

New High School for Wilton Transport and Access Impact Assessment

Prepared for:

NSW Department of Education

Prepared by:

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Revision Schedule

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REF Response

This Transport and Access Impact Assessment has been prepared to support the REF pathway for the new high school for Wilton. As part of the REF requirements, the NSW Department of Education has engaged Stantec to deliver a Transport and Access Impact Assessment that addresses several conditions. Table 1-1 outlines the transport conditions to be assessed and documented for this REF, along with our responses.

Table 1-1: REF Requirements

REF Requirement	Report Reference and Response
Produce a Transport and Access Impact Assessment that includes:	
Operational traffic impact assessment with modelling of existing and proposed performance levels of nearby intersections	This has been addressed in Section 4.2.6
Details of the delivery (including status and timing) of the surrounding road and active transport network the school is to rely upon, including timing for completion in relation to the proposed pedestrian and vehicular access arrangements	- Surrounding transport network and timings are detailed in Section 1.6 - Site access arrangements detailed in Section 3
School Transport Plan	This has been addressed in Section 6
Construction traffic and access impact assessment, including construction worker parking, number of heavy vehicles, heavy vehicle routes, access and parking arrangements, measures to ensure road safety and network efficiency during construction in consideration of potential impacts on general traffic, cyclists and pedestrians and bus services, measures to ensure the safety of vehicles and pedestrians accessing adjoining properties where shared vehicle and pedestrian access occurs	This has been addressed in Section 5.



Table of Contents

Revision Schedule	ii
Disclaimer.....	iii
REF Response	i
1 Introduction	1
1.1 Site Description	2
1.2 Proposed Activity Description	3
1.3 Mitigation Measures	4
1.4 Evaluation of Environmental Impacts.....	7
1.5 Policy Context	8
1.5.1 State Policy and Guidance	8
1.5.2 Local Policy and Guidance	9
1.6 Proposed Activity	10
1.6.1 Site Location and Wilton Growth Area	10
1.7 Scope of Study.....	14
1.8 Report Structure	14
2 Existing and Future Conditions.....	15
2.1 Existing Travel Behaviour	15
2.2 Active Transport.....	15
2.3 Public Transport.....	16
2.4 Private Transport.....	18
2.4.1 Road Network	18
3 Site Access Arrangements	22
3.1 Pedestrian Access	23
3.2 Bicycle/ Scooter Access and Parking	23
3.3 End of Trip Facilities.....	23
3.4 Bus Access	24
3.5 Vehicle Access.....	25
3.6 Car Parking	28
4 Operational Impacts.....	29
4.1 Trip Generation	29
4.2 Trip Distribution	30
4.2.1 School Intake Catchment.....	30
4.2.2 Walking Coverage.....	31
4.2.3 Cycling Coverage.....	32
4.2.4 Bus Service Coverage	33
4.2.5 Private Transport Demand	34
4.2.6 Demand Modelling	35
4.2.7 Proposed Mid-block intersection Modelling	38
4.2.8 Cumulative Impacts Operational Management.....	38
4.3 Forecasted Mode Split	39
4.3.1 Mode Split Benchmark	41
5 Construction Traffic and Access Impact Assessment.....	42
5.1 Purpose	42
5.1.1 Objectives	42
5.2 Construction Traffic Management Plan.....	42
5.2.1 Description of Construction Activities.....	42
5.2.2 Work Hours	43



5.2.3	Construction Worker Parking and Traffic	44
5.2.4	Construction Traffic Volumes	44
5.2.5	Site Access and Construction Vehicle Routes	44
5.2.6	On-street Work Zones	47
5.2.7	Traffic Guidance Scheme	47
5.2.8	Pedestrian and Cyclist Management	47
5.2.9	Public Transport	47
5.2.10	Traffic Movements in Adjoining Areas	47
6	School Transport Plan	48
6.1	Introduction	48
6.2	Transport Goals	48
6.2.1	Mode Share Targets	49
6.2.2	Links to Other Application Documentation	49
6.3	Policies and Procedures	49
6.4	School Transport Operations	50
6.4.1	Site Transport Access	51
6.4.2	Day-to-Day School Operations	51
6.4.3	Event Transport Operations for Share our Space, Hall Hire and Excursions	53
6.4.4	Sample Transport Encouragement Programs	53
6.4.5	School Student Transport Scheme (SSTS)	53
6.4.6	Ride to School Day	53
6.5	Communication Plan	53
6.5.1	Channels	54
6.5.2	Messages	54
6.5.3	Travel Access Guide	55
6.6	Data Collections and Monitoring	56
6.6.1	Data Collection	56
6.6.2	Ongoing Feedback Framework and Evaluation	56
6.6.3	Reporting Findings	57
6.7	Governance Framework	57
6.7.1	Travel Coordinator	58
6.7.2	External Transport Working Group	61
7	Conclusion	62

List of Tables

Table 1-1: REF Requirements	i
Table 1-1: Mitigation Measures	4
Table 1-2: State Strategic Policies and Plans	8
Table 1-3: Local Strategic Policies and Plans	9
Table 3-1: Bicycle Parking Requirements	23
Table 3-2: School Bus Zone Requirements	24
Table 4-1: High School Walking Coverage (Notional)	31
Table 4-2: High School Cycling Coverage (Notional)	32
Table 4-3: High School Bus Service Coverage	33
Table 4-4: Drop-off and Pick-up (DOPU) Requirements	34
Table 4-5: Intersection performance for intersections in North Wilton Stages 1, 2 and 3 - full development in 2036	36
Table 4-6: Modelling Assumptions and Future Growth Forecasting	37
Table 4-7: Moderate Student Mode Share Targets	39
Table 4-8: Staff Mode Share Targets Breakdown	40



Table 4-9: Rouse Hill High School - Student Catchment Coverage (Notional)	41
Table 4-10: Rouse Hill High School – Baseline Student Mode Share (Term 3, 2023)	41
Table 6-1: Managing a School's Duty of Care and Road Safety	50
Table 6-2: Day-to-Day School Operations	51
Table 6-3: Sustainable Travel Communications Plan	54
Table 6-4: Internal and External Stakeholders	58
Table 6-5: Transport Encouragement Programs	59

List of Figures

Figure 1: Aerial Photograph of the Site	2
Figure 2: Proposed Site Plan	3
Figure 3: Site Location and Wilton Growth Area Structure Plan	10
Figure 4: Wilton Growth Area Infrastructure Delivery Plan - 5 years	11
Figure 5: Wilton Growth Area Infrastructure Delivery Plan - 20 years	12
Figure 6: North Wilton Neighbourhood Plan	13
Figure 7: Proposed Pedestrian and Cycle Network (Grey Grid)	15
Figure 8: Existing Public and School Bus Network Within the High School Intake Area	16
Figure 9: Proposed Bus Network for Wilton Junction Full Development	17
Figure 10: Typical Road Sections – Road 14 and 20	18
Figure 11: School Site Location and Surrounding Road Network	19
Figure 12: Interim Road Configuration	20
Figure 13: Existing Bridge Across Hume Motorway	21
Figure 14: New High School for Wilton Masterplan	22
Figure 15: 10.5m Vehicle Swept Path (Entry and Egress at Southern Car Park)	26
Figure 16: 10.5m Vehicle Swept Path (Entry and Egress at Northern Car Park)	27
Figure 17: Estimated High School Intake Catchment and Projected Student Distribution for 2036	30
Figure 18: High School Walking Coverage	31
Figure 19: High School Cycling Coverage	32
Figure 20: High School Bus Service Coverage	33
Figure 21: Intersection Modelling of Mid-block Crossing	38
Figure 22: Construction vehicle routes	45
Figure 23: Construction vehicle access around the site	46
Figure 24: Managing a Schools Duty of Care and Road Safety Process	50



1 Introduction

This Transport Impact Assessment has been prepared to support a Review of Environmental Factors (REF) for the NSW Department of Education (DoE) for the construction and operation of the new high school for Wilton (the activity).

The purpose of the REF is to assess the potential environmental impacts of the activity prescribed by *State Environmental Planning Policy (Transport and Infrastructure) 2021* (T&I SEPP) as “development permitted without consent” on land carried out by or on behalf of a public authority under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The activity is to be undertaken pursuant to Chapter 3, Part 3.4, Section 3.37A of the T&I SEPP.

This document has been prepared in accordance with the Guidelines for Division 5.1 assessments (the Guidelines) by the Department of Planning, Housing and Infrastructure (DPHI) as well as the Addendum Division 5.1 guidelines for schools. The purpose of this report is to outline the impacts and mitigations to the transport network and encourage sustainable travel to and from schools.



1.1 Site Description

The current street address is 200 Fairway Drive, Wilton, NSW 2571. The site forms part of the southern portion of Lot 1063 in Deposited Plan 1289197 that was previously subdivided by Landcom. The site is approximately 3.79ha hectares in size and is located within the North Wilton Precinct.

As a result of precinct wide rezonings, the surrounding locality is transitioning from a semi-rural residential area to a highly urbanised area with new low to medium density residential development with supporting services. North Wilton is approximately 85km south-west of the Sydney CBD, 30km north-west of Wollongong and 30km southwest of Campbelltown-Macarthur Strategic Centre. The precinct is located on an interchange with the Hume Highway, which connects the Southern Highlands with the Sydney metropolitan region to the northeast and Canberra to the south-west.

The proposed school site does not currently have road access, however, Landcom is expected to deliver the road network and surrounding public domain network in accordance with DA/2022/1279/1. Proposed Road 14, located on the eastern boundary of the site, will ultimately provide future access to the site. The site contains several patches of remnant native vegetation particularly within the south-western portion of the site. An aerial photograph of the site is provided in Figure 1.



Figure 1: Aerial Photograph of the Site¹

¹ Source: Urbis, 2025



1.2 Proposed Activity Description

The proposed activity is for the staged construction and operation of a new high school for Wilton which will accommodate up to 1,000 students and 78 staff.

The new high school includes general and support learning spaces, specialist learning hubs, a library, administrative areas and a staff hub. Core facilities include a canteen, carparks, and sports courts.

Specifically, this proposal includes the following:

- Stage 1 includes:
 - Construction of a learning hub (Block A).
 - Sport field and sports courts.
 - Northern car park
- Stage 2 includes:
 - Construction of learning hubs (Blocks B and C) and a sports and performance hub (Block D):
 - Southern car park
- Associated site utilities and services including installation of new padmount substation and a new main switchboard.
- Main school pedestrian entrance proposed off Road 14.
- Kiss and drop zone proposed along Road 14.
- Earthworks and tree removal.



Figure 2: Proposed Site Plan²

² Source: TKD, 2025



1.3 Mitigation Measures

The nature of the REF pathway is such that all impacts must be 'closed out' by a mitigation measure. **In effect, the REF pathway requires that all impacts are mitigated such that they are rendered not significant.** For the avoidance of doubt, if there is a significant impact, it **must** be mitigated to ensure that all matters are not considered significant for the conclusion of the REF (refer below Evaluation of Environmental Impacts).

Table 1-1 provides a list of project specific mitigation measures proposed by Stantec and standard mitigation measures prepared by DoE.

Table 1-1: Mitigation Measures

Aspect	MM ID	MM Name	Mitigation Measure	Timing
Operational Transport	OPTMM1	School Transport Plan for Stage 1	Prior to the commencement of stage of operations, a School Transport Plan must be prepared to the satisfaction of the DoE Transport Planning Team. A copy of the School Transport Plan is to be provided to the relevant DoE Project Lead for implementation during operations.	Prior to the commencement of each stage of Operations.
Operational Transport	OPTMM2	School Bus Service	Ongoing coordination and consultation with TfNSW must be conducted regarding new school bus services and the extension of existing school routes to ensure students have adequate bus services.	Prior to commencement of Operation of Stage 2
Operational Transport	OPTMM3	School Operation	Implement off-set bell times between the Public School and High School, i.e. two bell times staged by at least 30 minutes apart.	Prior to commencement of Operation of Stage 1



Aspect	MM ID	MM Name	Mitigation Measure	Timing
Operational Transport	OPTMM4	Interim Access Management Plan	Where any of the following works are not complete prior to the commencement of Operation, an Interim Access Management Plan must be prepared in consultation with Landcom, Council and TfNSW and to the satisfaction of the DoE Transport team to provide safe temporary access to the site. The works are: • Mid-block pedestrian crossing on Fairway Drive (between Road 14 and the eastern roundabout). • 2.5m wide shared path on eastern side on unnamed sub-arterial road. • 2.5m wide shared path east of Road 14 through open space. • Wombat crossing on Road 20, north west of the playing fields. • Wombat crossing on Road 14, south of Road 20. • Wombat crossing on Road 14, north of Road 15. • Wombat crossing on Road 14, north of the entrance to the southern high school car park. • Kiss and drop zone, with a minimum of 21 spaces and a total length of 137 metres, located along the Road 14 school frontage. This zone is positioned north of the Wombat crossing on Road 14, north of the entrance to the southern high school car park. The Interim Access Management Plan must be updated when any of the above works are complete, until all of the above works are complete. The Interim Access Management Plan must be implemented until such time that all of the above works are complete.	Prior to commencement of Operation of Stage 1
Operational Transport	OPTMM5	Staff Parking Management	Allocate 36 parking spaces in the northern car park exclusively for high school staff. Install clear signage to ensure these spaces are reserved for high school staff use only.	Prior to commencement of Operation of Stage 1



Aspect	MM ID	MM Name	Mitigation Measure	Timing
Construction	CMM18	Construction Traffic	A detailed CTPMP is to be prepared by a qualified transport consultant prior to the commencement of each construction phase. This plan should be developed in consultation with the DOE Transport Planning Team, TfNSW and local council. The CTPMP should include: • site-specific risk assessment for managing construction traffic during school hours, including school drop-off and pick-ups. • specified routes for construction vehicles (see Figure 22 and Figure 23 of the Transport Impact Assessment). • details that accredited traffic controllers will be provided where pedestrian or cyclist routes are affected • a schedule of worker start and finish times and demonstrate that this does not have any significant impact on local traffic activity. • measures to manage construction traffic impacts including addressing impacts to Nilloc bridge during the construction phase.	Prior to commencement of any construction (Stage 1 and Stage 2)



1.4 Evaluation of Environmental Impacts

Potential impacts can be appropriately mitigated or managed to ensure that there is minimal impact on the locality, community and/or the environment. The following is addressed by the development activity (see Section 1.3 for a list of mitigation measures):

- Ability for students to use sustainable modes of travel i.e. by providing bike parking facility on site and providing bus routes servicing the site and school catchment.
- Ability for students to safely access bus services i.e. by providing school bus zone on North-South sub-arterial road.
- Ensuring safe and efficient operation of the school kiss and drop zone.
- Ensuring that students and visitors with mobility issues can safely and efficiently access the school site.
- Ensuring that a mechanism is in place for ongoing review and update of the School Transport Plan.

The extent and nature of potential impacts are low. Potential impacts can be appropriately mitigated or managed to ensure that there is minimal impact on the locality, community and/or the environment.



1.5 Policy Context

1.5.1 State Policy and Guidance

State strategic policies and plans relating to transport for the new high school for Wilton are provided in Table 1-2.

Table 1-2: State Strategic Policies and Plans

Document	Description
Guide to Transport Impact Assessment – Technical Guide for Transport Practitioners	The TfNSW Guide to Transport Impact Assessment (TIA) provides a comprehensive framework for evaluating the impacts of transport projects in New South Wales. The guide is designed for transport practitioners to provide best practice guidance and common information. This TIA has been prepared following the guidelines outlined in the document where appropriate.
Future Transport Strategy	The Future Transport Strategy (Strategy) was released in 2022 and replaces the Future Transport 2056, published in 2018. It is a 40-year strategy for Sydney and Regional New South Wales (NSW) prepared by Transport for NSW (TfNSW) to achieve. The Strategy details the strategic directions and responses for delivering TfNSW's vision for safe, healthy, sustainable, accessible and integrated passenger and freight journeys in NSW. Regarding schools, a key action included is the provision of safer walking, cycling and public transport access to schools.
Active Transport Strategy	The "Active Transport Strategy (2022)" sets out the NSW Government's vision to double active transport trips in 20 years. The strategy is built out of the Future Transport and forms the basis for active transport across the state. The plan identifies five focus areas and ambitions, which are supported by short-term (0-5 years) priority moves and deliverable actions. A key action is to provide communities with access to 15-minute neighbourhoods, which provide communities with access to health services, schools, shops, and recreational events within a 15-minute walk or cycle.
Western City District Plan	The Western City District Plan is a 20-year plan to manage growth in the context of economic, social and environmental matters to achieve the 40-year vision for Greater Sydney. It is a guide for implementing the Greater Sydney Region Plan, A Metropolis of Three Cities, at a district level and is a bridge between regional and local planning. The Plan recognises the Western Parkland City as an emerging economic and residential hub, with the new Western Sydney Airport and the Aerotropolis catalysing growth. The Plan identifies Wilton as a key growth area that will contribute to the overall housing supply and potential benefiting from its proximity to the broader Western Sydney region's economic opportunities.



1.5.2 Local Policy and Guidance

Local strategic policies and plans relating to transport for the new high school for Wilton are provided in Table 1-3.

Table 1-3: Local Strategic Policies and Plans

Document	Description
Wilton 2040	Wilton 2040 Plan sets out a vision for the Wilton Growth Area and provides a development framework for the region which encompass Wilton Town Centre alongside the supporting residential neighbourhoods, employment areas and infrastructure.
Wilton Growth Area Infrastructure Phasing Plan	The Wilton Growth Area Infrastructure Phasing Plan provides a roadmap for the delivery of essential infrastructure in the Wilton region over the next 20 years, in alignment with the region's anticipated growth and development.
North Wilton Precinct Structure Plan	The North Wilton Precinct Structure Plan illustrates the broad level development outcomes for the North Wilton precinct, detailing the development footprint, land uses, open space and conservation areas, corridors and major transport linkages.
North Wilton Precinct Neighbourhood Plan No. 1	The North Wilton Precinct Neighbourhood Plan No. 1 sets out a guide to development in the North Wilton neighbourhood precinct. The plan identifies the vision, development principles, key elements and structure plan for the precinct, including a set of planning, design and environmental controls for the precinct.
Wollondilly DCP 2016	The Wollondilly DCP 2016 provides detailed guidelines and requirements for development in the Wollondilly Shire Council. The DCP provides design principles and development controls to guide development applications. Specifically, parking rates outlined in the DCP have been considered in determining the parking requirements for the proposed school site.
Wilton Junction Development Transport Management and Accessibility Plan	The Wilton Junction Development Transport Management and Accessibility Plan (TAMP) was prepared in June 2014 to accompany the rezoning application for the Wilton Junction Precinct. The TAMP provided an assessment of the transport requirements and a range of measures to support the levels of growth in the Wilton Junction area. The TAMP emphasised the need for improvements to road and public transport network. Specifically, the plan proposed sequential upgrades to the existing Hume Highway/Picton Road Interchange, alongside the staged introduction of bus services (including local and regional bus connections) in alignment with the development of areas across Wilton Junction.



1.6 Proposed Activity

1.6.1 Site Location and Wilton Growth Area

The proposed site of the new high school for Wilton is located within the Wilton Growth Area, which is located approximately 80km from Sydney CBD and 30km north-west of Wollongong. The Final Wilton 2040 Plan outlines a long-term vision for transformation of the area consisting of Wilton Town Centre with surrounding residential and employment areas. Figure 3 depicts the location of the proposed school site with respect to the proposed land uses and transport network envisioned for the growth area.

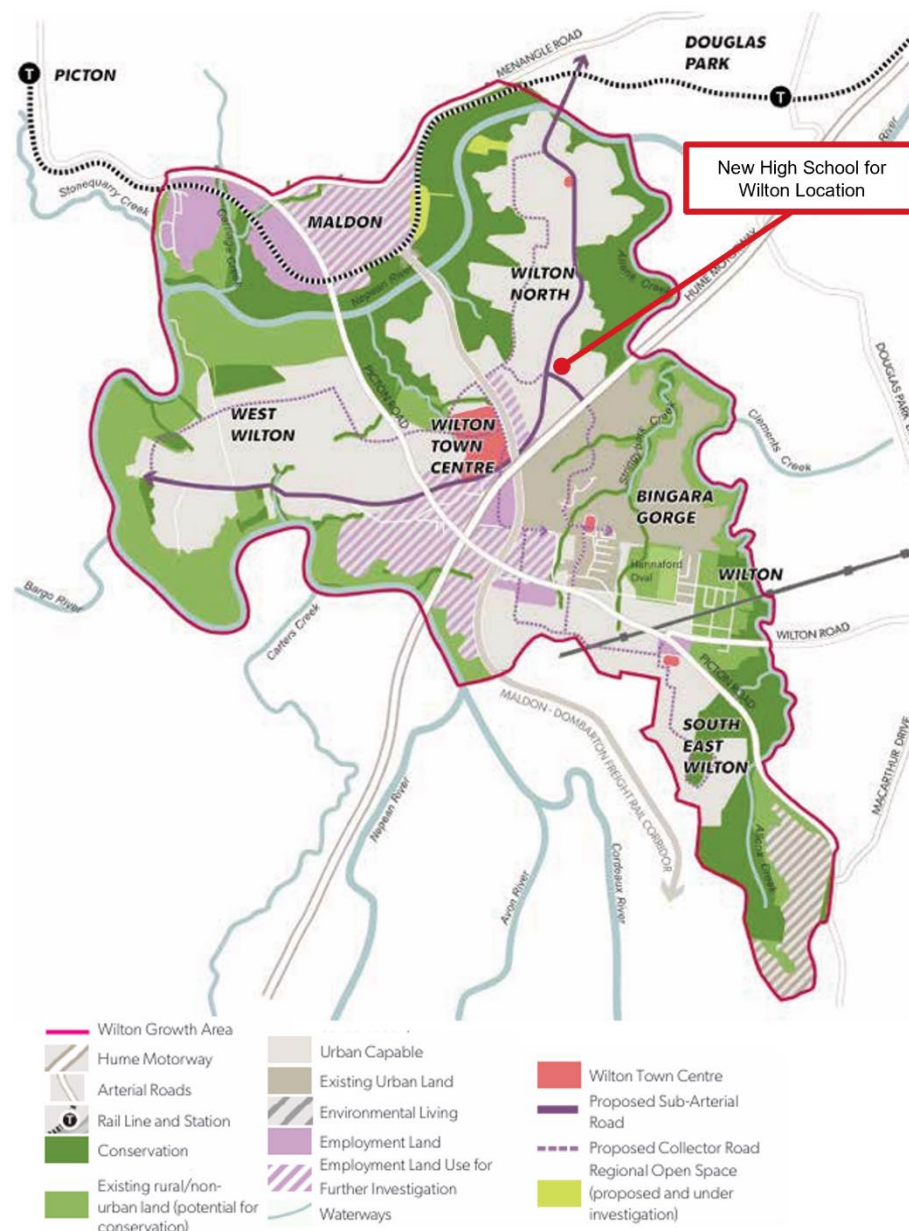


Figure 3: Site Location and Wilton Growth Area Structure Plan³

³ Source: [Wilton 2040 – A Plan for the Wilton Growth Area](#)



To support the anticipated growth and development, the Wilton Growth Area Infrastructure Phasing Plan sets out a roadmap for delivering essential infrastructure in the region over the next 20 years. This includes staging infrastructure provision in alignment with forecast development activity. Figure 5 and illustrates the infrastructure rollout across a five-year and 20-year horizon respectively.

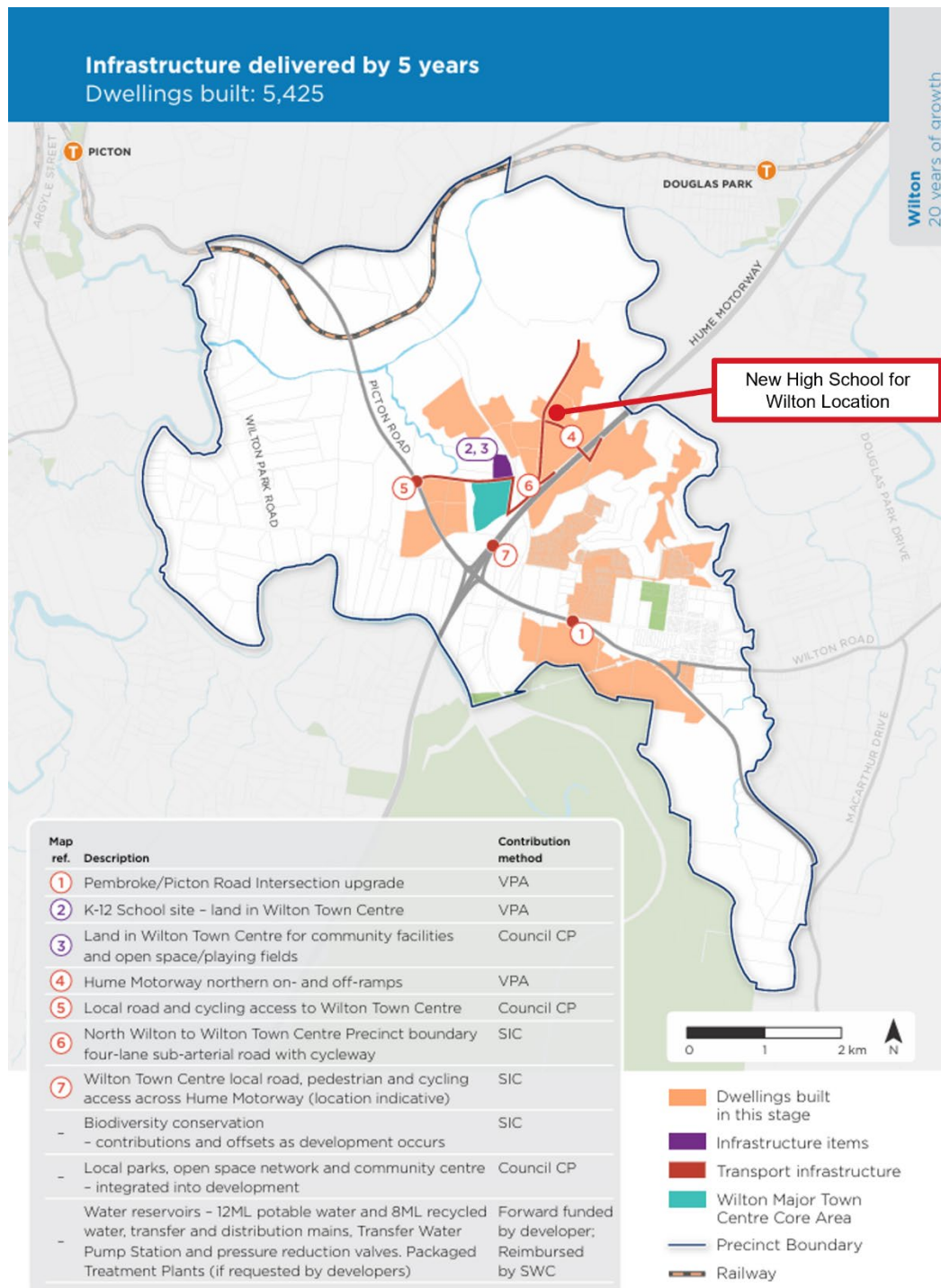


Figure 4: Wilton Growth Area Infrastructure Delivery Plan - 5 years⁴

⁴ Source: [Wilton Infrastructure Phasing Plan](#)



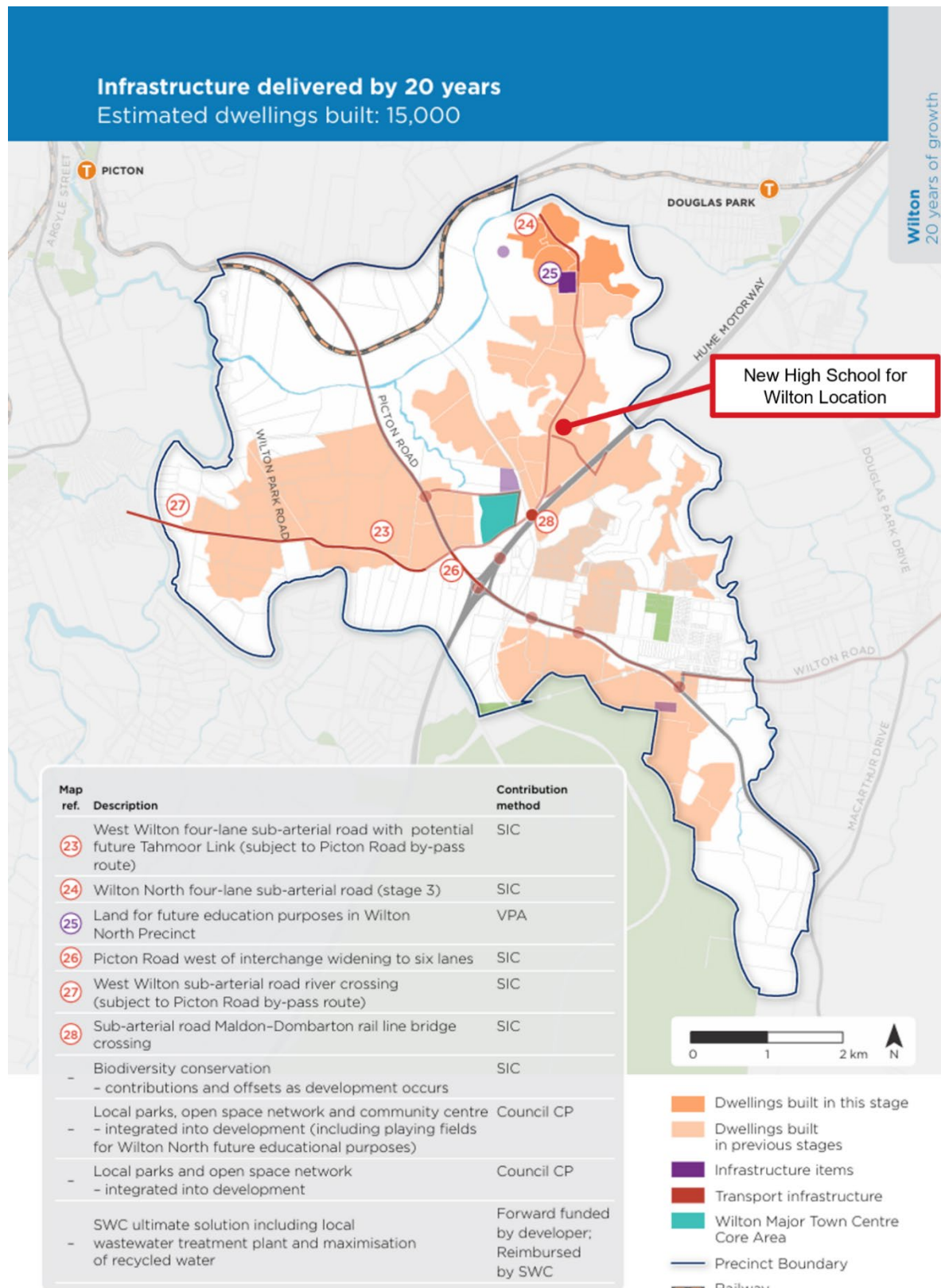


Figure 5: Wilton Growth Area Infrastructure Delivery Plan - 20 years⁵

⁵ Source: [Wilton Infrastructure Phasing Plan](#)



The proposed school site is located within the North Wilton Precinct which forms part of the Wilton Growth Area. More detailed plans of the school site's surrounds are presented in North Wilton Precinct Neighbourhood Plan No. 1, where Figure 6 shows the land uses and transport linkages within the neighbourhood precinct which houses the school site.

