125 Nancy Ellis Leebold Drive, Bankstown

Transport Impact Assessment

Prepared for: Urbis Pty Ltd

Ref: 301351354 | Date: 28 February 2024

Revision

Revision	Date	Comment	Prepared By	Approved By
A	21 November 2023	Final for preliminary assessment	S. Hong	B. Maynard
B	21 February 2024	Final for Submission	S. Hong	B. Maynard
C	23 February 2024	Final for Submission	S. Hong	B. Maynard
D	28 February 2024	Final for Submission	S. Hong	B. Maynard

Brett Maynard

For and on behalf of

Stantec Australia Pty Ltd

L9, 203 Pacific Highway, St Leonards NSW 2065

Acknowledgment of Country

In the spirit of reconciliation, Stantec acknowledges the Traditional Custodians of country throughout Australia and their connections to land, sea and community. We pay our respect to their Elders past and present, and extend that respect to all Aboriginal and Torres Strait Islander peoples.

Limitations

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TRANSPORT IMPACT ASSESSMENT

125 Nancy Ellis Leebold Drive, Bankstown

Appendices

1. Introduction

1.1 Background

It is understood that a Development Application (DA) is to be lodged with Bankstown Airport Limited (BAL) for modification works to the existing site at 125 Nancy Ellis Leebold Drive, Bankstown Aerodrome and obtain approvals for the site be used as a distribution centre. The site is currently managed by ESR and has historically been utilised by Toll Logistics.

The modification works will involve improvements to the building itself, removal of existing fences, closing of the existing fire brigade access point and modifications to the existing car park.

Stantec has been commissioned to prepare a Transport Impact Assessment (TIA) to support the proposed DA.

The location of the subject site and the surrounding road network is shown in Figure 1.

Figure 1: Subject site and its environs

Base image source: Nearmap

1.2 Pre-DA Feedback

A pre-DA meeting was held on 18 September 2023 with AECOM (on behalf of BAL) and the project team. The following comments were raised by AECOM, as it pertains to traffic and parking:

- Details on the number of staff and delivery vehicles that would be accommodated on the site at any one time and the traffic impacts to the intersection of Milperra Road and Nancy Ellis Leebold Drive will need to be provided.
- The new access will need to be justified given that the site already has two access points from the primary frontage. Approval for the access will need to be provided by BAL. It is noted that the new access is no longer included in the proposal.

1.3 Purpose of this Report

This report sets out an assessment of the anticipated transport implications of the proposed development, including consideration of the following:

- existing traffic and parking conditions surrounding the site.
- suitability of the proposed parking in terms of supply (quantum) and layout.
- service vehicle requirements.
- pedestrian and bicycle requirements.
- the traffic generating characteristics of the proposed development.
- suitability of the proposed access arrangements for the site.
- the transport impact of the development proposal on the surrounding road network.

1.4 References

In preparing this report, reference has been made to the following:

- an inspection of the site and its surrounds.
- Bankstown Airport Development Guidelines 2019.
- Pre-DA minutes (prepared by Urbis, dated September 2023).
- Australian/ New Zealand Standard, Parking Facilities (AS 2890).
- traffic surveys undertaken by Matrix as referenced in the context of this report.
- plans for the proposed development prepared by SBA Architects.
- other documents and data as referenced in this report.

2. Existing Conditions

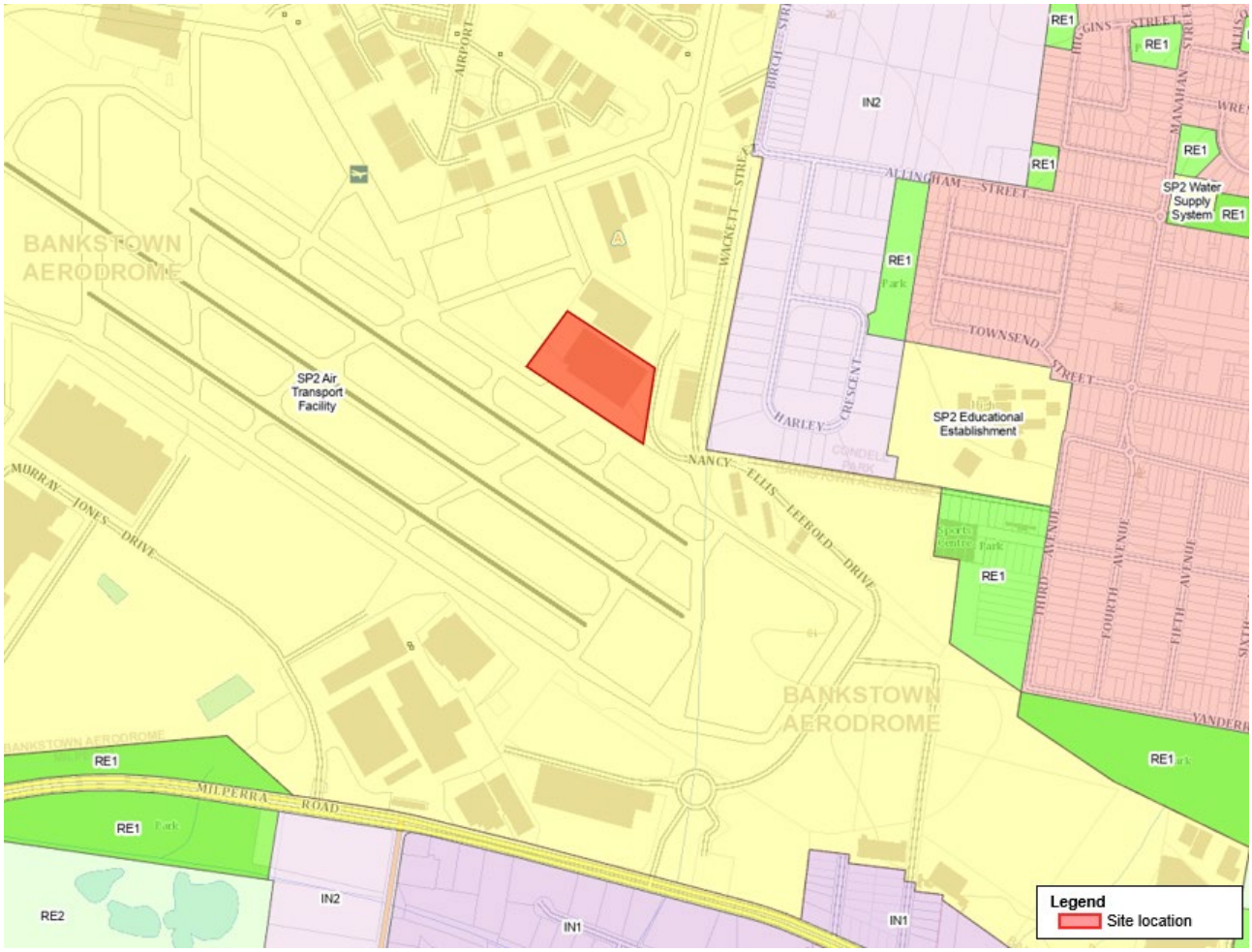
2.1 Land Zoning

The subject site is located at 125 Nancy Ellis Leebold Drive, Bankstown Aerodrome and is within airport land controlled by BAL. The site of approximately 23,800m^2 has a frontage of 140 metres to Nancy Ellis Leebold Drive. The site currently has a land use classification as SP2 – Air Transport Facility and is within an aviation zone.

The site is currently occupied by a warehouse with ancillary office spaces and an at-grade car park accommodating approximately 140 parking spaces.

The location of the subject site and the surrounding land zoning is shown in Figure 2.

