 3:14 OOSH Services 4:00 4:05 5:00 5:05 6:00 6:05
	A	Shall be utilised upon completion of road network.	A	Shall be utilised upon completion of road network.

4.4 Road Network

The subject site is located in the suburb of Edmondson Park and is primarily serviced by local roads including Buchan Avenue to the North, Faulkner Way to the west and future extension of road to the south-east.

A summary of the State, Regional and Council managed local roads serving the site is presented in Figure 37 and the following tables.

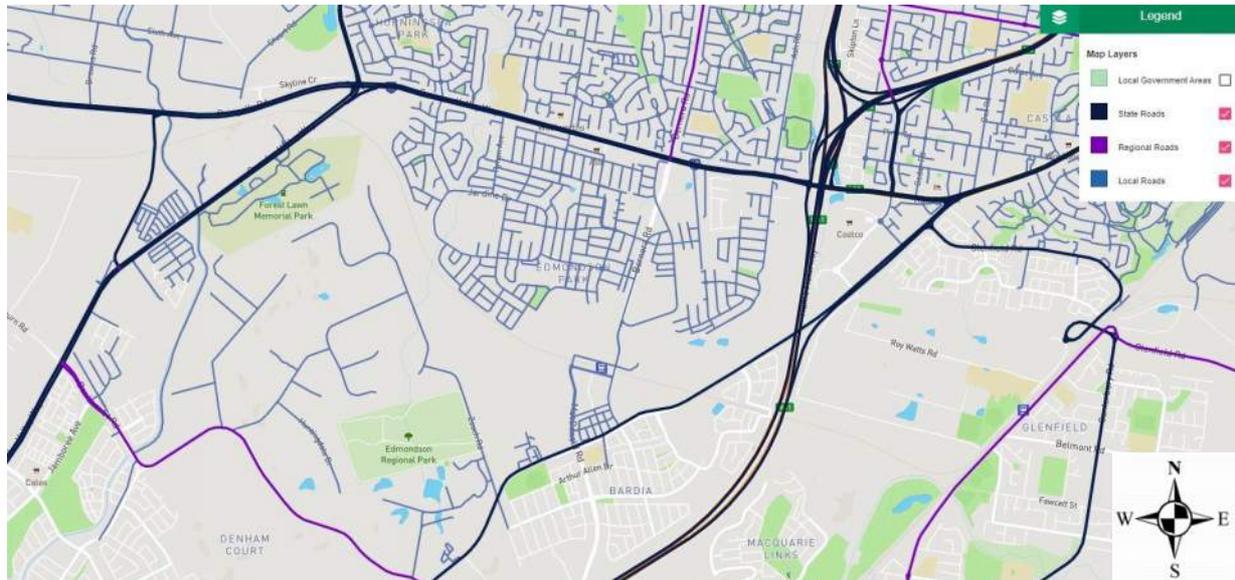


Figure 37 - Surrounding Road Network (Source: RMS Road Hierarchy)

The NSW administrative road hierarchy comprises the following road classifications, which align with the generic road hierarchy as follows:

- State Roads** - Freeways and Primary Arterials (RMS managed)
- Regional Roads** - Secondary or Sub Arterials (Council managed, partly funded by the State)
- Local Roads** - Collector and Local Access Roads (Council managed)

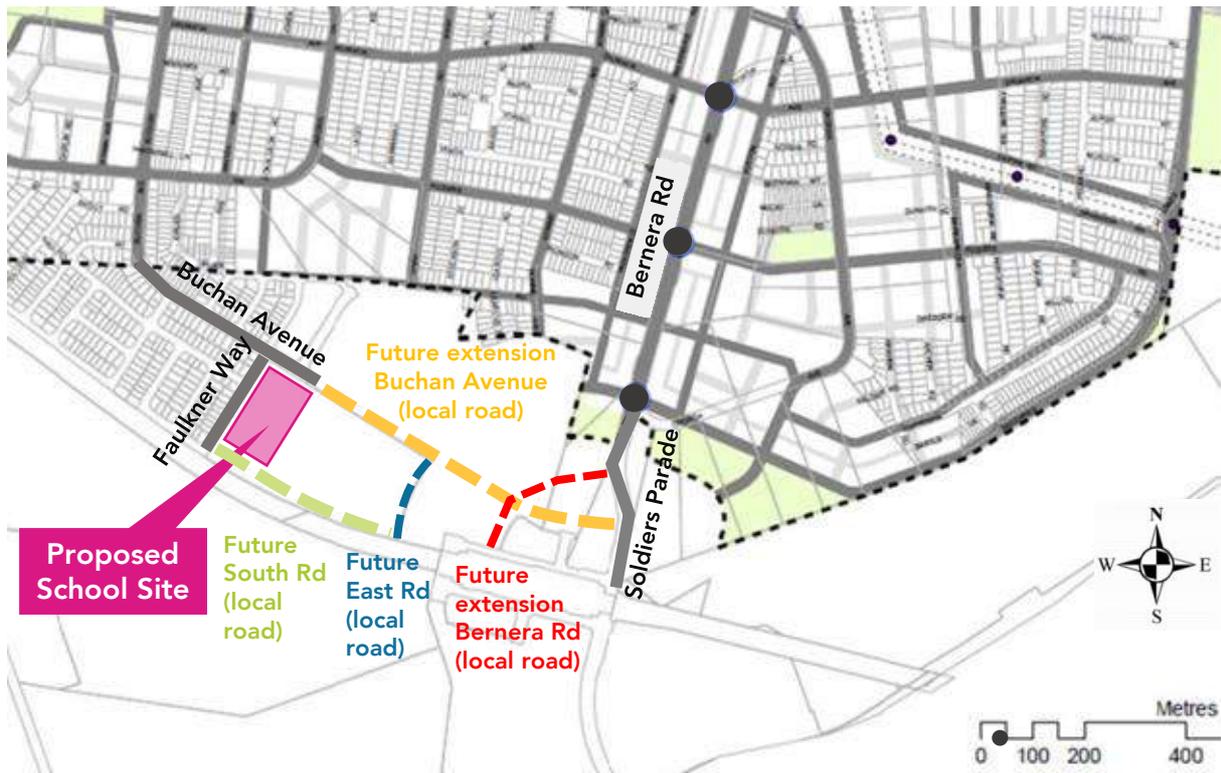


Figure 38 - Future Road Network surrounding the school

Table 4 - Buchan Avenue

Buchan Avenue	
Road Classification	Collector Road
Alignment	East-West in the vicinity of the site
Number of Lanes	1 lane in each direction
Carriageway Type	Undivided
Carriageway Width	15m in section with 1 lane in each direction with on road bicycle way.
Speed Limit	50km/h
School Zone	No, but will be in future
Parking Controls	Unrestricted
Forms Site Frontage	Yes



Figure 39 - Buchan Avenue – Westbound towards Faulkner Way

Table 5 - Faulkner Way

Faulkner Way	
Road Classification	Local Road
Alignment	North - South in the vicinity of the site
Number of Lanes	1 lane in each direction
Carriageway Type	Undivided
Carriageway Width	9.6m
Speed Limit	50km/h
School Zone	No, but will be in future
Parking Controls	Unrestricted Parking
Forms Site Frontage	Yes



Figure 40 - Faulkner Way – Northbound towards Buchan Avenue

Table 6 - Bernera Rd

Bernera Rd	
Road Classification	Collector Road
Alignment	North - South
Number of Lanes	Varies from a dual carriage road to 1 lane in each direction
Carriageway Type	Divided
Carriageway Width	18.5m
Speed Limit	60km/h
School Zone	No
Parking Controls	Combination of "No stopping" and "Bus zone"
Forms Site Frontage	No



Figure 41 - Bernard Road – Northbound towards Poziers Rd

Table 7 - Soldiers Parade

Soldiers Parade	
Road Classification	Collector Road
Alignment	North - South
Number of Lanes	Varies from a dual carriage road to 1 lane in each direction
Carriageway Type	Divided within the vicinity of the site
Carriageway Width	16m – 21m
Speed Limit	60km/h
School Zone	No
Parking Controls	Restricted
Forms Site Frontage	No



Figure 42 - Soldiers Parade – Southbound towards Campbelltown Road

Table 8 - The South and East Road

The South-East Road	
Road Classification	Local Road
Alignment	East – West in the vicinity of the site & North – South when extending to further east
Number of Lanes	1 lane in each direction
Carriageway Type	Undivided
Carriageway Width	9.6m
Speed Limit	50km/h
School Zone	No, but will be in future
Parking Controls	Unrestricted
Forms Site Frontage	Yes

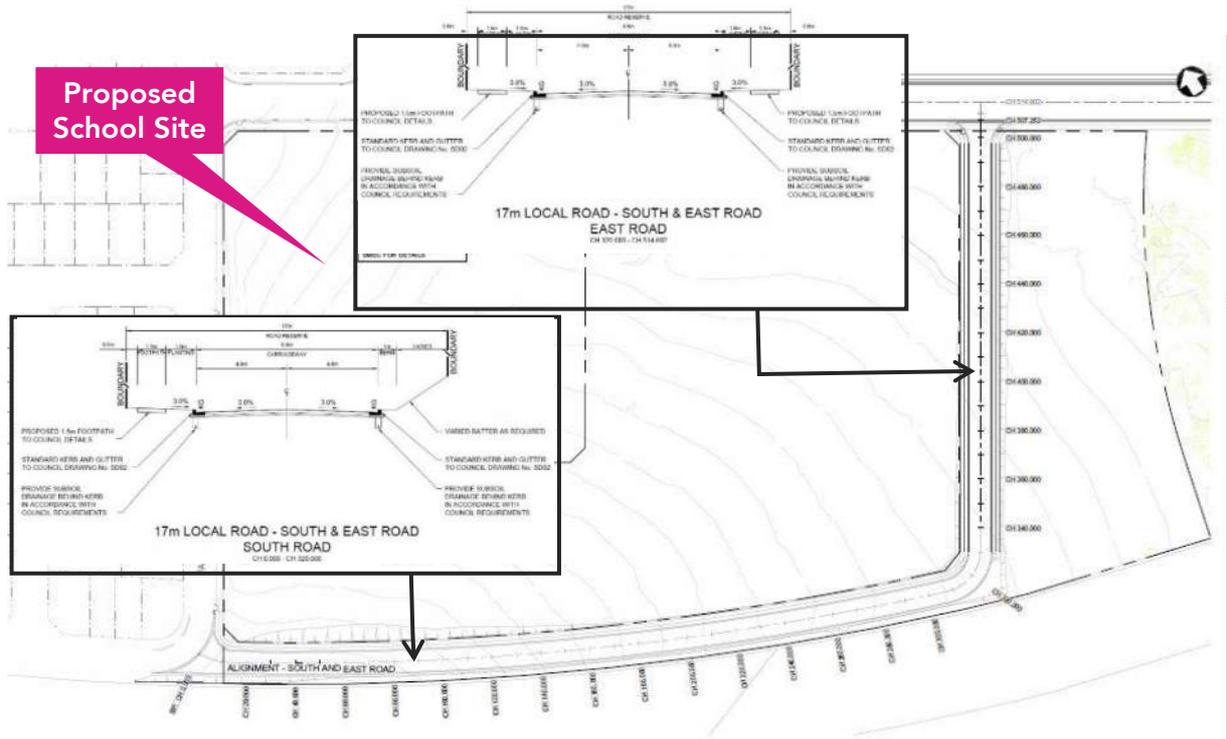


Figure 43 - The South-East Road – Faulkner Way towards Parkway Avenue

5. Travel Patterns and Travel Demand

5.1 Transport Base Line

The proposed development is a new school in a still developing suburb, hence no surveys have been undertaken to determine current travel patterns. Therefore, an analysis of the Journey to Work data has been undertaken.

Based on the Australian Bureau of Statistics Journey to Work Data, 76.5% of people residing in Edmondson Park area drive to work, 14.4% travel on public transport and 1% use active transport. It is noted that this data is based on 2016 census, at which time much of the infrastructure was not provided. It is likely that with a connectivity to the train station, the mode share by public transport is likely to have increased.

Out of all residents travelling from the Edmondson Park area to work by car, 10% travel within Edmondson Park, 7.9% to Liverpool, 4% work at no fixed address, 3% to Chipping Norton and 2.7% to Casula, as visualised in Figure 44.

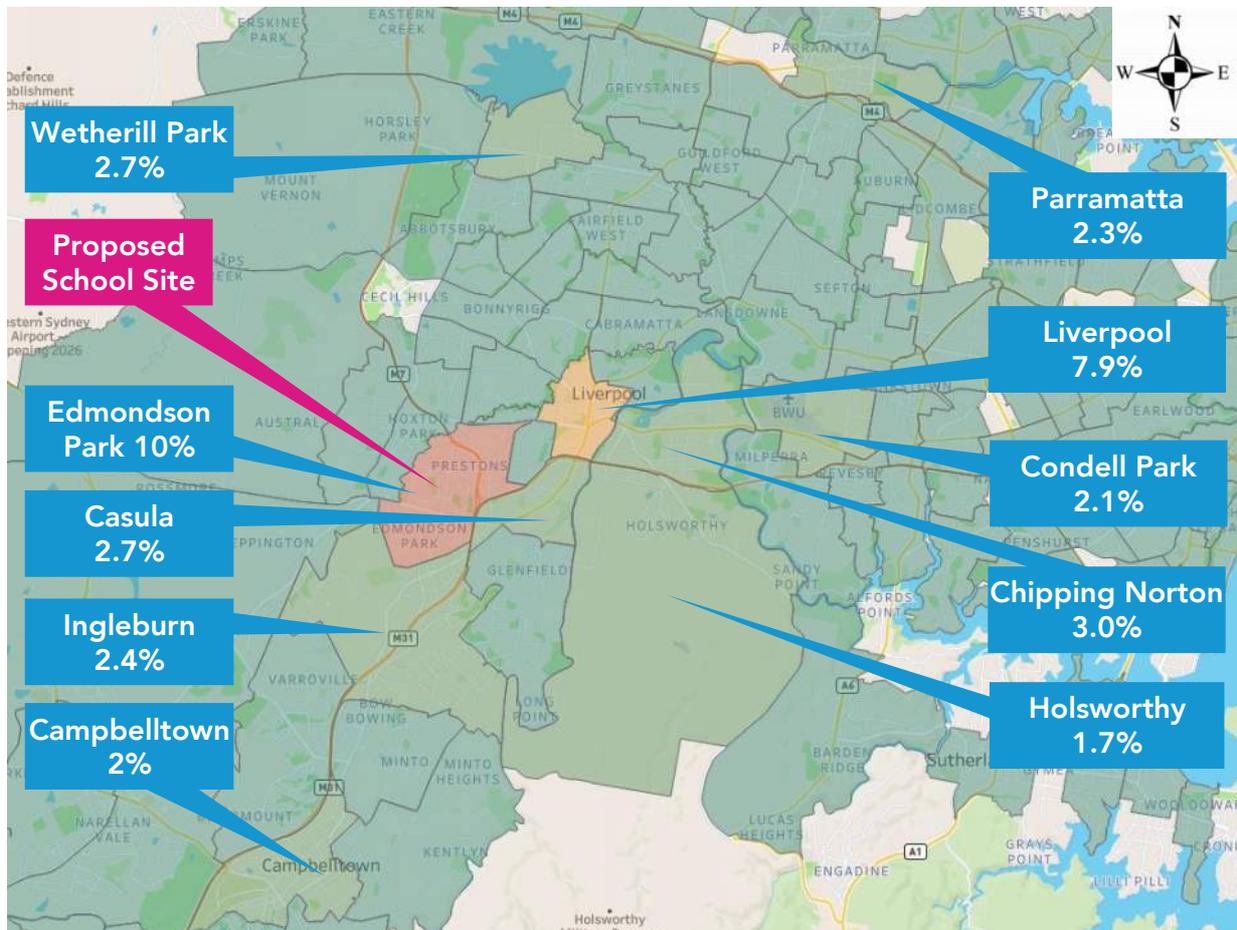


Figure 44 - Journey to Work from Edmondson Park Area

5.2 Potential Achievements

This section presents potential walking, cycling, public transport and car utilisation in an ideal scenario, where everybody would utilise only alternative transport modes.

5.2.1 Walking

“As crow flies” and actual 400 / 800 / 1200m walking catchments are presented in Figure 45.

Within the enrolment catchment, 8% of students reside within the 400m walking catchment, 18% within the 401m - 800m catchment and 16% within the 801m - 1200m catchment.

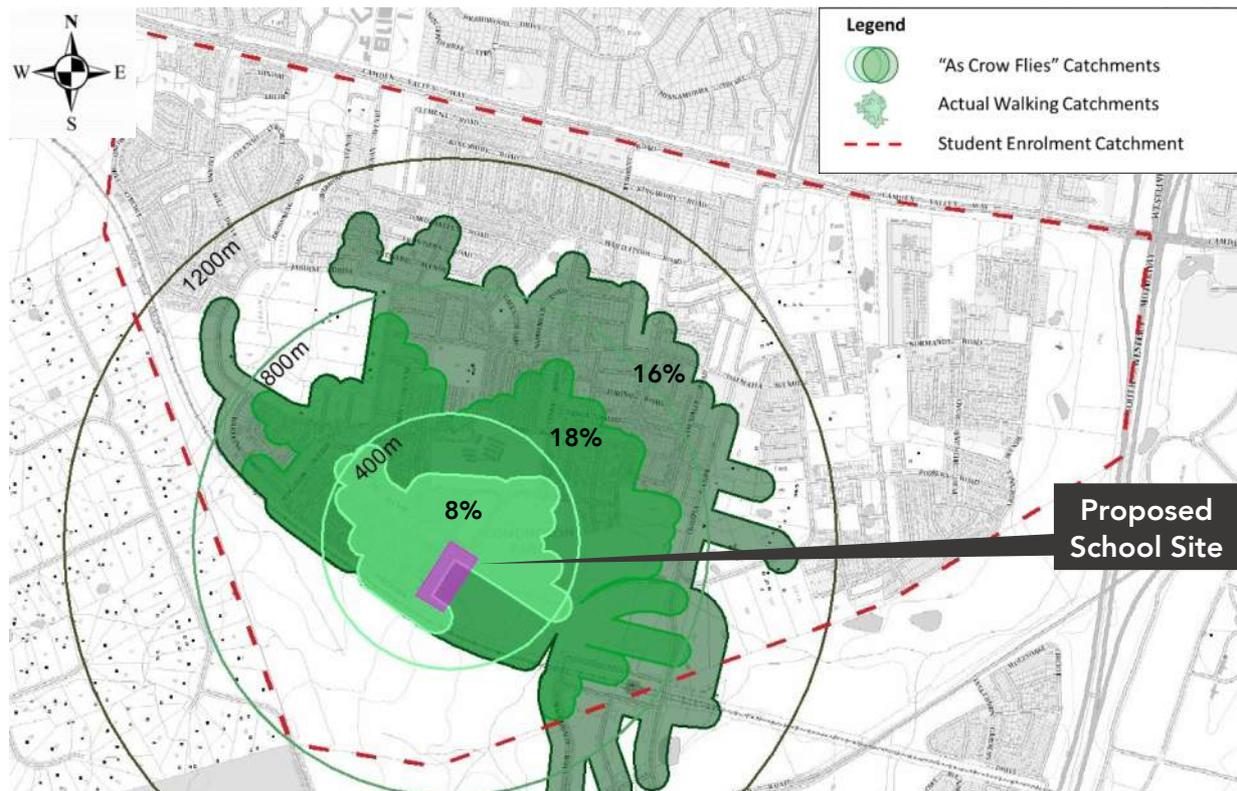


Figure 45 - Walking Catchment and Student Population

5.2.2 Cycling

“As crow flies” and actual 1200m / 2400 cycling catchments are presented in Figure 46.

Within the enrolment catchment, 42% students reside within the 1200m walking / cycling catchment and 52% students reside within the 1201m - 2400m cycling catchment. 6% of student are located outside the cycling catchment.

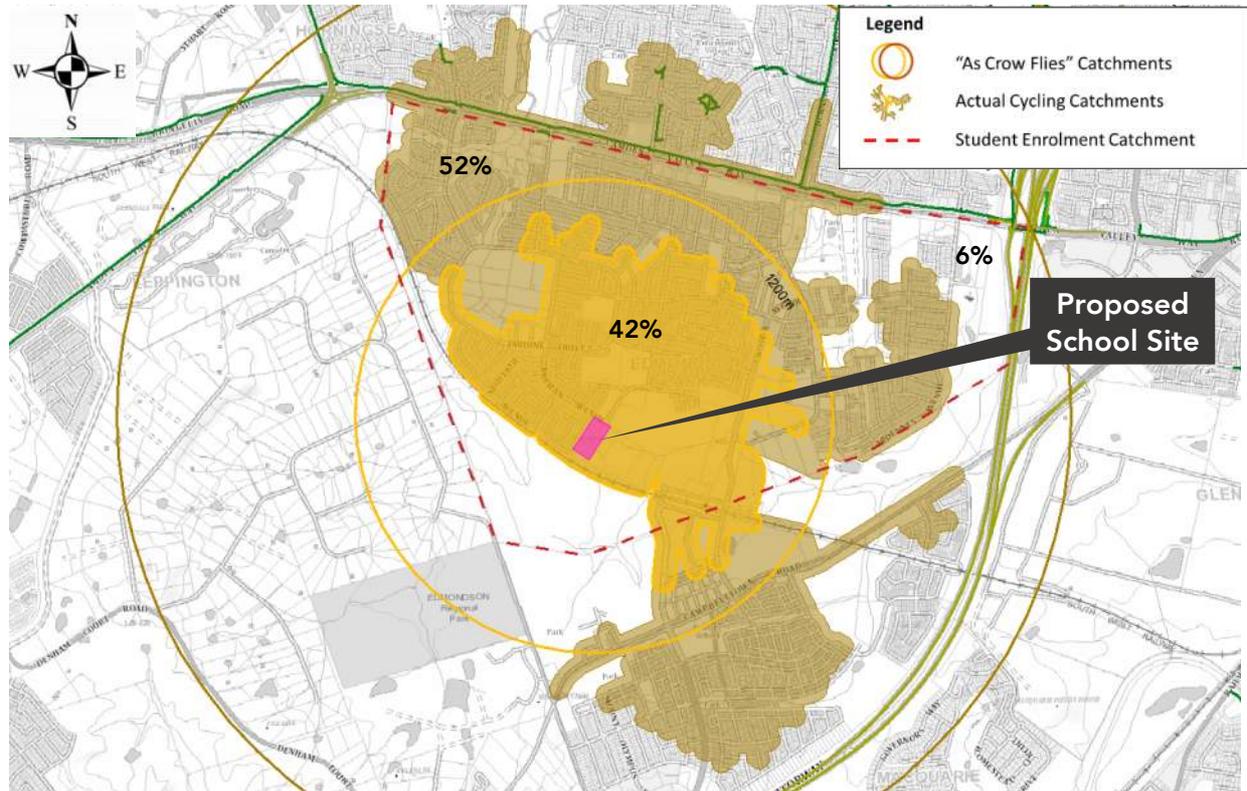


Figure 46 - Cycling Catchment and Student Population

5.2.3 Public Transport

“As crow flies” 1600m and actual 2300m SSTS exclusion zones are presented in Figure 47.

95% of students live within the SSTS exclusion zone and therefore, only 5% of students are eligible for a free or discounted bus pass. However, it is possible that some students may take the bus. Analysis of the depersonalised data shows that 52% of students reside within a 400m walk of an existing bus stop. The proposed bus routes will require the addition of some bus stop infrastructure. By using the indicative bus stops as shown in Figure 47, an additional 40% on the east and 8% on the west of the student enrolment catchment are within 400m from a bus stops.

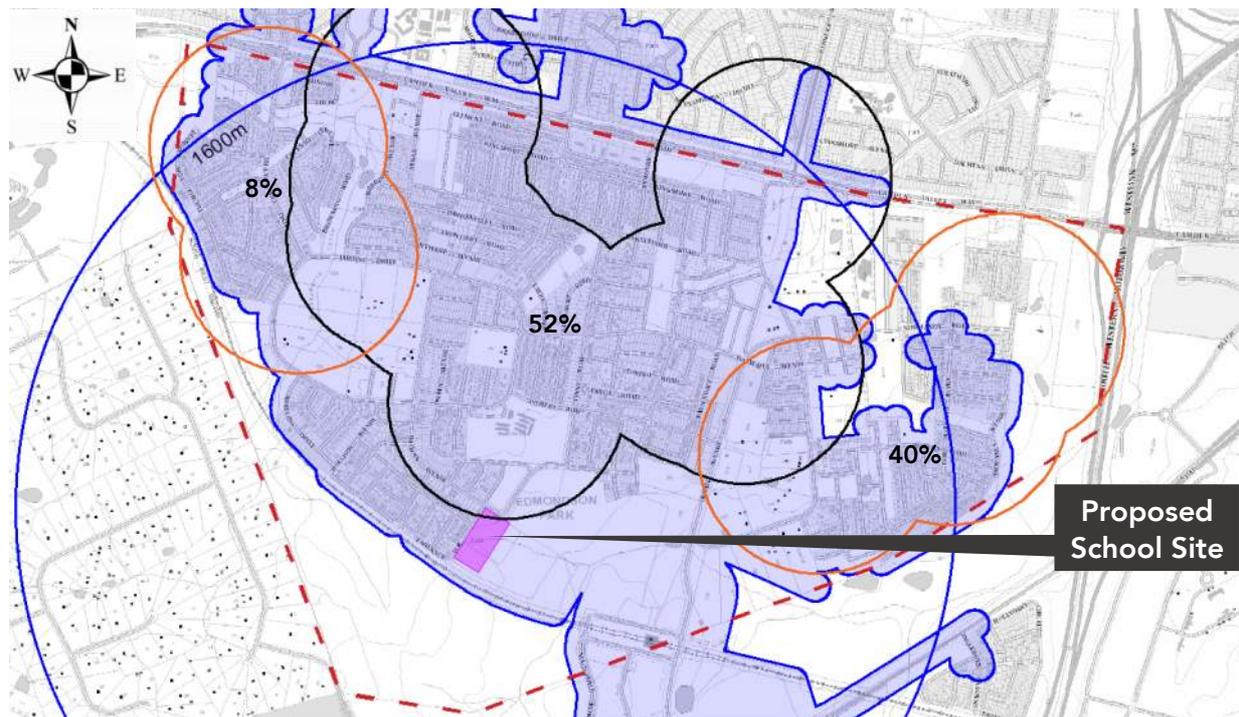


Figure 47 - Public Transport Catchment and Student Population

5.2.4 Summary

A summary of the potential mode share achievements for the primary school students are shown in Table 9. The 40 pre-school students are not part of this assessment, as the enrolment catchment does not overlap with the primary school's catchment. Further, the pre-school facility will be operated separately to the primary school.

Table 9 - Potential Transport Mode Share

Catchment Analysis	Actual (on path / using road network as a proxy)	
	#	%
1 - 400m (5-min walk)	80	8%
401 - 800m (10-min walk)	180	18%
801 - 1200m (15-min walk)	160	16%
1 - 1200m (Walking)	420	42%
1201 - 2400m (Cycling)	520	52%
1 - 1600m / 2300m (excl. from SSTS Primary)	950	95%
# inside SSTS zone, with PT option	480	48%
OOSH placements	Yet to be decided	
Total primary student enrolments	1,012	

6. School Transport Scenarios

This section presents a discussion on the required and provided / proposed transport facilities for three different school transport scenarios based on mode share utilisation:

- Base case scenario shows provision requirements for mode share utilisation based on the transport base line discussed in Section 5.1, in which data obtained through Journey to Work was used.
- Moderate / target scenario discusses measures proposed by the project, which are expected to lead to a reduction in car usage and an increase in alternative mode shares compared to the base case scenario.
- Ideal scenario outlines provision requirements for if all students were to use alternative transport modes.

6.1 Base Case Scenario

Considering that the proposed development is for a new school, existing travel characteristic could not be obtained through surveys. Therefore, Journey to Work data was analysed which shows that in the suburb of Edmondson Park 76.5% of people travel to work by car.

An analysis based on Poisson distribution has been conducted to determine potential provision requirement for pick-up and drop-off for if 76.5% of students were driven to / from school. The following parameters have been adopted:

- 30 minutes interval for pick-up and drop-off¹ - reflects the peak time interval over which pick-up/drop-off activity occurs for a typical school
- 30 seconds dwell time for drop-off²
- 210 seconds dwell time for pick-up² - The shorter service time in the AM peak is due to the fact that drop-off activity is usually shorter in duration than the afternoon pick-up activities where parents need to stop temporarily to wait for their child.
- Car occupancy of 1.2 students/car³ - to determine the number of vehicles travelling to/from the site. This number varies significantly based on school's accessibility and cultural influences, with the occupancy ranging between 1.2 - 2 students per car.

Table 10 shows the pick-up and drop-off space requirement for the base case scenario.

Table 10 - Pick-up and Drop-off Queuing Analysis for Base Case Scenario

Total Number of students	Vehicle Utilisation	Number of students being driven	Car Occupancy	Number of Vehicles Arriving	Poisson Distribution - Modelled No of Spaces (Length)
1,012	76.2%	771	1.2	643	>50 (300m)

¹ Assumption based on ptc.'s past experience and site observations of school pick-up/drop-off areas.

² Approximate dwell time taken for a vehicle to pull into a bay, drop-off or pick-up the student and drive away (based on past experience and observation).

³ Based on previous travel surveys undertaken at public primary schools

Using Poisson distribution, it was calculated that the number of spaces required to achieve a 95%ile queue of 0 vehicles, more than 50 spaces are required which equates to 300m. This is not achievable along the frontages of the site as shown in Figure 48.