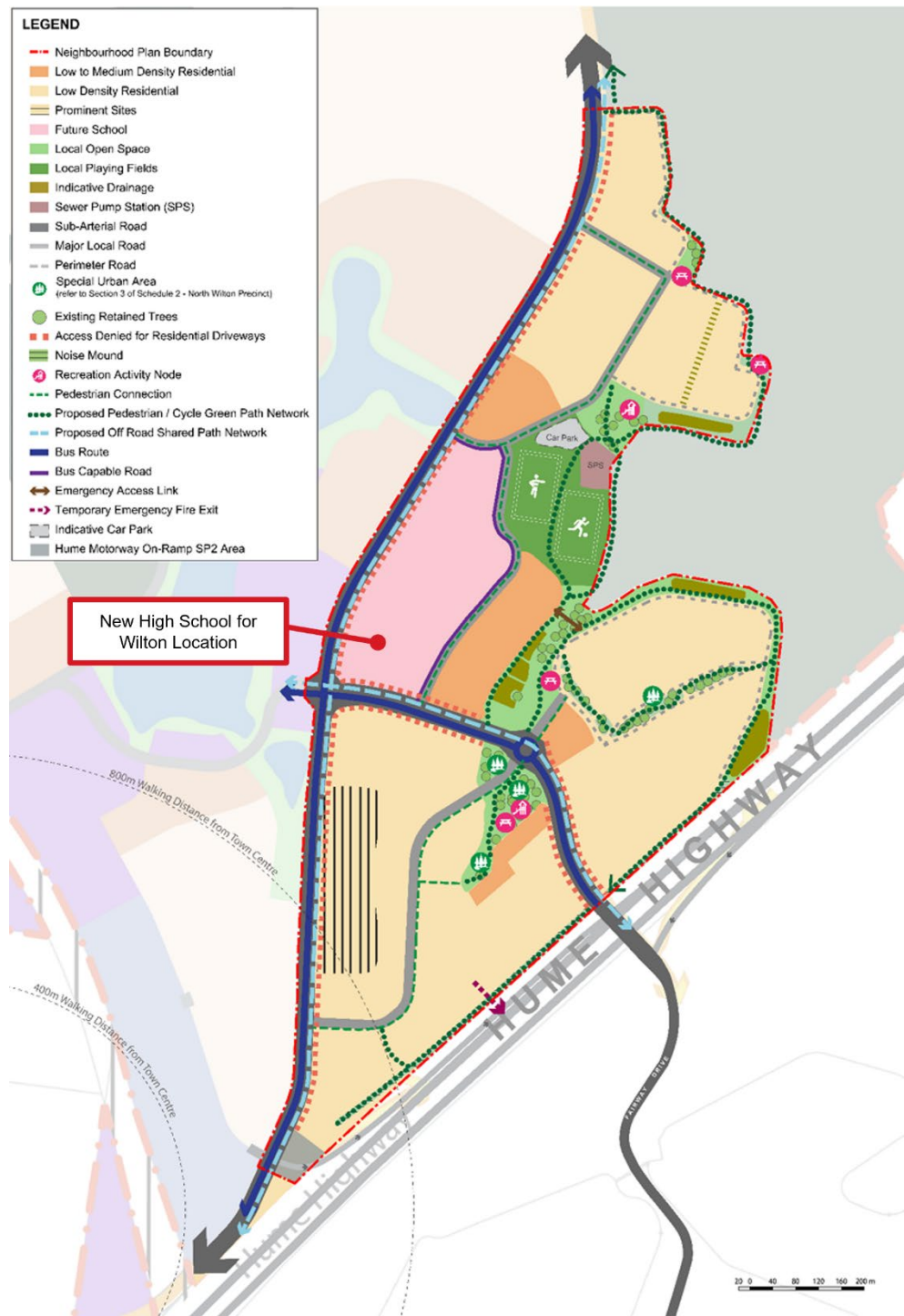


Figure 6: North Wilton Neighbourhood Plan⁶

⁶ Source: [North Wilton Precinct - Schedule 2 Neighbourhood Plan No. 1](#)



1.7 Scope of Study

This report has been prepared to assist the Department of Education in their response to the REF for the new high school for Wilton. This Transport and Access Impact Assessment (TIA) addresses the conditions set out in the REF with regards to the TIA component as set out at the start of this document.

1.8 Report Structure

This report has been developed to comply with the conditions detailed in the REF and in accordance with the guidelines set by Transport for NSW for the development of a Transport Impact Assessment. The report is structured as follows to meet these conditions:

Chapter 2 – Existing and Future Conditions, pg.15

Chapter 3 – Site Access Arrangements, pg.22

Chapter 4 – Operational Impacts, pg. 29

Chapter 5 – Construction Traffic and Access Impact Assessment, pg. 42

Chapter 6 – School Transport Plan, pg. 48

Chapter 7 – Conclusion, pg. 62



2 Existing and Future Conditions

Given that the site is located in a greenfield area, both existing and future conditions have been combined for this Traffic Impact Assessment (TIA).

2.1 Existing Travel Behaviour

The new high school in Wilton is situated on a greenfield site, meaning there are no existing travel patterns to analyse for this report. The School Transport Coordinator will assess travel behaviours and update the School Transport Plan to evaluate the school's impact on the surrounding area and identify any emerging issues.

2.2 Active Transport

The school site is currently situated within a predominantly greenfield area, with no existing footpaths or cycling infrastructure.

As per the North Wilton Precinct Neighbourhood Plan No. 1, a highly walkable neighbourhood with connected pedestrian routes is anticipated with key pedestrian connections to schools, shops, local community and recreation facilities and bus stops, complemented by a network of green paths through parks and open space corridors. The proposed cycling network consists of off-road shared paths along the sub-arterial roads and through open space corridors, with a minimum width of 2.5m. In addition, it should be noted students cycling to school can utilise footpaths where available as children up to the age of 16 are allowed to cycle on footpaths in NSW. The pedestrian and cycle network surrounding the school site is shown in Figure 7, which is expected to be in place by the school's opening in Term 1 2027.

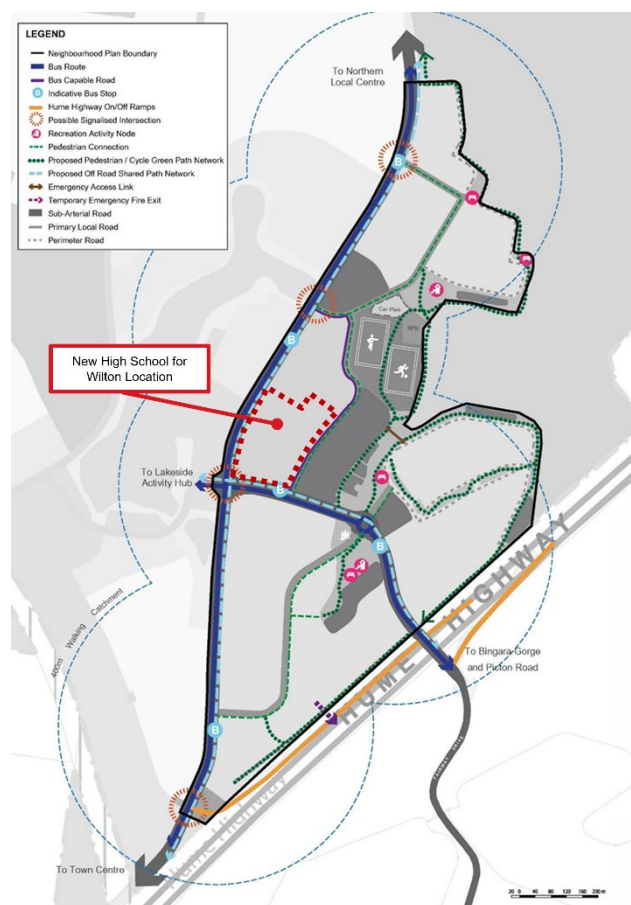


Figure 7: Proposed Pedestrian and Cycle Network (Grey Grid)⁷

⁷ Source: [North Wilton Precinct - Schedule 2 Neighbourhood Plan No. 1](#)

2.3 Public Transport

As the school site is currently located within a predominantly greenfield area, public transport services are limited. The nearest available bus stop is located on Fairway Drive after Butler Drive (Stop ID 2571373). This stop services currently supports school bus services only. The only public transport route available in proximity to the school is the 901 Wilton to Picton via Douglas Park service which boards and alights on Pembroke Parade near White Street. This existing bus stop is located approximately 5 kilometres from the school site.

Figure 8 shows the public and school bus routes that currently operate in Wilton region, which currently do not extend to service the North Wilton precinct.

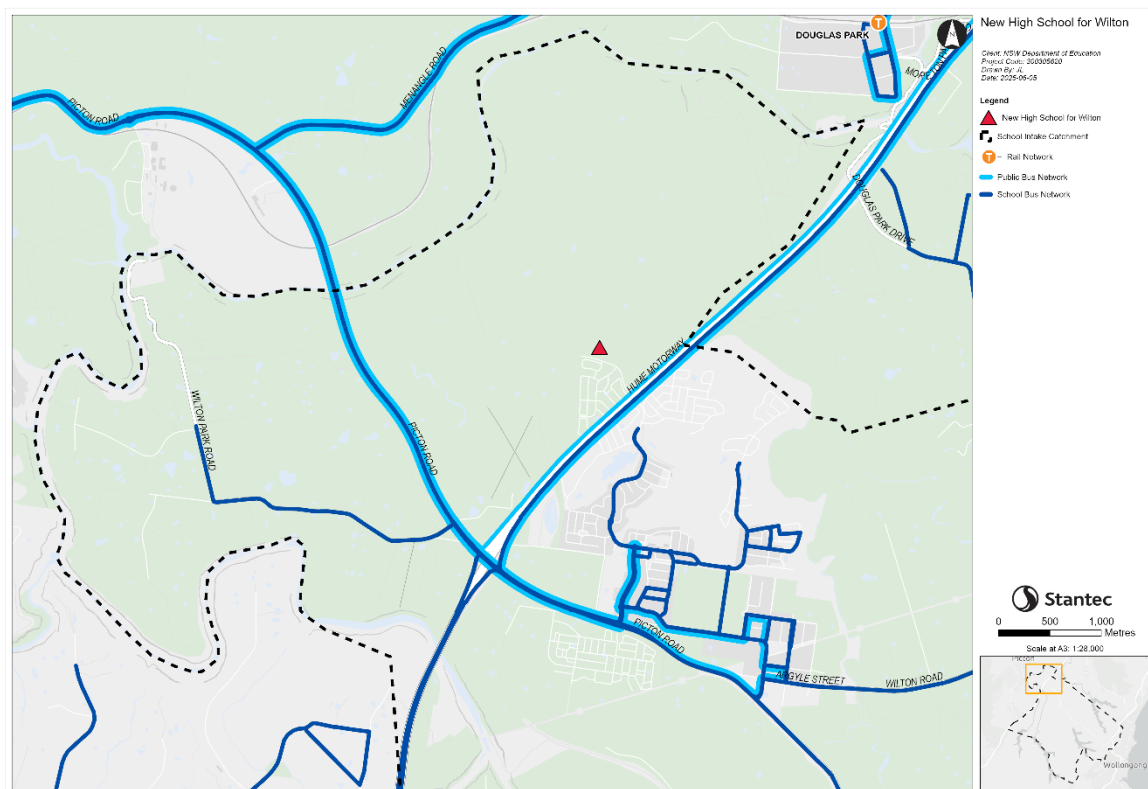


Figure 8: Existing Public and School Bus Network Within the High School Intake Area

An indicative public transport network surrounding the proposed school site as per the North Wilton Precinct Neighbourhood Plan No. 1 is shown in above in Figure 7. This includes a proposed bus zone at the school's western frontage and designated bus routes along the surrounding sub-arterial roads.

Figure 9 below shows the proposed bus network for the full development of Wilton Junction area which includes:

- Local bus routes connecting Wilton Town Centre to the growth areas – Wilton East, Wilton South, Wilton North.
- Regional bus routes linking Wilton to Picton, Campbelltown and Macarthur, and Wollongong.

It is noted that TfNSW has indicated future bus network plans for the area which encompass new bus routes linking Wilton Junction with Picton and Campbelltown, and a potential new route between Wilton Junction and Wollongong. Detailed alignments of these routes are yet to be finalised by TfNSW.

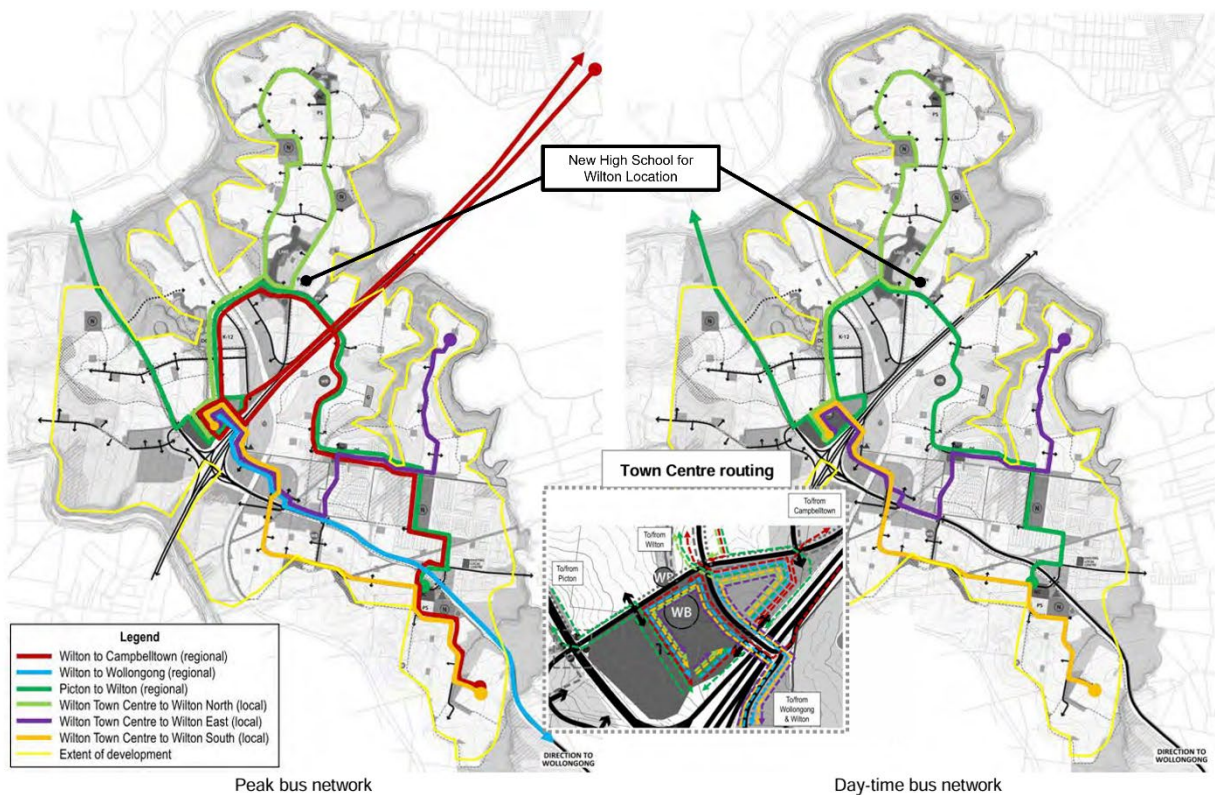


Figure 9: Proposed Bus Network for Wilton Junction Full Development⁸

⁸ Source: [Wilton Junction Development Transport Management and Accessibility Plan](#)

2.4 Private Transport

2.4.1 Road Network

The school site is currently situated in a predominantly greenfield area, with ongoing road network development. Road network construction in the area began in 2022/23, following which, roads south of the East-West sub-arterial road were completed, and works on Road 14 commenced in 2024.

The proposed school site is bounded by Road 14, Road 20, Road 102 (Fairway Drive), and sub-arterial road 108. The surrounding road network consists of sub-arterial roads to the west and south, and Hume Motorway further south which borders the North Wilton precinct. Figure 11 shows the location of the proposed school site in relation to the surrounding road network with the associated road hierarchy classification.

Road 14 and Road 20 are local roads that run along the northern and eastern boundaries of school site, with one traffic lane and one parking lane in each direction. A kiss-and-drop zone been proposed along the school frontage on the western side of Road 14. A typical plan and section of these roads is shown in Figure 10.

At the time of the school's opening, an interim road configuration will be in place. The north-south sub-arterial road west of the school site will feature two southbound lanes, meaning Road 14, Road 20 and the north-south sub-arterial road will be operational in an anti-clockwise direction as shown in Figure 12. The bus bay along the school frontage on the north-south sub-arterial road is expected to be operational during this interim arrangement. Duplication of the north-south sub-arterial road is anticipated to be completed by 2029/2030.

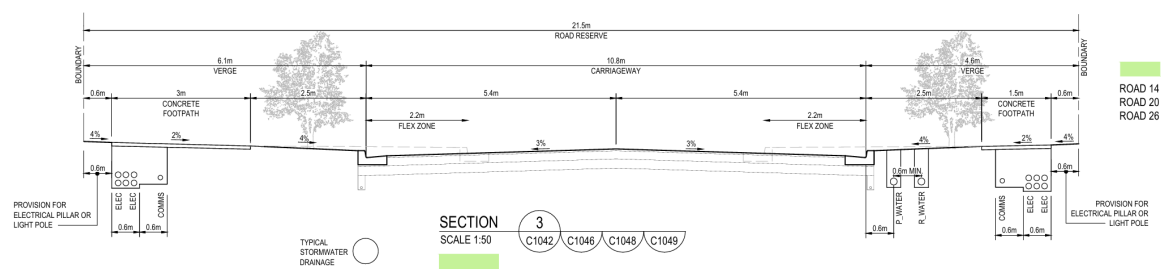


Figure 10: Typical Road Sections – Road 14 and 20⁹

Road safety measures are expected to be in place which include proposed wombat crossings at key crossing locations and the implementation of school zone in alignment with TfNSW guidelines. Wombat crossings enhance pedestrian safety by slowing traffic and improving visibility, while school zones with reduced speed limits ensure safer conditions during school drop-off/ pick-up periods.

⁹ Source: Landcom, 2022



New High School for Wilton - Transport and Access Impact Assessment
Existing and Future Conditions

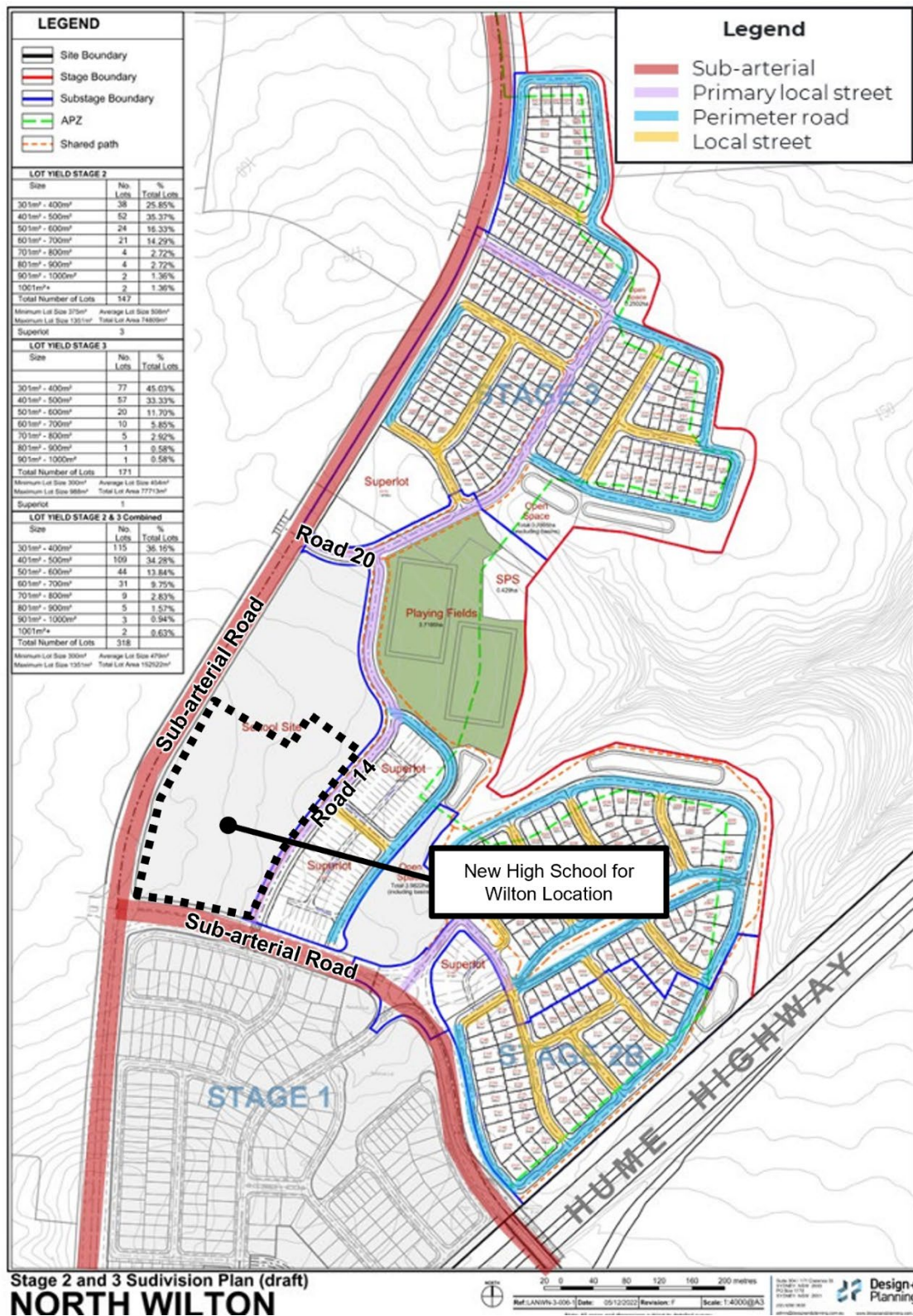


Figure 11: School Site Location and Surrounding Road Network ¹⁰



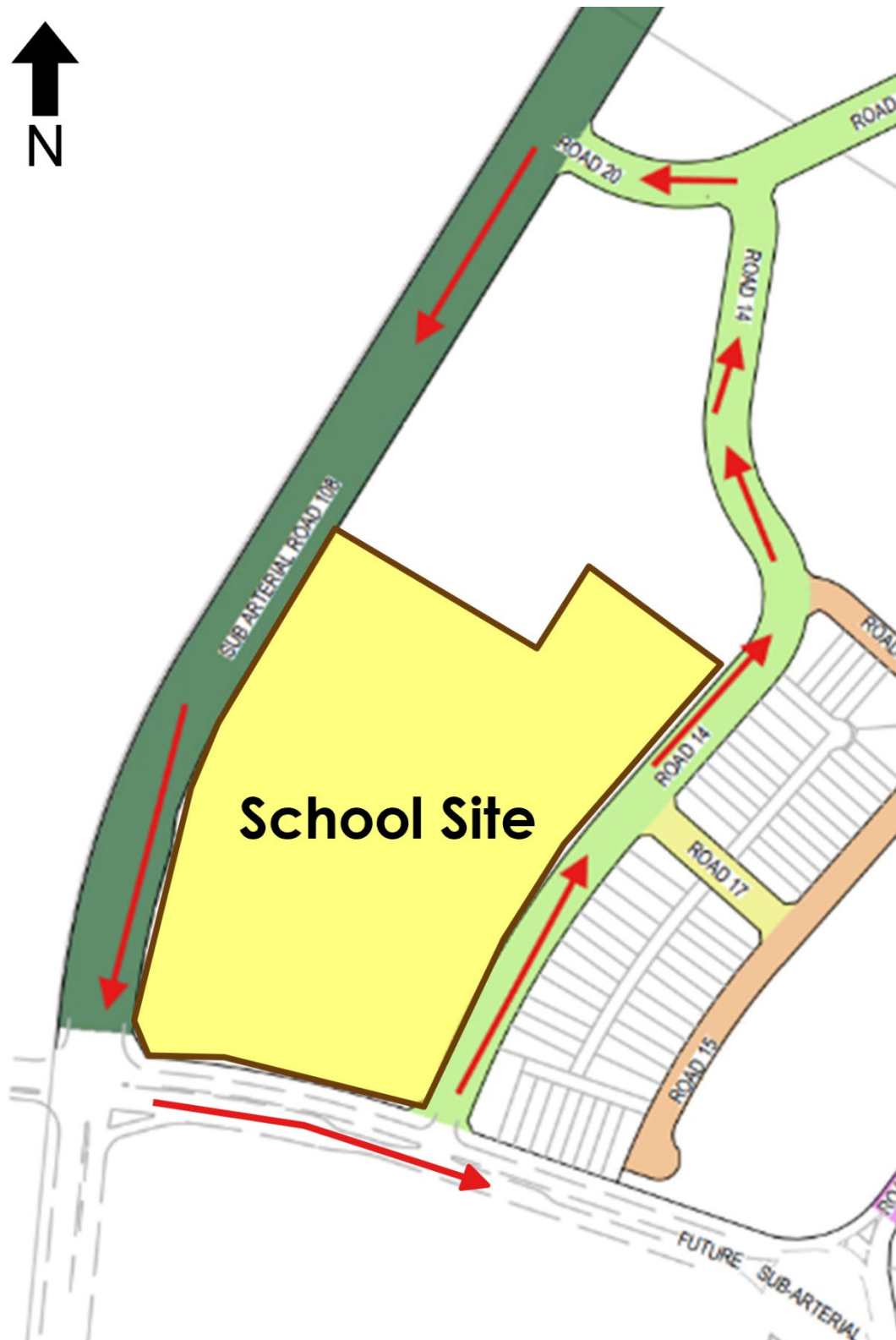


Figure 12: Interim Road Configuration

In addition, it is noted that the existing road bridge (known as Niloc bridge) across the Hume Motorway (Figure 13) serves as a temporary arrangement for access in and out for the North Wilton precinct, while construction of a new bridge is underway. The configuration of the existing bridge consists of a single lane controlled by traffic signals at each end to regulate traffic flow for two-way movements. The new bridge is anticipated to be completed and open by mid-2027. It should be noted that any construction-related traffic and access arrangements are to be addressed by the detailed Construction Traffic Management Plan prepared by the appointed contractor. Any operations-related traffic and access arrangements will be addressed in the School Transport Plan.

