Construction Traffic Management Plan
57 Station Road, Seven Hills

Prepared for:

Lehr Consultants International Pty Ltd

8 June 2022

The Transport Planning Partnership

Construction Traffic Management Plan
57 Station Road, Seven Hills

Client: Lehr Consultants International Pty Ltd

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1 Introduction

1.1 Overview

The Transport Planning Partnership (TTPP) has prepared this Construction Traffic Management Plan (CTMP) report on behalf of Lehr Consultants International (LCI) to accompany a State Significant Development Application (SSD-33781208) to be submitted to the Department of Planning, Industry and Environment (DPIE). The application is for a proposal which seeks to construct a new data storage premise at 57 Station Road, Seven Hills (Lot B in DP 404669).

Activities will comprise the construction of two-storey data hall building and internal circulation road, installation of equipment plant and generators, as well as landscaping works.

This CTMP assesses the traffic, public transport, local access, pedestrian and parking implications associated with the various stages of proposed construction activities. It also provides mitigation measures, where necessary, to ensure minimal impacts on the surrounding road network.

1.2 Purpose of this Plan

The overall principles of traffic management plan during the construction works include:

- manage access to/from adjacent properties.
- manage and control construction vehicle activity in the vicinity of the site.
- provide an appropriate and convenient environment for pedestrians and cyclists.
- minimise impact on pedestrian movements.
- provide alternative detour routes.
- maintain appropriate public transport access; and
- maintain bus service reliability and minimise bus service delay.

The report has been prepared and checked by engineers who hold *RMS Prepare a Work Zone Traffic Management Plan* certification.

2 Existing Conditions

2.1 Site Context

The subject site is located at 57 Station Road, Seven Hills (Lot B DP 404669) which has an area of approximately 2.57 hectares (ha). The site is located within the Blacktown City Council local government area and is zoned as IN1 – General Industrial according to the Blacktown Local Environmental Plan (LEP) 2015.

The site is a corner lot with frontages on Station Road (south) and McCoy Street road reserve (east). To the north of the site is Blacktown Creek and to the south of the site is the Main Western Railway. Neighbouring industrial developments are located along the north-west boundary of the site and McCoy Park is located south-east of the site.

Currently vehicular access is available via three two-way driveways off Station Road. These will be shared between the two sites during construction and operational periods.

The proposed development (SYD08) is located within the rear half of the site, while the approved development application (DA-21-01058) (SYD09) is located within the front half of the site. Figure 2.1 illustrates the Proposal site and nearby surrounds.

The site was previously occupied by buildings and shipping containers which were associated with the former industrial use(s) of the site. As part of the approved DA for SYD09 (DA-21-0108) the former buildings and other structures have been demolished and removed from the site.

It should be noted that together with the SYD09, the whole site will be operated as a single campus.

Figure 2.1: Subject Site and Surrounds

2.2 Surrounding Road Network

Station Road is a two-way, two-lane divided road linking Prospect Highway to the north and Fitzwilliam Road (and Old Windsor Road) to the south. In the vicinity of the subject site, there is a posted speed limit of 60 km/h and No Stopping restrictions on both sides of the road. The width of the carriageway is 12.5 m, which includes a painted median of 1.5 m width.

McCoy Street is a local access road adjacent to the subject site. It provides access to McCoy Park, and roughly 14 angled on-street car parking spaces.

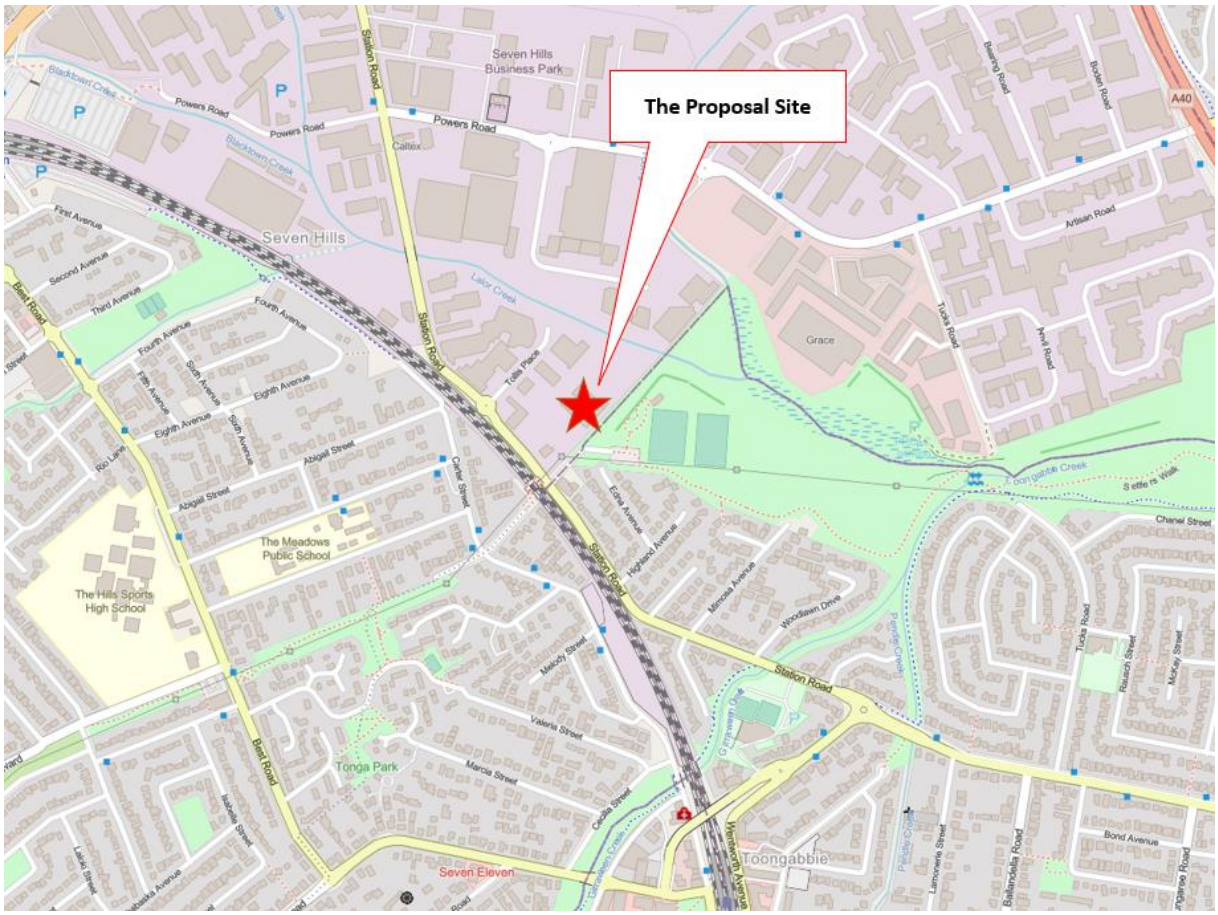
Tollis Place is two lane, two-way road, connecting with Station Road via a roundabout, located approximately 60m north of the subject site. It has a posted speed limit of 50 km/hr with unrestricted parking available on both sides of the road.

In the wider road network context, **Prospect Highway** is a six-lane, two-way arterial road that is located north of the subject site. It is the main east-west arterial connection in the vicinity. It is classified as a State road and intersects with other State roads, Seven Hill Road, Abbott Road and Johnson Avenue at a signalised junction. It provides the link to other main highways towards the north, including the M2 Motorway, M7 Motorway, and old Windsor Road. It has a posted speed limit of 60 km/h with clearway conditions.

To the south of the site, Station Road adjoins **Fitzwilliam Road** which intersects with **Old Windsor Road** further in the east direction. It is a key arterial road in Sydney spanning between Kellyville and Northmead. Generally, the carriageway is configured as a four-lane, two-way road having a posted speed limit of 80 km/h and clearway conditions. The North-West T-way runs alongside the entire length of Old Windsor Road.

Figure 2.2 shows the site within the broader surrounding road network.

Figure 2.2: Surrounding Road Network



2.3 Public Transport Facilities

The closest bus stop is located on Carter Street which is 300 m walking distance from the subject site. This bus stop is located south of the railway line and is accessed by the pedestrian overpass across the railway line. Bus routes 705 and 711 Blacktown to Parramatta service this bus stop. The frequency of services is summarised in Table 2.1.

The subject site is located at the midpoint between Seven Hills train station and Toongabbie train station. However, Toongabbie train station is slightly closer, located a 1 km walk in the south direction (13-minute walk) while Seven Hills station is 1.7 km away (22-minute walk). Both train stations are serviced by the T1 North Shore & Western Line and T5 Cumberland Line.

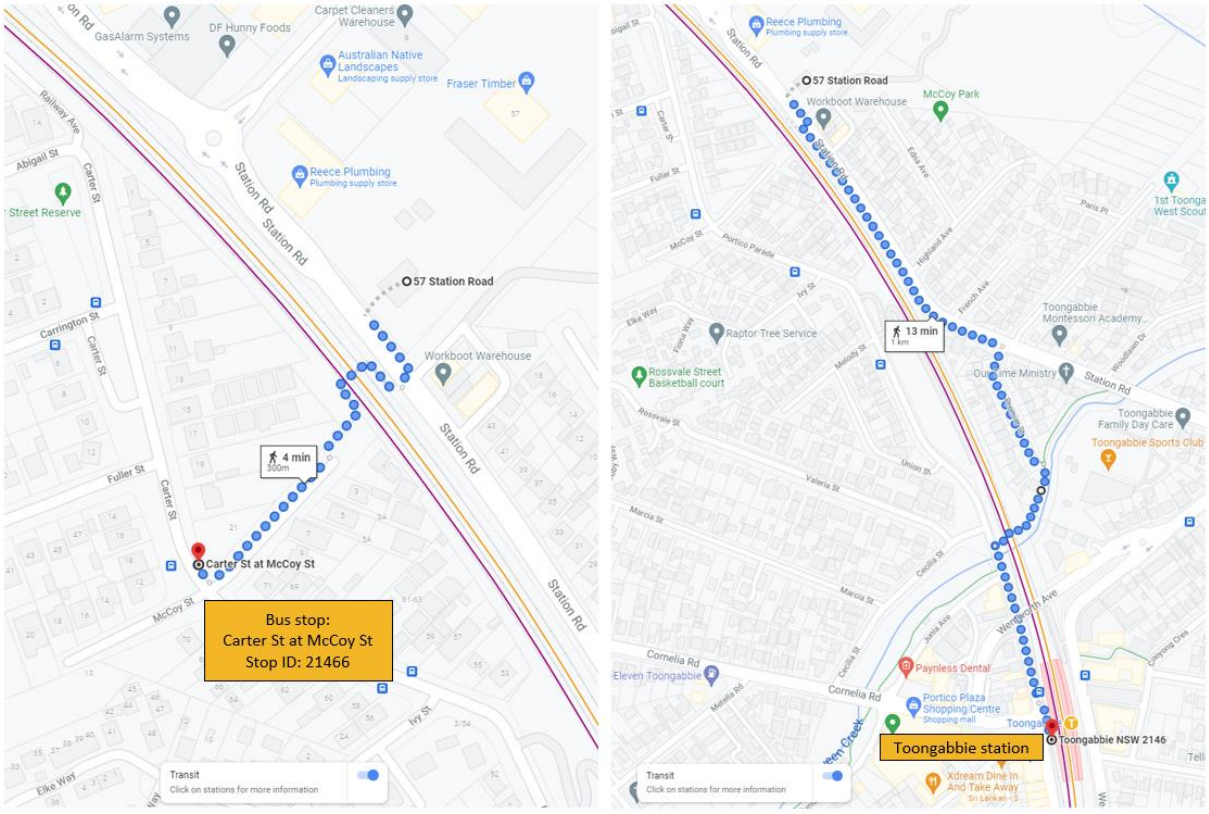
Figure 2.3 shows the site's proximity to the nearby public transport infrastructure.