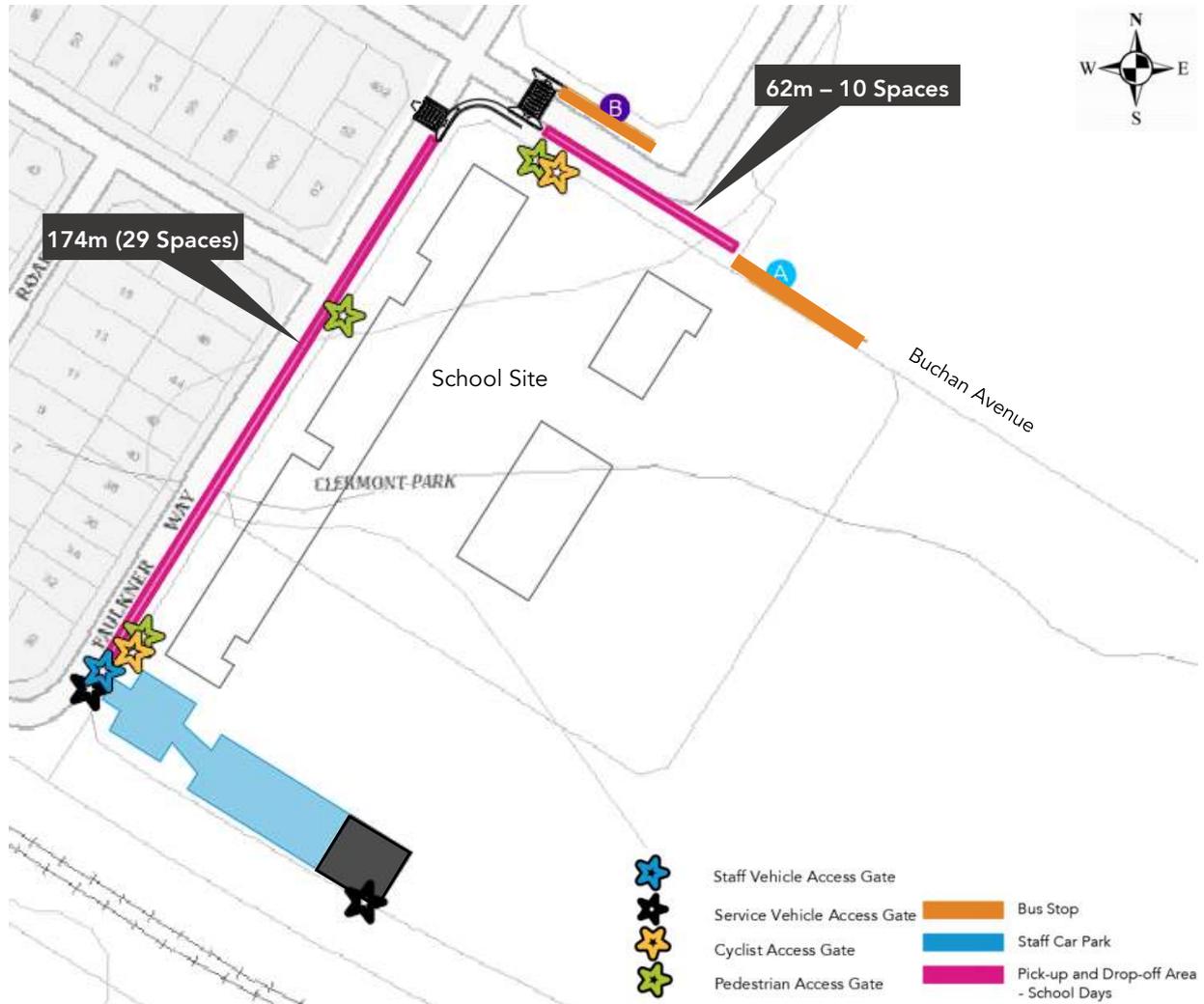


Figure 48 - Pick-up and Drop-off Requirement for Base Case Scenario

6.2 Moderate / Target Scenario

As part of the development of the proposed school various measures have been considered and implemented to enable better active and public transport utilisation.

The proposed site layout and facilities plan of the School is illustrated in Figure 49.



Figure 49 - Development Proposal Site Plan (Source: TKD Architects)

The physical measures and their potential impact on travel behaviours are discussed in detail in the following sections. Operation measures are discussed in the School Transport Plan.

6.2.1 Bell Times

To meet the transport demand of students attending the school it is proposed to implement two bell times. By offsetting bell times by 20 minutes, less buses are required to collect students and the pick-up and drop-off facilities can be alleviated from large queues.

6.2.2 Pedestrian Infrastructure

The project is proposing to provide raised zebra crossings on two frontage roads of the school i.e., across Buchan Avenue and Faulkner Way. The following considerations have been made:

- All crossings will be raised and constructed with buildouts to prioritise students, reduce the number of lanes students need to cross and act as traffic calming devices.
- The northern crossing will provide access for students and parents walking and cycling to / from the northern residential developments and will also directly serve Bus Stop B (refer to Figure 50). In addition, the raised amenity will act as a traffic calming device, which is particularly beneficial before the pick-up and drop-off located on Buchan Avenue.
- The western crossing provides access for students and parents to / from the western side of Faulkner Way. In addition, the raised amenity will act as a traffic calming device, which is particularly beneficial

before the pick-up and drop-off located on Faulkner Way. The crossing is proposed to be located on the northern section of Faulkner Way as it will serve a desire line with greater pedestrian usage.

- The buildouts of the two pedestrian crossings will be connected along the south-eastern corner of Buchan Avenue and Faulkner Way to minimise the footprint of the intersection. This will serve as a traffic calming device and provide a larger pedestrian facility.
- Multiple pedestrian gates have been implemented to provide access for students arriving from all directions and at both pick-up and drop-off lanes.

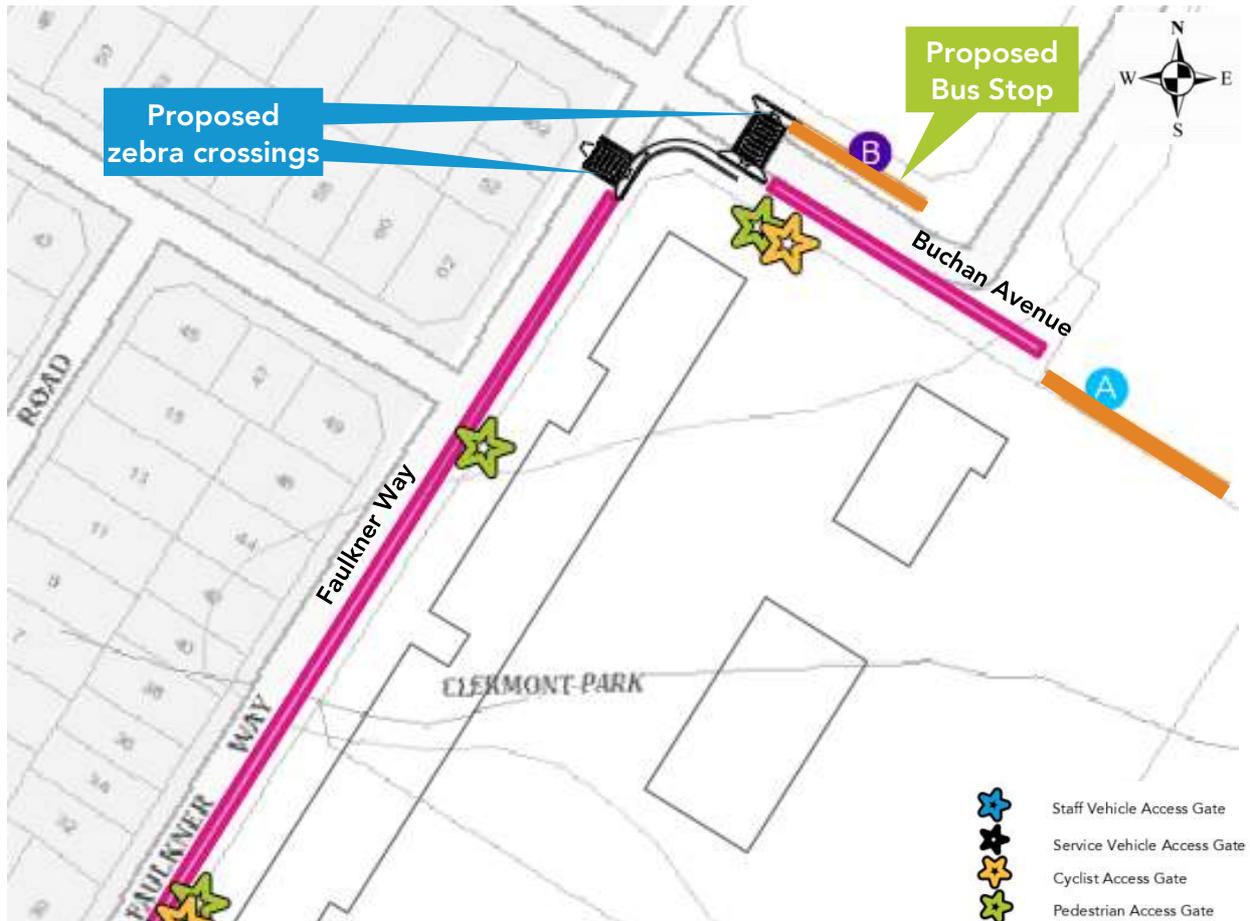


Figure 50 - Northern Crossing – Considerations

6.2.3 Bicycle and End of Trip Facilities

The development proposes to provide 158 bicycle and 24 scooter spaces for students, which accounts for 18% of students. The racks have been distributed between two access points: the southern entry off Faulkner Way and the main entry off Buchan Avenue, refer to Figure 51 for the location.

The development also proposes to provide enclosed bicycle parking spaces for staff; A shower and a change room are provided in close proximity to the staff room. Lockers are provided within the staff room.

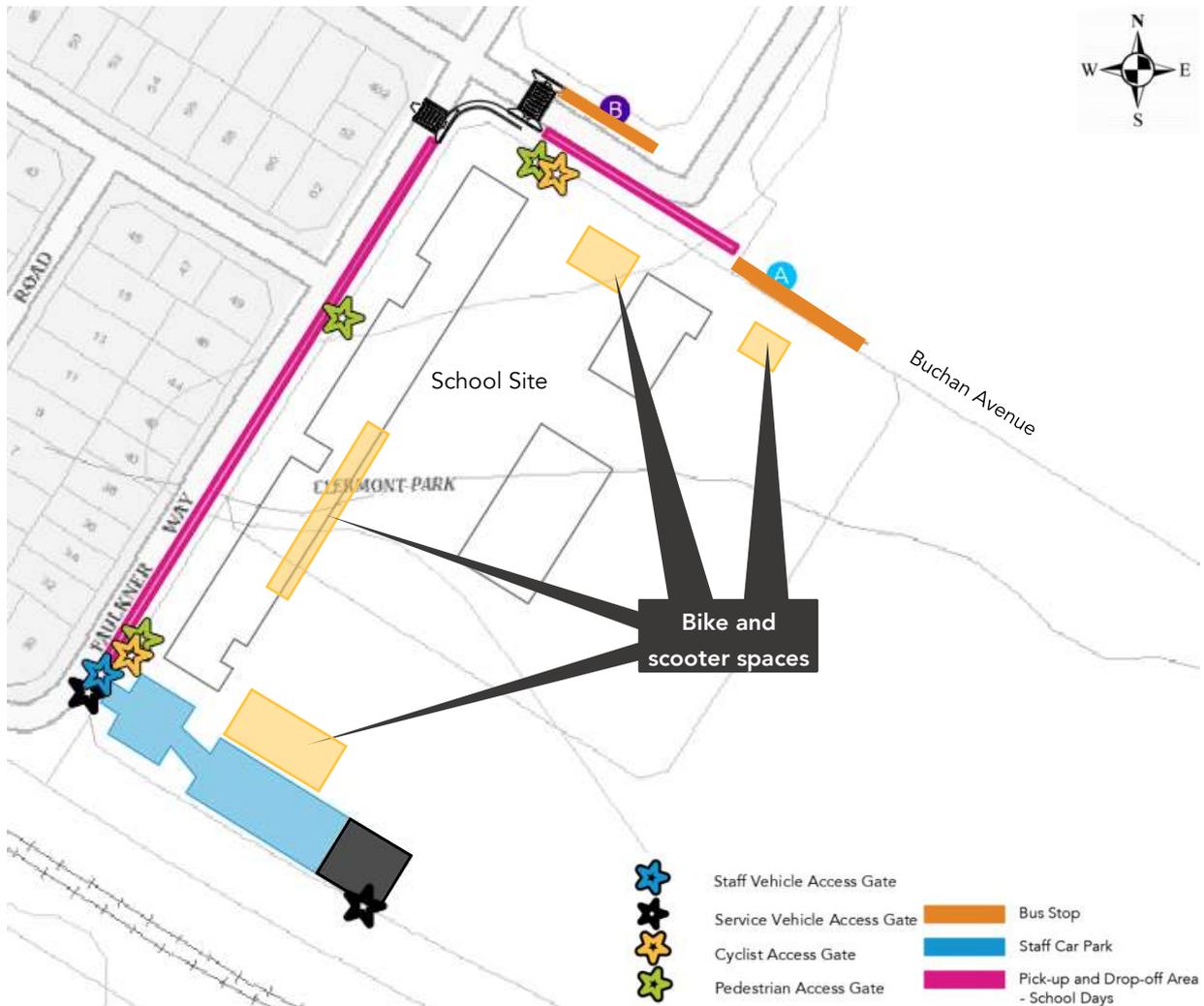


Figure 51 - Bicycle and Scooter Rack Distribution

6.2.4 Public Transport

As discussed in Section 4.3.6, the proposed School site only has 3 bus routes (103, 859, 869) which are within the 400m catchment. It is proposed that additional bus services are provided along the nearby bus stops (bus stop A and B as shown in Figure 50) along Buchan Avenue so that parents can accompany their children to School and continue on a bus to their place of work.

As part of improving the potential public transport utilisation by the school community, the project is proposing measures described in the following subsections.

6.2.4.1. Facilities

There is one bus stop currently under construction on the southern side of Buchan Avenue. The project is proposing to provide an additional bus stop on the northern side of Buchan Avenue with a zebra crossing to enable safer access to bus stop B, as shown in Figure 52.

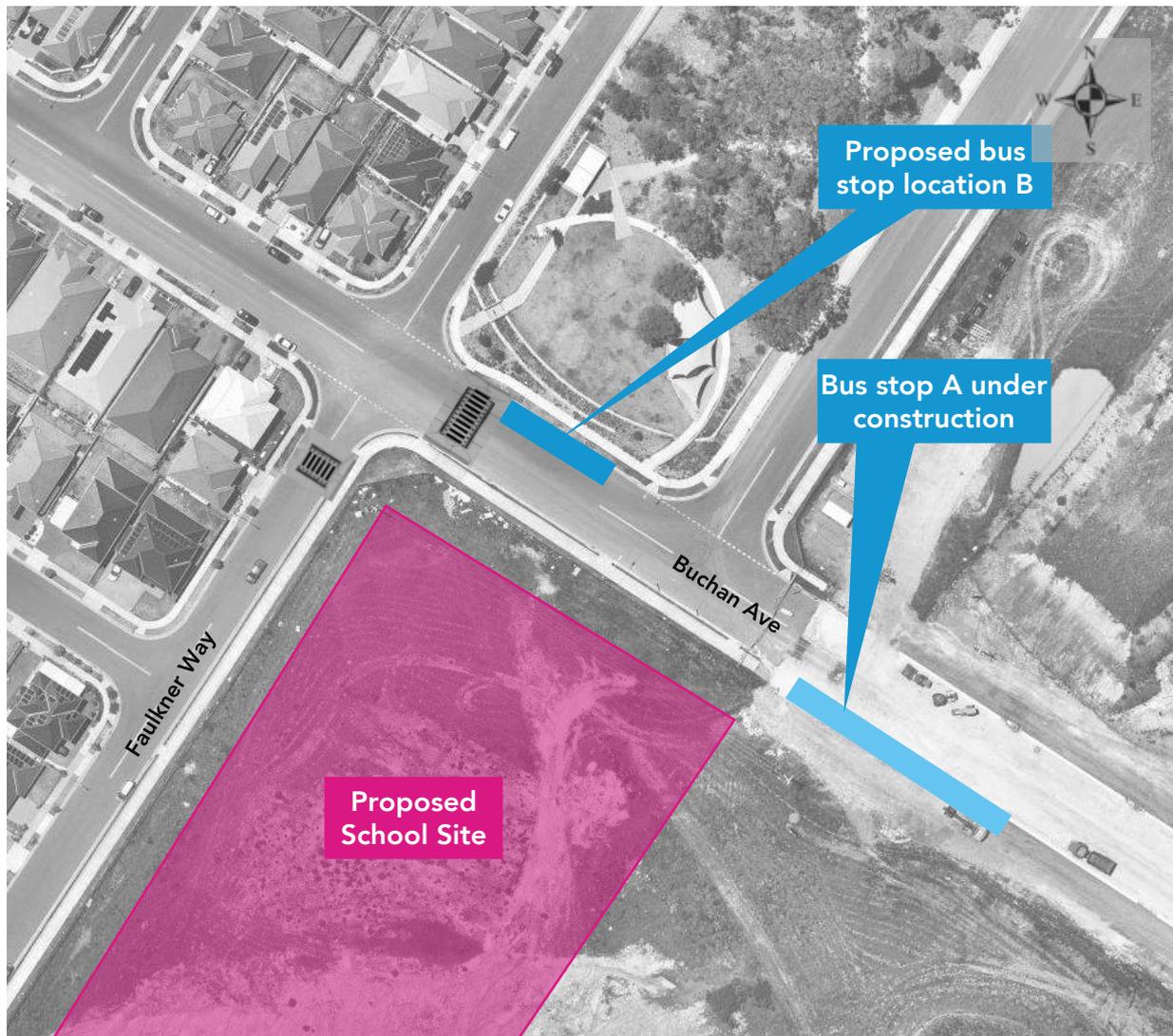


Figure 52 - Bus stop facilities

6.2.4.2. Bus Routes and Services

Upon discussion with the Service Planner from TfNSW, two of the proposed bus routes covering the eastern and western areas are to be considered for implementation with some minor amendments to suit the existing road and bus infrastructure. It is noted that the road infrastructure in Edmondson Park has not been fully constructed yet. Adjustments to the bus routes will be required upon completion of road and intersection work. The following is a potential option for the bus routes.

Both bus routes and shown in Figure 53 will drop children off and can also be used by parents to access Edmondson Park Station where they can use the existing train services to reach Liverpool or the City using the T2 and T8 train lines as discussed in Section 4.3.

It is proposed to provide a regular bus route that will coincide with the staggered bell times.

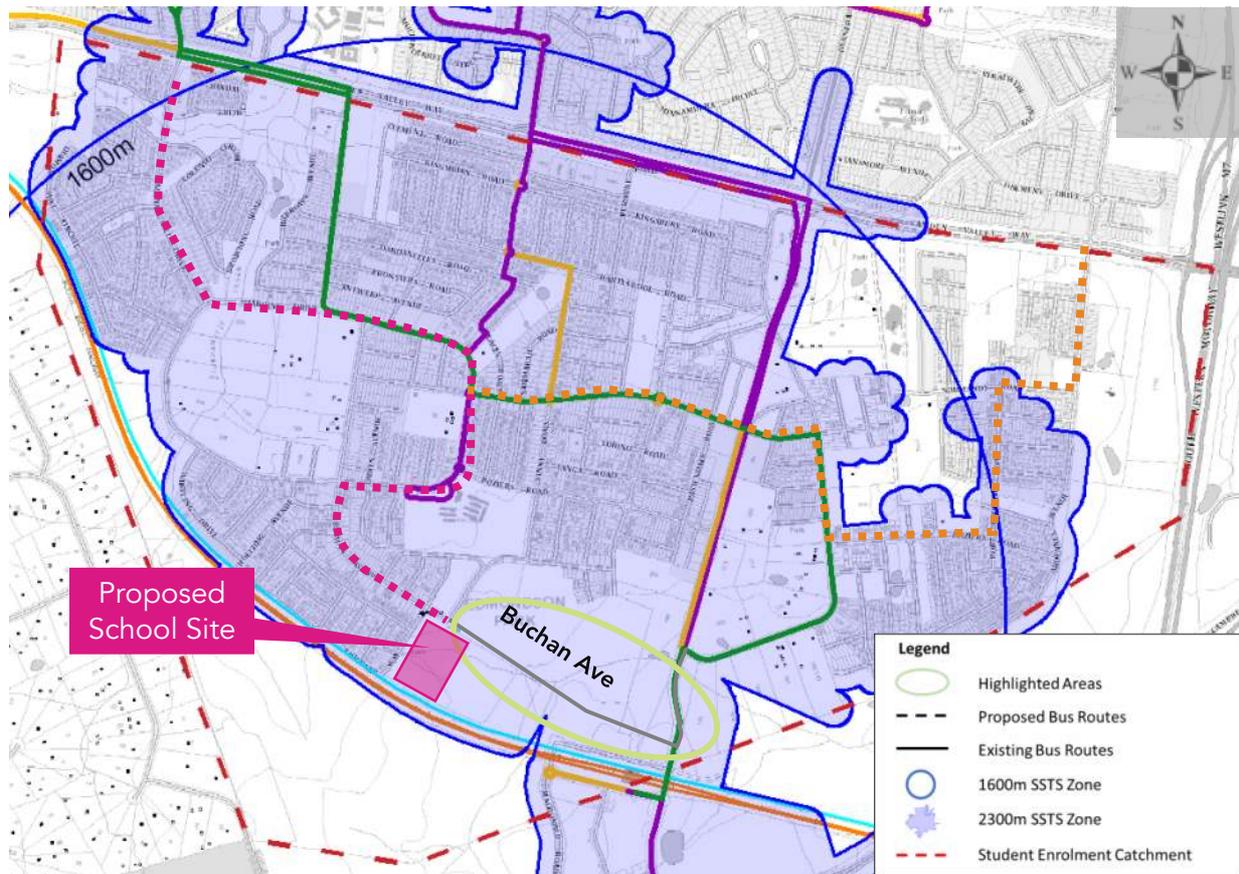


Figure 53 - Proposed bus route

6.2.5 Pick-up and Drop-off Location

The following considerations have been made regarding pick-up and drop-off locations:

- It is important to provide convenient and sufficient pick-up and drop-off facilities, as otherwise carers may undertake illegal manoeuvres (double parking for example) or stop across the road of the school, thus making the students cross the road in non-dedicated locations.
- It is beneficial to disperse the pick-up and drop-off location to reduce the number of vehicles arriving / leaving at the same time in a concentrated area. Considering the residence of students within the enrolment catchment, the following has been considered:
 - For those living to the north-east of the school it is proposed to provide the pick-up and drop-off along Buchan Avenue (refer to the orange lines in Figure 54).
 - For those living north and west of the school it is more convenient to pick-up / drop-off on Faulkner Way as drivers would need to perform a U-turn to get on the right side of Buchan Avenue (refer to the green lines in Figure 54).
 - All vehicles will exit via the future south and east roads onto Buchan Avenue (refer to the blue lines in Figure 54).

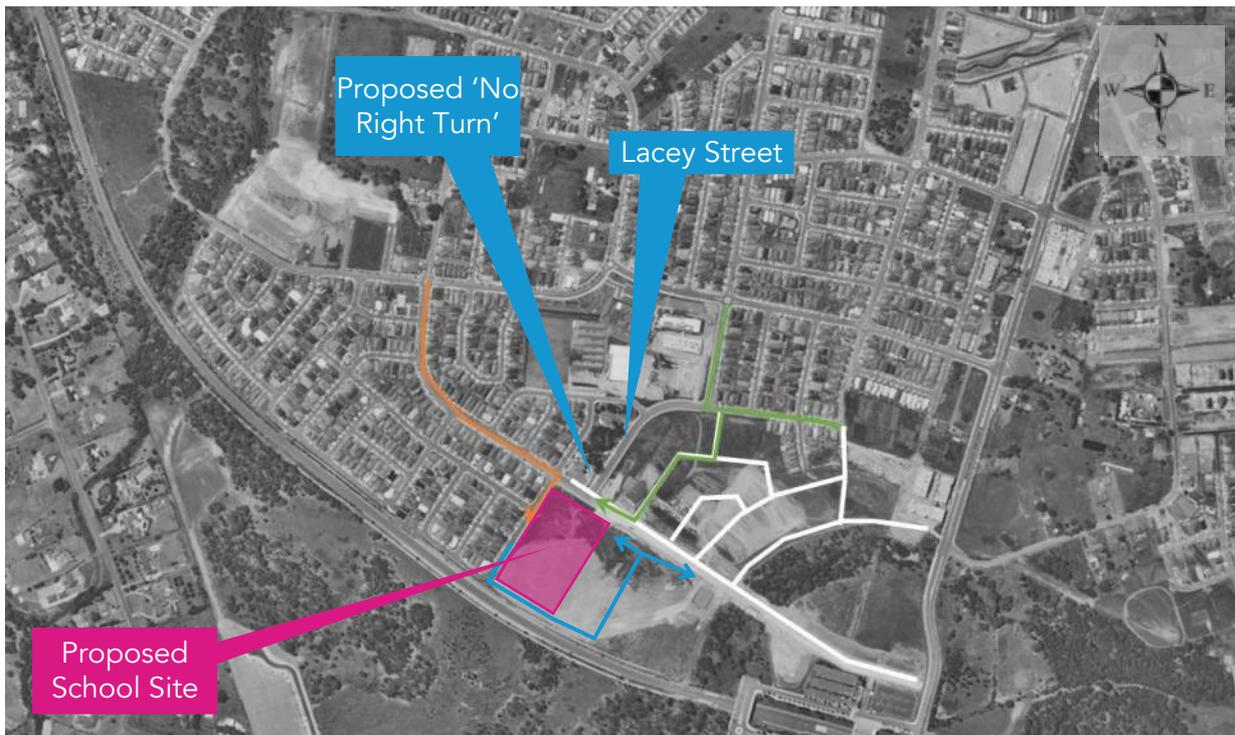


Figure 54 - Pick-up and Drop-off Distribution

- The Lacey Street and Buchan Avenue intersection is a potential conflict point when vehicles turn right from Lacey Street, they may be within a blind spot of the parents who exit the pick-up and drop-off. Upon completion of the adjacent roads east of Lacey Street, a 'No Right Turn' restriction is recommended to be implemented at the intersection, either during school peak hours only or permanently. An example of the conflict point and the mitigation measure is shown in Figure 55.

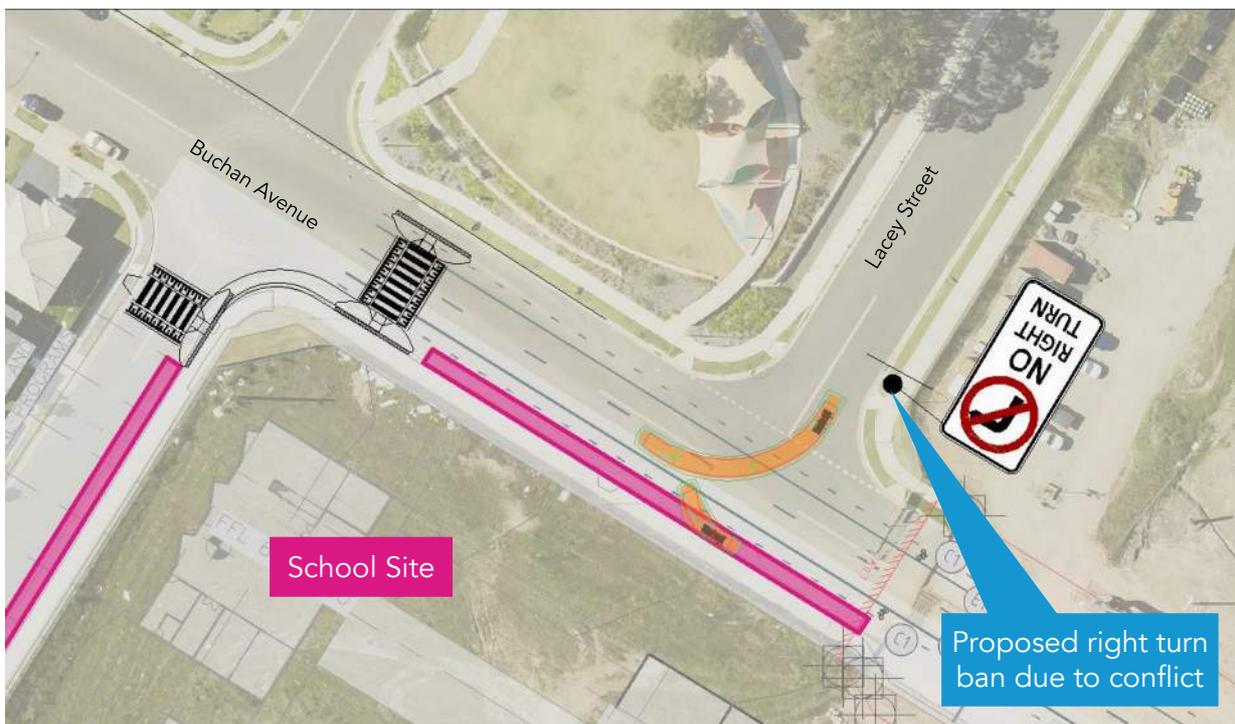


Figure 55 - Conflict point at Lacey Street and Buchan Avenue Intersection

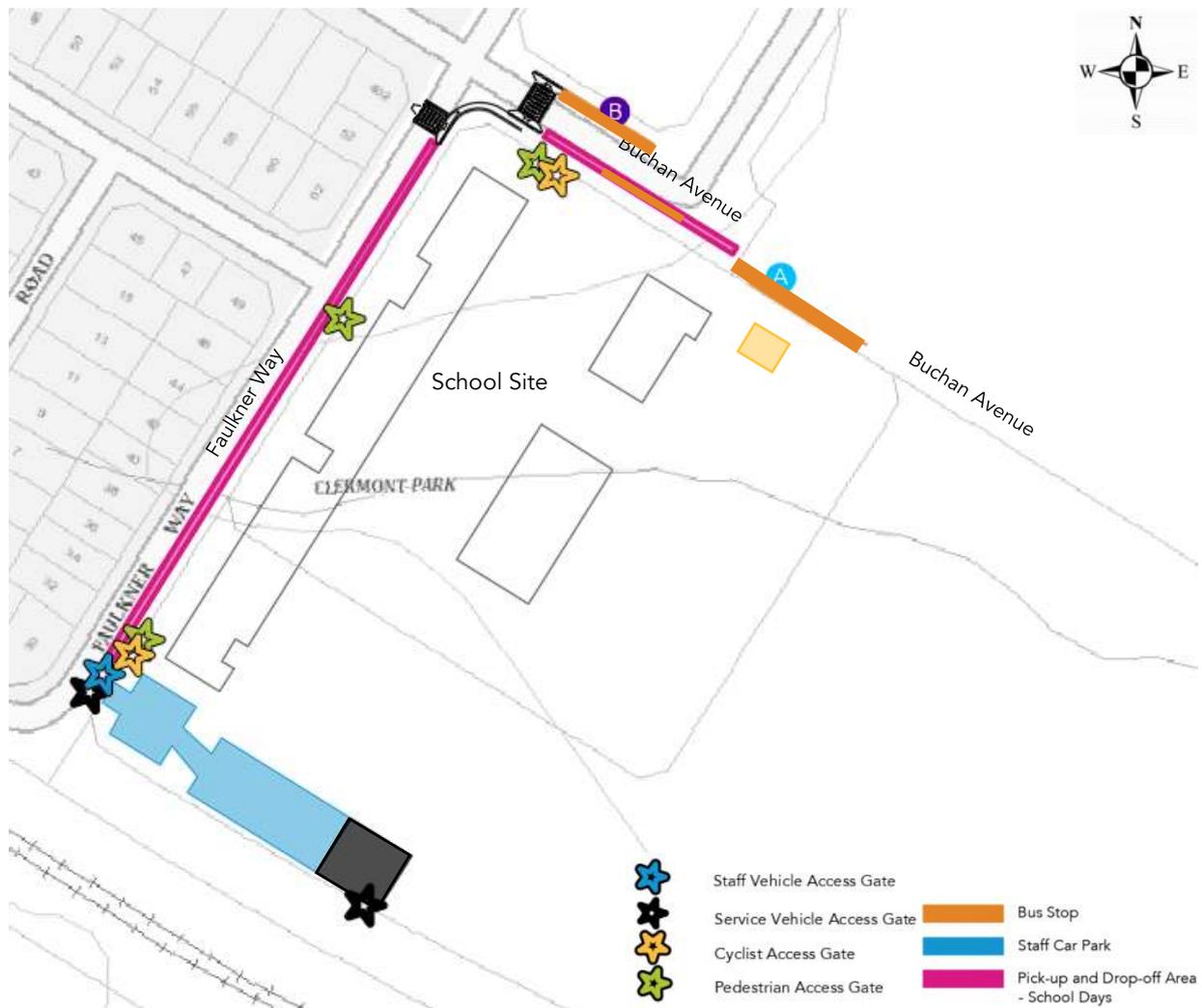


Figure 56 - School Access Plan

6.2.6 Transport Operations, Encouragement Programs and Staffing

In order to achieve the proposed targets, appropriate encouragement programs need to be implemented such as a “Walking Bus”, “Walk to School Day”, etc. These are further described in the School Transport Plan.

