New Liverpool Public School

Student Transport Plan

Prepared by: GTA Consultants (Group) Pty Ltd for NSW Department of Education
on 11/06/2021
Reference: N174701
Issue #: A

GTAconsultants now Stantec

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Quality Record

Issue	Date	Description	Prepared By	Checked By	Approved By	Signed
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1.1. School Context

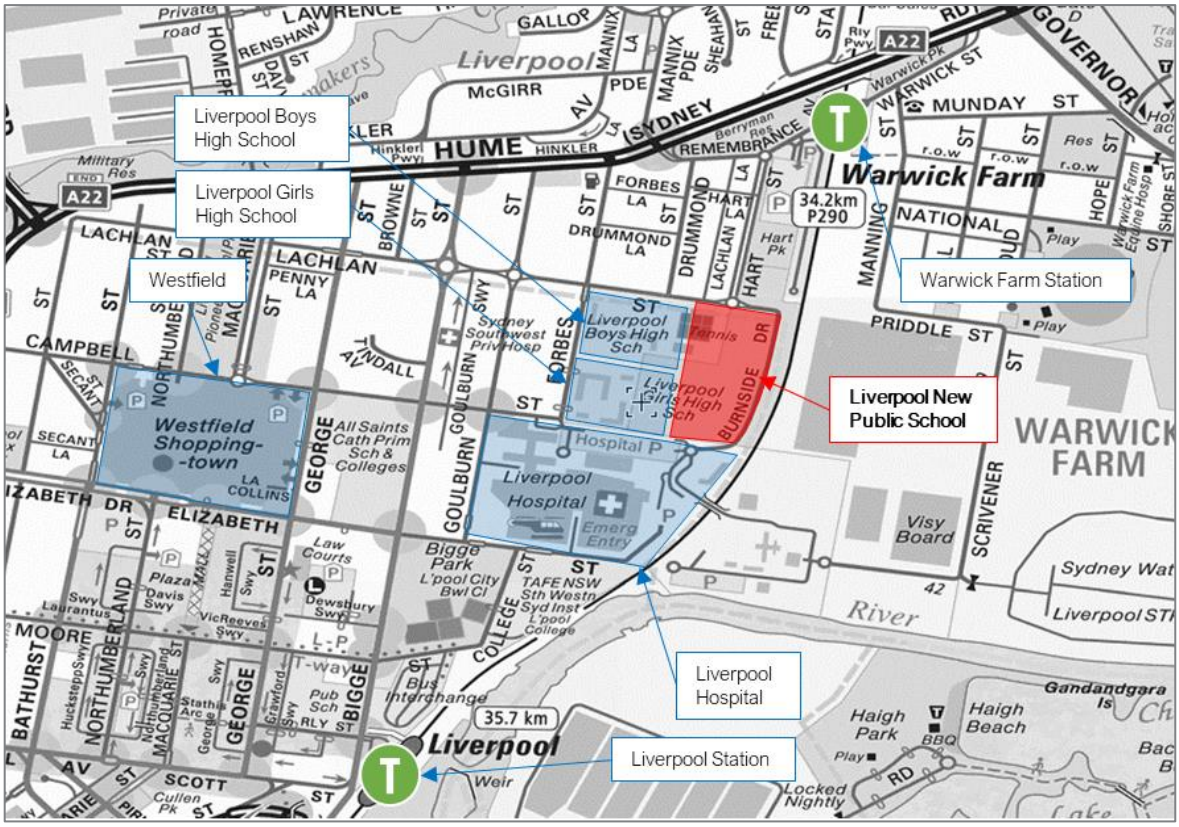
1.1.1. Overview

The New Liverpool Public School (NLPS) is a new primary school proposed within Liverpool, located approximately 25 kilometres south west of Sydney CBD. The proposed school is bounded by Lachlan Street to the north, Burnside Drive to the east, Liverpool Hospital to the south and the existing Liverpool Boys High School and Liverpool Girls High School to the west. Liverpool Station is located around 900 metres southwest of the school and Warwick Farm Station is located around 500 metres north of the school.

High density residential is located north of the site and the railway corridor is to the east of the site. On the opposite side of the rail corridor there is a mix of low density residential and industrial development. West of the site is the existing Liverpool Boys/ Girls High School.

The site location is illustrated in Figure 1.1.

Figure 1.1: Site and Surrounding Environment



1.1.2. School Catchment Boundary

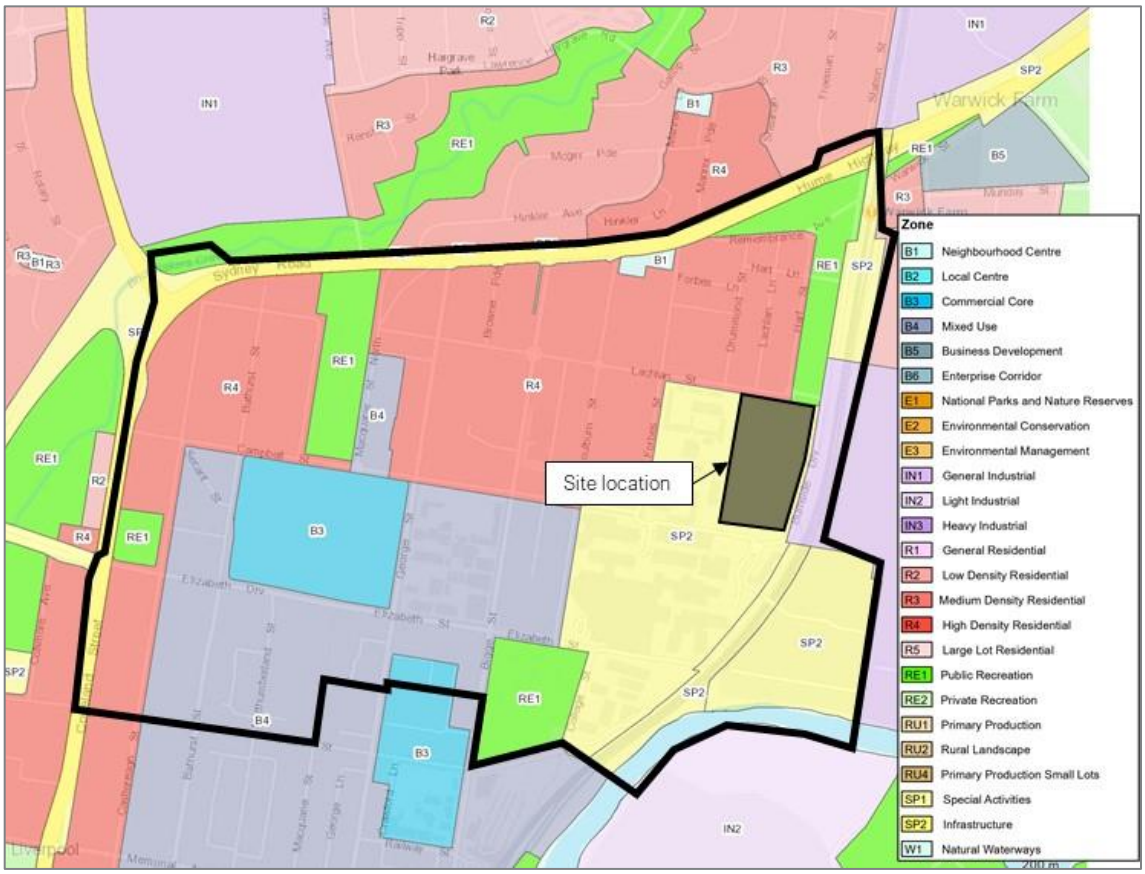
The future school catchment boundary for NLPS is illustrated in Figure 1.2. The catchment is bounded by Hume Highway to the north and west, the rail corridor to the east, and extends south to Moore Street. The catchment has been further overlaid on a map (Figure 1.3) illustrating the surrounding land zoning to highlight the residential areas and geographic location in relation to NLPS.

As seen, the majority of the residential catchment is located to the west and north-west of the proposed school (primarily high-density residential zoning) and to the south-west (mixed use zoning).

Figure 1.2: School Catchment Boundary

Source: School Infrastructure, received 1 March 2021

Figure 1.3: Surrounding Land Zoning



Base Image Source: NSW Government ePlanning Spatial Viewer, https://www.planningportal.nsw.gov.au/spatialviewer/#/find-a-property/address, accessed 1 March 2021

1.1.3. Proposed Development

The NLPS is located within the grounds of the existing Liverpool Boys and Girls High School in the Liverpool Central Business District (CBD), at 18 Forbes Street, Liverpool. The proposed NLPS is located in the eastern portion of the existing school grounds (refer to Figure 1.4).

The site is legally described as Lot 1 in DP 1137425. The application seeks consent for the construction and operation of a new primary school. This will include construction of a new school building for core school facilities, teaching spaces, support units, preschools as well as associated landscaping and open space improvements.

Figure 1.4: Context Plan

Source: Fitpatrick + Partners, dated 0206/2021

1.2. Strategic Context

This section provides an overview of the strategic context of the proposed development, including the relevant planning strategies and opportunities.

1.2.1. Future Transport 2056 and Supporting Plans (2018)

Reviews have been completed for the following Transport for NSW supporting plans:

- Future Transport Strategy 2056
- Greater Sydney Services and Infrastructure Plan
- Regional NSW Services and Infrastructure Plan
- Road Safety Plan (Towards Zero).

To support the land use vision for Greater Sydney, the NSW Government developed a vision for the transport system that will enable people and goods to move conveniently around the city using:

- City-shaping corridors – Major trunk road and rail public transport corridors providing higher speed and volume linkages between our cities and centres that shape locational decisions of residents and businesses.
- City-serving corridors – Higher density corridors concentrated within ~10km of metropolitan centres providing high frequency access to metropolitan cities/ centres with more frequent stopping patterns.
- Centre-serving corridors – Local corridors that support buses, walking and cycling, to connect people with their nearest centre and transport node.

Some of the key initiatives of this vision include:

- Sydney Growth Trains (part of More Trains, More Services program), which is committed within the next 10 years.
- Trial of on-demand bus services on selected local bus routes, which is committed within the next 10 years
- Introduction of higher frequency transport services across Greater Sydney, which is under investigations between now and the next 20 years
- Providing education campaigns for public transport users that target behaviours around rail corridors and level crossings, school student travel, safe travel for older or less mobile passengers and travel training across the network.

The More Trains, More Services initiative includes a service capacity upgrade program designed to transform the existing rail system. This program aims to transform Sydney's busiest train lines over the next 10 years and beyond, through digital systems, advanced signalling and infrastructure upgrades.

1.2.2. Greater Sydney Commission's Western City District Plan (2018)

Education

Schools are essential local infrastructure. The Department of Education's high-level *School Assets Strategic Plan Summary* coordinates planning for, and delivery of, both new and expanded schools. It encourages the joint and shared use of facilities with local governments and the private sector to develop innovative ways to provide school infrastructure. The NSW Government will spend $4.2 billion over the next four years on building and upgrading schools, including the addition of more than 1,500 new classrooms providing places for 32,000 students. Shared use of facilities and increased opportunities for students to walk and cycle to school will better connect schools with local communities.

Planning for early education and childcare facilities requires innovative approaches to the use of land and floor space, including co-location with compatible uses such as primary schools and office buildings, close to transport facilities.

Education and Child Care

The State Environmental Planning Policy (SEPP) for Educational Establishments and Child Care Facilities 2017 makes it easier for childcare providers, schools, TAFEs and universities to build new facilities and improve existing facilities. It streamlines approval processes, recognising the need for additional educational infrastructure with a focus on good design.

Joint and Shared Use

Joint and shared use of facilities is encouraged to make school assets available to the community outside school hours and to give schools access to community facilities. Each neighbourhood has facilities such as libraries, community centres, adult education, sport and recreation facilities that function to enhance and promote social connections and networks within the community. Schools are an important example of social connectors and where shared use of such facilities is achieved their function as a community hub is significantly enhanced.

1.2.3. Movement and Place

Movement and Place is a cross-government framework for planning and managing roads and streets across NSW. The framework delivers on NSW policy and strategy directions to create successful streets and roads by balancing the movement of people and goods with the amenity and quality of places. Movement and Place

considers the whole street including footpaths, from property line to property line. It takes into account the needs of all users of this space including pedestrians, cyclists, deliveries, private vehicles and public transport, as well as people spending time in those places.

Qualities that contribute to a well-designed built environment have been grouped under five themes in the *Practitioner's Guide to Movement and Place*, a guideline which guides the design and planning around streets and roads for use on state government projects. These are:

- Access and Connection – enabling urban mobility through access to opportunity, services, and amenities with walkable neighbourhoods, cycle routes, and public transport.
- Amenity and Uses – providing a diversity of public and private spaces to accommodate a variety of activities at different times of the day and night; and a mix of land uses that permits daily activities to be accessed on foot (such as primary schools and local shops).
- Character and Form – the identification of a place perceived through its built form, landscape character and the contribution of local people over time.
- Green and Blue – Trees, landscapes and water for greening and cooling places in sustainable ways, improving people's comfort and experience, and providing open space for recreation and respite.
- Comfort and Safety – clear air, sun, shade, peaceful parks and active building frontages contributing to the liveability of places, including feelings of safety.

1.2.4. Better Placed

Better Placed is an integrated design policy prepared by the Government Architect of New South Wales, used to enhance the design quality of our built environment, and raising expectations and raising standards about working better and creating better environments. The policy outlines five elements of well-designed built environments:

- Healthy – for all members of our communities, promoting physical activity and walkable environments, social cohesion, and community safety and security to support people's well-being.
- Responsive – to the needs and aspirations of local people, now and into the future, inviting innovative use and habitation, interaction, productivity and enjoyment.
- Integrated – by drawing together the relationships between parts and elements, considering interfaces at multiple scales, and working to common goals and aspirations.
- Equitable – by presenting opportunities for all segments of our community so residents and visitors have access to and can move about freely between public domain, infrastructure, open space and buildings.
- Resilient – to the dynamic, challenging conditions of our time, to adapt and evolve while retaining essential qualities and values.

The policy also establishes seven distinct objectives to define the key considerations in the design of the built environment, being: better fit, better performance, better for community, better for people, better working, better value, and better look and feel.

1.2.1. Road Safety Education Program

The Road Safety Education Program is a long-term integrated education initiative. The program aims to increase road safety knowledge, understanding and skills.

Transport for New South Wales works closely with the Department of Education, the Association of Independent Schools of NSW and the Catholic Education Commission NSW to develop these programs. The NSW Government is committed to continuing the Road Safety Education program and encouraging more children to walk to school safely.

1.2.2. Safety Around Schools Program

This program aims to reduce the number and severity of child casualties in 40 km/h school zones. Transport for New South Wales will continue to focus strongly on improving the visibility of school zones to increase driver awareness and compliance. School zones are designed to protect children on their journey to and from school. Measures include:

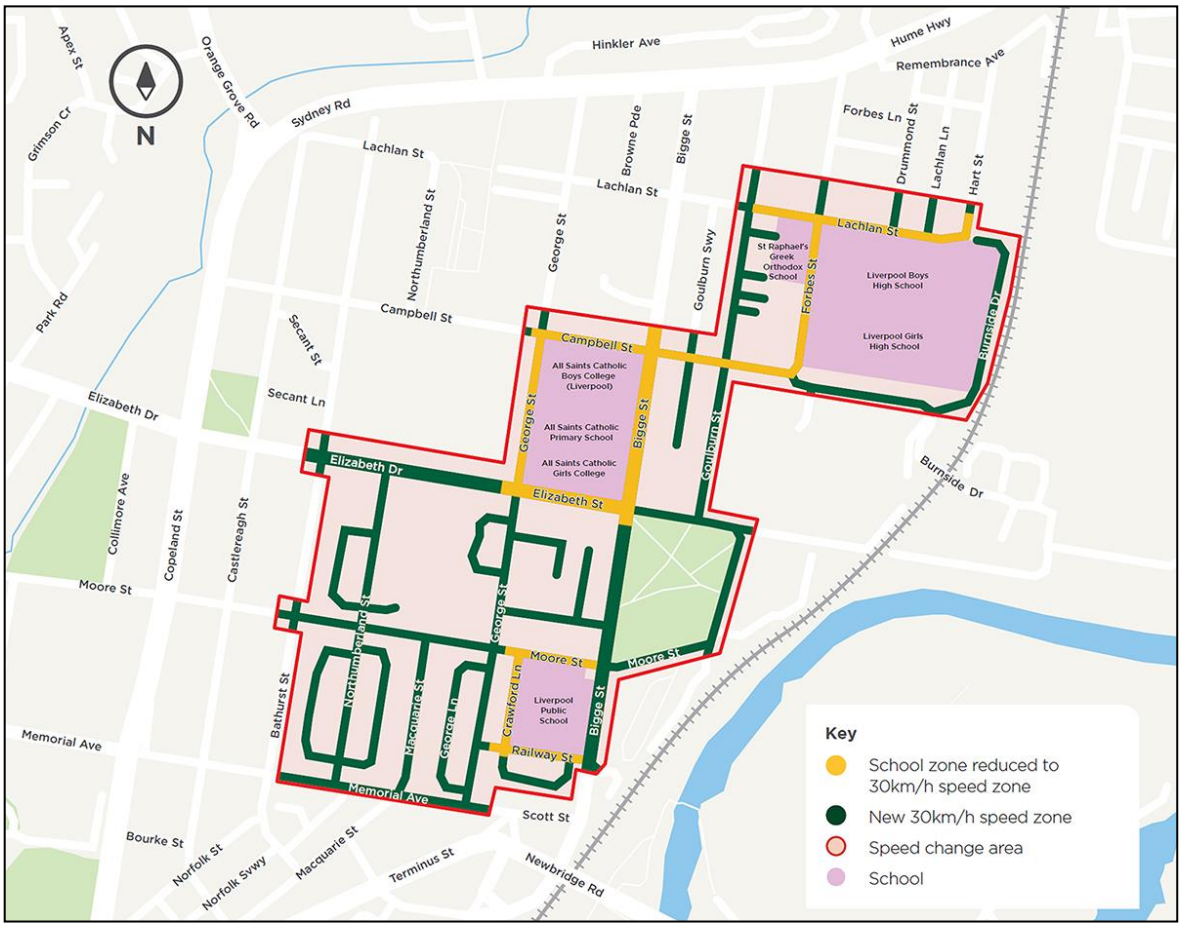
- dragon's teeth road markings in all school zones
- the replacement of old, damaged school zone signs with new fluorescent signs
- marked foot crossings
- raised pedestrian crossings
- pedestrian refuges and fencing
- traffic signal-controlled pedestrian crossings.