Table 2.1: Existing Bus Services

Bus Route	Route Description	Frequency
705	Blacktown to Parramatta via Seven Hill	Peak: every 30 minutes Off-peak: every 1 hour
711	Blacktown to Parramatta via Wentworthville	Peak: every 15 – 30 minutes Off-peak: every 1 hour

Information Source: Transport for NSW

Figure 2.3: Site Nearby Public Transport



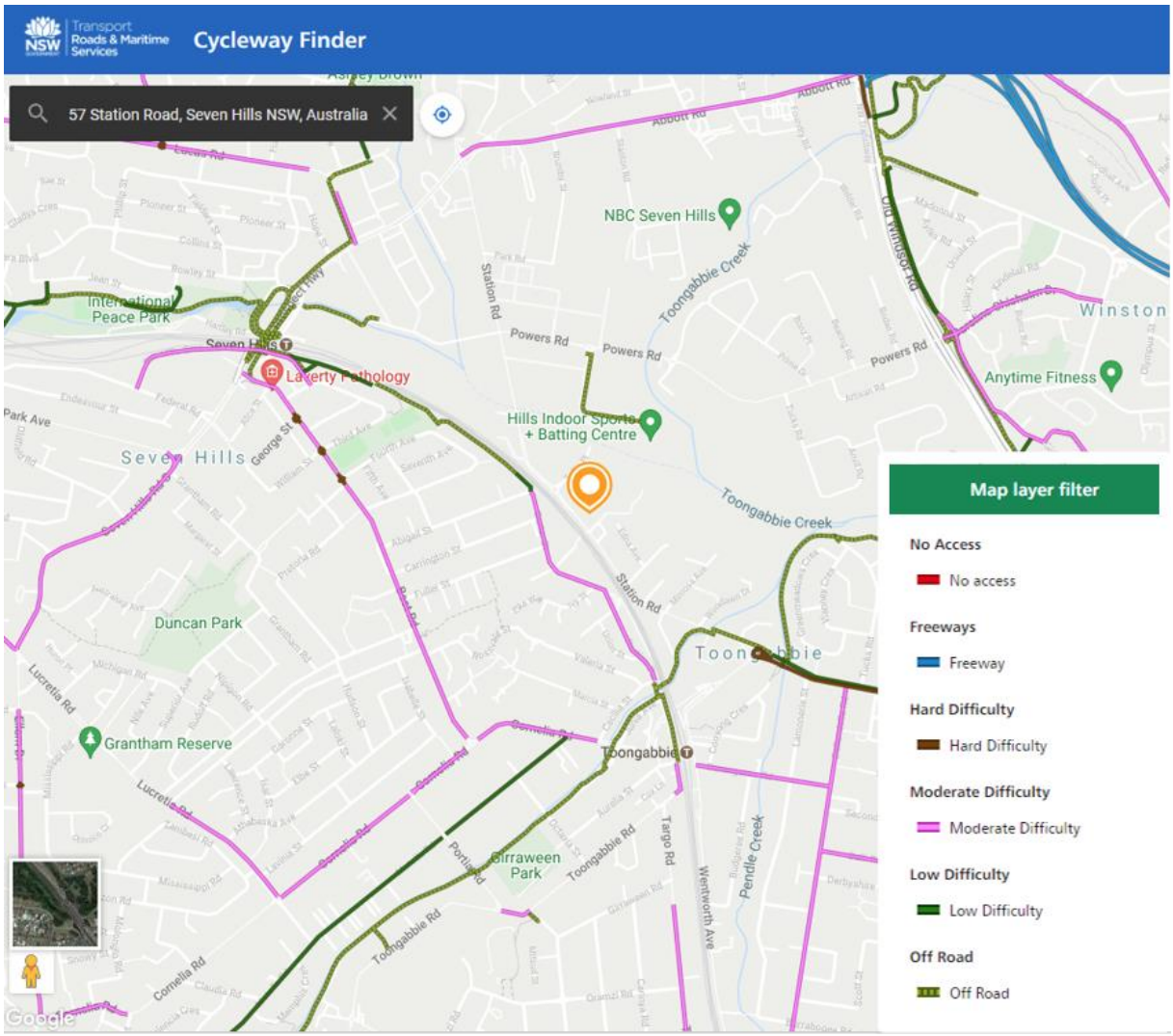
Basemap Source: Google Maps, accessed online 03/02/22

2.4 Pedestrian and Cyclist Infrastructure

There is an established footpath on the north side of Station Road (development side), and kerb ramps at McCoy Street. A zebra pedestrian crossing is located south of McCoy Street, which leads directly towards the pedestrian overpass across the railway line.

Within the immediate vicinity of the site, there are no dedicated cycleways. In the broader areas, there is mixture of on-road and off-road cycling paths as shown in Figure 2.4.

Figure 2.4: Existing Cycling Infrastructure



Basemap Source: Transport for NSW Cycleway Finder, accessed online 03/02/22

3 Proposed Construction Activities

3.1 Description of Works

Construction works as part of the proposed development would involve the construction of a two-storey data centre with a data-storage capacity of 19.2 megawatts (MW). The works will be completed in two stages as summarised in Table 3.1.

Table 3.1: Construction Stages

Stage	Activities	Start	End
Prior to SYD08 project	Demolition, earthworks, retaining wall activities	January 2022	August 2022
Stage 1	construction of the building structure with some on-grade plant installation	January 2023	May 2024
Stage 2	installation of services and internal fit-out and finishes	September 2023	September 2024

The main components of the construction works include the main building, internal circulation road around the building for vehicles, external plant and storage, generators, and landscaping works.

The data centre building will mostly comprise server racks which will extend across the first floor and second floor. The remaining area of the building will be allocated for offices, amenities, and storage area.

3.2 Hours of Construction

The construction hours will be generally limited to:

- 7:00am - 6:00pm Monday to Friday
- 8:00am - 5:00pm on Saturday.
- No work on Sunday or Public Holidays.

Some activities may be undertaken outside of these hours with the approval of the Planning Secretary, which include:

- Activities that are inaudible at non-associated receivers;
- The delivery of materials as requested by the NSW Police Force or other authorities for safety reasons; or
- Emergency work to avoid the loss of life, property and/or material harm to the environment.

3.3 Construction Workforce

On average, there would be in the order of 100 workers on-site on a daily basis. During the peak of construction, it is anticipated that there would be up to 250 workers per day.

3.4 Construction Site Access

Vehicular access to/ from the construction site (located at the rear of SYD09) is intended via the two-way driveway off Station Road as shown in Figure 3.1. The alternative arrangement would be that all vehicles enter via the northern driveway and all vehicles exit via the existing southern driveway off Station Road accompanied by one-way traffic flow through the site. However, once the Construction Contractor has been appointed for the project, the construction access arrangement would be confirmed.

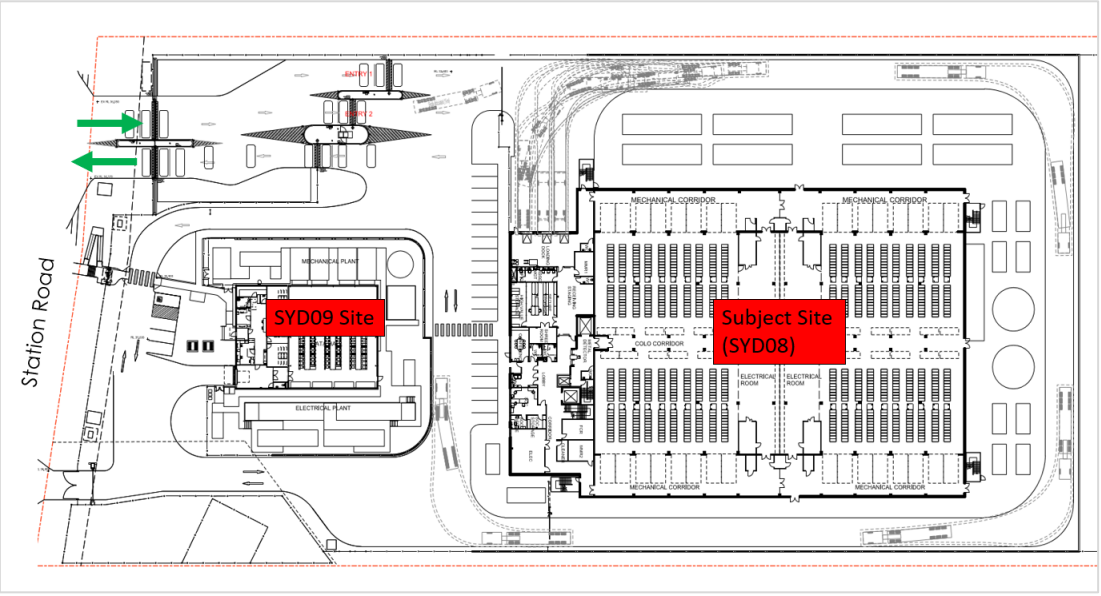
SYD09 would be operational during the construction period of the SYD08 development. There would be four staff on-site as part of the operation of SYD09.

