



Reference: 20.456r05v02

3 August 2021

The Technical and Further Education Commission (ABN 89 755 348 137)
c/- Cadence Australia Pty Ltd
Level 1
10 Mallett Street
Camperdown NSW 2050

Attention: Mr Sam Gibson, Project Manager

**Re: TRAFFIX Response to Review of Response to Submissions
TAFE NSW Institute of Applied Technology for Construction
2-44 O'Connell Street, Kingswood (SSD 8571481)**

Dear Sam,

We refer to the correspondence received from Transport for NSW (TfNSW) 2021 and Penrith City Council (Council) dated 24 June 2021 regarding the subject development (State Significant Development Application – SSD 8571481). TRAFFIX has reviewed the responses from TfNSW and Council and has responded to each traffic item as follows:

TfNSW Exhibition of EIS Dated 24th June 2021 - Attachment A

Green Travel Plan

1. Comments

TfNSW has reviewed the revised Green Travel Plan (GTP) and appreciate the improvements that have been made. However, the GTP still needs further details and improvements to make it an effective plan.

Recommendation

The following recommendations are offered for consideration:

a) Provide more details for the active transport facilities around the site including:

- Showing the cycling and walking facilities and site permeability throughout the TAFE site, not just the proposed shared paths adjacent to the new development;*
- Showing permeability for cycling and walking of streets on east side of the campus if available;*



- Explaining why O'Connell Street and Second Avenue are more bicycle friendly than other streets (such as Algje Crescent) if relevant;
- Considering if there are improvements that could be made to the recommended streets to make them more cycling and/or walking friendly;
- Identifying any other options required to improve the cycling and walking facilities in the area (with better crossings, footpaths and/or bike paths);
- Identifying if there is adequate shade and lighting for safe and amenable cycling and walking through the site and its surrounds.

TRAFFIX Response: Reference should be made to Appendix F (Architectural Design Report) of the Environmental Impact Statement prepared separately showing available walking and cycling facilities, site permeability and pedestrian footpaths provided throughout the subject site.

O'Connell Street and Second Avenue connect the subject site with nearby destinations such as Kingswood Railway Station and Caddens Corner Shopping Centre and are therefore more likely to be used by cyclists. This logic is supported by the cycle routes suggested by TfNSW Cycleway Finder which shows Second Avenue, O'Connell Street and Great Western Highway as cycle routes between the subject site and Kingswood Railway Station. Other minor local roads such as Algje Crescent are not recommended via TfNSW Cycleway Finder.

Any improvements to surrounding streets are matters for Council and/or TfNSW to consider independently of the subject application and are not the responsibility of TAFE NSW. Adequate lighting is to be provided for all new pathways with natural shading where tree canopy is established. This requirement has been included in the Green Travel Plan (reference: 20.456r04v06) prepared separately.

b) Provide further details for the End of Trip facilities:

- Provides details and maps of end of trip facilities, including number (noted there are 26 bike parking spaces in total) and location of all secure bike parking, casual bike parking (including whether there is lighting, shelter and passive surveillance), showers and lockers;
- Identify whether provision of end of trip facilities is sufficient to meet demand.

TRAFFIX Response: Application of the long-term bicycle travel mode target for staff and students (4.7%) to the 2030 development scenario staff and student population increase results in a requirement for 23 bicycle parking spaces. Therefore, provision of 26 bicycle parking spaces is considered adequate to satisfy Council's DCP requirement and long-term bicycle travel mode targets for staff and students. In response, a minimum of 26 bicycle parking spaces and end of trip facilities provided with adequate lighting, shelter and passive surveillance are to be provided on the lower ground floor. Reference should be made to Section 6.3 of the Traffic Impact Assessment (reference: 20.456r02v08) and the Green Travel Plan (reference: 20.456r04v06) prepared separately.

c) Consider innovative ways to incorporate public transport and active transport into the fabric of life at the TAFE campus. Potential suggestions for inclusion include:

- Regular bike maintenance workshops and bike maintenance tools provided onsite for staff and students to use;
- Bike club/group to organise rides and bike buddy's etc., potentially in collaboration with similar groups at WSU;



- Celebrate ride to work day, world car-free day, September and/or organise other regular events to promote active and public transport;
- Consider how TAFE students can work on projects that are innovative in facilitating and promoting sustainable transport options;
- A screen with real time information for bus departures, including shuttle buses, in a main area of the development.