School zone flashing lights are designed to alert drivers that they are entering a 40 km/h school zone and to adjust their speed accordingly. School zone flashing lights have been rolled out across NSW as part of this program and the NSW Government has ensured that every school in NSW has at least one set of school zone flashing lights.

1.2.3. Liverpool CBD 30 km/h Speed Limit Zone

Transport for New South Wales introduced a 30 km/h speed zone for the Liverpool city centre in mid-July 2020 to provide a safer environment for pedestrians and cyclists, as well as for students attending schools in the city centre. A review of the trial will be undertaken 12 months from its implementation by Transport for New South Wales. As part of the trial, existing school zones within the new 30 km/h area have also been reduced to 30 km/h.

Figure 1.5: Liverpool CBD 30 km/h Speed Limit Zone



Base Image Source: Liverpool City Council, https://www.liverpool.nsw.gov.au/services/roads-traffic-and-parking/road-safety, accessed 4 March 2021

1.3. East-West Pedestrian Link

The redevelopment of the Liverpool Boys and Girls High School is the subject of a separate project (of which the scope is unresolved, and timing is currently unknown). Part of this project (and aligning with the aspirations for the Liverpool Innovation Precinct) was the creation of an East-West Link as shown in Figure 1.6.

The current layout of the Liverpool Boys and Girls High School buildings does not support the introduction of an East-West pedestrian link at this stage, however, the design of the New Liverpool Public School does not preclude the introduction of this link in the future.

Figure 1.6: East-West Pedestrian Link

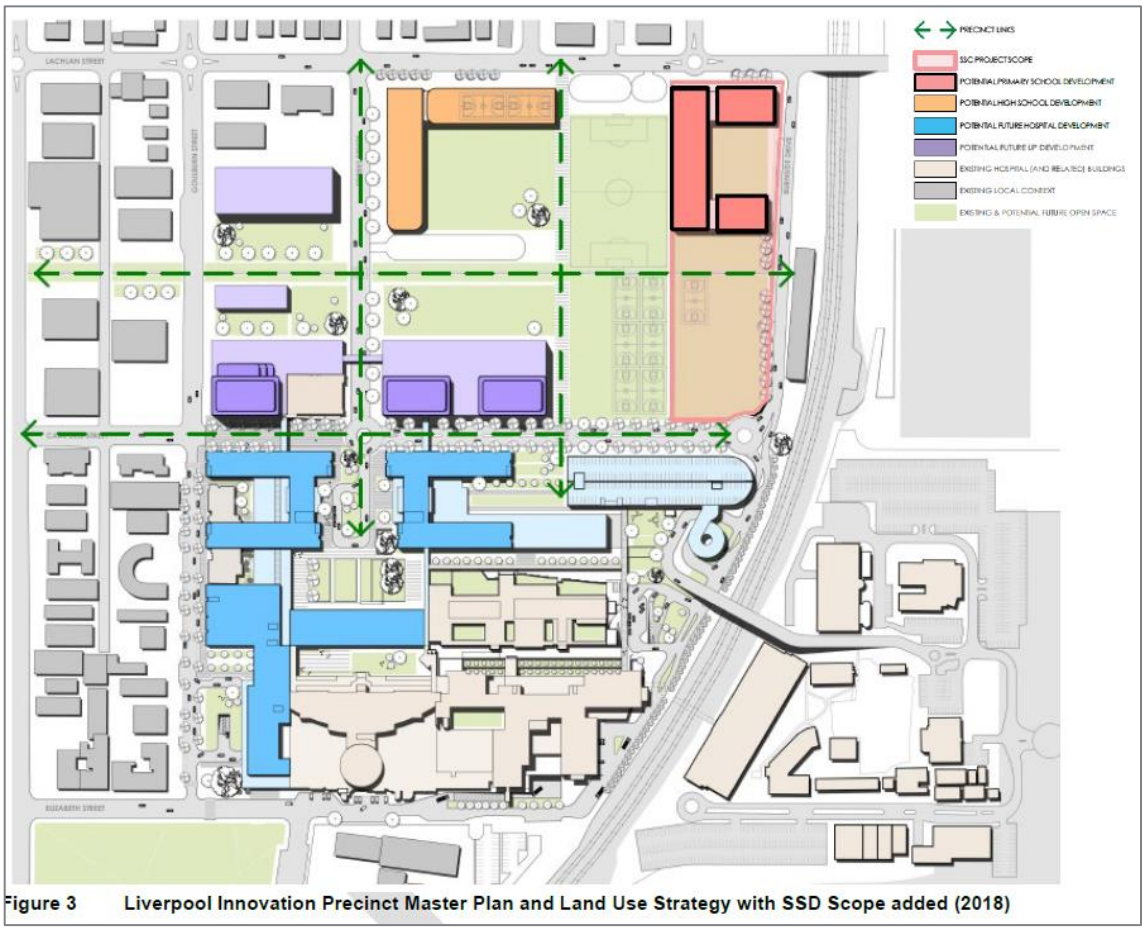


Figure 3 Liverpool Innovation Precinct Master Plan and Land Use Strategy with SSD Scope added (2018)

Source: CBRE, received 10 May 2021

1.4. Existing Transport Network and Operations

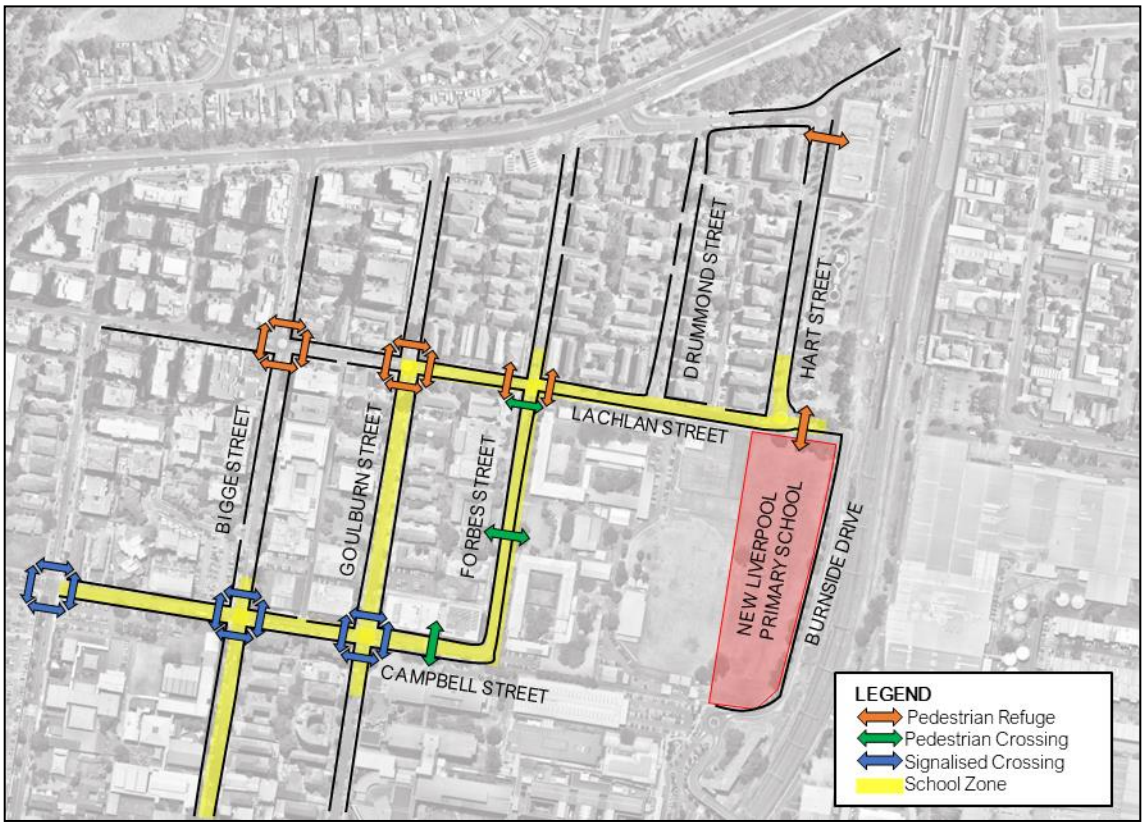
Elements of the following existing transport network and operations have been informed by the *Transport and Accessibility Impact Statement for New Liverpool Public School* (TAIA) documents prepared by GTA Consultants (2021). Transport features of the proposed school development are also included in this section, as they form part of the baseline scenario at the school's opening date.

1.4.1. Pedestrian Infrastructure

An overview of the existing pedestrian accessibility near the school is presented in Figure 1.7.

Generally, pedestrian amenity is moderate to high near the school, with a range of crossing facilities being signalised pedestrian crossings, zebra crossings and refuge islands. All nearby intersections present kerb ramps at each approach, except the western approach of the Lachlan Street/ Drummond Street intersection and the northern approach of the Lachlan Street/ Hart Street/ Burnside Drive roundabout. Existing 30 km/h school zones and 30 km/h high pedestrian activity zones are present near the site.

Figure 1.7: Existing Pedestrian Accessibility



Base map source: Nearmap

Roads near the school feature footpaths of at least 1.2 metres wide on both sides of the road. On some roads (such as the southern edge of Lachlan Street, and eastern edge of Forbes Street), the footpath width is wider (around three metres), providing greater footpath capacity.

Pedestrian crossing infrastructure is provided near the site in the form of a raised pedestrian crossing on the southern approach of the Forbes Street/ Lachlan Street intersection and a mid-block raised pedestrian crossing on Forbes Street. Further south, another mid-block pedestrian crossing is provided on Campbell Street. The Goulburn Street/ Campbell Street intersection is the closest signalised intersection and provides signalised pedestrian crossings on all four legs.

Development Proposal

Primary pedestrian access is proposed on Burnside Drive, at the eastern frontage of the school. Secondary access will be provided on Lachlan Street, at the northern frontage of the school.

The existing footpath on the eastern frontage of the school (i.e. western side of Burnside Drive) is proposed to be widened from the existing 1.2 metres to 2.5 metres (subject to a separate planning approval) to accommodate the increased pedestrian volumes and provide suitable widths adjacent to the kerbside parking.

As noted earlier, there is no existing pedestrian priority crossing facility to the north, resulting in a gap in pedestrian connection for users arriving to the school from the areas north of Lachlan Street. A school crossing is proposed on Lachlan Street, between Drummond Street and Lachlan Lane to facilitate pedestrian connectivity across Lachlan Street. The provision of a school crossing rather than a formal pedestrian crossing will encourage safe pedestrian movement across Lachlan Street associated with the schools before and after school bell times.

A new crossing supervisor will be engaged by the school to operate this new school crossing. Crossing supervisors will be instructed to monitor pedestrians and facilitate crossing in groups to maximise visibility of pedestrians and reduce traffic delays.

A new pedestrian refuge island is also proposed on the north approach of the Lachlan Street/ Forbes Street intersection to improve the east-west pedestrian movement across this intersection and to improve the alignment of the existing kerb ramps.

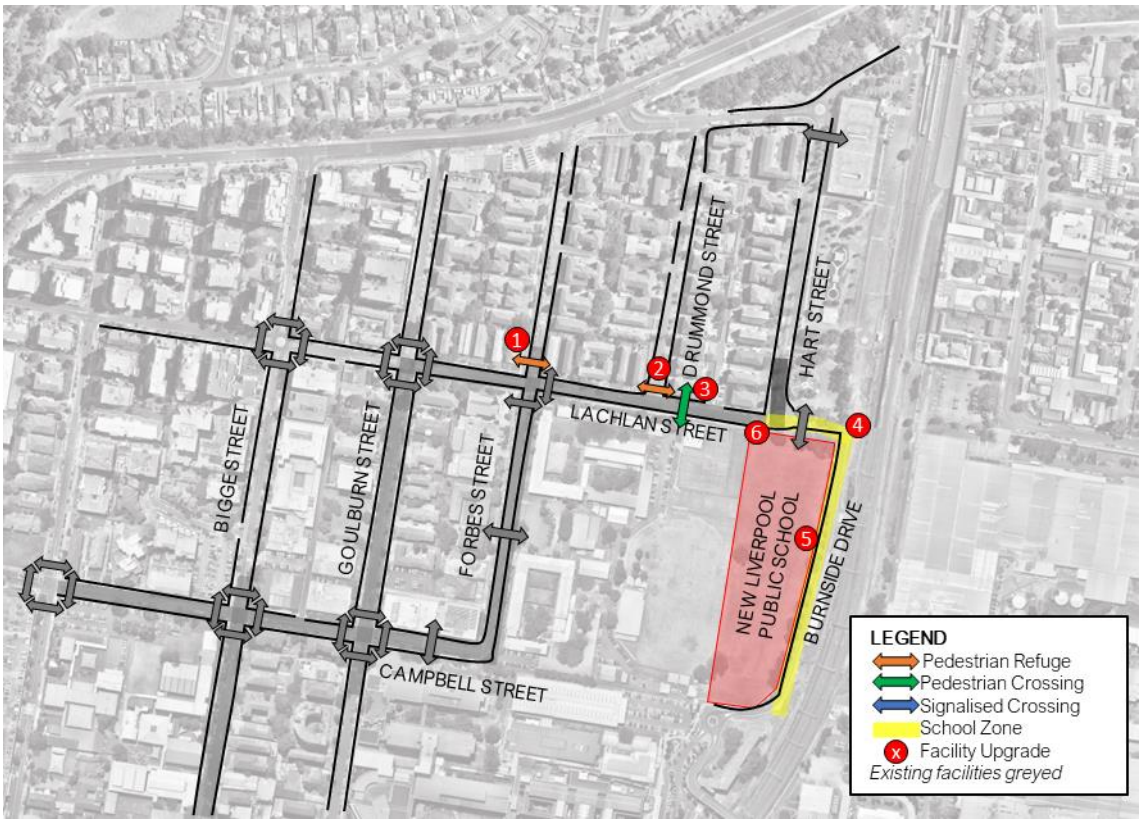
Additionally, the existing school zone, which terminates at the Lachlan Street/ Hart Street/ Burnside Drive roundabout is proposed to be extended along the length of Burnside Drive. This is to promote a low-speed environment conducive to safe student travel and pedestrian prioritisation.

These proposed pedestrian facility upgrades are summarised in Table 4.4 and illustrated in Figure 4.9.