With Stage 1 of the new high school for Wilton and the adjacent primary school scheduled to open in Day 1, Term 1 2027, the existing single lane road bridge will continue to provide interim vehicular access to the school site until the new bridge becomes operational. Because the schools will not yet be operating a full capacity, low to no transport impacts are anticipated. Upon the opening of the new bridge, the existing road bridge will be repurposed and converted into a pedestrian-only/ shared user bridge.

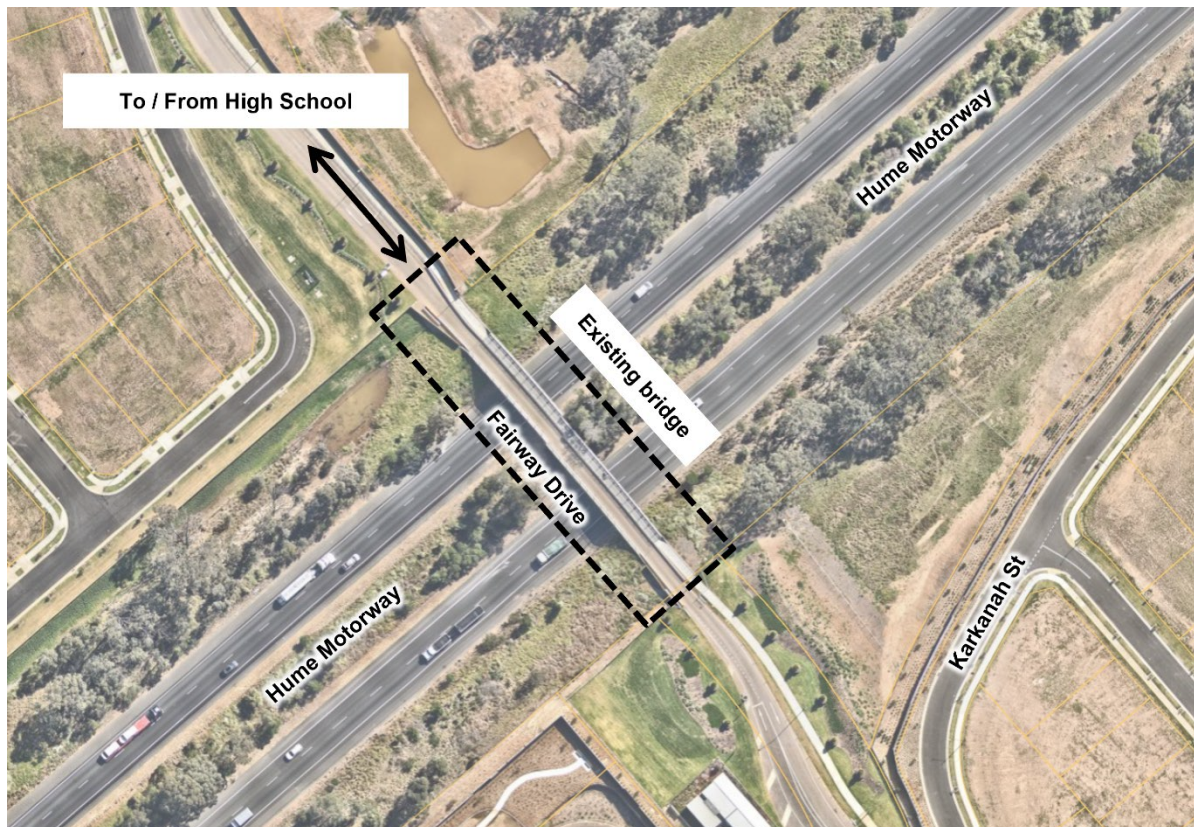


Figure 13: Existing Bridge Across Hume Motorway

3 Site Access Arrangements

Figure 14 documents the transport considerations of the new high school for Wilton. Identified within the graphic is pedestrian and vehicle access into the school site, as well as on-site parking and drop-off and pick-up locations.

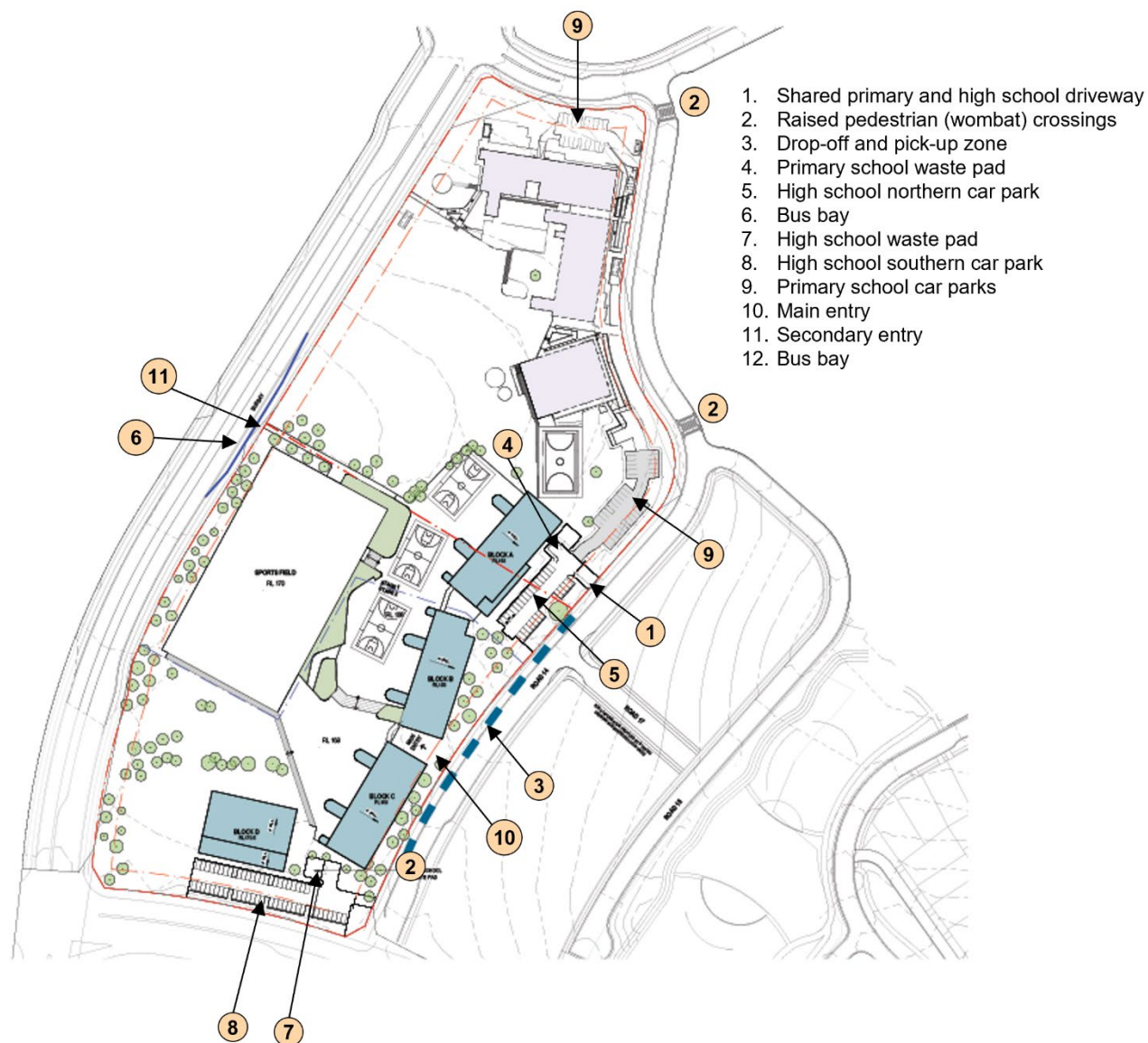


Figure 14: New High School for Wilton Masterplan¹¹

¹¹ Source: TKD Architects, April 2025; modified by Stantec



3.1 Pedestrian Access

During Stage 1, pedestrian access to the school is provided via the entry point to the High School northern car park, as shown in Figure 14. This entry connects to Block A, which is to be delivered as part of Stage 1.

Following the completion of Stage 2, pedestrian access will be available from both the eastern and western frontages of the school.

In total, two pedestrian access points are proposed for the school site. The main entry will be located on Road 14 (Stage 1), with a secondary entry provided on the North-South sub-arterial road (Stage 2). Formalised crossing facilities are anticipated within the vicinity of the site to support safe pedestrian movement.

3.2 Bicycle/ Scooter Access and Parking

As cycling is permitted in NSW on footpaths for students up to the age of 16, students can access the school from all sides using the surrounding pedestrian and cycling networks.

As per Green Star Buildings Submission Guidelines, bicycle parking facilities are to be informed by the Sustainable Transport Plan (STP). This document serves as the STP for this purpose and the student bicycle parking provision is to be based on the target mode share outlined in Section 4.3.

Table 3-1 outlines the bicycle parking requirements to accommodate the planned school capacity of 1,000 students and 78 staff.

Table 3-1: Bicycle Parking Requirements

Description	Values
Number of high school students	1,000
Mode share target for students travelling by bicycle	4.1%
Total bicycle parking requirements	41 student parking spaces + 3 staff parking spaces

Bicycle parking facilities are to be located close to the school pedestrian entries to ensure convenient access for students and staff travelling via cycling.

3.3 End of Trip Facilities

End of trip facilities (e.g. showers and lockers) are crucial for supporting sustainable commuting choices (e.g. cycling to work for staff).

As per Green Star Buildings Submission Guidelines, end of trip facilities are required for staff at a rate of 2 showers per 50 to 99 staff and 1 locker per 8 staff. Based on the planned school capacity of 78 staff, this equates to a requirement of 2 showers and 10 lockers for staff. Shower facilities, intended for staff use, are to be located close to the staff and administration area.



3.4 Bus Access

A school bus zone is proposed for the eastern side of the unnamed sub-arterial road, located to the west of the school site and in proximity to the secondary high school entrance. This will be delivered by Landcom prior to the school's opening in Stage 1. Free or subsidised public transport travel is available to students via the School Student Transport Scheme (SSTS). The SSTS is available for Year 7 to 12 students who live outside of a 2,900-metre on-path or a 2,000-metre notional walk distance from the school.

Based on target mode share outlined in Section 4.3, analysis was undertaken to determine the number of bus spaces required to service the school. Assumptions used in this calculation are outlined in Table 3-2 and encompass:

- Dwell time per bus as 5 minutes
- Each bus bay to service 4 buses over a 20-minute period
- School bus services are expected to service other high schools in the Wollondilly region. As such, up to 80% of the total bus capacity is assumed to be allocated for students attending the new high school for Wilton.

This results in a requirement for three bus pick-up/ drop off spaces, with a total bus zone length of 57 metres.

It is important to note that these guidelines are indicative only. Discussions must be held with the Council and TfNSW regarding future service availability, as this will impact the number of spaces required to support services to the school. Additional bus storage capacity should be future-proofed to allow for expansion of the bus bay to meet demand if necessary. Current space requirements are determined by student distribution estimations, which will become clearer once the proximity of student residences is determined closer to the opening of the school and across both stages.

Table 3-2: School Bus Zone Requirements

Description	
Number of high school students	1,000 students
Mode share target for students	51%
Bus service demand	505 students
Bus passenger capacity	60 passengers
Bus occupancy rate	80%
Number of buses required	12 buses
Bus dwell time per pick up	5 mins
Service drop-off and pick-up period	20 mins
Bus space capacity (per drop-off and pick-up period)	4 buses
Bus zone space required	3 spaces
Bus zone length required	57m
Bus zone width	3.1m (as per the Transport for NSW Bus Infrastructure Guide)



3.5 Vehicle Access

Vehicular access to the school site is provided via two entry points on Road 14, as shown in Figure 14. These entry points provide access to the northern and southern car parks within the school site, respectively.

A waste pad for the high school is proposed within the southern car park, as shown in Figure 14. To the north, the shared primary and high school driveway provides access to the waste pad for the primary school, adjacent to the high school's northern car park. Swept paths have been undertaken at both northern and southern car parks to assess how access to the site and the proposed waste pads will integrate with the adjacent car parks. Figure 15 and Figure 16 demonstrate that the proposed design can adequately accommodate the manoeuvrability of a 10.5-metre long vehicle.



New High School for Wilton - Transport and Access Impact Assessment
Site Access Arrangements

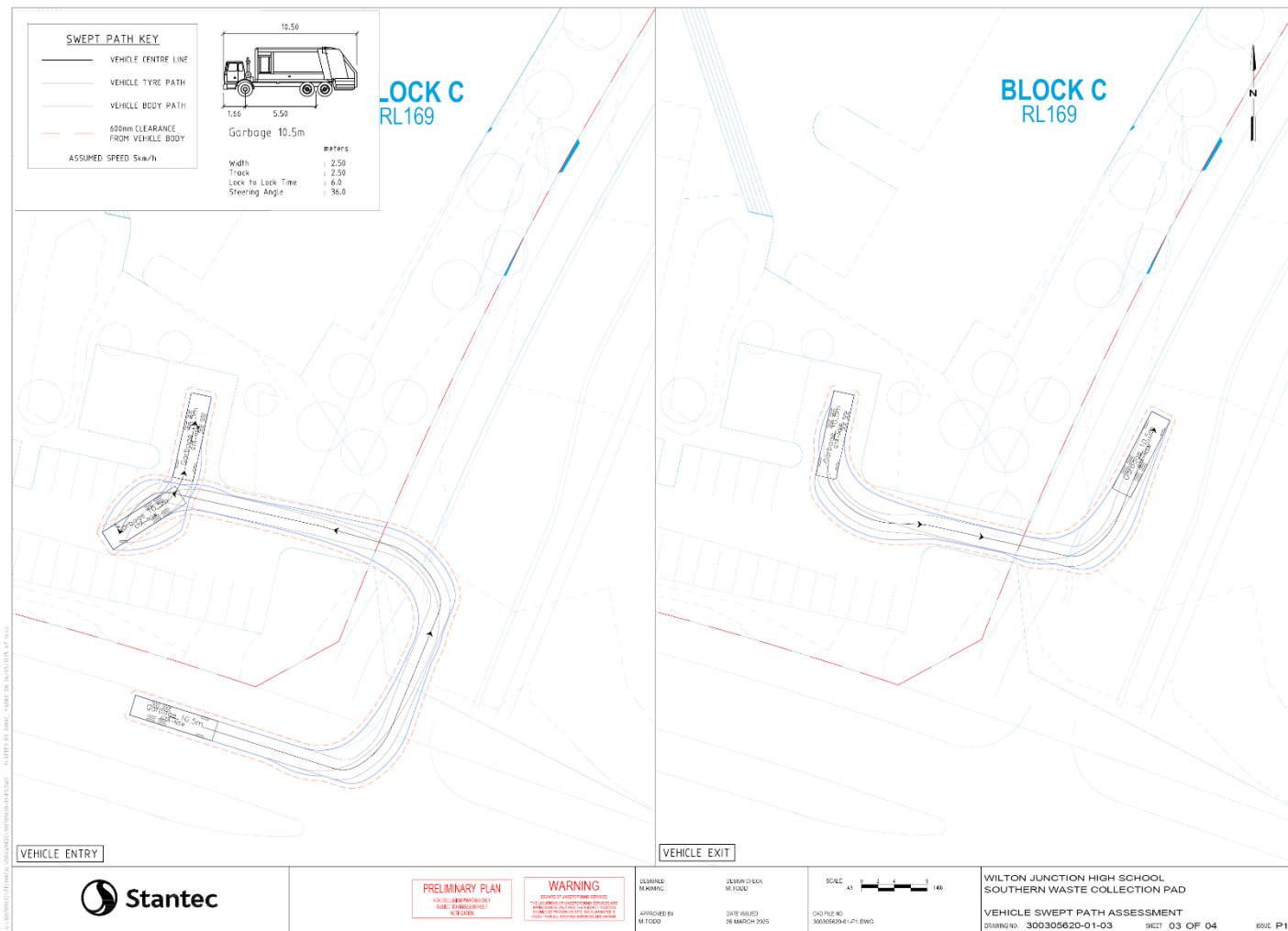


Figure 15: 10.5m Vehicle Swept Path (Entry and Egress at Southern Car Park)



New High School for Wilton - Transport and Access Impact Assessment
Site Access Arrangements

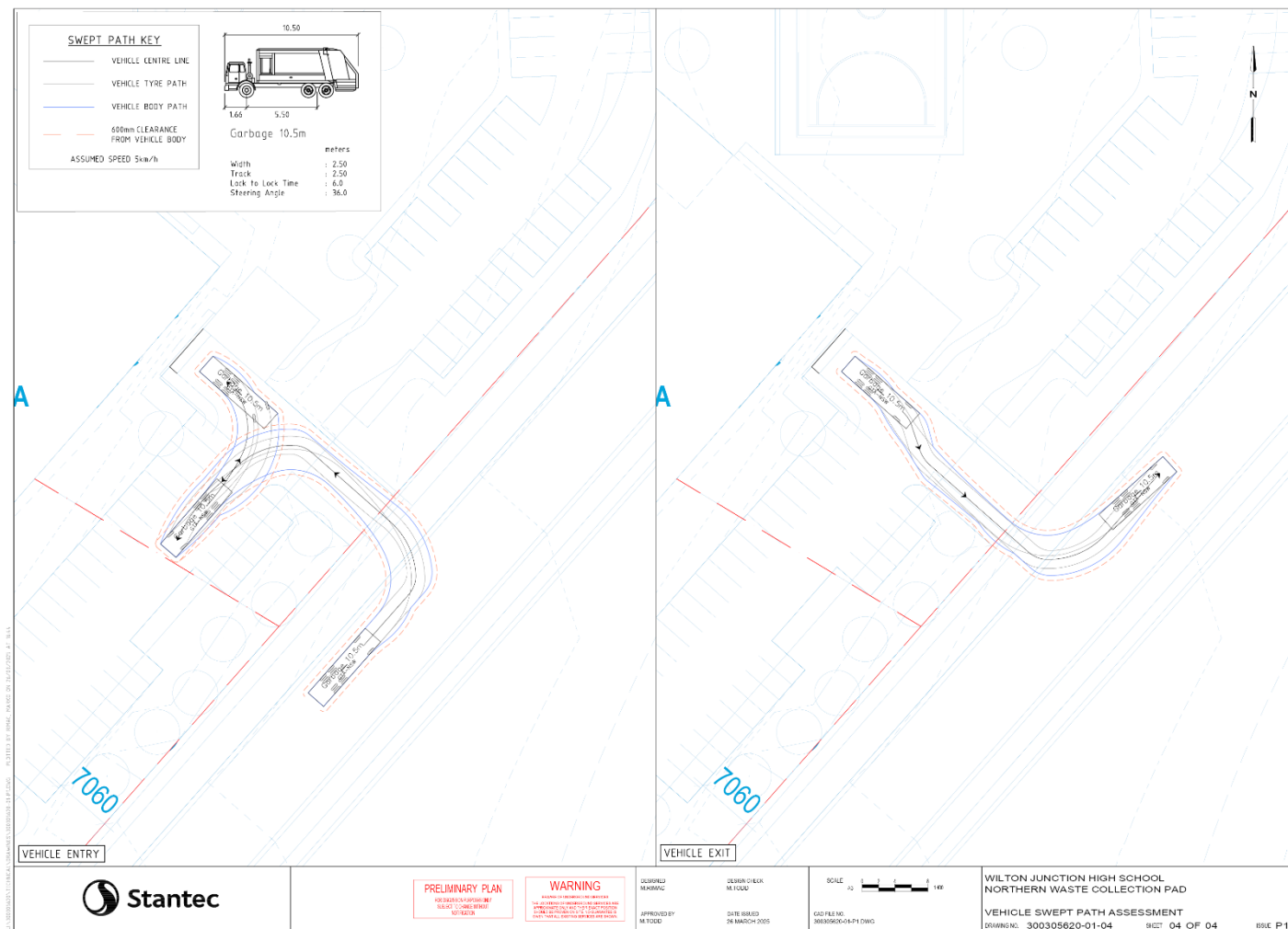


Figure 16: 10.5m Vehicle Swept Path (Entry and Egress at Northern Car Park)



3.6 Car Parking

On-site car parking facilities are proposed at each end along the eastern school frontage, accessible via vehicular entries off Road 14 as shown in Figure 14. The site will consist of a car park to the south with 54 spaces (with two accessible spaces) and a car park to the north with 36 spaces (with two accessible spaces).

The Wollondilly DCP 2016 specifies the following rates for off-street parking for educational establishments with students over 16 years of age:

- Student parking: 1 space per full time equivalent staff. This results in a total of 78 staff car parking spaces being required, under the planned staff conditions of 78 high school staff.

It is noted that NSW Department of Education does not seek the provision of any student car parking on site. Therefore, a minimum car parking provision for students has not been considered.

A total of 90 on-site parking spaces have been provided for in the masterplan (Refer to Figure 14) and this meets the DCP requirement. The on-site parking facilities are to be designed in accordance with AS 2890.1:2004 to ensure adequate parking is provided to meet the conditions set.

To support effective parking management, appropriate signage is to be installed between the southern primary school and high school car parks. Clear communication is to be provided to staff from each school to ensure they use the designated car parks. This will help prevent capacity issues caused by incorrect parking.

4 Operational Impacts

4.1 Trip Generation

The following section details the trip generation for the new high school for Wilton. Student catchment and demand for the school has been estimated using NSW Government [Travel Zone Projections 2024](#) (TZP24) data set through the TfNSW Open Data Portal. Using this data analysis was undertaken for different modes of transport (walking, cycling, public transport and private vehicles) to understand student travel modes.

The following process has been undertaken to forecast student distribution under the 2036 school capacity scenario of 1,000 students:

For a new school, the assessment process differs from that of a pre-existing school, relying on population projection estimates and the proposed student intake boundary. Transport for NSW provides population and dwelling projections by Travel Zone (TZ) level for NSW. The latest version, Travel Zone Projections 2024 (TZP24), was released in November 2024. These projections support a strategic view of NSW and align with the NSW Government Common Planning Assumptions.

Using these projections, we can estimate the maximum distance students may need to travel which will ultimately determine how they may travel to the school. We can also use projection data to approximate the location of student residences based on growth area boundaries, projected population, and a local primary school student factor.

For the Wilton Growth Area, we determined the proportion of students attending government-owned high schools in similar growth areas including Schofields, Oran Park, Leppington, Gregory Hills, Edmondson Park, and The Ponds. This allowed us to identify a factor, which can be applied to growth projections. We found that 4% of the total population in these areas are government-run high school attending students.

After determining the proportional factor to be applied to the TfNSW growth projections, we used GIS to manipulate the data and project an estimated population distribution for students residing within the proposed intake area. The following assumptions were considered:

- A 4% factor was applied to the projected population to estimate the school enrolment.
- Travel zones were clipped to the growth area boundaries to more accurately reflect the student distribution.
- The create random points geoprocessing tool was used to randomise the student distribution based on population projections. A minimum distance of 5m between points was applied to allow multiple students within the same property boundary, better reflecting households with more than one student.



4.2 Trip Distribution

4.2.1 School Intake Catchment

Figure 17 depicts the new high school for Wilton intake catchment and the geographical locations of the projected student distribution 2036. It is important to note that while the map shows only a small portion of the intake boundary, this area is where growth is concentrated. Additionally, there is no projected population within the Cataract Travel Zone (TZ 5500) which covers the vast majority of the remaining intake zone.

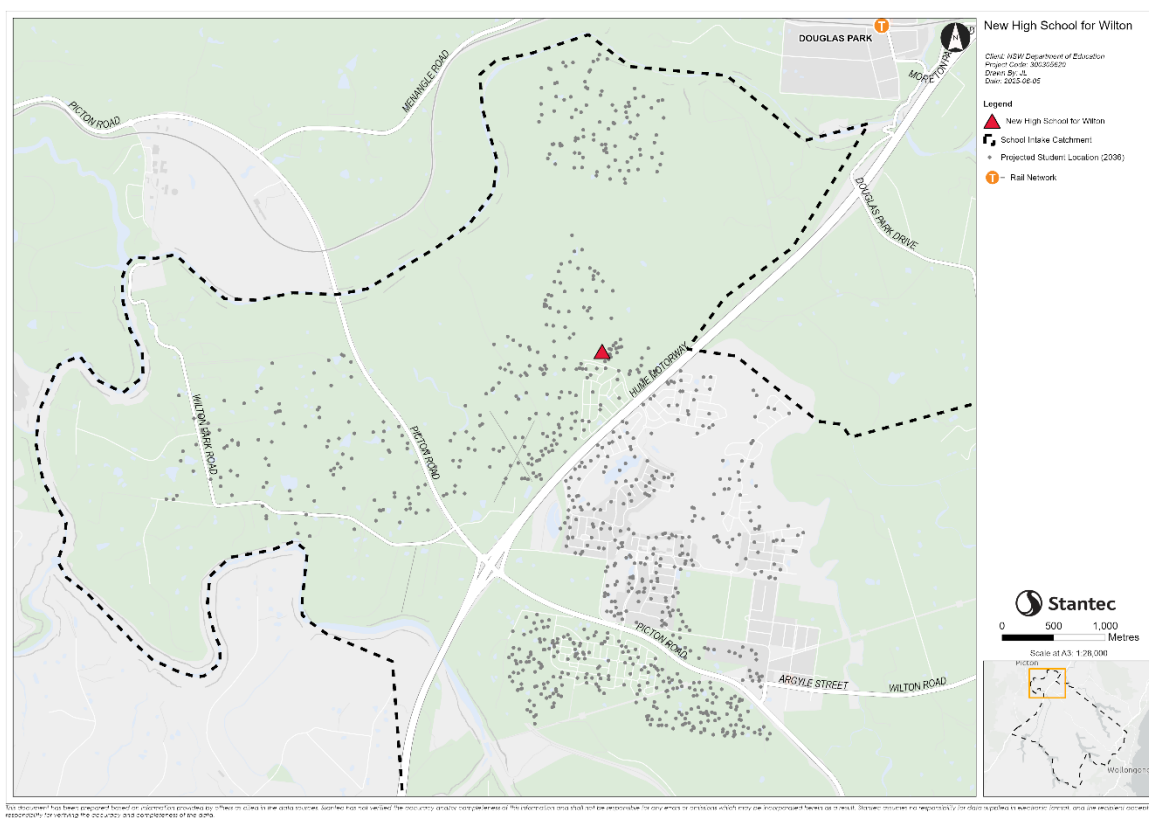


Figure 17: Estimated High School Intake Catchment and Projected Student Distribution for 2036

4.2.2 Walking Coverage

Figure 18 shows the extent of the walking catchment bands and projected student locations for 2036. Around 28% of students are projected to live within a 1,600-metre notional or a 20-minute walk of the school site. A summary of the walking catchment analysis is shown in Table 4-1.