SYD09 operations would remain entirely separate to the SYD08 development construction, separated by fencing around the SYD09 site perimeter.

It is proposed to provide construction site personnel on-site near the driveway to manage and direct construction vehicles towards the construction works area, and SYD09 staff vehicles towards the SYD09 building.

Having consideration for the low staff levels and vehicle movements at SYD09, management of vehicle movements on-site, and physical separation of SYD09 from the construction works, the proposed construction works should cause no impact on the daily operation of SYD09.

Figure 3.1: Construction Site Access

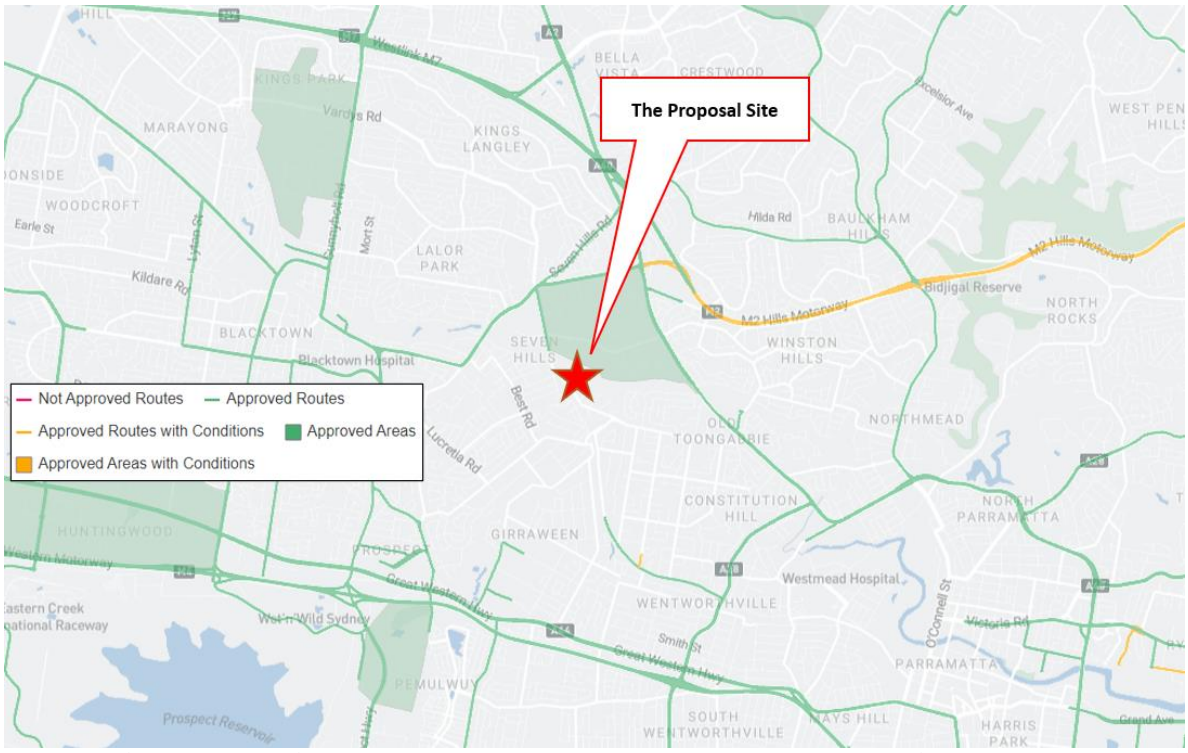


3.5 Transport Routes

Construction materials and equipment would be delivered from other suburbs throughout the greater Sydney Metropolitan Area. These vehicles would access the site from arterial roads such as Prospect Highway and Old Windsor Road before connecting to Station Road.

The National Heavy Vehicle Regulator (NHVR) specifies regulations for all heavy vehicles and provides an online journey planner tool, which is used to identify the acceptable transport routes for various types of vehicles. The largest vehicle to be used for construction is expected to be a 19 m semi-trailer. Figure 3.2 shows the NHVR network map for a 19 m semi-trailer along with some conditions on the road network.

Figure 3.2: 19m-Semitrailer Network Map

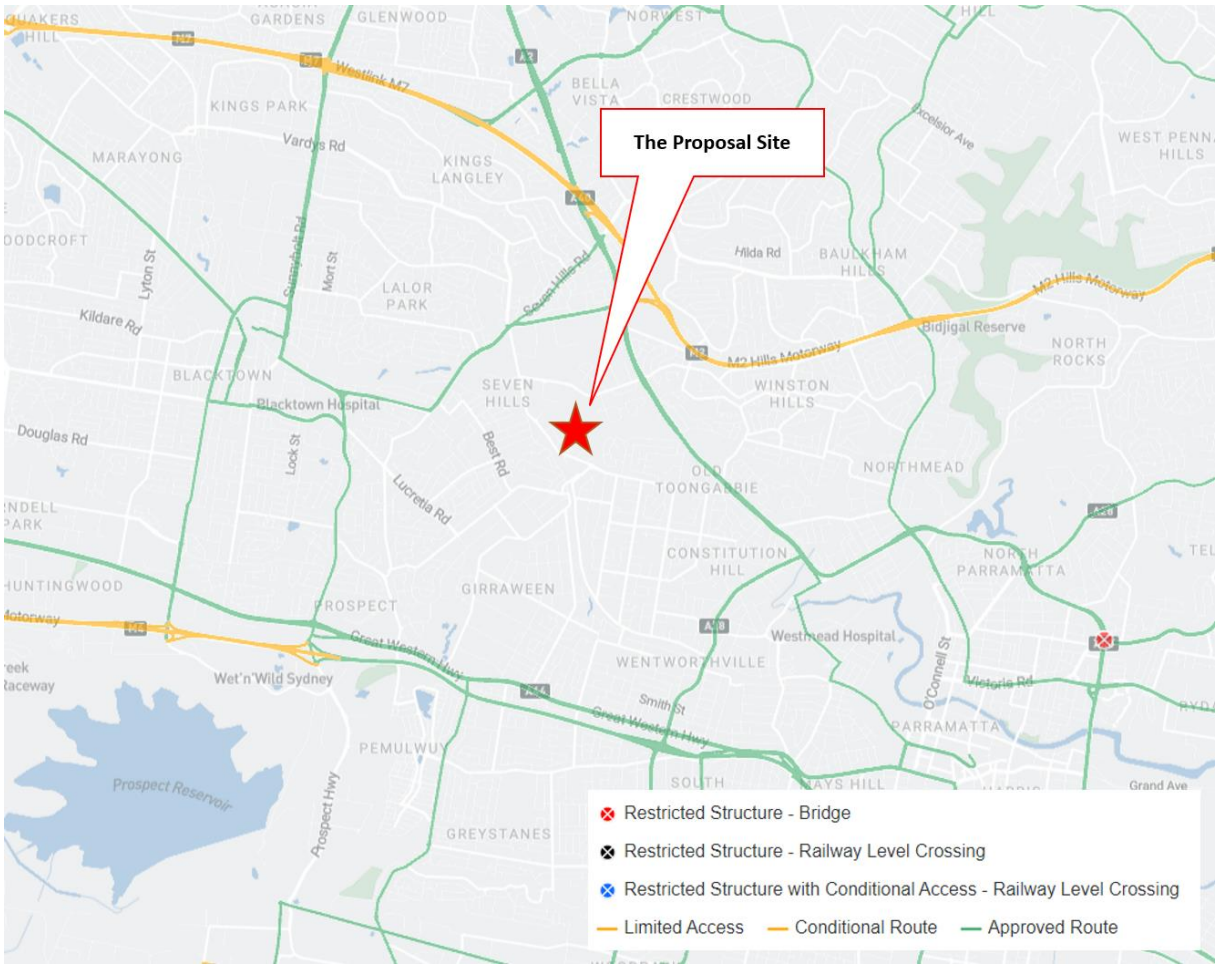


Source: National Heavy Vehicle Regulator (NHVR) Portal Rote Planner Tool, accessed online on 04/03/2022

It is noted that Oversize/ Overmass (OSOM) may be required to deliver generators and bulky plant to the subject. According to the Class 1 Notice, Ministerial Order is required for OSOM vehicles to travel throughout the NSW road network. Depending on the dimensions of the OSOM vehicle and the travel conditions, a pilot vehicle and escort vehicle may be required. Whether pilot vehicles and escort vehicles are required will be determined once details of any oversize/ overmass infrastructure is known. This will occur once the Construction Contractor has been appointed for the project.

Figure 3.3 shows the NHVR network map for OSOM vehicles along with some conditions on the road network.

Figure 3.3: OSOM Network Map



Source: National Heavy Vehicle Regulator (NHVR) Portal Rote Planner Tool, accessed online on 04/03/2022

Workers traveling by private vehicle would generally travel from surrounding residential suburbs using arterial roads such as Old Windsor Road, Prospect Highway or Abbott Road. Then, they would continue their commute along Station Road to access the subject site.

Considering the site's proximity to surrounding public transport network, workers can also access the site via train and bus with walking. The site is located between Seven Hills train station and Toongabbie train station. However, Toongabbie train station is slightly closer, located a 1 km walk in the south direction (13-minute walk) while Seven Hills station is 1.7 km away (22-minute walk). Both train stations are serviced by the T1 North Shore & Western Line and T5 Cumberland Line. The closest bus stop is located on Carter Street, a 300 m walking distance from the site. This bus stop is located south of the railway line, and is accessed by the pedestrian overpass across the railway line.

Use of public transport and car-pooling would be highly encouraged amongst construction workers since there will be a limited number of construction car parking spaces available on-site (see Section 3.6 for details).

3.6 Construction Worker Parking

Car parking would be provided on-site during construction, and would be located such that construction works and vehicle circulation on-site are uninterrupted. A minimum of 25 construction parking spaces would be provided on-site. Car-pooling amongst workers and use of public transport would be strongly encouraged. Secure storage areas would be provided on-site for tools and equipment of workers to reduce car dependency for workers.