Table 1.1: Proposed Pedestrian Infrastructure Upgrades Summary

No.	Location	Upgrade	Responsibility/ Action	Time Frame Recommendation
1	Lachlan Street/ Forbes Street intersection	Intersection improvements to Forbes Street (North) to provide left in/ left out only with island treatment on the northern approach to intersection to include a pedestrian refuge. Adjust kerb ramp on north-west corner to point across Forbes Street rather than into intersection.	School Infrastructure	Prior to school opening
2	Lachlan Street/ Drummond Street intersection	New refuge island on the northern approach of the Lachlan Street/ Drummond Street intersection	School Infrastructure	Prior to school opening
3	Lachlan Street (between Drummond Street and Lachlan Lane)	Install new school crossing and appoint crossing supervisor.	School Infrastructure	Prior to school opening
4	Burnside Drive	Extend school zone to Burnside Drive	Transport for NSW in consultation with Health Infrastructure	Prior to school opening
5	Burnside Drive footpath (western side)	Widen existing footpath to 2.5 metres	School Infrastructure	Prior to school opening
6	Lachlan Street footpath (at school boundary)	Widen existing footpath to 3.0-4.0 metres (see Section 1.7.1)	School Infrastructure	Medium term (up to 5 years)

Figure 1.8: Proposed Pedestrian Facility Upgrades



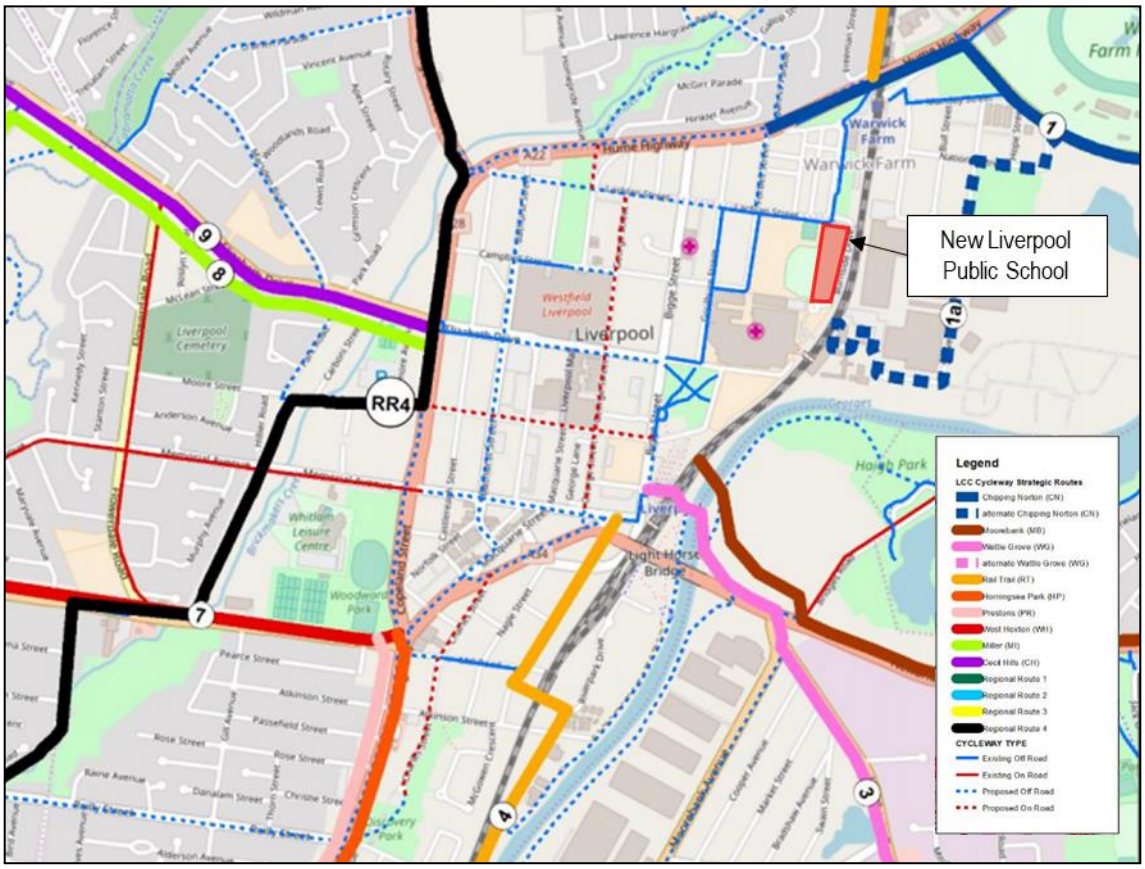
Base map source: Nearmap

1.4.2. Cycling Infrastructure

The cycling network surrounding the site, including proposed on-road and off-road cycleways is shown in Figure 1.9.

There are existing off-road cycling facilities on the northwest corner of the school on Lachlan Street and Forbes Street providing connectivity to Warwick Farm Station, Liverpool Hospital and Liverpool Station. As part of the Liverpool Bike Plan, off-road cycling facilities are proposed along Forbes Street providing connectivity to Warwick Farm Public School. Furthermore, the cycling facilities on Lachlan Street are proposed to be extended from Goulburn Street to Hume Highway, providing connectivity to Westfield Liverpool.

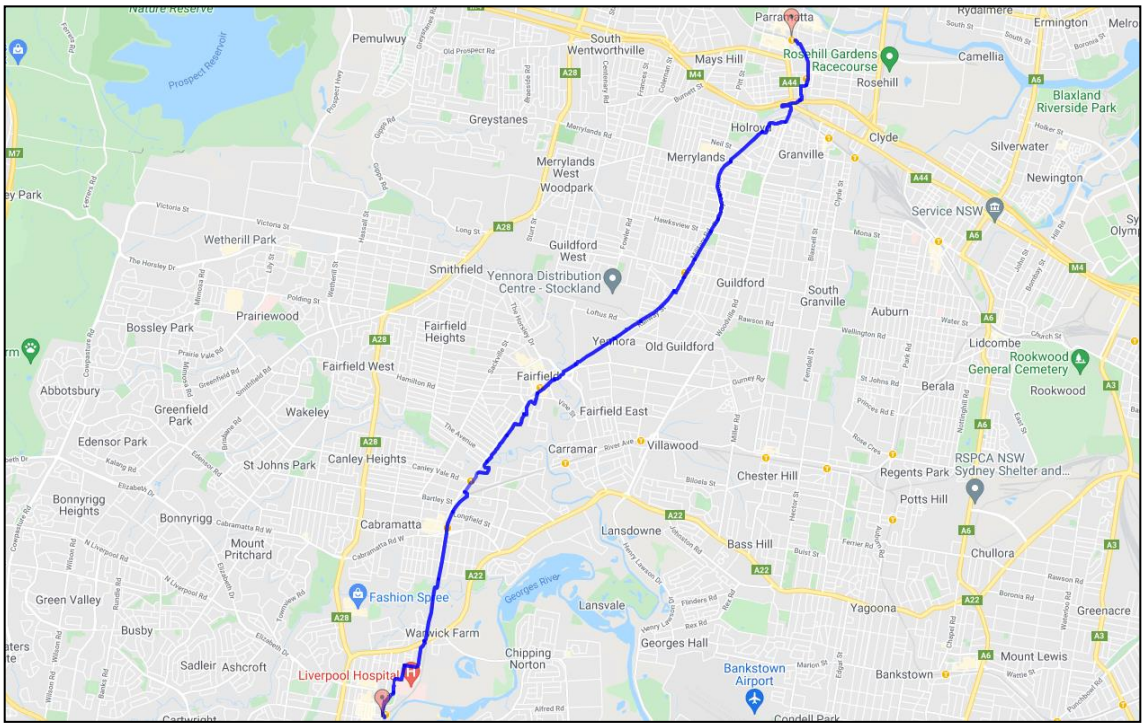
Figure 1.9: Liverpool Cycle Network



Base image source: Liverpool Bike Plan 2018-2023, by Liverpool City Council, https://www.liverpool.nsw.gov.au/venues/parks-and-playgrounds/cycleways-and-walkways, accessed 1 March 2021

The Parramatta to Liverpool rail-side trail comprises a shared path and on-street cycling links that extend between Parramatta train Station and Liverpool Station and passes adjacent to the site along Lachlan Street.

Figure 1.10:Parramatta to Liverpool railside trail



Source: https://www.railtrails.org.au/trail-descriptions/nsw-and-act?view=trail&id=172, accessed 10 May 2021

1.4.3. Train Services

The NLPS is located approximately 500 metres south of Warwick Farm Station and 1.3 km north of Liverpool Station. Both Liverpool and Warwick Farm stations are on the T2 Inner West and Leppington Line, T3 Bankstown Line and T5 Cumberland Line, which provide services to the City and Richmond Area every 10 minutes during on peak and 30 minutes during the off peak.

A review of train occupancy data for February 2019[1] found that occupancy levels on trains at Liverpool Station is generally low on arrival at Liverpool Station. Of the 8,184 services during that month (upon arrival at Liverpool station, excluding 09/02/2019 and 10/02/2019 which were missing the Liverpool data), 8,155 services had occupancy levels less than 65 per cent train capacity and 29 services presented occupancy between 65 per cent and 105 percent.

Similar results were found for Warwick Farm Station for the same period. Of the 8,181 services during that month (upon arrival at Warwick Farm station, excluding 09/02/2019 and 10/02/2019 which were missing the Warwick Farm data), 8,141 services had occupancy levels less than 65 per cent train capacity and 40 services had occupancy between 65 per cent and 105 percent.

As both stations are within walking distance of the school and train services can accommodate increased patronage, there is potential to encourage greater train mode share for the new school.

1.4.4. Bus Services

There are multiple bus services that operate near the site with the nearest stop located at Liverpool Boys High School on Forbes Street. The surrounding bus network services are detailed in Table 1.2 and shown indicatively in Figure 1.11.

[1] Data sourced from TfNSW Open Data (https://opendata.transport.nsw.gov.au/dataset/train-occupancy-nov-2018-feb-2019), accessed on 18 March 2021

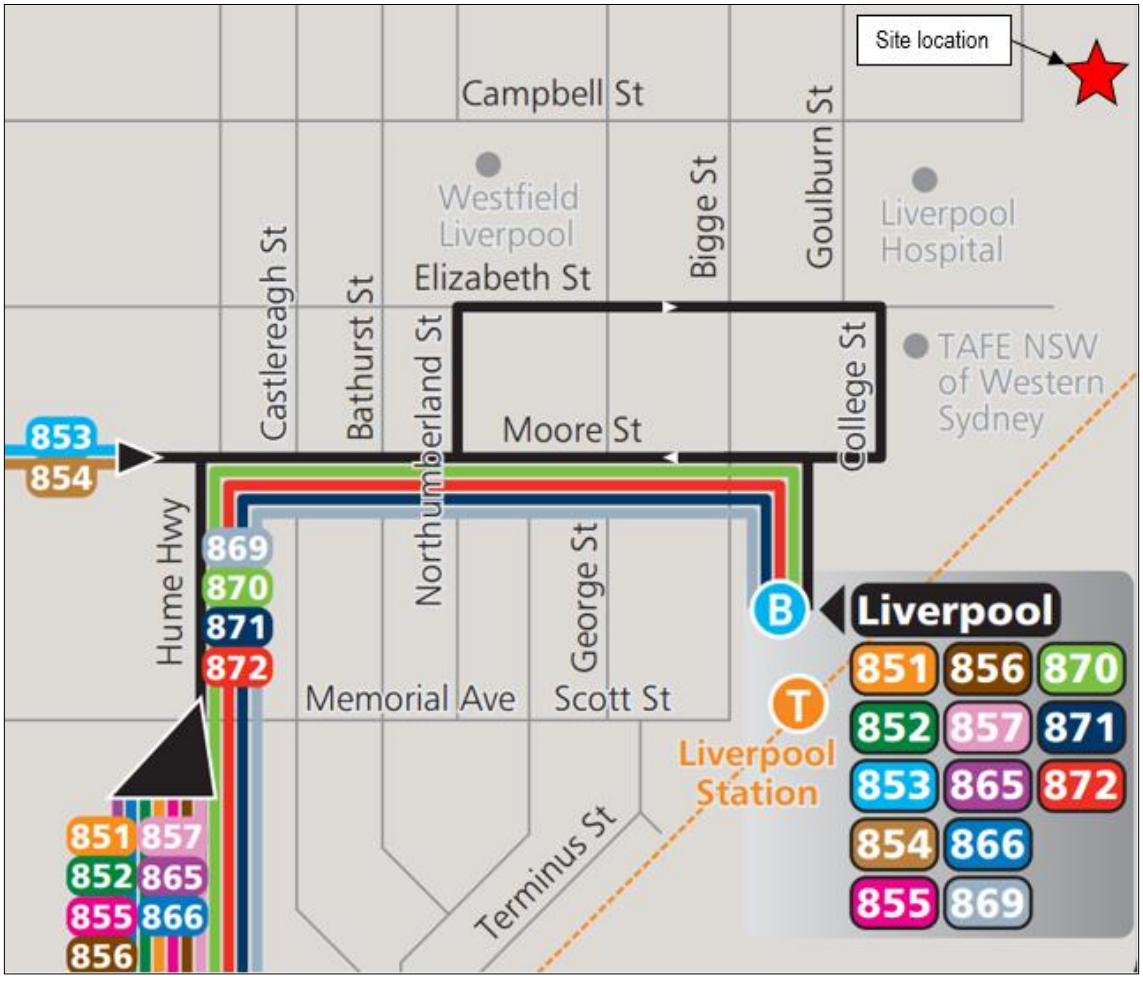
Table 1.2: Bus service frequency[1]

Route No.	Description	AM/ PM peak frequency	Off-peak frequency	School frequency
851[2]	Liverpool to Carnes Hill Marketplace via Cowpasture Road	None / 20 minutes	60 minutes	One service per day at 3:34pm
852[2]	Carnes Hill Marketplace to Liverpool via Greenway Drive and Cowpasture Road	30 minutes/ 30 minutes	60 minutes	One service per day at 7:43am
853[2]	Liverpool to Carnes Hill via Hoxton Park Road	20 minutes/ 20 minutes	60 minutes	One service per day at 3:36pm
854[2]	Liverpool to Carnes Hills via Greenway Drive and Hoxton Park Road	15 minutes/ 15 minutes	60 minutes	One service per day at 3:16pm
856[2]	Bringelly to Liverpool	Varies throughout day	-	One service per day at 7:15am
857	Liverpool to Narellan	30 minutes/ 30 minutes	60 minutes	One service per day at 3:25pm
865[2]	Casula to Liverpool via Lurnea Shops	30 minutes/ 30 minutes	30 minutes	One service per day at 8:01pm
866[2]	Casula to Liverpool	30 minutes/ 30 minutes	30 minutes	One service per day at 8:00am
1005	Bringelly and Allenby to Liverpool Schools	One service per day at 7:11am	-	One service per day at 7:11am
1040	West Hoxton, Hoxton Park to Liverpool	One service per day at 7:36am	-	One service per day at 7:36am
1048	Denham Court to Liverpool	One service per day at 7:31am	-	One service per day at 7:31am
1051	Greenway Park, Hoxton Park to Liverpool	One service per day at 7:42am		One service per day at 7:42am
2034	Liverpool to Casula (Churchill Gardens), Horningsea Park, Rossmore			One service per day at 3:12pm
3033	Macquarie Fields Shops to Liverpool Boys High School	One service per day at 7:36am	-	One service per day at 7:36am
9029	Emmaus College to Liverpool High School via Bonnyrigg Heights Public School and Freeman College	One service per day at 7:35am	-	One service per day at 7:35am
9201	Miller Shopping Centre to Liverpool High School	One service per day at 7:34am	-	One service per day at 7:34am
9311	Lord Howe Drive opposite Cape Baron Avenue to All Saints College	One service per day at 7:35am	-	One service per day at 7:35am
901	Holsworthy Station to Liverpool Interchange	30 minutes/ 30 minutes	60 minutes	-
902	Holsworthy Station to Liverpool Station	30 minutes/ 30 minutes	60 minutes	-
903	Liverpool Interchange to Chipping Norton (loop service)	30 minutes/ 30 minutes	60 minutes	-

Route No.	Description	AM/ PM peak frequency	Off-peak frequency	School frequency
904	Fairfield Station to Liverpool Station	30 minutes/ 30 minutes	60 minutes	-
M90	Liverpool Station to Westfield Burwood	10 minutes/ 10 minutes	15 minutes	-
823	Liverpool Interchange to Warwick Farm (loop service)	30 minutes/ 30 minutes	60 minutes	-

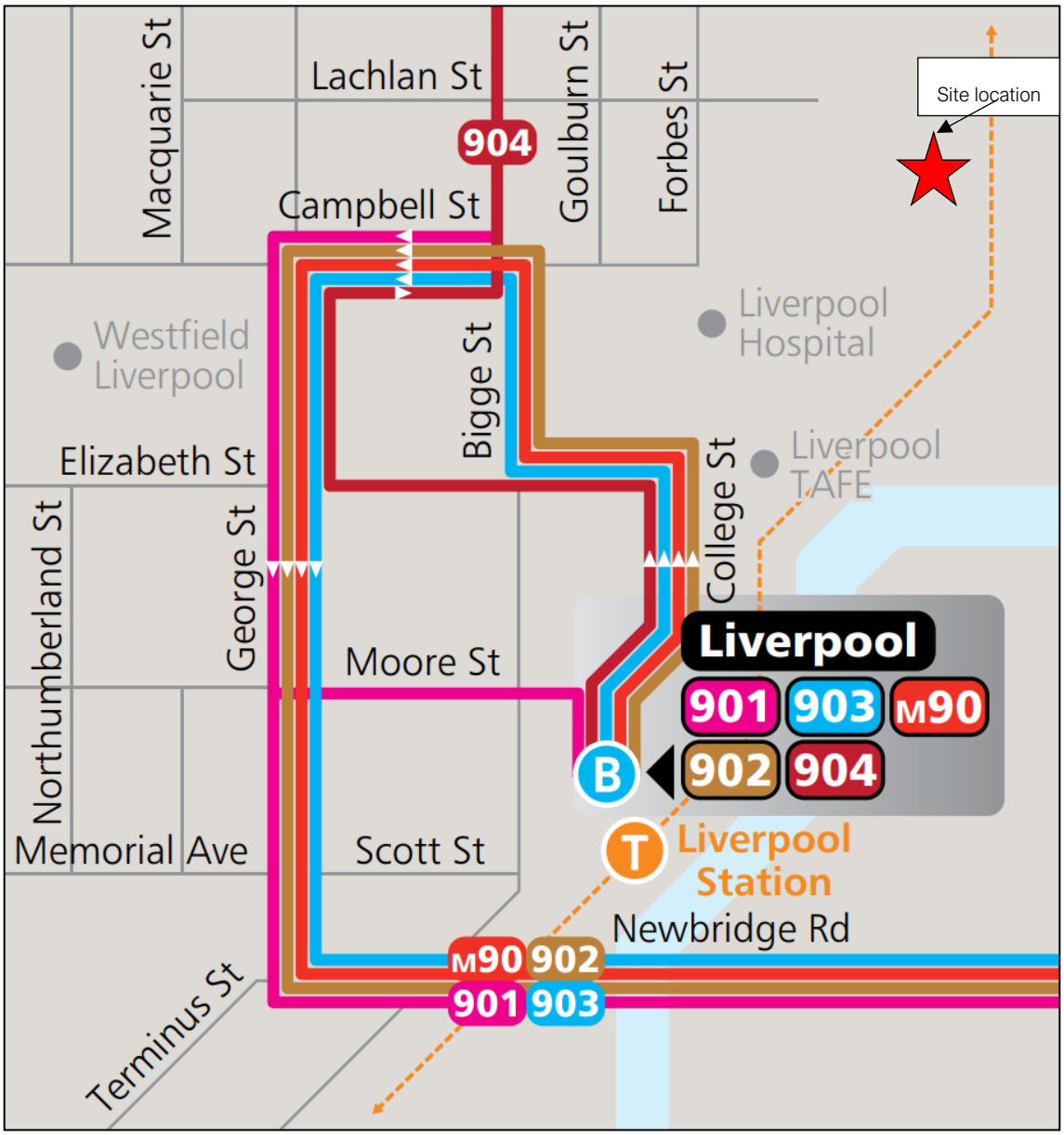
Note:
1. Sourced from https://transportnsw.info/routes/bus, https://interlinebus.com.au/pdf/school_services/Liverpool%20Boys%20&%20Girls%20High%20School.pdf, https://static1.squarespace.com/static/5a668f1080bd5e34d18a7e76/t/5db6774ac853f67fa18c69f5/1572239186516/LIVERPOOL+BOYS+%26+GIRLS+HIGH+SCHOOL+14+OCT+19.pdf, https://www.transdevnsw.com.au/uploads/timetables/243/attachment/Liverpool%20.pdf, accessed 14 October 2019.
2. These bus services operate an alternate route that services the Forbes Street bus stop outside Liverpool Boys High School/ Liverpool Girls High School once per day.