6.2.7 Target Travel Mode

When defining potential travel modes, the following has been taken into consideration:

- Potential achievements discussed in Section 5.2
- Proposed infrastructure improvements and proposed active and public transport provisions / changes presented in the above sections.
- Some parents will choose to drive regardless of the infrastructure and facilities provided. The further the distance between the School and the place of residence, the more likely it is that parents will drive.

- The infrastructure barriers which may cause students and parents in different areas within the catchment to choose different modes of transport.

Due to the infrastructure barriers, the school’s enrolment catchment has been divided into three sections as shown in Figure 57. The area shown blue has been divided as students can only use Jardine Drive to access the school. As discussed in Section 4.2, Jardine Drive has a lack of lighting, no formalised pedestrian or cycling facilities and is quite narrow to allow safe passage for students. The area shown green on the other hand is divided by Soldiers Parade and Bernera Road which has limited crossing opportunities.

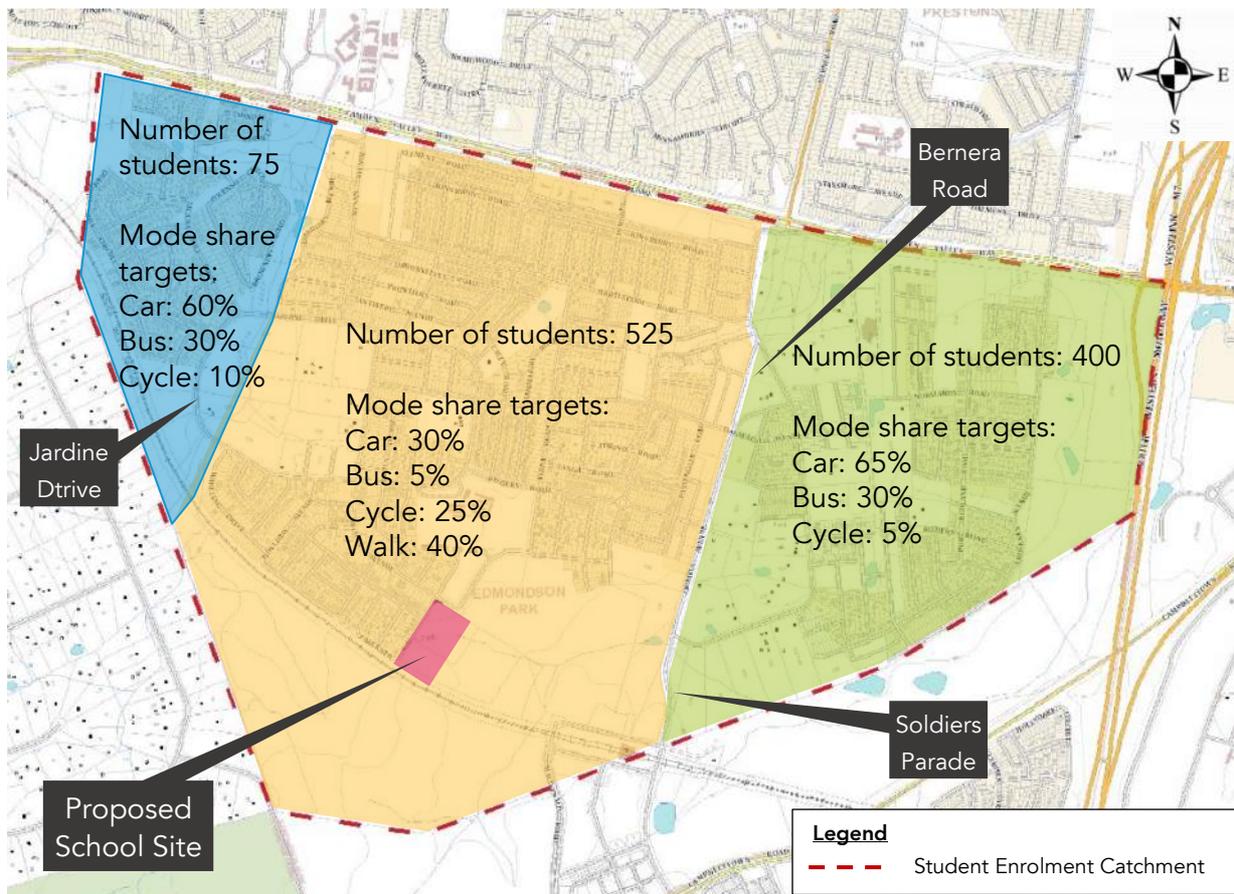


Figure 57 - Travel mode targets

Based on predicted student numbers living within each of the three areas and the potential mode share targets in the individual areas, the proposed overall targets for each travel mode are:

- 21% walking
- 16% cycling or scooting
- 17% taking public transport
- 46% driving

6.2.8 Pick-up and Drop-off Quantity

Based on the proposed target travel modes and Poisson distribution assumptions made in Section 6.1, the proposed School will likely require the following number of pick-up and drop-off spaces:

Table 11 - Pick-up and Drop-off for Moderate / Target Scenario

Number of students	Vehicle Utilisation	Number of students being driven	Car Occupancy	Number of Vehicles Arriving	Number of vehicles per bell time	Poisson Distribution Modelled No of Spaces (Length)
1,012	46%	466	1.2	388	194	35 (210m)

6.3 Ideal Scenario

Based on the travel analysis shown in Section 5.2, 42% of students live within the walking catchment and 52% of students live within the cycling catchment. Therefore, in an ideal (but potentially unrealistic) scenario, near all of these students would walk or cycle to school.

In this scenario, 520 bike parking spaces would be required.

In an ideal scenario where all students utilise public and active transport, no students would need to travel by private vehicles and therefore, no pick-up and drop-off spaces would be required.

Up to 47% (~470) of students could benefit from the existing bus routes. Additionally, 29% (~290) of students who live in areas where there are active transport barriers to reach the school, they would benefit from the proposed bus routes. With a bus capacity of approximately 50 passengers and the potential for parents to want to accompany their children, this would require a provision of up to 8 buses per bell time.

6.4 Travel Modes – Comparison of Transport Scenarios

A comparison of the three school transport scenarios is shown in Table 12.

Table 12 - School Transport Scenario Comparison

Mode Share	Base Case		Moderate Case		Ideal Case	
	%	#	%	#	%	#
Walking	0.9%	9	21%	210	42%	420
Cycling and Scooting	0.3%	3	16%	160	52%	520
Public Transport – Bus + Train	3.8%	38	17%	170	(~76%)	(~760)
Private Vehicles	76.5%	765	38%	46%	380	-
Carpooling	7.2%	72	8%		80	460
Other	11.3%	120	-	-	-	-

7. Demand and Design Assessment

7.1 Planning Policies

The site is located within Liverpool City Council's *Liverpool Local Environment Plan 2008*. In establishing the parking provision requirements, reference is made to parking provision rates stipulated in the following planning documents:

- Liverpool Development Control Plan 2008 Part 1 – General Controls for all Developments
- Liverpool Development Control Plan 2008 Part 2.11 – Land Subdivision and Development in Edmondson Park (Liverpool DCP)
- Edmondson Park South Development Control Plan 2012 (Edmondson Park South DCP)
- Road and Maritime Services (RMS) Guide to Trip Generating Developments 2002 (RMS Guide)
- Disability Standards 2010
- Planning Guidelines for Walking and Cycling (NSW Government 2004)

The following sections outline the minimum parking requirements and discussions around the proposed school development.

The following sections also present an assessment of the proposed development with reference to the requirements of AS2890.1:2004 (Off-street car parking), AS2890.2:2018 (Off-street commercial vehicle facilities), AS2890.6:2018 (Off-street parking for people with disabilities) and AS2890.3:2015 (Bicycle parking) and industry best practice. This section is to be read in conjunction with the architectural plans provided by TKD Architects shown in Attachment 1.

7.2 Pedestrian Access

The following considerations have been made:

- Pedestrian access gates are physically separated from vehicular access points (refer to the green stars representing pedestrian gates and the blue star representing vehicular access in Figure 58).
- There are footpaths on each side of the surrounding roads providing good pedestrian connectivity in the direct vicinity of the school.
- The project is proposing to provide zebra crossings across two of the frontage roads, Buchan Avenue and Faulkner Way. A detailed description on the chosen locations is provided in Section 6.2.2.
- Pedestrian gates, zebra crossing locations and the bus stops are located in close proximity to each other.

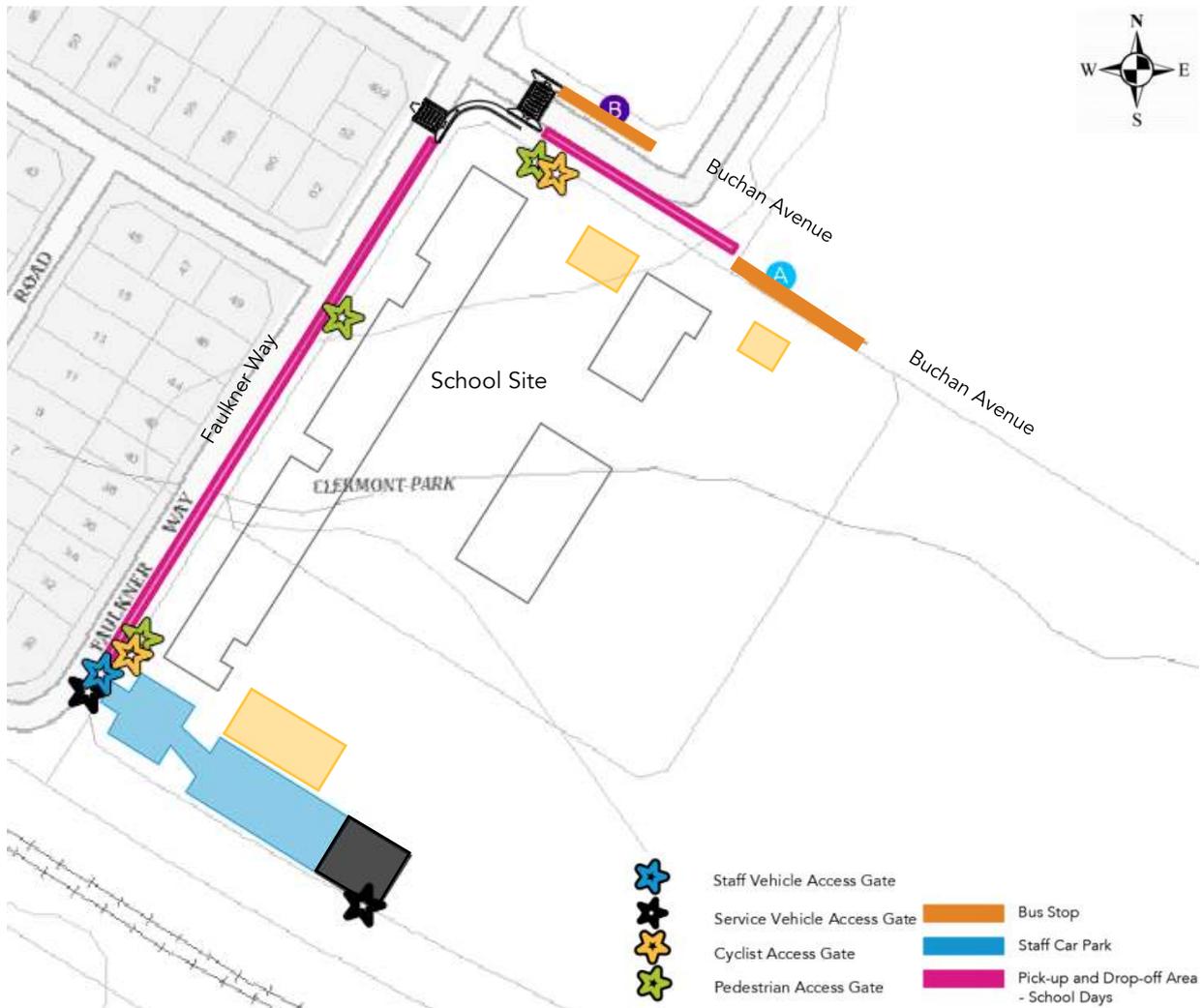


Figure 58 - Pedestrian Access

7.3 Bicycles and Scooters

7.3.1 Demand Assessment

The parking rates for bicycles spaces varies based on different planning documents relevant to the site. The *NSW Planning Guidelines for Walking & Cycling 2004* outlines the bicycle parking requirement for staff and visitors only. The *Austrroads Guide to Traffic Management Part 11* and NSW Government’s *Educational Facilities Standards and Guidelines* both provide bicycle parking rates based on students only. The Liverpool DCP states the bicycle parking provision for staff and students.

The bicycle parking requirement and provision for staff, visitors and students at the proposed primary and pre-school are summarised in Table 13.

Table 13 - Bicycle Parking Requirement and Provision

User Group	No. of staff / students	Bicycle Parking Provision Rate	Bicycle Parking Requirement	Bicycle Parking Provided	
Planning Guidelines for Walking and Cycling					
Primary School Staff	59	1 staff space for 3-5% staff (long-term use)	2 – 3 spaces	158 bike and 24 scooter spaces	
Primary School Visitor		1 visitor space for 5-10% staff (short-term use)	3 – 6 spaces		
Preschool Staff	7	1 staff space for 3-5% staff (long-term use)	1 space		
Preschool Visitor		1 visitor space for 5-10% staff (short-term use)	1 space		
Total:			7-11		
Austrroads Guide to Traffic Management					
Primary School Student	Approx. 289 students in Year 5 and 6	1 space per 5 students over Year 4 (long-stay)	20 spaces		
Preschool Student	N/A	N/A	N/A		
Total:			20		
Educational Facilities Standards and Guidelines					
Primary School Student	Core 35 School		60 spaces	6 staff bike spaces	
Preschool Student	-		-		
Total:			60		
Liverpool DCP					
Primary School Staff	59	1 space per 10 staff	6 spaces		
Primary School Students	1012	1 space per 10 students	101 spaces		
Preschool Staff	7	1 per 10 staff	1 space		
Preschool Centre	1	2 per centre	2 spaces		
Total:			110		

The development proposes to provide a total of 158 bike and 24 scooter spaces for students and visitors and additional 6 for staff.

The school will have space allocated for potential expansion of bicycle spaces in the case of future demand growth.

7.3.2 End of Trip Facilities

The Liverpool DCP and the *NSW Planning Guidelines for Walking & Cycling 2004* also state that bicycle facilities are to incorporate end of trip facilities for staff. The lockers, showers and change rooms requirements and provisions according to the planning guidelines are summarised in Table 14, Table 15 and Table 16 respectively.

Table 14 - Lockers for Staff Requirement and Provision

User Group	No of Staff	Racks	Lockers Provision Rate	Lockers Requirement	Lockers Provided	
Liverpool DCP						
Primary School Staff	59	6	1 per employee bicycle space	6	Sufficient lockers provided within staff room	
Preschool Staff	7					
NSW Planning Guidelines for Walking & Cycling 2004						
Primary School Staff	59	6	1 per 3 racks	2		
Preschool Staff	7					

Table 15 - Showers Requirement and Provision

User Group	Staff	Shower Provision Rate	Showers Requirement	Showers Provided	
Liverpool DCP					
Primary School Staff	59	1 per 10 employee bicycle spaces	1	1	
Preschool Staff	7				
NSW Planning Guidelines for Walking & Cycling 2004					
Primary School Staff	59	- 1 for 0-12 staff - 2 (1 male and 1 female) for 13-49 staff - 4 (2 male and 2 female) for 50-149 staff	4 (2 male and 2 female)		
Preschool Staff	7				

Table 16 - Change Cubicle Requirement and Provision

User Group	No of Staff	Change Rooms Provision Rate	Change Rooms Requirement	Change Rooms Provided	
Liverpool DCP					
Primary School Staff	59	1 per 10 employee bicycle spaces	1	1 within the shower room	
Preschool Staff	7				
NSW Planning Guidelines for Walking & Cycling 2004					
Primary School Staff	59	2 (1 male and 1 female) for 13-500 staff	2 (1 male and 1 female)		
Preschool Staff	7				

The development is proposing to provide 1 shower and change room for staff, which is in accordance with the Liverpool DCP.

7.3.3 Location

Bicycle spaces have been provided close to entry points as shown in Figure 59, with yellow stars representing cyclists' access gates and yellow area are bicycle spaces.

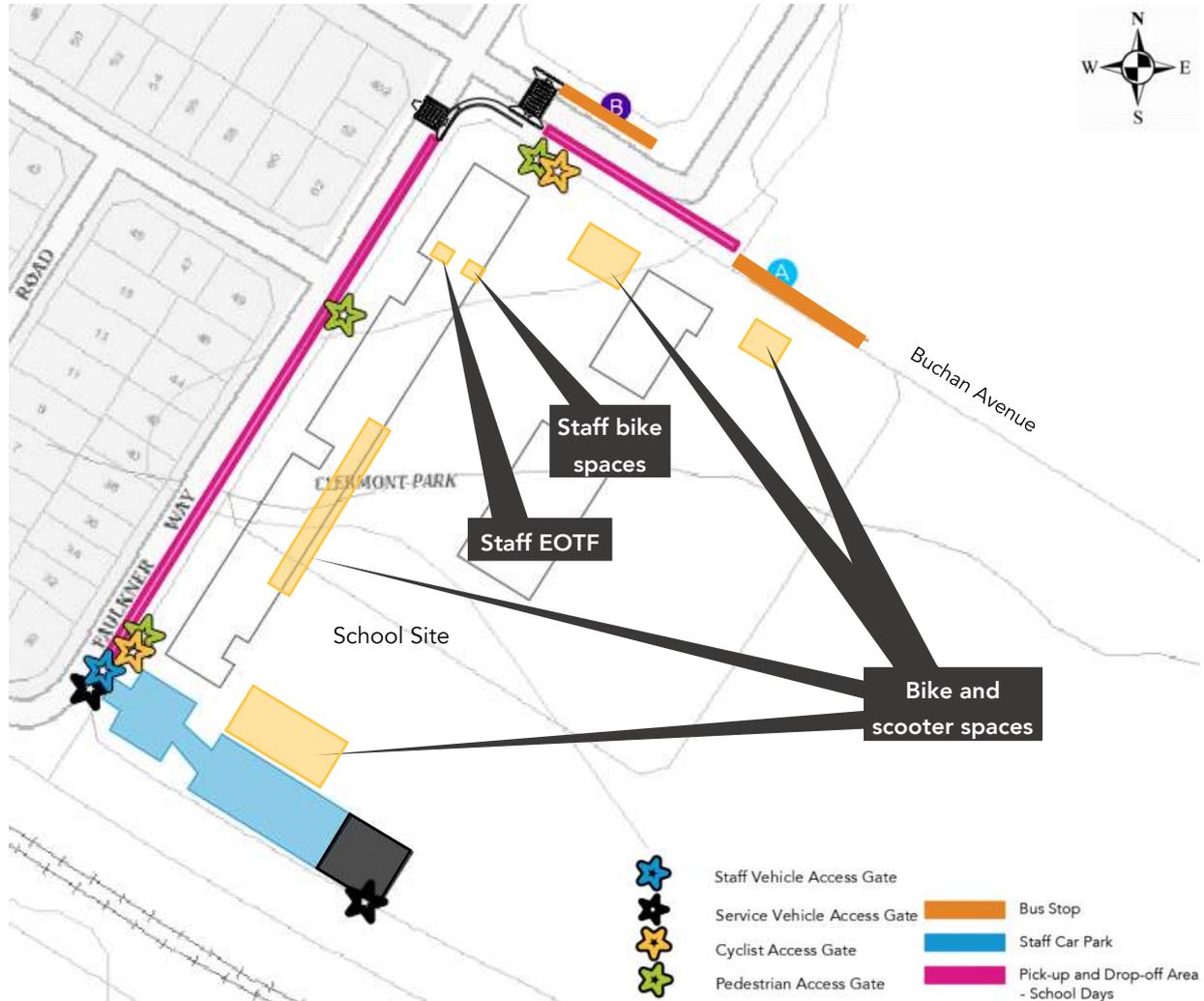


Figure 59 - Bicycle Space Location

7.3.4 Design Assessment

The DCP outlines that bicycle parking facilities are to comply with AS 2890.3:1993. It is therefore proposed to provide staff bicycle spaces in a secured Shared Multi Use storeroom, which may be equipped with bike racks. Bicycle spaces for visitors and students are provided as rails. This arrangement complies with Council's DCP.

Bicycle spaces shall be provided according to the standards, where a parking space envelope has the dimensions of 1.8m x 0.5m and an aisle of 1.5m is provided. As assessment of bicycle parking areas is provided in Attachment 3.

Scooter parking in form of racks will be provided as per Figure 60 or similar.

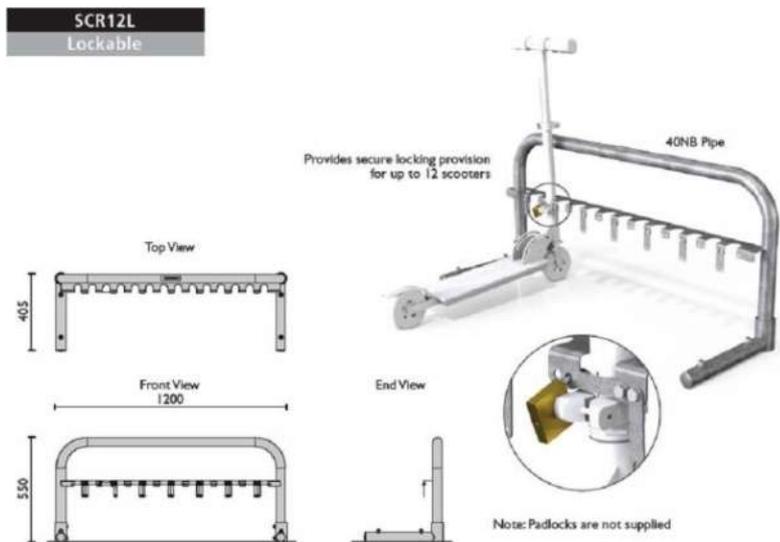


Figure 60 - Scooter Parking

7.4 Zebra crossings

7.4.1 Design

The proposed zebra crossings across the frontage roads are shown in Figure 61.

The proposal is to provide raised pedestrian crossings with kerb buildouts to reduce the width of the crossing at all frontage roads. Pedestrian fencing is proposed on the zebra crossings near the intersections. Grates are proposed along the kerb to allow water to flow to the water pits.

The buildouts of the two pedestrian crossings will be connected along the south eastern corner of Buchan Avenue and Faulkner Way to minimise the footprint of the intersection. This will serve as a traffic calming device and provide a larger pedestrian facility.

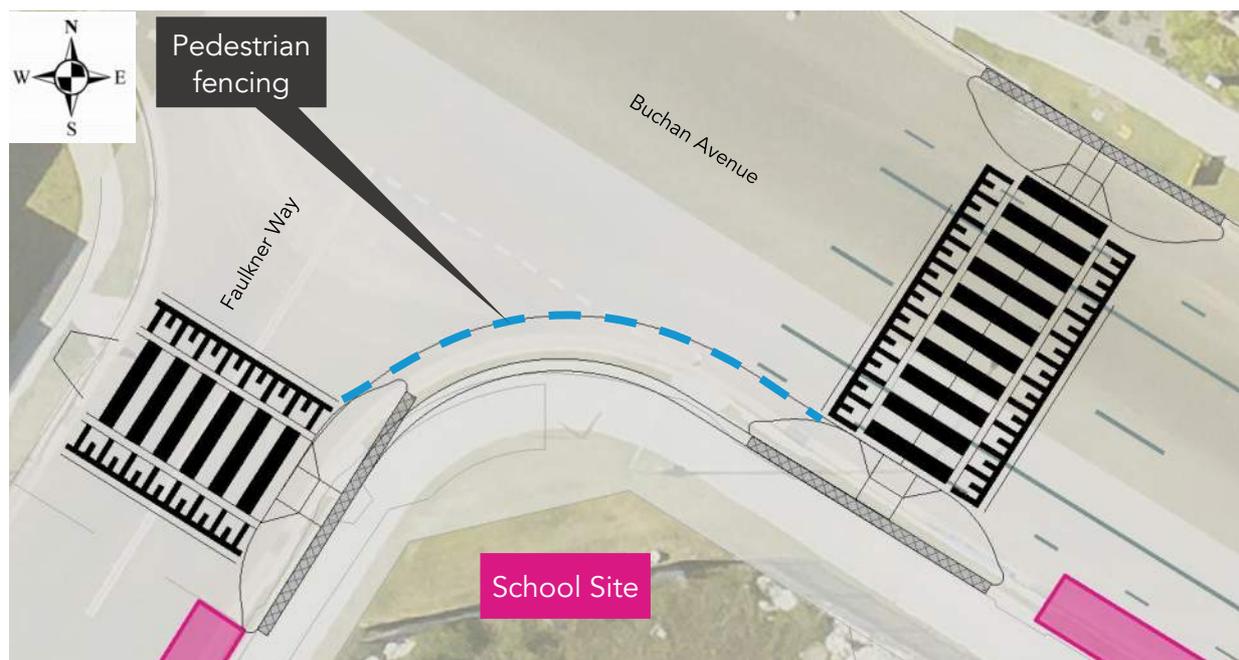


Figure 61 - Pedestrian Crossings

7.4.1.1. Zebra Crossing Warrants

RMS *Supplement to Austroads Guide to Traffic Management Part 10 (Supplement AGtTM Part 10): Traffic Control and Communication Devices (2016)* stipulates the conditions for "Reduced warrant for sites used predominantly by children and by aged or impaired pedestrians" which are as follows:

If the crossing is used predominantly by school children, is not suitable site for a children's crossing and in two counts of one hour duration immediately before and after school hours:-

(a) $P^i \geq 30$

AND

(b) $V^i \geq 200$

a pedestrian (zebra) crossing may be installed.

If at least 50% of pedestrians using the crossing are aged or impaired and for each three one hour periods in a typical day

(a) $P \geq 30$

AND

(b) $V \geq 200$

AND

(c) $PV \geq 60,000$

a pedestrian (zebra) crossing may be installed.

Discussion:

The proposed pedestrian crossing locations and the existing and development vehicular volumes during the morning and afternoon school peak hours at the frontage roads are presented in Figure 62. The major users utilising the proposed pedestrian crossings along the frontage roads will be the School students and their parents.

The proposed number of School students is 1,012, and therefore, the number of pedestrians immediately before and after school at the proposed zebra crossings is expected to be at least 30 ($P \geq 30$). Additionally, it can be seen from Figure 62 that the one-hour vehicular flow immediately before and after school hours along the Buchan Avenue frontage road is greater than 200 vehicles ($V \geq 200$). Therefore, it is anticipated that a zebra crossing will be required along Buchan Avenue. The number of vehicles using Faulkner Way can be estimated by using the pick-up and drop-off distributions described in Section 6.2.8. The estimated quantity of vehicles for each bell time is 193, which totals 386 vehicles within one hour, as the bell times are offset by a 20-minute period. By distributing the traffic based on the ratio of pick-up and drop-off length on both frontages (Buchan Avenue being 63m and Faulkner Way being 175m), it is anticipated that 283 will drive through the Faulkner Way zebra crossing, which is greater than 200 vehicles ($V \geq 200$). Therefore, Faulkner Way will also require a zebra crossing.

⁴ Pedestrian flow

⁵ Vehicular flow



Figure 62 - Vehicular Flows

7.4.1.2. Children's crossing Warrant

RMS *Supplement to Austroads Guide to Traffic Management Part 10 (Supplement AGtTM Part 10): Traffic Control and Communication Devices (2016)* stipulates the following requirements for Children's crossing:

- *The crossing is located on local and lightly trafficked roads where in a one hour duration immediately before and after school hours the traffic flow exceeds 50 vehicles per hour in each direction and during the same hour 20 or more children cross the road within 20 m of the proposed crossing location.*

Discussion

As shown in Figure 62 the vehicular volumes along the frontage roads exceed 50 vehicles per hour in each direction for both frontages. Likewise, as discussed in Section 7.4.1.1, the number of pedestrians immediately before and after school at the proposed zebra crossings is expected to be at least 30 ($P \geq 30$). Hence, both frontages meet the warrants for a Children's Crossing.

- *85th percentile speed of traffic must not exceed 60km/h one hour before or after school hours. Note: In special circumstances where a children's crossing is required on roads where the 85th percentile speed is greater than 60km/h, council may apply to RMS for consideration and approval (Principal Manager or equivalent – Level 4 delegation or above).*

Discussion

The proposed frontage roads are expected to be subjected to "School Zone Speed Limit" after the school commencement, meaning that the speed limit of all frontage roads will be 40km/h. Additionally, all surrounding roads have a posted speed limit of 50km/h, therefore the speed of vehicles is anticipated to be less than 60 km/h.

- *An undertaking from the school principal to arrange the display of the Children Crossing flags or signs during and only during the specified period of operation 8.00am – 9.30am and 2.30pm – 4.00pm and when necessary at other times such as school excursions and school sport days.*

Discussion

Children Crossing flags or signs can be posted during specified period of operation and when necessary.

- *In some instances, a children's crossing may be installed at existing pedestrian crossings (zebras) where the existing Children Crossing flags are in operation and such crossings are located near infants and primary schools. However, if the prominent use of the existing zebra crossing occurs during the hour before and after school, consideration should be given to its removal and replacement with a children's crossing.*

Discussion

Children Crossing flags or signs can be posted during specified period of operation and when necessary.

7.4.1.3. Summary

As discussed in Sections 7.4.1.1 and 7.4.1.2 both frontage roads meet the warrants for a zebra crossing. Therefore, it is required that raised zebra crossings are provided on both frontage roads.

7.4.2 Swept Paths at Zebra Crossings

Kerb buildout on the proposed zebra crossings have been designed to allow Heavy Rigid Vehicle (HRV) turn movements. Figure 63 shows that a HRV and a B99 vehicle can pass each other at the proposed zebra crossings.