Table 4-1: High School Walking Coverage (Notional)

Distance Band	Students	Proportion (%)	Cumulative (%)
0 - 400m	35	3%	3%
401 - 800m	78	8%	11%
801 - 1,200m	88	9%	20%
1,201 - 2,000m	191	19%	39%
>2,000m	608	61%	100%
Total	1,000		

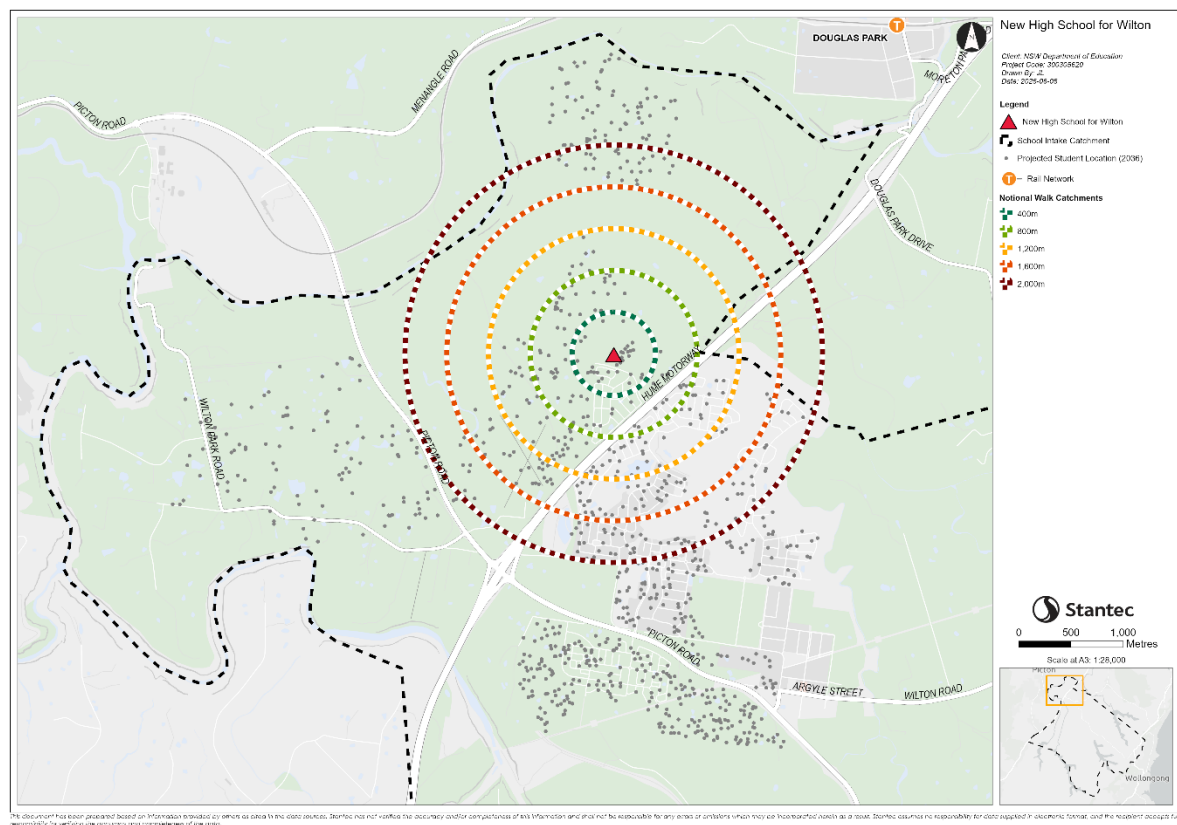


Figure 18: High School Walking Coverage

4.2.3 Cycling Coverage

Figure 19 shows the extent of the cycling catchment bands and projected student locations for 2036. The majority of student population (89%) are projected to live within a 3,600-metre notional cycle catchment of the school site, which has been considered as the upper limit for reasonable cycling distance for high school students. Notably, around half (52%) are projected to reside within a 2,400-metre notional cycle catchment. A summary of the cycling analysis is shown in Table 4-2.

Table 4-2: High School Cycling Coverage (Notional)

Distance Band	Students	Proportion (%)	Cumulative (%)
0 – 1,200m	201	20%	20%
1,201 – 2,400m	320	32%	52%
2,401 – 3,600m	373	37%	89%
>3,600m	106	11%	100%
Total	1,000		

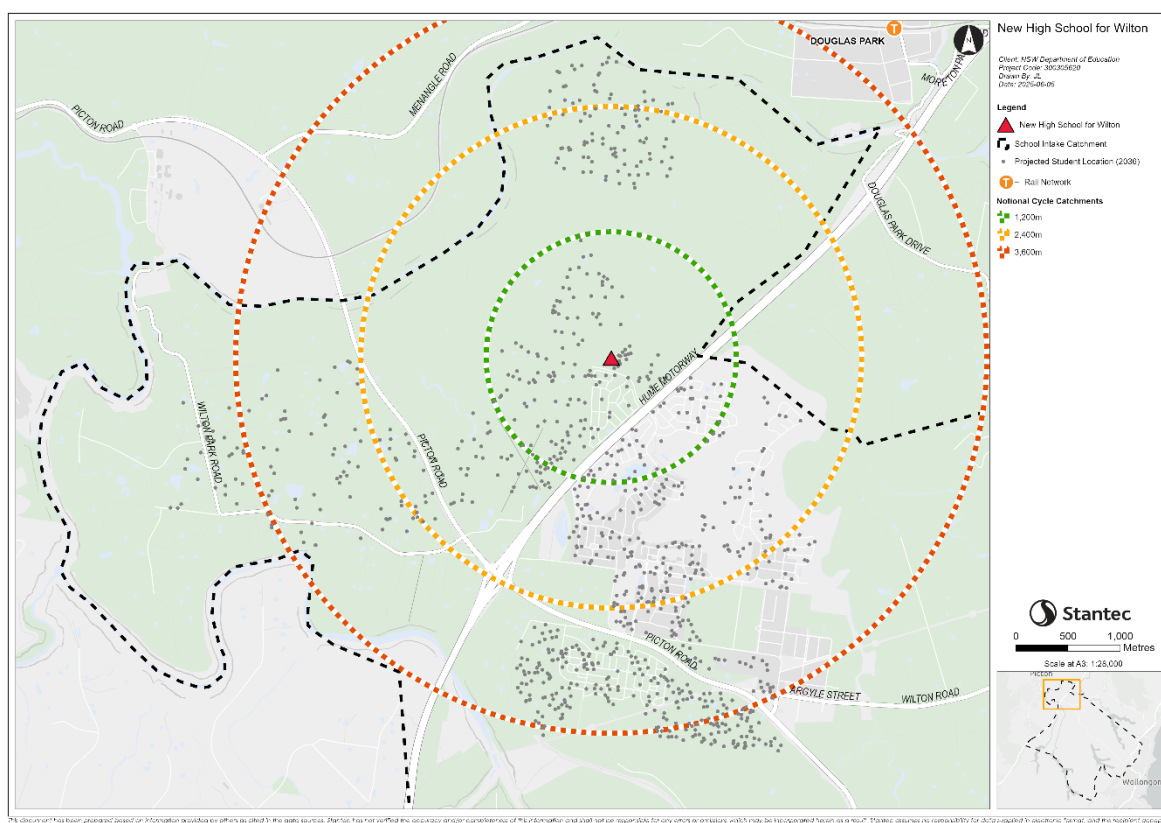


Figure 19: High School Cycling Coverage

4.2.4 Bus Service Coverage

At present, no bus services operate within or around the school site. However, for the purpose of this assessment, it is assumed that the proposed bus network identified in the 2014 Transport Assessment and Management Plan (TAMP) will be implemented. Given that the indicative locations of bus stops are not known, a 400-metre walking buffer has been applied along the proposed bus routes to estimate the potential walkable catchment area as shown in Figure 20. This approach provides an indication of the bus service coverage accessible by walking. This has been further combined with an analysis of existing bus services and stops within the high school intake area to provide an overall indication of bus service access.

A summary of the bus service catchment analysis is outlined in Table 4-3.

Table 4-3: High School Bus Service Coverage

	Number of students	Proportion (%)
Within 2km notional walk from school (ineligible for SSTS)	379	38%
Beyond 2km notional walk from school (eligible for SSTS)	519	52%
Total	898	90%

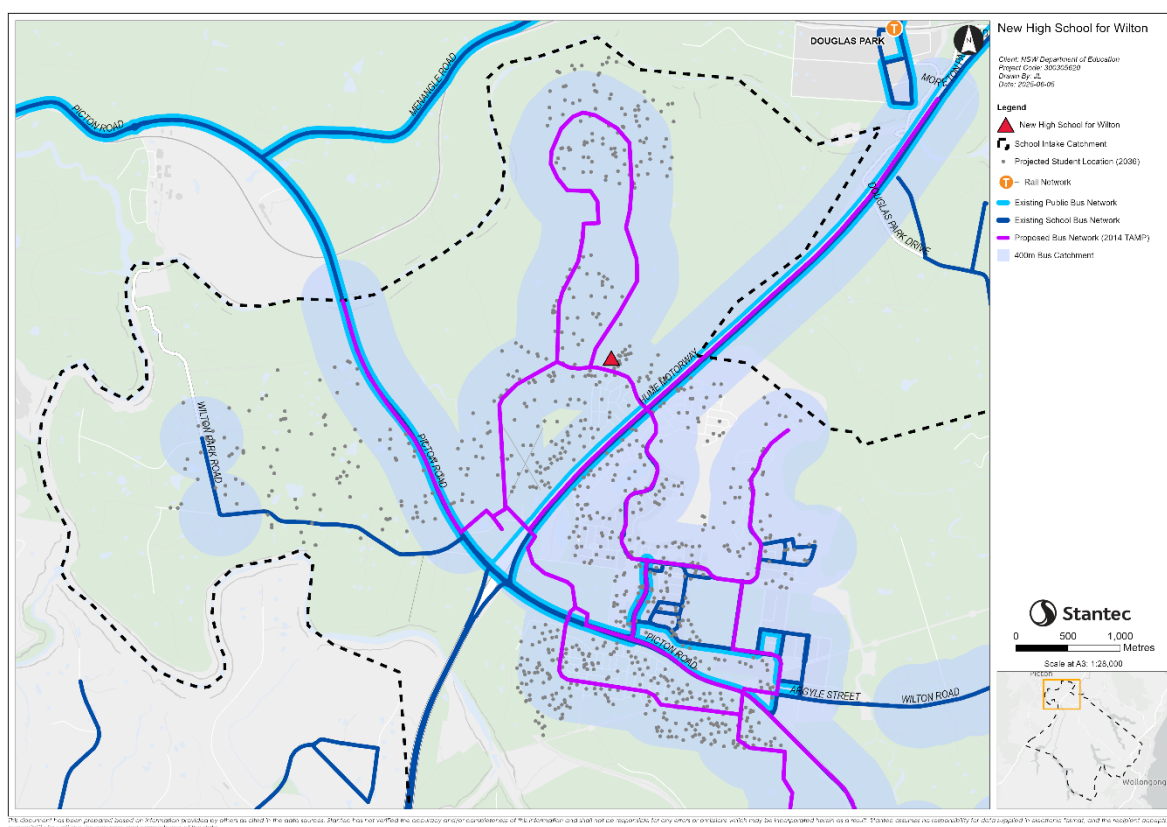


Figure 20: High School Bus Service Coverage

4.2.5 Private Transport Demand

Based on a moderate target mode share for private vehicle at 25% (refer to Section 4.3), approximately 250 out of 1,000 students are expected to travel to school by private vehicle. A student vehicle occupancy rate of 1.2, accounting for siblings and moderate carpooling, is considered adequate based on observations at similar schools. Given this rate, the demand for private transport is anticipated to be 209.

4.2.5.1 Drop-off and Pick-up

A Drop-off/ Pick-up (DOPU) zone, with a minimum length of approximately 137m (21 spaces), is proposed along the eastern school frontage on Road 14. This has been calculated using the previously identified moderate mode share target for private vehicles using the considerations shown in Table 4-4. It is noted this facility will be delivered by Landcom prior to the school's opening.

Table 4-4: Drop-off and Pick-up (DOPU) Requirements

Description	Considerations
Number of students enrolled	1,000 students
Moderate target mode share for students travelling via private vehicle	25%
Proportion of students using private vehicle	250
Average dwell time per pick-up	1.5 min
Length of time pick-up is operational	15 mins
15-minute capacity per K&D car space	10 vehicles
Number of students assumed per vehicle	1.2
Number of vehicles picking up and dropping off	209 vehicles
Number of DOPU spaces required	21 spaces
Metres of DOPU kerbside zoning required	137m

It is recommended that the bell time of the new high school for Wilton is to be offset by at least 30 minutes from the bell time of the adjacent primary school. This adjustment minimises the overlap of afternoon pick-up activities of both schools, thereby reducing the cumulative traffic congestion impacts associated with the two schools.



4.2.6 Demand Modelling

The North Wilton Development Stages 2 and 3 – Transport Impact Assessment, developed by consultant WSP for Landcom in 2022, provides an overview of the transport impacts of the North Wilton Stages 2 and 3.

Considerations for the modelled scenarios in the report cover:

- The completion of North Wilton Stage 1 between 2023 and 2024.
- The completion of North Wilton Stage 2 between 2024 and 2025.
- The completion of North Wilton Stage 3 between 2025 and 2026.
- The completion of Wilton Junction modelled in the TMAP as 2036 with 100 per cent development and traffic generation. This has been modelled to demonstrate that the proposed intersection layouts can accommodate the long-term traffic demands.

4.2.6.1 Traffic Generation

The traffic generation for proposed residential development in the region were estimated using Transport for NSW rates from Technical Direction TDT13-04a – Guide to Traffic Generating Developments Updated traffic surveys (August 2013). The rates used are 0.99 vehicle trips per dwelling in the AM peak hour and 0.95 vehicle trips per dwelling in the PM peak hour.

North Wilton Stage 1 development includes a proposed school, and the following assumptions have been made regarding the school:

- 1,000 students
- 25 students per class, one teacher per class
- 25 per cent additional administration staff
- 50 staff in total, 90 per cent drive based on 2016 Journey to Work data
- 2 per cent of students drive and park
- 60 per cent arrive as car passengers, 1.33 students per vehicle
- Two frontages for drop-off and pick-up (on the eastern and northern frontages of the school)
- Pro-rata of arrival direction based on the location of residences
- 100 per cent in the AM peak hour, 20 per cent coincides with the PM peak hour.

4.2.6.2 Intersection Performance

The intersection performance associated with North Wilton Stages 1, 2 and 3 developments alongside the full Wilton Junction development, is summarised by intersection in Table 4-5. All modelled intersections show a level of service of C or above in both AM and PM peak periods, except for the North-South sub-arterial and Hume Entry Ramp intersection in the AM peak period which was modelled to have a level of service of D. Notwithstanding, the proposed intersection layouts have sufficient capacity to accommodate the forecast traffic in 2036 with full development of Wilton Junction.



Table 4-5: Intersection performance for intersections in North Wilton Stages 1, 2 and 3 - full development in 2036¹²

Intersection	Peak period	Volume (veh/hr)	Average delay (sec/veh)	Degree of saturation	95% queue (m)	Queue on movement	Level of Service
East-West sub-arterial and Hume Exit Ramp (see Figure 6.4)	AM peak hour	1,058	13.3	0.33	36	West through	A
	PM peak hour	1,305	25.6	0.39	44	West through	B
East-West sub-arterial and residential roundabout (see Figure 6.2)	AM peak hour	1,739	12.5	0.41	18	East	A
	PM peak hour	1,639	12.6	0.47	22	East	A
East-West sub-arterial and School intersection (see Figure 6.5)	AM peak hour	1,987	27.7	0.81	147	East through	B
	PM peak hour	1,396	21.7	0.70	90	East through	B
North-South sub-arterial and East-West sub-arterial (see Figure 6.6)	AM peak hour	2,603	33.5	0.86	112	East left turn	C
	PM peak hour	2,525	32.7	0.90	81	South right turn	C
North-South sub-arterial and Hume Entry Ramp	AM peak hour	2,715	54.7	0.95	430	North through	D
	PM peak hour	2,137	22.2	0.84	96	South through	B
North-South sub-arterial and School intersection	AM peak hour	2,191	32.0	0.86	193	North through	C
	PM peak hour	2,112	40.3	0.97	267	South through	C
North-South sub-arterial and Stage 3	AM peak hour	1,622	17.7	0.33	<1 vehicle	East left turn	B
	PM peak hour	1,568	7.6	0.30	<1 vehicle	South right turn	A

Source: SIDRA modelling by WSP

4.2.6.3 Further Modelling for Cumulative Assessment

As outlined in previous sections, WSP completed the school modelling in December 2022 as part of the North Wilton Development Stages 2 and 3 – Transport Impact Assessment. Table 4-6 shows the assumptions used by WSP, projecting a total of 1,000 students across both schools (high and primary schools). The forecast for future year capacities across all school sites (high, primary, and pre-school) is now 1,612. To assess the suitability of the modelling, Table 4-6 details the Stage 2 student capacities, projected mode share, and resulting vehicle generation.

¹² Source: North Wilton Development Stages 2 and 3 – Transport Impact Assessment, WSP



Table 4-6: Modelling Assumptions and Future Growth Forecasting

Scenario	Detail
WSP Assumptions	• 1,000 students • 60 per cent arrive as car passengers, 1.33 students per vehicle • Two frontages for drop-off and pick-up (on the eastern and northern frontages of the school) • Pro-rata of arrival direction based on the location of residences • 100 per cent in the AM peak hour, 20 per cent coincides with the PM peak hour. • 50 staff (90% car mode share) • Total vehicle generation: 496
High School Trip Generation	• 1,000 students at full capacity • Mode share target of 25% • 1.2 students per vehicle assumed • 78 staff (80% in own car) • Total vehicle generation: 270
Public School Trip Generation	• 552 student at full capacity • Mode share target of 48% private vehicle use • 1.2 students per vehicle assumed • 35 staff (80% in own car) • Total vehicle generation: 248
Pre-school Trip Generation	• 60 pre-school students • All students to arrive by private vehicle • 1.1 students per vehicle assumed • 7 staff (80% in own car) • Total vehicle generation: 60

Overall, an additional 31 vehicles with students and 51 additional vehicle with staff; total of 82 additional vehicles, will be entering the network compared to the WSP modelling assumptions and the total student capacity scenario. Additionally:

- All three key intersections (East-West sub-arterial and School Intersection, North-South sub-arterial and School Intersection, and North-South sub-arterial and East-West sub-arterial) operate at a satisfactory Level of Service (LoS). The school, with its planned population of 1,612 students, would add between 3% and 4% to the demand at each intersection.
- The PM peak hour modelled by WSP does not align with the school's PM pick-up time. Background traffic during the PM pick-up is expected to be significantly lower than during the PM peak hour.
- During the AM peak hour (expected to align with the AM drop-off period), the degree of saturation at the three intersections varies between 0.81 and 0.86.
- The 82 additional vehicle movements are expected to distribute across all turning movements at the intersections, limiting the impact on each approach. The movements are also distributed across two school bell times off-set by 30minutes.
- Adding traffic demand between 3% and 4% to the intersections is expected to have a minor to negligible impact on the degree of saturation (DoS) and is not expected to lower the LoS.



Considering this, SINSW confirmed that the additional traffic generation of 82 vehicles will have a negligible impact on the results of the previous intersection modelling. Therefore, no additional modelling is necessary to assess this impact.

4.2.7 Proposed Mid-block intersection Modelling

In response to the REF submission, the assessment team acknowledged the advice from TfNSW that stated initial traffic modelling was based on Landcom constructing a signalised pedestrian crossing at the intersection of Road 102 (Fairway Drive) and Road 14. However, TfNSW has since advised Landcom to deliver a mid-block crossing in place of the originally proposed signalised crossing.

Following this further consultation was undertaken by WSP in consultation with Landcom regarding the TfNSW submission. Updated traffic modelling has been completed to reflect the revised crossing type as shown in the image below



Figure 21: Intersection Modelling of Mid-block Crossing¹³

Based on the outcomes of this modelling, it is recommended that Transport for NSW consider the information provided in this memo (attached in Appendix A) and approve, in principle, the proposed mid-block signalised pedestrian crossing on the East-West Sub-arterial Road in North Wilton.

As a result of the removal of the previously proposed signalised crossing at the intersection of road 14 and sub-arterial road 102 (Fairway Drive), the wombat crossing initially planned north of the high school kiss and drop zone is to be relocated. The revised location is between the southern extent of the kiss and drop zone and the north of the southern high school car park. This adjustment is intended to support the safe passage of students accessing the school site.

4.2.8 Cumulative Impacts Operational Management

Considering the impact of the school's traffic generation, a key consideration for the high school will be the effective management of integration with the primary school, both during construction and once the buildings are occupied. Many schools across NSW operate K-12 as two separate entities that

¹³ Source: WSP North Wilton Development – Warrants and intersection modelling for proposed mid-block pedestrian crossing – 22/08/2025

function parallel to each other within the same site. To manage these processes effectively, considerations need to be made for student safety, mitigating traffic congestion and its impact on the local road network, and out-of-hours operations.

A common initiative to spread the impact of traffic at sites supporting both primary and high school is to offset bell times between the two schools. This is often achieved over a period of 30 minutes, allowing the bulk of traffic from one school to clear before the remaining traffic accesses the site. This has been included as a mitigation measure, as it will reduce the concentration of traffic during peak periods, thereby decreasing queue lengths and waiting times.

4.3 Forecasted Mode Split

Based on the student trip distribution discussed above, mode share scenarios for the new high school for Wilton have been developed using NSW government population projections for 2036. These scenarios consider transport accessibility for walking, cycling, public transport, and private vehicles.

For existing schools, mode share scenarios are calculated using a baseline mode share, determined from depersonalised student data and a school travel survey. Baseline mode shares reflect student travel patterns without major interventions. Once established, moderate and reach mode share targets can be calculated as follows:

- Moderate target mode share: This scenario considers existing accessibility and the implementation of key active transport infrastructure and adequate bus services.
- Reach target mode share: This scenario maximises the uptake of sustainable travel modes, minimising dependency on private vehicles. It includes the continued promotion of bus services, active transport encouragement programs, and carpool programs.

Since a baseline mode share target cannot be determined, a moderate mode share target has been calculated based on the estimated student distribution and anticipated infrastructure and services. Consequently, no reach target has been generated, as this requires an approximate location of student residences and clarification of service provision.

Table 4-7: Moderate Student Mode Share Targets

Travel mode	No of students	Proportion of students (%)
Walk	207	21%
Cycle	41	4%
Public transport	505	51%
Private vehicle	247	25%
Total	1,000	100%

A total of 78 full time equivalent staff are forecasted to be employed at the new high school for Wilton, and staff are mostly expected to travel to and from school via private vehicle with some car-pooling and some using alternative modes including public transport.



Mode share targets define the desired method of access to the school site in enabling a shift towards walking, cycling and public transport. Staff mode share targets and rationale for each mode are outlined below in Table 4-8.

Table 4-8: Staff Mode Share Targets Breakdown

Mode	Number of staff	Percent of staff	Rationale
Walk	4	5%	Low to medium residential density of North Wilton neighbourhood precinct and likelihood of staff residence resulting in ability to use active transport network
Cycling	4	5%	Provision of end of trip facilities will encourage staff to ride to work
Public transport	0	0%	A lack of existing public transport routes which service the area. Existing public transport networks are considered disconnected and inefficient for staff to choose bus and/or train travel
Car, as driver	62	80%	Majority of staff will choose private vehicle as their mode of travel due to convenience and variability in time of travel
Car, as carpool passenger	8	10%	Staff who live close together or on the way to the school will choose to carpool together
Total	78	100%	



4.3.1 Mode Split Benchmark

Student mode shares observed for Rouse Hill High School have been used as a benchmark for achievable mode shares at the new high school for Wilton. Both schools are located in the outer urban region of Sydney with comparable land use and transport infrastructure and share similar student distributions across their intake areas. It should be noted here that the major difference between the two schools is Niloc Bridge, with Rouse Hill experiencing no comparable barriers.

Table 4-9 presents the student distribution of Rouse Hill High School students whilst Table 4-10 outlines the baseline mode share for Rouse Hill High School students.

Table 4-9: Rouse Hill High School - Student Catchment Coverage (Notional)¹⁴

Distance Band	Students	Proportion (%)	Cumulative (%)
0 - 400m	11	1%	1%
401 - 800m	73	7%	8%
801 - 1,200m	162	16%	24%
1,201 - 2,000m	364	35%	59%
>2,000m	417	41%	100%
Total	1,027	100%	-

Table 4-10: Rouse Hill High School – Baseline Student Mode Share (Term 3, 2023)

Travel Mode	No of Students	Proportion of Students (%)
Walk	180	28%
Cycle	8	2%
Public transport	269	42%
Private vehicle	180	28%
Total	1,000	100%

¹⁴ Note: Student locations based on depersonalised student data provided by Department of Education in 2021



5 Construction Traffic and Access Impact Assessment

5.1 Purpose

The following construction traffic and access impact assessment is a high level and preliminary plan intended to ensure that traffic is safely managed during the demolition, excavation, and construction phases of the project. The subsequent sections outline specific considerations for the school site to support the safety of workers and road users in the vicinity of the construction site, however, must be viewed in conjunction with the detailed construction traffic management plan upon engagement of a contractor.

5.1.1 Objectives

The primary objectives of the assessment include the following:

- To identify the need for adequate and compliant traffic management requirements within the vicinity of the school.
- To ensure continuous, safe and efficient movement of traffic for both the general public and construction vehicles.
- Establishment of a safe pedestrian environment around the site.
- To inform the Contractor and set the ground rules for managing construction traffic associated with the site.

The overall principles of traffic management during the construction activity include:

- Provide an appropriate and convenient environment for pedestrians
- Minimise the impact on pedestrian movements
- Maintain appropriate capacity for pedestrians at all times on footpaths around the site
- Maintain appropriate public transport access
- Maintain current levels of parking within the precinct
- Maintain permanent access to/ from the hospital accesses for emergency services
- Restrict construction vehicle movements to designated routes to/ from the site
- Manage and control construction vehicle activity around the site
- Minimise impacts to general traffic in the vicinity of the site.

5.2 Construction Traffic Management Plan

5.2.1 Description of Construction Activities

The proposed activity is for the construction and operation of the new high school for Wilton. Details of the proposed activity is outlined in Section 1.1.



5.2.2 Work Hours

The undertaking of any construction work, including the entry and exit of construction and delivery vehicles at the site, is restricted to the following standard work hours:

- Monday to Friday inclusive: Between 7.00am to 6.00pm;
- Saturday: Between 8.00am to 1.00pm; and
- Sunday and Public Holidays: No work permitted.

Where noise levels are not expected to exceed the existing background noise level plus 5dB, and noise monitoring is undertaken in accordance with the Approved Methods for Measurement and Analysis of Environmental Noise in NSW (EPA, 2022), works may also be undertaken during the following additional work hours:

- Mondays to Friday inclusive: Between 6:00pm to 7:00pm; and
- Saturday: Between 1:00pm to 4:00pm.

Construction work may be undertaken outside of the standard and additional work hours outlined above, but only if notification has been given to the occupiers of any land within a minimum of 80 metres of the site boundaries before undertaking the work or as soon as is practical afterwards, and only if it is strictly required:

- By the police or a public authority for the delivery of vehicles, plant or materials; or
- In an emergency to avoid the loss of life, damage to property or to prevent environmental harm; or
- Where the works are completely inaudible at the nearest sensitive receiver; or
- For the delivery, setup and removal of construction cranes, where notice of the crane related works is provided to Council and affected residents at least seven days prior to the works; or
- Maintenance and repair of public infrastructure where disruption to essential services, required system conditions (such as low-flow conditions for sewers) and/or considerations of worker safety do not allow work within standard hours; or
- Public infrastructure works where work outside the recommended standard hours is supported by the affected community to shorten the length of the project; and
- where it is demonstrated and justified for the need to work outside the recommended construction hours.