Figure 1.11:Surrounding Bus Network (Interline)



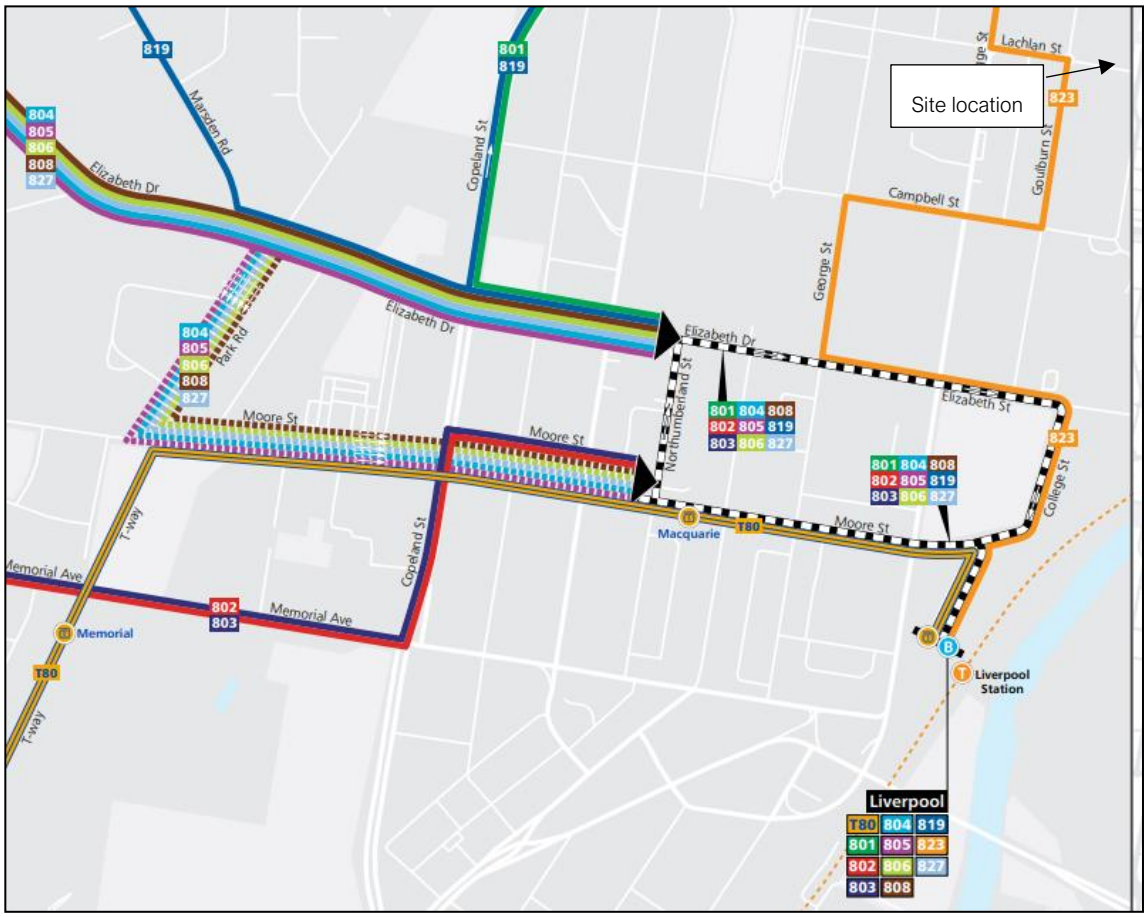
Base image source: https://interlinebus.com.au/img/Network_Map.jpg, accessed 10 May 2021

Figure 1.12:Surrounding Bus Network (Transdev)



Base source image: https://www.transdevnsw.com.au/ accessed 1 March 2021

Figure 1.13:Surrounding Bus Network (Transit Systems)



Base source image:
https://static1.squarespace.com/static/5a668f1080bd5e34d18a7e76/t/60762031dc5ee83e48116aef/1618354237661/21080_TS_R3_network_map_20210418.pdf, accessed 10 May 2021

Development Proposal

A new bus zone is proposed on Lachlan Street west of the site, replacing existing on-street unrestricted parking. This location allows buses to access the bus zone from both the north (via Hart Street) and the south/ west (via Lachlan Street and then u-turning around the Lachlan Street/ Hart Street/ Burnside Drive roundabout). This proposal also minimises the impact to the existing road infrastructure due to the utilisation of the existing roundabout for turnaround and utilisation of the wide carriageway width along Lachlan Street.

Lachlan Street currently has a carriageway width of around 12 metres which is suitable for a three metre parking lane to the south (suitable for buses), a 2.5 metre parking lane to the north (suitable for light vehicles) and 6.5 metres for the two travel lanes (car in one direction and bus in the other).

Lachlan Street also currently has wide pedestrian paths (around three metres) on the southern side which provide a high level of pedestrian amenity and accessibility.

Indicatively, the proposed bus zone would cater for up to two buses simultaneously, requiring a minimum length of 48.5 metres to accommodate two buses and the required draw-in and draw-out lengths.

1.4.5. Road Network

Forbes Street

Forbes Street functions as a local road and is aligned in a north-south direction. It is a two-way road configured with one traffic lane and one parking lane in each direction within a 12.5-metre wide carriageway.

Kerbside parallel parking is permitted on both sides of the road. The kerbside parking on the eastern side of the road along the Liverpool Boys High School and Liverpool Girls High School frontage is subjected to Bus Zone restrictions during school days between 8:15am and 9:15am and 2:45pm and 3:45pm. The kerbside parking on the western side of the road has No Parking during school days between 8:30am and 9:30am and 2:30pm and 3:30pm.

Forbes Street has a posted speed limit of 30 km/h due to being a high pedestrian activity area, with a 30 km/h school zone operating between 8:00am-9:30am and 2:30pm-4:00pm. Forbes Street currently carries around 4,000 vehicles per day[2].

There are two existing raised pedestrian crossings on Forbes Street. One located near the Lachlan Street/ Forbes Street intersection and another midblock between Lachlan Street and Campbell Street.

Forbes Street is shown in Figure 1.14 and Figure 1.15.

Lachlan Street

Lachlan Street functions as a collector road and is aligned in an east west direction. It is a two-way road configured with one traffic lane and one parking lane in each direction within a 12-metre wide carriageway. Kerbside parallel parking is permitted on both side of the road.

Lachlan Street has a posted speed limit of 30 km/h due to being a high pedestrian activity area with a 30 km/h school zone operating between 8:00am-9:30am and 2:30pm-4:00pm. Lachlan Street currently carries around 5,000 vehicles per day[3].

Low profile pedestrian refuges are provided on the east and western approaches of the Lachlan Street/ Forbes Street intersection. It is noted that the existing kerb ramp on the north-western corner of the Lachlan Street/ Forbes Street intersection is not aligned with the kerb ramp to the east, presenting a deficiency in the existing design.

Lachlan Street is shown in Figure 1.16 and Figure 1.17.

Burnside Drive

Burnside Drive functions as a collector road and is aligned in a north south direction. It is a two-way road configured with one travel lane in each direction within a seven-metre-wide carriageway. Kerbside parking is not permitted on both sides of the road. South of the Lachlan Street/ Hart Street/ Burnside Drive intersection, Burnside Drive is a private road, owned by Health Infrastructure.

Burnside Drive has a posted speed limit of 30 km/h in the Council-owned section. In the Health Infrastructure-owned section, the posted speed limit is 50 km/h. Burnside Drive currently carries around 6,000 vehicles per day[4].

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[2] Based on the peak hour traffic counts undertaken by GTA on 22 October 2019 and assuming a peak-to-daily ratio of 8% for arterial roads and 10% for local roads.

[3] Based on the peak hour traffic counts undertaken by GTA on 22 October 2019 and assuming a peak-to-daily ratio of 8% for arterial roads and 10% for local roads.

[4] Based on the peak hour traffic counts undertaken by GTA on 22 October 2019 and assuming a peak-to-daily ratio of 8% for arterial roads and 10% for local roads.

The Lachlan Street/ Hart Street/ Burnside Drive roundabout provides pedestrian refuges on the eastern and western approaches only.

Burnside Drive is shown in Figure 1.18 and Figure 1.19.

Campbell Street

Campbell Street functions as a collector road and is aligned in an east west direction. It is a two-way road configured with one travel lane and one parking lane in each direction.

Kerbside parking is permitted on both side of the road, subject to two-hour time restrictions during weekdays between 8:30am and 6:00pm and Saturday between 8:30am and 12:30pm.

Campbell Street has a posted speed limit of 30 km/h with a school zone operating between 8:00am-9:30am and 2:30pm-4:00pm. Campbell Street currently carries around 4,000 vehicles per day[5].

An existing midblock raised pedestrian crossing is present between Goulburn Street and Forbes Street.

Campbell Street is shown in Figure 1.20 and Figure 1.21.

Figure 1.14:Forbes Street (looking north)

Figure 1.15:Forbes Street (looking south)

Figure 1.16:Lachlan Street (looking east)

Figure 1.17:Lachlan Street (looking west)

[5] Based on the peak hour traffic counts undertaken by GTA on 22 October 2019 and assuming a peak-to-daily ratio of 8% for arterial roads and 10% for local roads.

Figure 1.18:Burnside Drive (looking north)

Figure 1.19:Burnside Drive (looking south)

Figure 1.20:Campbell Street (looking east)

Figure 1.21:Campbell Street (looking west)

Crash Analysis

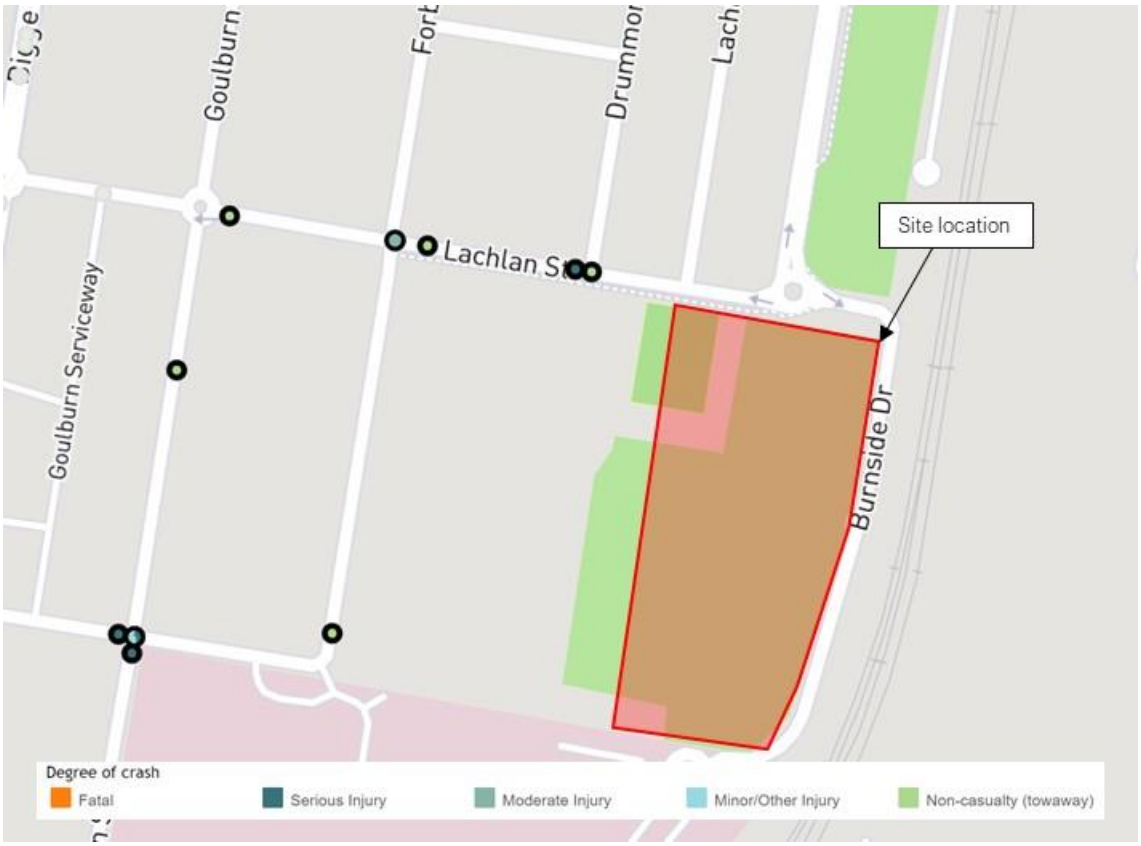
Historical crash data for the road network surrounding the site was sourced for the periods from January 2015 to December 2019. During this period 14 crashes occurred, including:

- 4 crashes resulting in serious injury
- 2 crashes resulting in moderate injury
- 1 crash resulting in minor injury/ other injuries
- 7 crashes non-casualty (towaway) crashes.

Of the 14 crashes that occurred, seven crashes (50 per cent) occurred along the Liverpool High School's frontage with four crashes on Lachlan Street, one crash on Forbes Street and two crashes at the Lachlan Street/ Forbes Street intersection. Two crashes occurred on Goulburn Street, one on Campbell Street and four crashes at the Goulburn Street/ Campbell Street intersection. No crashes involved pedestrians.

Figure 1.22 illustrates the locations of the crashes that occurred between January 2015 and December 2019.

Figure 1.22:Historical crashes, January 2014 to December 2018



Base image source: Transport for NSW Centre for Road Safety, https://roadsafety.transport.nsw.gov.au/statistics/interactivecrashstats/lga_stats.html?tablga=4, accessed 1 March 2021

Development Proposal

Two new vehicular crossovers are proposed on Burnside Drive as part of a separate planning approval. One mid-way along Burnside Drive to provide access to the bin collection area for the waste collection vehicle only and a second towards the southern end of Burnside Drive to provide access to the staff-only car parking area.

All student pick-up/ drop-off will occur in the new kerbside parking area along Burnside Drive, with no parent/ guardian vehicles to enter the school site. Refer to the TAIA for further detail.

1.5. Travel Patterns and Travel Demand

1.5.1. Introduction

Our assessment process to evaluate existing travel patterns and demand is informed by the SINSW guidelines; it involves the geospatial analysis of depersonalised student enrolment address data against the underlying walking, cycling and public transport networks. This analysis consequently produces a visualisation and calculation of how many students live within selected walking, cycling and public transport catchments to the school. This data in turn informs the potential maximum number of students that could theoretically use these travel modes to travel to and from school.

1.5.2. Pedestrian Demand

Based on Figure 1.23 and Table 1.3, 71 per cent of existing students live within a 1,200 metre (15 minute) walk from the new school, representing a majority of students who reside within a reasonable walking distance to school. The existing student numbers are based on enrolments at Liverpool Public School that are within NLPS' school catchment.