Some workers may already live close to good public transport connections, and therefore, using public transport would be the natural choice for them. Notwithstanding this, to further encourage workers to travel to work by public transport a shuttle bus service would be proposed to operate from the two nearest major transport interchanges, Seven Hills train station and Blacktown train station, and the nearest train station being Toongabbie.

At Seven Hill train station, there is a commuter car park with some 1,600 parking spaces. Surrounding Blacktown train station there are several unrestricted car parking areas including:

- Commuter car park accessed off George Street – approx. 500 spaces.
- Commuter car park accessed off Richmond Road – 72 spaces.
- Blacktown Council Parking Area No. 12 off Boys Avenue – 130 spaces.
- Blacktown Council Parking Area No. 12 off Humphries Lane – 102 spaces.

Toongabbie train station is located a 1 km walk (13-minute walk) from the site which is a reasonable walking distance to/from work. Notwithstanding this, a shuttle service to Toongabbie train station would be proposed. Near Toongabbie train station, there are some 50 unrestricted car parking spaces on the west side of Junia Avenue.

As described in Section 3.3, there would be in the order of 100 workers on-site on a daily basis. Day to day, it is estimated that a minimum of 50% of the workforce would travel by public transport and either walk to the site or utilise the shuttle bus services. The remaining workers would carpool and be parked on-site.

During the peak of construction, it is anticipated that there would be up to 250 workers per day. The Construction Contractor would be encouraged to target a car occupancy rate of 2 persons per vehicle as a minimum for the peak construction period. During this time, the number of shuttle bus services would be maximised to improve site accessibility for the majority of workers who would be travelling by public transport and/or parking at surrounding station commuter car parking areas.

Seven Hills train station is 5 km (10-minute) round-trip from the subject site. On this basis, there could be in the order of 5-6 shuttle services per hour provided before and after the work day. Blacktown train station is 12 km (25-minute) round-trip from the subject site, therefore, there could be 2 shuttle services per hour provided before and after the work day. Toongabbie train station is 3 km (5-minute) round-trip from the subject site and, as, such there could be in the order of 10-12 shuttle services per hour provided before and after the work day.

The Proponent is in consultation with Parramatta City Council regarding the use of the McCoy Street park car parking area for overflow construction worker parking during the peak of construction works. From recent Nearmap aerial imagery, McCoy Park car park appears to be unused Monday to Friday. Construction works on Saturday are not expected to be as intensive as weekdays. Therefore, the workforce and worker car parking demands would be significantly reduced on Saturday and could be accommodated for on the subject site.

The McCoy Street park car parking area would be able to accommodate 65 car parking spaces with the dimensions in accordance with AS28590.1:

- 2.4 m parking space width.
- 5.4 m parking space length.
- 6.9 m aisle width (which complies with the minimum requirement for 5.8m).
- 1.0 m blind aisle extension beyond the last parking space.

An indicative layout of the potential construction car parking within the McCoy Park car park is shown in Figure 3.4.

Figure 3.4: McCoy Park Construction Parking (Indicative Layout)

In total, the proposed car parking arrangement could accommodate up to 90 car parking spaces (25 spaces on-site plus 65 spaces in McCoy Park car park).

Alternatively, Binalong Park is in the vicinity of the site and its car park has potential to be used as overflow construction parking Monday to Friday during the day. This park is located 4.5 km (6-minute) round-trip from the subject site, and thus, a shuttle bus service would be proposed to transport workers between the site and Binalong Park.

The car park is split into two sections as shown in Figure 3.5. It would be proposed to utilise the south parking area, which contains 84 car parking spaces. From recent Nearmap aerial imagery, the south car park appears to be less utilised than the north car park, and mostly vacant Monday to Friday.

Binalong Park is located within the Parramatta City Council local governments area. Therefore, if the car park is proposed to be used instead of McCoy Park consultation would be undertaken between Parramatta City Council and the Proponent with the Construction Contractor.

Figure 3.5: Binalong Park (Contingency Construction Parking)

4 Construction Impacts Assessment

4.1 Traffic Generation

Construction activities are anticipated to generate approximately 30 heavy vehicles per day during the standard construction period. During the peak of construction, it is anticipated that there would be up to 80 heavy vehicles per day. These vehicle movements would occur throughout the day. Assuming 10% of the daily vehicle generation occurs in the road network peak periods (7:30am-8:30am and 4:15pm-5:15pm), there could be around:

- 3 heavy vehicles (6 trips) per hour during standard construction periods,
- 8 heavy vehicles (16 trips) per hour during peak construction periods.

Workers would commute to/ from site before the construction start time and after the construction end time, which fall outside of the road network peak periods.

4.2 Traffic Modelling

SIDRA intersection modelling, using version 9 software, has been carried out to determine the impacts of construction vehicles during the road network peak periods. To assess the "worst case" scenario, the peak construction period has been modelled i.e. 8 heavy vehicles (16 trips) per hour.

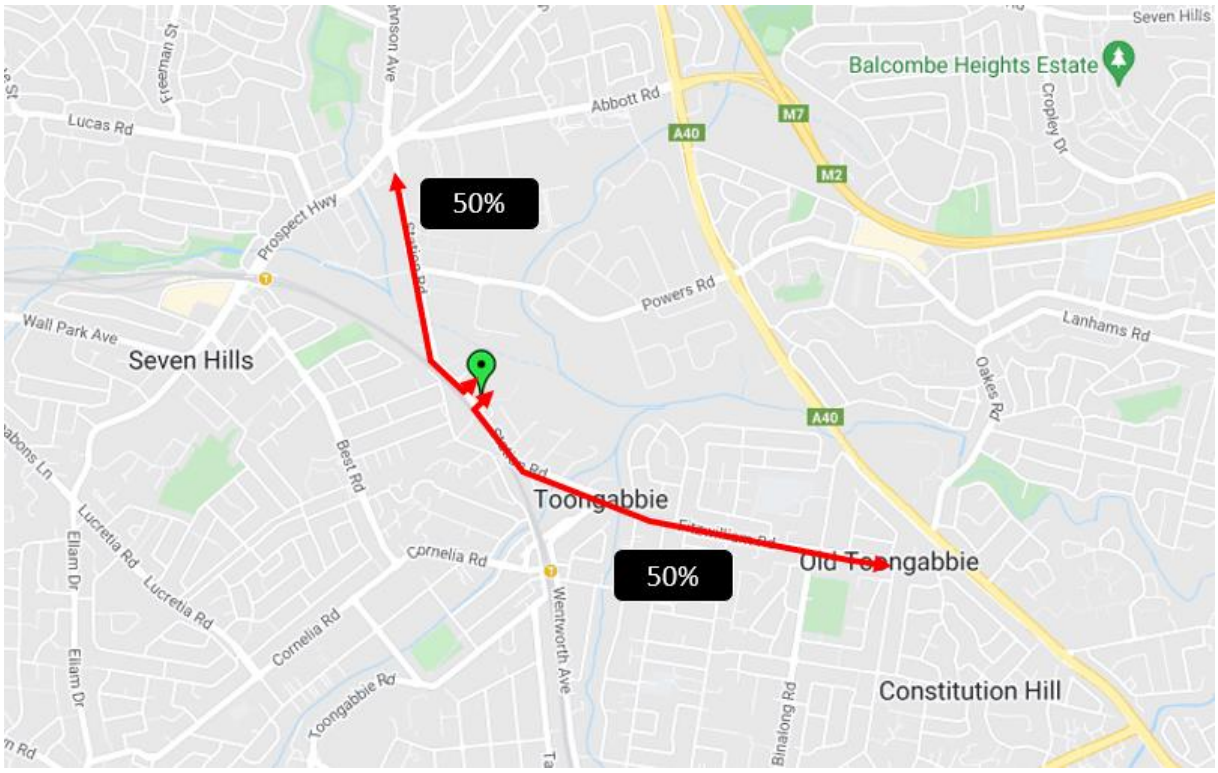
4.2.1 Trip Distribution on Surrounding Network

Without having engaged a Construction Contractor at this stage of the project, it is anticipated that construction vehicles would access the site from the arterial road network form the north-east direction (Prospect Highway, Abbott Road, M2 Motorway, and/or M7 Motorway) and south-east direction (Old Windsor Road and Cumberland Highway).

The split of construction vehicles from the north and south is expected to be equal (50:50) from both directions.

At the Tollis Place/ Station Road intersection, all construction vehicles would travel north-west on Station Road towards Prospect Highway/ Abbott Road. At the Station Road/ Fitzwilliam Road/ Wentworth Avenue intersection, construction vehicles would be expected to travel eastbound on Fitzwilliam Road towards Cumberland Highway.

Figure 4.1: Directional Split on Surrounding Network



4.2.2 Directional Split at Site Access

During the peak of construction, it is expected that there would be 8 construction vehicles accessing the site which equates to 16 vehicle trips during each peak hour. These vehicles would follow a 50:50 directional split i.e. 8 vehicles entering the site and 8 vehicles exiting the site in each peak hour.

4.2.3 Level of Service Criteria

Transport for NSW (TfNSW) uses level of service as a performance measure to indicate the operating efficiency of a given intersection. The level of service ranges from A to F. Level of service between A and D indicate the intersection is operating within capacity. With LoS A providing exceptionally good performance to LoS D indicating satisfactory performance, LoS E and F indicate the intersection is operating at or near capacity and generally would require intersection improvement works to maintain reasonable performance.

The level of service is directly related to the average delay experienced by vehicles travelling through the intersection. At signalised intersections, the average delay is the volume of weighted average delay over all movements. For roundabouts and priority (give way and stop sign) controlled intersections, the average delay relates to the movement with the highest average delay per vehicle.

Table 4.1 shows the criteria that TfNSW adopt in assessing the level of service at intersections.

Table 4.1: Intersection Level of Service Criteria

Level of Service (LoS)	Average Delay per vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Sign
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	Near capacity	Near capacity, 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, requires additional capacity	Unsatisfactory, requires other control mode or major treatment

4.3 Cumulative Traffic Impacts

DPIE's Major Projects website and Council's online DA tracker have been reviewed for projects within the vicinity which are proposed or have been approved. At the time of preparing this TIA, both sources indicate that there are no relevant projects to be considered in the cumulative traffic assessment.