TRAFFIX Response: The Green Travel Plan (reference: 20.456r04v06) prepared separately has been updated to address the above suggestions.

d) Improve the TAG with particular consideration for active transport map:

- consider increasing active transport map beyond the 800m radius from centre of campus, and noting where there are footpaths;
- provide recommended walking and cycling routes to key destinations – such as Werrington Station, Kingswood Station (consider how they can avoid riding next to busy roads for the whole length), and Caddens Corner Shopping Centre;
- include the WSU internal cycling and walking network as mentioned in the response to previous comments.

TRAFFIX Response: The TAG provided within the Green Travel Plan (reference: 20.456r04v06) prepared separately has been updated to take into consideration the above. Reference should be made to the updated TAG provided in Attachment 1 of the Green Travel Plan (reference: 20.456r04v06) prepared separately.

e) Communications strategy is required and should include communication activities associated with all the initiatives, what channels will be used, who will be responsible for delivery and when will it be scheduled.

TRAFFIX Response: The Green Travel Plan has been updated to include communication activities associated with all the initiatives including what channels will be used, who will be responsible for delivery and when will it be scheduled. This includes information regarding TAFE bicycle facilities, shuttle bus services, carpool schemes and electric vehicle charging spaces, relevant communication channels, persons responsible and frequency of updates. Reference should be made to the Green Travel Plan (reference: 20.456r04v06) prepared separately for further details.

Transport Assessment

2. Comment

TfNSW notes that the updated SIDRA Intersection 9 modelling indicates that the queue length of the right turn bay at the Great Western Highway / French Street / O'Connell Street intersection exceeds the length of the bay by approximately 10 metres during the 95th percentile in 2030 + development.

Whilst it is understood that the GTP car driver target of 69.3% by 2030 is being proposed, there is a current project as part of the Federal Stimulus Program at the intersection of Great Western Highway / French Street / O'Connell Street. The project scope will provide right turn red arrow pedestrian protection for traffic turning from French and O'Connell streets as well as providing the missing pedestrian legs. The project designs are currently being developed, however the abovementioned scope has been identified. These changes to the intersection will likely result in



longer delays and queue lengths. Which when including the extra development traffic predicated this may result in the queues for the right turn bay exceeding the length of the bay earlier than expected.

Recommendation:

It is therefore recommended that the right turn bay on the western leg of Great Western Highway (GWH) is extended to accommodate the increased traffic expected as a result of this development. Subject to DPIE's approval, TfNSW requests that the following requirement to be included in the development consent:

The extension to the right turn bay on the western leg of GWH at the intersection of GWH / French Street / O'Connell Street shall be designed to meet TfNSW requirements, and endorsed by a suitably qualified practitioner. The design requirements shall be in accordance with AUSTRROADS and other Australian Codes of Practice. The certified copies of the civil design plans shall be submitted to TfNSW for consideration and approval prior to the release of the Construction Certificate by the Principal Certifying Authority and commencement of road works. Please send all documentation to development.sydney@transport.nsw.gov.au.

The developer is required to enter into a Works Authorisation Deed (WAD) for the abovementioned works.

TfNSW fees for administration, plan checking, civil works inspections and project management shall be paid by the developer prior to the commencement of works.