Figure 2: Local land use map



Base image source: ePlanning Spatial Viewer

2.2 Road Network

2.2.1 Road Hierarchy

Roads are classified according to the functions they perform. The main purpose of defining a road's functional class is to provide a basis for establishing the policies which guide the management of the road according to their intended service or qualities. In terms of functional road classification, State roads are strategically important as they form the primary network used for the movement of people and goods between regions, and throughout the State. Transport for NSW (TfNSW) is responsible for funding, prioritising and carrying out works on State roads. State roads generally include roads classified as freeways, state highways, and main roads under the Roads Act 1993, and the regulation to manage the road system is stated in the Australian Road Rules. TfNSW defines four levels in a typical functional road hierarchy, ranking from high mobility and low accessibility, to high accessibility and low mobility. These road classes are:

- Arterial Roads – Controlled by TfNSW, typically no limit in flow and designed to carry vehicles long distance between regional centres.
- Sub-Arterial Roads – Managed by either Council or TfNSW under a joint agreement. Typically, their operating capacity ranges between 10,000 and 20,000 vehicles per day, and their aim is to carry through traffic between specific areas in a sub region or provide connectivity from arterial road routes (regional links).
- Collector Roads – Provide connectivity between local sites and the sub-arterial road network, and typically carry between 2,000 and 10,000 vehicles per day.
- Local Roads – Provide direct access to properties and the collector road system and typically carry between 500 and 4,000 vehicles per day.

2.2.2 Adjoining Roads

Nancy Ellis Leebold Drive

Nancy Ellis Leebold Drive is a collector road, managed by BAL. The road alignment varies but is aligned in a north-south direction along the frontage of the site. It is a two-way road configured with one travel lane in each direction, set within a 9 metre wide carriageway, as shown in Figure 3. The speed limit along the roadway is 50 kilometres per hour.

Figure 3: Nancy Ellis Leebold Drive (along site frontage looking north)

Source: Google Maps

Milperra Road

Milperra Road is a classified State Road aligned in the east-west direction. It is a two-way road configured with three lanes in each direction, set within a 20 metre wide carriageway, as shown in Figure 4. There is a posted speed limit of 70 kilometres per hour.

Figure 4: Milperra Road (looking west)

Source: Google Maps

Henry Lawson Drive

Henry Lawson Drive is a classified State Road aligned in the north-south direction. It is a two-way road configured with one lane in each direction, set within a 12 metre wide carriageway, as shown in Figure 5. Additional lane capacity is available at key intersections (including in the vicinity of Milperra Road). There is a posted speed limit of 60 kilometres per hour.

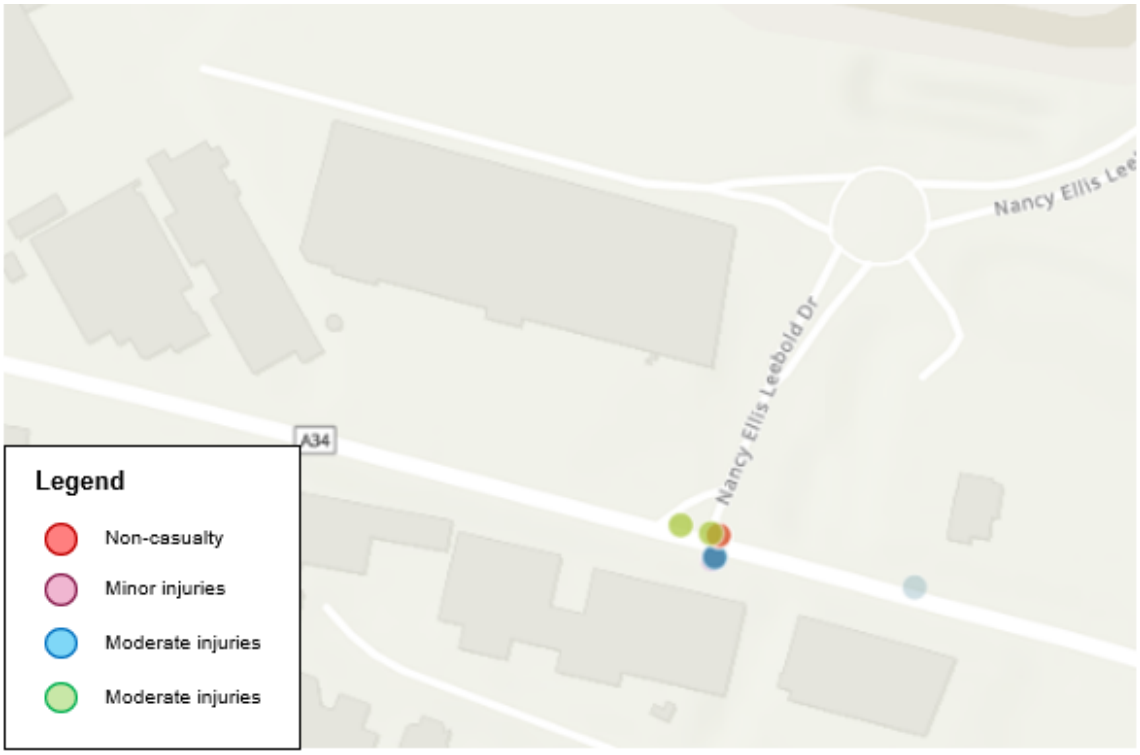
Figure 5: Henry Lawson Drive (looking north)

Source: Google Maps

2.2.3 Crash History

Analysis of the most recent five-year period of available crash data from 2018 to 2022 has been completed based on crash data available on the TfNSW Centre for Road Safety website for the intersection between Milperra Road and Nancy Ellis Leebold Drive. The locations and severity of the crashes recorded during the five-year period is shown in Figure 6.

Figure 6: Crash map from 2018 to 2022



Base map source: TfNSW Centre for Road Safety (accessed September 2023)

The following key statistics can be drawn from the crash data:

- Nine (9) crashes were reported during the five-year period.
- Approximately 50 per cent of crashes resulted in serious injuries.
- All crashes occurred during daylight hours.
- No fatal crashes were recorded during the five-year period.
- Approximately 50 per cent of crashes were caused by rear-end road user movements.

2.2.4 Traffic Volumes

Stantec commissioned traffic movement counts at the signalised intersection of Milperra Road and Nancy Ellis Leebold Drive on Thursday 3 August 2023 during the following AM and PM peak periods:

- 7:30am and 9:30am
- 4:00pm and 6:30pm

The traffic volumes associated with the peak periods are included in Appendix A.

2.2.5 Intersection Operation

The existing operation of the intersection between Milperra Road and Nancy Ellis Leebold Drive has been assessed using SIDRA INTERSECTION, a modelling software package which calculates intersection performance.

The commonly used measure of intersection performance, as defined by TfNSW, is vehicle delay. SIDRA INTERSECTION determines the average delay that vehicles encounter and provides a measure of the level of service.

Table 1 shows the criteria that SIDRA INTERSECTION adopts in assessing the level of service.

Table 1: SIDRA 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 will cause excessive delays	At capacity, requires other control mode
F	Greater than 70	Extra capacity required	Extreme delay, major treatment required

Table 2 presents a summary of the existing performance levels of the intersection, with full results presented in Appendix B.

Table 2: Existing operating conditions

Intersection	Peak	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Milperra Road & Nancy Ellis Leebold Drive	AM	0.853	28	353	B
	PM	0.553	16	173	B

The results indicate that the intersection is operating at a LOS B with spare capacity in both the AM and PM peaks, average delays of approximately 15 to 30 seconds and a 95th percentile queue length of approximately 350 metres in the AM peak and 175 metres in the PM peaks. These queue lengths are associated with the western approach along Milperra Road and representative of the significant traffic volumes on Milperra Road.