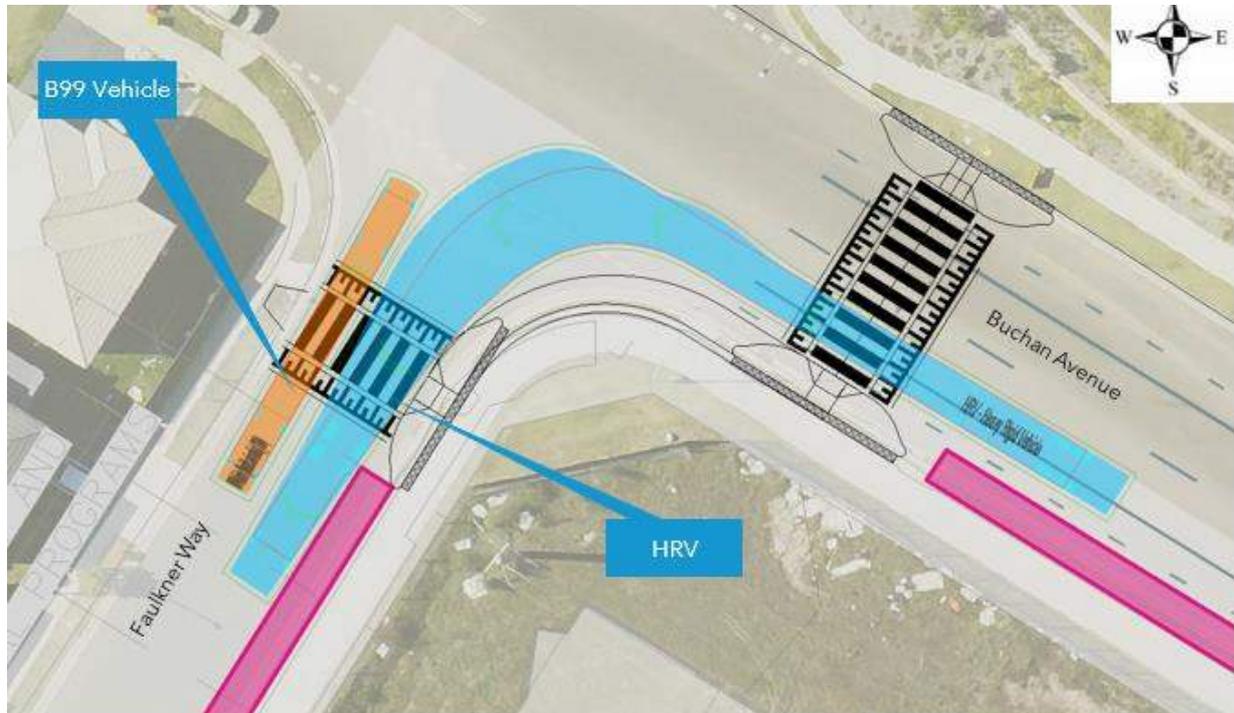


Figure 63 - Swept path assessment along proposed zebra crossings

7.5 Public Transport

7.5.1 Bus Stop Quantity

There is currently a bus stop being constructed on the southern side of Buchan Avenue and an additional proposed bus stop on the northern side. These bus stops will be used by students residing outside of walking and cycling catchment and by parents for their onward journey to work.

Given the proposed public transport mode share target of 17% (refer to Section 6.2.7), it is anticipated that approximately 170 students will require bus transportation. The bus arrival and departure time is being discussed with the bus operator to be aligned with the student's pick-up and drop-off times and parents' journey to work time as discussed in Section 4.3.4.

7.5.2 Access

As discussed in Section 6.2.4.1, the project is proposing to provide a zebra crossing across Buchan Avenue just west of the bus stop to enable students to safely travel between the school and the bus stop on the northern side of the road.

7.5.3 Location

The bus stop on the southern side of Buchan Avenue will be located east of the school's pedestrian access gate. Students will need to walk approximately 60m to reach the gate and will not need to cross any roads, which is considered optimal.

The bus stop located on the northern side of Buchan Avenue will require students to cross the road using the Zebra crossing. The crossing is aligned so that students can access it immediately after getting off the bus.

Signage required to communicate the bus zone is shown in **Attachment 2**.

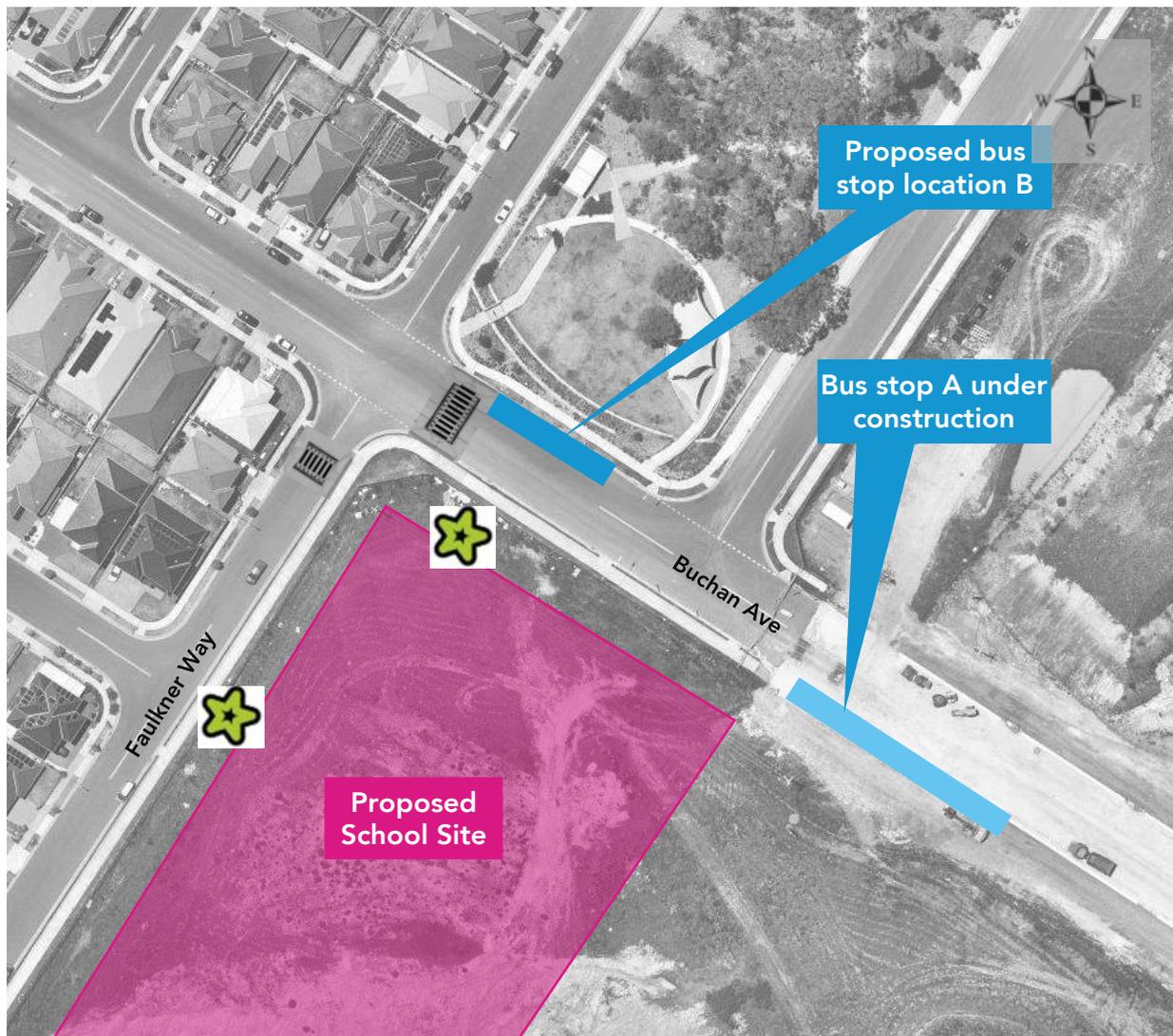


Figure 64 - Bus stop location

7.5.4 Dimension

A bus is typically 12.5m long, but it requires space to turn into the bus zone and to swing out of it. Therefore, a bus zone requires to be 30m in length.

As shown in Figure 65, the required length for a bus zone can be accommodated on the norther side of Buchan Avenue, just east of the proposed raised zebra crossing.

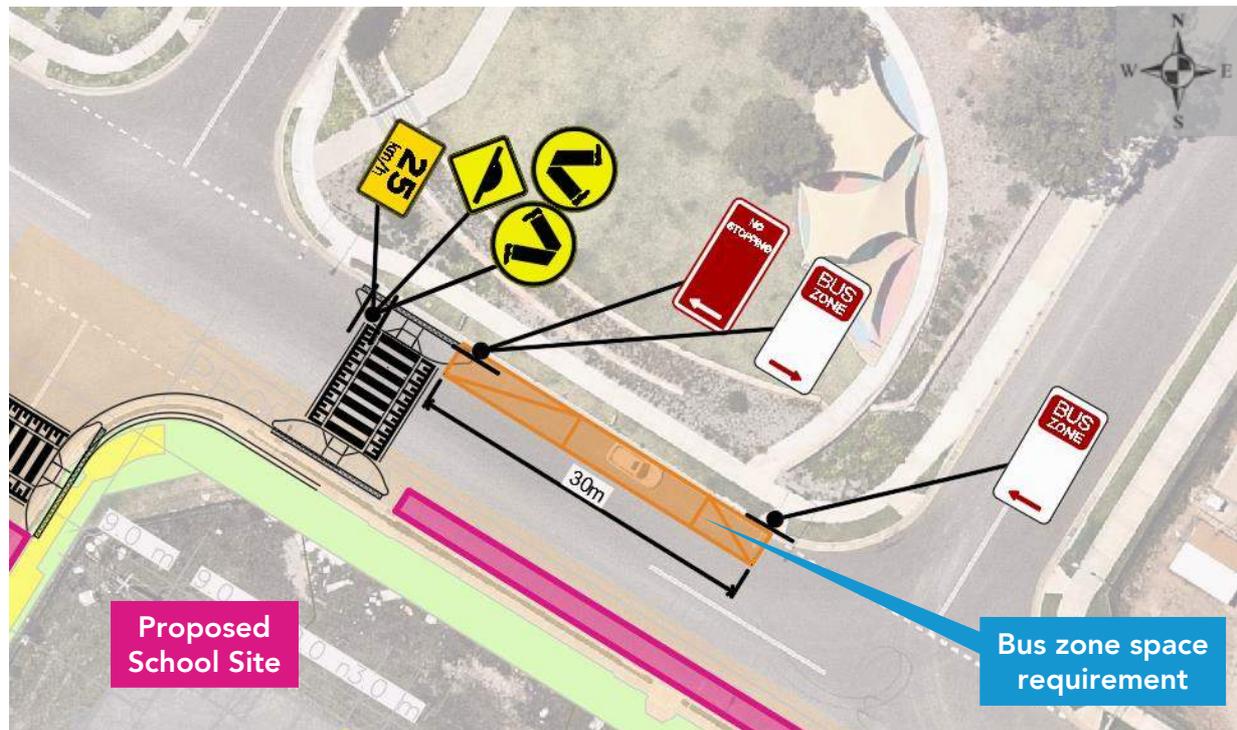


Figure 65 - Dimesion requirement for a bus zone

7.6 School Zone

A school zone needs to be established along the frontage and surrounding roads to alert drivers of the change in the speed limit during the main pick-up and drop-off times.

The School Zone is to be implemented according to the requirements of “RTA TD 2003/RS02 Installation of 40km/h School Zones on Multi-lane Roads and High Speed Roads”. This involves the installation of appropriate line marking and signage with flashing lights at the beginning / finish of a school zone, approximately 100m from each school access point, refer to the proposed layout in **Attachment 2**.

7.7 Pick up and Drop off

7.7.1 Demand Assessment

The project is committed to implement appropriate measures discussed in detail in the School Transport Plan to attract the largest possible proportion of students to use active and public transport to commute to and from school. Based on target travel mode analysis described in Section 6.2.8 , the general pick-up and drop-off for the School has been calculated to be at around 46% students.

The number of required pick-up spaces is calculated using a model based on Poisson distribution, and the analysis is shown in Table 11 in Section 6.2.8. A total of 35 general pick-up and drop-off spaces is required at a time. The following pick-up / drop-off spaces are proposed along the frontage roads:

- A total of 39 “Pick-up and Drop-off” spaces are proposed including 10 “Pick-up and Drop-off” spaces during pick-up and drop-off times along Buchan Avenue and 29 “Pick-up and Drop-off” spaces during pick-up and drop-off times along Faulkner Way.

All pick-up and drop-off spaces are provided along the frontage as shown in Figure 66. Since the frontage roads can accommodate the pick-up and drop-off requirement, on-site pick-up and drop-off is not considered required. Appropriate signage needs to be implemented for pick-up and drop-off, which is presented in **Attachment 2**.

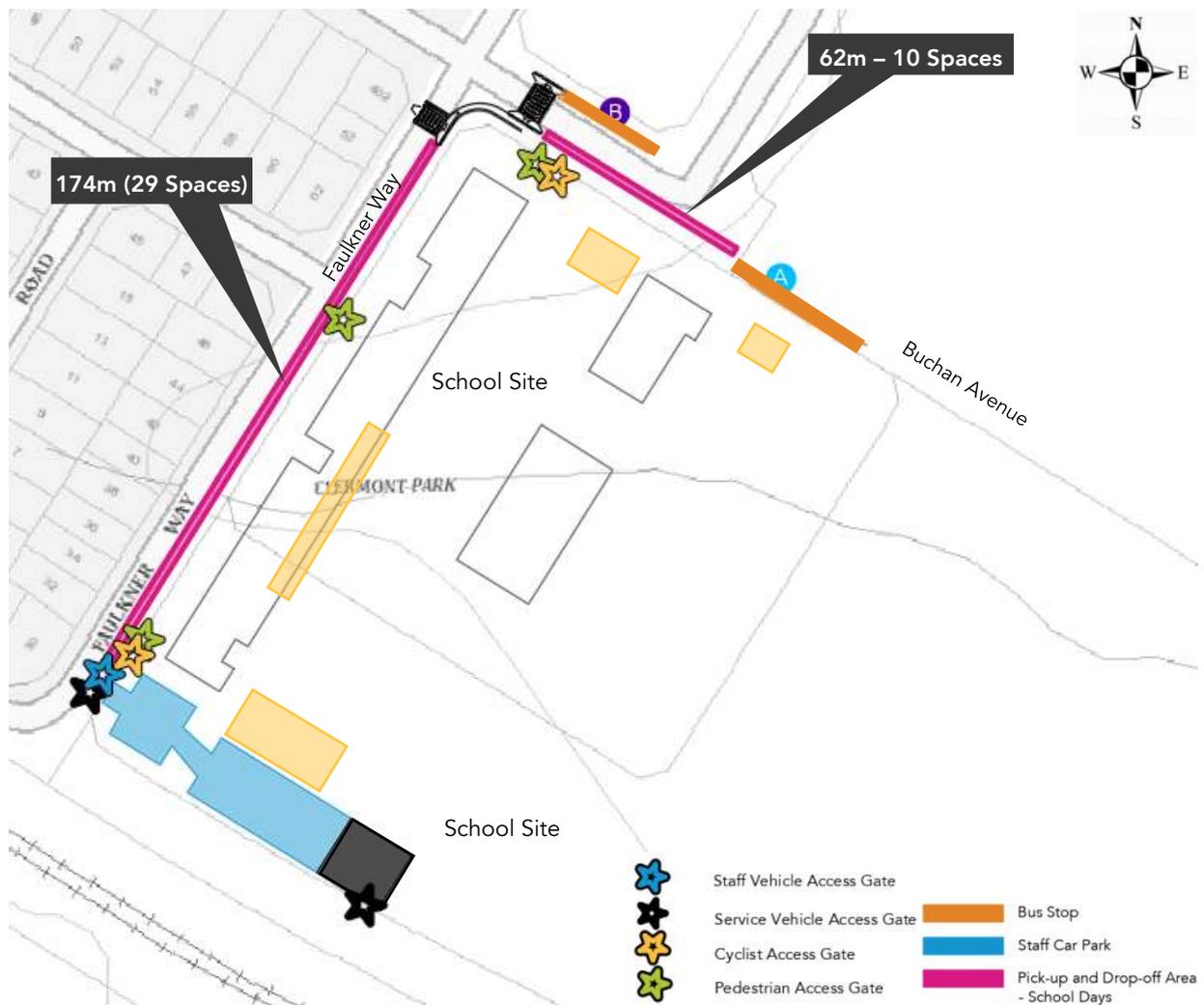


Figure 66 - Pick-up and Drop-off Locations

7.7.2 Design Assessment

The on street parallel kerb side car parking arrangements have been assessed against the requirements of AS2890.5:1993. General on-street spaces have been marked to be 2.3m wide and 6m long.

7.8 Car Parking

7.8.1 Guidelines and Statutory Documents

Liverpool City Council's DCP 2008 Part 1

In regard to car parking provision requirement, reference is made to *Liverpool DCP 2008 Part 1 Section 20.3*. It is noted that the detailed design of the preschool is not part of this SSDA (only seeking consent for land use and cold shell); however, the car parking provision incorporates the demand for it. The DCP stipulates the following car parking provision rates for educational establishments and child care centres in rural, residential and industrial zones:

Educational Establishment

- 1 space per 1 staff member
- 1 space per 30 students

Childcare Centres

- 1 space per staff member
- 1 space per 10 children

Educational Facilities Standards and Guidelines (EFSG)

This document does not provide any car parking rates.

The Department of Education⁶

The following is stated:

- *"A school is not obliged to provide parking on site to anyone at any time."*
- *"If a school has space available they may offer disabled parking spaces and parking for visitors and staff."*

⁶ <https://education.nsw.gov.au/teaching-and-learning/curriculum/learning-across-the-curriculum/road-safety-education/safe-travel/parking-on-school-grounds>

7.8.2 Demand Assessment

7.8.2.1. General Car Parking

The car parking requirements and provision for the primary school and preschool are summarised in Table 17.

Table 17 - Car Parking Requirement and Provision

Minimum Car Parking Provision Rate		Minimum car parking requirement	Car parking provided
59 Primary School Staff			
Liverpool DCP	1 space per 1 staff	59	35 for Primary School Staff
DoE	Not obliged to provide parking	0	
7 Preschool Staff			
Liverpool DCP	1 space per 1 staff	7	7 for Preschool Staff
1,012 Primary School Students			
Liverpool DCP	1 space per 30 students	34	0 for Primary School Students
DoE	Not obliged to provide parking	0	
40 Preschool Students			
Liverpool DCP	1 space per 10 students	4	6 for Preschool Students
		Total	35 for Primary School 13 for Preschool
		59 for Primary School Staff 34 for Primary School Students 7 for Preschool Staff 4 for Preschool Students/Visitor	

The development application proposes to provide 35 car spaces for the primary school and 13 for the preschool.

As a means of discussion, provision of parking spaces on school grounds reduces space that could be used for education or play areas otherwise. On the other hand, if all parking spaces were to be located off site, school staff would need to rely on and share on-street parking. Therefore, a balance between these two considerations needs to be met.

Taking into account the concise enrolment area of the school and the proposed walking, cycling and public transport connectivity to the site, it is considered that parking spaces for students, parents and visitors are not required on site.

It is proposed to provide 35 parking spaces for primary school staff, which accounts for 59% of staff. This is seen as acceptable due to the proximity of the school to the train station, and by limiting the on-street parking provision there is a potential to shift towards alternative transport modes.

It should be noted that the proposed development is a new school with no pre-existing travel behaviours. Therefore, by implementing the School Transport Plan low private car usage can be promoted from commencement of operations.

7.8.2.2. Accessible Car Parking

In regard to the accessible parking, the *Liverpool DCP 2008 Part 1 Section 20.3* stipulates the disabled car parking rate for educational land use. The requirement and provisions are summarised in Table 18.

Table 18 - Accessible Car Parking Requirement and Provision

Uses	Total Car Parking Provided	Accessible Car Parking Provision Rate	Accessible Car Parking Requirement	Accessible Car Parking Provided
Primary School	35	2 per 100 car parking spaces	1	1
Preschool	13	Not Required for car parking areas under 20 spaces	0	1

The proposed staff car park accommodates a total of 35 car spaces for the primary school, which results in a minimum requirement for 1 accessible car parking space. The development proposes to provide 1 accessible space for the use of the primary school, thereby meeting the DCP requirement.

The preschool car park accommodates a total of 13 car spaces and does not require any accessible car spaces based on the DCP. However, the project proposes to provide 1 accessible space for preschool, thereby exceeding the DCP requirement.

7.8.3 Design Assessment

7.8.3.1. Car Park Access

The car park access driveway has been assessed according to AS 2890.1. The access to the proposed 48 space at grade car park (35 Class 1A employee parking and 6 Class 3 short term parking) is via Faulkner Way, a local road. Consideration has been made to Class 3 car spaces, and therefore, according to AS 2890.1, it will therefore require a Category 2 (combined entry/exit) driveway of 6.0m to 9m width. In response, the proposed driveway has a minimum width of 6m and is in accordance with the standards. The driveway will also be used by waste, maintenance and emergency vehicles.

A swept path assessment demonstrating two-way passing of two B99 vehicles with appropriate clearance is included in **Attachment 3**.

7.8.3.2. Car Parking Arrangement

The proposed car park access and parking arrangements of the at grade car park have been assessed against the requirements of AS2890.1:2004, with reference to Class 1A (employee) and Class 3 (short term parking) facilities. The facilities are to provide the following dimensions (90° angle parking):

Class 1:

- Car Spaces: 2.4m x 5.4m
- Aisle Width: 5.8m

Class 3:

- Car Spaces: 2.6m x 5.4m
- Aisle Width: 5.8m

The staff and short term parking spaces shall be at least 2.4m / 2.6 x 5.4m in dimensions respectively, with a minimum aisle width of 5.8m.

All spaces meet the clearance requirements (door opening and entry flanges) of the parking space envelope requirements provided in Figure 5.2 of AS2890.1.

A turning bay is not required, as the parking spaces will be allocated to staff.

A blind aisle extension of 1m depth as per the requirement of AS 2890.1 Clause 2.4.2 (c) is provided to ensure manoeuvrability into and out of the last parking space.

Two accessible car spaces with 2.4m width and 5.4m length and a shared area of same dimension will be provided. The accessible space shall be provided in accordance to AS 2890.6. The shared area will also provide pedestrian access to the school.

It is assumed that teachers will access the car park outside the pick-up and drop-off hours and the school will manage staff access accordingly so as to avoid conflicts with student drop-off / pick-up.

7.8.3.3. Sight Distance

The location of the proposed access driveway is considered appropriate, in regards to sight distance. AS2890.1 Clause 3.2.4 stipulates that a roadway with a speed limit of 50 km/h must accommodate a desirable sight distance of 69m or a minimum stopping sight distance of 45m. The proposed driveway is located at the corner of the road from where the Vehicle Sight distance to the left and right is met.

The triangular pedestrian sight splays (2.0m x 2.5m) with a maximum height of 1.15m is provided at the driveway as per AS2890.1.

7.9 Motorcycle Parking

The DCP does not stipulate the provision of motorcycle parking and the development does not propose to provide any.

7.10 Waste Collection

In regard to the service vehicles requirement, Liverpool City Council's *Liverpool DCP Part 1* stipulates the following:

Liverpool DCP 2008 Part 1 Section 20.5 stipulates the following for loading facilities:

Adequate facilities for servicing developments shall be provided on-site to ensure loading/unloading activities do not occur on street and compromise the safety, amenity and capacity of the public road system.

Provision for loading facilities shall be provided for development in accordance with AS2890.2 – 2002.

Service facilities shall be conveniently located close to service entrances (or other building entrances) to discourage loading/unloading in other than the designated areas.

Areas where heavy vehicles are manoeuvring shall be separated from areas of car parking or pedestrian movement with safety being the over-riding consideration.

Liverpool DCP 2008 Part 1 Section 25 stipulates the following for waste management facilities: "Waste management facilities shall be provided for in all new buildings (except dwelling houses, Attached

dwellings, Semi-Detached Dwellings and Dual Occupancy). These shall be designed to ensure that the storage and collection of waste and recyclables is user friendly for both the occupant and the waste collection contractor."

A number of waste location options were investigated and are shown in **Attachment 4**. The option chosen is a compromise between the most efficient footprint, the requirement for a waste truck to drive through the car park and the operational distance from the main buildings.

The development proposes a dedicated waste collection area on the eastern side of the car park, with the following 2 access points:

- One off Faulkner Way shared with the staff car park; and
- One along the proposed new south road.

The site has been designed to accommodate two different types of waste vehicles, a Heavy Rigid Vehicle (HRV) for a front loader and a 11 m long waste truck for a rear loader. The entry and exit routes depend on which waste vehicle would need to access the site.

The HRV, which would be the largest anticipated vehicle entering the site, will access the site entering via Faulkner Way, continue within the staff car park until it reaches the waste bin. In order to exit the site, the vehicle will reverse back into the car parking aisle and exit via the south road.

The 11m long rear loader truck will access the site by entering via the south road, undertake a U turn within the waste area and reverse back towards the waste bin. In order to exit the site, the truck will continue within the staff car park and then exit via Faulkner Way.

The waste collection vehicles can enter and exit the site in forward manner as shown in the design review in **Attachment 3**.

The waste collection vehicle movements will occur during off-peak periods and will not impact on the school operation.

7.11 General Deliveries

Other delivery vehicles (courier / parcel deliveries etc.) will utilise the on-street parking along Buchan Avenue and Faulkner Way. It is noted that the pick-up and drop-off zones along school frontages will have unrestricted parking outside of school hours.

7.12 Emergency Vehicles

All emergency vehicles can use the surrounding roads to park in case of emergency. However, if internal access is required, emergency vehicles can access the site via the car park / waste area.

7.13 Coach Parking

Liverpool DCP 2008 Part 1 stipulates that an educational establishment requires to provide loading facilities for a coach.

The coach will utilise the bus stops along Buchan Avenue and the arrival and departure time would be operationally managed.

8. Traffic Impact Assessment

Edmondson Park is currently undergoing significant development and expansion with associated construction traffic and changing traffic patterns. Therefore, it is not prudent to conduct traffic surveys for the purpose of establishing existing, stable, base traffic volumes. Consequently, the latest traffic modelling and assessment for Edmondson Park has been reviewed to determine if the inputs and assumptions are consistent with the current proposal.

It is understood that there was a traffic microsimulation model being updated at time of writing. The most recent traffic modelling for Edmondson Park was conducted as part of the AECOM, *Edmondson Park South – Concept Plan MOD 5 Transport Management and Accessibility Plan*, June 2020 (MOD 5 TMAP) and its addendum AECOM, *Edmondson Park South – Concept Plan MOD 5 Transport Management and Accessibility Plan Addendum*, June 2020 (MOD5 TMAP ADD). This section should be read in conjunction with these two reports.

8.1 Edmondson Park South – Concept Plan MOD 5 Transport Management and Accessibility Plan

8.1.1 Assumptions

The traffic modelling for the MOD 5 TMAP assumed the following regarding the school site:

- Area: 2 ha
- Type: Primary School
- Capacity: ~1,000 students

Minor changes were made to the extent of the VISSIM model. The modelling extents are shown in Figure 67.

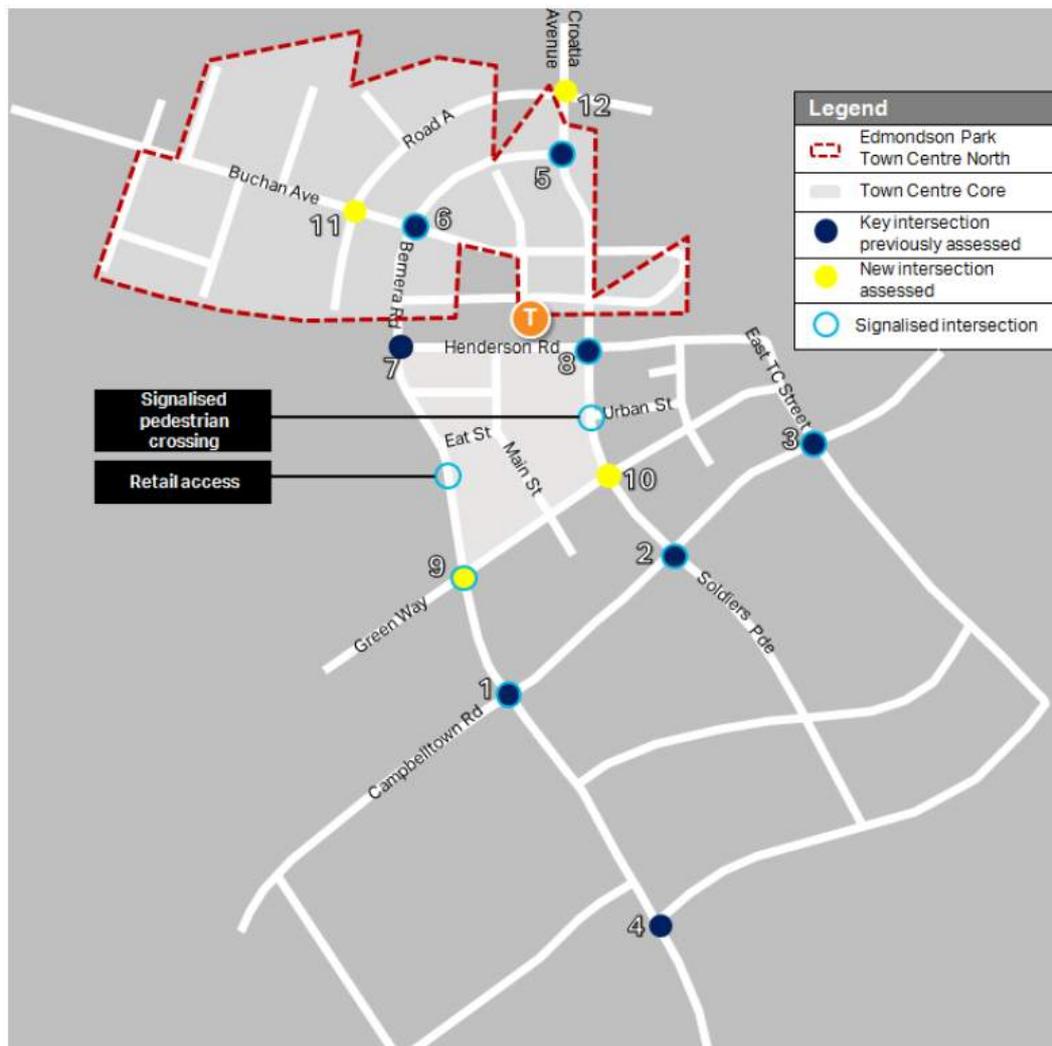


Figure 67 - VISSIM model extent TMAP (Source: AECOM, 2019)

8.1.2 Findings

The following findings from the MOD 5 TMAP are particularly relevant to this assessment:

- VISSIM modelling (2026)
 - Intersections at Campbelltown Road will all operate at a LoS D
 - The intersection of Bernera Road / Buchan Avenue will operate at LoS D in the AM peak
 - All other intersection will operate a LoS C or better
- SIDRA modelling (2036)
 - Campbelltown Road / Bernera Road will operate a LoS D
 - Campbelltown Road / Soldiers Parade and Campbelltown Road / East Town Centre Street will operate at LoS C

8.2 Edmondson Park South – Concept Plan MOD 5 Transport Management and Accessibility Plan Addendum

8.2.1 Assumptions

The following findings from the MOD 5 TMAP ADD are particularly relevant to this assessment:

- School site area is assumed to be 2 ha which can be expanded to 6 ha (if required).
- The school site will consist of a Primary School with a capacity of ~1000 students in the 2 ha scenario.
- The school site will consist of a Primary School and a High School with a total capacity of ~3000 students in the 6 ha scenario
- Minor changes were made to the extent of the VISSIM model. The modelling extents are shown in Figure 68.