Figure 1.23:New Liverpool PS Walking Catchments

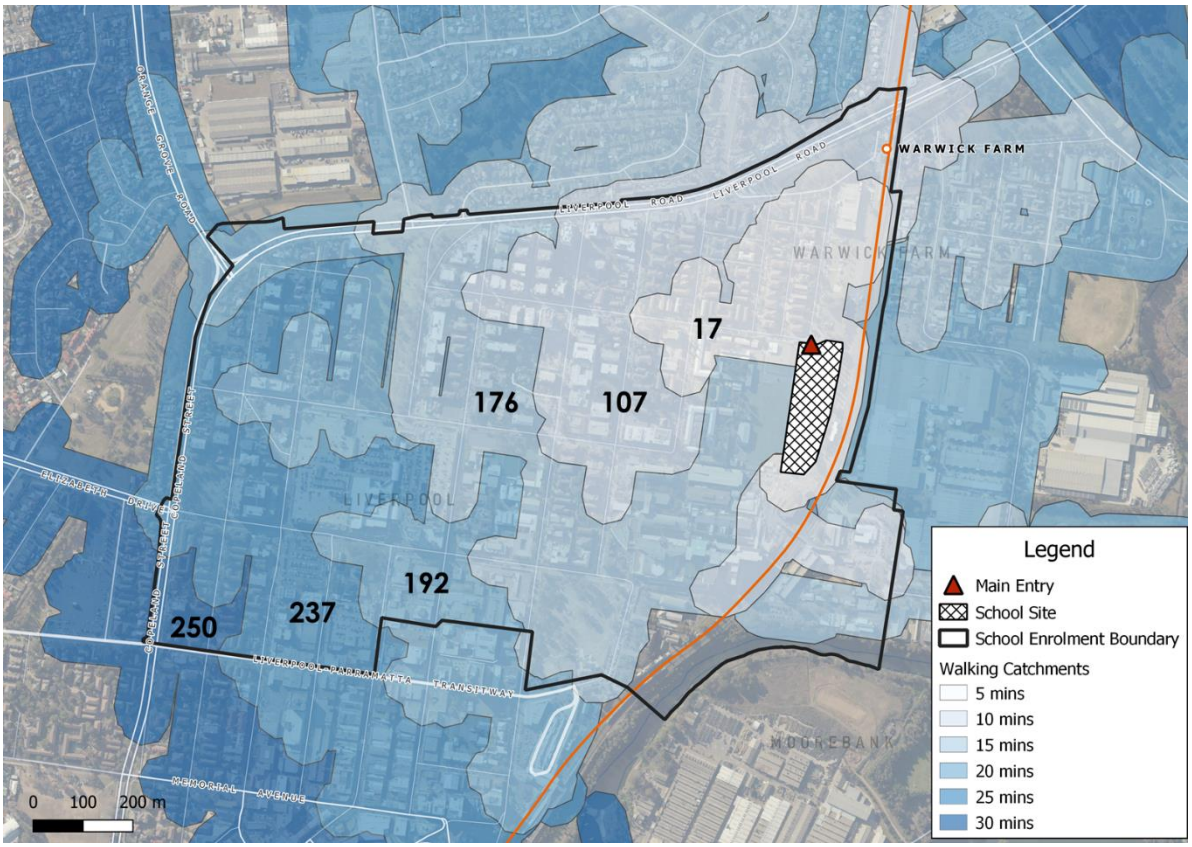


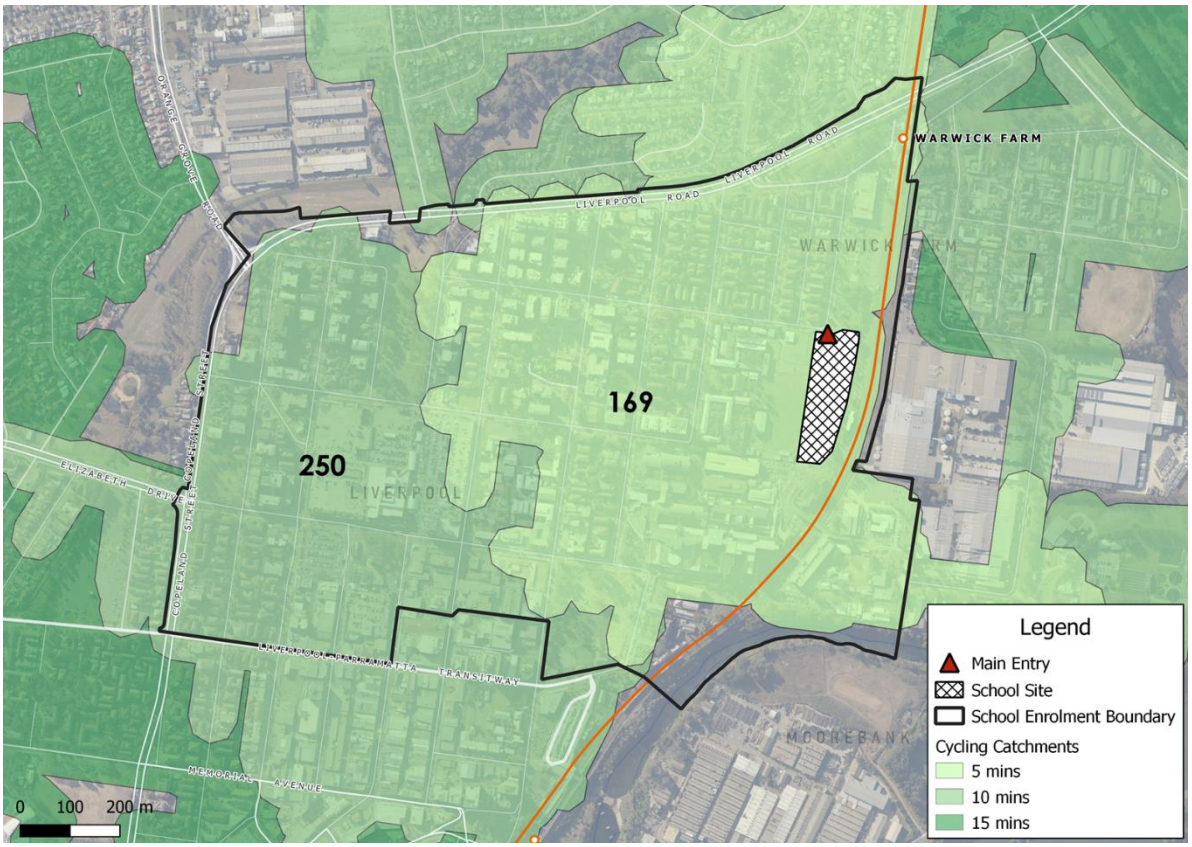
Table 1.3: Summary of existing students living within walking catchments to New Liverpool Public School

Boundary	No. of Students	% Students	Cumulative %
Within 400m	17	7%	7%
Within 401m-800m	90	36%	43%
Within 801m-1200m	69	28%	71%
Within 1201m-1600m	16	6%	77%
Outside 1600m	58	23%	100%
Total	**250**[6]	**100%**	

1.5.3. Cycling Demand

Figure 1.24 shows 5 and 10-minute on-path cycling catchments, representing likely durations primary school aged children are likely to cycle to get to school. Whilst this analysis takes into account all students it should be noted that generally Year 5 and Year 6 students are more likely to cycle to school than students of younger years.

Figure 1.24: New Liverpool PS Cycling Catchments



[6] Only includes students whose registered address is within the school enrolment boundary, based on current enrolments at Liverpool Public School

Table 1.4: Summary of existing students living within cycling catchments to New Liverpool Public School

Boundary	No. of Students	% Students
Students within 5-minute cycling catchment	169	68%
Students within 10-minute cycling catchment	81	32%
Total	**250**	**100%**

As shown in Figure 1.24 and Table 1.4, more than two-thirds of students within the enrolment catchment live within a reasonably bikeable five-minute trip to school, and this extends to 100 per cent of the catchment for a ten-minute cycling trip, notwithstanding any infrastructural or safety barriers that may discourage cycling.

1.5.4. Public Transport Demand

As shown in Figure 1.25, the School Student Transport Scheme (SSTS) catchments – both the 1.6km straight line distance and 2.3km walking distance – extend beyond the school's enrolment boundary. As such, no students will be eligible for a free school travel bus pass; they would be eligible for a $55 per term school term bus pass instead.

Figure 1.25:SSTS Catchments

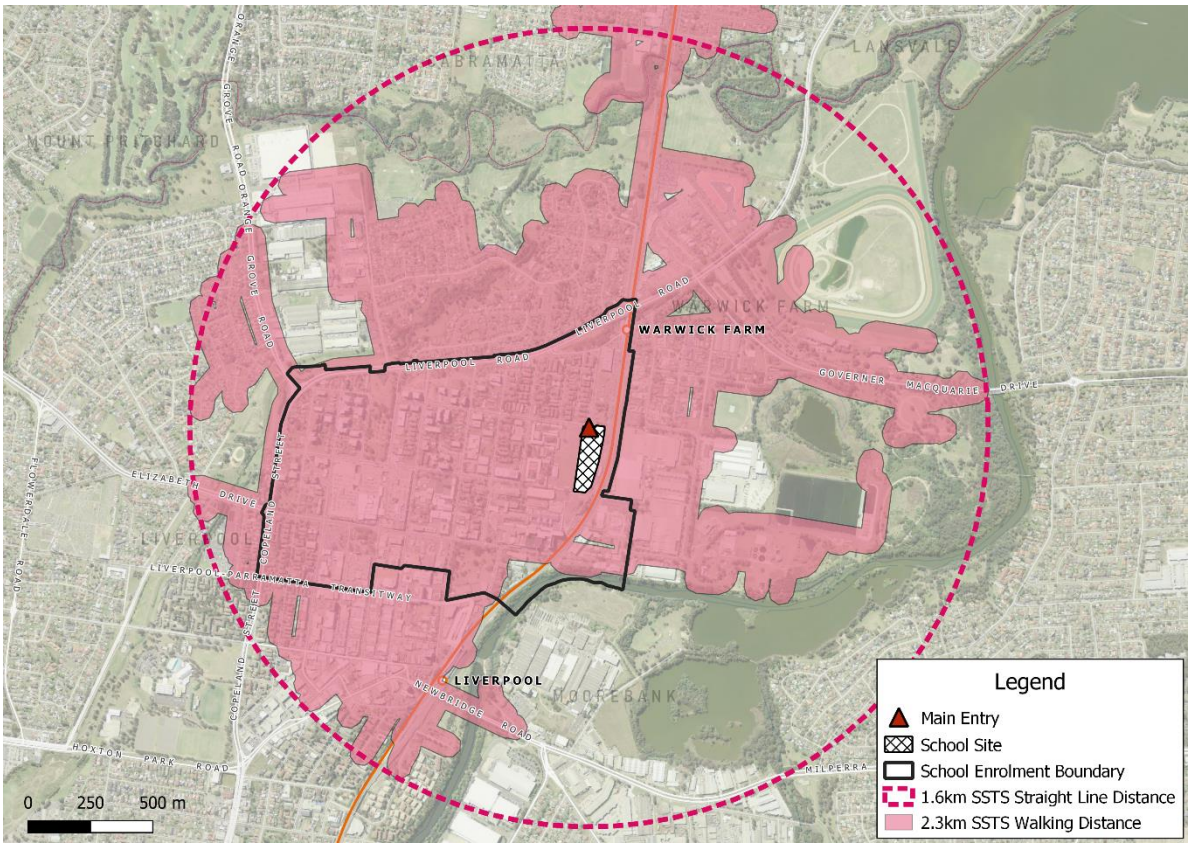


Figure 1.26 shows the 400-metre walking catchment to bus stops that provide a one-seat bus trip to school. As there are no dedicated school buses, these are stops for public bus routes that stop at the nearby bus stops on Forbes Street and Goulburn Street. Based on the spatial analysis carried out to produce Figure 1.26, Table 1.5 shows the number of students within a 400-metre walking catchment to bus stops that are within the school enrolment boundary.

Figure 1.26: Walking catchment to bus stops providing a one-seat bus trip to NLPS

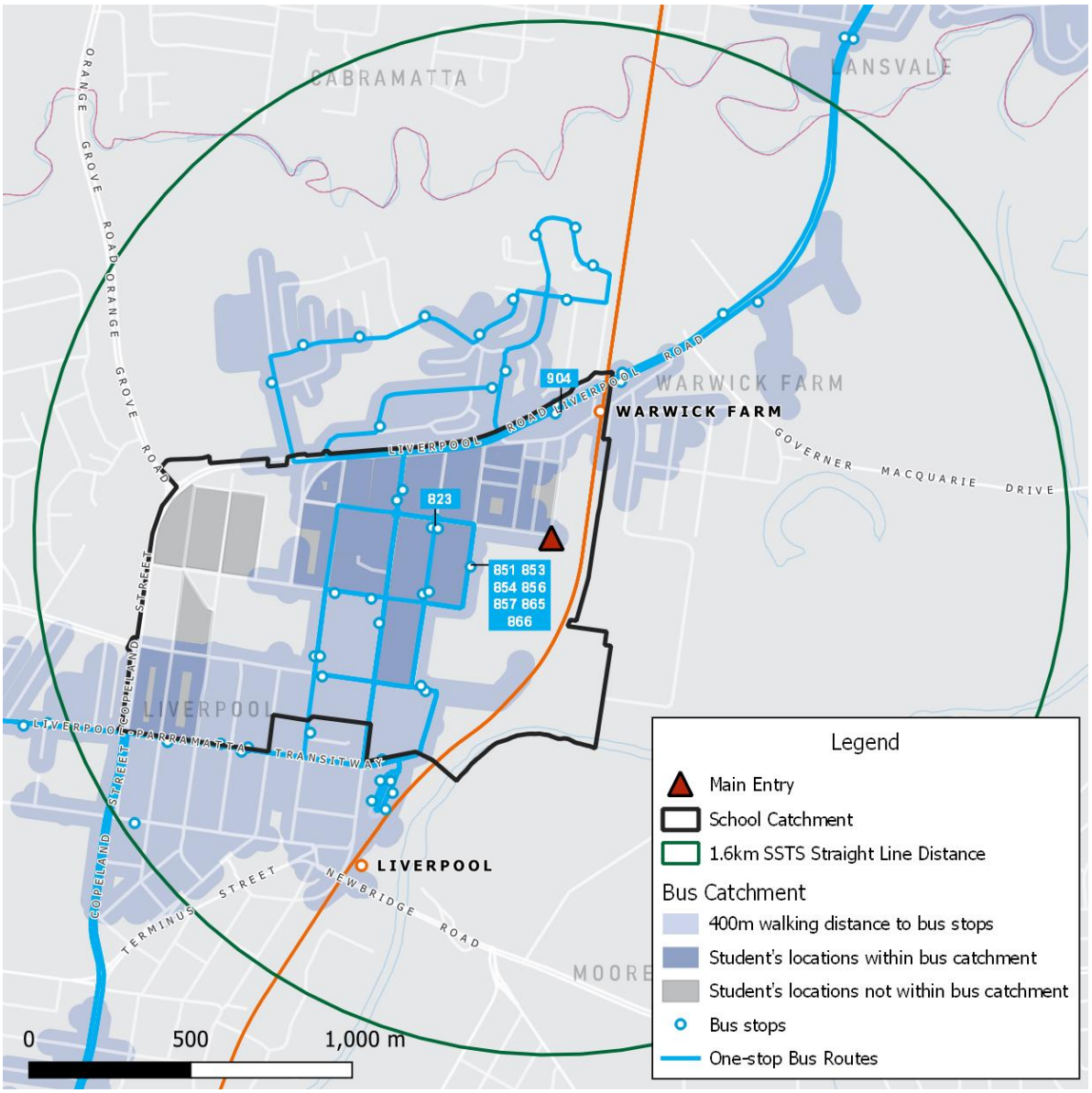


Table 1.5: Number of students within a walking catchment to bus stops

Location	Within 400m Bus Catchment	Not within 400m Bus Catchment
Within 1200m walking catchment	173	19
Not within 1200m walking catchment	45	13
Total	**218**	**32**

As shown in Table 1.5, 45 students (or 18 per cent of total) live beyond the 1200m walking catchment to school *and* within a 400m walking catchment to a bus stop. These students, while not eligible for a free bus pass, can still obtain a subsidised school term bus pass for $55 per term.

1.6. Mode Share Targets

1.6.1. Student Targets

As the proposed school is a new development, the 'base case' mode share was prepared using a first principles approach. Data from GTA Consultants' *Trip Generation Surveys, Schools Analysis Report (2014)* was used to show the average modal split of trips to and from primary schools in Metropolitan Sydney. It was found that travel to and from primary schools were primarily comprised of either car or active transport (mainly walking), with a small percentage of public transport usage. A range of mode share usage was noted in the surveyed schools, a result of the built environment characteristics and nature of the families and the jobs they have to do in their daily lives.

The average statistics from the GTA Consultants' *Trip Generation Surveys, Schools Analysis Report (2014)* for Primary Schools within the Sydney Metropolitan area are reproduced in Table 1.6 below:

Table 1.6: Average Sydney Primary School Mode Share

Walk	Bus	Car
53%	2%	45%

With regard to the de-personalised student data, the walking, cycling and bus catchments in Section 1.5 and the Sydney-wide school mode share patterns, the expected mode choice of students based upon their age and distance from school is shown in Table 1.7.

Table 1.7: Expected Use of Mode by Distance from School

Catchment	Walk	Cycle	Bus	Car
Kindergarten to Year 4				
1-400m	High	Low	Low	Low
401m-800m	High	Low	Low	Moderate
801m-1200m	Moderate	Low	Low	Moderate
1201m-1600m	Low	Low	Low	High
1601m+	Low	Low	Low	High
Year 5 and Year 6				
1-400m	High	Low	Low	Low
401m-800m	High	Low	Low	Low
801m-1200m	High	Low	Low	Moderate
1201m-1600m	Low	Low	Low	High
1601m+	Low	Low	Moderate	High

By understanding what kind of transport choices students and their parents are likely to make based on the student's age and distance from the school, an initial base case mode share scenario has been developed. These targets, in Table 1.8, are generally in accordance with the average mode split of primary schools in the Sydney Metropolitan Area.

Table 1.8: New Liverpool Public School Base Case Mode Share

Walk	Cycle	Bus	Car
50%	2.5%	2.5%	45%

However, it is also valuable to understand the shifted mode share that could be achieved in the long-term with the implementation of active transport infrastructure, adjusted public transport services and other sustainable travel programs, as later described in Section 2.2. Table 1.9 depicts the increased propensity of sustainable transport choices and decreased likelihood of private car travel.