This aligns with the site observations which was completed on Monday 7 August 2023 which did not indicate any extensive delays at the intersection, nor that the intersection was operating at capacity.

2.3 Public Transport

Public transport options surrounding the site are limited, with no train station or bus services within comfortable walking distance from the site (800 metres). The closest bus stop is along Milperra Road, which provides access to the M90 bus service (frequent services between Burwood and Liverpool) and is located approximately 1.8 kilometres from the site.

2.4 Pedestrian & Cycling Infrastructure

Both pedestrian and cycling infrastructure are limited in the vicinity of the site. No footpaths or formal crossing facilities are provided along Nancy Ellis Leebold Drive, north of the roundabout near Milperra Road. However, wide grassy verges are provided along both sides of Nancy Ellis Leebold Drive. It is also noted that pedestrian activity along Nancy Ellis Leebold Drive is expected to be minimal.

A shared path is provided along the eastern side of Nancy Ellis Leebold Drive, between Milperra Road and the roundabout. No formal cycleways are currently provided along Nancy Ellis Leebold Drive north of the roundabout, however the road carriageway is suitable for on-road cycling.

3. Development Proposal

3.1 Land Uses

The proposal involves modification works to the existing site and building and obtaining approvals for the site to be used as a distribution centre. The modification works will involve the following:

- improvements to the existing building including a new awning
- removal of existing fences and installing a new fence dividing the air-side from the hardstand
- relocation of the existing fire brigade access point
- modification of the existing main car park to accommodate a central aisle which will provide connection between Nancy Ellis Leebold Drive and the outbound loading area for delivery vehicles.
- removal of existing parking spaces and provision of new car parking areas.

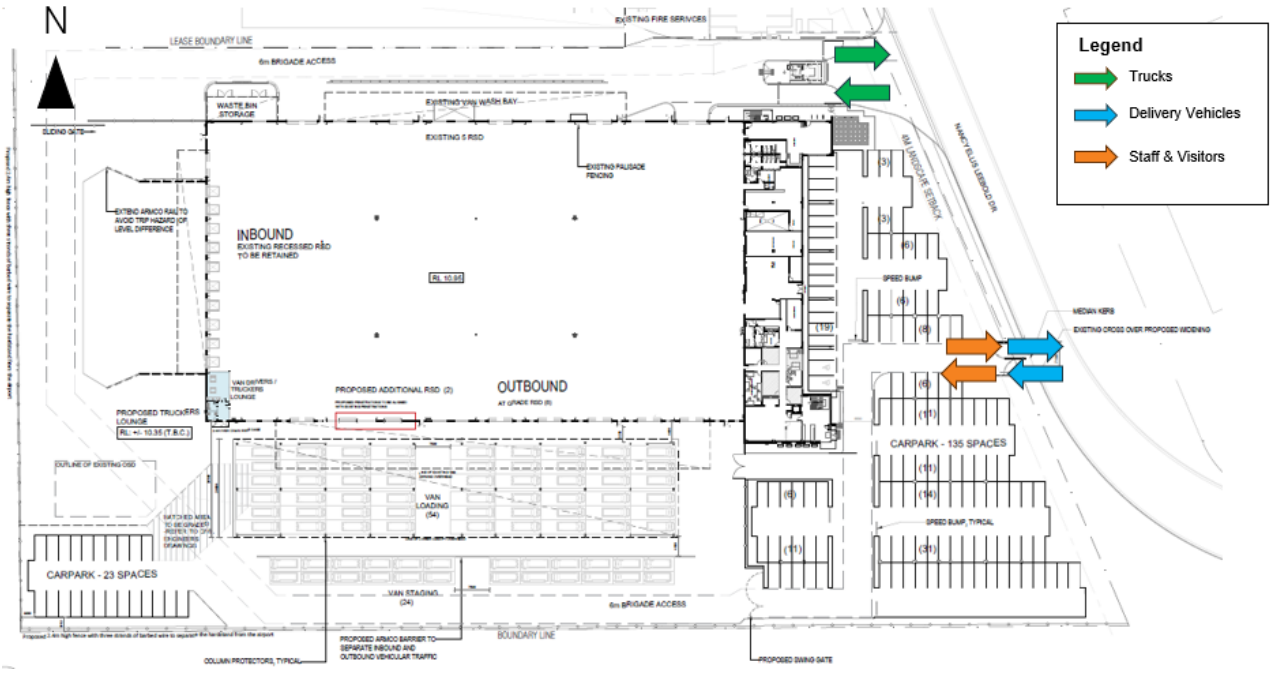
The proposed modification will result in approximately 7,172m^2 GFA of warehouse space and 2,185m^2 GFA of ancillary office and truckers lounge space.

The intention is for the proposed development to be in operation by late 2024.

3.2 Vehicle Access

Vehicle entry and exit to the site is proposed via the two existing driveways along Nancy Ellis Leebold Drive. This is shown in the site plan below in Figure 7. The two driveways are required to effectively separate three key vehicle user groups (heavy vehicle inbound deliveries, outbound distribution deliveries, staff/visitor activity).

Figure 7: Site plan



Source: SBA Architects (October 2023)

Heavy vehicles (inbound delivery) will be limited to 20 metre articulated vehicles (AVs) whilst the delivery vehicles (outbound delivery) will be limited to cars and delivery vehicles, such as the Mercedes Benz Sprinter Panel Van (or similar) as a typical maximum size.

Heavy vehicles will enter and exit the site via the existing northern shared driveway to ensure that heavy vehicles movements do not conflict with delivery and staff/ visitor vehicle movements.

Delivery vehicles and staff/ visitors will enter and exit the site via the existing southern driveway, which will be widened to accommodate the increase in vehicle volume and ease of two-way vehicle movements.

3.3 Car Parking

In total, the proposed development will provide 158 on-site car parking spaces, inclusive of two existing accessible spaces. This includes a new car parking area in the south-western corner of the site which will provide an additional 23 car parking spaces.

3.4 Loading & Unloading Areas

The loading and unloading areas within the site will be separated into an inbound and outbound area. The inbound area will be located on the western side of the site, at the rear of the building, and will utilise the existing loading dock area which can accommodate up to 10 AVs simultaneously. This area will facilitate the unloading of bulk goods from the trucks and into the warehouse.

The outbound area will be located to the south of the site which will accommodate the loading of packages and items into the delivery vehicles. This area will be further separated into two areas: the 'delivery vehicle loading' area and the 'delivery vehicle staging' area. Delivery vehicles will arrive and wait in the 'delivery vehicle staging' area before being directed into the 'delivery vehicle loading' area. The 'delivery vehicle staging area' will be able to accommodate up to 24 delivery vehicles, whilst the 'delivery vehicle loading' area will be able to accommodate up to 54 delivery vehicles. In total, the outbound area will be able to accommodate up to 78 delivery vehicles at any given time.

4. Parking and Loading Assessment

4.1 Car Parking Requirements

The development is subject to the car parking requirements set out in the Bankstown Airport Development Guidelines 2019 Section 5.3, which requires the on-site car parking spaces to be provided based on the following minimum rates (as it relates to the site):

- Warehouse or distribution centres: 1 car space per 60m^2 GFA
- Commercial premises: 1 car space per 40m^2 GFA

Based on the above rates, the proposed development will be required to provide 175 on-site parking spaces, as summarised in Table 3.

Table 3: Car parking requirements

Land use	GFA	Minimum Car Parking Rate	Minimum Car Parking Requirement
Warehouse/ Distribution Centre	7,172m^2	1 space per 60m^2 GA	120 spaces
Ancillary Offices	2,185m^2	1 space per 40m^2 GFA	55 spaces
Total			**175 spaces**

The proposal includes 158 on-site parking spaces which represents a shortfall of 17 spaces from the minimum requirements of the Bankstown Airport Development Guidelines 2019.