SYD09 would be operational during the construction period of the SYD08 development. There would be four staff on-site as part of the operation of SYD09. SYD09 staff would be on-site for their shift between 7am-7pm. Having consideration for the employee shift start and end times which would occur outside of the road network peak periods, there would be no impacts caused by SYD09 during the modelled peak hours (7:30am-8:30am and 4:15pm-5:15pm). There would be minimal cumulative traffic impacts between SYD09 operation and SYD08 construction given the low traffic generation of the SYD09 operation which would be in the order of 4 incoming vehicle trips before 7am and 4 outgoing vehicle trips after 7pm. SYD09 operations would remain entirely separate to the SYD08 development construction, separated by fencing around the SYD09 site perimeter.

4.4 Modelled Scenarios

Scenarios that have been modelled using SIDRA are as follows:

- Scenario 0 – Existing conditions (base case).
- Scenario 1 – Existing conditions with construction traffic.

4.5 Traffic Modelling Results

The SIDRA modelling results indicate the modelled nearby intersections currently operate at a very good level of service (LoS B).

Having consideration for the construction traffic generation, the nearby intersections continue to operate at a very good level of service (LoS B) with very minimal impact to average delay per vehicle. However, there is an exception for the Station Road/ McCoy Street intersection. The worst performing movement at this intersection has a LoS E and LoS F in the AM peak and PM peak periods, respectively. Detailed analysis of the operation at this intersection is provided herein.

4.5.1 Station Road / McCoy Street Intersection

S0 – Existing Conditions

It is important to recognise that the LoS E in the AM peak period is as a result of the right-turn movement out of McCoy Street north approach onto Station Road. There is one vehicle turning right-out of McCoy Street across the one-hour period. In reality, circulating vehicles at the roundabouts located either side of McCoy Street (at Tollis Place and Wentworth Avenue) would cause gaps in traffic flow on Station Road which would allow the vehicle to exit McCoy Street.

The next worst approach is the right-turn movement from Station Road east approach onto McCoy Street. This movement operates at LoS B under existing and future conditions in the peak periods. Thus, it is apparent that the right-turn movement out of McCoy Street is the cause of the overall poor level of service for the intersection, and therefore, is considered as not giving a true representation of the performance of this intersection as a whole. As such, the second worst movement has been reported in the SIDRA results summary in Table 4.2.

In the PM peak period, the overall intersection LoS F is also due to the right-turn movement out of the McCoy Street approach. This occurs on the basis that SIDRA software does not process turning movements with a zero value and, during the surveyed peak hour, there were no vehicles turning right onto Station Road. However, in order to perform this analysis, one vehicle trip has been input in SIDRA for the right-turn movement which generates the poor performance. Reporting this movement as the 'worst movement' for the intersection is considered to inaccurately present the actual intersection performance. As such, the second worst movement has been reported in in Table 4.2.

S1 – Construction Period

Similarly, the second worst movement has been reported in the construction period for a like-for-like comparison with existing conditions.

4.5.2 Station Road / Site Access Intersection

S0 – Existing Conditions

As the site is currently vacant, there were no turning movements in or out of the site. Therefore, the site access not been modelled under existing conditions.

S1 – Construction Period

Having consideration for construction vehicles, the Station Road / Site Access intersection would operate at LoS F as a result of the 8 construction vehicles exiting the site onto Station Road. However, this does not provide a true representation of the actual intersection performance as circulating vehicles at the roundabouts located either side of the site access (at Tollis Place and Wentworth Avenue) would cause gaps in traffic flow on Station Road which would allow the construction vehicles to exit site.

The next worst movement would be the Station Road east approach operating at a LoS B in the AM peak and LoS D in the PM peak. In the PM peak period, there would be 4 vehicles turning right into the site access which equates to an average of one vehicle every 15 minutes across the one-hour period. In reality, this would not result in any impacts to traffic flow on Station Road as there would be gaps in the traffic flow caused by the upstream roundabout at Tollis Street.

In a worst case scenario, should there be more than one construction vehicle which arrives at the same time (waiting to turn right into the site access) there would be sufficient space within the traffic lane and painted median along the site frontage for the through movement on Station Road to pass the vehicles entering the site. The width of the north-west traffic lane including median is 7.0m as shown in Figure 4.2. This would be able to accommodate 2 x 2.5m-wide heavy vehicles with the following clearances:

- 0.5m clearance between the kerb and the passing heavy vehicle,
- 0.5m clearance between the two heavy vehicles travelling in the same direction, and
- 1.0m clearance between the heavy vehicle waiting to turn at the site access and a vehicle travelling in the opposite direction.

Therefore, reporting the above-mentioned movements as the 'worst movement' for the intersection is considered to inaccurately present the actual intersection performance. As such, the next worst movement has been reported in Table 4.2.

SIDRA modelling results for the road network peak periods are summarised Table 4.2 while the detailed SIDRA movement summary outputs are contained in Appendix B.

Table 4.2: SIDRA Modelling Results

Intersection	Peak Period	Scenario 0 – Existing Conditions		Scenario 1 – Peak Construction	
		Ave Delay (s)	LoS	Ave Delay (s)	LoS
Station Rd/ Tollis Pl	AM	16	B	16	B
	PM	21	B	21	B
Station Rd/ Site Access	AM	N/A [a]	N/A [a]	4	A
	PM	N/A [a]	N/A [a]	4	A
Station Rd/ McCoy St	AM	17	B	17	B
	PM	26	B	27	B
Station Rd/ Fitzwilliam Rd/ Wentworth Ave	AM	17	B	17	B
	PM	20	B	20	B

Notes:
a) Not applicable as the site is currently vacant, there were no turning movements in or out of the site. Therefore, the site access not been modelled under existing conditions.

Figure 4.2: Station Road North-West Traffic Lane

Source: Nearmap aerial imagery, viewed online 31/05/22

4.6 Pedestrian and Cyclist Impacts

Construction works would take place within the site boundary. There will be site fencing installed along the site boundary line (as part of DA-21-01058) which will provide separation between the footpath on Station Road and the subject site. The proposed construction works would not result in any impacts to pedestrians using the public footpath.

As assessed above, there would be 4 construction vehicles travelling from the north-west direction and 4 construction vehicles travelling from the south-east direction on Station Road during the construction peak period. This low number of additional vehicles on the local road network would not negatively impact cyclists on the surrounding network.

4.7 Public Transport Impacts

Construction traffic generation is expected to be low, and unlikely to result in any impacts to public transport routes in the broader road and transport network.

4.8 Emergency Services

Emergency service vehicles will be permitted access through the construction site area of SYD08, as well as the operational area of SYD09.

5 Traffic Management Measures

5.1 Traffic and Pedestrian Control Plan

A site-specific Traffic Control Plan (TCP) has been prepared and designed in accordance with Roads and Maritime Traffic Control at Works Sites manual. The TCP is provided in Appendix A.

Advisory road signs would be installed on Station Road to warn drivers approaching the site location of construction trucks turning, and signage would be installed at the site exit driveway, so construction vehicle drivers are aware of pedestrians and cyclists. All advisory signs would be installed in accordance with AS 1742.3 *Manual of Uniform Traffic Control Devices - Traffic Control Devices for Works on Roads.* Signs would be installed and maintained throughout the construction period where it applies.

5.2 Inspection of Traffic Control Measures

Temporary traffic controls will be regularly inspected by the Construction Contractor to identify potential safety hazards to enable implementation of corrective solutions. Daily inspections and maintenance of controls will be undertaken by the contractor and maintenance will be recorded. The site supervisor will check all relevant traffic control management measures on-site prior to commencement of works each day.

5.3 Worker Induction

All workers and subcontractors on-site would be required to undergo a site induction. The induction will include details of transport routes to/ from the site and on-site parking, as well as standard environmental, OH&S, driver protocols and emergency procedure. This would be the responsibility of the Construction Contractor once appointed.

5.4 Vehicle Access and Transport Routes

All construction vehicles will enter and exit the site in a forward direction, and all loading/ unloading shall be undertaken on-site during the approved work hours. Other protocols would be in place to ensure:

- site inductions are implemented for construction workers.
- heavy vehicle drivers shall adhere to the nominated transport routes.
- heavy vehicle drivers and construction workers are aware of pedestrians and cyclists in the vicinity of the site.
- drivers shall be aware of existing sign posted speed limits.