Table 1.9: Future Use of Mode by Distance from School

Catchment	Walk	Cycle	Bus	Car
Kindergarten to Year 4				
1-400m	High	Low	Low	Low
401m-800m	High	Low	Low	Low
801m-1200m	High	Low	Low	Low
1201m-1600m	Low	Low	Moderate	High
1601m+	Low	Low	Moderate	High
Year 5 and Year 6				
1-400m	High	Low	Low	Low
401m-800m	High	Low	Low	Low
801m-1200m	High	Moderate	Low	Low
1201m-1600m	Low	Moderate	Moderate	Low
1601m+	Low	Moderate	High	Low

Using this future mode choice likelihood matrix, 'moderate' target and 'reach' target mode share scenarios have been developed. The moderate target mode share is set between the base case and reach target and is considered a realistic target to strive for in the short-term (e.g. one to two years after opening), while the reach target is an aspirational long-term goal. The reach target is considered a 'best case scenario' and reflects the maximum number of students living within reasonable walking and cycling distances to the school or a short walking distance to a bus stop that takes students to school. Accordingly, these aspirational mode share targets are summarised in Table 1.10.

Table 1.10: Future Mode Share Targets

Scenario	Walk	Cycle	Bus	Car
Moderate	60% (+10%)	5% (+2.5%)	5% (+2.5%)	30% (-15%)
Reach	70% (+20%)	7.5% (+5%)	7.5% (+5%)	15% (-30%)

Discussion

Table 1.10 shows a 'reach' sustainable transport (active and public transport) mode share target of 85 per cent, with less than one-in-five students travelling to school by private car. While these targets are certainly ambitious, the relatively small school catchment boundary and higher residential density means that most students are within a reasonable walking and cycling distance of the school.

1.6.2. Staff Targets

As stated before, the school is a new development, meaning that there is no existing mode share for both future students and staff. A survey of nearby primary schools – Liverpool Public School (LPS) and Liverpool West Public School (LWPS) – was conducted from 26 November 2019 to 3 December 2019.

79 staff responses were received (64 full-time and 15 part-time), for which 91 per cent travelled to school by private car. Comparing the survey results to the 2016 Census 'Journey to Work' data for the Destination Zone (DZ) shown in Figure 1.27, this indicates that car mode share for the nearby schools' staff is greater than the car mode share for all employees working in the DZ. The full survey results are included in Table 1.11.

Figure 1.27: ABS Census destination zone 115980011

Source: ABS Maps (https://itt.abs.gov.au/itt/r.jsp?ABSMaps), accessed 6 December 2019

Table 1.11: Staff Travel Mode Share – 2019 Survey Results

Mode	Responses	Percentage	Comparison to ABS JTW data[7]
Private car (driver)	72	91%	79%
Private car (passenger)	0	0%	3%
Motorcycle/ Scooter	0	0%	0%
Bus	4	5%	1%
Train	2	3%	13%
Walk	1	1%	2%
Bicycle	0	0%	0%

[7] Note: Australian Bureau of Statistics Journey to Work 2016 census data for destination zone 115980011

Comments from the surveys identify the primary reasons for travel via car to be convenience and using the car to travel elsewhere before or after school. Several respondents also identified infrequent or inconvenient bus services to be a limiting factor in adopting public transport to travel to school.

The target staff travel mode share splits have been developed as follows:

- Mode share targets with substantial reductions in single-vehicle private car trips are targeted, underpinned by the school's development features:
    - as NLPS will be a new school, there is no entrenched culture, precedence, or expectation to provide a high level of car parking for staff members
    - a proportion of parking may be allocated to car-poolers only, promoting multi-occupancy car trips, with an initial allocation of half of the spaces for car-poolers
    - limited on-street and on-site parking availability (33 staff parking spaces only) decreases the attractiveness to drive to school and self-selects for a staff cohort more inclined to travel via public or active transport.
- The reduction in car mode share would be reflected in an uptake in public transport and active transport:
    - increased public transport patronage to 40 per cent, aligning with similar utilisation seen in the Chatswood and Macquarie Park Centres for professionals
    - increased active travel to around 10 per cent.

Table 1.12: Staff Mode Share

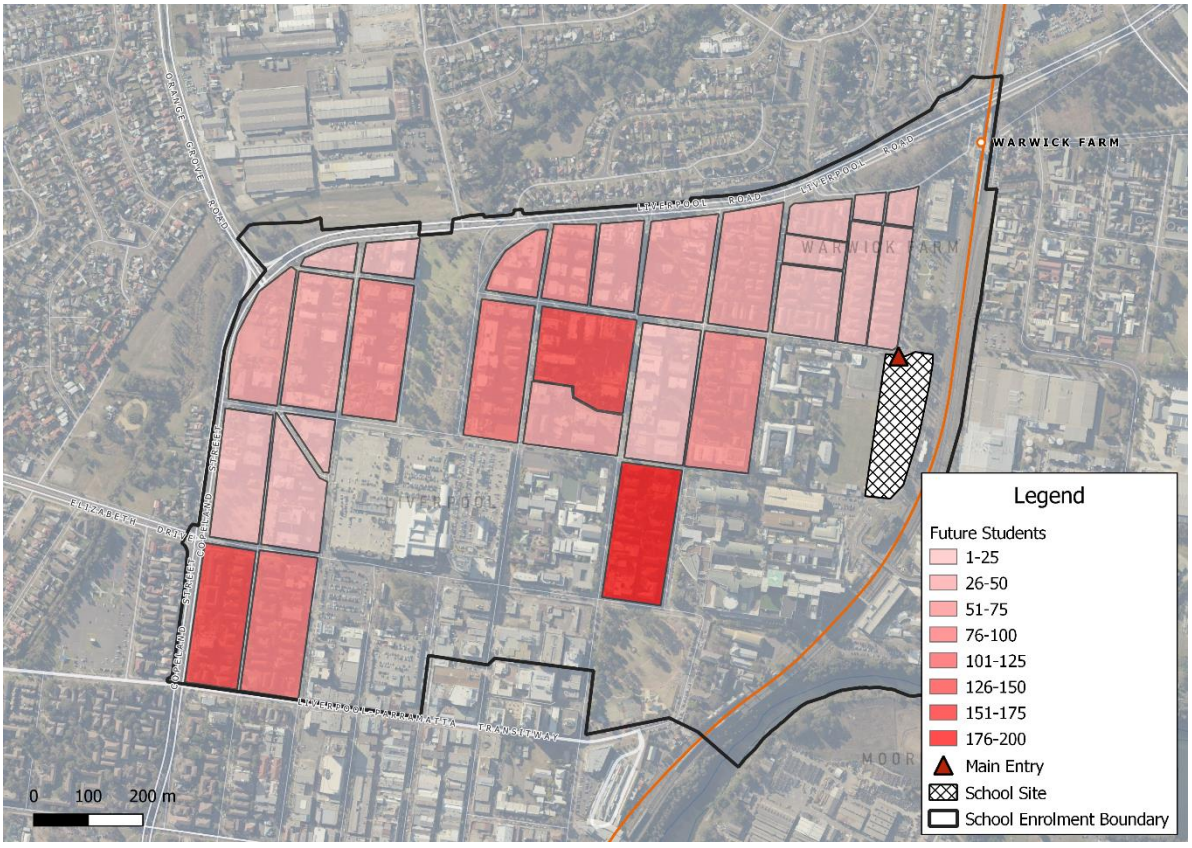
Mode	Base Case Mode Share (based on comparable schools)	Target Mode Share
Private car (driver)	91%	34%
Private car (passenger)	0%	17%
Dropped off (driver does not stay)	0%	0%
Motorcycle/ Scooter	0%	0%
Bus	5%	5%
Train	3%	35%
Bus, then train	0%	0%
Train, then bus	0%	0%
Walk	1%	5%
Bicycle	0%	4%
Other	0%	0%

1.7. Site Access Transport Provisions

1.7.1. Pedestrian Access

While there are currently only 250 students within the proposed school enrolment catchment, residential growth in the Liverpool CBD is anticipated to meet the school's upper limit capacity of 1,200 (excluding pre-school and support unit students). Using the current density and distribution of students, a multiplier of 4.8 to existing street block populations has been applied as a proxy for the future distribution of NLPS students, shown in Figure 1.28.

Figure 1.28: Estimated Future Student Population Distribution



As the 1200-metre walking catchment – shown in Figure 1.29 and Figure 1.30 – only extends as far as Macquarie Street, it is only street blocks to the east of Macquarie Street that are relevant for further analysis. In order to understand what pedestrian infrastructure may be appropriate for the NLPS, the future street block density data has informed the development of the 'moderate' and 'reach' scenario pedestrian volumes. In alignment with the mode share targets set in Table 1.10 prior, the volumes reflect the 'moderate' target of 60% walking and 'reach' target of 70%. Figure 1.29 and Figure 1.30 show the 'journey to school' morning volumes for each footpath segment, accumulating to higher numbers with the increasing proximity to the school.

Additionally, the base case crossing facilities are shown existing crossing facilities in blue, and the development proposal's new crossings in purple. Note that the volumes shown are associated with high-level estimated walking activity to the school only; they do not incorporate other walking activity that would also be present.

Figure 1.29:Projected NLPS Student Pedestrian Volumes – Moderate Scenario

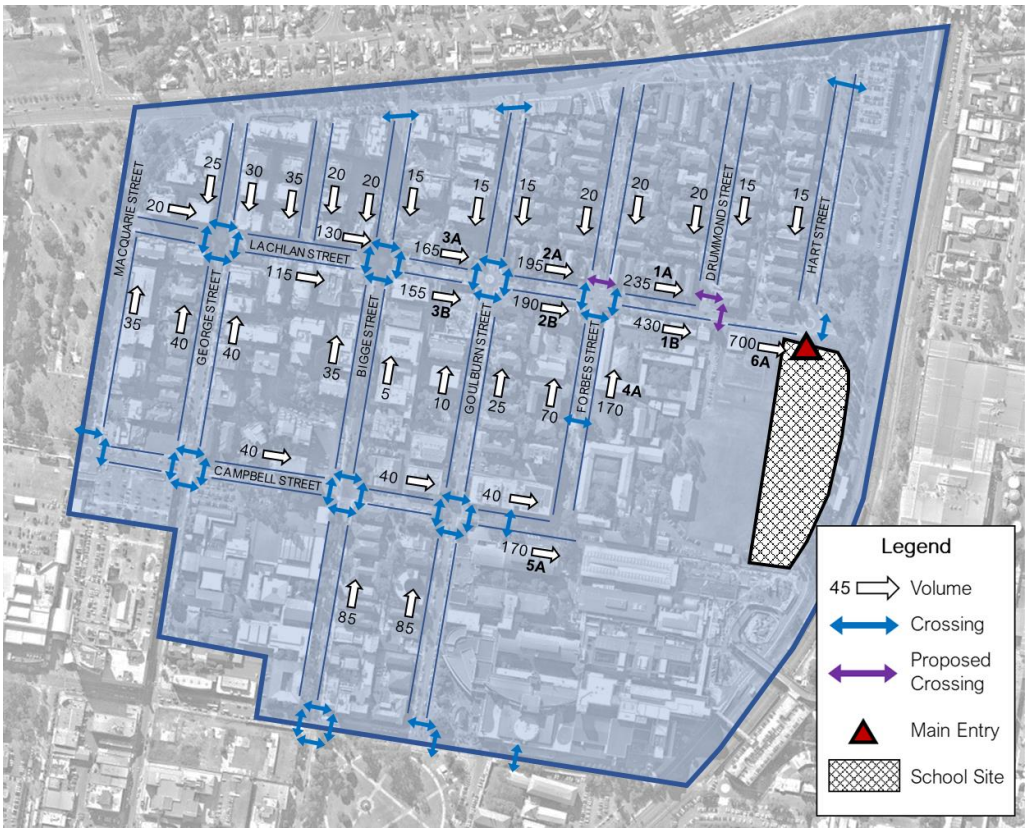
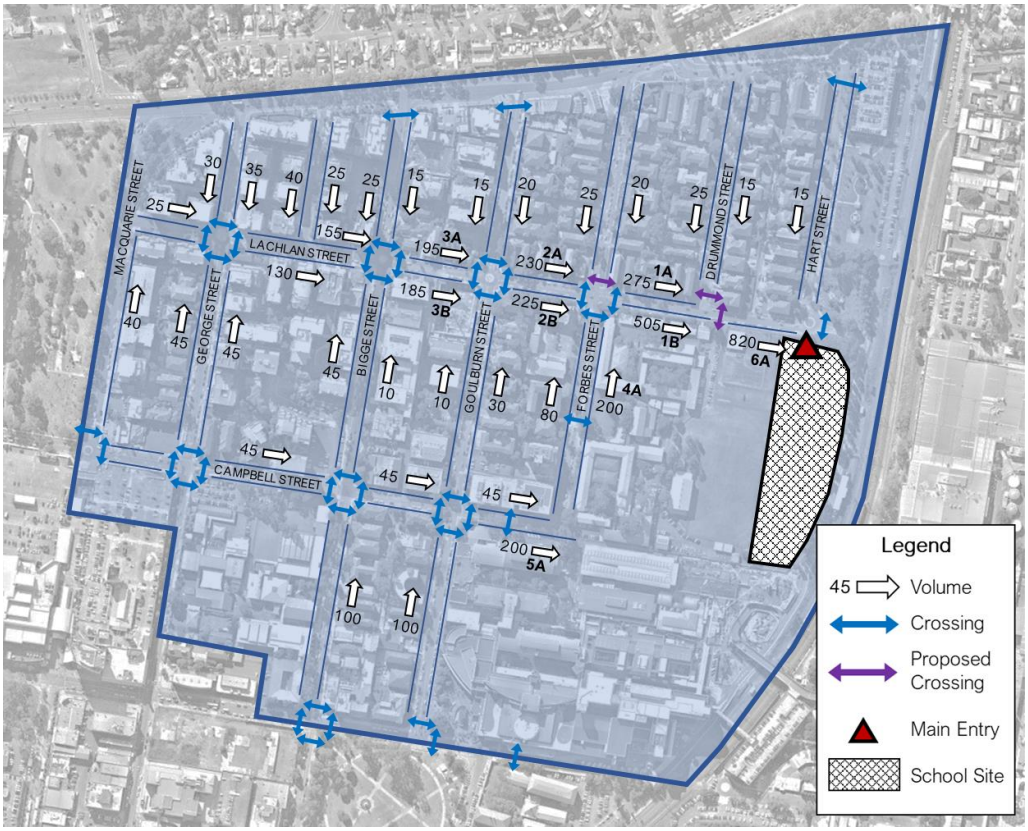


Figure 1.30:Projected NLPS Student Pedestrian Volumes – Reach Scenario



The high-volume footpath segments – and their corresponding volumes by scenario – are summarised in Table 1.13. The reference codes (e.g. 1A) are used as shorthand to easily identify the specific footpath segments and recur throughout the remainder of this section.

Table 1.13: Future Projected High Volume Footpath Segments

Ref	Street	Side	From	To	Students		
					Base	Moderate	Reach
1A	Lachlan Street	North	Forbes Street	Drummond Street	195	235	275
1B	Lachlan Street	South	Forbes Street	Drummond Street	360	430	505
2A	Lachlan Street	North	Goulburn Street	Forbes Street	165	195	230
2B	Lachlan Street	South	Goulburn Street	Forbes Street	160	190	225
3A	Lachlan Street	North	Bigge Street	Goulburn Street	140	165	195
3B	Lachlan Street	South	Bigge Street	Goulburn Street	130	155	185
4A	Forbes Street	East	Campbell Street	Lachlan Street	145	170	200
5A	Campbell Street	South	Goulburn Street	Forbes Street	145	170	200
6A	Lachlan Street	South	Drummond Street	School Entry	585	700	820

Adequacy of Footpath Widths

To assess the adequacy of the existing footpath widths on expected high-volume streets, a Fruin Level of Service (LOS) assessment can be used to understand the performance of pedestrian space under certain conditions. The levels of service are categorised between LOS A (free flow conditions) and F (a complete breakdown in flow). The Fruin LOS criteria is typically applied to areas where pedestrians are traversing, such as footpaths. These criteria are summarised in Figure 1.31.

Figure 1.31:Fruin Level of Service criteria

Level of Service	**Flow Rate** *(pedestrian/minute/meter)*	**Density** *(pedestrian per squared meter)*
A	≤ 7	≤ 0.08
B	7 - 23	0.08 - 0.27
C	23 - 33	0.27 - 0.45
D	33 - 49	0.45 - 0.69
E	49 - 82	0.69 - 1.66
F	≥ 82	≥ 1.66

Source: Fruin (1971)

Considering the Fruin Level of Service criteria, Table 1.14 shows the varied LOS criteria for each of the high-volume footpaths within the walking catchment.

Table 1.14: Future Projected Level of Service Criteria by Footpath Segment

Ref	Existing Width (m)	LOS A	LOS B	LOS C	LOS D	LOS E	LOS F
1A	1.2	0-8	8-28	28-40	40-59	59-98	98+
1B	3.0	0-21	21-69	69-99	99-147	147-246	246+
2A	1.2	0-8	8-28	28-40	40-59	59-98	98+
2B	3.0	0-21	21-69	69-99	99-147	147-246	246+
3A	1.8	0-13	13-41	41-54	54-88	88-148	148+
3B	2.0	0-14	14-46	46-66	66-98	98-164	164+
4A	3.0	0-21	21-69	69-99	99-147	147-246	246+
5A	3.0	0-21	21-69	69-99	99-147	147-246	246+
6A	2.7	0-19	19-62	62-89	89-132	132-221	221+

Note: values shown as ppm (person per minute).