In terms of operational requirements, the distribution centre will be staffed based on a roster plan which includes a night and day roster. On average, there will be approximately 70 staff during the night roster and 30 staff during the day roster. Assuming that all staff arrive and depart the site via private vehicles, considering the limited public transport options within the vicinity of the site, and a vehicle occupancy of one person per vehicle, the average parking demand will be between 70 to 100 vehicles.

It is also noted that these estimates are considered conservative as there may be some level of carpooling. Additionally, roster changeover would be coordinated such that there is no material overlap in parking demand between night and day rosters. As such, the provision of 158 on-site parking spaces is expected to be sufficient to accommodate the operational demand generated by the staff, with the remaining spaces available for visitor parking.

On-site parking spaces will not be required for the delivery vehicles as they will be parked off-site in a separate facility.

4.2 Loading and Servicing Requirements

The loading and servicing requirements will be governed by the operational requirements of the distribution centre.

The inbound area will maintain all 10 existing loading bays to accommodate delivery trucks (noting it is unlikely that all bays are used at once), whilst the outbound area will provide 78 delivery vehicle spaces. This provision is based on the operational requirements of the proposed distribution centre.

4.3 Design Layout Review

The car park and loading/ unloading layout has been reviewed against the requirements of the Australian Standard for Off-Street Car Parking (AS2890 series). This assessment included a review of the following:

- bay aisle width
- adjacent structures
- turnaround facilities
- circulation roads and ramps
- ramp grades
- height clearances
- internal queueing
- service vehicle bays & loading docks

Details of this review are discussed below and shown graphically in Appendix E:

- The existing loading dock has been designed to accommodate vehicles up to and including a 20 metre AV. The swept path assessment indicates that a 20 metre AV will be able to enter and exit the ten inbound loading bays, to be retained, in a maximum of three movements. All ten loading bays can accommodate a 20 metre AV simultaneously.
- The swept path assessment indicates that a 20 metre AV will be able to enter and exit the site via the existing northern shared driveway. It is understood that the site currently accommodates AVs with entry and exit via the existing northern shared driveway, and as such, this is not a change from the existing movement of trucks in and out of the driveway.
- The swept path assessment indicates that two-way flow of delivery vehicles can be achieved through the site.
- The layout of the outbound area is considered appropriate to allow one-way circulation of delivery vehicles. The movement of vehicles in this area will be managed by staff.

5. Traffic Impact Assessment

5.1 Traffic Generation

5.1.1 Existing Traffic Generation

The site has historically been utilised by Toll Logistics, however, operations at the site have ramped down significantly. Based on traffic counts gathered at the driveways on Thursday 3 August 2023, the site is currently generating approximately 20 vehicles in the morning peak and two vehicles in the afternoon peak.

5.1.2 Development Traffic Generation

Whilst it is acknowledged that traffic generation is typically calculated based on the rates provided by the TfNSW Guide to Traffic Generating Developments (2002) and the Technical Direction 2013/04a, the proposed operations of this distribution centre will be unique to the tenant, and as such, the traffic generated has been estimated using an empirical analysis based on the operational requirements outlined in Table 4.

Table 4: Summary of Daily operations

Time	Activity
10:00pm	10:00pm – 11:00pm: Night roster associates arrive (average 70 staff) 11:00pm – 6:00am: Inbound trucks arrive and departure (approx. 50 trucks)
11:00pm	
12:00pm	
0:00am	
1:00am	
2:00am	
3:00am	
4:00am	
5:00am	
6:00am	
7:00am	7:00am – 8:00am: Night roster associates leave (average 70 staff) 7:00am – 8:00am: Day roster associates arrive (average 30 staff) 7:30am – 9:30am: Delivery truck departure (approx. 11 trucks) 7:30am – 10:30am: Delivery vehicle arrival/ departure (max. 35 vehicles in and 35 vehicles out every 20 minutes during road network peak hour) 9:00am – 12:00am: Inbound truck arrival and departure (approx. 15 trucks)
8:00am	
9:00am	
10:00am	
11:00am	
12:00pm	
2:00pm	2:00pm – 5:00pm: Delivery vehicle arrival/ departure (approx. 17 vehicles in and 17 vehicles out every 20 minutes during road network peak hour)
3:00pm	
4:00pm	
5:00pm	5:30pm – 6:00pm: Day roster associates leave (average 30 staff)
6:00pm	

The following assumptions have been adopted to estimate the traffic generated by the facility:

- All staff will travel to and from the site via private vehicles.
- Vehicle occupancy of staff vehicles is conservatively one (1) person per vehicle.

Based on the daily operational requirements outlined in Table 4, the morning and afternoon operations are expected to generate up to 316 vehicles[1] and 102 vehicles[2] respectively during the road network peak hours, noting that although night and day roster associate vehicle trips have been included, these movements are expected to occur between 7-8am which is before the 8:15-9:15am road network peak. This is also conservative in that traffic generation has not been reduced to account for existing or historical site traffic generation, noting that the existing tenant is significantly ramping down their operations at the site and therefore not representative of historical operations. The inbound and outbound traffic is summarised in Table 5.

Table 5: Inbound and outbound vehicle movements

	Inbound	Outbound
AM peak	135 vehicles	181 vehicles
PM peak	51 vehicles	51 vehicles

5.1.3 Net Traffic Generation

Based on the above calculations, the proposed development is expected to generate an additional 316 vehicles in the morning peak and 102 vehicles in the afternoon peak, noting low existing traffic generation.

5.1.4 Cumulative Traffic Considerations

The new industrial precinct on the south-west side of the airport and the new development on the north-eastern corner of the intersection between Milperra Road and Nancy Ellis Leebold Drive (opposite Bunnings) were operational at the time of the traffic surveys and therefore have been captured in the traffic data collected.

The industrial development known as the LandCross site located north-west of the roundabout on Nancy Ellis Leebold Drive was nearing completion but not yet fully occupied at the time of the traffic surveys. Accordingly, additional traffic generation based on precinct DA traffic reports has been considered in the calculations for both the AM and PM peaks. A 25% reduction factor has been applied to account for construction contractor activity that was observed on-site. The LandCross site is estimated to generate approximately 31 vehicle trips in both the AM and PM peaks.

5.2 Distribution and Assignment

The directional distribution and assignment of traffic generated by the proposed development will be influenced by several factors, including the:

- configuration of the arterial road network in the immediate vicinity of the site.
- existing (and future) operation of intersections providing access between the local and arterial road network.
- surrounding employment centres, retail centres and schools in relation to the site.
- likely distribution of employee residential locations in relation to the site.
- configuration of access points to the site

During the morning peak, all delivery vehicles will approach the site from the west. All other inbound and outbound movements have been distributed in proportion to the existing turning movements at the intersections.

[1] 70 night roster departure, 30 day roster arrival, 6 inbound truck departure and 210 delivery vehicles = 316 vehicles
[2] 162 delivery vehicles

5.3 Future Intersection Operation

5.3.1 Intersection Analysis

The operation of the intersection between Milperra Road and Nancy Ellis Leebold Drive has been assessed using SIDRA. The following scenarios have been modelled:

- 2023 existing conditions (as per Section 2.2.5)
- 2024 post-development conditions

The 2024 post-development results are summarised in Table 6, with detailed results included in Appendix C.

Table 6: Post-development operational conditions

Intersection	Peak	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Milperra Road & Nancy Ellis Leebold Drive	AM	0.896	33	411	C
	PM	0.597	18	189	B

The results indicate that the overall intersection will continue to operate satisfactorily during both the AM and PM road network peak hours.