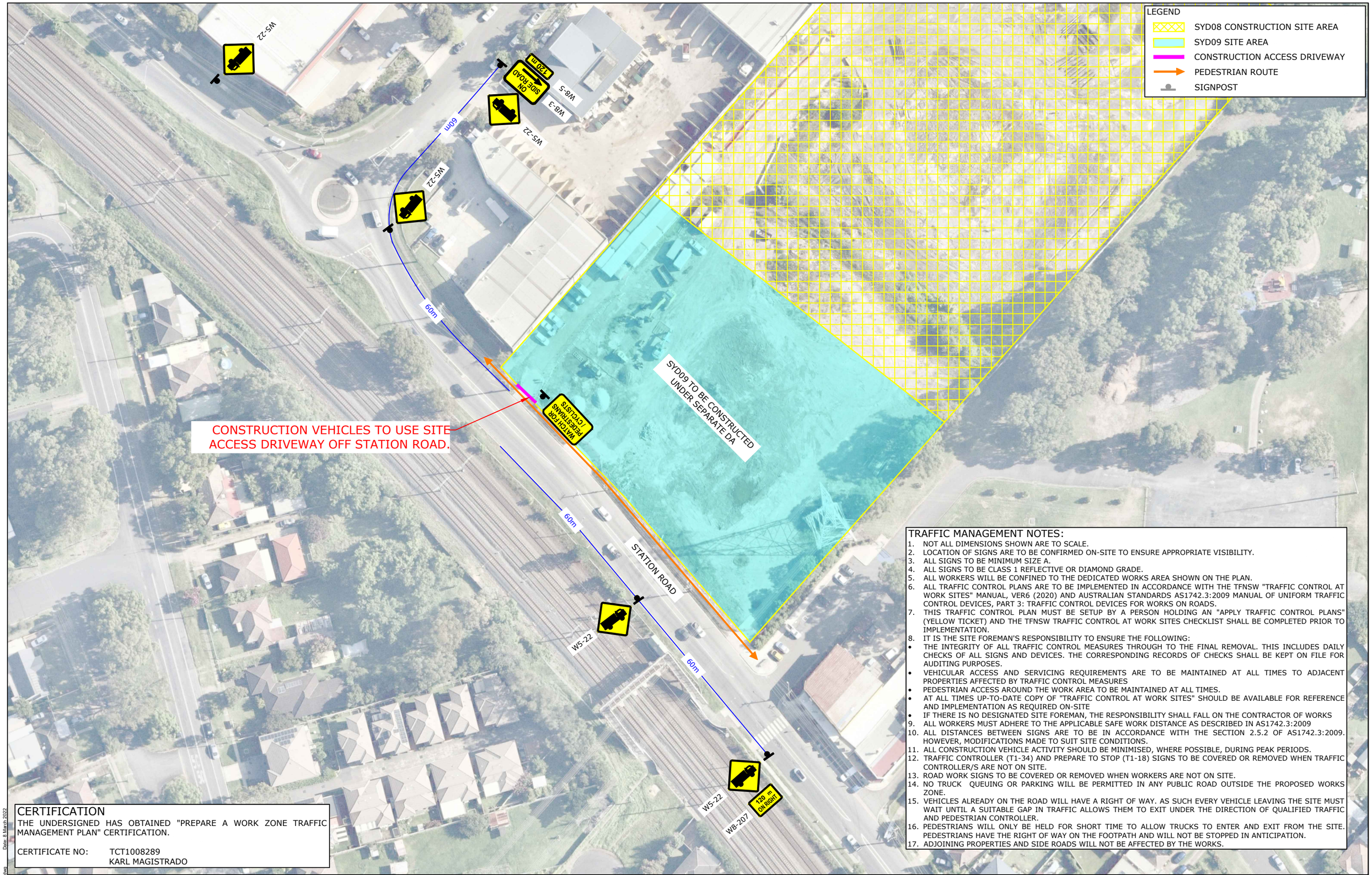
6 Conclusion

The key findings of the assessment are as follows:

- The proposed construction works would be fully contained within the site, and would not cause any impacts on the surrounding road network.
- Overall, construction traffic impacts would be minor considering that there would be a low number of heavy vehicles generated during the road network peak periods, and the arrival/ departure of construction workers is expected to occur outside of the road network peak periods.
- Construction staff parking would be accommodated off-street via on-site car parking, and within nearby available car parks. Consultation with Council is underway regarding utilising nearby car parks during the peak of the construction works as overflow construction staff parking.
- Construction workers would be strongly encouraged to travel to work using public transport. To support this measure, a shuttle bus service would be proposed to operate from the two nearest major transport interchanges, those being Seven Hills train station and Blacktown train station to transport workers to/from the site.
- Construction works and construction vehicle movements would not result in any adverse safety or operational impacts on the surrounding road network, pedestrians and cyclists, public transport capacity, and emergency services.

Appendix A

Traffic Control Plan



TRAFFIC MANAGEMENT NOTES:

1. NOT ALL DIMENSIONS SHOWN ARE TO SCALE.
2. LOCATION OF SIGNS ARE TO BE CONFIRMED ON-SITE TO ENSURE APPROPRIATE VISIBILITY.
3. ALL SIGNS TO BE MINIMUM SIZE A.
4. ALL SIGNS TO BE CLASS 1 REFLECTIVE OR DIAMOND GRADE.
5. ALL WORKERS WILL BE CONFINED TO THE DEDICATED WORKS AREA SHOWN ON THE PLAN.
6. ALL TRAFFIC CONTROL PLANS ARE TO BE IMPLEMENTED IN ACCORDANCE WITH THE TFNSW "TRAFFIC CONTROL AT WORK SITES" MANUAL, VER6 (2020) AND AUSTRALIAN STANDARDS AS1742.3:2009 MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, PART 3: TRAFFIC CONTROL DEVICES FOR WORKS ON ROADS.
7. THIS TRAFFIC CONTROL PLAN MUST BE SETUP BY A PERSON HOLDING AN "APPLY TRAFFIC CONTROL PLANS" (YELLOW TICKET) AND THE TFNSW TRAFFIC CONTROL AT WORK SITES CHECKLIST SHALL BE COMPLETED PRIOR TO IMPLEMENTATION.
8. IT IS THE SITE FOREMAN'S RESPONSIBILITY TO ENSURE THE FOLLOWING:
   - THE INTEGRITY OF ALL TRAFFIC CONTROL MEASURES THROUGH TO THE FINAL REMOVAL. THIS INCLUDES DAILY CHECKS OF ALL SIGNS AND DEVICES. THE CORRESPONDING RECORDS OF CHECKS SHALL BE KEPT ON FILE FOR AUDITING PURPOSES.
   - VEHICULAR ACCESS AND SERVICING REQUIREMENTS ARE TO BE MAINTAINED AT ALL TIMES TO ADJACENT PROPERTIES AFFECTED BY TRAFFIC CONTROL MEASURES
   - PEDESTRIAN ACCESS AROUND THE WORK AREA TO BE MAINTAINED AT ALL TIMES.
   - AT ALL TIMES UP-TO-DATE COPY OF "TRAFFIC CONTROL AT WORK SITES" SHOULD BE AVAILABLE FOR REFERENCE AND IMPLEMENTATION AS REQUIRED ON-SITE
   - IF THERE IS NO DESIGNATED SITE FOREMAN, THE RESPONSIBILITY SHALL FALL ON THE CONTRACTOR OF WORKS
9. ALL WORKERS MUST ADHERE TO THE APPLICABLE SAFE WORK DISTANCE AS DESCRIBED IN AS1742.3:2009
10. ALL DISTANCES BETWEEN SIGNS ARE TO BE IN ACCORDANCE WITH THE SECTION 2.5.2 OF AS1742.3:2009. HOWEVER, MODIFICATIONS MADE TO SUIT SITE CONDITIONS.
11. ALL CONSTRUCTION VEHICLE ACTIVITY SHOULD BE MINIMISED, WHERE POSSIBLE, DURING PEAK PERIODS.
12. TRAFFIC CONTROLLER (T1-34) AND PREPARE TO STOP (T1-18) SIGNS TO BE COVERED OR REMOVED WHEN TRAFFIC CONTROLLER/S ARE NOT ON SITE.
13. ROAD WORK SIGNS TO BE COVERED OR REMOVED WHEN WORKERS ARE NOT ON SITE.
14. NO TRUCK QUEUING OR PARKING WILL BE PERMITTED IN ANY PUBLIC ROAD OUTSIDE THE PROPOSED WORKS ZONE.
15. VEHICLES ALREADY ON THE ROAD WILL HAVE A RIGHT OF WAY. AS SUCH EVERY VEHICLE LEAVING THE SITE MUST WAIT UNTIL A SUITABLE GAP IN TRAFFIC ALLOWS THEM TO EXIT UNDER THE DIRECTION OF QUALIFIED TRAFFIC AND PEDESTRIAN CONTROLLER.
16. PEDESTRIANS WILL ONLY BE HELD FOR SHORT TIME TO ALLOW TRUCKS TO ENTER AND EXIT FROM THE SITE. PEDESTRIANS HAVE THE RIGHT OF WAY ON THE FOOTPATH AND WILL NOT BE STOPPED IN ANTICIPATION.
17. ADJOINING PROPERTIES AND SIDE ROADS WILL NOT BE AFFECTED BY THE WORKS.

CERTIFICATION

THE UNDERSIGNED HAS OBTAINED "PREPARE A WORK ZONE TRAFFIC MANAGEMENT PLAN" CERTIFICATION.

CERTIFICATE NO: TCT1008289
KARL MAGISTRADO

Date: 8 March 2022

Filename: 20407CAD005-220308-TCP.dwg

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	SB	KH	08/03/22

ttpp transport planning

PROJECT: 57 STATION ROAD, SEVEN HILLS

TITLE: TRAFFIC CONTROL PLAN

DWG No. 20407CAD005 FIGURE 1

DATE STAMP 08 MARCH 2022

PROJECT No.	SCALE	REV.
20407	NTS	A

Appendix B

SIDRA Modelling Movements Summary Outputs

MOVEMENT SUMMARY

Site: 101 [EB AM - Station Rd / Tollis Pl (Site Folder: Exisiting Base)]

2022 Modelling by Sokan 7:30-8:30
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Station Rd														
2	T1	1049	56	1104	5.3	0.730	3.7	LOS A	6.9	50.7	0.27	0.43	0.27	52.9
3	R2	18	1	19	5.6	0.730	7.4	LOS A	6.9	50.7	0.27	0.43	0.27	44.6
3u	U	2	0	2	0.0	0.730	9.3	LOS A	6.9	50.7	0.27	0.43	0.27	33.3
Approach		1069	57	1125	5.3	0.730	3.8	LOS A	6.9	50.7	0.27	0.43	0.27	52.8
North: Tollis Pl														
4	L2	15	4	16	26.7	0.075	11.0	LOS A	0.4	3.4	0.72	0.78	0.72	30.1
6	R2	28	5	29	17.9	0.075	14.7	LOS B	0.4	3.4	0.72	0.78	0.72	44.7
6u	U	1	0	1	0.0	0.075	15.8	LOS B	0.4	3.4	0.72	0.78	0.72	38.5
Approach		44	9	46	20.5	0.075	13.5	LOS A	0.4	3.4	0.72	0.78	0.72	41.3
West: Station Rd														
7	L2	30	8	32	26.7	0.536	4.8	LOS A	2.9	21.0	0.10	0.44	0.10	49.4
8	T1	769	37	809	4.8	0.536	4.6	LOS A	2.9	21.0	0.10	0.44	0.10	50.4
9u	U	10	0	11	0.0	0.536	10.4	LOS A	2.9	21.0	0.10	0.44	0.10	56.1
Approach		809	45	852	5.6	0.536	4.7	LOS A	2.9	21.0	0.10	0.44	0.10	50.5
All Vehicles		1922	111	2023	5.8	0.730	4.4	LOS A	6.9	50.7	0.21	0.44	0.21	51.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [EB AM - Station Rd / McCoy St (Site Folder: Exisiting Base)]