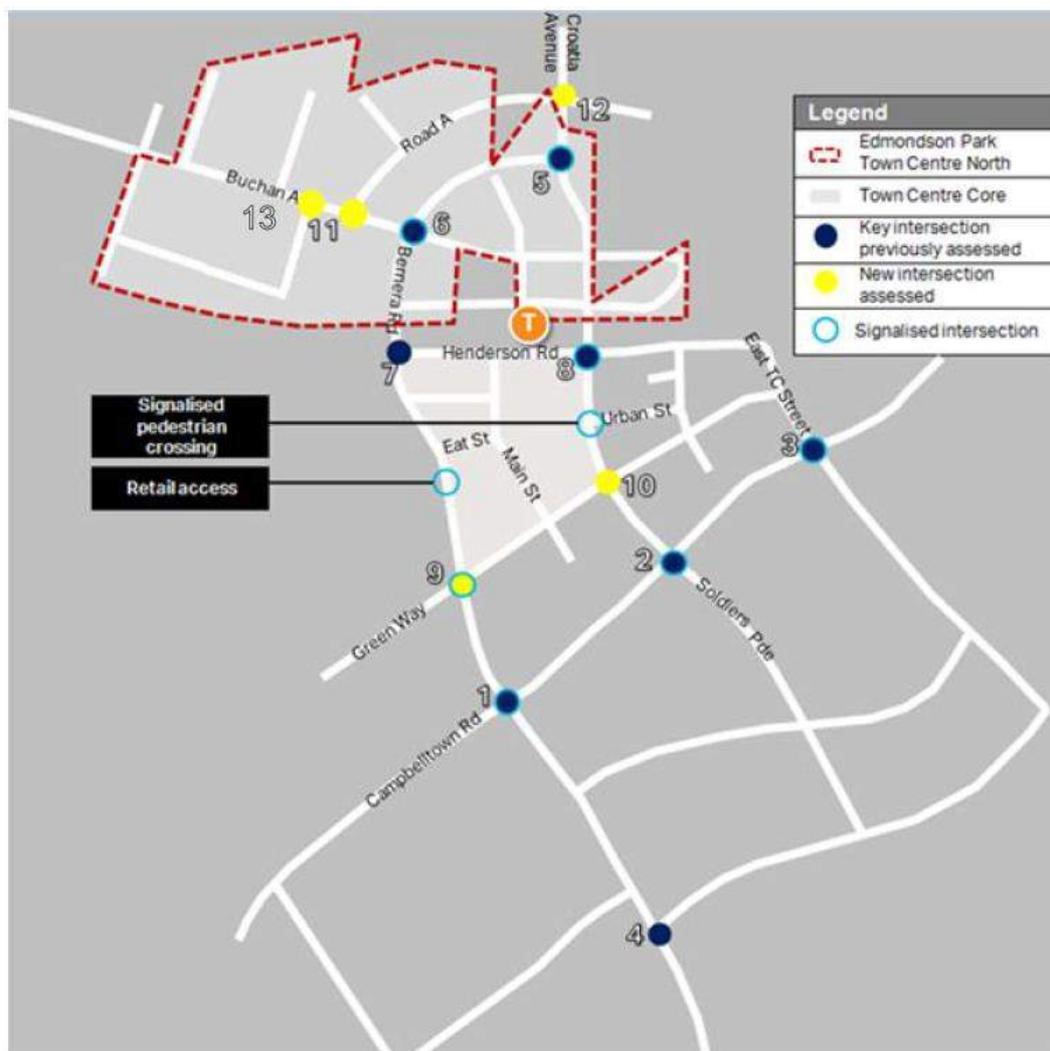


Figure 68 - VISSIM model extent TMAP Addendum (Source: AECOM, 2020)

8.2.2 Findings

The following findings from the MOD 5 TMAP ADD are particularly relevant to this assessment:

- Primary School Only (~1000 students, 2 ha)
 - Intersections at Campbelltown Road will all operate at a LoS D.
 - The intersection of Bernera Road / Buchan Avenue will operate at LoS D in the AM peak.
 - All other intersection will operate at LoS C or better.
- Primary School and High School (~3000 students, 6 ha)
 - With the 6 ha school scenario, there are several locations in the model where intersection performance falls below the desired Level of Service criteria of LoS D during the AM peak hour.
 - Buchan Avenue / East Street (school loop road) is expected to perform at LoS F with 114.7 seconds' delay.
 - Intersections at Campbelltown Road will all operate at LoS E or F.
 - It was identified that upgrades were required at the intersection of Buchan Avenue / Bernera Road. The western leg of the intersection requires an additional right turn slip lane to accommodate the additional vehicle trips generated by the increased school population from the 6 ha school site. It is noted that this upgrade is not triggered by the primary school proposed with this application and will need to be dealt with at the time of the secondary school assessment.

8.3 Traffic Assessment

The proposed public school in Edmondson Park, as detailed in this report, is anticipated to accommodate a Primary School with a student capacity of 1,012 students. It is therefore assumed that, based on the assumptions found in the aforementioned reports prepared by AECOM, the VISSIM model has accurately captured this Primary School in the 2ha scenario.

As discussed in the previous section, the intersections assessed in the VISSIM model will operate at LoS D or better with the Primary School Only scenario and the school will therefore be adequately accommodated by the network as shown in Figure 68.

It is noted that the modelling did not incorporate a pre-school. Conservatively, if all 40 students were driven to and from the pre-school, this would result in an additional traffic generation of 40 vehicles in an hour, which relates to 1 vehicle every 1.5 minutes. This addition is considered to be minor and therefore not have a significant impact on the surrounding road network.

9. Construction Traffic and Pedestrian Management

9.1 Objectives

The traffic management plan associated with the construction activity aims to ensure the safety of all workers and road users within the vicinity of the construction site and the following are the primary objectives:

- To minimise the impact of the construction vehicle traffic on the overall operation of the road network;
- To ensure continuous, safe and efficient movement of traffic for both the general public and construction workers;
- Installation of appropriate advance warning signs to inform users of the changed traffic conditions;
- To provide a description of the construction vehicles and the volume of these construction vehicles accessing the construction site;
- To provide information regarding the changed access arrangement and also a description of the proposed external routes for vehicles including the construction vehicles accessing the site; and
- Establishment of a safe pedestrian environment in the vicinity of the site.

9.2 Hours of Work

All works, associated with the project will be restricted to the time periods by the Conditions of Consent, which details the following permitted working hours associated with the construction activity:

- Monday to Friday 7am to 6pm (Conditions);
- Saturday 8am to 1pm (Conditions);
- Sunday, Public Hols No work permitted (Conditions);

9.3 General Requirements

In accordance with Transport for New South Wales (TfNSW) requirements, all vehicles transporting loose materials will have the entire load covered and/or secured to prevent any large items, dust or dirt particles depositing onto the roadway during travel to and from the site. All subcontractors must be inducted by the lead contractor to ensure that the procedures are met for all vehicles entering and exiting the construction site. The contractors will monitor the roads leading to and from the site and take all necessary steps to rectify any road deposits caused by site vehicles.

Vehicles operating to and from and within the site shall do so in a manner, which does not create unnecessary noise or vibration.

No tracked vehicles will be permitted or required on any paved roads. Public roads and access points will not be obstructed by any materials, vehicles, refuse skips or the like, under any circumstances. No construction vehicles are permitted to double park, or park on the public road.

9.4 Construction Process

It is proposed that the on-site construction works are to commence in December 2021 and are likely to be completed over the following 12-13 months, with completion of the construction works estimated to be in early 2023. The estimates are as follows:

- Construction Program / Milestones
 - Stage 1 – Bulk earthworks, retaining walls and footings – 4 months
 - Stage 2 – Building installation – 5 months
 - Stage 3 – Landscaping – 3 months
- Average construction workers per day is about 65 persons;

It is expected that the construction will involve approximately the following number of vehicles during each stage of the project:

- Stage 1 – Earthworks – Civil Works: 50-100 per day (Truck and Dog)
- Stage 2 – Main Works – Construction: 20-40 per week (Mainly up to 19m Articulated Vehicle, 25m Prime Movers will be required for 4 weeks to deliver DfMA)

Within the context of the broader road network, construction traffic activity, which will be spread throughout each day, is not anticipated to cause a notable impact upon the capacity or operation of the road network and will fall within typical daily traffic variations.

9.5 Construction Vehicle Types

The construction stage of the development will involve the use of a number of different vehicle types in relation to the various stages and tasks involved. The development will be constructed using prefabricated DfMA modules, therefore the maximum vehicle size has been determined on the basis that the largest modules have been chosen. All vehicles will be limited to up to a 25m long Prime Mover for all material removal and deliveries.

Any oversized vehicle (including the use of mobile cranes) that is required to travel to the project into the vicinity of the site will be dealt with separately, with the submission of required permits to and subsequent approval by the Council and TfNSW prior to any delivery being undertaken.

Refer to Section 9.10 for further details regarding special deliveries.

9.6 Construction Vehicle Routes

The site is located on the corner of Faulkner Way and Buchan Avenue. Buchan Avenue is currently being constructed to link to Soldiers Parade which links to Campbelltown Road and Camden Valley Way (State Roads). Construction of the site will begin upon completion of the Buchan Avenue link. Buchan Avenue will be constructed to be left-in and left-out at the intersection with Soldiers Parade. The proposed construction vehicle routes have regard for the surrounding traffic arrangements in the vicinity of the site. No queuing or marshalling of trucks is permitted on any public road and all loading and unloading of materials will be undertaken within the site as described in Section 9.7.

All vehicle routes to the site are constrained to existing public roads that have the physical geometry to accommodate the turning movements. Approaching the site, some vehicle movements may entail the

assistance of traffic controllers, as more than one lane will be required for turning manoeuvres. For signage and controls requirements in these cases refer to Section 9.8.

Figure 69 shows the ingress and egress for the largest construction vehicle, 25m Prime Mover routes for the construction of the development. Swept path for key intersections along the route have been provided in Attachment 5.

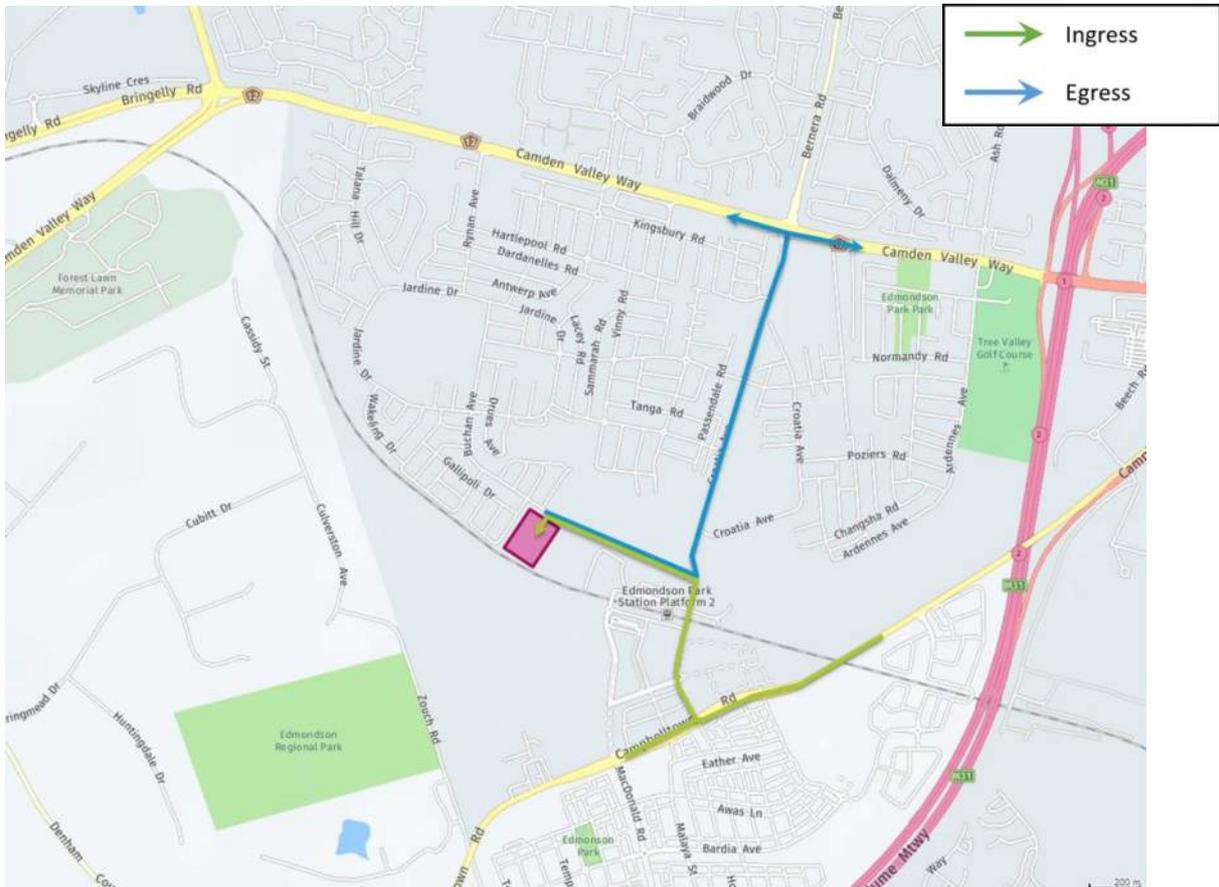


Figure 69 - 19m AV construction vehicle routes

9.7 Construction Vehicle Access and Work Zone Provision

During the construction of the school, access and egress for construction vehicles will be located on Buchan Avenue and Faulkner Way. Two accesses will be provided on Buchan Avenue which will be used for ingress and egress while Faulkner Way will have one access which will only be used for egress when required.

No work zones are proposed during the construction of the development. A figure of showing both accesses is shown in Figure 70.

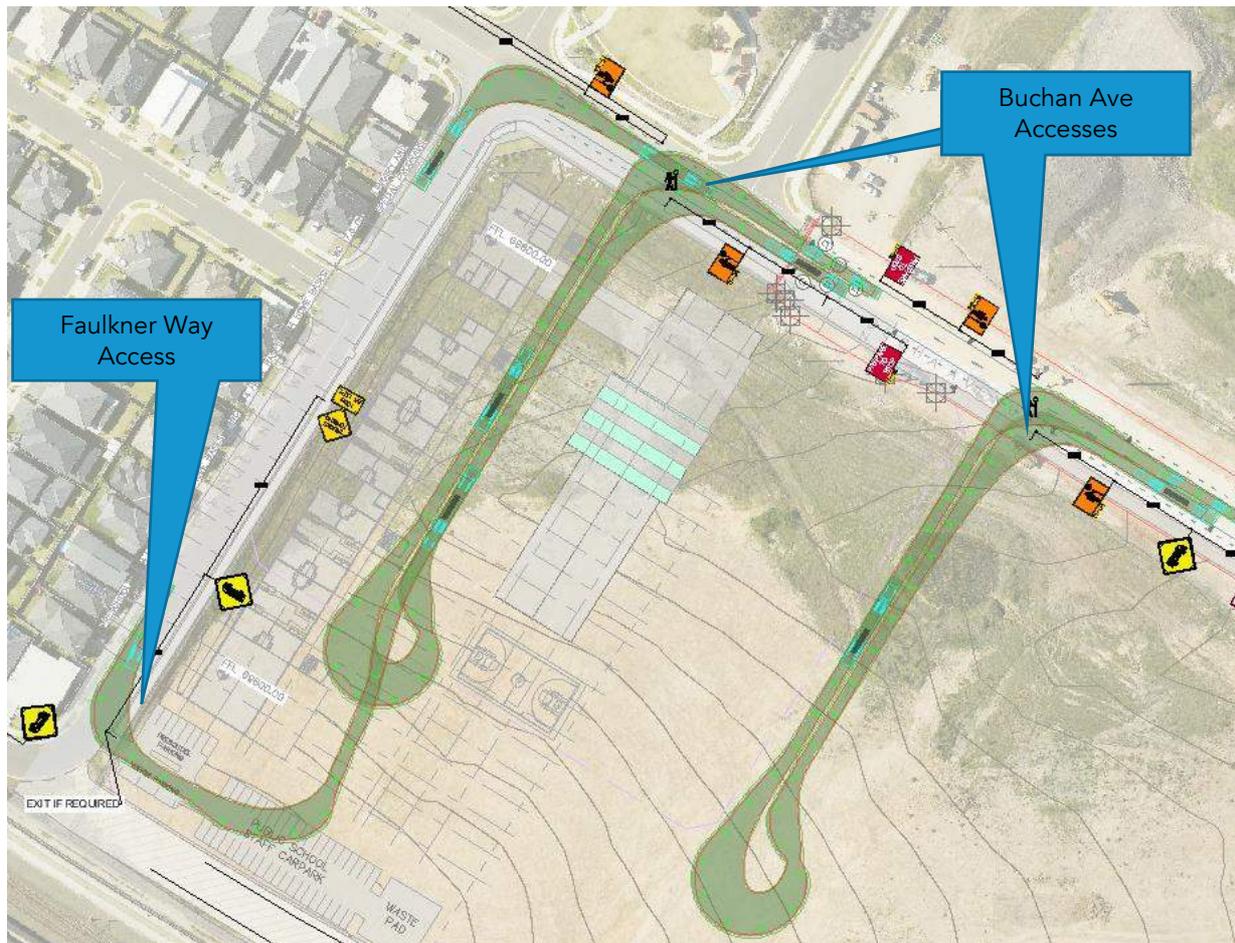


Figure 70 - Construction vehicle access

9.8 Traffic Control Measures

The Traffic Control Plan (TCP) outlines the proposed traffic management to inform road users of the changed traffic conditions in the vicinity of the works site. This will minimise conflicts between construction vehicles and existing traffic in the locality.

The TCPs have been set out in accordance with the RMS Traffic Control at Works Site. These specific TCPs will be provided by the traffic management contractor prior to commencement of works and submitted to Council / RMS for approval.

All vehicles greater than a Truck and Dog, when turning into Buchan Avenue from Soldiers Parade need to occupy the opposite direction lane, therefore, traffic control measure TCP 77 and TCP 195 will be required along Buchan Avenue to manage traffic. Likewise, both TCPs will be required along further up along Buchan Avenue adjacent to the access to inform other road users of turning vehicles in and out of the site. TCP 195 will also be required on Faulkner Way to advise road users of trucks leaving the site from the access.

A trained and accredited RMS traffic controller will be required to meet the requirements of TCP 77.

The locations and required measures are shown in Figure 71, Figure 72 and Figure 73.



Figure 71 - Soldiers Parade & Buchan Avenue TCP

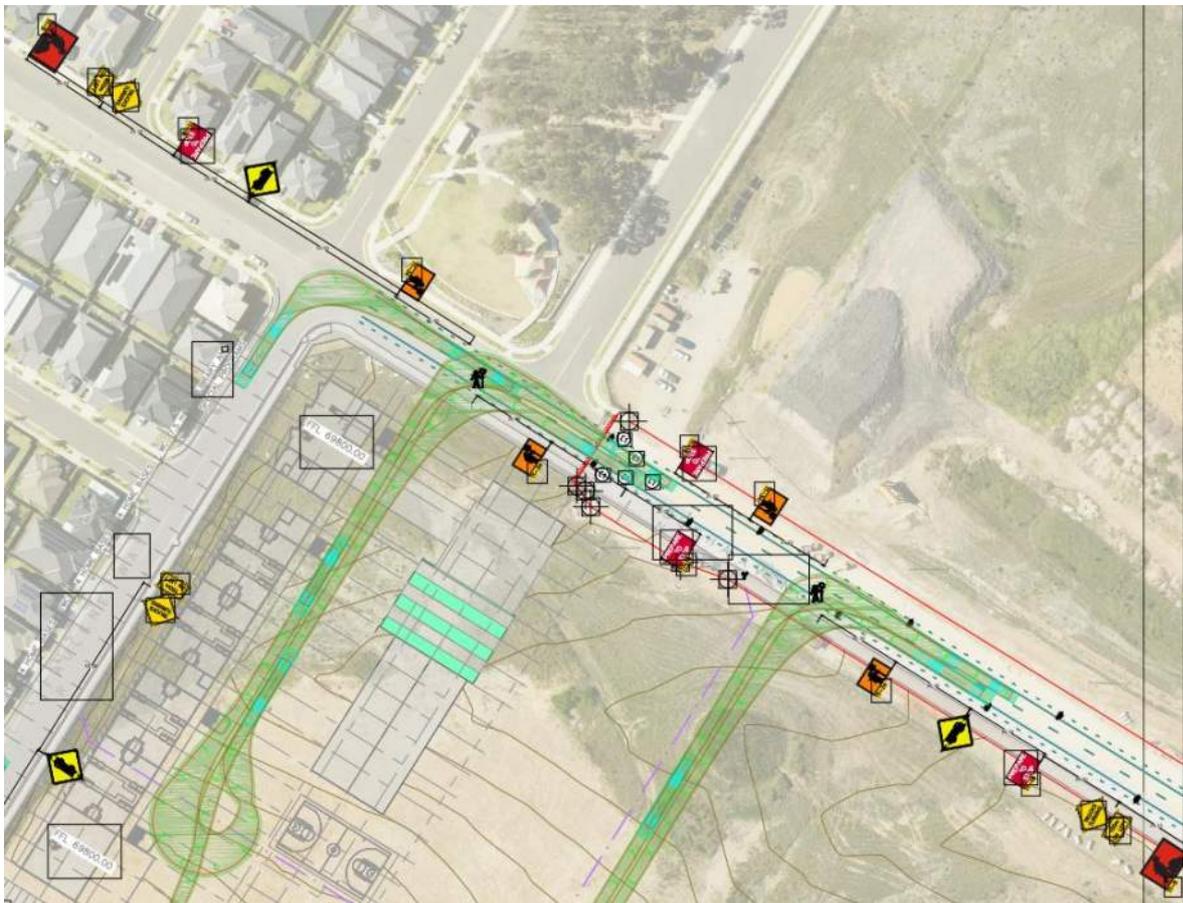


Figure 72 - Buchan Avenue & Site access TCP



Figure 73 - Faulkner Way TCP

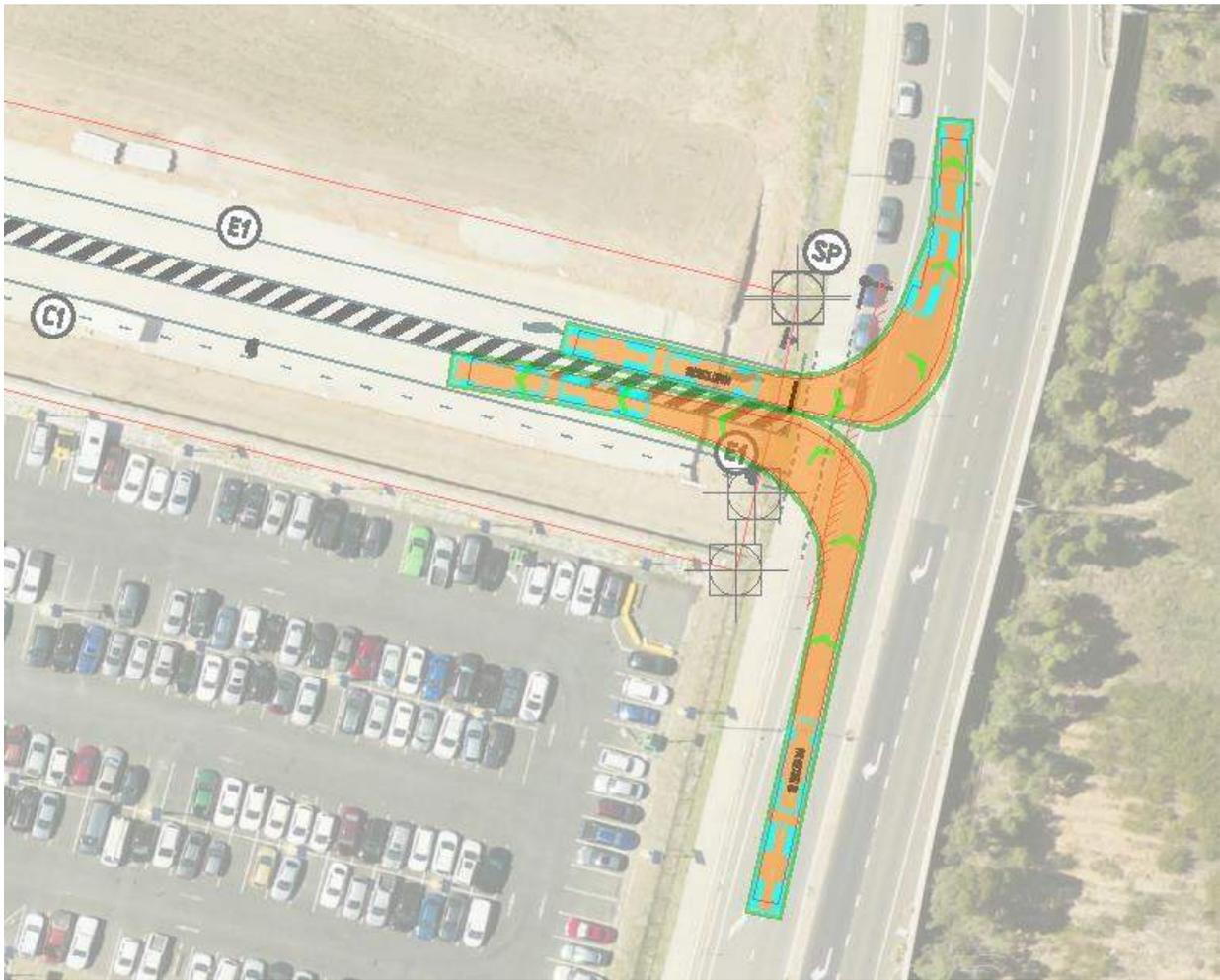


Figure 74 - 19m Truck and Dog – Buchan Avenue and Soldiers Parade Intersection

9.9 Pedestrian Access

The general public will not be allowed access to the site. The contractor will ensure that the proposed site fencing is maintained in a clean, well illuminated and safe manner at all times, throughout the duration of the project. Due to the nature of the site and the emphasis placed on materials handling, the efficient control and protection of pedestrian traffic is of utmost importance.

The site perimeter boundaries consist of site fencing, installed during the various construction phases. The site fencing will be established immediately following site possession and fitted with appropriate public directional signage.

It should be noted that Traffic Controllers are **NOT** to stop general traffic, pedestrians or cyclists on the public street(s) to allow trucks to enter or leave the site. They **MUST** wait until a suitable gap in traffic allows them to assist trucks to enter or exit the site. Special treatment is not to be given to trucks leaving a construction site - the vehicles already on the road and pedestrians on the footpath have right-of-way.

Pedestrians may be held only for very short periods to ensure safety when trucks are leaving or entering BUT the contractor must NOT stop pedestrians in anticipation i.e. **at all times the pedestrians have right-of-way on the footpath, not construction vehicles.**

The Applicant must apply to the Council to organise appropriate approvals for site fencing prior to commencement of works.

9.10 Special Deliveries

It is understood that oversize vehicles are generally not allowed to travel on Local Roads unless approval for a one-off occasion is obtained from the National Heavy Vehicle Regulator (NHVR) and Council. Requests to use these vehicles must be submitted to the NHVR 28 days prior to the vehicle's scheduled travel date. For more information, please contact the NHVR on 1300 696 487 or www.nhvr.gov.au.

Should the lead contractor require a partial road closure on State, Regional and/or Local Roads, or carry out work within 100m of Traffic Signals, an application will be made to the relevant authority to obtain their approval.

9.11 Cumulative Effect of Adjacent Developments

It is known that works will be undertaken to construct the south and east road, which are expected to be finished by mid-2022. The land to the north of Buchan Avenue will also be developed in the future. The exact timing of these works is unknown at the time of writing. These developments may occur concurrently; however, they have not been approved and no contractors have been appointed yet.

During the construction of the School, liaison with adjacent developments (if any) will be undertaken to mitigate the cumulative effect of the concurrent works. This will include the coordination of truck movements to prevent the combined impact of construction activities. Though potential cumulative impacts will include higher demand for parking during construction, these impacts will be mitigated through appropriate liaison and communication.

9.12 Construction Staff Parking

As discussed in Section 9.4, the average number of construction staff per day will be approximately 65. Parking for construction staff will be provided either off-site on Lot 2 or on-street. To minimise car usage, the contractor will be encouraged to assist in the transportation of workers to the site and all site personnel will be made aware of the public transport options available in the vicinity of the site (refer to Section 4) and encouraged to utilise these facilities.

Site personnel who choose to drive will also be encouraged to consider car-pooling wherever practicable.

The on-street parking spaces available in the vicinity of the site are shown in Figure 75. Approximately 56 spaces as marked by green lines would be available for construction staff at all times during the construction period.

Approximately 42 on-street parking spaces as marked by pink lines in Figure 75 may be available temporarily or periodically. This is because of the following reasons:

- The land to the north of Buchan Avenue is vacant at the moment, therefore, the kerbside parking spaces on the northern side of Buchan Avenue are less likely to be utilised. However, if any construction is undertaken on the now vacant land, the number of kerbside parking spaces may be reduced.
- The area to the east of the School site may be temporarily used for construction and the construction vehicles would access this site via Buchan Avenue gate during those period. The temporary vehicular gate area as marked by a brown arrow in Figure 75 could be used to park vehicles when the gate / site is not being used.