5.3.2 Traffic Impact Summary

The SIDRA analysis of the existing conditions (see Section 2.2.5) indicates that the 95th percentile queue length for each of the movements are within the lane lengths and there is no overflow of queueing into adjacent through lanes or intersections. The 95th percentile queue length for the eastbound through lane is approximately 350 metres in the AM peak and 175 metres in the PM peak. Whilst it is noted that the short right turn lane along Milperra Road, into Nancy Ellis Leebold Drive, is at capacity in the AM peak with a 95th percentile queue length of 64 metres, this is within the existing lane length of 65 metres and the average queue length is approximately 40 metres which is well within the existing lane length. The 95th percentile queue length during the PM peak is approximately 54 metres.

The AM peak results for the post-development scenario indicates that the 95%ile queue length for the eastbound through movement will increase from approximately 350 metres to 411 metres, however this is minor from an operational perspective, still within the existing lane lengths and there is no indication that the queue will extend into the intersection between Milperra Road and Ashford Avenue. The 95th percentile queue length for the short right turn lane along Milperra Road, into Nancy Ellis Leebold Drive will be approximately 69 metres (an increase of one vehicle during the AM peak hour), indicating that there would occasionally be a single vehicle overflowing into the westbound through lane along Milperra Road. The average queue is 42 metres which is contained within the existing lane length. There is no indication that this occasional overflow would impact the overall performance of the westbound through lane.

The PM peak results from the post-development scenario indicates that the 95th percentile queue length for the eastbound through movement will increase from approximately 175 metres to 189 metres, which continues to be well within the existing lane lengths. The 95th percentile queue length for the short right turn lane along Milperra Road will also increase to approximately 73 metres, again indicating that there would occasionally be a vehicle overflowing into the westbound through lane along Milperra Road and noting that the average queue is 45 metres which is contained within the existing lane length. Similar to the AM peak, there is no indication that this occasional overflow would impact the overall performance of the westbound through lane.

The comparison between the queue lengths for the key approach lanes are summarised in Table 7.

Table 7: Queue length comparison

Key Movement	Available queuing length	Baseline + Proposed Development Average Queue	Baseline + Proposed Development 95% Queue
Milperra Rd Right Turn	65m	AM: 42m PM: 45m	AM: 69m PM: 73m
Nancy Ellis Leebold Dr	130m	AM: 71m PM: 46m	AM: 117m PM: 74m
Milperra Rd Eastbound Through	425m	AM: 252m PM: 116m	AM: 411m PM: 189m

As shown in the table above, post-development, the queue lengths along Nancy Ellis Leebold Drive and Milperra Road (eastbound through) will be contained wholly within the available lengths. Whilst the 95th percentile queue length for the short right turn lane along Milperra Road will slightly exceed the available length in the AM and PM peak, as aforementioned, the overflow will be approximately one vehicle length and will occur occasionally. Although relatively similar, there are some minor differences in traffic signal phase splits between the existing and post-development scenarios. The total phase time for the movements along Milperra Road (phases A and B) remain the same.

Table 8: Phase splits

Phase	AM		PM	
	Existing	Post-development	Existing	Post-development
A	50%	51%	65%	62%
B	31%	31%	16%	19%
C	19%	19%	19%	19%

Overall, the impact the proposed development will have on the surrounding road network and the intersection between Milperra Road and Nancy Ellis Leebold Drive is expected to be minor, with no adverse impact.

5.4 Additional Sensitivity Analysis

At the request of Aeria Management Group (Bankstown Airport), Stantec conducted some additional sensitivity analysis to consider the traffic impact associated with future development of the 10 Nancy Ellis Leebold Drive. This has been included for completeness, noting it does not form part of the proposal.

As there is no current proposal for the site and/or development application traffic generation has been calculated based on the assumption that building GFA would be approximately 50 per cent of total site area, which is consistent with the development of the LandCross site). A vehicle trip rate of 0.34 per 100m^2 GFA was adopted, which is consistent with the rate used in the Bankstown Airport WMDP. This results in approximately 81 vehicle trips in both the AM and PM peaks.

The SIDRA results are summarised in Table 9, whilst the queue lengths are summarised in Table 10. Any additional concerns arising from these queue lengths would need to be addressed as part of the future development application.

Table 9: 10 Nancy Ellis Leebold Drive sensitivity analysis SIDRA results

Intersection	Peak	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Milperra Road & Nancy Ellis Leebold Drive	AM	0.914	39	430	C
	PM	0.694	21	200	B

Table 10: 10 Nancy Ellis Leebold Drive sensitivity analysis queue lengths

Key Movement	Available queuing length	Baseline + Proposed Development + 10 NEL Average Queue	Landcross + Proposed Development + 10 NEL 95% Queue
Milperra Rd Right Turn	65m	AM: 48m PM: 54m	AM: 81m PM: 87m
Nancy Ellis Leebold Dr	130m	AM: 87m PM: 51m	AM: 130m PM: 82m
Milperra Rd Eastbound Through	425m	AM: 257m PM: 121m	AM: 430m PM: 200m

The results indicate that the 95th percentile queue lengths along Milperra Road right turn will exceed the available length in the AM and PM peaks, whilst the queue length along Milperra Road eastbound through will exceed the available length in the AM peak. The 95 percentile queue length along Nancy Ellis Leebold Drive will reach the capacity of the available queue length in the AM peak.

6. Conclusion

Based on the analysis and discussions presented within this report, the following conclusions are made:

- The proposal involves the modification to the existing site and building and obtain approvals for the site to be used as a distribution centre. The modification works will result in approximately 7,172m^2 GFA of warehouse space and 2,185m^2 GFA of ancillary office and truckers lounge space. The intention is for the proposed development to be in operation by late 2024.
- Based on the requirements of the Bankstown Airport Development Guidelines, the proposed development would need to provide 175 car parking spaces.
- The development proposes a total of 158 car parking spaces which is a combination of 135 existing car parking spaces and 23 new parking spaces in the south-western corner of the site. Whilst this represents a minor shortfall, the number of staff on-site at any given time is expected to be between 70 to 100 staff. A parking demand of up to 100 spaces is conservative as it assumes all staff drive with only one person per car. It is further noted that roster changeover would be coordinated such that there is no material overlap in parking demand between night and day rosters. As such the proposed provision will be able to sufficiently cater the day-to-day parking demand generated by the proposed distribution centre, with the remaining parking spaces available for visitor parking.
- The site is expected to generate up to 316 additional vehicle trips in the AM road network peak hour and 102 additional vehicle trips in the PM road network peak hour (noting that the existing tenant has been significantly ramping down their site operations). It is noted that these estimates are considered conservative, as they have not been reduced to account for existing or historical operation of the site.
- The SIDRA results show that whilst the development will have a minor impact on the existing operational conditions of the intersection of Milperra Road and Nancy Ellis Leebold Drive, noting overall performance indicators are satisfactory and there is no indication that the proposed development will have an adverse impact on the surrounding road network.