Except in emergencies, these circumstances are not to be interpreted as endorsement for work outside the recommended standard hours and should be justified in each case. Work schedule convenience or project expedience is not considered sufficient justification. Any departure from this Mitigation Measure must be immediately notified to the Post Approvals and Compliance Team.



5.2.3 Construction Worker Parking and Traffic

It is expected that up to 200 construction workers would be on site during peak construction activities. Construction worker parking is to be provided on site where possible. Informal public parking is available on surrounding local streets such as Road 14 for any parking spillover.

Any construction worker arrivals and departures by vehicle would typically be outside of road network peak hours and as such, are unlikely to impact the surrounding road network. The Principal Contractor would be required to outline a schedule of worker start and finish times and demonstrate that this does not have any significant impact on local traffic activity. It is also expected that the Principal Contractor would be required to implement measures to reduce worker car travel, such as shuttle buses from key transport nodes or designated remote pick-up points as necessary.

In addition, consideration is to be given to the management of construction traffic associated with the adjacent primary school development, which may coincide with the high school construction period. Coordination between the two construction programs is required to mitigate potential cumulative impacts on the surrounding transport network and, where possible, minimise peak overlap of construction activities and associated traffic volumes.

5.2.4 Construction Traffic Volumes

The site will have various types of construction vehicles accessing the site. The largest standard construction vehicles regularly accessing the site would include 12.5-metre heavy rigid vehicles. It is likely that a limited number of larger special-purpose vehicles (e.g. floats for plant and equipment, large mobile cranes) will be required, however, these would be subject to a separate oversize and over-mass application process, with an analysis of the specific vehicle access and manoeuvring requirements.

It is expected that for most of the project, no more than 20 heavy vehicles (40 heavy vehicle movements) are expected per day.

5.2.5 Site Access and Construction Vehicle Routes

As part of the detailed CTMP, a traffic guidance scheme (formerly a traffic control plan) will be prepared in accordance with the principles of the Transport for NSW Traffic Control at Work Sites manual. The traffic guidance scheme (TGS) would primarily show where “Truck” signs would be located at specific locations (such as uncontrolled intersections) along the approved truck routes to warn other road users of the increase in construction vehicle movements.

Generally, construction vehicles will have origins and destinations from a wide variety of locations throughout Sydney. However, all construction vehicles will be restricted to the State and Regional Road network where practicable. It is expected that vehicles will approach the site from Picton Road, Pembroke Parade and Fairway Drive to reach the relevant access point on Road 14.

Construction vehicles should be advised to follow the routes as shown in Figure 22.



New High School for Wilton - Transport and Access Impact Assessment
Construction Traffic and Access Impact Assessment

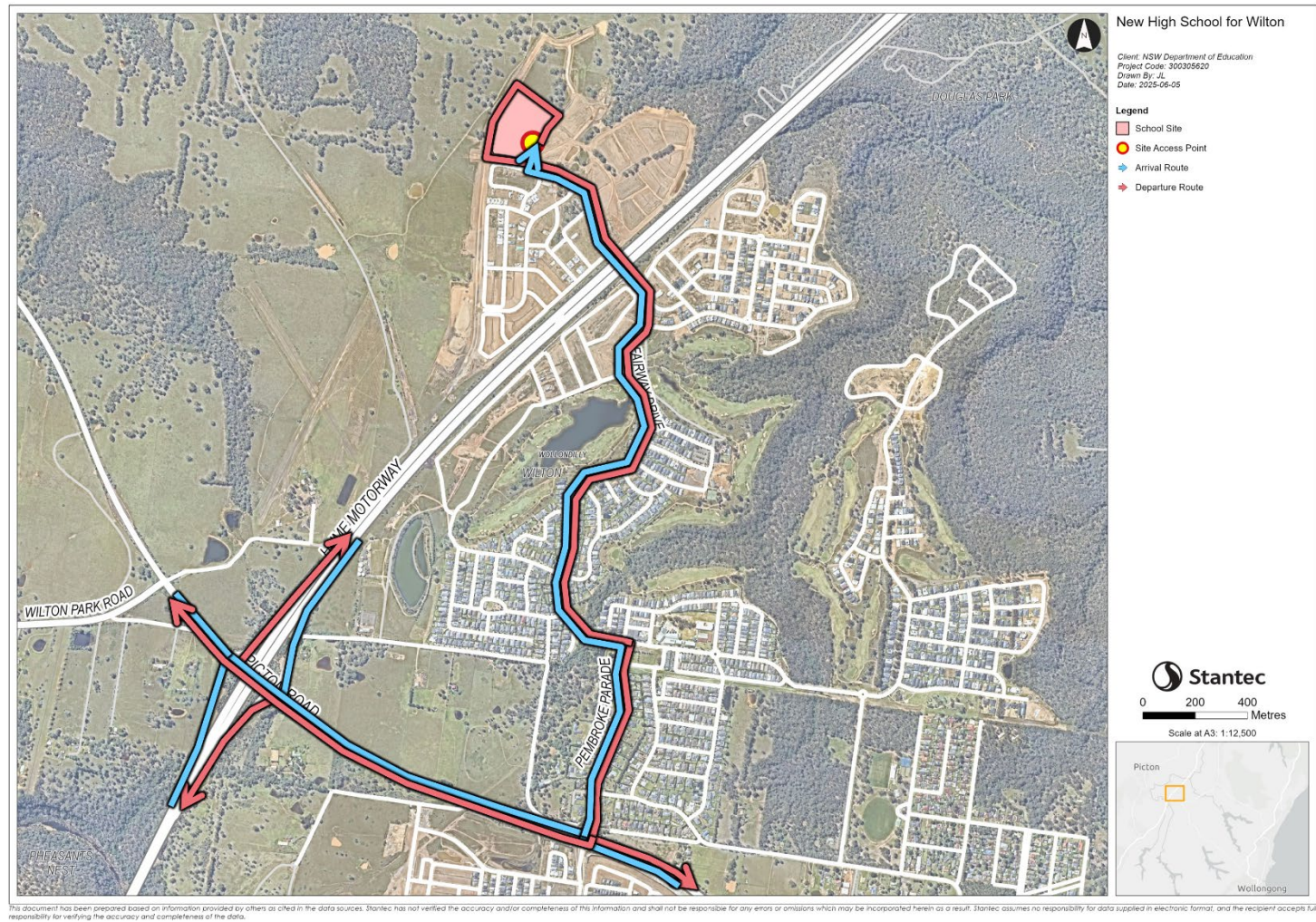


Figure 22: Construction vehicle routes



A road configuration will be in place during construction whereby the north-south sub-arterial road west of the school site will feature two southbound lanes, meaning Road 14, Road 20 and the north-south sub-arterial road will be operational in an anti-clockwise direction, as shown in Figure 23.

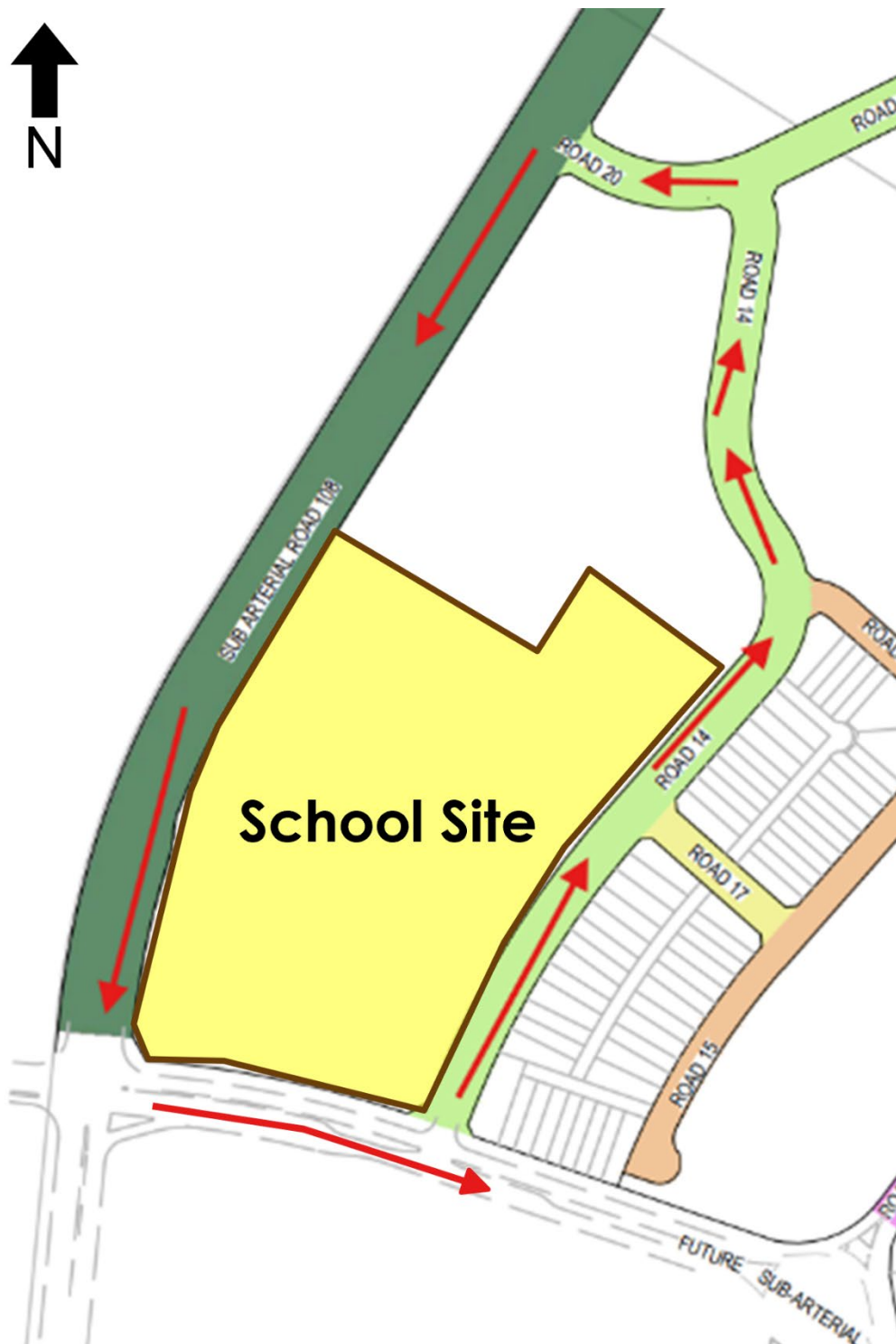


Figure 23: Construction vehicle access around the site



5.2.6 On-street Work Zones

No works zones are proposed at this stage, however, may change subject to the proposed methodology of the appointed contractor.

5.2.7 Traffic Guidance Scheme

Detailed information for work site operations is contained in the Traffic Control at Work Sites manual version 6.1 (Transport for NSW, 2022). The control of traffic at work sites must be undertaken with reference to WorkCover requirements and any other Workplace Health and Safety manuals.

The Principal Contractor will be required to provide TGSs for the proposed works which will generally consider the following:

- Construction vehicle activity, including the loading/ unloading of trucks to be conducted within the work site.
- Pedestrians and all passing vehicles will maintain priority.
- A clear definition of the work site boundary is to be provided by the erection of site fencing and/ or A and B Class hoardings around the site boundaries.
- All construction vehicle activity will be minimised during peak periods, where possible.

5.2.8 Pedestrian and Cyclist Management

During the construction period, pedestrian and cyclist movements are to be maintained as much as possible. Where works require the closure of an existing pedestrian route, a suitable alternative is to be provided. Class A hoarding/ ATF fencing would be provided between pedestrian paths and any work site. Where overhead works are occurring, B-Class hoarding will be provided where pedestrian movement is being maintained. It is not expected that cyclist or pedestrian routes would be majorly impacted by the proposed construction works.

Where pedestrian or cyclist routes are affected, accredited traffic controllers will be provided to manage the impact and minimise conflict between vehicles and pedestrians or cyclists.

5.2.9 Public Transport

Given the infrequent heavy vehicle movements associated with the construction works, the overall impact on existing public transport services in the surroundings are expected to be negligible. This includes the impact on the identified local area bus services.

5.2.10 Traffic Movements in Adjoining Areas

No adverse effects are expected from the movement of heavy vehicles through adjacent areas.



6 School Transport Plan

6.1 Introduction

This School Transport Plan has been prepared for the NSW Department of Education, in support of the new high school for Wilton, with reference to the NSW Department of Education Transport Assessment and School Transport Plan Report Guidelines.

This School Travel Plan has been informed by the preceding transport assessment, which comprised of a spatial analysis of forecasted student enrolments (2027 and 2036 enrolment years), proposed transport conditions, and the setting of base case, moderate and reach travel mode share targets.

While the targets for active and sustainable travel are aspirational, there is an opportunity to shift and shape active and sustainable travel behaviours at the new high school for Wilton. To this end, the plan has been developed with focused and specific actions to increase the rate of use in active travel and public transport options to travel to school.

The measures included in the School Transport Plan include:

- Sustainable transport encouragement programs to increase the rate of walking and cycling to school.
- Targeting registration of 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 a kiss and drop near the school.

6.2 Transport Goals

This section of the report utilises the understanding of external transport conditions for the new high school for Wilton identified through the preceding transport assessment and defines the vision and objectives for the new high school for Wilton to be achieved through the School Transport Plan. The vision and objectives provided support the adoption of the ideal transport scenario for which the school should aspire to achieve. This is to be supported through the implementation of measures proposed as part of the Transport Assessment, by following the communications plan to promote the use of active and public transport and through the continuous monitoring of performance in support of the travel coordinator role.

As identified in the report guidelines, the overall vision for the School Transport Plan is to support the efficient, safe, and sustainable access to school during the planning, construction, and operation of school assets. To support this statement, the objectives that support the vision are:

- To proactively identify and meet school travel demand safely, efficiently and sustainably, and to deliver transport infrastructure to meet school travel demand.
- To maximise the use of active and public transport modes to reduce car traffic before and after school day start and end times.



- To help mitigate congestion on the road network surrounding the school.
- To increase active travel to and from school in a safe transport environment.
- To enhance connectivity to the neighbourhood and community through safe travel to and from school.
- To empower children and young people to be safe road users now and into the future.
- To meet the DoE's duty of care of students which extends beyond the school boundary, if there is a foreseeable risk of injury or harm to students as they travel to and from school.
- To "reduce the administrative burden" on a school principal (managing kiss-and-drop behaviour, parent and community complaints, calling bus companies etc.) by reducing the time and effort for schools/principals to coordinate and liaise with council, TfNSW to create a safe, connected transport environment around their school.

6.2.1 Mode Share Targets

A range of mode share targets were defined in the preceding Transport Assessment. These targets are to be reviewed periodically following the occupation of the school building.

6.2.2 Links to Other Application Documentation

No further application documents are required for consideration for this School Transport Plan. Other documentation would typically consider an ESD report for 4-star Green Star achievement, consultation plan, change management plan, and/ or a risk assessment.

6.3 Policies and Procedures

To enable the success of the School Transport Plan, specific communication expectations can be applied that consider increasing active and public transport use to school; reducing the rates of driving alone and kiss-and-drop to school, meeting ESD / 4-star Green Star requirements and managing risks. The following list indicates a range of transport-based policies that support the implementation of infrastructure improvements at a given school.

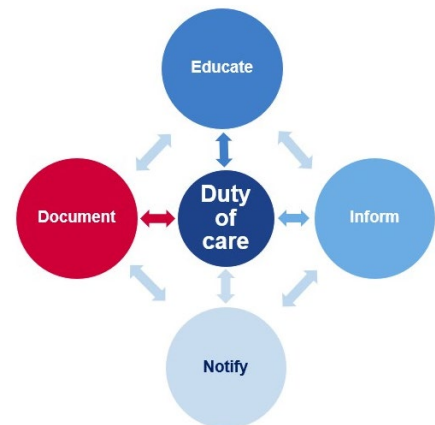
- a. prioritise multi-modal transport access
- b. staggered start/end times
- c. multiple kiss-and-drop locations
- d. remote kiss-and-drop
- e. parking allocation and location
- f. parking management system operations
- g. school access policies for access via a pedestrian gate, bicycle cage, driveways and parking at arrival/end times, during OOSH, school day and outside hours
- h. Share our Space

The policies that are to be considered at the new high school for Wilton, which support the infrastructure and service improvements agreed upon in the transport assessment are discussed in further detail below.



6.4 School Transport Operations

As part of the NSW Department of Education's code of conduct, all personnel have a legal obligation to keep students safe and support their well-being. Student safety is most important around school bell times when the chances of physical harm resulting from accidents are increased. The appropriate management of school transport operations should be considered a high priority for the school, which falls under their duty of care. The school's duty of care is supported by a four-step process, as shown in Figure 24.



To support the Duty of Care Process shown, Table 6-1 details the aspects under the four headers that need to be considered by the school in managing risk and improving the overall safety and well-being of students. Further information in support of this can be found on the NSW Department of Education [website](#).

Table 6-1: Managing a School's Duty of Care and Road Safety

Figure 24: Managing a School's Duty of Care and Road Safety Process

Managing a School's Duty of Care and Road Safety
Educate
Which student groups need to be educated about road safety concerns?
• Individual or small groups of students? • Year/stage group of students? • The whole school?
How will road safety education be made relevant?
This can be achieved through:
• Localised, school-specific teaching and learning activities • Identified outcomes • A strengths-based approach?
Inform
Which parents/carers need informing about the road safety concern?
The parents of:
• Individual or small groups of students • A year/stage group of students • All students?
How will it be communicated?
• Social media (Facebook, school apps, Twitter, Instagram, TikTok) • Newsletters • School website • Enrolment pack information, • Orientation day • School noticeboard sign, email • Meetings • Take-home activity/note
Notify

If emergency services assistance is required, call them before calling the WHS Incident Report and Support Hotline.

All WHS related incidents and injuries, including a near miss, must be reported in line with Incident Notification & Response Procedures. This includes any non-workplace incident that impacts students, staff, and the school community, e.g., travel to/from school.

Situations that have the potential to cause injury to an employee, student, member of the community, volunteer, or contractor should also be reported to the Incident Report and Support Hotline. This includes non-workplace situations, e.g., travel to/from school.

It is valuable to report all concerns to:

- Highlight that a risk exists
- Contribute to managing your duty of care
- Get the concern noted so appropriate support and corrective actions can be initiated to prevent further incidents
- Build a data profile that Health and Safety, and School Infrastructure NSW Directorates can use to bring about change for your school.

Who needs notifying if student/s are unsafe road users, or the infrastructure is unsupportive of a safe school site or school zone:

1. Parents/carers
2. Internally: school staff, P & C, school WHS Committee, WHS Advisor, WHS Incident Hotline, Assets Management Unit, local Director Educational Leadership, local Road Safety Education Officer
3. Externally: Council Road Safety Officer or general manager, Transport for NSW, police highway patrol/liaison officer, council parking rangers, bus operator

Notifications can either be made by phone call, face-to-face informal discussion/formal meeting, email, formal letters, [Snap send solve app](#)

Document

Who will document, record, and track the actions?

- Class teachers, SASS staff, and school executives will be responsible for reporting these actions.
- The school principal will be responsible for managing these actions

6.4.1 Site Transport Access

Numerous transport access points exist around the school site, with all being operational around school bell times. The following list covers all transport access points and modes

6.4.2 Day-to-Day School Operations

Table 6-2 details transport site access that is active during day-to-day school operations. For this, appropriate measures should be considered to support student safety.

Table 6-2: Day-to-Day School Operations

	On-site	Adjacent-to-site	Management measures
Site entries, pedestrian, and vehicle	Y	Y	Y
Kiss-and-drop including Assisted School Transport Program	N	Y	Y
Buses	N	Y	Y
Parking including carpool, carshare pod	Y	Y	Y
Deliveries and service vehicles	Y	N	Y



The following measures have been taken from the NSW Government website for managing school road safety. These measures will need to be implemented to appropriately manage student safety regarding the day-to-day school operation site access:

- Regularly review the school site entry and exit risk management plan.
- Use various communication strategies to inform parents and carers about safe road user behaviours on site and in the school zone.
- Update casual teachers about student arrival and departure procedures.
- Assist students entering and exiting the school safely.
- Where applicable, liaising with the School Crossing Supervisor and/or the Assisted School Travel Program providers on effective management.
- Use various communication strategies to inform parents and carers about safe road user behaviours onsite and in school zones.
- Update casual teachers about student arrival and departure procedures.
- Assist vulnerable students to allow them to enter and exit the school safely.
- Label, number or colour code access points for easier reference and recognition by students, families and staff, e.g. pedestrian entry and exits, kiss and drop area, bus travellers, cyclists, etc.
- Spread the arrival and departure of students and families across different pick-up and drop-off accesses to reduce congestion in any one spot, either on or off-site.
- Use signage, social media, school website, note home or assemblies to inform students, families, staff and visitors of changes to entry and exit or pick up and drop off arrangements such as construction on site or in the school zone; hazards (fallen trees, power lines, floods); delays to public transport and school buses.

Running in parallel to these measures, parents should be encouraged to:

- Walk their children to school, where possible.
- If driving is unavoidable, park away from the school and walk with their children, or drop off their independent children to walk the rest of the way to increase physical and mental health and help reduce traffic congestion around the school site.
- Remind staff to maintain their own safety to reduce their risk of trips, slips and falls when supervising students at kiss and drop zones. For example:
 - Remain behind the school fence or well away from the edge of the footpath.
 - Do not stand on the road between vehicles (to avoid crush injury).
 - Wear a high-visibility jacket when in or near to the traffic environment.



- Ask drivers to wait until the child is properly buckled up, if the child can do it themselves, before driving off.

Remind teachers and other school staff they are not permitted to operate as a School Crossing Supervisor and control traffic. They can assist students cross the road when it is safe to cross.

6.4.3 Event Transport Operations for Share our Space, Hall Hire and Excursions

An Out-of-Hours Event Management Plan will be required to support the opening of facilities to the community should the new high school for Wilton wish to do so.

6.4.4 Sample Transport Encouragement Programs

There are a range of measures which can be implemented by the school, to encourage safe and sustainable transport access to and from the school. A summary of the measures which can be implemented at the new high school for Wilton is highlighted below. A Travel Coordinator (TC) will be appointed within the first 12 months of the operations, and the highlighted measures will be implemented by the TC with consultation from the school as and when necessary.

6.4.5 School Student Transport Scheme (SSTS)

The School Student Transport Scheme provides eligible school students with free or subsidised travel on public transport to and from school and is dependent on where students reside and the availability of public transport. If a student doesn't qualify for free school travel, they may be able to buy a School Term Bus Pass for discounted travel on buses between home and school. Further information on this scheme can be found on the [TfNSW](#) website.

6.4.6 Ride to School Day

National Ride2School Day is an annual event that encourages students to ride into school. It provides students with the opportunity to trial cycling into school, which can further increase uptake in the future. Further measures can be provided during Ride2School day such as free breakfasts and bike tuning to encourage a greater number of participants.

6.5 Communication Plan

The communications plan provides a range of initiatives and actions, including some to be completed and implemented before 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 have been developed to achieve the 'moderate' scenario mode share targets.

These actions need to be reviewed regularly, at least annually, to review actions and refine them as the school community needs may change over time.



6.5.1 Channels

All communications should be promoted through the appropriate channels used by the school, to help target the widest audience possible. The recommended channels have been provided in Table 6-3 below.

6.5.2 Messages

The following communications plan has been co-designed and developed across a number of School Transport Plans. The communications plan provides a guide for some of the messages that the School Principal and current staff involved with sustainable transport initiatives may communicate to promote the uptake of walking, cycling and public transport to school.

Table 6-3: Sustainable Travel Communications Plan

What	When	Which Channel	To Whom
Share the vision and targets for the number of students targeted to walk, ride, or take public transport to school.	Before school opens and periodically throughout the year	Social media School website Email newsletters	Staff, parents, and students
Share the walking, cycling, train and bus transport options to travel to the schools, drawing from the TAG. Note: Public school websites have standardised transport information available to parents and students.	On the school website at all times	Social media School website Email newsletters	Staff, parents, and students
Promote and encourage students to use discounted or free travel by signing up to the SSTS to encourage use of public transport as a sustainable travel option.	Regular periodic updates, including at the start of each term	Social media Newsletters	Students and parents
Promote and encourage participation in National Ride2School Day.	Prior to the annual event in March.	Social media	Staff, parents, and students
Promote Walk Safely to School Day. Materials available at www.walk.com.au	Prior to the annual event in May	Social media	Staff, students, and parents
Communicate the expected standards of behaviour for Kiss and Drop, and Road Safety. Materials are available through the TfNSW School Safety website. Link	Regularly/ as required	Social media	Students and parents
Conduct discussions with Road Safety officers and School Principals about the access and operations at the Kiss and Drop zone.	Before school opens and periodically throughout the year	School website School Noticeboards	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 Social media	Students and parents



What	When	Which Channel	To Whom
Communicate road safety education YouTube video links including: Keeping your child safe around buses - Link Riding safely with children – Link Walking safely with children – Link School zones – Link School crossings – Link	Regularly, multiple times each term	School website Social media	Students and parents
Communicate external resources supplied by groups such as Bicycle NSW to help reduce barriers to cycling	Regularly, multiple times each term	School website Social media	Students and parents
Communicate regarding the availability of vouchers which can be applied for through the NSW Government Active Kids Program. Which includes vouchers for sports and recreation purposes up to the value of \$50 per child.	Before school opens and periodically throughout the year	Online school communication channels (e.g., Facebook page, newsletters)	Staff, parents, and students

6.5.3 Travel Access Guide

A Travel Access Guide (TAG) provides suggested safe and accessible options for travelling to school. The guide provides advice on safe access initiatives, site access, public transport use, bicycle parking and much more. A TAG will need to be produced as part of the school reopening to provide students with information relevant to:

- Ped scooter parking
- Bicycle parking
- Carpool parking
- Parking management
- End-of-trip facilities (staff)
- Flexible and reconfigurable spaces
- Provision of bubblers and taps to encourage water drinking and less waste
- Remote kiss-and-drop

The TAG should also provide supportive measures and messages that can be communicated to parents and carers which help encourage changes in attitude towards forms of transport mode choice. The following are examples of messages which can be used to achieve this:

- Get involved in using active and public transport to school with your student
- Help your student practice the active and public transport they are learning (try for part trip or whole trip)
- Speak to staff and government transport stakeholders about travel to school programs and infrastructure



- Use active and public transport from school drop-off to work
- Report transport issues as the concern arises (e.g. Send Snap Solve app, Council@ email, phone number)
- Improved quality of life (increased healthy lifestyles, well-being, physical activity)
- Life-long learning opportunities
 - Transport as a learning and resilience-building opportunity
 - Additional learning opportunities
 - Educational opportunities for parents and the community
 - Joint/community use for transport programs

A Travel Access Guide is to be completed for the new high school for Wilton prior to the commencement of operations at the school.

6.6 Data Collections and Monitoring

For the School Travel Plan to be effective it must be reviewed on a regular basis. It is important to ensure that the School Travel Plan is meeting its objectives and having the intended impact on car use and transport choices for the school's staff and students. The implementation of the School Travel Plan will be reviewed periodically through staff and student travel surveys. The School Travel Plan is required to be updated and changed to reflect changing circumstances and local context/ facilities should they occur.

6.6.1 Data Collection

To monitor the School Travel Plan, a travel questionnaire is to be conducted for all staff and students within the first 12 months following the occupation of the new buildings. The survey undertaken for this STP is to be used as the baseline for travel planning programs. Subsequent survey results are to be reported annually by the school and used to inform funding allocation for successful programs/ removal of unsuccessful programs. Future travel surveys are to be collected using the same methodology documented in this STP for consistency. This will ensure that surveys are collected by the teachers responsible for each first-period class on either a Tuesday, Wednesday, or Thursday. This should be done during a period of time that is not situated close to public holidays or during a period of examinations. Ideally the survey is to be conducted on a day that is not impacted by weather or other external circumstances which may influence the final outcome. Surveys are to be collected in person and not online to ensure maximum participation is achieved. All surveys are to be collected on the same day at the same time. Surveys are to be conducted once for each term that the School Travel Coordinator role is active.