Regarding the analysis for this STP, it should be noted that the analysis of pedestrian volumes *only* involves the expected students of the NLPS and their parents/ carers; i.e. it does not consider other students or pedestrians. Recognising that students in grades Kindergarten to Year 4 (five of the seven grades) are highly likely to be accompanied by a parent, and that these parents will walk both to *and* from the school in a single journey (either morning drop-off or afternoon pick-up), the following multiplier has been applied to the projected volumes:

$$student\ pedestrian\ volume + \left(student\ pedestrian\ volume \times \frac{5}{7}\ grades \times 2\ trips\right) = final\ pedestrian\ volume$$

To then understand the flow rate (persons per minute), the final volume is divided by 30, as it is expected that all trips will be distributed over a half an hour period. Demonstrating this methodology for the footpath 6A 'reach' scenario, for example, shows the flow rate calculation as follows:

$$820\ students\ walking + \left(820 \times \frac{5}{7}\ grades \times 2\ trips\right) \div 30\ minutes = 66.4\ persons\ per\ minute$$

In the above example, 66 persons per minute on footpath 6A results in a LOS C.

Applying the Fruin LOS criteria to footpaths 1A to 6A, Table 1.15 shows the LOS of existing footpath widths for all three scenarios, assuming that all walking trips occur evenly within a half-hour period before and after school. Figure 1.32 depicts the expected LOS results for the high-volume footpaths in the 'reach' scenario.

Table 1.15: Existing Widths and Expected Level of Service by Scenario

Ref	Existing Width (m)	Base LOS	Moderate LOS	Reach LOS
1A	1.2	B	B	B
1B	3.0	B	B	B
2A	1.2	B	B	B
2B	3.0	A	A	A
3A	1.8	A	B	B
3B	2.0	A	A	B
4A	3.0	A	A	A
5A	3.0	A	A	A
6A	2.7	B	B	C

Figure 1.32: Expected Reach Scenario Level of Service

In the 'moderate' scenario, the expected NLPS student volumes equate to LOS A or B for all of the high-volume footpaths. However, in the 'reach' scenario, the increased volumes shift footpath 6A from LOS B to LOS C, meaning that there is slightly restricted circulation and difficulty passing others. However, the existing footpath widths are adequate and meet minimum requirements for the base scenario.

In anticipation of achieving the 'reach' scenario, it is recommended that footpath 6A is increased to a width between 3.0m and 4.0 metres. Further, if student walking volumes are higher than expected, or if students

are regularly observed to be walking on the grass verge, it is recommended that footpaths are considered for widening.

Finally, the two north-south median refuge crossings at the Lachlan Street – Forbes Street intersection are not compliant with current best practice and do not provide sufficient safety for children walking to and from school. Using the *Australasian Pedestrian Facility Selection Tool [V2.2]*[8], a zebra crossing, kerb extension or signalised crossing are not appropriate within the local context.

Alternatively, it is recommended that the existing low-form refuge islands are replaced with standards-compliant refuges, ensuring that enough width is provided in the crossing gap for both pedestrians and cyclists.

Figure 1.33:Non-Compliant Island at Lachlan Street

1.7.2. Cycling Access

To encourage students to cycle to and from school, and to reach the 'moderate' scenario target mode share of 5%, delivery of additional cycling infrastructure will be required. The existing facilities are fragmented and do not sufficiently provide key trunks of safe cycling infrastructure, appropriate for all ages. Figure 1.34 shows the recommended cycling infrastructure, in alignment with the Liverpool City Council *Bike Plan*.

[8] *Austroads Pedestrian Facility Selection Tool:* https://austroads.com.au/pedestrian-tool/assets/docs/Feasibility-diagrams_V2-2.pdf?fbclid=IwAR2GfmnYAm_-FNMCu7ZlyIIYIHy2tVGFyGwMcA4DpBn_5HRVEzunflvf56E

Figure 1.34:Moderate Scenario Cycling Infrastructure

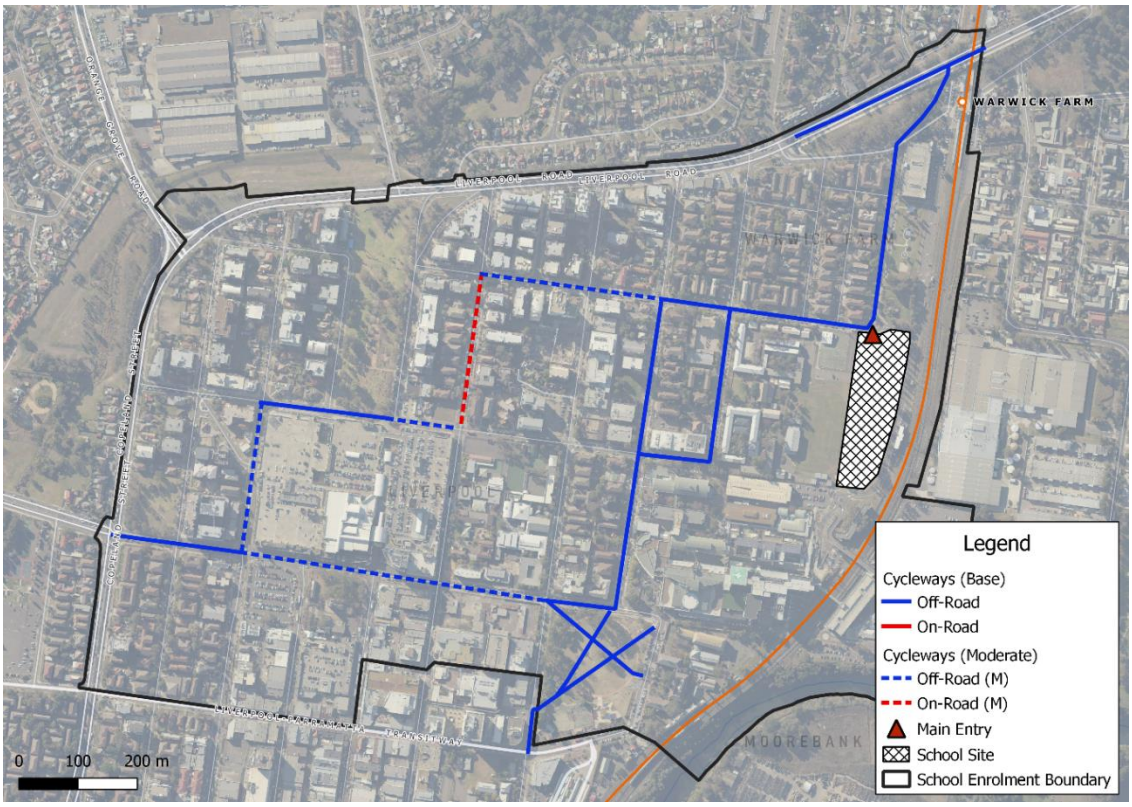


Table 1.16: Summary of Proposed Cycling Works – Moderate Scenario

Street	From	To	Typology	Responsibility
Lachlan Street	Goulburn Street	George Street	Off-Road	SINSW working in collaboration with Liverpool City Council will investigate
George Street	Lachlan Street	Campbell Street	On-Road	SINSW working in collaboration with Liverpool City Council will investigate
Campbell Street	Macquarie Street	George Street	Off-Road	SINSW working in collaboration with Liverpool City Council will investigate
Bathurst Street	Campbell Street	Elizabeth Drive	Off-Road	SINSW working in collaboration with Liverpool City Council will investigate
Elizabeth Drive	Bathurst Street	Bigge Street	Off-Road	SINSW working in collaboration with Transport for NSW will investigate (Principal Bicycle Network route)

It should be noted that while the recommendation of George Street as an on-road cycling facility is to ensure congruence with Liverpool Council's *Bike Plan*, consideration should be given to its delivery as an off-road facility, providing additional safety and comfort for the NLPS students that may ride to school.

The 'reach' scenario recommended infrastructure involves full delivery of Council's proposed cycling network within the school enrolment boundary.

Critical to delivery of this stage is a *new* signalised pedestrian and cyclist crossing at the intersection of Lachlan Street and Macquarie Street, without which there is no safe and direct east-west access between the school and the residences to the west of Liverpool Pioneers' Memorial Park.

Figure 1.35:Reach Scenario Cycling Infrastructure

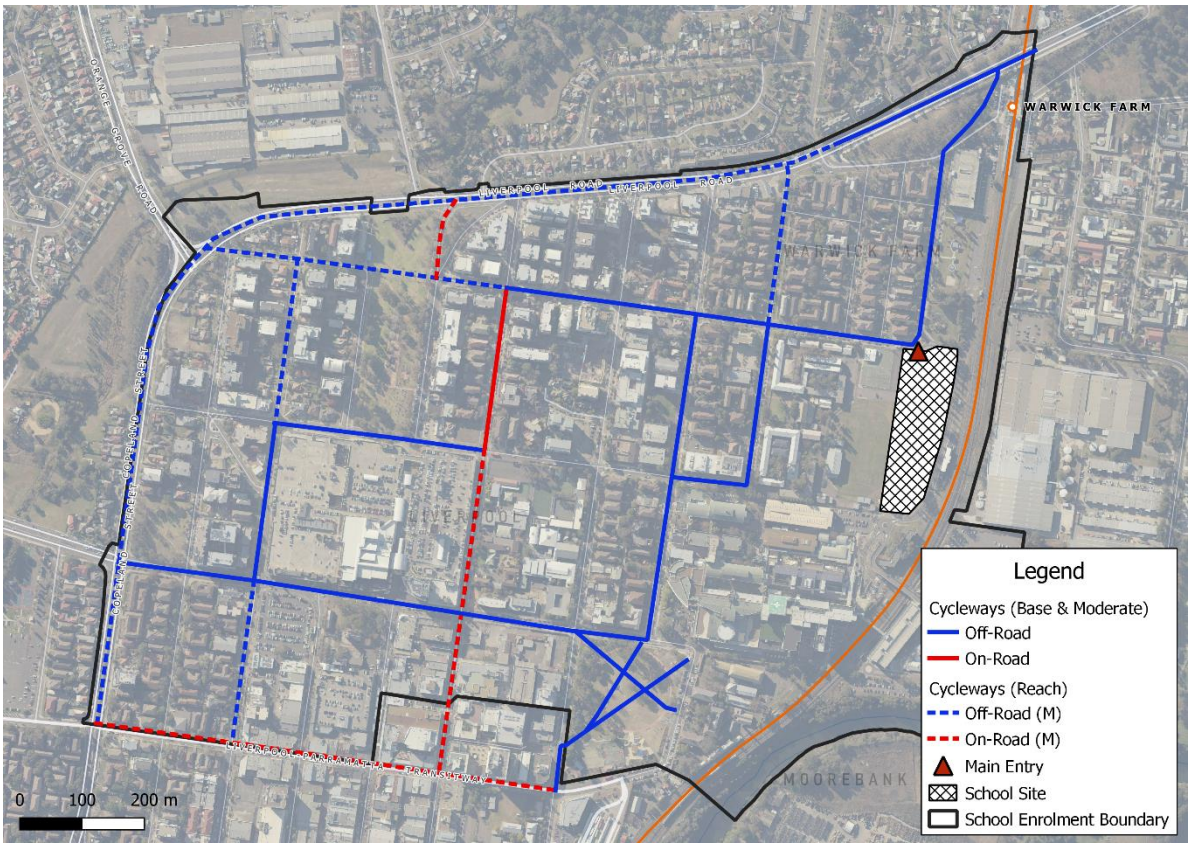


Table 1.17: Summary of Proposed Cycling Works – Reach Scenario

Street	From	To	Typology	Responsibility
Forbes Street	Lachlan Street	Hume Highway	Off-Road	SINSW working in collaboration with Liverpool City Council will investigate
Bathurst Street	Moore Street	Elizabeth Drive	Off-Road	SINSW working in collaboration with Liverpool City Council will investigate
Bathurst Street	Campbell Street	Lachlan Street	Off-Road	SINSW working in collaboration with Liverpool City Council will investigate
Lachlan Street	George Street	Hume Highway	Off-Road	SINSW working in collaboration with Liverpool City Council will investigate
Moore Street	Hume Highway	Bigge Street	On-Road	SINSW working in collaboration with Liverpool City Council will investigate
George Street	Moore Street	Campbell Street	On-Road	SINSW working in collaboration with Liverpool City Council will investigate

Street	From	To	Typology	Responsibility
Macquarie Street	Lachlan Street	Hume Highway	On-Road	SINSW working in collaboration with Liverpool City Council will investigate
Hume Highway	Moore Street	Remembrance Avenue	Off-Road	SINSW working in collaboration with Transport for NSW will investigate (Principal Bicycle Network route)
Signalised Crossing	Intersection of Lachlan Street and Macquarie Street			SINSW working in collaboration with Liverpool City Council and Transport for NSW will investigate

Bicycle/ Rideables Parking Provision

As part of the development proposal, 60 bicycle/ rideables (e.g. scooters) parking spaces are provided south of the support unit building. Table 1.18 shows that this level of provision is sufficient to meet not only the base case prediction of 30 cyclists/ riders, but also the moderate scenario figure of 50. If New Liverpool Public School were to effectively meet its moderate cycling mode share target, consideration should then be given to the introduction of an additional 40 bicycle/ rideables parking spaces to meet the long-term reach target.

Table 1.18: Parking Provision

Facility	Development Proposal	Base Case	Moderate Scenario	Reach Scenario	Responsibility
Bicycle/ Rideables Racks	60	30	50	90	SINSW

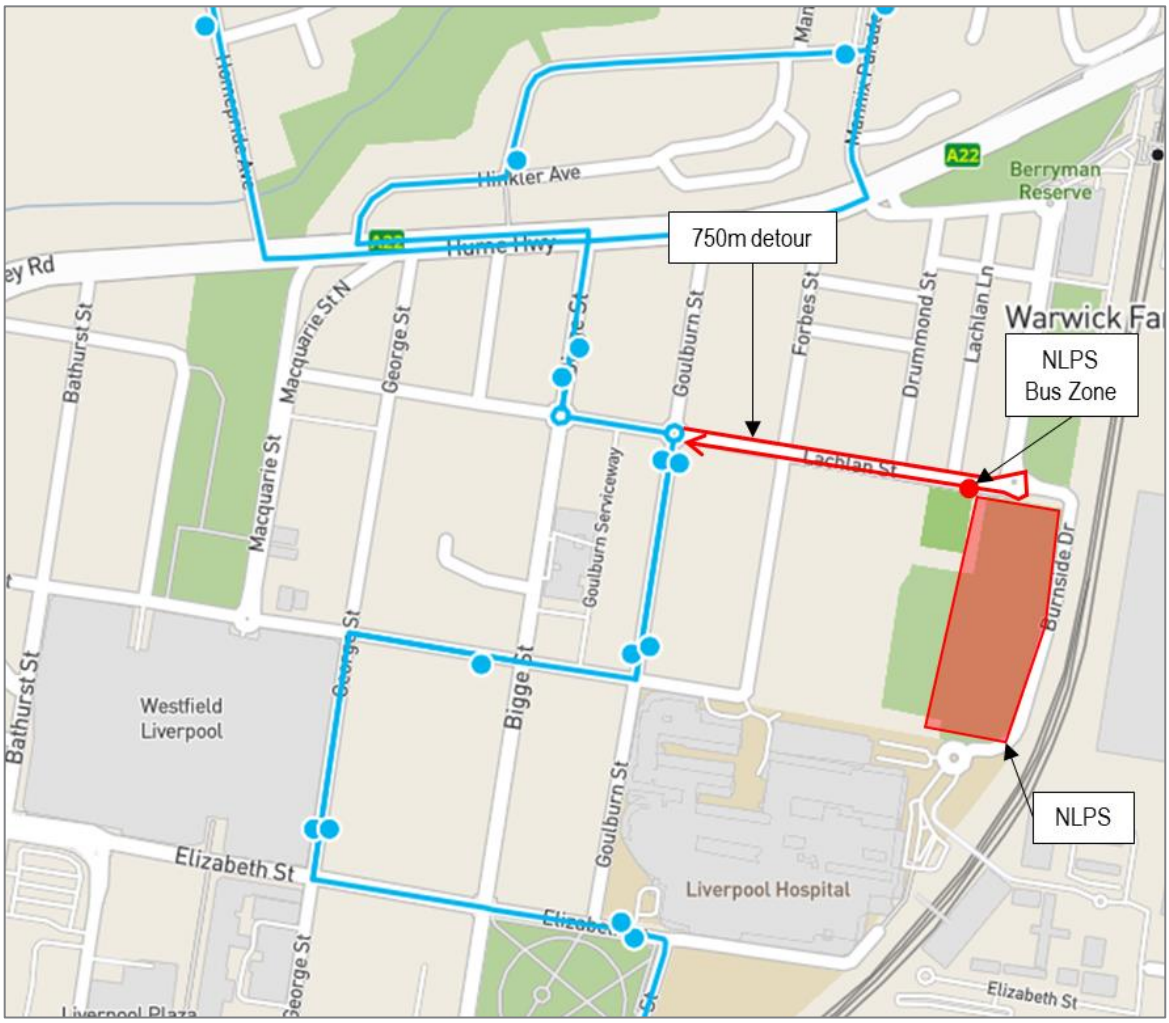
1.7.3. Public Transport Access

The proposed bus zone – described in Section 1.4.4 – is currently proposed for school excursion coaches only, however consideration for twice-a-day diversion of public bus services can be explored in consultation with the bus operators. It is recommended that such a diversion is at least considered, for both the 'moderate' and 'reach' scenarios.