Appendices

We design with community in mind

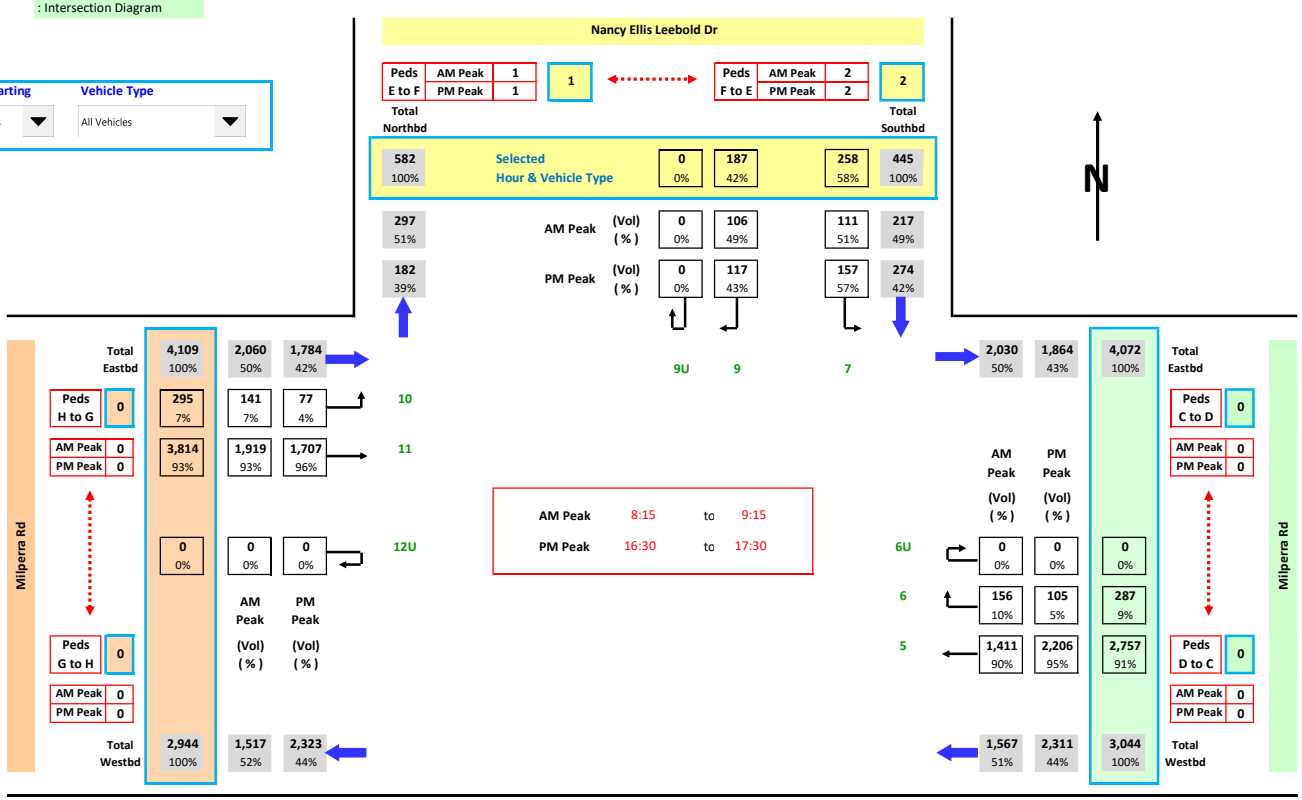
Appendix A. Surveyed Traffic Volumes

Job No. : AUNSW7457
Client : Stantec Australia Pty Ltd
Suburb : Bankstown Airport
Location : 1. Milperra Road / Nancy Ellis Leebold Drive

Day/Date : Thursday, 3rd August 2023
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

MATRIX Traffic and Transport Data

Hour Starting: AM Totals
Vehicle Type: All Vehicles



Appendix B. Existing Conditions SIDRA Results

MOVEMENT SUMMARY

Site: 101 [Milperra Road & Nancy Ellis Leebold Drive - AM Peak (Site Folder: Existing)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

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: Milperra Road (E)														
5	T1	1350	104	1421	7.7	0.331	5.1	LOS A	9.7	72.1	0.33	0.30	0.33	62.2
6	R2	152	8	160	5.3	* 0.338	51.2	LOS D	8.8	64.4	0.85	0.79	0.85	22.4
Approach		1502	112	1581	7.5	0.338	9.8	LOS A	9.7	72.1	0.38	0.35	0.38	55.7
North: Nancy Ellis Leebold Drive														
7	L2	111	18	117	16.2	0.156	33.7	LOS C	4.6	37.0	0.63	0.71	0.63	28.2
9	R2	106	9	112	8.5	* 0.446	64.9	LOS E	7.1	53.4	0.96	0.79	0.96	20.5
Approach		217	27	228	12.4	0.446	48.9	LOS D	7.1	53.4	0.79	0.75	0.79	23.5
West: Milperra Road (W)														
10	L2	141	24	148	17.0	0.090	7.2	LOS A	0.0	0.0	0.00	0.56	0.00	52.5
11	T1	1919	254	2020	13.2	* 0.853	40.9	LOS C	45.3	353.1	0.93	0.89	0.99	35.7
Approach		2060	278	2168	13.5	0.853	38.6	LOS C	45.3	353.1	0.87	0.87	0.92	36.3
All Vehicles		3779	417	3978	11.0	0.853	27.7	LOS B	45.3	353.1	0.67	0.66	0.70	41.1

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

* 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 ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: Milperra Road (E)												
P2	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	237.4	225.1	0.95
North: Nancy Ellis Leebold Drive												
P3	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	231.3	217.2	0.94
All Pedestrians		100	105	64.3	LOS F	0.2	0.2	0.96	0.96	234.4	221.2	0.94

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.

MOVEMENT SUMMARY

Site: 101 [Milperra Road & Nancy Ellis Leebold Drive - PM Peak (Site Folder: Existing)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

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: Milperra Road (E)														
5	T1	2206	104	2322	4.7	* 0.553	6.5	LOS A	21.4	155.8	0.42	0.39	0.42	60.4
6	R2	105	8	111	7.6	0.517	70.3	LOS E	7.3	54.2	0.98	0.79	0.98	18.0
Approach		2311	112	2433	4.8	0.553	9.4	LOS A	21.4	155.8	0.45	0.41	0.45	56.6
North: Nancy Ellis Leebold Drive														
7	L2	157	6	165	3.8	0.298	47.6	LOS D	8.5	61.7	0.81	0.77	0.81	23.5
9	R2	117	10	123	8.5	* 0.492	65.4	LOS E	7.9	59.5	0.97	0.79	0.97	20.4
Approach		274	16	288	5.8	0.492	55.2	LOS D	8.5	61.7	0.88	0.78	0.88	21.9
West: Milperra Road (W)														
10	L2	77	7	81	9.1	0.046	7.0	LOS A	0.0	0.0	0.00	0.57	0.00	53.0
11	T1	1707	77	1797	4.5	0.533	17.8	LOS B	23.8	173.0	0.62	0.56	0.62	49.8
Approach		1784	84	1878	4.7	0.533	17.3	LOS B	23.8	173.0	0.59	0.56	0.59	49.9
All Vehicles		4369	212	4599	4.9	0.553	15.5	LOS B	23.8	173.0	0.53	0.50	0.53	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.
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.

* 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 ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: Milperra Road (E)												
P2	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	237.4	225.1	0.95
North: Nancy Ellis Leebold Drive												
P3	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	231.3	217.2	0.94
All Pedestrians		100	105	64.3	LOS F	0.2	0.2	0.96	0.96	234.4	221.2	0.94

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.

Appendix C. Post-Development SIDRA Results

MOVEMENT SUMMARY

Site: 101 [Milperra Road & Nancy Ellis Leebold Drive - AM Peak (Site Folder: Scenario 4 - Existing + Landcross + Reduced Dev (35 in & out))]

Output produced by SIDRA INTERSECTION Version: 9.0.3.9771

Reprocess the Site in this Version to see the selected Movement Class results. All results may be affected by reprocessing compared with Version 9.0 results.