2022 Modelling by Sokan 7:30-8:30
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Station Road														
2	T1	1065	56	1121	5.3	0.548	0.0	LOS A	0.1	0.4	0.00	0.00	0.01	59.9
3	R2	1	0	1	0.0	0.548	17.1	LOS B	0.1	0.4	0.00	0.00	0.01	55.4
Approach		1066	56	1122	5.3	0.548	0.0	NA	0.1	0.4	0.00	0.00	0.01	59.9
North: McCoy St														
4	L2	1	0	1	0.0	0.023	8.3	LOS A	0.1	0.4	0.91	0.91	0.91	27.8
6	R2	1	0	1	0.0	0.023	65.2	LOS E	0.1	0.4	0.91	0.91	0.91	8.0
Approach		2	0	2	0.0	0.023	36.8	LOS C	0.1	0.4	0.91	0.91	0.91	17.8
West: Station Road														
7	L2	4	1	4	25.0	0.406	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	13.5
8	T1	786	41	827	5.2	0.406	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.7
Approach		790	42	832	5.3	0.406	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.4
All Vehicles		1858	98	1956	5.3	0.548	0.1	NA	0.1	0.4	0.00	0.00	0.01	59.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [EB AM - Station Rd / Fitzwilliam Rd / Wentworth Ave (Site Folder: Exisiting Base)]

2022 Modelling by Sokan 7:30-8:30
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Wentworth Ave														
10	L2	644	35	678	5.4	0.738	10.8	LOS A	8.9	64.9	0.90	0.99	1.16	32.1
12	R2	418	12	440	2.9	0.553	12.9	LOS A	4.4	31.6	0.77	0.90	0.86	38.4
12u	U	2	1	2	50.0	0.553	16.8	LOS B	4.4	31.6	0.77	0.90	0.86	35.0
Approach		1064	48	1120	4.5	0.738	11.6	LOS A	8.9	64.9	0.85	0.95	1.04	35.0
East: Fitzwilliam Rd														
1	L2	449	9	473	2.0	0.527	8.0	LOS A	4.2	29.9	0.77	0.84	0.84	41.3
2	T1	420	21	442	5.0	0.536	8.4	LOS A	4.2	31.0	0.77	0.84	0.86	35.1
3u	U	3	0	3	0.0	0.536	14.5	LOS B	4.2	31.0	0.77	0.84	0.86	45.0
Approach		872	30	918	3.4	0.536	8.2	LOS A	4.2	31.0	0.77	0.84	0.85	38.5
West: Station Rd														
8	T1	371	14	391	3.8	0.461	6.3	LOS A	3.1	22.7	0.70	0.75	0.72	42.2
9	R2	460	23	484	5.0	0.533	10.8	LOS A	4.2	30.7	0.74	0.85	0.80	36.0
9u	U	6	0	6	0.0	0.533	12.7	LOS A	4.2	30.7	0.74	0.85	0.80	24.2
Approach		837	37	881	4.4	0.533	8.9	LOS A	4.2	30.7	0.73	0.81	0.77	38.3
All Vehicles		2773	115	2919	4.1	0.738	9.7	LOS A	8.9	64.9	0.79	0.87	0.90	37.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [EB PM - Station Rd / Tollis Pl (Site Folder: Exisiting Base)]

2022 Modelling by Sokan 16:15-17:15
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Station Rd														
2	T1	884	21	931	2.4	0.658	3.8	LOS A	4.9	35.3	0.30	0.46	0.30	52.8
3	R2	37	3	39	8.1	0.658	7.6	LOS A	4.9	35.3	0.30	0.46	0.30	43.6
3u	U	1	0	1	0.0	0.658	9.4	LOS A	4.9	35.3	0.30	0.46	0.30	32.9
Approach		922	24	971	2.6	0.658	4.0	LOS A	4.9	35.3	0.30	0.46	0.30	52.6
North: Tollis Pl														
4	L2	48	1	51	2.1	0.192	14.9	LOS B	1.3	9.3	0.89	0.90	0.89	26.9
6	R2	39	4	41	10.3	0.192	19.7	LOS B	1.3	9.3	0.89	0.90	0.89	42.2
6u	U	1	0	1	0.0	0.192	20.9	LOS B	1.3	9.3	0.89	0.90	0.89	34.6
Approach		88	5	93	5.7	0.192	17.1	LOS B	1.3	9.3	0.89	0.90	0.89	35.8
West: Station Rd														
7	L2	26	5	27	19.2	0.721	4.8	LOS A	5.8	41.9	0.22	0.44	0.22	49.4
8	T1	1014	26	1067	2.6	0.721	4.8	LOS A	5.8	41.9	0.22	0.44	0.22	49.6
9u	U	31	1	33	3.2	0.721	10.6	LOS A	5.8	41.9	0.22	0.44	0.22	55.4
Approach		1071	32	1127	3.0	0.721	4.9	LOS A	5.8	41.9	0.22	0.44	0.22	49.9
All Vehicles		2081	61	2191	2.9	0.721	5.0	LOS A	5.8	41.9	0.29	0.47	0.29	50.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [EB PM - Station Rd / McCoy St (Site Folder: Exisiting Base)]

2022 Modelling by Sokan 16:15-17:15
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Station Road														
2	T1	920	24	968	2.6	0.479	0.5	LOS A	0.5	3.4	0.04	0.00	0.06	59.0
3	R2	5	0	5	0.0	0.479	26.1	LOS B	0.5	3.4	0.04	0.00	0.06	54.6
Approach		925	24	974	2.6	0.479	0.6	NA	0.5	3.4	0.04	0.00	0.06	59.0
North: McCoy St														
4	L2	3	0	3	0.0	0.036	13.4	LOS A	0.1	0.6	0.91	0.96	0.91	30.6
6	R2	1	0	1	0.0	0.036	80.0	LOS F	0.1	0.6	0.91	0.96	0.91	8.8
Approach		4	0	4	0.0	0.036	30.1	LOS C	0.1	0.6	0.91	0.96	0.91	25.1
West: Station Road														
7	L2	1	0	1	0.0	0.535	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	13.6
8	T1	1060	27	1116	2.5	0.535	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.6
Approach		1061	27	1117	2.5	0.535	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.5
All Vehicles		1990	51	2095	2.6	0.535	0.4	NA	0.5	3.4	0.02	0.00	0.03	59.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [EB PM - Station Rd / Fitzwilliam Rd / Wentworth Ave (Site Folder: Exisiting Base)]

2022 Modelling by Sokan 16:15-17:15
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Wentworth Ave														
10	L2	486	10	512	2.1	0.643	10.1	LOS A	6.3	44.8	0.88	0.97	1.07	33.0
12	R2	486	7	512	1.4	0.617	13.5	LOS A	5.9	41.7	0.87	0.95	1.02	37.8
12u	U	7	0	7	0.0	0.617	15.5	LOS B	5.9	41.7	0.87	0.95	1.02	39.1
Approach		979	17	1031	1.7	0.643	11.8	LOS A	6.3	44.8	0.87	0.96	1.04	35.8
East: Fitzwilliam Rd														
1	L2	451	9	475	2.0	0.716	14.1	LOS A	7.9	56.0	0.98	1.13	1.34	34.5
2	T1	485	14	511	2.9	0.721	13.6	LOS A	8.3	59.6	0.99	1.12	1.35	29.7
3u	U	5	0	5	0.0	0.721	19.7	LOS B	8.3	59.6	0.99	1.12	1.35	38.5
Approach		941	23	991	2.4	0.721	13.8	LOS A	8.3	59.6	0.98	1.13	1.34	32.2
West: Station Rd														
8	T1	456	13	480	2.9	0.633	9.4	LOS A	5.9	42.3	0.86	0.95	1.05	37.8
9	R2	615	15	647	2.4	0.764	15.6	LOS B	9.7	69.4	0.96	1.07	1.30	31.0
9u	U	6	0	6	0.0	0.764	17.5	LOS B	9.7	69.4	0.96	1.07	1.30	20.4
Approach		1077	28	1134	2.6	0.764	13.0	LOS A	9.7	69.4	0.92	1.02	1.19	33.4
All Vehicles		2997	68	3155	2.3	0.764	12.9	LOS A	9.7	69.4	0.92	1.03	1.19	33.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [EB + C AM - Station Rd / Tollis Pl (Site Folder: Exisiting Base + Construction)]

2022 Modelling by Sokan 7:30-8:30
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Station Rd														
2	T1	1053	60	1108	5.7	0.734	3.7	LOS A	7.1	51.8	0.27	0.43	0.27	52.9
3	R2	18	1	19	5.6	0.734	7.4	LOS A	7.1	51.8	0.27	0.43	0.27	44.5
3u	U	2	0	2	0.0	0.734	9.3	LOS A	7.1	51.8	0.27	0.43	0.27	33.3
Approach		1073	61	1129	5.7	0.734	3.8	LOS A	7.1	51.8	0.27	0.43	0.27	52.8
North: Tollis Pl														
4	L2	15	4	16	26.7	0.076	11.1	LOS A	0.4	3.4	0.72	0.78	0.72	30.0
6	R2	28	5	29	17.9	0.076	14.8	LOS B	0.4	3.4	0.72	0.78	0.72	44.6
6u	U	1	0	1	0.0	0.076	15.9	LOS B	0.4	3.4	0.72	0.78	0.72	38.4
Approach		44	9	46	20.5	0.076	13.6	LOS A	0.4	3.4	0.72	0.78	0.72	41.2
West: Station Rd														
7	L2	30	8	32	26.7	0.540	4.8	LOS A	2.9	21.4	0.10	0.44	0.10	49.4
8	T1	773	41	814	5.3	0.540	4.6	LOS A	2.9	21.4	0.10	0.44	0.10	50.4
9u	U	10	0	11	0.0	0.540	10.4	LOS A	2.9	21.4	0.10	0.44	0.10	56.1
Approach		813	49	856	6.0	0.540	4.7	LOS A	2.9	21.4	0.10	0.44	0.10	50.5
All Vehicles		1930	119	2032	6.2	0.734	4.4	LOS A	7.1	51.8	0.21	0.44	0.21	51.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [EB + C AM - Station Rd / Site Access (Site Folder: Exisiting Base + Construction)]