Two potential bus services are identified, the 823 Liverpool to Warwick Farm (Loop Service) and the 904 Fairfield to Liverpool (and vice versa). This would require a 750-metre detour for the 823 service (approximately 1.5 minutes at 30 km/h, plus pick-up/ set-down time) and a 1000-metre detour for the 904 service (approximately 2 minutes at 30km/h, plus pick-up/ set-down time). This is indicatively illustrated in Figure 1.36, Figure 1.37, and Figure 1.38. These extensions would benefit students who live towards the south-west of the school catchment and provide them with a bus stop (at Westfield Liverpool, George Street) which would be within a 10-minute walk of their residence.

As per the NSW *Guide to Appointed School Bus Stops*, to establish a new bus stop, it must first be appointed by Transport for NSW or a bus operator. Following this, the roads authority for the road approves the appointed bus stop. Burnside Drive and Lachlan Street are classified as local roads hence the relevant authority is Liverpool City Council.

Figure 1.36:Route 823 Liverpool to Warwick Farm (Loop Service) potential extension



Base Image Source: https://transportnsw.info/routes/details/sydney-buses-network/823/22823, accessed 10 May 2021

Figure 1.37:904 Fairfield to Liverpool potential extension

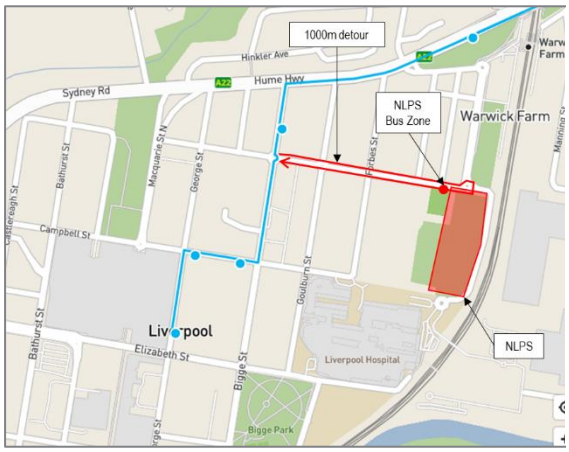
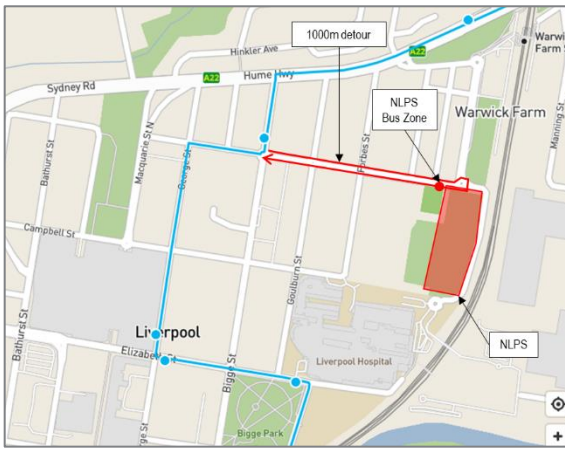


Figure 1.38:904 Liverpool to Fairfield potential extension



Base Image Source: https://transportnsw.info/routes/details/sydney-buses-network/904/38904, accessed 10 May 2021

2. STUDENT TRANSPORT PLAN

02

2.1. Executive Summary

This Student Transport Plan addresses the State Significant Development Application requirements for the development of the New Liverpool Public School (NLPS), which will result in a full student body of 1200 (excluding pre-school and support unit students). This Student Transport Plan has been prepared with reference to the Department of Education Transport Assessment Background and Reporting Requirements, Section C: School Transport Plan.

This Student Transport Plan has been informed by the preceding transport assessment, which comprised a spatial analysis of student enrolments and the geographic distribution of students in relation to the school, desktop-based site investigations, the setting of base case, moderate and reach travel mode share targets and a discussion of potential site access infrastructure associated with these target scenarios.

While the proposed targets for active and sustainable travel are aspirational, there is an opportunity to shift and shape active and sustainable travel behaviours through the school's development. With a mindset of actively encouraging and promoting sustainable travel, the NLPS can become an exemplar for use of active and public transport modes for similar schools in the nearby region.

Proposed measures include:

- Sustainable transport encouragement programs to increase the rate of walking and cycling to school
- Efforts to increase registration into the School Student Transport Scheme (SSTS), which is used by school bus operators and Transport for NSW to measure the demand for a dedicated school bus
- Communications program to convey positive road safety messaging and expected standards of behaviour for kiss and drop near the school.

2.2. Action Plan

2.2.1. Transport Objectives

Achievable and aspirational transport objectives and mode share targets have been designed with the following guiding principle:

1. Support the implementation of the sustainable travel program with resources to enable the aspirational sustainable travel targets to be achieved in the future through increased uptake of public transport and increased active travel modes like walking and cycling to NLPS.

Accordingly, the Student Transport Plan's objectives are:

1. To proactively identify and meet school travel demand safely, efficiently and sustainably;
2. To maximise the use of active and public transport modes to reduce car traffic before and after school day start and end times;
3. To increase active travel to and from school in a safe transport environment; and
4. To enhance connectedness to neighbourhood and community through safe travel to and from school.

2.2.2. Mode Share Targets

A range of mode share targets were explored in the preceding transport assessment, comprising the base case, moderate and reach targets. Based on this assessment, the moderate target has been used for school travel in the short-term, for example, following the end of the development construction and the first few years after school opening. The moderate targets are shown in Table 2.1.

Table 2.1: Moderate Scenario NLPS Mode Share Targets (assuming a roll of 1000 students)

Walk	Cycle	School Bus	Car (kiss and drop)
60%	5%	5%	30%
600 students	50 students	50 students	300 students

However, it is also valuable to understand the mode share that could be achieved in the long-term with the implementation of a coordinated and resourced suite of sustainable travel programs as will be proposed later in this Student Transport Plan. Using the reach target as the future aspirational mode share and with support of the proposed programs, it is foreseeable that as many as 70 per cent of students and 7.5 per cent of students walk and cycle respectively to school. These aspirational mode share targets are summarised in Table 2.2.

Table 2.2: Reach Scenario Mode Share Targets (assuming a roll of 1200 students)

Walk	Cycle	School Bus	Car (kiss and drop)
70%	7.5%	7.5%	15%
840 students	90 students	90 students	180 students

2.2.3. Programs

The following Sustainable Travel Action Plan includes a range of initiatives and actions, including some to be completed and implemented prior to the opening of the new school buildings, that will help to achieve the mode share targets and reduce the overall car travel associated with the school. Unless explicitly stated as a 'reach' scenario intervention/initiative, all proposals included in the Action Plan have developed to achieve the 'moderate' scenario mode share targets.

Travel Coordinator

As recommended in the SINSW guidelines for Transport Assessments and Student Transport Plans, a School Travel Coordinator is required for the duration of construction and first year of post-occupancy and transport programs must be implemented to achieve travel behaviour change.

A fundamental enabler of a successful program to uplift increased use of public transport and uptake of active travel to school is adequate resourcing.

While the implementation of programs such as Independent Travel Training and Walk Safely to School Day have traditionally been the responsibility of the School Principal, it is recommended that the School Principal is supported with a resource to assist implement, measure and monitor the active travel programs to reduce the administrative burden on school staff.

The role of the Travel Coordinator would include implementing the Sustainable Travel Action Plan and Communications Plan as outlined in this Student Transport Plan, measuring the participation of the program and collecting data on the way staff and students travel to/ from school and then recommending improvements to the program to assist NLPS meet its moderate and reach travel mode share targets.

This role is typically initially funded by the project during delivery. After year 1, subsequent arrangements for carriage of this role should be discussed between SINSW, Department of Education and TfNSW.

The actions need to be reviewed on a regular basis, at least annually, to review the actions and refine as the school community needs may change over time.

Table 2.3: Sustainable Travel Action Plan

Strategy	Action	Target Audience	Timeframe	Responsibility
Enabling active travel through resourcing				
Travel Coordinator	Progress the appointment of a Travel Coordinator for the New Liverpool Public School. This would include scoping the role and procuring a contractor, or other to promote, coordinate and monitor the implementation of the sustainable travel initiatives.	N/A	Prior to school opening	Department of Education led by Project Director and School Principal
Recurrent funding submission	Department of Education to confirm a budget for recurrent funding to enable mode shift from car to active which would fund Travel Coordinator and associated program costs (communications, participation costs).	N/A	Prior to school opening	Department of Education led by Project Director and School Principal
Sustainable Transport Programs to be coordinated by a Travel Coordinator				
Ride-to-School day	School participates in Ride-To-School day. This provides an opportunity for students, parents and teachers to try riding, walking, skating or scooting to school as well as celebrating the regular walkers and riders. Further information: www.bicyclenetwork.com.au	Staff, parents and students	In first year of opening and then annually	Travel Coordinator
Walking buddy program	Pair older students (year 5&6) with younger students who live close together to walk to school as a pair or small group.	Parents and students	In first year of opening and ongoing	Travel Coordinator
Walking School Bus (WSB) scheme	Research a sustainable alternative to walking school buses as this is volunteer dependent and may not have ongoing support. The concept is an organised group who walk to schools guided by two adults.	Parents and students	In first year of opening and ongoing	Travel Coordinator
Walk Safely to School Day	Promote and take part in 'Walk Safely to School Day'. Further information: www.walk.com.au	Staff and students	In first year of opening and then annually	Travel Coordinator
School Student Transport Scheme (SSTS)	Promote this scheme among the school community. Applications to the SSTS, for subsidised school term bus pass (students living within 1.6km from the school), are used as an indicator for demand for a dedicated school bus by Transport for NSW. Therefore, there needs to be an uplift in applications to the scheme to justify a dedicated school bus or the proposed selected diversions to the public buses to help achieve the proposed school travel targets.	Parents and students	Prior to opening and ongoing	Travel Coordinator
Reduce car travel				
Staff car-pooling	Establish a car-pooling scheme that enables staff to share their car trip to the school with more than 1 person in the car, reducing cars travelling to the school.	All staff	In first year of opening and ongoing	Travel Coordinator
Parents Car Pooling initiative	Discuss the idea of a car-pooling scheme for parents to share the transport of students to/ from school and encouraging more than 1 student in the car for each drop-off and pick up	All parents	In first year of opening and ongoing	Travel Coordinator

Strategy	Action	Target Audience	Timeframe	Responsibility
Seek assistance from Transport for NSW for school bus services				
Dedicated school bus service	Depending on the uptake of the SSTS from the school community as facilitated by the Travel Coordinator, liaise with Transport for NSW's Travel Demand Management and Short-Term Bus Service Planning teams to explore the feasibility of a dedicated school bus or proposed diversions to the public buses.	Students	Within three years after school opening	Travel Coordinator, relevant staff at Transport for NSW
Infrastructure and environmental elements to encourage active travel to school				
Widened footpaths	Deliver the recommended footpath widening works on Lachlan Street. **['Reach' scenario only]**	Students and parents	Within five years after school opening	SINSW, Liverpool City Council
Replacement of refuge islands at Lachlan Street - Forbes Street intersection	Replace existing low-form refuge islands with new best practice-compliant refuges, providing sufficient safety for children walking to and from school.	Students and parents	Prior to school opening	SINSW
Cycling infrastructure	Deliver off-road cycling infrastructure, as per the 'moderate' (Figure 1.34) and 'reach' (Figure 1.35) scenarios, creating a viable network for students to safely cycle to and from school.	Students	Within three years after school opening	SINSW, Liverpool City Council
Signalised intersection	Investigate delivery of a new signalised pedestrian and cyclist crossing at the intersection of Lachlan Street and Macquarie Street. **['Reach' scenario only]**	Students	Within three years after school opening	SINSW, TfNSW, Liverpool City Council
Additional actions				
Inspire the school community towards active transport to school as a vision for the school and its community	Communicate to Staff and Students key messages to promote sustainable travel including targets and actions outlined in the Student Transport Plan, through the Communications Plan (see below). Travel Coordinator to prepare messaging for School Principal	Staff, students and parents	Per communication plan	Travel Coordinator to prepare messaging for the School Principal to send out
Transport Access Guide (TAG)	Prepare a transport access guide for New Liverpool Public School and publish on the school website and other school communication mediums so that it is easy to understand the options to travel to school using active modes or public transport.	Staff, students and parents	Per communication plan	Travel Coordinator

2.2.4. Communication Plan

This Communication Plan provides a guide for some of the messages that the School Principal may communicate to promote uptake of walking, cycling and bus to school, which the Travel Coordinator will prepare in advance.

Table 2.4: New Liverpool Public School Communication Plan

What	When	Which Channel	To Whom
Share the vision and targets for the number of children targeted to walk, ride or catch a bus to school.	Before school opens and periodically throughout the year	Online school communication channels (e.g. Facebook page)	Staff, parents and students
Share the walking, cycling and bus transport options to get to New Liverpool Public School, drawing from the TAG. Note: Public school websites also have standardised transport information available to parents and students.	On the school website at all times	Facebook School website	Staff, parents and students
Promote that students would be able to access discounted or free travel by signing up to the SSTS to encourage use of public transport as a sustainable travel option.	Regular periodic updates	Facebook	Parents
Promote and encourage participation in National Ride2School Day.	Prior to the annual event in March.	Facebook	Staff, parents and students
Promote Walk Safely to School Day. Materials available at walk.com.au	Prior to the annual event in May	Facebook	Staff, students and parents
Communicating expected standards of behaviour for Kiss n Drop and Road Safety (use road safety information supplied by Liverpool City Council).	Regularly, multiple times each term.	Facebook	Students and parents
Communicate links to NSW Department of Education Road Safety Website, which is typically included in all Public School Websites.	Regularly, multiple times each term	School website and Facebook	Students and parents
Communicate road safety education YouTube video links including: Safety - https://youtu.be/OcNgdmniL8E School Zone - https://www.youtube.com/watch?v=l7Le_k0R0PY&feature=youtu.be School Crossings - https://youtu.be/ih0rXAqxSZg	Regularly, multiple times each term	School website Facebook page	Students and parents

2.3. Evaluation Plan

2.3.1. Data Collection Methodology

The Student Transport Plan is recommended to be evaluated periodically during year 1 post-construction and as a minimum biennially to increase the success of increasing sustainable travel mode share to school. It is recommended that data is collected biennially in Terms 3 to enable refinements to be made to the program in time to influence behaviour changes.

The School Principal will delegate the evaluation of the Student Transport Plan to the Travel Coordinator.

The data that can be collected to review whether the sustainable travel participation targets are realistic and being achieved are available from:

1. Department of Education Enrolment de-personalised data together with a GIS analysis of the student catchment to assess whether travel modes are aligned with those set out in this document.
2. A Journey to School survey at regular intervals to understand whether students are arriving and departing from school by walking, riding, scooting, bus or private vehicle (including how many children travel to school in that car for drop-off or pick up). Other information that might be gathered includes access points used into the school and times of travel.
3. A record of the number of students participating in the active travel program events such as Walk to School.
4. Targeted interviews with parents, teachers and students participating in the active travel plan actions to understand which elements of the active travel program are assisting them in their daily lives and what might be done to make the program more relevant/helpful to them.

2.3.2. Data Evaluation Methodology

The data should evaluate whether the sustainable travel mode shares are being met or are on track to being met.

Recommendations on how the Student Transport Plan, with a focus on the Action Plan and Communications Plan might be improved to assist with reaching the targets and aspirational targets should be provided as a result of the data analysis. If the targets are on track to be met, consideration might be given to increasing the active mode share target. The Action Plan and Communications Plan might also be subsequently re-shaped based on parent interviews and feedback.

2.3.3. Ongoing Feedback Framework

The School Principal will delegate the ongoing feedback framework to the Travel Coordinator to continuously improve the oversight of sustainable travel outcomes for Harrington Park Public School in concert with school stakeholders. This may include activities such as:

- Reviewing the adequacy of bicycle racks required periodically – are more required?
- Observing road safety activity beyond the school grounds to identify any improvements required.
- Observing how pathways are being used, or whether pathway design is inadequate or in the wrong location (for example if 'goat tracks' are worn through particular areas, should a request to Council be put in to improve the pathway in future works programs.
- Observing the operation of any future school buses and the drop off/ pick up facilities for any potential safety concerns. Make recommendations up to the School Principal, Transport for NSW, Liverpool City Council and the bus operator accordingly.

- Liaising with the Liverpool City Council Road Safety Officer with respect to the management of parking behaviours around the school.
- Any other feedback from Transport for NSW, Police, Residents, Teachers, Parents or Students that might arise from time to time.

2.4. Governance Framework

2.4.1. Stakeholders

The table of contacts below identify the stakeholders who will deliver actions to support the New Liverpool Student Transport Plan.

Table 2.5: New Liverpool Public Student Transport Plan Contacts

Contacts	Role	Phone	Email
TBC	Liverpool City Council Road Safety Officer	TBC	TBC
TBC	Department of Education Road Safety Education Officer	TBC	TBC
TBC	Transport for NSW	TBC	TBC
TBC	Project Director, Department of Education	TBC	TBC
Rebecca Lehman	Sustainable Transport Technical Advisor, Department of Education	0432 427 766	rebecca.lehman@det.nsw.edu.au

A.STAKEHOLDER ENGAGEMENT REGISTER

A

APPENDIX: STAKEHOLDER ENGAGEMENT REGISTER

Stakeholder	Engagement Date	Summary of engagement	Outcome
School Infrastructure (including Rebecca Lehman, Sustainable Transport Technical Advisor, Department of Education)	10 June 2021	Internal meeting between the project team and School Infrastructure.	• Updated wording on stakeholder responsibility regarding proposed infrastructure upgrades. • Update bicycle parking sections to include rideables (e.g. scooters) • Addition of section regarding East-West pedestrian link

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