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Milperra Road (E)															
5	T1	All MCs	1421	7.7	1421	7.7	0.331	5.1	LOS A	9.7	72.1	0.33	0.30	0.33	62.2
6	R2	All MCs	169	5.6	169	5.6	* 0.359	51.4	LOS D	9.4	68.9	0.86	0.80	0.86	22.3
Approach			1591	7.5	1591	7.5	0.359	10.1	LOS A	9.7	72.1	0.39	0.35	0.39	55.3
North: Nancy Ellis Leebold Drive															
7	L2	All MCs	220	11.0	220	11.0	0.284	36.9	LOS C	9.3	71.4	0.67	0.75	0.67	27.7
9	R2	All MCs	216	5.9	216	5.9	* 0.847	76.7	LOS F	15.9	116.5	1.00	0.94	1.22	18.4
Approach			436	8.5	436	8.5	0.847	56.6	LOS E	15.9	116.5	0.83	0.84	0.94	21.8
West: Milperra Road (W)															
10	L2	All MCs	298	8.8	298	8.8	0.171	6.6	LOS A	0.0	0.0	0.00	0.54	0.00	53.0
11	T1	All MCs	2020	13.2	2020	13.2	* 0.896	49.0	LOS D	52.7	410.8	0.95	0.96	1.08	32.4
Approach			2318	12.7	2318	12.7	0.896	43.5	LOS D	52.7	410.8	0.83	0.91	0.94	33.7
All Vehicles			4344	10.3	4344	10.3	0.896	32.6	LOS C	52.7	410.8	0.67	0.70	0.74	37.8

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)

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 ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: Milperra Road (E)												
P2	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	237.4	225.1	0.95
North: Nancy Ellis Leebold Drive												
P3	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	231.3	217.2	0.94
All Pedestrians		100	105	64.3	LOS F	0.2	0.2	0.96	0.96	234.4	221.2	0.94

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.

MOVEMENT SUMMARY

Site: 101 [Milperra Road & Nancy Ellis Leebold Drive - PM Peak (Site Folder: Scenario 4 - Existing + Landcross + Reduced Dev (35 in & out))]

Output produced by SIDRA INTERSECTION Version: 9.0.3.9771

Reprocess the Site in this Version to see the selected Movement Class results. All results may be affected by reprocessing compared with Version 9.0 results.

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Milperra Road (E)															
5	T1	All MCs	2322	4.7	2322	4.7	0.565	7.0	LOS A	22.6	164.6	0.44	0.40	0.44	59.8
6	R2	All MCs	152	6.3	152	6.3	* 0.597	68.1	LOS E	9.9	73.1	0.99	0.81	0.99	18.4
Approach			2474	4.8	2474	4.8	0.597	10.7	LOS A	22.6	164.6	0.47	0.43	0.47	55.0
North: Nancy Ellis Leebold Drive															
7	L2	All MCs	206	3.6	206	3.6	0.339	45.7	LOS D	10.5	75.5	0.80	0.78	0.80	24.2
9	R2	All MCs	153	7.6	153	7.6	* 0.578	65.6	LOS E	9.9	73.8	0.98	0.81	0.98	20.4
Approach			359	5.3	359	5.3	0.578	54.2	LOS D	10.5	75.5	0.87	0.79	0.87	22.3
West: Milperra Road (W)															
10	L2	All MCs	111	7.6	111	7.6	0.063	6.7	LOS A	0.0	0.0	0.00	0.56	0.00	52.1
11	T1	All MCs	1797	4.5	1797	4.5	* 0.565	20.4	LOS B	25.9	188.5	0.67	0.60	0.67	47.7
Approach			1907	4.7	1907	4.7	0.565	19.6	LOS B	25.9	188.5	0.63	0.60	0.63	47.8
All Vehicles			4740	4.8	4740	4.8	0.597	17.6	LOS B	25.9	188.5	0.56	0.53	0.56	48.2

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 ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: Milperra Road (E)												
P2	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	237.4	225.1	0.95
North: Nancy Ellis Leebold Drive												
P3	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	231.3	217.2	0.94
All Pedestrians		100	105	64.3	LOS F	0.2	0.2	0.96	0.96	234.4	221.2	0.94

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.

Appendix D. Sensitivity Analysis SIDRA Results

MOVEMENT SUMMARY

Site: 101 [Milperra Road & Nancy Ellis Leebold Drive - PM Peak (Site Folder: Scenario 3 - Existing + Landcross + 10 Nancy Ellis Leebold Drive + Reduced Dev (35 in & out))]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

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: Milperra Road (E)														
5	T1	2206	104	2322	4.7	0.581	7.8	LOS A	24.3	177.1	0.46	0.43	0.46	58.8
6	R2	167	11	176	6.6	* 0.694	70.0	LOS E	11.8	87.5	1.00	0.84	1.04	18.0
Approach		2373	115	2498	4.8	0.694	12.2	LOS A	24.3	177.1	0.50	0.46	0.51	53.3
North: Nancy Ellis Leebold Drive														
7	L2	218	8	229	3.7	0.362	44.9	LOS D	11.6	83.4	0.79	0.78	0.79	24.5
9	R2	163	14	172	8.6	* 0.597	64.3	LOS E	11.0	83.0	0.98	0.82	0.98	20.6
Approach		381	22	401	5.8	0.597	53.2	LOS D	11.6	83.4	0.87	0.80	0.87	22.5
West: Milperra Road (W)														
10	L2	122	10	128	8.2	0.073	6.7	LOS A	0.0	0.0	0.00	0.55	0.00	51.6
11	T1	1707	77	1797	4.5	* 0.583	21.8	LOS B	27.1	196.9	0.69	0.62	0.69	46.6
Approach		1829	87	1925	4.8	0.583	20.8	LOS B	27.1	196.9	0.64	0.62	0.64	46.8
All Vehicles		4583	224	4824	4.9	0.694	19.0	LOS B	27.1	196.9	0.59	0.55	0.59	46.9

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.
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.

* 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 ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: Milperra Road (E)												
P2	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	237.4	225.1	0.95
North: Nancy Ellis Leebold Drive												
P3	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	231.3	217.2	0.94
All Pedestrians		100	105	64.3	LOS F	0.2	0.2	0.96	0.96	234.4	221.2	0.94

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.

MOVEMENT SUMMARY

Site: 101 [Milperra Road & Nancy Ellis Leebold Drive - AM Peak (Site Folder: Scenario 3 - Existing + Landcross + 10 Nancy Ellis Leebold Drive + Reduced Dev (35 in & out))]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

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: Milperra Road (E)														
5	T1	1350	104	1421	7.7	0.331	5.1	LOS A	9.7	72.1	0.33	0.30	0.33	62.2
6	R2	182	10	192	5.5	* 0.406	52.0	LOS D	10.8	78.9	0.87	0.80	0.87	22.0
Approach		1532	114	1613	7.4	0.406	10.7	LOS A	10.8	78.9	0.40	0.36	0.40	54.5
North: Nancy Ellis Leebold Drive														
7	L2	229	26	241	11.4	0.312	37.6	LOS C	10.4	79.7	0.68	0.76	0.68	27.5
9	R2	225	13	237	5.8	* 0.929	89.3	LOS F	19.2	141.4	1.00	1.03	1.40	16.6
Approach		454	39	478	8.6	0.929	63.3	LOS E	19.2	141.4	0.84	0.89	1.04	20.3
West: Milperra Road (W)														
10	L2	302	28	318	9.3	0.182	6.6	LOS A	0.0	0.0	0.00	0.54	0.00	52.9
11	T1	1919	254	2020	13.2	* 0.901	50.4	LOS D	53.8	419.5	0.95	0.97	1.09	31.9
Approach		2221	282	2338	12.7	0.901	44.5	LOS D	53.8	419.5	0.82	0.92	0.94	33.3
All Vehicles		4207	435	4428	10.3	0.929	34.2	LOS C	53.8	419.5	0.67	0.71	0.75	36.8

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.
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.