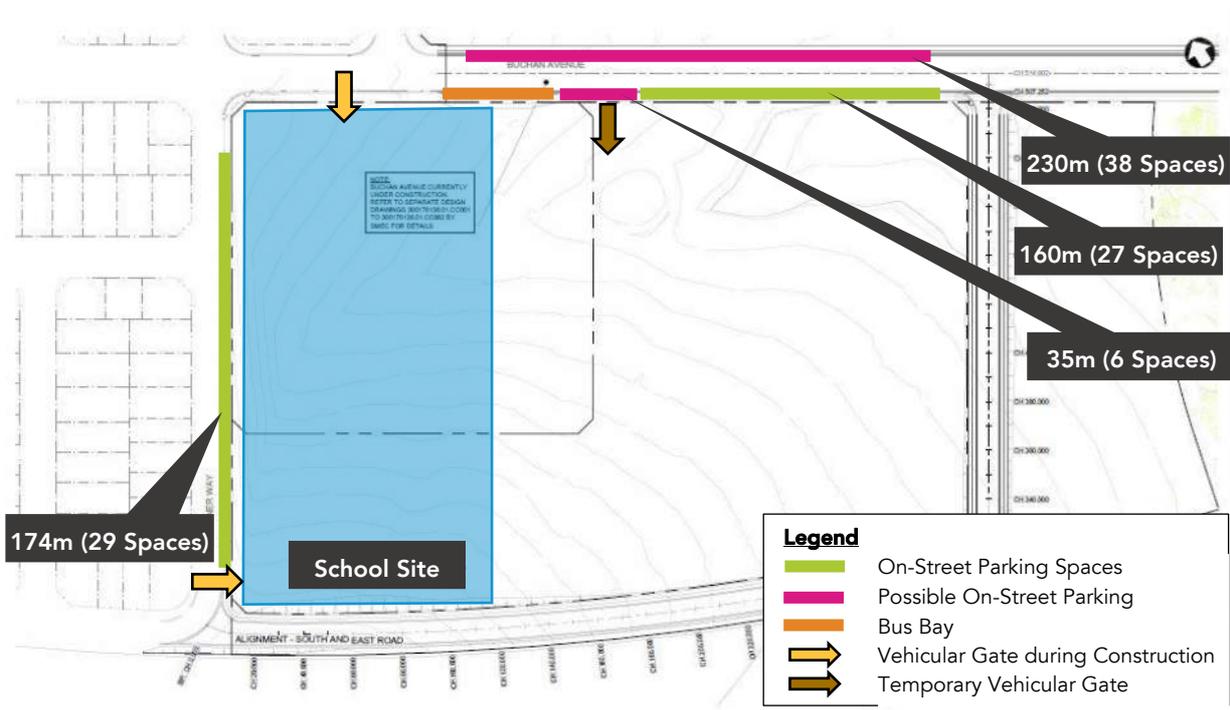


Figure 75 – On-Street Parking Spaces on the vicinity of the Site

9.13 Work Site Security

To provide security to the works site and protection to the general public, it is likely that the site perimeter boundaries will comprise of site fencing, installed during the various construction phases. The site fencing will be established immediately following site possession and fitted with appropriate public directional signage. The exact location of the site fencing will be determined by the contractor.

All gates are securely locked outside of working hours and may be regularly patrolled by security staff. This security network should work closely with the contractor to ensure that security is being maintained throughout the construction period.

The contractor should maintain a site entry register requiring all visitors to sign in upon entry. All visitors will be required to wear an identification “visitor” badge and wear appropriate PPE at all times while on site.

All visitors to the site will also be issued with temporary site access ID card, in order to gain authorised entry to the project site and for display whilst being escorted on site.

9.14 Construction Staff Induction

All construction staff and subcontractors are required to undergo a site-specific induction which outlines the construction procedures and management framework specific to the project. The induction is aimed at instilling in each person a common-sense approach to safety, to ensure they employ the responsible environmental practices and awareness needed to deliver the project in accordance with the relevant regulations and standards.

A record of all site inducted personnel will be retained on site as well as within the site induction management platform.

9.15 Emergency Vehicle Access

The proposed traffic control arrangements do not propose closure of any local roads. Any emergency vehicles requiring access to the project site will do so via the site access along Buchan Avenue or Faulkner Way.

A detailed Emergency Management Plan will be further developed by the contractor prior to site establishment works.

9.16 Access to Adjoining Properties

Access to all adjoining properties will be maintained throughout the works. The adjacent landowners will be notified of works via letter box distribution and road signage to advised of anticipated truck movements in operation with access to adjoining properties being maintained at all times.

9.17 Occupational Health and Safety

Any workers required to undertake works or traffic control within the public domain shall be suitably trained and will be covered by adequate and appropriate insurances. All traffic control personnel will be required to hold TfNSW accreditation in accordance with Section 2.4 of Traffic Control at Worksites.

The comprehensive Work Health & Safety Management Plan will be provided by the contractor and shall be constantly reviewed as the design and construction methodology progress.

9.18 Method of Communicating Traffic Changes

During construction the contractor shall each morning, prior to work commencing, ensure all signage is erected in accordance with the TCP and clearly visible. Each evening, upon completion of work, the contractor is to ensure signage is either covered or removed as required.

Any variation to the layout of the TCP on site is to be recorded and certified by authorised TfNSW accredited personnel. The associated TCP road signage will inform drivers of works activities in the area including truck movements in operation.

9.19 Contact Details for On-Site Enquiries and Site Access

The contractor is yet to be appointed and contact details of a Site Manager will be provided at a later stage.

9.20 Maintenance of Roads and Footpaths

The roads and footpaths along the route of travel will be kept in a serviceable state at all times. Any damage arising as a result of the proposed truck movements will be treated / repaired by the contractor at no cost to Council.

10. Collaboration with Stakeholders

Three Transport Working Group meetings were held with TfNSW and Council representatives to pre-empt any potential issues and address them during the planning process. The following sections summarise transport, traffic, access and parking comments made during these meetings and present how these comments have been addressed.

Comments made in the meetings and extracted from meeting minutes are shown in grey italics, a response is presented below.

10.1 Meeting #1 – 9th April 2021

Timing for completion of South and East Road

Landcom is preparing for DA submissions and the indicative date of completion is mid-2022, which will be prior to commencement of the school.

Timing for completion of Buchan Avenue

Buchan Avenue is due to be completed in July / August 2021 and therefore will be completed before construction of the school commences.

Consider what road network will the bus bay support and consider lengthening.

An assessment of bus routes has been undertaken based on enrolment boundaries and projected travel demand. The existing, recommended and proposed bus routes and their travel demand are presented and discussed in Section 3.4.2.3, Section 4.3 and Section 6.2.4.

It was raised to consider any potential staging issues. CIPL/RCC to work with Landcom to confirm if they have future staging plan. Eg. what network would be in place for 200 students, what required for 500 then what the network plus bus services would be in place for capacity at 1000 students.

Landcom is preparing for DA submissions and the indicative date of completion of the future south and east roads is mid-2022, which will be prior to commencement of the school. Parents will be able to use these roads to loop around the school to exit back onto Buchan Avenue upon commencement.

Note teachers may take public transport but unlikely school kids will use public transport.

Consultation with TfNSW has been undertaken and amendments to the existing bus routes and time tables will be undertaken to support student transport. In addition, a School Transport Plan has been prepared to promote the use of public transport by students.

Impact of the proposed high school was raised by (TfNSW). It has been confirmed that the SSDA report will focus solely on primary school. Council confirmed Landcom concept plan considers high school - SINSW will speak to service planning team to understand indicative intake area for high school

The potential future high school is not part of this proposal.

Buchan Avenue incorporates bus bay design of approximately 20m in length. PTC will determine in assessment how much servicing is required.

TfNSW indicated they would be looking for 100m of bus bay to incorporate high school planning. This is in line with St Francis school across the road. Likely bus drop off would be on opposite side of Buchan Avenue in the morning, same side as school in the afternoon

PTC will consider transport assessment for St Francis and retrieve information from DPIE's website. St Francis planned infrastructure for population increases and agreed with council on staged delivery

The recommended bus timetable shown in Table 3 in Section 4.3.6 highlights that only 1 bus stop will be required to service the primary school. A bus stop accommodating one bus at a time requires a length of 30m, which has been provided as discussed in Section 7.5.4.

It has been queried if any issues with accessing school through Buchan Avenue during construction. CW advised Buchan Avenue will extend to Soldiers Parade, however there is currently no intersection treatment. Landcom wanted to wait for confirmation of land use before finalising. Currently Soldiers Parade is connected to Campbelltown Road and would allow left into site, right out of site would be difficult.

After construction need to consider right turn off Soldiers parade. Currently median strip exists. Two roads intersect Soldiers Parade, LCC is determining priority between Buchan Avenue and Croatia Avenue to signalise

Confirmation has been sought about the initial intersection treatment at Buchan Avenue / Soldiers Parade. It has been confirmed that only left-in / left-out turning movements will be allowed. Construction vehicle routes have been adopted accordingly, as discussed in Section 9.6.

10.2 Meeting #2 – 22nd April 2021

Inclusion of bicycle tracks have been proposed to ensure primary school kids can safely travel to school by bicycle.

North/South access via bicycle is lacking, with the area East of Soldiers Parade having no bicycle track lanes or infrastructure.

Some parts of existing bicycle route (to the West) would require riding on the street, which is not safe for primary school age children.

Connectivity would be required at crossings across Soldiers Parade and Buchan Avenue for students to the East of the catchment.

These items are discussed in Section 4.2 and it is recommended that Council incorporate these measures in their future infrastructure upgrade plans.

TfNSW gave update on current bus routes. Proposal for bus routes to the East and West of the site. Final route is TBC and timing will depend on funding application.

Although there are bus stops on Rynan Ave, the North/South section of the route is proposed to be moved to Talana Hill Dr, which will extend past the existing Christian school and on to EPPS.

Buchan Ave will be left in left out, which limits the routes that can be used.

A bus route incorporating right turn onto Bernera Rd from Croatia Ave may not be possible. This would also be difficult due to traffic volumes and is therefore not a preferred route.

It was agreed that the proposal to travel through Poziers Rd or Dalmatia Ave is a better option. Council advised both are responsibility of developers and subject to DA.

It was noted that there will be a major interchange near the train station, this could affect public bus routes.

It has been noted that for the purposes of the SSDA the chosen route must support access to the school when it begins operating. The route can be changed when construction on surrounding roads is completed.

Maxwells Crescent is part of Landcom's scope. DA expected to be submitted in the next few months. Completion time currently unknown.

Jardine Ave needs to be flood proofed to allow investigation of bus route.

The above comments have been made based on recommended bus routes presented in Figure 30 and discussed in Section 4.3.2. Upon discussions during this meeting, the bus routes have been amended as follows:

- The route on the western side has been amended to travel along Jardine Avenue;
- A temporary route has been found to accommodate a bus service from the east until an appropriate intersection treatment at Soldiers Parade is constructed. This route shall be revisited in the future.

The bus routes that are proposed and will be pursued by TfNSW are shown in Section 6.2.4.2.

Options for the bus bay opposite the school were discussed. Preferred option is across from entrance, as this would only require one pedestrian crossing across Buchan Ave, which would also align to the desire line. The preferred option would fit one bus.

Council raised the issue that the high school would need multiple bus bays. The preferred bus stop option is sufficient for the primary school which is what the SSDA will cover.

The preferred and proposed bus stop option is presented in Section 6.2.4.1. The high school demand will need to be assessed at the time of a new development application.

Soldiers parade is a major barrier road to students from the East. Pedestrian friendly signals will be required, otherwise transport by car/bus will be needed.

Landcom have proposed installation of traffic signals, however this has not been approved. RL asked for timeframe for traffic signals however TfNSW could not advise. A warrant approval will be required before signal upgrades can take place.

It was noted that the warrant needs to demonstrate how conditions can be met in the next 5 years.

The installation of signals at this intersection is not part of this application. However, it is recommended that the comments made here were followed through, in particular in regard to the pedestrian friendly phasing times.

The majority of enrolment catchment access to the school will be via walking and is major expectation of the project.

Currently there are no safe crossing points or pedestrian access in some areas of major barrier/collector roads such as from the East of Soldiers Parade.

Cycling from areas to the West is an option, however there is currently no connectivity with the shared path. TfNSW noted the western bus route could solve this issue.

These items are discussed in Section 4.2 and it is recommended that Council incorporate these measures in their future infrastructure upgrade plans.

Currently the Faulkner Way lacks signages

A signage plan including the proposed bus zone, pick-up and drop-off areas and proposed locations for zebra crossings are presented in **Attachment 2**.

Council noted that council will want to see vehicle movement studies as Buchan Ave is main access road to Western part of Edmondson Park.

Traffic modelling for Edmondson Park was conducted as part of the AECOM, *Edmondson Park South – Concept Plan MOD 5 Transport Management and Accessibility Plan*, June 2020 (MOD 5 TMAP) and its addendum AECOM, *Edmondson Park South – Concept Plan MOD 5 Transport Management and Accessibility Plan Addendum*, June 2020 (MOD5 TMAP ADD). This modelling incorporates the proposed primary school.

Need to determine the intended status of the intersection between Buchan/Faulkner, and if any treatment will be required.

No changes to the existing intersection treatment are proposed nor recommended, apart from the proposed zebra crossings and kerb buildouts discussed in Section 7.4.

10.3 Meeting #3 – 7th May 2021

Proposing three entry points into the school. Pick up and drop off will be along Falkner Way and Buchan Avenue. Proposing two zebra crossings.

No comments received.

Proposing continuous lines for existing bus routes. For the East of the catchment, students main transport will be driving or public transport. This is due to the intersection not yet being constructed therefore no safe crossing for students.

TfNSW noted that proposed bus route indicated in pink would be moved further west once flood proof crossing had been completed by council. Council noted that there is no project plan yet, so this is still at least 2 years away.

TfNSW noted that the request for a special route in the East for the school had been submitted. Alternatively, a full time route is being proposed that would include a stop at the train station.

Council acknowledged LCC will attempt to accelerate Jardine Drive flood works.

The above points have been incorporated in the proposed public transport strategy for the prospective students, refer to Section 7.5.

Carpark driveway will be off Faulkner Way. This will be for pre-school parking and primary school staff.

The waste management pad access has been designed for two types of waste collection vehicles.

No comments received.

It was noted that if Jardine Drive can be finished, it would be a good road for students living in the West of the catchment to cycle.

Soldiers Parade needs an intersection that is signalised on all four pedestrian approaches. These should be suitable for students.

Once Solders Parade is signalised, students living in the East would be able to cycle.

These items are discussed in Section 4.2 and it is recommended that Council incorporate these measures in their future infrastructure upgrade plans.

This report will propose no right turn from Faulkner Way onto Buchan Avenue once Buchan is constructed. TfNSW noted that this may not be enforceable and suggested a median strip. MO noted that this would be a matter for council to consider.

A median treatment would be supported.

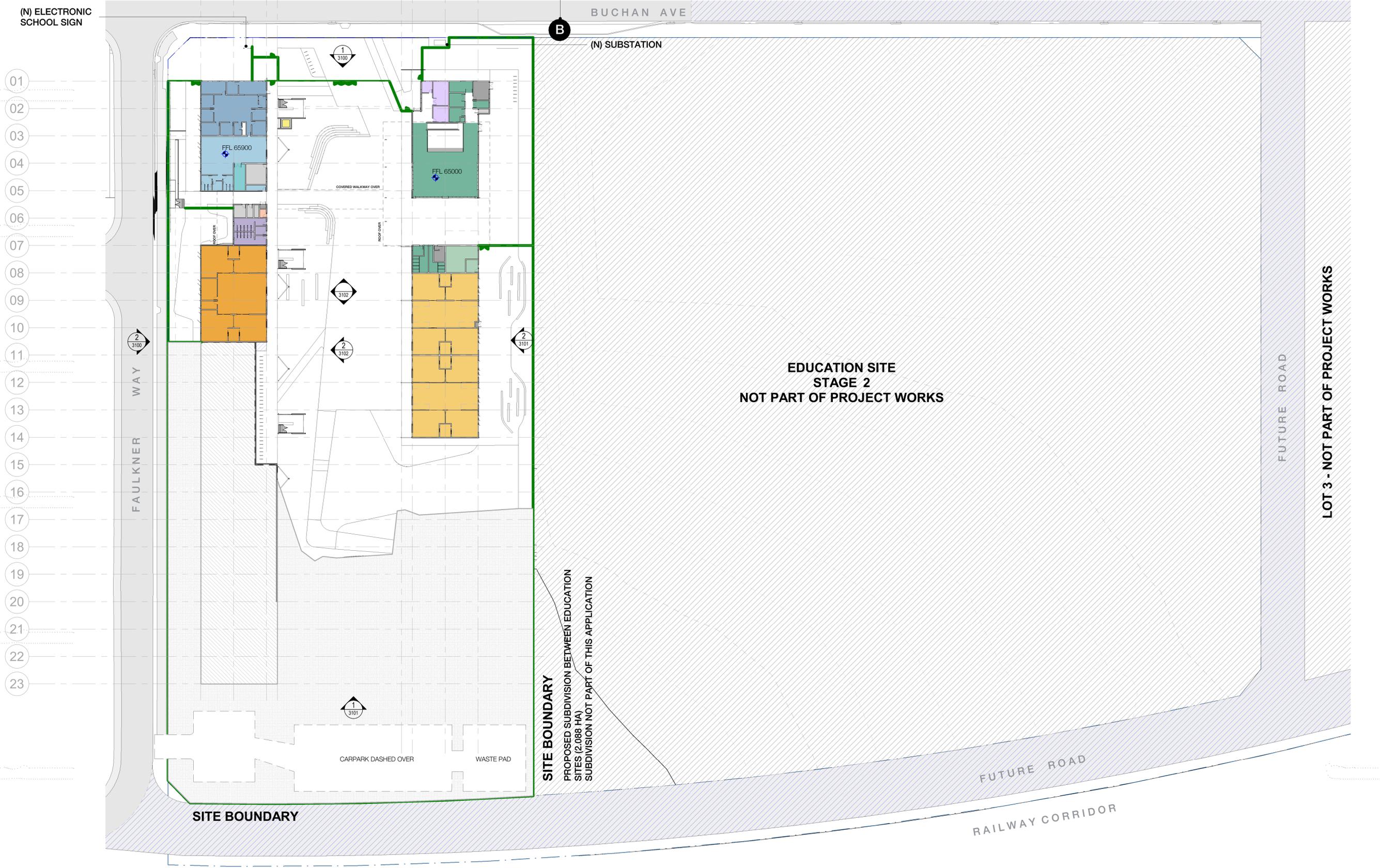
Council noted to consider a roundabout located at Faulkner Way and Buchan Avenue. This would be dependent on if South Road is constructed before the school is opened. Council noted that council would support using the South Road for better vehicle circulation and for this to be noted in the report.

A roundabout is not recommended and not seen as required at this location. Roundabouts are generally more difficult to navigate by young students.

PTC noted that the preference for crossings will be zebra. Previous experience notes that children's crossings rely on a supervisor that may not be available.

No comments received.

Attachment 1 Architectural Drawings



EDUCATION SITE
STAGE 2
NOT PART OF PROJECT WORKS

LOT 3 - NOT PART OF PROJECT WORKS

SITE BOUNDARY
PROPOSED SUBDIVISION BETWEEN EDUCATION
SITES (2.088 HA)
SUBDIVISION NOT PART OF THIS APPLICATION

SITE BOUNDARY

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Project Managers
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Traffic Consultant
PTC
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NSW Nominated Architects: Robert Denton Reg. No. 5782, Alex Kibble Reg. No. 6015
Do not scale drawings. Verify all dimensions on site. Notify architect of all discrepancies

Rev	Date	Description	Chkd	Auth
P1	06.04.21	Issue for Coordination	HC	AK
A	20.04.21	Issue for Coordination	HC	AK
B	29.04.21	Issue for Coordination	HC	AK

Project
**NEW PRIMARY SCHOOL IN
EDMONDSON PARK**
BUCHAN AVE
EDMONDSON PARK

Drawing Title
GROUND FLOOR

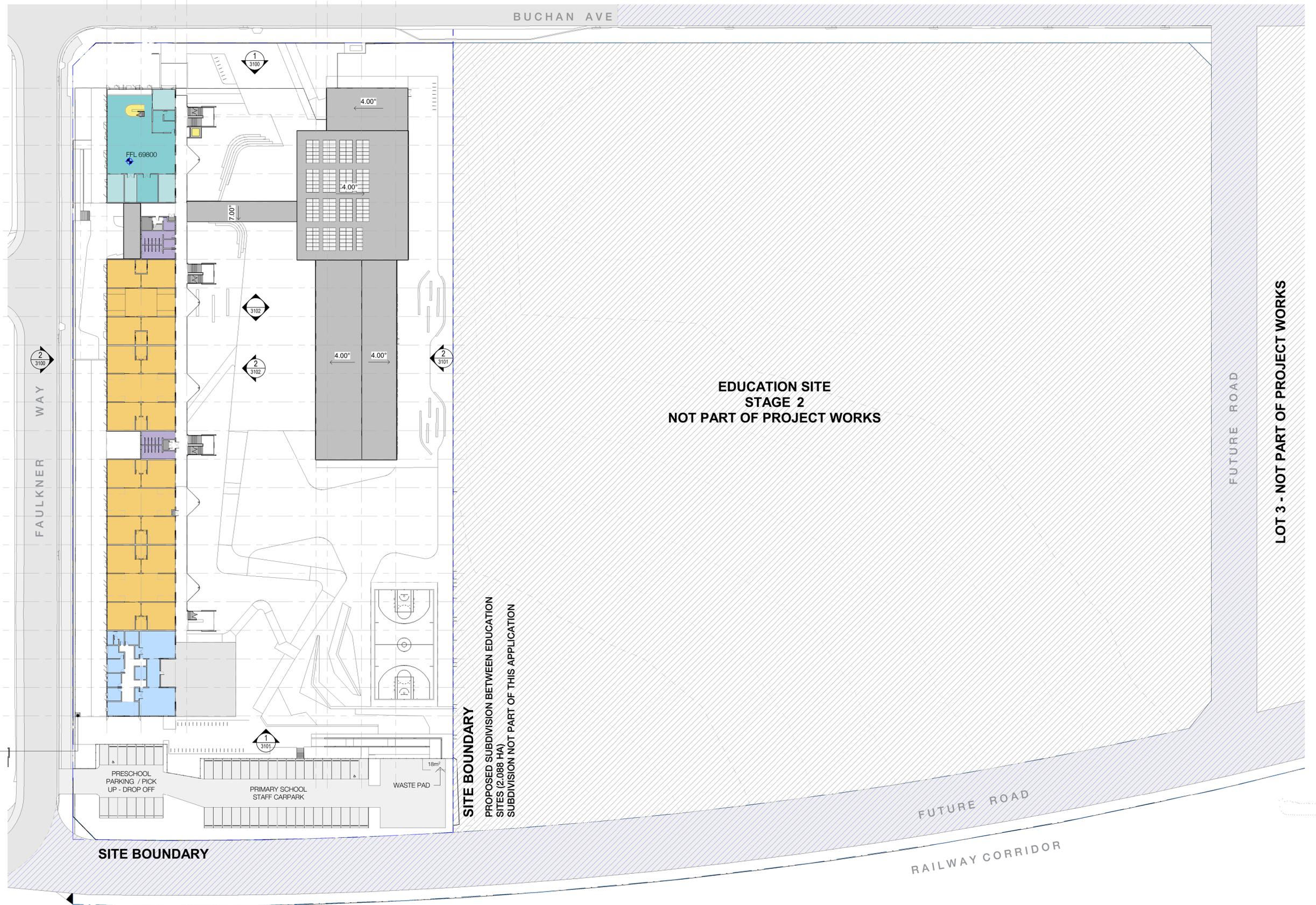
Proj. Dir	Proj. Arch	Drawn	Sheet
AK	AH	HC	A1

Job No.	Date	Scale
210002	03/25/21	1 : 500

Drawing No.	Revision
AR- W-DW- 2000	B

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TKDArchitects
Tanner Kibble Denton



(N) EXTERNAL
COMMS
CUPBOARD

SITE BOUNDARY

SITE BOUNDARY
PROPOSED SUBDIVISION BETWEEN EDUCATION
SITES (2.098 HA)
SUBDIVISION NOT PART OF THIS APPLICATION

**EDUCATION SITE
STAGE 2
NOT PART OF PROJECT WORKS**

LOT 3 - NOT PART OF PROJECT WORKS

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Rev	Date	Description	Chkd	Auth
P1	06.04.21	Issue for Coordination	HC	AK
A	20.04.21	Issue for Coordination	HC	AK
B	29.04.21	Issue for Coordination	HC	AK

Project
**NEW PRIMARY SCHOOL IN
EDMONDSON PARK**
BUCHAN AVE
EDMONDSON PARK
Drawing Title
LEVEL 01

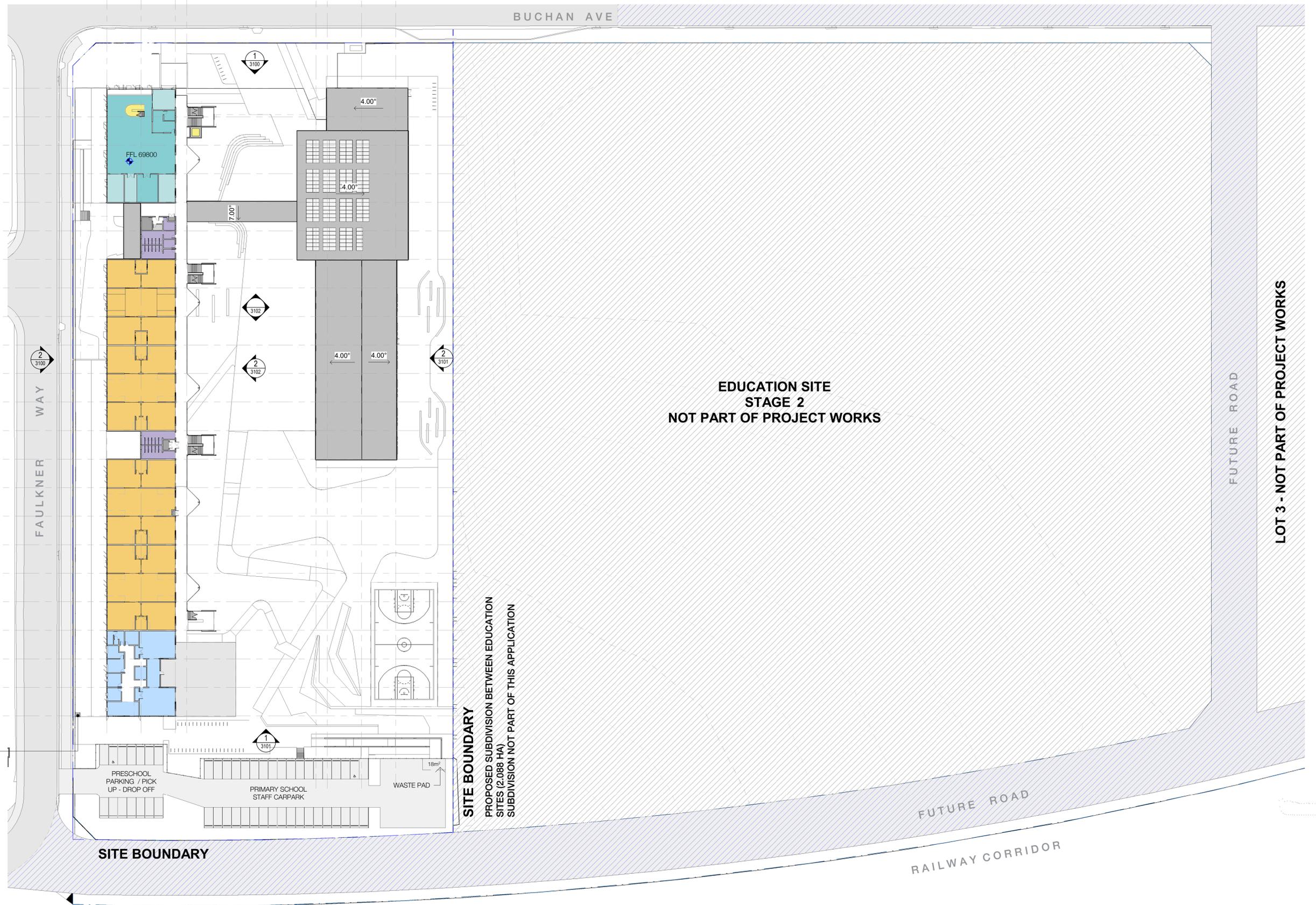
Proj. Dir	Proj. Arch	Drawn	Sheet
AK	AH	HC	A1
Job No.	Date	Scale	
210002	03/25/21	1 : 500	
Drawing No.	Revision		
AR- W-DW- 2001	B		



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TKD Architects
Tanner Kibble Denton



(N) EXTERNAL COMMS CUPBOARD

SITE BOUNDARY

SITE BOUNDARY
 PROPOSED SUBDIVISION BETWEEN EDUCATION SITES (2.098 HA)
 SUBDIVISION NOT PART OF THIS APPLICATION

EDUCATION SITE
 STAGE 2
 NOT PART OF PROJECT WORKS

LOT 3 - NOT PART OF PROJECT WORKS

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PTC
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NSW Nominated Architects: Robert Denton Reg. No. 5782, Alex Kibble Reg. No. 6015
 Do not scale drawings. Verify all dimensions on site. Notify architect of all discrepancies

Rev	Date	Description	Chkd	Auth
P1	06.04.21	Issue for Coordination	HC	AK
A	20.04.21	Issue for Coordination	HC	AK
B	29.04.21	Issue for Coordination	HC	AK

Project
NEW PRIMARY SCHOOL IN EDMONDSON PARK
 BUCHAN AVE
 EDMONDSON PARK

Drawing Title
LEVEL 01

Proj. Dir	Proj. Arch	Drawn	Sheet
AK	AH	HC	A1

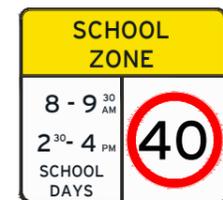
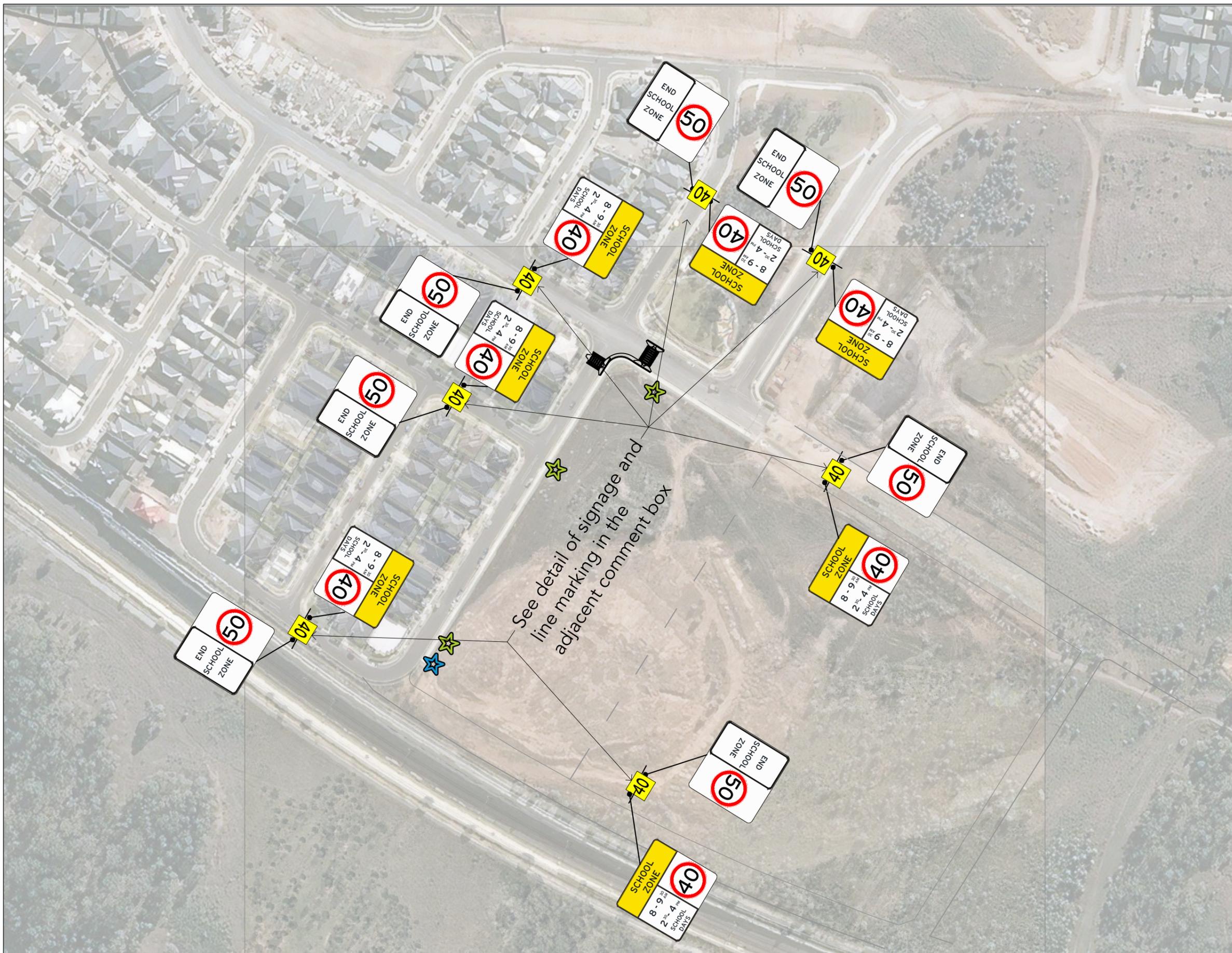
Job No.	Date	Scale
210002	03/25/21	1 : 500