2022 Modelling by Sokan 7:30-8:30
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Station Rd														
5	T1	1056	56	1112	5.3	0.590	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.4
6	R2	3	3	3	100.0	0.014	20.8	LOS B	0.0	0.6	0.81	0.87	0.81	16.0
Approach		1059	59	1115	5.6	0.590	0.1	NA	0.0	0.6	0.00	0.00	0.00	59.0
North: Site Access														
7	L2	4	4	4	100.0	1.019	543.8	LOS F	3.1	40.0	1.00	1.15	1.50	0.6
9	R2	4	4	4	100.0	1.019	1225.6	LOS F	3.1	40.0	1.00	1.15	1.50	0.5
Approach		8	8	8	100.0	1.019	884.7	LOS F	3.1	40.0	1.00	1.15	1.50	0.5
West: Station Rd														
10	L2	5	5	5	100.0	0.446	4.3	LOS A	0.0	0.0	0.00	0.00	0.00	24.6
11	T1	790	42	832	5.3	0.446	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.5
Approach		795	47	837	5.9	0.446	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.2
All Vehicles		1862	114	1960	6.1	1.019	3.9	NA	3.1	40.0	0.01	0.01	0.01	43.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [EB + C AM - Station Rd / McCoy St (Site Folder: Exisiting Base + Construction)]

2022 Modelling by Sokan 7:30-8:30
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Station Road														
2	T1	1069	60	1125	5.6	0.551	0.0	LOS A	0.1	0.4	0.00	0.00	0.01	59.9
3	R2	1	0	1	0.0	0.551	17.3	LOS B	0.1	0.4	0.00	0.00	0.01	55.4
Approach		1070	60	1126	5.6	0.551	0.0	NA	0.1	0.4	0.00	0.00	0.01	59.9
North: McCoy St														
4	L2	1	0	1	0.0	0.024	8.4	LOS A	0.1	0.4	0.92	0.92	0.92	27.4
6	R2	1	0	1	0.0	0.024	67.5	LOS E	0.1	0.4	0.92	0.92	0.92	7.9
Approach		2	0	2	0.0	0.024	37.9	LOS C	0.1	0.4	0.92	0.92	0.92	17.6
West: Station Road														
7	L2	4	1	4	25.0	0.409	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	13.5
8	T1	790	45	832	5.7	0.409	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.7
Approach		794	46	836	5.8	0.409	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.4
All Vehicles		1866	106	1964	5.7	0.551	0.1	NA	0.1	0.4	0.00	0.00	0.01	59.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [EB + C AM - Station Rd / Fitzwilliam Rd / Wentworth Ave (Site Folder: Exisiting Base + Construction)]

2022 Modelling by Sokan 7:30-8:30
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Wentworth Ave														
10	L2	644	35	678	5.4	0.743	11.1	LOS A	9.0	66.1	0.91	1.00	1.18	31.8
12	R2	418	12	440	2.9	0.557	13.0	LOS A	4.5	32.1	0.77	0.91	0.87	38.3
12u	U	2	1	2	50.0	0.557	16.9	LOS B	4.5	32.1	0.77	0.91	0.87	34.9
Approach		1064	48	1120	4.5	0.743	11.8	LOS A	9.0	66.1	0.86	0.96	1.06	34.8
East: Fitzwilliam Rd														
1	L2	449	9	473	2.0	0.527	8.0	LOS A	4.2	29.9	0.77	0.84	0.84	41.3
2	T1	424	25	446	5.9	0.543	8.5	LOS A	4.4	32.0	0.78	0.85	0.87	35.1
3u	U	3	0	3	0.0	0.543	14.6	LOS B	4.4	32.0	0.78	0.85	0.87	45.0
Approach		876	34	922	3.9	0.543	8.3	LOS A	4.4	32.0	0.77	0.84	0.86	38.5
West: Station Rd														
8	T1	375	18	395	4.8	0.468	6.4	LOS A	3.2	23.5	0.71	0.76	0.73	42.0
9	R2	460	23	484	5.0	0.534	10.9	LOS A	4.2	30.8	0.74	0.85	0.80	36.0
9u	U	6	0	6	0.0	0.534	12.7	LOS A	4.2	30.8	0.74	0.85	0.80	24.2
Approach		841	41	885	4.9	0.534	8.9	LOS A	4.2	30.8	0.73	0.81	0.77	38.3
All Vehicles		2781	123	2927	4.4	0.743	9.8	LOS A	9.0	66.1	0.79	0.88	0.91	36.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [EB + C PM - Station Rd / Tollis Pl (Site Folder: Exisiting Base + Construction)]

2022 Modelling by Sokan 16:15-17:15
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Station Rd														
2	T1	888	25	935	2.8	0.662	3.8	LOS A	5.0	36.0	0.30	0.46	0.30	52.8
3	R2	37	3	39	8.1	0.662	7.6	LOS A	5.0	36.0	0.30	0.46	0.30	43.6
3u	U	1	0	1	0.0	0.662	9.5	LOS A	5.0	36.0	0.30	0.46	0.30	32.9
Approach		926	28	975	3.0	0.662	4.0	LOS A	5.0	36.0	0.30	0.46	0.30	52.6
North: Tollis Pl														
4	L2	48	1	51	2.1	0.194	15.1	LOS B	1.3	9.4	0.89	0.91	0.89	26.7
6	R2	39	4	41	10.3	0.194	19.9	LOS B	1.3	9.4	0.89	0.91	0.89	42.1
6u	U	1	0	1	0.0	0.194	21.0	LOS B	1.3	9.4	0.89	0.91	0.89	34.5
Approach		88	5	93	5.7	0.194	17.3	LOS B	1.3	9.4	0.89	0.91	0.89	35.7
West: Station Rd														
7	L2	26	5	27	19.2	0.724	4.9	LOS A	6.0	42.9	0.23	0.44	0.23	49.3
8	T1	1018	30	1072	2.9	0.724	4.8	LOS A	6.0	42.9	0.23	0.44	0.23	49.6
9u	U	31	1	33	3.2	0.724	10.6	LOS A	6.0	42.9	0.23	0.44	0.23	55.4
Approach		1075	36	1132	3.3	0.724	4.9	LOS A	6.0	42.9	0.23	0.44	0.23	49.8
All Vehicles		2089	69	2199	3.3	0.724	5.0	LOS A	6.0	42.9	0.29	0.47	0.29	50.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [EB + C PM - Station Rd / Site Access (Site Folder: Exisiting Base + Construction)]

2022 Modelling by Sokan 16:15-17:15
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Station Rd														
5	T1	920	24	968	2.6	0.505	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.6
6	R2	4	4	4	100.0	0.049	47.6	LOS D	0.1	1.9	0.93	0.97	0.93	8.9
Approach		924	28	973	3.0	0.505	0.3	NA	0.1	1.9	0.00	0.00	0.00	58.3
North: Site Access														
7	L2	3	3	3	100.0	1.038	528.5	LOS F	3.0	39.5	1.00	1.14	1.49	0.6
9	R2	5	5	5	100.0	1.038	1022.0	LOS F	3.0	39.5	1.00	1.14	1.49	0.5
Approach		8	8	8	100.0	1.038	837.0	LOS F	3.0	39.5	1.00	1.14	1.49	0.5
West: Station Rd														
10	L2	4	4	4	100.0	0.586	4.3	LOS A	0.0	0.0	0.00	0.00	0.00	24.6
11	T1	1060	27	1116	2.5	0.586	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.3
Approach		1064	31	1120	2.9	0.586	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.1
All Vehicles		1996	67	2101	3.4	1.038	3.5	NA	3.0	39.5	0.01	0.01	0.01	44.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [EB + C PM - Station Rd / McCoy St (Site Folder: Exisiting Base + Construction)]

2022 Modelling by Sokan 16:15-17:15
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Station Road														
2	T1	924	28	973	3.0	0.483	0.5	LOS A	0.5	3.5	0.04	0.00	0.06	59.0
3	R2	5	0	5	0.0	0.483	26.6	LOS B	0.5	3.5	0.04	0.00	0.06	54.5
Approach		929	28	978	3.0	0.483	0.6	NA	0.5	3.5	0.04	0.00	0.06	59.0
North: McCoy St														
4	L2	3	0	3	0.0	0.037	13.6	LOS A	0.1	0.7	0.91	0.96	0.91	30.2
6	R2	1	0	1	0.0	0.037	82.9	LOS F	0.1	0.7	0.91	0.96	0.91	8.7
Approach		4	0	4	0.0	0.037	30.9	LOS C	0.1	0.7	0.91	0.96	0.91	24.8
West: Station Road														
7	L2	1	0	1	0.0	0.538	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	13.6
8	T1	1064	31	1120	2.9	0.538	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.6
Approach		1065	31	1121	2.9	0.538	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.5
All Vehicles		1998	59	2103	3.0	0.538	0.4	NA	0.5	3.5	0.02	0.00	0.03	59.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [EB + C PM - Station Rd / Fitzwilliam Rd / Wentworth Ave (Site Folder: Exisiting Base + Construction)]

2022 Modelling by Sokan 16:15-17:15
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Wentworth Ave														
10	L2	486	10	512	2.1	0.648	10.2	LOS A	6.4	45.7	0.89	0.97	1.08	32.8
12	R2	486	7	512	1.4	0.622	13.7	LOS A	6.0	42.5	0.87	0.96	1.03	37.7
12u	U	7	0	7	0.0	0.622	15.6	LOS B	6.0	42.5	0.87	0.96	1.03	39.0
Approach		979	17	1031	1.7	0.648	12.0	LOS A	6.4	45.7	0.88	0.97	1.06	35.6
East: Fitzwilliam Rd														
1	L2	451	9	475	2.0	0.717	14.1	LOS A	7.9	56.2	0.98	1.13	1.34	34.4
2	T1	489	18	515	3.7	0.731	13.9	LOS A	8.6	61.8	0.99	1.14	1.37	29.3
3u	U	5	0	5	0.0	0.731	20.0	LOS B	8.6	61.8	0.99	1.14	1.37	38.1
Approach		945	27	995	2.9	0.731	14.1	LOS A	8.6	61.8	0.99	1.14	1.36	32.0
West: Station Rd														
8	T1	460	17	484	3.7	0.642	9.5	LOS A	6.1	43.7	0.87	0.96	1.06	37.4
9	R2	615	15	647	2.4	0.765	15.6	LOS B	9.7	69.6	0.96	1.07	1.30	31.0
9u	U	6	0	6	0.0	0.765	17.5	LOS B	9.7	69.6	0.96	1.07	1.30	20.4
Approach		1081	32	1138	3.0	0.765	13.0	LOS A	9.7	69.6	0.92	1.03	1.20	33.3
All Vehicles		3005	76	3163	2.5	0.765	13.0	LOS A	9.7	69.6	0.93	1.04	1.20	33.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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