6.6.2 Ongoing Feedback Framework and Evaluation

The School Travel Coordinator will manage the ongoing feedback framework to continuously improve the oversight of sustainable travel outcomes for the new high school for Wilton in consultation with



relevant school stakeholders. This work will continue to be carried out by a designated school staff after the handover of Travel Coordinator's role. This may include activities such as:

- Reviewing the adequacy of bicycle racks required periodically.
- Surveying the uptake of the Travel Access Guide
- Observing road safety activity outside 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 Transport for NSW, Wollondilly Shire Council and the bus operator accordingly.
- Liaising with the Wollondilly Shire Council Road Safety Officer concerning the management of parking behaviours around the school.
- Responding to any other feedback from Transport for NSW, Police, Residents, Teachers, Parents or Students that might arise from time to time.
- Determining whether the mode share targets set are too ambitious and if they should be more specific and targeted.

6.6.3 Reporting Findings

Findings are to be reported back to the working groups detailed in the following chapter. Findings are to be presented by linking back to the communications plan and governance arrangements discussed. The reporting process will provide the results of the monitoring process with SI, Wollondilly Shire Council and TfNSW to demonstrate the effectiveness of the School Travel Plan approach in order to expand, revise, strengthen or improve the use of this tool across the portfolio transport programs (report to SI, TfNSW). A working group is to be held at a point in the school calendar year to discuss assessment outcomes when required. Points of feedback can address issues such as:

- Adopting or revising programs to increase sustainable transport use (school).
- Installing additional infrastructure to accommodate sustainable transport demand (school, council and/ or state government).
- Web tools or apps that enable the school community to report transport issues / missing links (Send Snap Solve or Social Pinpoint).

6.7 Governance Framework

To capitalise on the potential of the School Transport Plan, ongoing engagement with transport stakeholders is required. On-going engagement with internal and external stakeholder groups will be required with the groups detailed in Table 6-4.



Table 6-4: Internal and External Stakeholders

Internal Working Group	External Working Group		
A working group with school leadership, Road Safety Education Officer, students, teachers, parents/carers, and neighbours.	A working group with school leadership, state government agencies and local government		
	TfNSW	Wollondilly Shire Council	SI / DET/ Other
	- Active Travel to Schools - Bus Service Planning - Bus contract manager - Assisted School Transport Program - Subsidised School Transport Scheme	- Manager, Transport Planning - Active Travel - Road Safety Officer - LGA Travel Coordinator - Sustainability	- Travel Coordinator - Principal - Road Safety Education Officer - AMU representative - Private bus operator - Transport Planning Manager

6.7.1 Travel Coordinator

A Travel Coordinator is required within the first 12 months of occupancy, whilst transport programs must be implemented to achieve travel behaviour change. The role will be managed by DET. This includes determining the role and procuring a contractor, or other to promote, coordinate and monitor the implementation of the sustainable travel initiatives.

The Travel Coordinator will be responsible for implementing the actions shown in Table 6-5. The actions provide the means to encourage sustainable transport options at the new high school for Wilton and will need to be reviewed regularly, at least annually, to review the actions and refine them as the school community needs may change over time.



Table 6-5: Transport Encouragement Programs

Strategy	Action	Target Audience	Timeframe	Coordinator
Enabling active travel through resourcing				
Walk Safely to School Day	Promote and take part in 'Walk Safely to School Day'. Further information: www.walk.com.au	Staff and students	Annually	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	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 beyond 2.9 km walking distance from the school), are used as an indicator for demand for dedicated school buses by Transport for NSW. Therefore, an uplift in applications to the scheme is needed to support the continued provision of school buses to help achieve the school travel targets.	Parents and students (both schools)	Annually	Travel Coordinator
Reduce Car Travel				
Communication Plan	Discuss and refine the Communications Plans and key messages with the School Principals and TfNSW to encourage a higher usage of non-private vehicle modes from staff, parents, and students.	Staff, parents, and students	Post occupation and then annually	Travel Coordinator
Staff car-pooling	Establish and organise a car-pooling scheme that enables staff to share their car trip to the school with more than one person in the car, reducing cars travelling to the school.	Staff and students	Post occupation and then ongoing	Travel Coordinator
Parking management plan	Liaise with the Principal and Wollondilly Shire Council to develop policies to manage the demand for staff parking using the on-site spaces and on-street parking in the surrounding streets if required.	Staff and students	Post occupation and then ongoing	Travel Coordinator and Wollondilly Shire Council
Additional Actions				
Inspire the school community towards using active and public transport to travel to school	Communicate to Staff and Students key messages to promote sustainable travel including targets and actions outlined in the School Transport Plan in the Communications Plan.	Staff, students, and parents	Per communication plan	Travel Coordinator to prepare messaging for the School Principals to send out



Strategy	Action	Target Audience	Timeframe	Coordinator
Travel Access Guide (TAG)	Distribute a travel access guide 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 to prepare for the School Principals to send out
Provide cycle training to staff and students	Utilise the following resources to train staff and students: - AustCycle http://austcycle.com.au/ - BikeWise http://www.bikewise.com.au/services-courses/cycle-courses/city-cycling/ - Bicycle NSW http://bicyclensw.org.au/events/courses/skills/beginner/	Staff, parents, and students	Quarterly	Travel Coordinator and School Principal
Other incentives for staff to use active and public transport	Propose and discuss the following initiatives with the School Principal to consider and implement: - Pre-loaded Opal cards during orientation. - School-subsidised panniers or backpacks for staff committed to active travel. - Salary sacrifice options for purchases of bikes or other micro-mobility options. - Time in staff meetings to share tips and support for staff wanting to start cycling. - Wayfinding at the school with directions to the End of Trip facilities. - A role for a school sustainable travel champion that focuses on modelling the desired behaviours and positive communication around active and public transport.	Staff	Post occupation and then ongoing	Travel Coordinator
Travel surveys for staff and students	- Use travel surveys to be issued to staff and students to obtain workforce data analysis (including staff residential postcodes) to identify changes to the actual staff/student travel origin and destination patterns, to inform strategies that help to reduce car parking demand for staff and students to get to and from the site. - Collaborate with the School Principal on the method and timing to circulate the travel surveys to staff and students as appropriate.	Staff, students, and parents	Quarterly	Travel Coordinator



6.7.2 External Transport Working Group

The external Transport Working Group is to follow on from the Transport Working Group formed in Consultation Stream 2 of this Plan, during the transport options development phase of the Transport Assessment. The Department of Education and the Travel Coordinator should identify and advance relationships with these stakeholders including Council, bus operators and TfNSW – to govern transport issues and opportunities during the implementation of the Travel Plan. If this group already exists due to previous works with Department of Education for the same school, the Terms of Reference are to be amended to include this school project. Feedback during the external working group should highlight:

- If students are spilling out onto the road, new footpaths or pedestrian crossings required.
- If road safety issues are raised by parents or staff, a Road Safety Audit may be required to address issues.
- If buses are turning away students because the buses are full, i.e. new bus services are required.

Document arrangements for this group are to include:

- Meeting regularly i.e. monthly / quarterly.
- Report transport usage.
- Inform updates to the School Transport Plan.
- Seek funding for reported missing links or operational issues.
- Collaborative response to key issues.



7 Conclusion

The key findings of this Transport and Access Impact Assessment are as follows:

- Given the planned combined capacity of 1,612 students for the new high school and primary school at Wilton, the development is expected to generate 82 additional vehicle trips beyond the 1,000-student scenario assessed in the North Wilton Development Stages 2 and 3 Transport Impact Assessment. Intersection modelling confirms this minor increase will have a negligible impact on performance, and as such, no further modelling is required.
- The planning and operation of the new high school for Wilton is to be coordinated with the adjacent proposed primary school through operational management measures, such as staggered bell times, to minimise cumulative impacts associated with transport operations of both schools.
- The proposed public domain works, to be delivered by Landcom, are necessary to ensure safe and accessible pedestrian connections to the school. These works include new pedestrian crossings, footpaths, a bus zone on the sub-arterial road, and a kiss-and-drop zone on Road 14. Appropriate mitigation measures are proposed to ensure these works are completed prior to the commencement of school operations.
- Other mitigation measures, which encompass new bus services, provision of sufficient site transport facilities (car parking, bicycle parking and kiss-and-drop spaces), and staggered bell times with the adjacent public school, are intended to support transport access to the school site and minimise impact on the surrounding transport network.
- The proposed on-site parking and kiss-and-drop zone provisions are adequate to meet the school's operational demand in accordance with the DCP requirements and forecasted mode shares.



Appendix A Intersection Modelling



Memo

To: Nav Prasad
From: Tom van Drempt
Subject: North Wilton Development – Warrants and intersection modelling for proposed mid-block pedestrian crossing
Our ref: PS135057-WSP-PAM-MEM-011-PedestrianSignals
Date: 22 August 2025

A memo summarising the above with the warrant assessment just for the mid-block pedestrian signals. This will need to include a concept plan or a sketch plan showing the distances between the traffic signals, roundabout and proposed mid-block pedestrian signals, median width and lane widths (i.e. the cross section at the mid-block traffic signals)

1. Proposed arrangement

The proposed arrangement, shown with distances between intersections in Figure 1.1 includes:

- Intersection of North-South Sub-arterial road and East-West Sub-arterial Road: traffic signals
- Intersection of East-West Sub-arterial Road and Road 14 (school road): stop sign with right-turn out of Road 14 banned
- Mid-block pedestrian signals

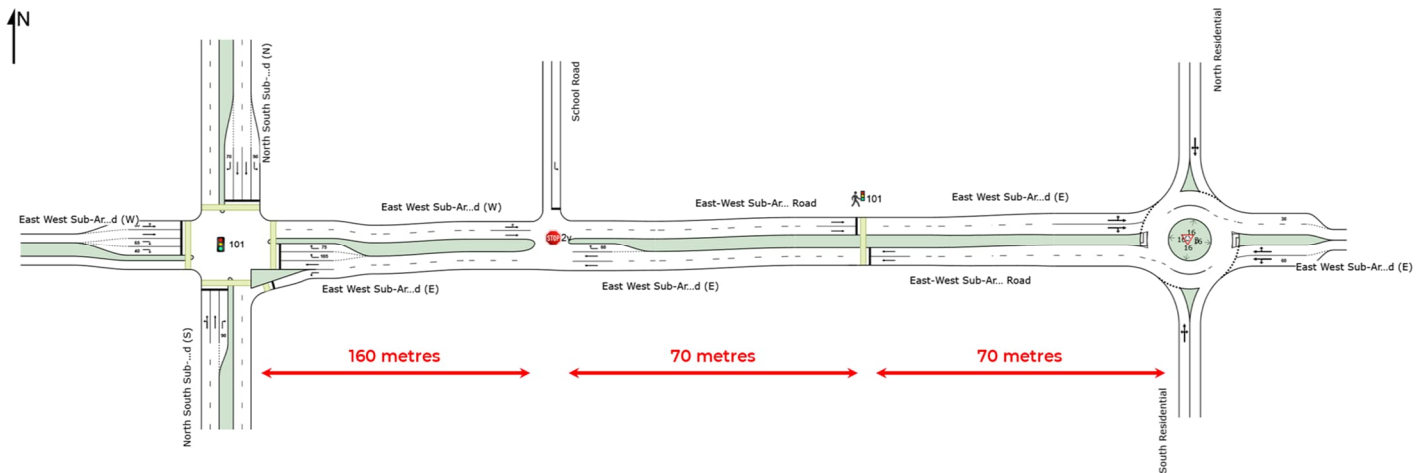


Figure 1.1 Intersection spacing along East-West Sub-arterial Road

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 Sydney NSW 2001

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WSP acknowledges that every project we work on takes place on First Peoples lands. We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

2. Pedestrian Signal Warrants

2.1 Mid-block signalised pedestrian crossing warrants

Transport for NSW Traffic signal design Section 2 – Warrants (December 2010 update) provides a guide on the conditions that should be met to justify the installation of mid-block signalised pedestrian crossings in NSW. The warrants “may be reduced if a site is used predominantly by children, the elderly or people with disabilities. In this case, a signalised mid-block marked foot crossing may be considered if one of the following warrants is met:

(a) The crossing is used predominantly by children and for each of two one-hour periods of an average day:

- i. the pedestrian flow exceeds 50 persons/hour; and
- ii. the vehicular flow exceeds 600 vehicles/hour in each direction.”

2.2 Forecast traffic volumes

Peak hour traffic volumes for the intersection were forecast for the 2031 and 2051 model years using the North Wilton G3M Aimsun model. From this, the 2037 year traffic volumes were interpolated for the Ramps and New Bridge REF. These are summarised by intersection approach in Table 2.1. Traffic volumes have been adjusted due to the right-turn ban from Road 14 to the East-West Sub-arterial Road, with the assumption that 50% will choose to divert via Road 20 and the other 50% will choose to use the roundabout at Road 103 to do a U-turn.

Table 2.1 Forecast traffic volumes at the East-West Sub-Arterial Road and Road 14 intersection

Road	Approach	Major/ Minor	2031		2037		2051	
			AM	PM	AM	PM	AM	PM
East-West Sub-Arterial Road	West	Major	258	382	287	351	323	281
	East	Major	686	565	810	651	928	694
Road 14 (School Road)	North	Minor	174	60	277	87	306	119
Total			1,118	1,007	1,374	1,089	1,557	1,094

2.3 Pedestrian volumes

The north-west corner will have a high school and primary school with a combined 1,000 students.

Making the same assumptions about percentages of students and parents walking, and their direction of travel, it is estimated that 66 pedestrians will use the signalised pedestrian crossings at this intersection to get access to the school.

Allowing for general walk trips in the area, it is estimated (conservatively low) that 80 to 90 pedestrian trips will use the signalised pedestrian crossings at this intersection in the peak hour.

2.4 Traffic warrants

The projected traffic volumes from the latest G3M traffic model are compared to the (a) Traffic demand and (b) Continuous traffic warrants in Figure 2.1. They indicate that:

- The major road Traffic demand (a) warrants are exceeded between 7am and 9am (two hours) in the westbound direction
- The eastbound direction traffic volume reaches a maximum of 54% of the major road Traffic demand (a) warrants
- The minor road Traffic demand (a) warrants are exceeded between 7am and 9am as well as 3pm and 4pm (three hours).

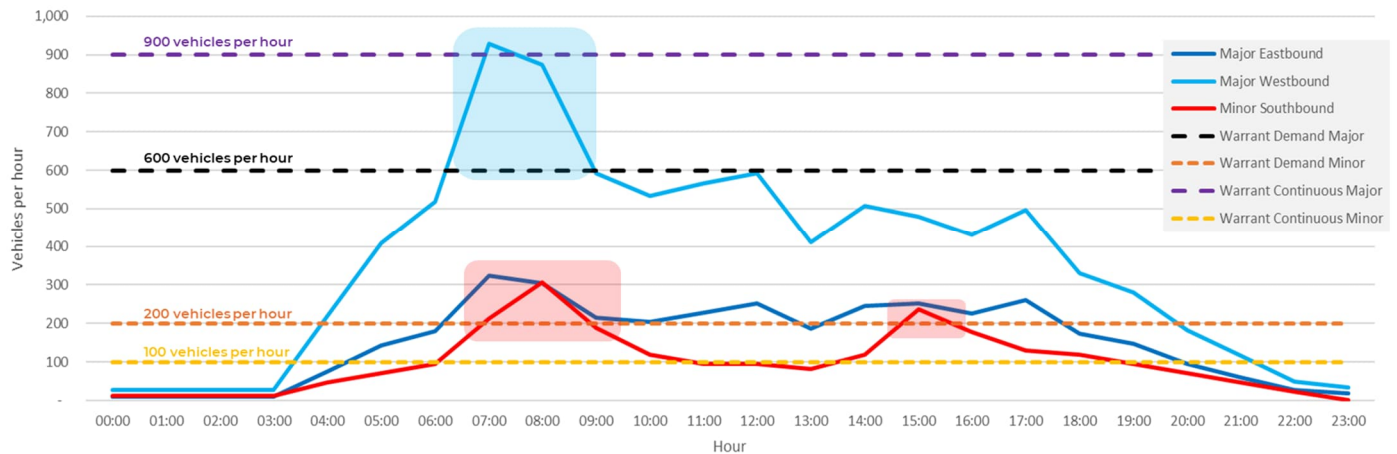


Figure 2.1 East-West Sub-Arterial Road and Road 14 (School Road) – comparison of forecast traffic volumes to traffic signal warrants

In the case of the proposed signalised mid-block pedestrian crossing near the school site, the forecast traffic volume is above 600 vehicles per hour and the volume of pedestrians is above 50 pedestrians per hour. The site meets the reduced warrants for a signalised mid-block pedestrian crossing.

From a design perspective, the sub-arterial road is proposed to have two through lanes in each direction, preventing the use of a marked pedestrian crossing on safety grounds. It is also noted that the intersection is on a pedestrian desire line between a residential area with approximately 300 dwellings and the primary and high school sites.

From a network perspective, the intersection immediately east is a roundabout, which does not provide the same level of access for pedestrians and child-cyclists. Therefore, because of the structure of the road network and land use around it, it is expected that this mid-block crossing will be the focal point of walk trips to the school from the area south of the East-West Sub-arterial.

The four/five lane road will require school children to cross multiple lanes of traffic (two, four or five in stages of between two and three lanes) to get to the school site. A marked pedestrian crossing will therefore not be suitable as there are multiple lanes to cross, and a refuge will not provide sufficient safety in this environment near a school.

A signalised mid-block crossing will provide a safe method of pedestrian access to the school site for pedestrians.

3. Updated SIDRA results

SIDRA Intersection models were developed for the three model years. The results are summarised in Table 3.1. They indicate that the proposed intersection configuration and layout can provide a suitable level of performance for the intersection in the early stages and the ultimate configuration.

The queue lengths are reported for the section of the East-West Sub-arterial that is the subject of this assessment only to demonstrate that the forecast queues are less than the distances between the intersections. In all cases the queue at the North-South Sub-arterial is less than 160 metres and the queue between the Road 14 school access road, the proposed mid-block pedestrian crossing and the roundabout into the residential area are less than 70 metres.

Table 3.1 East West Sub-arterial Road Intersection performance

Model Year	Intersection	Volume (veh/hr)	Degree of saturation	Average delay (sec/veh)	Level of Service	95% queue (m)*	Queue on movement*
	AM peak hour						
2031	 N-S SubArt	1,484	0.67	28.5	C	109	East left turn
	 Road 14	1,177	0.16	8.0	A	< 6	East right turn
	 Ped Signal	1,041	0.25	5.4 veh, 18.4 ped	A / B	31	East through
	 Road103	1,271	0.28	11.5	A	9/7	West right-turn
2037	 N-S SubArt	1,753	0.70	30.3	C	106	East left-turn
	 Road 14	1,446	0.26	8.0	A	8	East right-turn
	 Ped Signal	1,301	0.76	5.6 veh /18.4 ped	A / B	41	East through
	 Road103	1,354	0.29	11.8	A	11	West through
2051	 N-S SubArt	2,513	0.92	44.1	D	104	East through
	 Road 14	1,639	0.31	8.2	A	10	East right turn
	 Ped Signal	1,160	0.29	5.6 veh, 18.4 ped	A / B	40	East through
	 Road103	1,498	0.31	12.3	A	13	West through
	PM peak hour						
2031	 N-S SubArt	1,073	0.53	28.7	C	38	East through
	 Road 14	1,060	0.16	8.3	A	< 6	East right turn
	 Ped Signal	923	0.21	5.2veh, 18.4 ped	A / B	27	East through
	 Road103	1,247	0.29	11.1	A	9	West right-turn
2037	 N-S SubArt	1,206	0.62	28.9	C	29	East through
	 Road 14	1,146	0.24	8.2	A	8	East right-turn
	 Ped Signal	1,000	0.31	5.3 veh / 18.4 ped	A / B	29	East through
	 Road103	1,341	0.32	11.4	A	8	West right-turn
2051	 N-S SubArt	1,544	0.68	35.8	C	44	East right turn
	 Road 14	1,152	0.270	8.0	A	9	East right turn
	 Ped Signal	913	0.24	5.3 veh, 18.4 ped	A / B	32	East through
	 Road103	1,307	0.34	11.6	A	6	West through

Notes Queue length reported on the East-West Sub-arterial Road between the North-South Sub-arterial and the roundabout only



4. Updated Concept Plan

Please find attached the updated concept plan in Appendix C.

5. Recommendation

It is recommended that Transport for NSW consider the additional information provided in this memo to approve in-principle the proposed mid-block signalised pedestrian crossing on the East-West Sub-arterial Road in North Wilton.

Appendix A Intersection performance criteria

The performance criteria used to measure the impact on intersection performance include Level of Service, Degree of Saturation (DoS), average vehicle delay and queue length.

Level of Service is a basic performance parameter used to describe the operation of an intersection. The Transport for NSW Level of Service criteria for intersections which has been followed is shown in Table A.1. At signalised intersections, the criteria are related to average intersection delay (seconds per vehicle). At priority controlled (give-way and stop controlled) and roundabout intersections, the criteria are based on the modelled delay (seconds per vehicle) for the most delayed movement.

The **Degree of Saturation** is the ratio of demand flow to capacity. As it approaches 1.0, queues and delays could be expected. For a satisfactory situation, Degree of Saturation should ideally be less than the nominated practical degree of saturation, usually 0.9. The intersection Degree of Saturation is based on the movement with the highest value.

Average vehicle delay is the difference between interrupted and uninterrupted travel times through the intersection and is measured in seconds per vehicle. At signalised intersections, the average intersection delay is usually reported. At roundabouts and priority-controlled intersections, the average delay for the most delayed movement is usually reported.

Queue length is measured in metres reflecting the number of vehicles waiting at the stop line and is usually quoted as the 95th percentile back of queue, which is the value below which 95 per cent of all observed queue lengths fall. It reflects the number of vehicles per traffic lane at the start of the green period, when traffic starts moving again after a red signal. The intersection queue length is usually taken from the movement with the longest queue length.

Table A.1 Level of Service criteria for intersections

Level of Service	Average Delay (sec. per vehicle)	Traffic signals, roundabout	Give-way and stop signs
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity.	Acceptable delays and spare capacity.
C	29 to 42	Satisfactory	Satisfactory, but accident study required.
D	43 to 56	Operating near capacity	Near capacity and accident study required.
E	57 to 70	At capacity. At signals, incidents would cause excessive delays. Roundabouts require other control mode.	At capacity, requires other control mode.
F	Greater than 70	Unsatisfactory with excessive queuing.	Unsatisfactory with excessive queuing; requires other control mode.

Source: Guide to Transport Impact Assessment (Transport for NSW, 2024) (Guide to Traffic Generating Developments (Roads and Maritime Services, 2002)

Appendix B SIDRA Output

B.1 2031 AM Peak

MOVEMENT SUMMARY

 Site: 101 [4.5 NorthSouth SubArterial Road / EastWest SubArterial Road - 2031 AM 5050]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection of M01 with M02/M07 - 2036 with development

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 85 seconds (Site Optimum Cycle Time - Minimum Delay)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total	HV]	[Total	HV]				[Veh.	Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: North South Sub-Arterial Road (S)															
1	L2	All MCs	11	5.0	11	5.0	0.071	26.4	LOS B	1.0	7.3	0.79	0.62	0.79	43.1
2	T1	All MCs	54	5.0	54	5.0	0.071	27.2	LOS B	1.0	7.6	0.79	0.60	0.79	48.4
3	R2	All MCs	87	10.0	87	10.0	0.633	50.3	LOS D	3.8	29.2	1.00	0.82	1.10	32.3
Approach			152	7.9	152	7.9	0.633	40.5	LOS C	3.8	29.2	0.91	0.73	0.97	39.4
East: East West Sub-Arterial Road (E)															
4	L2	All MCs	499	10.0	499	10.0	* 0.666	25.8	LOS B	16.4	124.7	0.84	0.83	0.84	41.1
5	T1	All MCs	394	10.0	394	10.0	0.674	26.8	LOS B	14.3	108.6	0.92	0.80	0.92	34.5
6	R2	All MCs	26	5.0	26	5.0	0.106	47.9	LOS D	0.5	4.0	0.96	0.68	0.96	35.1
Approach			919	9.9	919	9.9	0.674	26.9	LOS B	16.4	124.7	0.88	0.81	0.88	38.6
North: North South Sub-Arterial Road (N)															
7	L2	All MCs	58	5.0	58	5.0	* 0.096	26.1	LOS B	1.6	11.9	0.71	0.72	0.71	42.5
8	T1	All MCs	177	5.0	177	5.0	0.202	28.5	LOS B	3.0	21.8	0.84	0.66	0.84	47.9
9	R2	All MCs	31	5.0	31	5.0	0.245	48.8	LOS D	1.3	9.4	0.98	0.72	0.98	37.7
Approach			265	5.0	265	5.0	0.245	30.3	LOS C	3.0	21.8	0.83	0.68	0.83	45.8
West: East West Sub-Arterial Road (W)															
10	L2	All MCs	11	5.0	11	5.0	0.119	21.0	LOS B	2.0	14.8	0.72	0.59	0.72	46.8
11	T1	All MCs	127	10.0	127	10.0	0.119	21.6	LOS B	2.0	15.2	0.73	0.58	0.73	37.7
12	R2	All MCs	11	5.0	11	5.0	0.042	47.3	LOS D	0.2	1.6	0.95	0.64	0.95	36.5
Approach			148	9.3	148	9.3	0.119	23.3	LOS B	2.0	15.2	0.74	0.58	0.74	38.6
All Vehicles			1484	8.7	1484	8.7	0.674	28.5	LOS C	16.4	124.7	0.86	0.76	0.87	40.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)



MOVEMENT SUMMARY

 **Site: 2v [5.5 EastWest SubArterial Road / School Access - 2031 AM 5050 (Site Folder: 2031)]**
Output produced by SIDRA INTERSECTION Version: 9.1.6.228

2036 Ultimate Development Updated TMAP Model

Site Category: (None)

Stop (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total	HV]	[Total	HV]				[Veh.	Dist]				
			veh/h	%	veh/h	%				v/c	sec				veh
East: East West Sub-Arterial Road (E)															
5	T1	All MCs	549	4.0	549	4.0	0.145	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
6	R2	All MCs	173	0.0	173	0.0	0.156	6.0	LOS A	0.7	4.6	0.38	0.61	0.38	48.0
Approach			722	3.0	722	3.0	0.156	1.4	NA	0.7	4.6	0.09	0.15	0.09	54.1
North: School Road															
7	L2	All MCs	183	0.0	183	0.0	0.153	8.0	LOS A	0.0	0.0	0.00	1.00	0.00	46.1
Approach			183	0.0	183	0.0	0.153	8.0	LOS A	0.0	0.0	0.00	1.00	0.00	46.1
West: East West Sub-Arterial Road (W)															
10	L2	All MCs	136	0.0	136	0.0	0.073	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	49.9
11	T1	All MCs	136	4.0	136	4.0	0.072	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			272	2.0	272	2.0	0.073	2.8	NA	0.0	0.0	0.00	0.29	0.00	52.2
All Vehicles			1177	2.3	1177	2.3	0.156	2.8	NA	0.7	4.6	0.06	0.31	0.06	51.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: U:\Projects\AU\PS135xxx\PS135057_North_Wilton_Stag\4_WIP\SIDRA\North Wilton - Traffic Signal Warrants RevA.sip9

MOVEMENT SUMMARY



 Site: 101 [7.0 East-West Sub-Arterial Road 2031 AM 5050 (Site Folder: 2031)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Between Road 14 and Road 103

Site Category: (None)