Drawing No. **AR- W-DW- 2001** Revision **B**

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TKDArchitects
 Tanner Kibble Denton

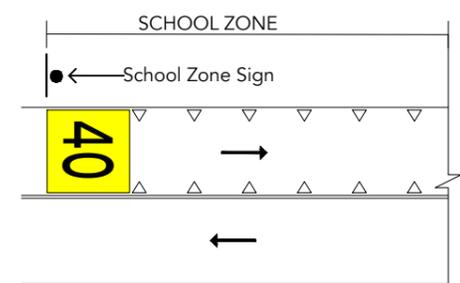
Attachment 2 Signage and Line Marking Plans



END OF SCHOOL ZONE SIGN

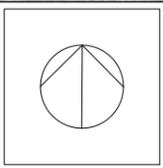


SCHOOL ZONE LINEMARKING

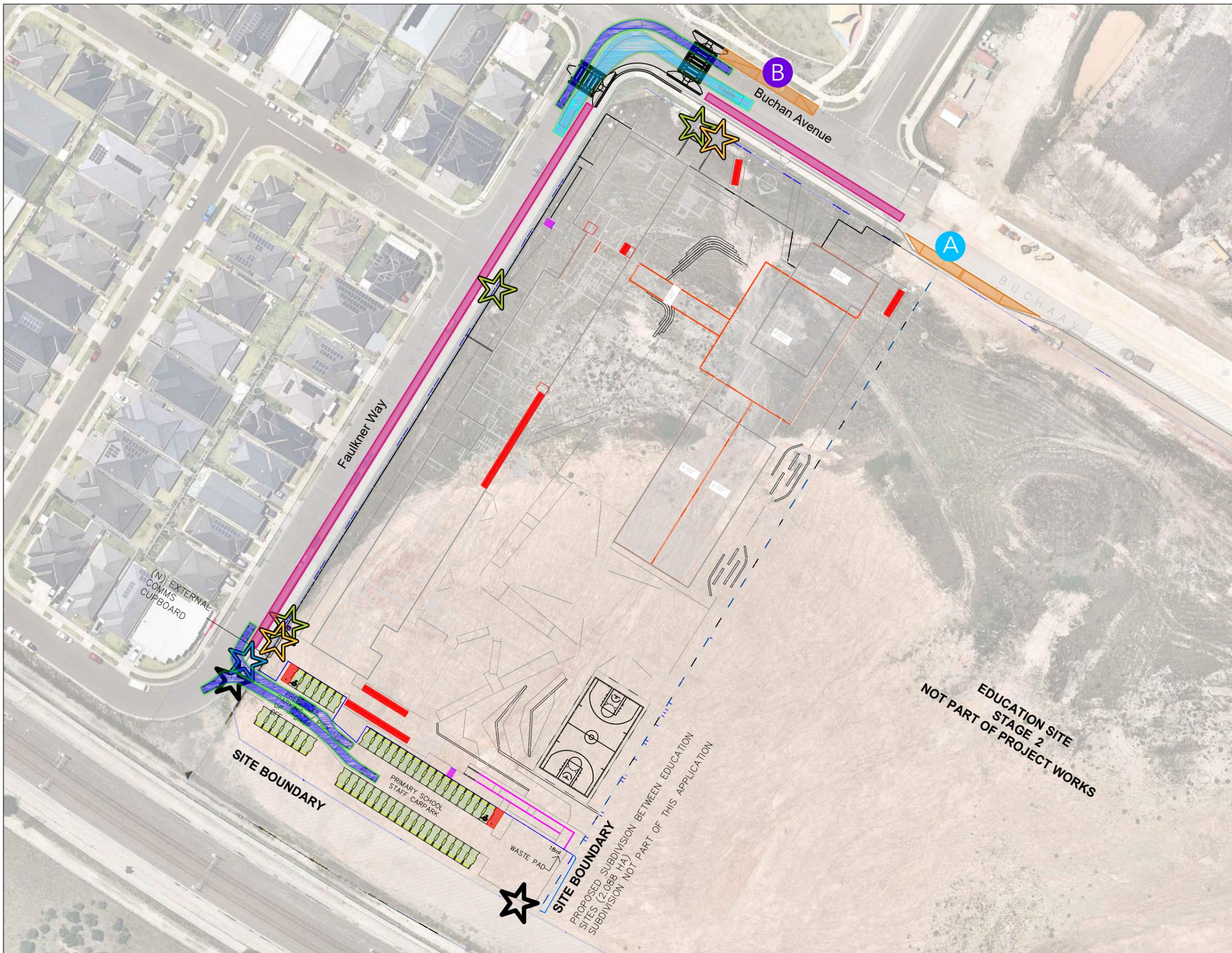


See detail of signage and line marking in the adjacent comment box

REV	DATE	COMMENT / DESCRIPTION	DRAWN	REVIEWED
1	30/04/21	FOR REVIEW	FM	KB



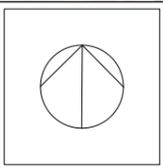
Attachment 3 Design Review



-  Bus Stop
-  Pick-up and Drop-off Area - School Days
-  Pedestrian Access Gate
-  Cyclist Access Gate
-  Vehicular Access Gate
-  Service Vehicle Access Gate
-  2.4 x 5.4m Car Parking Envelope
-  2.4 x 5.4m Accessible Shared Bay
-  0.5 x 1.8m Bicycle Parking Envelope

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 ptcconsultants.co

rev	date	comment / description	drawn	reviewed
1	19/05/21	FOR INFORMATION	PS	KB

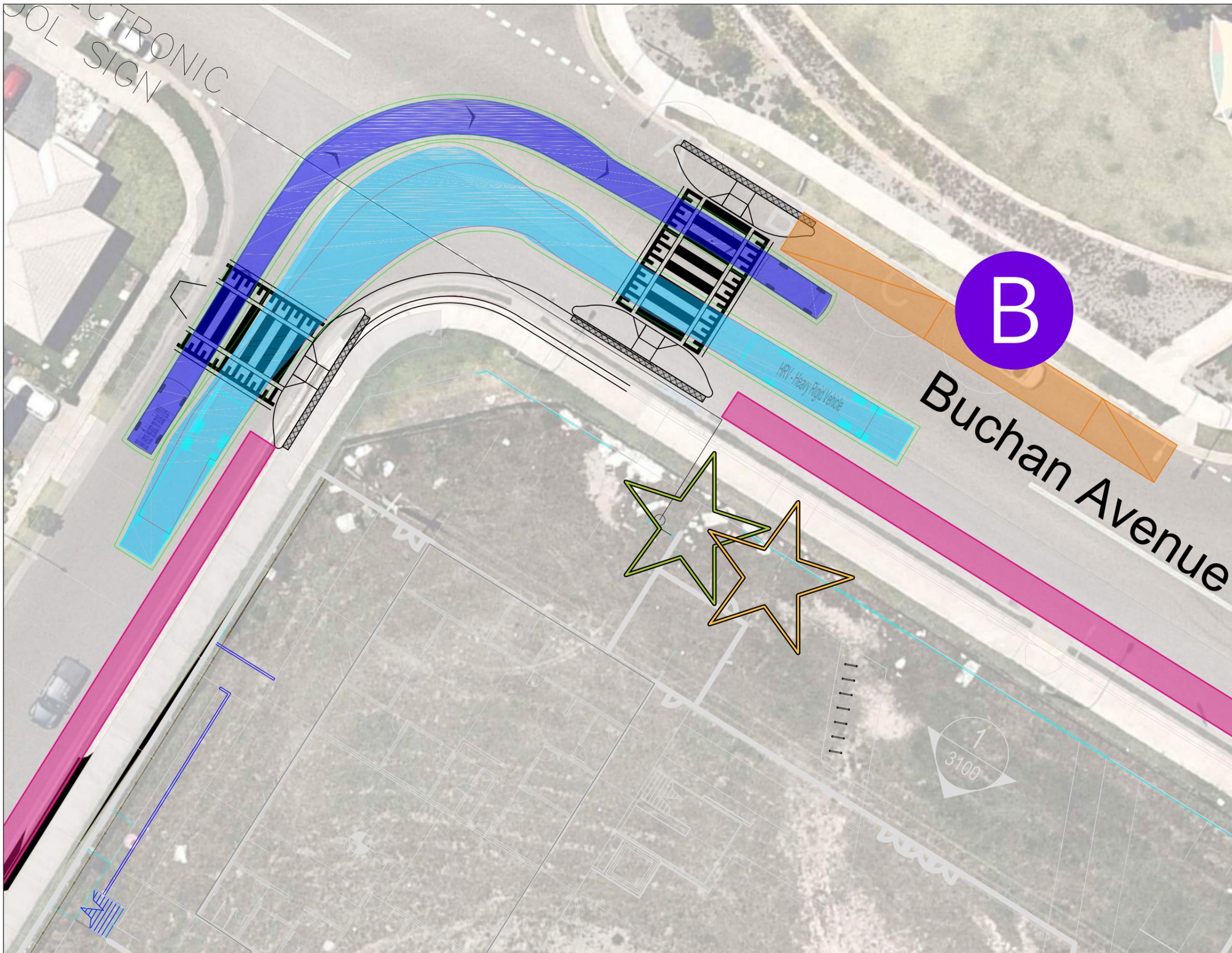


project
 New Primary School in Edmondson Park

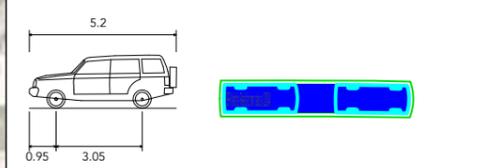
drawing title
 Overview

client	SINSW
drawing #	ptc-001
project #	21-3164
scale	1 : 1000

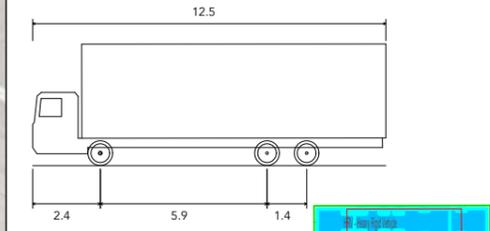
rev 01



- Bus Stop
- Pick-up and Drop-off Area - School Days
- Pedestrian Access Gate
- Cyclist Access Gate
- Vehicular Access Gate
- Service Vehicle Access Gate
- 2.4 x 5.4m Car Parking Envelope
- 2.4 x 5.4m Accessible Shared Bay
- 0.5 x 1.8m Bicycle Parking Envelope



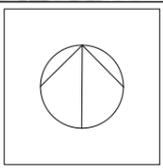
B99 Vehicle (Realistic min radius) (2004)
 Overall Length 5.200m
 Overall Width 1.940m
 Overall Body Height 1.878m
 Min Body Ground Clearance 0.272m
 Track Width 1.840m
 Lock-to-lock time 4.00s
 Curb to Curb Turning Radius 6.250m



HRV - Heavy Rigid Vehicle
 Overall Length 12.500m
 Overall Width 2.500m
 Overall Body Height 4.300m
 Min Body Ground Clearance 0.417m
 Track Width 2.500m
 Lock-to-lock time 6.00s
 Curb to Curb Turning Radius 12.500m

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rev	date	comment / description	drawn	reviewed
1	19/05/21	FOR INFORMATION	PS	KB



project
 New Primary School in Edmondson Park

drawing title
 Pedestrian Crossings

client SINSW
 drawing # ptc-002
 project # 21-3164
 scale 1 : 250

rev 01

TYPICAL

Please note the following compliance requirements:

Height Clearance: 2.2m (min) throughout all areas of the car park accessible to vehicles and bicycles.

2.5m above accessible and shared bays X wherever access is required for a refuse vehicle (and safety clearance envelope)

Sight Splays: Visibility splays in the form of a 2.5m x 2m right-angled triangle to be provided (AS2890.1). Ensure design avoids visual obstructions in sight sply (i.e. dense landscaping, tall fencing/walls etc.)

Parking Spaces: The parking envelopes shown, must be kept clear of all physical obstructions, including height clearance reductions. Ensure that grades within the parking module do not exceed 1:20 (1:40 for accessible bays).

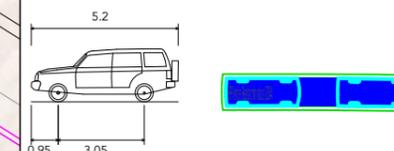
Accessible Spaces: To be designed in accordance with AS2890.6. i.e. standard parking space with adjacent shared bay (2.4m x 5.4m), to be installed as per AS2890.6 requirements (bollard and markings).

Bicycle Parking: Bicycle spaces are to allow for an envelope of 500mm by 1800mm, with an aisle width of 2000mm for locker storage, or 1500mm for racks.

Control Measures: Please note recommended control measures, including line markings, signage, bollards, convex mirrors, lights etc.

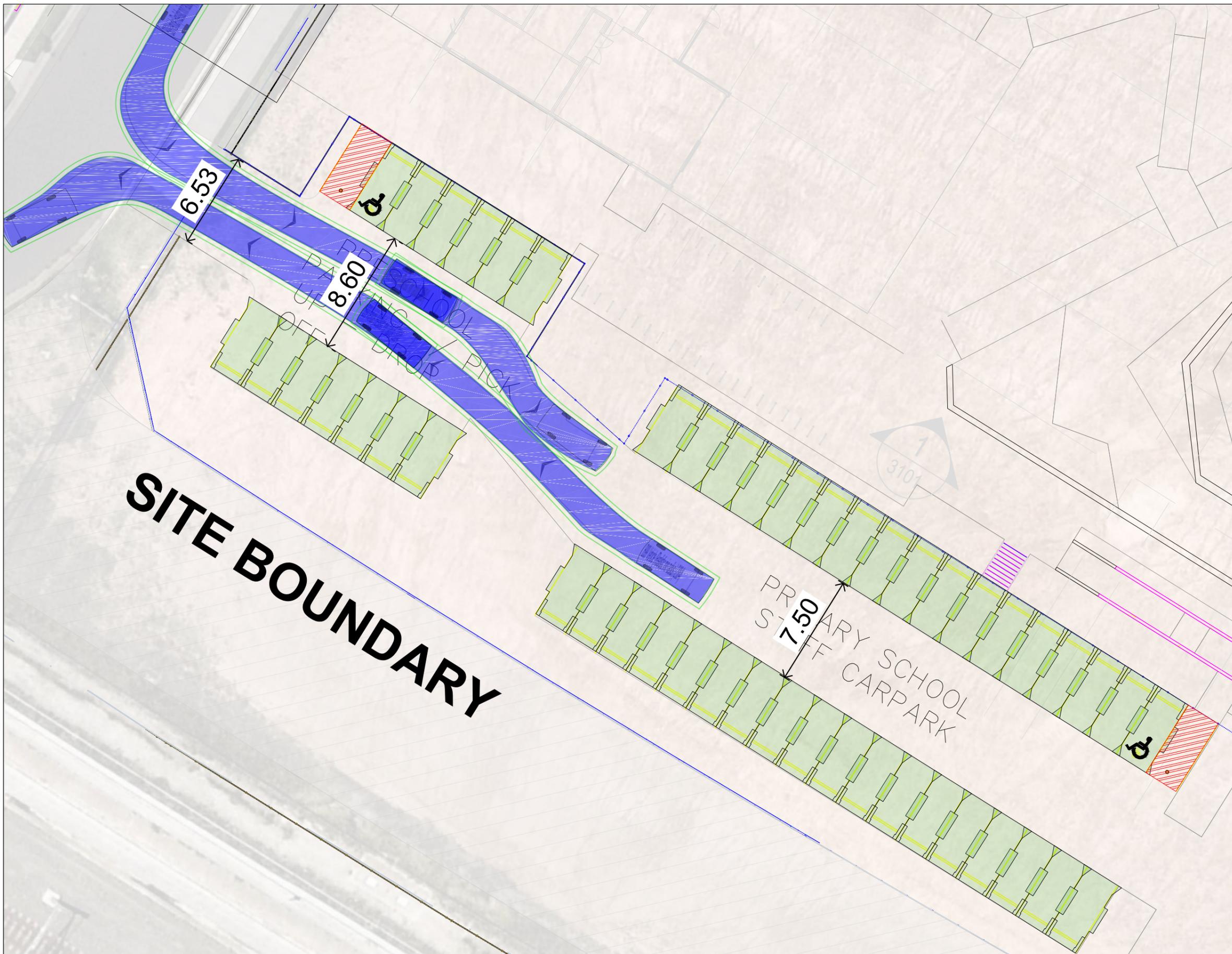
 2.4 x 5.4m Car Parking Envelope

 2.4 x 5.4m Accessible Shared Bay



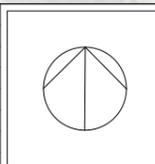
B99 Vehicle (Realistic min radius) (2004)

Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	1.878m
Min Body Ground Clearance	0.272m
Track Width	1.840m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.250m



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rev	date	comment / description	drawn	reviewed
1	19/05/21	FOR INFORMATION	PS	KB

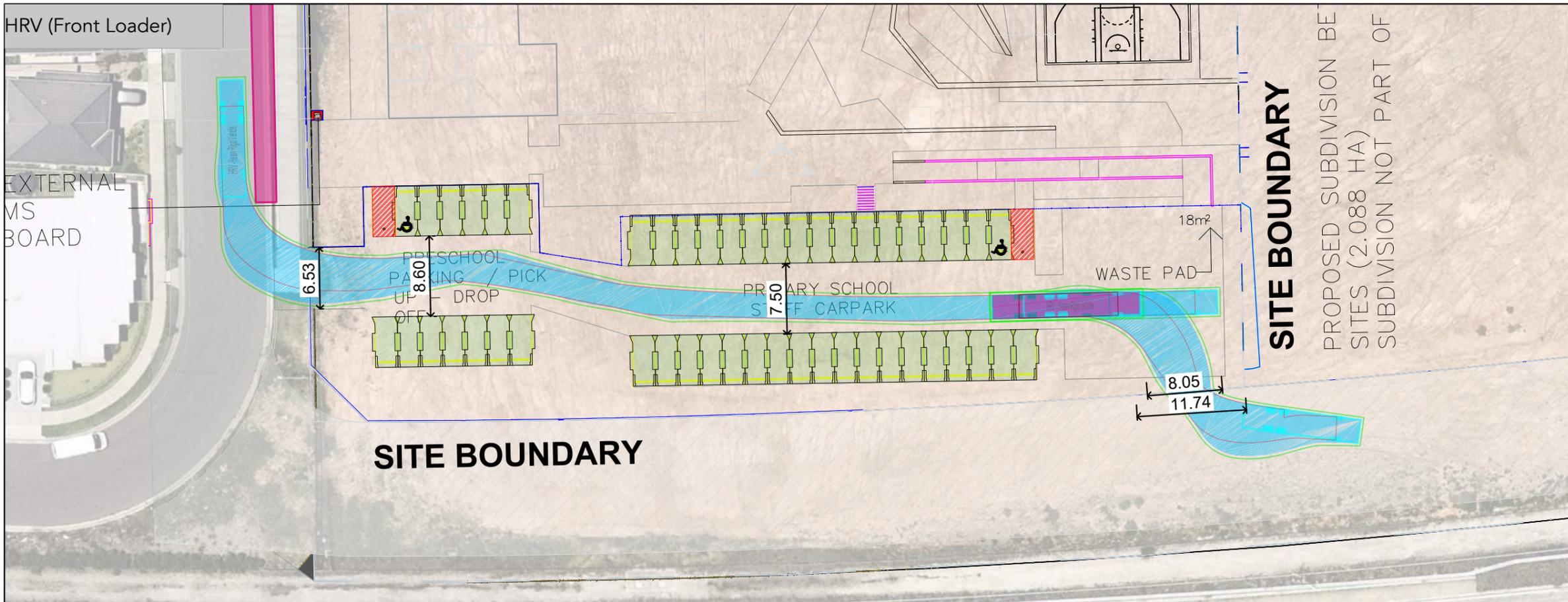


project
New Primary School in Edmondson Park

drawing title
Car Park
Design Review

client SINSW
drawing # ptc-003
project # 21-3164
scale 1 : 250

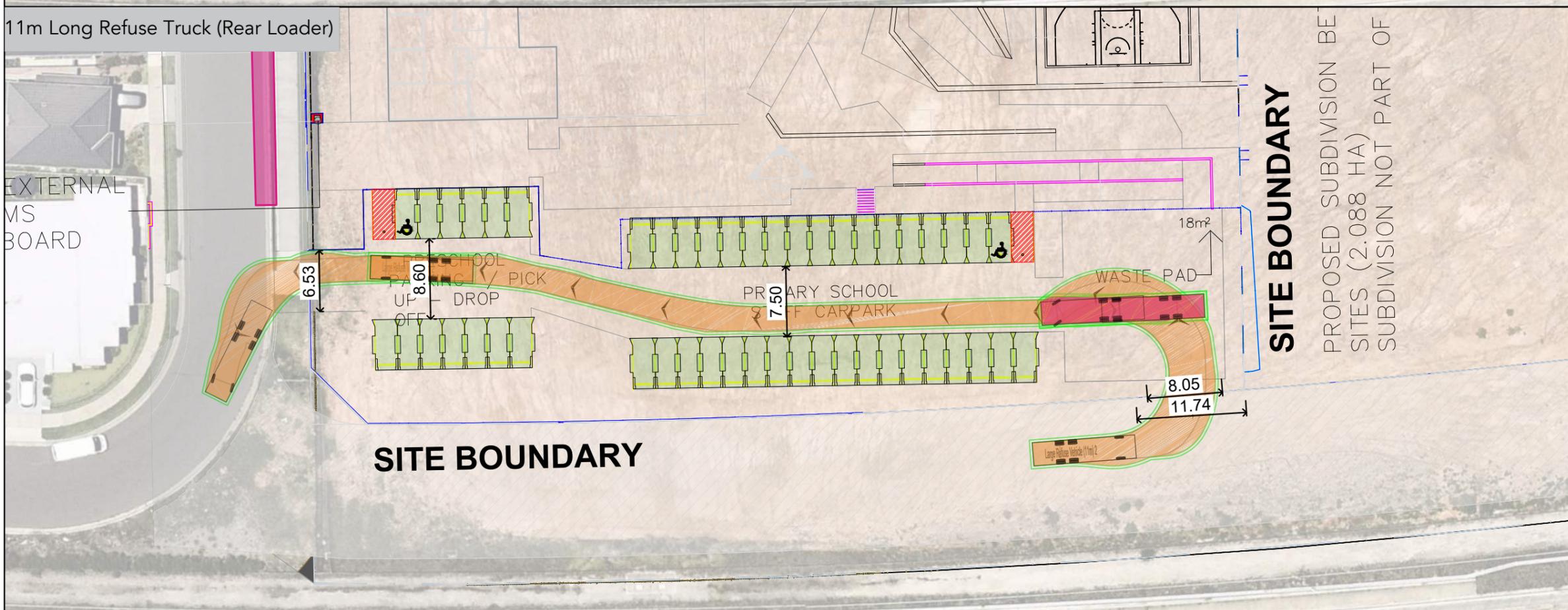
rev 01



comments

A3

- TYPICAL
- Please note the following compliance requirements:
- Height Clearance:** 2.2m (min) throughout all areas of the car park accessible to vehicles and bicycles.
2.5m above accessible and shared bays X wherever access is required for a refuse vehicle (and safety clearance envelope)
 - Sight Splays:** Visibility splays in the form of a 2.5m x 2m right-angled triangle to be provided (AS2890.1). Ensure design avoids visual obstructions in sight sply (i.e. dense landscaping, tall fencing/walls etc.)
 - Parking Spaces:** The parking envelopes shown, must be kept clear of all physical obstructions, including height clearance reductions. Ensure that grades within the parking module do not exceed 1:20 (1:40 for accessible bays).
 - Accessible Spaces:** To be designed in accordance with AS2890.6. i.e. standard parking space with adjacent shared bay (2.4m x 5.4m), to be installed as per AS2890.6 requirements (bollard and markings).
 - Bicycle Parking:** Bicycle spaces are to allow for an envelope of 500mm by 1800mm, with an aisle width of 2000mm for locker storage, or 1500mm for racks.
 - Control Measures:** Please note recommended control measures, including line markings, signage, bollards, convex mirrors, lights etc.



HRV - Heavy Rigid Vehicle

Overall Length	12.500m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.417m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12.500m

Large Refuse Vehicle (11m) 2

Overall Length	11.000m
Overall Width	2.500m
Overall Body Height	4.333m
Min Body Ground Clearance	0.451m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	10.000m

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rev	date	comment / description	drawn	reviewed
1	19/05/21	FOR INFORMATION	PS	KB

project

New Primary School in Edmondson Park

drawing title

Waste Collection Area
Swept Path Assessment

client SINSW

drawing # ptc-004

project # 21-3164

scale 1 : 500

rev 01

TYPICAL

Please note the following compliance requirements:

Height Clearance: 2.2m (min) throughout all areas of the car park accessible to vehicles and bicycles.

2.5m above accessible and shared bays
 X wherever access is required for a refuse vehicle (and safety clearance envelope)

Sight Splays: Visibility splays in the form of a 2.5m x 2m right-angled triangle to be provided (AS2890.1). Ensure design avoids visual obstructions in sight sply (i.e. dense landscaping, tall fencing/walls etc.)