* 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 ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: Milperra Road (E)												
P2	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	237.4	225.1	0.95
North: Nancy Ellis Leebold Drive												
P3	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	231.3	217.2	0.94
All Pedestrians		100	105	64.3	LOS F	0.2	0.2	0.96	0.96	234.4	221.2	0.94

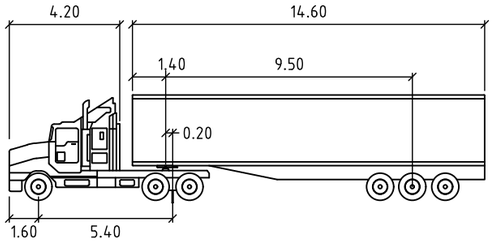
Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

Appendix E. Design Review & Swept Paths

SWEPT PATH KEY

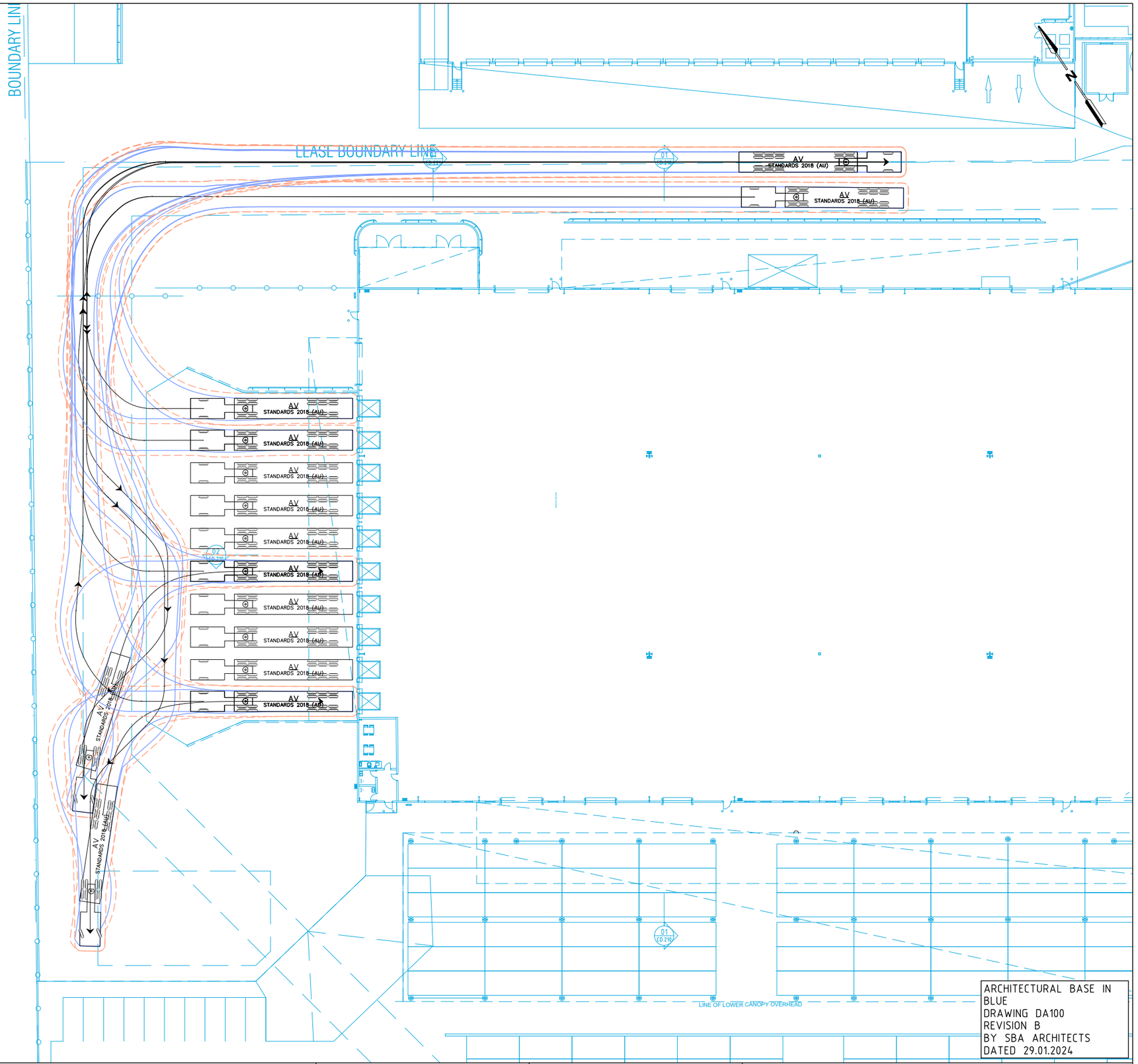
- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 600mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED5km/h



AV AS2890.2 20m

	meters		
Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 28.3
Tractor Track	: 2.50	Articulating Angle	: 72.0
Trailer Track	: 2.50		



Stantec

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT NOTIFICATION

WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

DESIGNED M.RIMAC	DESIGN CHECK S.HONG
APPROVED BY S.HONG	DATE ISSUED 21 FEBRUARY 2024

SCALE A3 0 2.5 5 10 1:500

CAD FILE NO. 301351354-01-P6.DWG

DNS5 BANKSTOWN AIRPORT
SEMI-TRAILER SWEPT PATHS

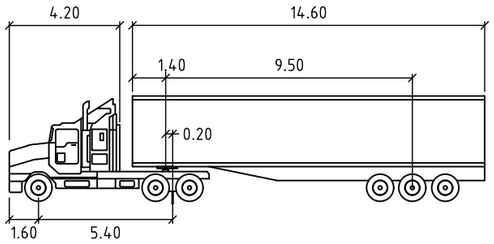
VEHICLE SWEPT PATH ASSESSMENT

DRAWING NO. 301351354-01-01 SHEET 01 OF 03 ISSUE P6

SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 600mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED5km/h



AV AS2890.2 20m

	meters		
Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 28.3
Tractor Track	: 2.50	Articulating Angle	: 72.0
Trailer Track	: 2.50		

BOUNDARY LINE

4M LANDSCAPE SETBACK

AV STANDARDS 2018 (AU)

ARCHITECTURAL BASE IN BLUE
DRAWING DA100
REVISION B
BY SBA ARCHITECTS
DATED 29.01.2024

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
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DESIGNED M.RIMAC	DESIGN CHECK S.HONG
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SCALE A3 0 2.5 5 10 1:500

CAD FILE NO. 301351354-01-P6.DWG

DNS5 BANKSTOWN AIRPORT
SEMI-TRAILER SWEPT PATHS

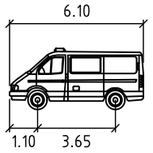
VEHICLE SWEPT PATH ASSESSMENT

DRAWING NO. 301351354-01-02 SHEET 02 OF 03 ISSUE P6

SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 300mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED5km/h



Sprinter Van

	meters
Width	: 2.02
Track	: 1.98
Lock to Lock Time	: 6.0
Steering Angle	: 36.4

ARCHITECTURAL BASE IN BLUE
DRAWING DA100
REVISION B
BY SBA ARCHITECTS
DATED 29.01.2024

Stantec

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DESIGNED M.RIMAC	DESIGN CHECK S.HONG
APPROVED BY S.HONG	DATE ISSUED 21 FEBRUARY 2024

SCALE A3 0 2.5 5 10 1:500

CAD FILE NO. 301351354-01-P6.DWG

DNS5 BANKSTOWN AIRPORT
VAN SWEPT PATHS

VEHICLE SWEPT PATH ASSESSMENT

DRAWING NO. 301351354-01-03 SHEET 03 OF 03 ISSUE P6

w

Stantec

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