Pedestrian Crossing (Signalised) - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 48 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total	HV]	[Total	HV]				[Veh.	Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
East: East-West Sub-Arterial Road															
2	T1	All MCs	722	2.0	722	2.0	* 0.322	5.6	LOS A	4.4	31.2	0.55	0.47	0.55	37.0
Approach			722	2.0	722	2.0	0.322	5.6	LOS A	4.4	31.2	0.55	0.47	0.55	37.0
West: East-West Sub-Arterial Road															
8	T1	All MCs	319	2.0	319	2.0	0.142	4.9	LOS A	1.7	12.1	0.48	0.39	0.48	38.8
Approach			319	2.0	319	2.0	0.142	4.9	LOS A	1.7	12.1	0.48	0.39	0.48	38.8
All Vehicles			1041	2.0	1041	2.0	0.322	5.4	LOS A	4.4	31.2	0.53	0.45	0.53	37.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
						[Ped	Dist]					
		ped/h	ped/h	sec		ped	m			sec	m	m/sec
East: East-West Sub-Arterial Road												
P11	Stage 1	90	95	18.4	LOS B	0.1	0.1	0.88	0.88	172.3	200.0	1.16
P12	Stage 2	90	95	18.4	LOS B	0.1	0.1	0.88	0.88	172.3	200.0	1.16
All Pedestrians		180	189	18.4	LOS B	0.1	0.1	0.88	0.88	172.3	200.0	1.16

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

 Site: 3 [T54 EastWest SubArterial Road / Residential Access - PM 5050 (Site Folder: 2031)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228



2036 Ultimate Development Updated TMAP Model

Site Category: (None)

Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total	HV]	[Total	HV]				[Veh.	Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: South Residential															
1	L2	All MCs	25	4.0	25	4.0	0.081	6.7	LOS A	0.3	2.3	0.53	0.71	0.53	35.5
2	T1	All MCs	13	4.0	13	4.0	0.081	6.9	LOS A	0.3	2.3	0.53	0.71	0.53	51.6
3	R2	All MCs	24	4.0	24	4.0	0.081	11.1	LOS A	0.3	2.3	0.53	0.71	0.53	49.9
Approach			62	4.0	62	4.0	0.081	8.4	LOS A	0.3	2.3	0.53	0.71	0.53	44.9
East: East West Sub-Arterial Road (E)															
4	L2	All MCs	186	4.0	186	4.0	0.287	5.0	LOS A	1.8	13.0	0.31	0.47	0.31	52.1
5	T1	All MCs	451	4.0	451	4.0	0.287	5.0	LOS A	1.8	13.0	0.32	0.50	0.32	34.9
6	R2	All MCs	147	4.0	147	4.0	0.287	9.2	LOS A	1.8	12.8	0.33	0.53	0.33	50.7
Approach			784	4.0	784	4.0	0.287	5.8	LOS A	1.8	13.0	0.32	0.50	0.32	42.9
North: North Residential															
7	L2	All MCs	2	4.0	2	4.0	0.078	6.0	LOS A	0.3	2.3	0.41	0.66	0.41	49.8
8	T1	All MCs	11	4.0	11	4.0	0.078	5.8	LOS A	0.3	2.3	0.41	0.66	0.41	51.0
9	R2	All MCs	60	4.0	60	4.0	0.078	10.0	LOS A	0.3	2.3	0.41	0.66	0.41	39.0
Approach			73	4.0	73	4.0	0.078	9.2	LOS A	0.3	2.3	0.41	0.66	0.41	41.5
West: East West Sub-Arterial Road (W)															
10	L2	All MCs	26	4.0	26	4.0	0.062	5.0	LOS A	0.3	2.2	0.39	0.52	0.39	49.3
11	T1	All MCs	258	4.0	258	4.0	0.208	4.6	LOS A	1.2	8.6	0.38	0.50	0.38	47.9
12	R2	All MCs	26	4.0	26	4.0	0.208	8.5	LOS A	1.2	8.6	0.38	0.50	0.38	48.2
12u	U	All MCs	18	0.0	18	0.0	0.208	10.4	LOS A	1.2	8.6	0.38	0.50	0.38	22.8
Approach			328	3.8	328	3.8	0.208	5.2	LOS A	1.2	8.6	0.38	0.50	0.38	47.1
All Vehicles			1247	3.9	1247	3.9	0.287	6.0	LOS A	1.8	13.0	0.35	0.52	0.35	43.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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B.2 2031 PM Peak

MOVEMENT SUMMARY

Site: 101 [4.5 NorthSouth SubArterial Road / EastWest SubArterial Road - 2031 PM 5050 (Site Folder: 2031)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection of M01 with M02/M07 - 2036 with development

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total	HV]	[Total	HV]				[Veh.	Dist]				
			veh/h	%	veh/h	%				veh	m				km/h
South: North South Sub-Arterial Road (S)															
1	L2	All MCs	11	5.0	11	5.0	0.098	23.4	LOS B	1.3	9.3	0.80	0.63	0.80	43.5
2	T1	All MCs	75	5.0	75	5.0	0.098	26.6	LOS B	1.3	9.7	0.81	0.62	0.81	48.7
3	R2	All MCs	98	10.0	98	10.0	0.519	44.1	LOS D	3.8	29.2	0.99	0.78	0.99	34.1
Approach			183	7.7	183	7.7	0.519	35.8	LOS C	3.8	29.2	0.90	0.71	0.90	41.4
East: East West Sub-Arterial Road (E)															
4	L2	All MCs	157	10.0	157	10.0	* 0.220	21.5	LOS B	3.9	29.6	0.67	0.73	0.67	43.2
5	T1	All MCs	167	10.0	167	10.0	0.343	25.4	LOS B	5.3	40.5	0.84	0.69	0.84	35.3
6	R2	All MCs	179	5.0	179	5.0	0.451	43.5	LOS D	3.5	25.3	0.98	0.77	0.98	36.4
Approach			503	8.2	503	8.2	0.451	30.6	LOS C	5.3	40.5	0.84	0.73	0.84	38.2
North: North South Sub-Arterial Road (N)															
7	L2	All MCs	34	5.0	34	5.0	* 0.055	24.1	LOS B	0.9	6.3	0.69	0.69	0.69	43.3
8	T1	All MCs	44	5.0	44	5.0	0.060	28.2	LOS B	0.7	5.2	0.84	0.60	0.84	48.0
9	R2	All MCs	19	5.0	19	5.0	0.143	45.4	LOS D	0.7	5.4	0.96	0.70	0.96	38.7
Approach			97	5.0	97	5.0	0.143	30.1	LOS C	0.9	6.3	0.81	0.65	0.81	44.7
West: East West Sub-Arterial Road (W)															
10	L2	All MCs	11	5.0	11	5.0	0.287	23.3	LOS B	4.3	32.5	0.82	0.67	0.82	45.5
11	T1	All MCs	268	10.0	268	10.0	0.287	24.9	LOS B	4.4	33.2	0.82	0.67	0.82	35.6
12	R2	All MCs	11	5.0	11	5.0	0.027	40.6	LOS C	0.2	1.4	0.91	0.65	0.91	38.5
Approach			289	9.6	289	9.6	0.287	25.4	LOS B	4.4	33.2	0.83	0.67	0.83	36.4
All Vehicles			1073	8.2	1073	8.2	0.519	30.1	LOS C	5.3	40.5	0.84	0.70	0.84	39.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

 Site: 2v [5.5 EastWest SubArterial Road / School Access - 2031 PM 5050 (Site Folder: 2031)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228



2036 Ultimate Development Updated TMAP Model

Site Category: (None)

Stop (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total	HV]	[Total	HV]				[Veh.	Dist]				
			veh/h	%	veh/h	%				v/c	sec				veh
East: East West Sub-Arterial Road (E)															
5	T1	All MCs	443	4.0	443	4.0	0.117	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
6	R2	All MCs	152	0.0	152	0.0	0.158	6.7	LOS A	0.7	4.6	0.47	0.68	0.47	47.3
Approach			595	3.0	595	3.0	0.158	1.7	NA	0.7	4.6	0.12	0.17	0.12	53.5
North: School Road															
7	L2	All MCs	63	0.0	63	0.0	0.056	8.3	LOS A	0.2	1.4	0.16	0.90	0.16	46.1
Approach			63	0.0	63	0.0	0.056	8.3	LOS A	0.2	1.4	0.16	0.90	0.16	46.1
West: East West Sub-Arterial Road (W)															
10	L2	All MCs	137	0.0	137	0.0	0.108	5.5	LOS A	0.0	0.0	0.00	0.40	0.00	51.7
11	T1	All MCs	265	4.0	265	4.0	0.108	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	56.4
Approach			402	2.6	402	2.6	0.108	1.9	NA	0.0	0.0	0.00	0.20	0.00	53.5
All Vehicles			1060	2.7	1060	2.7	0.158	2.2	NA	0.7	4.6	0.08	0.23	0.08	52.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

 **Site: 101 [7.0 East-West Sub-Arterial Road 2031 PM 5050 (Site Folder: 2031)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228



Between Road 14 and Road 103

Site Category: (None)

Pedestrian Crossing (Signalised) - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 48 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total	HV]	[Total	HV]				[Veh.	Dist]				
			veh/h	%	veh/h	%				veh	m				km/h
East: East-West Sub-Arterial Road															
2	T1	All MCs	595	2.0	595	2.0	* 0.265	5.4	LOS A	3.5	24.7	0.52	0.44	0.52	37.6
Approach			595	2.0	595	2.0	0.265	5.4	LOS A	3.5	24.7	0.52	0.44	0.52	37.6
West: East-West Sub-Arterial Road															
8	T1	All MCs	328	2.0	328	2.0	0.146	4.9	LOS A	1.8	12.5	0.48	0.39	0.48	38.8
Approach			328	2.0	328	2.0	0.146	4.9	LOS A	1.8	12.5	0.48	0.39	0.48	38.8
All Vehicles			923	2.0	923	2.0	0.265	5.2	LOS A	3.5	24.7	0.51	0.43	0.51	38.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
						[Ped	Dist]					
						ped/h	ped					
East: East-West Sub-Arterial Road												
P11	Stage 1	90	95	18.4	LOS B	0.1	0.1	0.88	0.88	126.1	140.0	1.11
P12	Stage 2	90	95	18.4	LOS B	0.1	0.1	0.88	0.88	126.1	140.0	1.11
All Pedestrians		180	189	18.4	LOS B	0.1	0.1	0.88	0.88	126.1	140.0	1.11

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: 3 [T54 EastWest SubArterial Road / Residential Access - PM 5050 (Site Folder: 2031)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

2036 Ultimate Development Updated TMAP Model

Site Category: (None)

Roundabout



Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total	HV]	[Total	HV]				[Veh.	Dist]				
			veh/h	%	veh/h	%				v/c	sec				veh
South: South Residential															
1	L2	All MCs	25	4.0	25	4.0	0.081	6.7	LOS A	0.3	2.3	0.53	0.71	0.53	35.5
2	T1	All MCs	13	4.0	13	4.0	0.081	6.9	LOS A	0.3	2.3	0.53	0.71	0.53	51.6
3	R2	All MCs	24	4.0	24	4.0	0.081	11.1	LOS A	0.3	2.3	0.53	0.71	0.53	49.9
Approach			62	4.0	62	4.0	0.081	8.4	LOS A	0.3	2.3	0.53	0.71	0.53	44.9
East: East West Sub-Arterial Road (E)															
4	L2	All MCs	186	4.0	186	4.0	0.287	5.0	LOS A	1.8	13.0	0.31	0.47	0.31	52.1
5	T1	All MCs	451	4.0	451	4.0	0.287	5.0	LOS A	1.8	13.0	0.32	0.50	0.32	34.9
6	R2	All MCs	147	4.0	147	4.0	0.287	9.2	LOS A	1.8	12.8	0.33	0.53	0.33	50.7
Approach			784	4.0	784	4.0	0.287	5.8	LOS A	1.8	13.0	0.32	0.50	0.32	42.9
North: North Residential															
7	L2	All MCs	2	4.0	2	4.0	0.078	6.0	LOS A	0.3	2.3	0.41	0.66	0.41	49.8
8	T1	All MCs	11	4.0	11	4.0	0.078	5.8	LOS A	0.3	2.3	0.41	0.66	0.41	51.0
9	R2	All MCs	60	4.0	60	4.0	0.078	10.0	LOS A	0.3	2.3	0.41	0.66	0.41	39.0
Approach			73	4.0	73	4.0	0.078	9.2	LOS A	0.3	2.3	0.41	0.66	0.41	41.5
West: East West Sub-Arterial Road (W)															
10	L2	All MCs	26	4.0	26	4.0	0.062	5.0	LOS A	0.3	2.2	0.39	0.52	0.39	49.3
11	T1	All MCs	258	4.0	258	4.0	0.208	4.6	LOS A	1.2	8.6	0.38	0.50	0.38	47.9
12	R2	All MCs	26	4.0	26	4.0	0.208	8.5	LOS A	1.2	8.6	0.38	0.50	0.38	48.2
12u	U	All MCs	18	0.0	18	0.0	0.208	10.4	LOS A	1.2	8.6	0.38	0.50	0.38	22.8
Approach			328	3.8	328	3.8	0.208	5.2	LOS A	1.2	8.6	0.38	0.50	0.38	47.1
All Vehicles			1247	3.9	1247	3.9	0.287	6.0	LOS A	1.8	13.0	0.35	0.52	0.35	43.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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B.3 2037 AM Peak

MOVEMENT SUMMARY

 Site: 101 [4.5 NorthSouth SubArterial Road / EastWest SubArterial Road - 2037 AM 5050 (Site Folder: 2037)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228



Intersection of M01 with M02/M07 - 2036 with development

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 84 seconds (Site Optimum Cycle Time - Minimum Delay)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total	HV]	[Total	HV]				[Veh.	Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: North South Sub-Arterial Road (S)															
1	L2	All MCs	11	5.0	11	5.0	0.064	24.4	LOS B	0.9	6.9	0.76	0.61	0.76	44.0
2	T1	All MCs	54	5.0	54	5.0	0.064	24.9	LOS B	1.0	7.2	0.76	0.59	0.76	49.2
3	R2	All MCs	84	10.0	84	10.0	0.703	51.9	LOS D	3.8	28.7	1.00	0.86	1.20	31.9
Approach			148	7.8	148	7.8	0.703	40.2	LOS C	3.8	28.7	0.90	0.74	1.01	39.6
East: East West Sub-Arterial Road (E)															
4	L2	All MCs	424	10.0	424	10.0	* 0.625	27.4	LOS B	14.0	106.4	0.85	0.83	0.85	40.4
5	T1	All MCs	358	10.0	358	10.0	0.678	28.7	LOS C	13.3	100.7	0.94	0.81	0.95	33.5
6	R2	All MCs	66	5.0	66	5.0	0.263	48.4	LOS D	1.4	10.1	0.98	0.72	0.98	35.0
Approach			848	9.6	848	9.6	0.678	29.6	LOS C	14.0	106.4	0.90	0.81	0.90	37.5
North: North South Sub-Arterial Road (N)															
7	L2	All MCs	85	5.0	85	5.0	* 0.127	23.8	LOS B	2.3	16.6	0.68	0.72	0.68	43.5
8	T1	All MCs	448	5.0	448	5.0	0.441	27.6	LOS B	7.7	56.3	0.87	0.73	0.87	48.2
9	R2	All MCs	80	5.0	80	5.0	0.636	50.7	LOS D	3.5	25.6	1.00	0.82	1.12	37.2
Approach			614	5.0	614	5.0	0.636	30.0	LOS C	7.7	56.3	0.86	0.74	0.88	46.2
West: East West Sub-Arterial Road (W)															
10	L2	All MCs	11	5.0	11	5.0	0.125	22.6	LOS B	1.9	14.7	0.75	0.61	0.75	46.0
11	T1	All MCs	121	10.0	121	10.0	0.125	23.4	LOS B	2.0	15.1	0.76	0.60	0.76	36.5
12	R2	All MCs	11	5.0	11	5.0	0.042	46.7	LOS D	0.2	1.5	0.95	0.64	0.95	36.6
Approach			142	9.3	142	9.3	0.125	25.1	LOS B	2.0	15.1	0.77	0.60	0.77	37.7
All Vehicles			1753	7.8	1753	7.8	0.703	30.3	LOS C	14.0	106.4	0.88	0.76	0.89	41.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

 Site: 2v [5.5 EastWest SubArterial Road / School Access - 2037 AM 5050 (Site Folder: 2037)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

2036 Ultimate Development Updated TMAP Model

Site Category: (None)

Stop (Two-Way)

Vehicle Movement Performance



Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Stop Rate	Eff. Rate	Aver. No. of Cycles	Aver. Speed
			[Total	HV]	[Total	HV]				[Veh.	Dist]					
			veh/h	%	veh/h	%	v/c	sec		veh	m					km/h
East: East West Sub-Arterial Road (E)																
5	T1	All MCs	577	4.0	577	4.0	0.152	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	0.00	59.9
6	R2	All MCs	276	0.0	276	0.0	0.258	6.3	LOS A	1.2	8.2	0.44	0.64	0.44	0.44	47.8
Approach			853	2.7	853	2.7	0.258	2.0	NA	1.2	8.2	0.14	0.21	0.14	0.14	52.7
North: School Road																
7	L2	All MCs	292	0.0	292	0.0	0.244	8.0	LOS A	1.1	7.6	0.04	0.96	0.04	0.04	46.1
Approach			292	0.0	292	0.0	0.244	8.0	LOS A	1.1	7.6	0.04	0.96	0.04	0.04	46.1
West: East West Sub-Arterial Road (W)																
10	L2	All MCs	145	0.0	145	0.0	0.081	5.5	LOS A	0.0	0.0	0.00	0.56	0.00	0.00	50.1
11	T1	All MCs	157	4.0	157	4.0	0.081	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	0.00	59.2
Approach			302	2.1	302	2.1	0.081	2.7	NA	0.0	0.0	0.00	0.28	0.00	0.00	52.3
All Vehicles			1446	2.0	1446	2.0	0.258	3.4	NA	1.2	8.2	0.09	0.37	0.09	0.09	50.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [7.0 East-West Sub-Arterial Road 2037 AM - 5050 (Site Folder: 2037)]
Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Between Road 14 and Road 103

Site Category: (None)

Pedestrian Crossing (Signalised) - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 48 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance



Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total	HV]	[Total	HV]				[Veh.	Dist]				
			veh/h	%	veh/h	%				veh	m				km/h
East: East-West Sub-Arterial Road															
2	T1	All MCs	853	2.0	853	2.0	* 0.380	5.8	LOS A	5.4	38.5	0.57	0.50	0.57	36.4
Approach			853	2.0	853	2.0	0.380	5.8	LOS A	5.4	38.5	0.57	0.50	0.57	36.4
West: East-West Sub-Arterial Road															
8	T1	All MCs	448	2.0	448	2.0	0.200	5.1	LOS A	2.5	17.7	0.50	0.42	0.50	38.3
Approach			448	2.0	448	2.0	0.200	5.1	LOS A	2.5	17.7	0.50	0.42	0.50	38.3
All Vehicles			1301	2.0	1301	2.0	0.380	5.6	LOS A	5.4	38.5	0.55	0.47	0.55	37.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped	Dist]			sec	m	m/sec
						ped	m					
East: East-West Sub-Arterial Road												
P11	Stage 1	90	95	18.4	LOS B	0.1	0.1	0.88	0.88	172.3	200.0	1.16
P12	Stage 2	90	95	18.4	LOS B	0.1	0.1	0.88	0.88	172.3	200.0	1.16
All Pedestrians		180	189	18.4	LOS B	0.1	0.1	0.88	0.88	172.3	200.0	1.16

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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Project: U:\Projects\AU\PS135xxx\PS135057_North_Wilton_Stag\4_WIP\SIDRA\North Wilton - Traffic Signal Warrants RevA.sip9

MOVEMENT SUMMARY

 **Site: 3 [T54 EastWest SubArterial Road / Residential Access - 2037 AM 5050 (Site Folder: 2037)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

2036 Ultimate Development Updated TMAP Model

Site Category: (None)

Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total	HV]	[Total	HV]				[Veh.	Dist]				
			veh/h	%	veh/h	%				v/c	sec				veh
South: South Residential															



1	L2	All MCs	68	4.0	68	4.0	0.128	7.3	LOS A	0.5	3.9	0.60	0.73	0.60	35.7
2	T1	All MCs	12	4.0	12	4.0	0.128	7.6	LOS A	0.5	3.9	0.60	0.73	0.60	52.0
3	R2	All MCs	8	4.0	8	4.0	0.128	11.8	LOS A	0.5	3.9	0.60	0.73	0.60	50.4
Approach			88	4.0	88	4.0	0.128	7.8	LOS A	0.5	3.9	0.60	0.73	0.60	39.6
East: East West Sub-Arterial Road (E)															
4	L2	All MCs	48	4.0	48	4.0	0.269	6.5	LOS A	1.7	12.2	0.58	0.58	0.58	50.9
5	T1	All MCs	474	4.0	474	4.0	0.269	6.6	LOS A	1.7	12.2	0.59	0.59	0.59	34.2
6	R2	All MCs	38	4.0	38	4.0	0.269	11.0	LOS A	1.6	11.7	0.59	0.61	0.59	50.2
Approach			560	4.0	560	4.0	0.269	6.9	LOS A	1.7	12.2	0.59	0.59	0.59	37.2
North: North Residential															
7	L2	All MCs	9	4.0	9	4.0	0.286	6.7	LOS A	1.4	10.4	0.52	0.68	0.52	49.2
8	T1	All MCs	12	4.0	12	4.0	0.286	6.6	LOS A	1.4	10.4	0.52	0.68	0.52	50.3
9	R2	All MCs	236	4.0	236	4.0	0.286	10.8	LOS A	1.4	10.4	0.52	0.68	0.52	38.4
Approach			257	4.0	257	4.0	0.286	10.4	LOS A	1.4	10.4	0.52	0.68	0.52	39.5
West: East West Sub-Arterial Road (E)															
10	L2	All MCs	81	4.0	81	4.0	0.083	4.1	LOS A	0.4	3.1	0.23	0.49	0.23	50.3
11	T1	All MCs	212	4.0	212	4.0	0.237	3.9	LOS A	1.5	10.7	0.21	0.53	0.21	47.3
12	R2	All MCs	81	4.0	81	4.0	0.237	7.9	LOS A	1.5	10.7	0.21	0.53	0.21	47.8
12u	U	All MCs	75	0.0	75	0.0	0.237	9.9	LOS A	1.5	10.7	0.21	0.53	0.21	22.9
Approach			448	3.3	448	3.3	0.237	5.6	LOS A	1.5	10.7	0.22	0.52	0.22	45.0
All Vehicles			1354	3.8	1354	3.8	0.286	7.2	LOS A	1.7	12.2	0.45	0.59	0.45	39.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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B.4 2037 PM Peak

MOVEMENT SUMMARY

 **Site: 101 [4.5 NorthSouth SubArterial Road / EastWest SubArterial Road - 2037 PM 5050 (Site Folder: 2037)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection of M01 with M02/M07 - 2036 with development

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 72 seconds (Site Optimum Cycle Time - Minimum Delay)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance															
Mov ID	Mov Turn	Mov Class	Demand Flows	Arrival Flows	Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue	Prop. Que	Eff. Stop Rate	Aver. Speed				

		[Total HV]		[Total HV]				[Veh. Dist]				Aver. No. of Cycles		km/h	
		veh/h	%	veh/h	%			v/c	sec			veh	m		
South: North South Sub-Arterial Road (S)															
1	L2	All MCs	11	5.0	11	5.0	0.226	21.9	LOS B	2.9	21.2	0.82	0.66	0.82	44.8
2	T1	All MCs	198	5.0	198	5.0	0.226	23.6	LOS B	3.0	21.8	0.83	0.66	0.83	49.6
3	R2	All MCs	103	10.0	103	10.0	0.554	40.9	LOS C	3.7	28.1	0.99	0.79	1.02	35.1
Approach			312	6.7	312	6.7	0.554	29.2	LOS C	3.7	28.1	0.88	0.70	0.89	45.4
East: East West Sub-Arterial Road (E)															
4	L2	All MCs	133	10.0	133	10.0	* 0.196	20.8	LOS B	3.0	23.1	0.68	0.73	0.68	43.5
5	T1	All MCs	132	10.0	132	10.0	0.297	24.1	LOS B	3.8	29.2	0.85	0.69	0.85	36.0
6	R2	All MCs	212	5.0	212	5.0	0.617	42.4	LOS C	3.9	28.5	1.00	0.82	1.09	36.8
Approach			476	7.8	476	7.8	0.617	31.4	LOS C	3.9	29.2	0.87	0.76	0.91	38.4
North: North South Sub-Arterial Road (N)															
7	L2	All MCs	37	5.0	37	5.0	0.058	21.8	LOS B	0.8	6.2	0.68	0.69	0.68	44.4
8	T1	All MCs	105	5.0	105	5.0	* 0.128	24.6	LOS B	1.5	11.0	0.83	0.63	0.83	49.2
9	R2	All MCs	27	5.0	27	5.0	0.186	41.1	LOS C	1.0	7.0	0.96	0.71	0.96	39.9
Approach			169	5.0	169	5.0	0.186	26.6	LOS B	1.5	11.0	0.82	0.66	0.82	46.9
West: East West Sub-Arterial Road (W)															
10	L2	All MCs	11	5.0	11	5.0	0.287	22.9	LOS B	3.5	26.3	0.85	0.69	0.85	45.5
11	T1	All MCs	228	10.0	228	10.0	0.287	24.9	LOS B	3.5	27.0	0.86	0.69	0.86	35.6
12	R2	All MCs	11	5.0	11	5.0	* 0.036	39.9	LOS C	0.2	1.3	0.94	0.64	0.94	38.7
Approach			249	9.6	249	9.6	0.287	25.4	LOS B	3.5	27.0	0.86	0.69	0.86	36.6
All Vehicles			1206	7.5	1206	7.5	0.617	28.9	LOS C	3.9	29.2	0.86	0.71	0.88	41.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

 **Site: 2v [5.5 EastWest SubArterial Road / School Access - 2037 PM 5050 (Site Folder: 2037)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

2036 Ultimate Development Updated TMAP Model

Site Category: (None)

Stop (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total	HV]	[Total	HV]				[Veh.	Dist]				
			veh/h	%	veh/h	%				v/c	sec				
East: East West Sub-Arterial Road (E)															



5	T1	All MCs	443	4.0	443	4.0	0.117	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
6	R2	All MCs	242	0.0	242	0.0	0.244	6.7	LOS A	1.1	7.5	0.48	0.67	0.48	47.4
Approach			685	2.6	685	2.6	0.244	2.4	NA	1.1	7.5	0.17	0.24	0.17	52.1
North: School Road															
7	L2	All MCs	92	0.0	92	0.0	0.079	8.2	LOS A	0.3	2.1	0.12	0.92	0.12	46.1
Approach			92	0.0	92	0.0	0.079	8.2	LOS A	0.3	2.1	0.12	0.92	0.12	46.1
West: East West Sub-Arterial Road (W)															
10	L2	All MCs	146	0.0	146	0.0	0.099	5.5	LOS A	0.0	0.0	0.00	0.46	0.00	51.0
11	T1	All MCs	223	4.0	223	4.0	0.099	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	57.0
Approach			369	2.4	369	2.4	0.099	2.2	NA	0.0	0.0	0.00	0.23	0.00	53.0
All Vehicles			1146	2.3	1146	2.3	0.244	2.8	NA	1.1	7.5	0.11	0.29	0.11	51.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 101 [7.0 East-West Sub-Arterial Road 2037 PM - 5050 (Site Folder: 2037)]
Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Between Road 14 and Road 103
Site Category: (None)
Pedestrian Crossing (Signalised) - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 48 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total	HV]	[Total	HV]				[Veh.	Dist]				
			veh/h	%	veh/h	%				v/c	sec				veh
East: East-West Sub-Arterial Road															



2	T1	All MCs	685	2.0	685	2.0	* 0.305	5.5	LOS A	4.1	29.2	0.54	0.46	0.54	37.2
Approach			685	2.0	685	2.0	0.305	5.5	LOS A	4.1	29.2	0.54	0.46	0.54	37.2
West: East-West Sub-Arterial Road															
8	T1	All MCs	315	2.0	315	2.0	0.140	4.9	LOS A	1.7	12.0	0.48	0.39	0.48	38.8
Approach			315	2.0	315	2.0	0.140	4.9	LOS A	1.7	12.0	0.48	0.39	0.48	38.8
All Vehicles			1000	2.0	1000	2.0	0.305	5.3	LOS A	4.1	29.2	0.52	0.44	0.52	37.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped	Dist]			sec	m	m/sec
						ped	m					
East: East-West Sub-Arterial Road												
P11	Stage 1	90	95	18.4	LOS B	0.1	0.1	0.88	0.88	172.3	200.0	1.16
P12	Stage 2	90	95	18.4	LOS B	0.1	0.1	0.88	0.88	172.3	200.0	1.16
All Pedestrians		180	189	18.4	LOS B	0.1	0.1	0.88	0.88	172.3	200.0	1.16