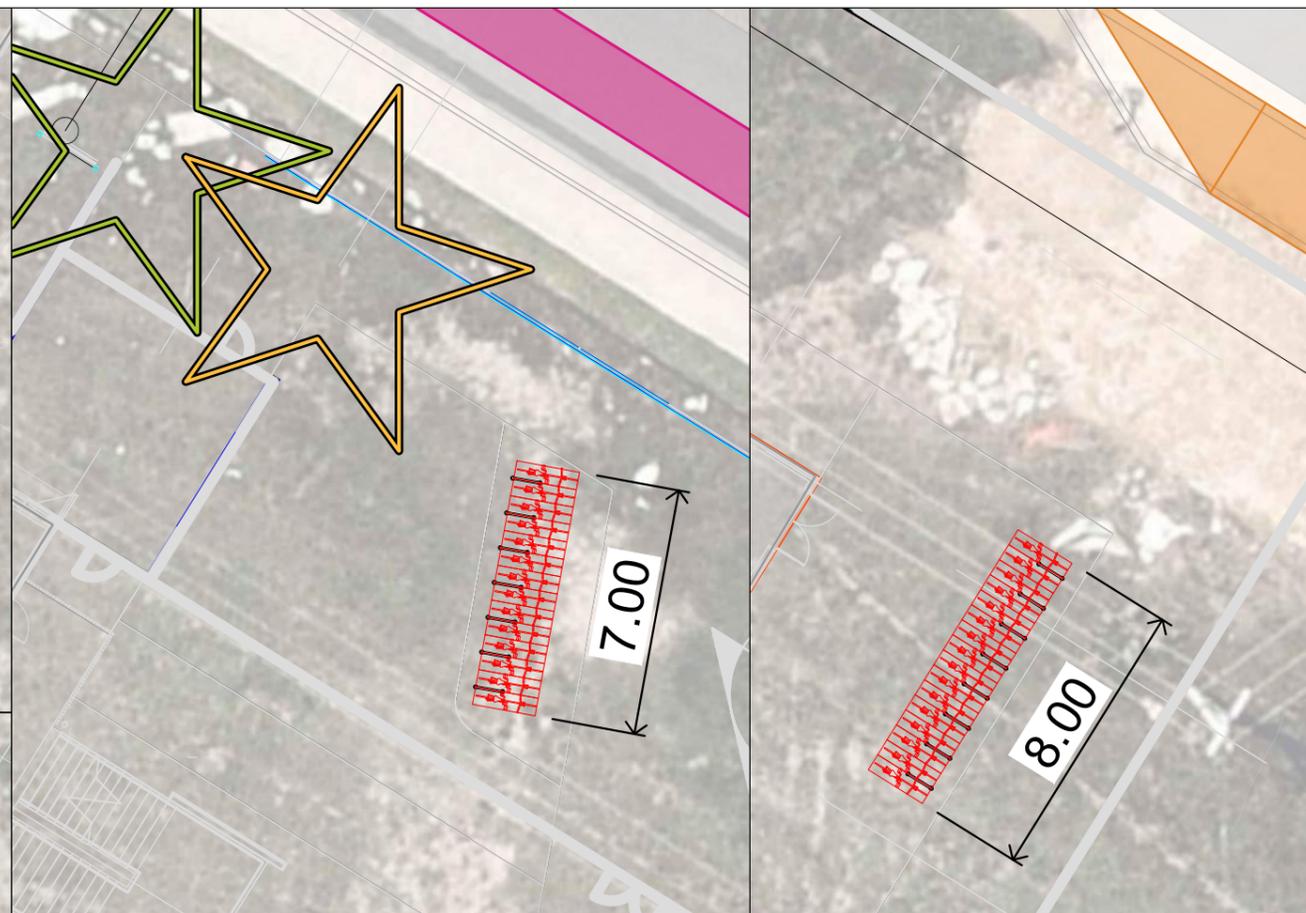
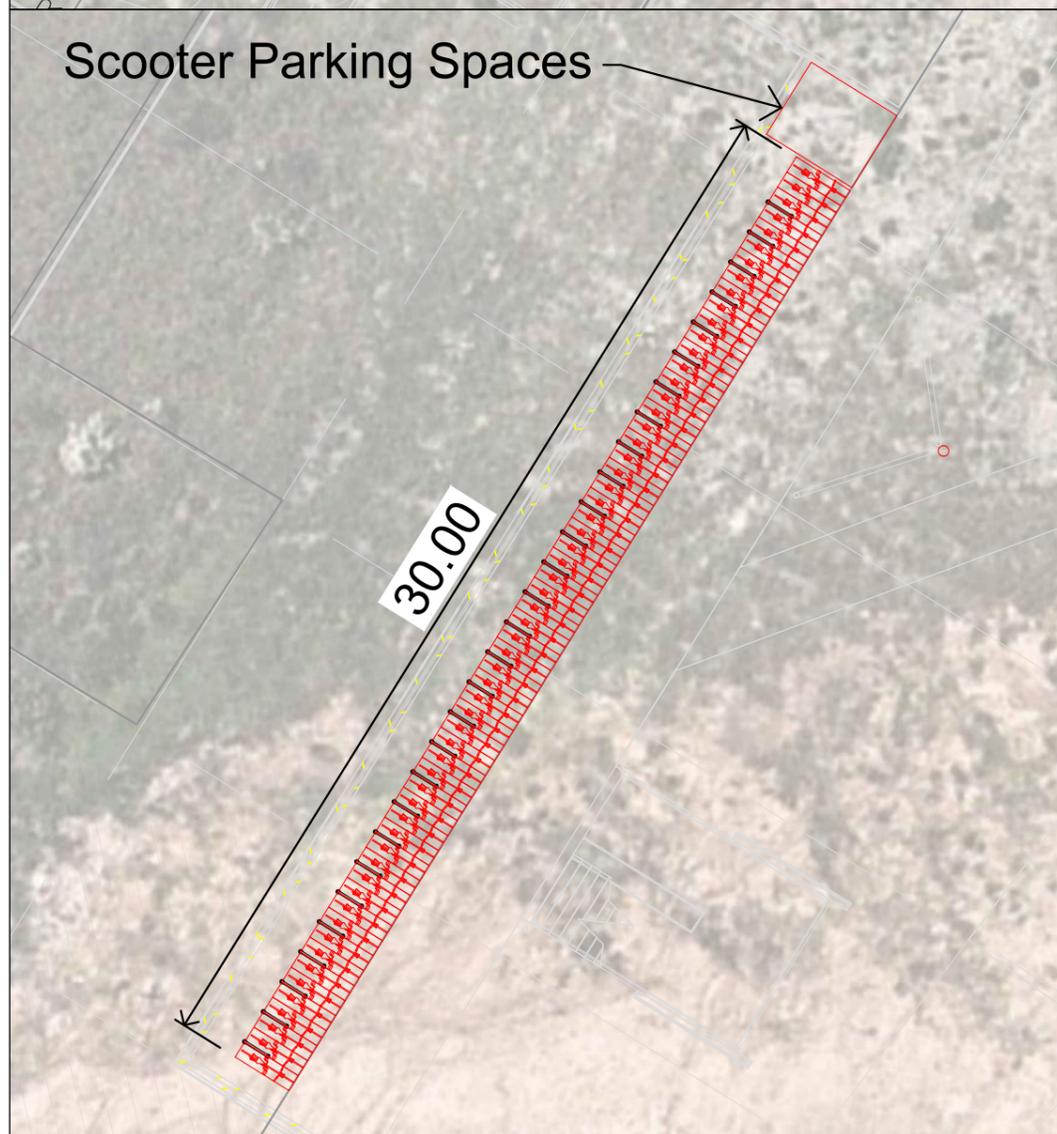
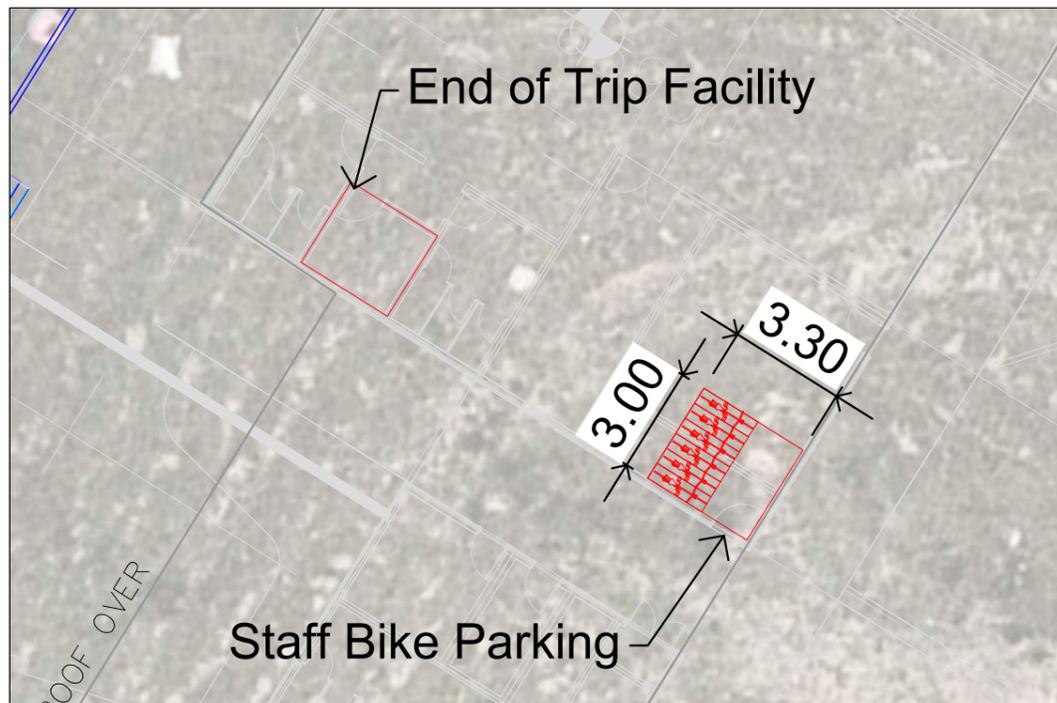
Parking Spaces: The parking envelopes shown, must be kept clear of all physical obstructions, including height clearance reductions. Ensure that grades within the parking module do not exceed 1:20 (1:40 for accessible bays).

Accessible Spaces: To be designed in accordance with AS2890.6. i.e. standard parking space with adjacent shared bay (2.4m x 5.4m), to be installed as per AS2890.6 requirements (bollard and markings).

Bicycle Parking: Bicycle spaces are to allow for an envelope of 500mm by 1800mm, with an aisle width of 2000mm for locker storage, or 1500mm for racks.

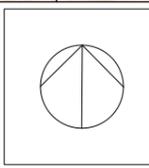
Control Measures: Please note recommended control measures, including line markings, signage, bollards, convex mirrors, lights etc.

-  Bus Stop
-  Pick-up and Drop-off Area - School Days
-  Pedestrian Access Gate
-  Cyclist Access Gate
-  Vehicular Access Gate
-  Service Vehicle Access Gate
-  2.4 x 5.4m Car Parking Envelope
-  2.4 x 5.4m Accessible Shared Bay
-  0.5 x 1.8m Bicycle Parking Envelope



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rev	date	comment / description	drawn	reviewed
1	19/05/21	FOR INFORMATION	PS	KB



project
 New Primary School in Edmondson Park

drawing title
 Bicycle and Scooter Parking Design Review

client SINSW
 drawing # ptc-005
 project # 21-3164
 scale 1 : 200

rev 01

Attachment 4 Waste Location Options

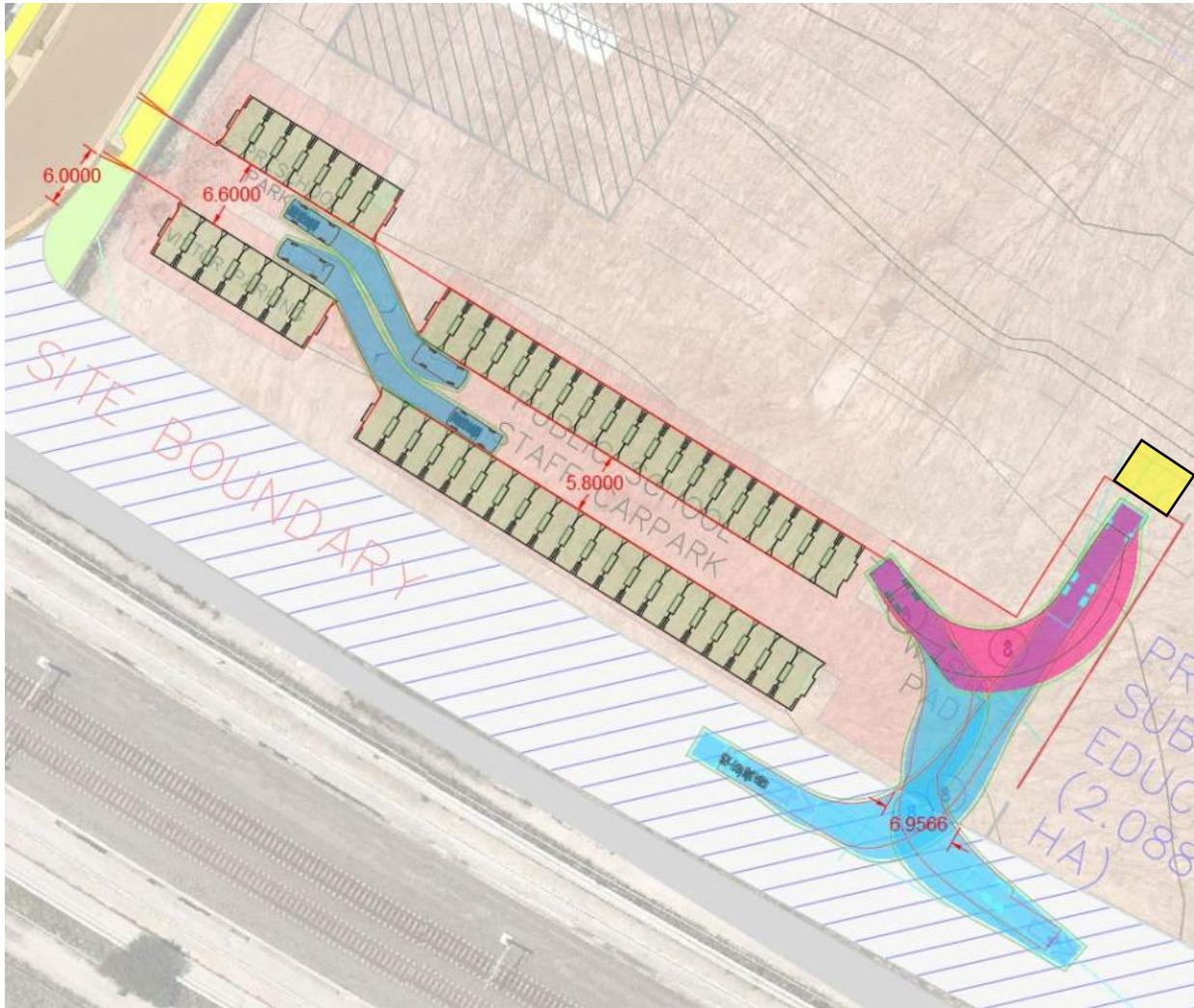


Figure 76 - Waste collection – in and outbound off future south road – front loader (not recommended)

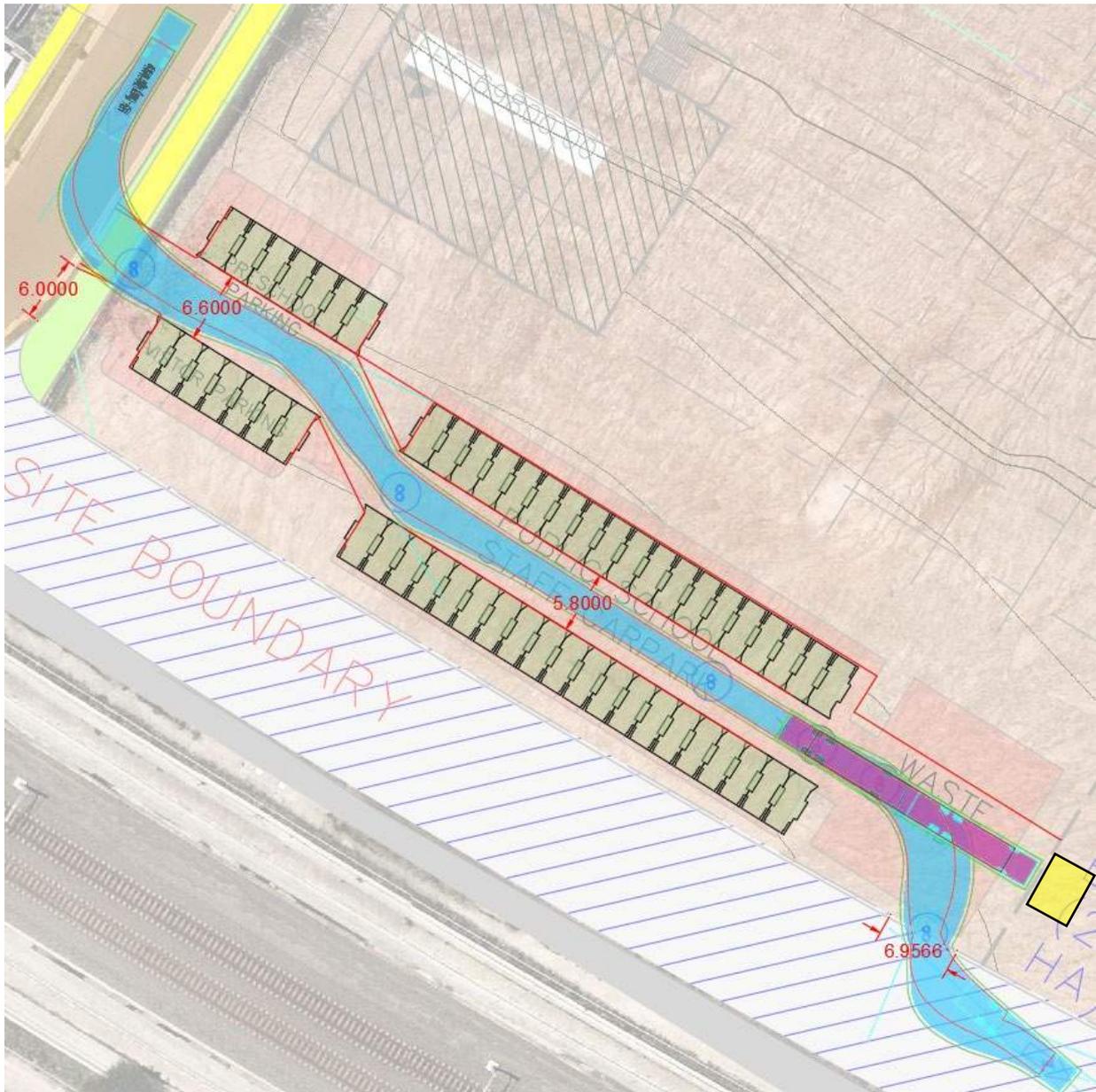


Figure 78 - Waste collection – inbound at Faulkner Way; outbound at future south road – front loader (recommended)

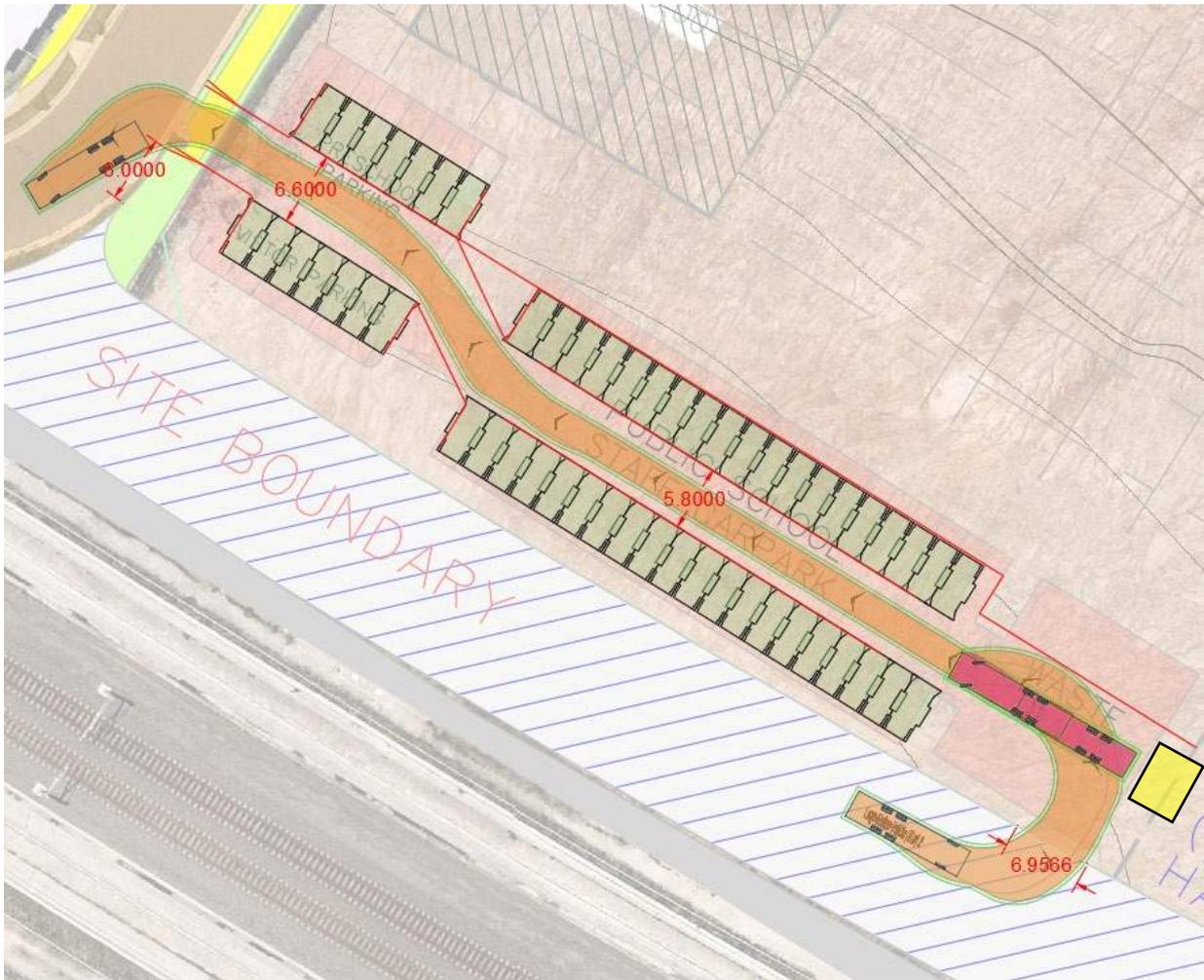
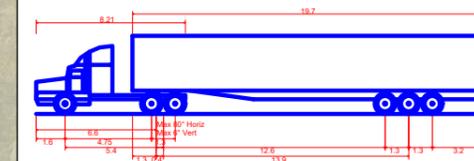


Figure 79 - Waste collection – inbound at future south road; outbound at Faulkner Way – rear loader (recommended)

Attachment 5 Construction Traffic Swept Paths and TCPs

VEHICLE PROFILE



Prime mover and long semi-trailer (25 m)

Overall Length	25.000m
Overall Width	3.000m
Overall Body Height	4.300m
Min Body Ground Clearance	0.540m
Max Track Width	3.000m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	15.000m



19M TRUCK AND DOG

Overall Length	19.000m
Overall Width	2.600m
Overall Body Height	3.750m
Min Body Ground Clearance	0.427m
Track Width	2.500m
Lock-to-lock time	4.00s
Wall to Wall Turning Radius	12.000m

SITE NOTES:

- S1. Maintain pedestrian access along formed pathway around the site.
- S2. Work site to be fenced to prevent unauthorised access.

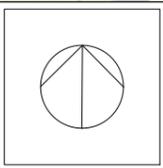
GENERAL NOTES:

- G1. All signs to be clearly visible throughout the works and monitored. Signs can be mounted if required on posts to be visible above parked cars. Signs to be coordinated on site to ensure they are clearly visible.
- G2. All signs to be size A.
- G3. All signs to be visible when workers are in the area and covered when workers are not present.
- G4. Signs to be in accordance with RMS Traffic Control at Worksites (TCAWS) Manual and AS1742.3 Traffic Control for Works on roads.
- G5. RMS/Council approvals to be obtained prior to implementation.
- G6. This TCP is based on TCAWS Manual and is to be set up by qualified traffic controllers (Yellow card). Any alterations on site to this TCP is to be documented and rerecorded by qualified personnel with a Red/Orange card.



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REV	DATE	COMMENT / DESCRIPTION	DRAWN	REVIEWED
P2	05.05.2021	for information	JM	SW
P1	03.05.2021	for information	JM	SW



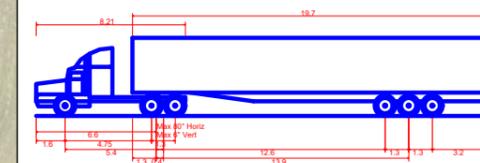
PROJECT
Edmondson Park Primary School - CTMP

DRAWING TITLE
Soldiers Parade & Buchan Avenue TCS Plan

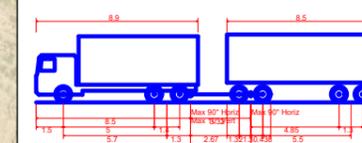
CLIENT SINSW
DRAWING # PTC-001
PROJECT # 21-3164
SCALE 1 : 1000 @ A3

PRELIMINARY
REV P2

VEHICLE PROFILE



Prime mover and long semi-trailer (25 m)
 Overall Length 25.000m
 Overall Width 3.000m
 Overall Body Height 4.300m
 Min Body Ground Clearance 0.540m
 Max Track Width 3.000m
 Lock-to-lock time 6.00s
 Curb to Curb Turning Radius 15.000m



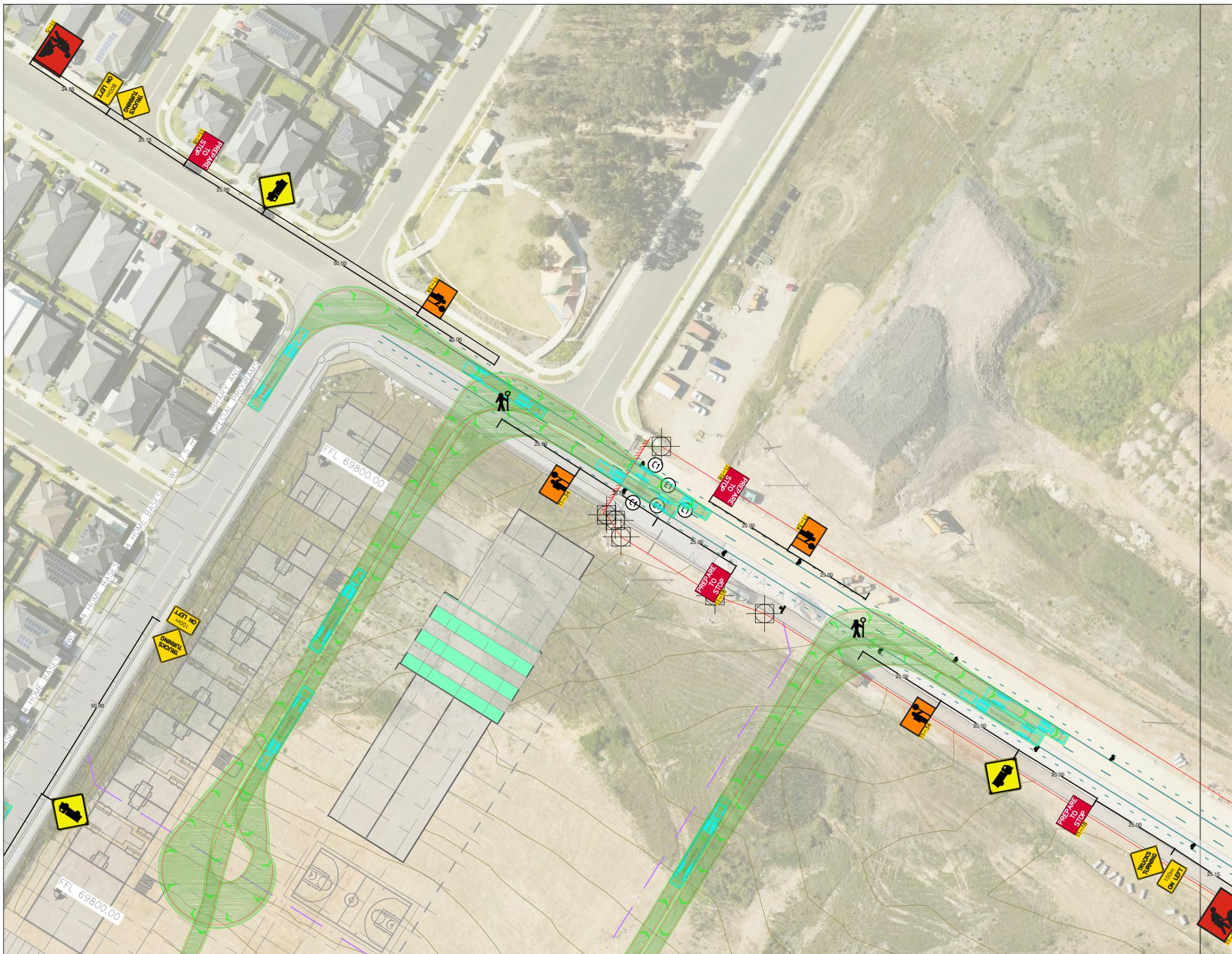
19M TRUCK AND DOG
 Overall Length 19.000m
 Overall Width 2.600m
 Overall Body Height 3.739m
 Min Body Ground Clearance 0.427m
 Track Width 2.500m
 Lock-to-lock time 4.00s
 Wall to Wall Turning Radius 12.000m

SITE NOTES:

- S1. Maintain pedestrian access along formed pathway around the site.
- S2. Work site to be fenced to prevent unauthorised access.

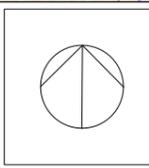
GENERAL NOTES:

- G1. All signs to be clearly visible throughout the works and monitored. Signs can be mounted if required on posts to be visible above parked cars. Signs to be coordinated on site to ensure they are clearly visible.
- G2. All signs to be size A.
- G3. All signs to be visible when workers are in the area and covered when workers are not present.
- G4. Signs to be in accordance with RMS Traffic Control at Worksites (TCAWS) Manual and AS1742.3 Traffic Control for Works on roads.
- G5. RMS/Council approvals to be obtained prior to implementation.
- G6. This TCP is based on TCAWS Manual and is to be set up by qualified traffic controllers (Yellow card). Any alterations on site to this TCP is to be documented and rerecorded by qualified personnel with a Red/Orange card.



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REV	DATE	COMMENT / DESCRIPTION	DRAWN	REVIEWED
P2	05.05.2021	for information	JM	SW
P1	03.05.2021	for information	JM	SW



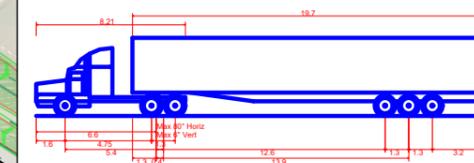
PROJECT
 Edmondson Park Primary School - CTMP

DRAWING TITLE
 Site Access & Buchan Avenue TCS Plan

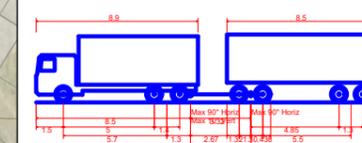
CLIENT SINSW
 DRAWING # PTC-001
 PROJECT # 21-3164
 SCALE 1 : 1000 @ A3

PRELIMINARY
REV P2

VEHICLE PROFILE



Prime mover and long semi-trailer (25 m)
 Overall Length 25.000m
 Overall Width 3.000m
 Overall Body Height 4.300m
 Min Body Ground Clearance 0.540m
 Max Track Width 3.000m
 Lock-to-lock time 6.00s
 Curb to Curb Turning Radius 15.000m



19M TRUCK AND DOG
 Overall Length 19.000m
 Overall Width 2.600m
 Overall Body Height 3.799m
 Min Body Ground Clearance 0.42m
 Track Width 2.500m
 Lock-to-lock time 4.00s
 Wall to Wall Turning Radius 12.000m

SITE NOTES:

- S1. Maintain pedestrian access along formed pathway around the site.
- S2. Work site to be fenced to prevent unauthorised access.

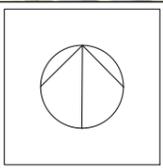
GENERAL NOTES:

- G1. All signs to be clearly visible throughout the works and monitored. Signs can be mounted if required on posts to be visible above parked cars. Signs to be coordinated on site to ensure they are clearly visible.
- G2. All signs to be size A.
- G3. All signs to be visible when workers are in the area and covered when workers are not present.
- G4. Signs to be in accordance with RMS Traffic Control at Worksites (TCAWS) Manual and AS1742.3 Traffic Control for Works on roads.
- G5. RMS/Council approvals to be obtained prior to implementation.
- G6. This TCP is based on TCAWS Manual and is to be set up by qualified traffic controllers (Yellow card). Any alterations on site to this TCP is to be documented and rerecorded by qualified personnel with a Red/Orange card.



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P1	03.05.2021	for information	JM	SW



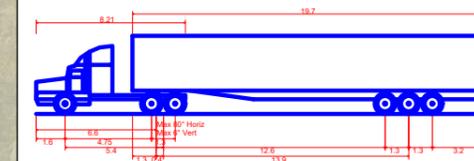
PROJECT
 Edmondson Park Primary School - CTMP

DRAWING TITLE
 Faulkner Way TCS Plan

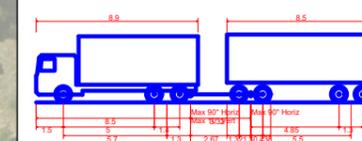
CLIENT SINSW
DRAWING # PTC-001
PROJECT # 21-3164
SCALE 1 : 1000 @ A3

PRELIMINARY
REV P2

VEHICLE PROFILE



Prime mover and long semi-trailer (25 m)
 Overall Length 25.000m
 Overall Width 3.000m
 Overall Body Height 4.300m
 Min Body Ground Clearance 0.540m
 Max Track Width 3.000m
 Lock-to-lock time 6.00s
 Curb to Curb Turning Radius 15.000m



19M TRUCK AND DOG
 Overall Length 19.000m
 Overall Width 2.600m
 Overall Body Height 3.790m
 Min Body Ground Clearance 0.420m
 Track Width 2.500m
 Lock-to-lock time 4.00s
 Wall to Wall Turning Radius 12.000m

SITE NOTES:

- S1. Maintain pedestrian access along formed pathway around the site.
- S2. Work site to be fenced to prevent unauthorised access.

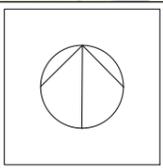
GENERAL NOTES:

- G1. All signs to be clearly visible throughout the works and monitored. Signs can be mounted if required on posts to be visible above parked cars. Signs to be coordinated on site to ensure they are clearly visible.
- G2. All signs to be size A.
- G3. All signs to be visible when workers are in the area and covered when workers are not present.
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- G6. This TCP is based on TCAWS Manual and is to be set up by qualified traffic controllers (Yellow card). Any alterations on site to this TCP is to be documented and rerecorded by qualified personnel with a Red/Orange card.



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REV	DATE	COMMENT / DESCRIPTION	DRAWN	REVIEWED
P2	05.05.2021	for information	JM	SW
P1	03.05.2021	for information	JM	SW



PROJECT
 Edmondson Park Primary School - CTMP

DRAWING TITLE
 Soldiers Parade & Buchan Avenue TCS Plan
 19m Truck and Dog

CLIENT SINSW
DRAWING # PTC-001
PROJECT # 21-3164
SCALE 1 : 1000 @ A3

PRELIMINARY
REV P2