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: 3 [T54 EastWest SubArterial Road / Residential Access - 2037 PM 5050 (Site Folder: 2037)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

2036 Ultimate Development Updated TMAP Model

Site Category: (None)

Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total	HV]	[Total	HV]				[Veh.	Dist]				
			veh/h	%	veh/h	%				v/c	sec				veh
South: South Residential															
1	L2	All MCs	66	4.0	66	4.0	0.109	7.0	LOS A	0.4	3.1	0.56	0.70	0.56	36.0
2	T1	All MCs	12	4.0	12	4.0	0.109	7.3	LOS A	0.4	3.1	0.56	0.70	0.56	52.5
3	R2	All MCs	2	4.0	2	4.0	0.109	11.4	LOS A	0.4	3.1	0.56	0.70	0.56	50.8
Approach			80	4.0	80	4.0	0.109	7.2	LOS A	0.4	3.1	0.56	0.70	0.56	39.2



East: East West Sub-Arterial Road (E)															
4	L2	All MCs	186	4.0	186	4.0	0.319	5.1	LOS A	2.0	14.8	0.33	0.47	0.33	52.1
5	T1	All MCs	532	4.0	532	4.0	0.319	5.1	LOS A	2.0	14.8	0.34	0.50	0.34	34.8
6	R2	All MCs	147	4.0	147	4.0	0.319	9.3	LOS A	2.0	14.6	0.35	0.52	0.35	50.7
Approach			865	4.0	865	4.0	0.319	5.8	LOS A	2.0	14.8	0.34	0.50	0.34	42.2
North: North Residential															
7	L2	All MCs	11	4.0	11	4.0	0.085	5.8	LOS A	0.4	2.5	0.39	0.64	0.39	50.2
8	T1	All MCs	11	4.0	11	4.0	0.085	5.7	LOS A	0.4	2.5	0.39	0.64	0.39	51.3
9	R2	All MCs	60	4.0	60	4.0	0.085	9.8	LOS A	0.4	2.5	0.39	0.64	0.39	39.2
Approach			81	4.0	81	4.0	0.085	8.8	LOS A	0.4	2.5	0.39	0.64	0.39	42.8
West: East West Sub-Arterial Road (W)															
10	L2	All MCs	26	4.0	26	4.0	0.058	4.8	LOS A	0.3	2.1	0.37	0.51	0.37	49.4
11	T1	All MCs	235	4.0	235	4.0	0.195	4.4	LOS A	1.1	8.2	0.35	0.50	0.35	47.8
12	R2	All MCs	26	4.0	26	4.0	0.195	8.4	LOS A	1.1	8.2	0.35	0.50	0.35	48.1
12u	U	All MCs	27	0.0	27	0.0	0.195	10.3	LOS A	1.1	8.2	0.35	0.50	0.35	22.8
Approach			315	3.7	315	3.7	0.195	5.3	LOS A	1.1	8.2	0.36	0.50	0.36	46.4
All Vehicles			1341	3.9	1341	3.9	0.319	5.9	LOS A	2.0	14.8	0.36	0.52	0.36	42.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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B.5 2051 AM Peak

MOVEMENT SUMMARY

 **Site: 101 [4.5 NorthSouth SubArterial Road / EastWest SubArterial Road - 2051 AM - NRT 5050 (Site Folder: 2051)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection of M01 with M02/M07 - 2036 with development

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 100 seconds (Site Optimum Cycle Time - Minimum Delay)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total	HV]	[Total	HV]				[Veh.	Dist]				
			veh/h	%	veh/h	%				v/c	sec				veh
South: North South Sub-Arterial Road (S)															
1	L2	All MCs	11	5.0	11	5.0	0.074	32.1	LOS C	1.2	8.9	0.80	0.64	0.80	40.8

2	T1	All MCs	55	5.0	55	5.0	0.074	32.6	LOS C	1.2	9.1	0.80	0.61	0.80	46.6
3	R2	All MCs	78	10.0	78	10.0	0.774	62.6	LOS E	4.2	32.1	1.00	0.89	1.29	29.2
Approach			143	7.7	143	7.7	0.774	48.9	LOS D	4.2	32.1	0.91	0.77	1.07	37.1
East: East West Sub-Arterial Road (E)															
4	L2	All MCs	316	10.0	316	10.0	* 0.554	34.8	LOS C	12.6	96.0	0.87	0.82	0.87	37.4
5	T1	All MCs	320	10.0	320	10.0	0.722	38.8	LOS C	14.9	113.1	0.97	0.86	1.02	29.0
6	R2	All MCs	164	5.0	164	5.0	* 0.776	62.4	LOS E	4.4	32.4	1.00	0.89	1.28	31.4
Approach			800	9.0	800	9.0	0.776	42.1	LOS C	14.9	113.1	0.94	0.85	1.01	33.1
North: North South Sub-Arterial Road (N)															
7	L2	All MCs	147	5.0	147	5.0	0.174	23.5	LOS B	4.0	29.5	0.60	0.73	0.60	44.6
8	T1	All MCs	1076	5.0	1076	5.0	* 0.787	35.3	LOS C	24.9	182.1	0.94	0.88	1.00	46.9
9	R2	All MCs	219	5.0	219	5.0	0.592	50.8	LOS D	9.9	72.0	0.95	0.82	0.95	38.8
Approach			1442	5.0	1442	5.0	0.787	36.4	LOS C	24.9	182.1	0.91	0.85	0.95	44.3
West: East West Sub-Arterial Road (W)															
10	L2	All MCs	11	5.0	11	5.0	0.132	21.3	LOS B	2.2	16.5	0.80	0.64	0.80	42.9
11	T1	All MCs	106	10.0	106	10.0	0.132	32.6	LOS C	2.2	17.0	0.81	0.63	0.81	32.1
12	R2	All MCs	11	5.0	11	5.0	0.050	55.7	LOS D	0.3	1.9	0.97	0.65	0.97	34.2
Approach			127	9.2	127	9.2	0.132	33.6	LOS C	2.2	17.0	0.82	0.63	0.82	33.8
All Vehicles			2513	6.6	2513	6.6	0.787	38.8	LOS C	24.9	182.1	0.91	0.84	0.97	40.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

 Site: 2v [5.5 EastWest SubArterial Road / School Access - 2051 AM - NRT 5050 (Site Folder: 2051)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

2036 Ultimate Development Updated TMAP Model

Site Category: (None)

Stop (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total	HV]	[Total	HV]				[Veh.	Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	m	km/h			
East: East West Sub-Arterial Road (E)															
5	T1	All MCs	639	4.0	639	4.0	0.169	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
6	R2	All MCs	338	0.0	338	0.0	0.329	6.7	LOS A	1.6	11.3	0.49	0.67	0.50	47.3
Approach			977	2.6	977	2.6	0.329	2.3	NA	1.6	11.3	0.17	0.23	0.17	52.1
North: School Road															

7	L2	All MCs	322	0.0	322	0.0	0.279	8.2	LOS A	1.3	9.0	0.14	0.91	0.14	46.1
Approach			322	0.0	322	0.0	0.279	8.2	LOS A	1.3	9.0	0.14	0.91	0.14	46.1
West: East West Sub-Arterial Road (W)															
10	L2	All MCs	133	0.0	133	0.0	0.091	5.5	LOS A	0.0	0.0	0.00	0.46	0.00	51.1
11	T1	All MCs	207	4.0	207	4.0	0.091	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	56.9
Approach			340	2.4	340	2.4	0.091	2.2	NA	0.0	0.0	0.00	0.23	0.00	53.0
All Vehicles			1639	2.1	1639	2.1	0.329	3.5	NA	1.6	11.3	0.13	0.36	0.13	50.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

 **Site: 101 [7.0 East-West Sub-Arterial Road 2051 AM 5050 (Site Folder: 2051)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Between Road 14 and Road 103

Site Category: (None)

Pedestrian Crossing (Signalised) - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 48 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total	HV]	[Total	HV]				[Veh.	Dist]				
			veh/h	%	veh/h	%				veh	m				km/h
East: East-West Sub-Arterial Road															
2	T1	All MCs	841	2.0	841	2.0	* 0.374	5.8	LOS A	5.3	37.8	0.57	0.49	0.57	36.5
Approach			841	2.0	841	2.0	0.374	5.8	LOS A	5.3	37.8	0.57	0.49	0.57	36.5
West: East-West Sub-Arterial Road															
8	T1	All MCs	319	2.0	319	2.0	0.142	4.9	LOS A	1.7	12.1	0.48	0.39	0.48	38.8
Approach			319	2.0	319	2.0	0.142	4.9	LOS A	1.7	12.1	0.48	0.39	0.48	38.8



All Vehicles	1160	2.0	1160	2.0	0.374	5.6	LOS A	5.3	37.8	0.54	0.47	0.54	37.1
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Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped Dist] ped m		Prop. Que Stop Rate	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: East-West Sub-Arterial Road												
P11	Stage 1	90	95	18.4	LOS B	0.1	0.1	0.88	0.88	172.3	200.0	1.16
P12	Stage 2	90	95	18.4	LOS B	0.1	0.1	0.88	0.88	172.3	200.0	1.16
All Pedestrians		180	189	18.4	LOS B	0.1	0.1	0.88	0.88	172.3	200.0	1.16

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

 **Site: 3 [7.5 EastWest SubArterial Road / Residential Access - 2051 AM - NRT 5050 (Site Folder: 2051)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

2036 Ultimate Development Updated TMAP Model
Site Category: (None)
Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total	HV]	[Total	HV]				[Veh.	Dist]				
			veh/h	%	veh/h	%				v/c	sec				veh
South: South Residential															
1	L2	All MCs	68	4.0	68	4.0	0.138	7.9	LOS A	0.6	4.3	0.64	0.76	0.64	35.4
2	T1	All MCs	12	4.0	12	4.0	0.138	8.1	LOS A	0.6	4.3	0.64	0.76	0.64	51.7
3	R2	All MCs	8	4.0	8	4.0	0.138	12.3	LOS A	0.6	4.3	0.64	0.76	0.64	50.0
Approach			88	4.0	88	4.0	0.138	8.3	LOS A	0.6	4.3	0.64	0.76	0.64	39.3
East: East West Sub-Arterial Road (E)															
4	L2	All MCs	48	4.0	48	4.0	0.314	6.9	LOS A	2.0	14.7	0.63	0.60	0.63	50.7
5	T1	All MCs	537	4.0	537	4.0	0.314	7.1	LOS A	2.0	14.7	0.64	0.62	0.64	34.0
6	R2	All MCs	38	4.0	38	4.0	0.314	11.5	LOS A	1.9	14.1	0.65	0.63	0.65	49.9
Approach			623	4.0	623	4.0	0.314	7.4	LOS A	2.0	14.7	0.64	0.62	0.64	36.7
North: North Residential															

7	L2	All MCs	9	4.0	9	4.0	0.302	7.2	LOS A	1.5	11.0	0.56	0.71	0.56	48.9
8	T1	All MCs	12	4.0	12	4.0	0.302	7.0	LOS A	1.5	11.0	0.56	0.71	0.56	50.1
9	R2	All MCs	236	4.0	236	4.0	0.302	11.2	LOS A	1.5	11.0	0.56	0.71	0.56	38.1
Approach			257	4.0	257	4.0	0.302	10.9	LOS A	1.5	11.0	0.56	0.71	0.56	39.2
West: East West Sub-Arterial Road (E)															
10	L2	All MCs	81	4.0	81	4.0	0.085	4.1	LOS A	0.4	3.2	0.23	0.49	0.23	50.2
11	T1	All MCs	232	4.0	232	4.0	0.286	3.9	LOS A	1.9	13.7	0.23	0.54	0.23	46.8
12	R2	All MCs	81	4.0	81	4.0	0.286	7.9	LOS A	1.9	13.7	0.23	0.54	0.23	47.3
12u	U	All MCs	136	0.0	136	0.0	0.286	9.9	LOS A	1.9	13.7	0.23	0.54	0.23	22.7
Approach			529	3.0	529	3.0	0.286	6.1	LOS A	1.9	13.7	0.23	0.54	0.23	42.8
All Vehicles			1498	3.6	1498	3.6	0.314	7.6	LOS A	2.0	14.7	0.48	0.61	0.48	39.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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B.6 2051 PM Peak

MOVEMENT SUMMARY

 **Site: 101 [4.5 NorthSouth SubArterial Road / EastWest SubArterial Road - 2051 PM - NRT 5050**

(Site Folder: 2051)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection of M01 with M02/M07 - 2036 with development

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 85 seconds (Site Optimum Cycle Time - Minimum Delay)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total	HV]	[Total	HV]				[Veh.	Dist]				
			veh/h	%	veh/h	%				veh	m				km/h
South: North South Sub-Arterial Road (S)															
1	L2	All MCs	11	5.0	11	5.0	0.541	27.9	LOS B	9.0	65.8	0.91	0.77	0.91	42.1
2	T1	All MCs	484	5.0	484	5.0	* 0.541	30.4	LOS C	9.1	66.7	0.92	0.77	0.92	47.3
3	R2	All MCs	115	10.0	115	10.0	0.447	42.5	LOS D	4.5	34.4	0.95	0.78	0.95	34.6
Approach			609	5.9	609	5.9	0.541	32.6	LOS C	9.1	66.7	0.92	0.77	0.92	45.3
East: East West Sub-Arterial Road (E)															
4	L2	All MCs	83	10.0	83	10.0	0.103	18.5	LOS B	1.9	14.2	0.57	0.69	0.57	44.7
5	T1	All MCs	60	10.0	60	10.0	0.115	23.7	LOS B	1.8	13.9	0.76	0.59	0.76	36.3

6	R2	All MCs	288	5.0	288	5.0	* 0.535	43.0	LOS D	5.8	42.0	0.97	0.80	0.97	36.6
Approach			432	6.7	432	6.7	0.535	35.6	LOS C	5.8	42.0	0.86	0.75	0.86	37.9
North: North South Sub-Arterial Road (N)															
7	L2	All MCs	45	5.0	45	5.0	0.066	23.1	LOS B	1.2	8.5	0.66	0.70	0.66	43.8
8	T1	All MCs	240	5.0	240	5.0	0.323	32.1	LOS C	4.4	31.8	0.90	0.72	0.90	46.7
9	R2	All MCs	61	5.0	61	5.0	0.327	45.7	LOS D	2.5	18.1	0.96	0.75	0.96	38.6
Approach			346	5.0	346	5.0	0.327	33.3	LOS C	4.4	31.8	0.88	0.72	0.88	45.0
West: East West Sub-Arterial Road (W)															
10	L2	All MCs	12	5.0	12	5.0	* 0.196	26.5	LOS B	2.5	18.9	0.85	0.68	0.85	43.3
11	T1	All MCs	135	10.0	135	10.0	0.196	30.6	LOS C	2.6	19.5	0.86	0.67	0.86	32.7
12	R2	All MCs	11	5.0	11	5.0	0.042	47.3	LOS D	0.2	1.6	0.95	0.64	0.95	36.5
Approach			157	9.3	157	9.3	0.196	31.4	LOS C	2.6	19.5	0.86	0.67	0.86	34.4
All Vehicles			1544	6.3	1544	6.3	0.541	33.5	LOS C	9.1	66.7	0.89	0.74	0.89	42.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

 **Site: 2v [5.5 EastWest SubArterial Road / School Access - 2051 PM - NRT 5050 (Site Folder: 2051)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

2036 Ultimate Development Updated TMAP Model

Site Category: (None)

Stop (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total	HV]	[Total	HV]				[Veh.	Dist]				
			veh/h	%	veh/h	%				v/c	sec				veh
East: East West Sub-Arterial Road (E)															
5	T1	All MCs	427	4.0	427	4.0	0.113	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
6	R2	All MCs	303	0.0	303	0.0	0.282	6.3	LOS A	1.3	9.2	0.44	0.64	0.44	47.8
Approach			731	2.3	731	2.3	0.282	2.6	NA	1.3	9.2	0.18	0.26	0.18	51.6
North: School Road															
7	L2	All MCs	125	0.0	125	0.0	0.104	8.0	LOS A	0.0	0.0	0.00	1.00	0.00	46.1
Approach			125	0.0	125	0.0	0.104	8.0	LOS A	0.0	0.0	0.00	1.00	0.00	46.1
West: East West Sub-Arterial Road (W)															
10	L2	All MCs	169	0.0	169	0.0	0.091	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	49.9
11	T1	All MCs	126	4.0	126	4.0	0.067	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			296	1.7	296	1.7	0.091	3.2	NA	0.0	0.0	0.00	0.33	0.00	51.7



All Vehicles	1152	1.9	1152	1.9	0.282	3.3	NA	1.3	9.2	0.12	0.36	0.12	50.7
--------------	------	-----	------	-----	-------	-----	----	-----	-----	------	------	------	------

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

 **Site: 101 [7.0 East-West Sub-Arterial Road 2051 PM 5050 (Site Folder: 2051)]**
Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Between Road 14 and Road 103
Site Category: (None)
Pedestrian Crossing (Signalised) - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 48 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance																
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed	
			[Total	HV]	[Total	HV]				[Veh.	Dist]					
			veh/h	%	veh/h	%				v/c	sec					veh
East: East-West Sub-Arterial Road																
2	T1	All MCs	696	2.0	696	2.0	* 0.310	5.5	LOS A	4.2	29.8	0.54	0.46	0.54	37.2	
Approach			696	2.0	696	2.0	0.310	5.5	LOS A	4.2	29.8	0.54	0.46	0.54	37.2	
West: East-West Sub-Arterial Road																
8	T1	All MCs	217	2.0	217	2.0	0.097	4.8	LOS A	1.1	8.0	0.46	0.37	0.46	39.3	
Approach			217	2.0	217	2.0	0.097	4.8	LOS A	1.1	8.0	0.46	0.37	0.46	39.3	
All Vehicles			913	2.0	913	2.0	0.310	5.3	LOS A	4.2	29.8	0.52	0.44	0.52	37.6	

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).



HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped Dist] ped m		Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: East-West Sub-Arterial Road												
P11	Stage 1	90	95	18.4	LOS B	0.1	0.1	0.88	0.88	172.3	200.0	1.16
P12	Stage 2	90	95	18.4	LOS B	0.1	0.1	0.88	0.88	172.3	200.0	1.16
All Pedestrians		180	189	18.4	LOS B	0.1	0.1	0.88	0.88	172.3	200.0	1.16

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

 **Site: 3 [7.5 EastWest SubArterial Road / Residential Access - 2051 PM - NRT 5050 (Site Folder: 2051)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

2036 Ultimate Development Updated TMAP Model

Site Category: (None)

Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total	HV]	[Total	HV]				[Veh.	Dist]				
			veh/h	%	veh/h	%				v/c	sec				
South: South Residential															
1	L2	All MCs	66	4.0	66	4.0	0.112	7.2	LOS A	0.4	3.2	0.57	0.71	0.57	35.9
2	T1	All MCs	12	4.0	12	4.0	0.112	7.4	LOS A	0.4	3.2	0.57	0.71	0.57	52.4
3	R2	All MCs	2	4.0	2	4.0	0.112	11.6	LOS A	0.4	3.2	0.57	0.71	0.57	50.7
Approach			80	4.0	80	4.0	0.112	7.3	LOS A	0.4	3.2	0.57	0.71	0.57	39.1
East: East West Sub-Arterial Road (E)															
4	L2	All MCs	186	4.0	186	4.0	0.335	5.1	LOS A	2.2	15.6	0.35	0.48	0.35	52.0
5	T1	All MCs	569	4.0	569	4.0	0.335	5.1	LOS A	2.2	15.6	0.35	0.50	0.35	34.8
6	R2	All MCs	147	4.0	147	4.0	0.335	9.3	LOS A	2.1	15.4	0.36	0.52	0.36	50.7
Approach			903	4.0	903	4.0	0.335	5.8	LOS A	2.2	15.6	0.35	0.50	0.35	41.9
North: North Residential															
7	L2	All MCs	2	4.0	2	4.0	0.073	5.4	LOS A	0.3	2.2	0.35	0.63	0.35	50.0
8	T1	All MCs	11	4.0	11	4.0	0.073	5.4	LOS A	0.3	2.2	0.35	0.63	0.35	51.1
9	R2	All MCs	60	4.0	60	4.0	0.073	9.6	LOS A	0.3	2.2	0.35	0.63	0.35	39.1
Approach			73	4.0	73	4.0	0.073	8.8	LOS A	0.3	2.2	0.35	0.63	0.35	41.7
West: East West Sub-Arterial Road (W)															
10	L2	All MCs	26	4.0	26	4.0	0.047	4.8	LOS A	0.2	1.6	0.37	0.51	0.37	49.5



11	T1	All MCs	164	4.0	164	4.0	0.157	4.4	LOS A	0.9	6.3	0.35	0.52	0.35	47.4
12	R2	All MCs	26	4.0	26	4.0	0.157	8.3	LOS A	0.9	6.3	0.34	0.52	0.34	47.7
12u	U	All MCs	35	0.0	35	0.0	0.157	10.3	LOS A	0.9	6.3	0.34	0.52	0.34	22.7
Approach			252	3.4	252	3.4	0.157	5.7	LOS A	0.9	6.3	0.35	0.52	0.35	45.2
All Vehicles			1307	3.9	1307	3.9	0.335	6.0	LOS A	2.2	15.6	0.37	0.52	0.37	42.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.



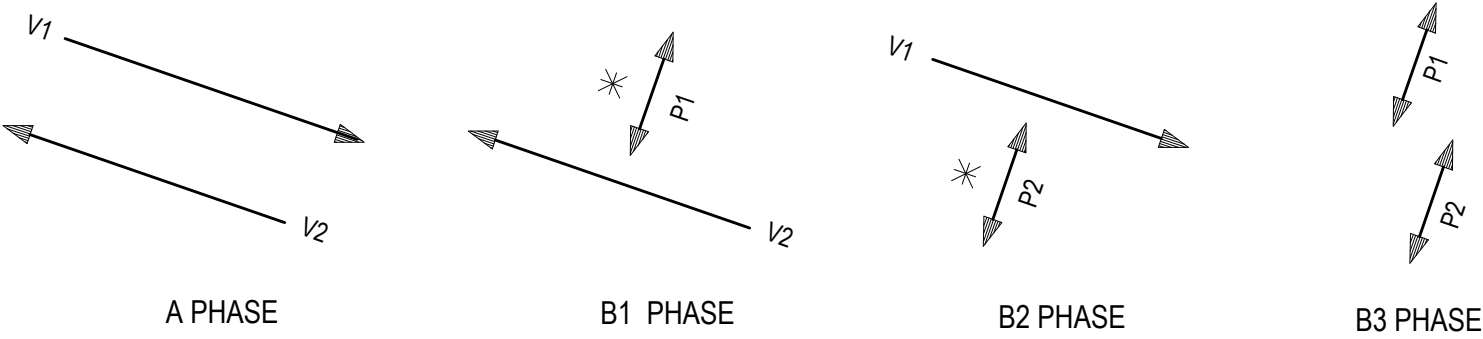
Appendix C Pedestrian signals concept plan

PEDESTRIAN SEQUENCE TABLE

PB No. ACTUATED	PEDESTRIAN SEQUENCE	PHASE MOVEMENT	REMARKS
5	P1 then P2	B1 → B2 *	* The degree of offset between pedestrian movements is variable i.e. WALK of second pedestrian may commence prior to termination of first
5 & 6			
5 & 7			
5, 6 & 7			
8			
6 & 8	P2 then P1	B2 → B1 *	
7 & 8			
6, 7 & 8			
6 & 7	P1 & P2 together	B3	Normal WALK + CLEAR
5 & 8	P1 & P2 together	B3	Increased WALK to permit pedestrians to use both crossings.
5, 6 & 8			
5, 7 & 8			
5, 6, 7 & 8			
6	P1 only	B1	
7	P2 only	B2	



MOVEMENTS



RESIDENTIAL

RESIDENTIAL

RESIDENTIAL

POSTS

					MGA CO-ORDINATES ZONE 56 / GDA2020	
POST	TYPE	LENGTH	OFFSET	REMARKS	EASTING	NORTHING
1	8	4.0	1.0	New	286306.440	6211867.812
2	8	4.0	1.0	New	286318.443	6211863.661
3	8	4.0	1.0	New	286315.502	6211855.155
4	8	4.0	1.0	New	286325.791	6211848.423
5	8	4.0	1.0	New	286322.850	6211839.917
6	8	4.0	1.0	New	286310.847	6211844.067
7	8	4.0	1.0	New	286313.789	6211852.573
8	8	4.0	1.0	New	286303.499	6211859.306
Controller					286303.572	6211874.518

NOTES

- This site is SCATS linked.
- Audio-tactile push buttons provided on posts 2, 3, 6 & 7.
- P1-P2 & P2-P1 PB's place an advance call for P2 & P1 pedestrians respectively.
- XSF5 introduces P1 & P2 concurrently (i.e. B3 Phase) and inhibits B1 and B2 Phase, when either P1 or P2 is demanded.
- Red runner software added for detectors 1-4.
- Pedestrian fence in accordance with standard road drawing R08000 series.
- Shared Path is delineated and signposted in accordance with Australian Standard AS1742.9 and Austroads guides
- Controller to be located at MGA Coordinates (Zone 56) EASTING 286303.572, NORTHING 6211874.518.
- Kerb ramps constructed in accordance with standard road drawing R0300-11.
- Civil construction works in accordance with Design Drawing DS0000/000000 prepared by Stantec.
- Supply point in accordance with Endeavour Energy electrical design drawing XXXXXX.

INCOMPLETE

- Supply point position & asset number
- Street lighting pole locations to be added

PUBLIC UTILITY LEGEND	
HYDRANT	□
STOP VALVE	▲
GAS VALVE	±
SEWER MANHOLE	⊕
COMMS PIT	■
ELECT LIGHT POLE	○
POWER POLE	○
STAY POLE	○
TELEPHONE BOX	⌈
COMMS PILLAR	●

REFERENCE PLANS	
SYMBOLS/ABRVS	VD003-6
STD POSN CMPT	VD001-5
INSTR STOP DET	VC005-17
VEH GROUP OP	TS-TN-019
DET LOGIC OP	TS-TN-020
PED MVT OP	TS-TN-021

U & D Ref.	Map 000 A0
I.S.G.	E: 270 210
CO-ORDS	N: 1 212 765
DESIGNED BY	RYAN BATES
CHECKED BY	JOHN BATES
SITE CHECKED	
RYAN BATES	
RECOMMENDED	

DESIGN APPROVAL
APPROVED
NAME: <i>R. Bates</i>
POSITION: MANAGER
DATE: 21/08/25
DESIGN PREPARED BY
B-Line Drafting
on behalf of Stantec

TFNSW RECOMMENDATION
ROAD DESIGN ENGINEERING
NAME: _____
POSITION: _____
DATE: _____
NETWORK OPERATIONS
NAME: _____
POSITION: _____
DATE: _____

TFNSW ACCEPTANCE
ACCEPTED
NAME: _____
POSITION: _____
DATE: _____
ACCEPTED BY
SECTION

TRANSPORT FOR NEW SOUTH WALES

WOLLONDILLY COUNCIL AREA
TRAFFIC SIGNALS AT
ROAD 102
WEST OF ROAD 104
NORTH WILTON

DESIGN LAYOUT

EXISTING

PROPOSED

CADD FILE: VV0000_XA_DES.dgn

SCALE 5 0 (1:200) 5 10

FILE SF0000/000000

REG No.
DS0000/000000

TCS No.
0000

ISSUE

A

SHEET

1



Stantec is a global leader in sustainable engineering, architecture, and environmental consulting. The diverse perspectives of our partners and interested parties drive us to think beyond what's previously been done on critical issues like climate change, digital transformation, and future-proofing our cities and infrastructure. We innovate at the intersection of community, creativity, and client relationships to advance communities everywhere, so that together we can redefine what's possible.

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