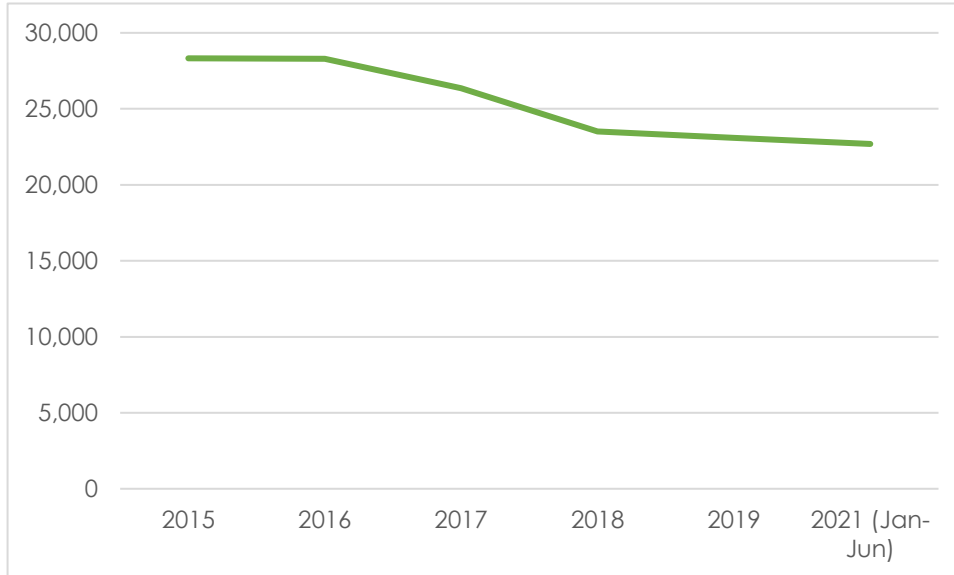
TRAFFIX Response: The background traffic growth rate assumed for the Traffic Impact Assessment (reference: 20.456r02v08) is considered an overestimation which was adopted as a worst case scenario and has resulted in the queue length of the right turn bay at Great Western Highway onto O'Connell Street slightly exceed the existing right turn bay during the morning peak period and is unlikely to occur under normal future peak conditions. In fact, the traffic along the Great Western Highway has been decreasing by 20% over the past 7 years based on data from the Permanent Classifier counter at the intersection of Great Western Highway and Pages Road (Station ID 7123-PR). The data provided in **Table 1** shows the weekday annual average daily traffic (AADT) for each year since 2015 and **Chart 1** further emphasises the declining trend. The data for 2020 was excluded due to the impact of the COVID-19 lockdown and the 2021 data considers the traffic before the current lockdown.

Table 1: AADT on Great Western Highway 2015-2021

Year	AADT Weekday	Growth Rate from Previous Year (%)
2021 (Jan-Jun)	22,689	-2%
2020	Excluded due to COVID-19 Impacts	
2019	23,090	-2%
2018	23,518	-11%
2017	26,360	-7%
2016	28,298	-0.1%
2015	28,324	N/A



Chart 1: AADT along Great Western Highway 2015 -2021



Based on the above further analysis, it is considered reasonable to reduce the growth rate from 2% to 0% having regard for declining long term traffic volume trends along this corridor. On this basis, the 2030 scenario has been reassessed at the critical intersection of the Great Western Highway, O'Connell Street and French Street. The model retains the previous travel modes for the trip distributions including the 84% of students/staff driving to TAFE. However, the Green Travel Plan is premised upon a car driver target of 69.3% by 2030 through the use of a number of strategies to encourage alternative transport modes. This applies to the entire future TAFE student population, including existing students, which will significantly suppress travel demand by private cars.

The revised model is still considered to overestimate the traffic generation of the development in 2030. Nevertheless, the SIDRA Intersection analysis of this scenario (0% growth rate with 84% car driver), shows a queue length of 64.4m for the right turn bay and this is accommodated by the existing right turn bay. The detailed results of this analysis are provided **Attachment 1** and the key results of the intersection during the critical morning period are summarised in **Table 2** below.

Table 2: Intersection Performance for Great Western Highway, French Street and O'Connell Street

Intersection	Control	Period	2030 +DEV Scenario with 84% car driver	Degree of Saturation (DoS)	Average Delay (AVD)	Level of Service (LoS)
Great Western Highway / French Street / O'Connell Street	Signal	AM	2% Growth Rate	1.052	44.4	D
			0% Growth Rate	0.829	27.2	B

It can be seen from Table 2 that with the more appropriate background traffic growth rate of 0%, the 2030 scenario with the development results in a level of service B with acceptable delays and spare capacity, based on the average delay of 27.2 seconds. As this intersection is the critical intersection during the morning peak period, the analysis outlined above concludes that the traffic generation of the proposed development is satisfactory, with no improvements necessary.



3. Comment

The swept path movements for a 12.5 metre vehicle at O'Connell Street indicate that simultaneous entry/exit cannot be achieved. This can lead to conflict points at the access where 2 opposing vehicles are attempting to use the access at the same time. It is noted that minor works to remove the median (in driveway) and widening of the internal road are proposed. This could extend to the widening at the entrance of the driveway to allow for simultaneous entry exit.

Recommendation:

The design of the access point should be widened to allow for simultaneous entry/exit movements of the largest vehicle with a passenger vehicle. However as O'Connell Street is a Local Road, Council is to determine if the development risks raised by TfNSW is satisfactorily addressed by the applicant. Should the driveway be widened the swept path of the longest vehicle entering and exiting the subject site, shall be in accordance with AUSTRROADS and to the satisfaction of Council.

TRAFFIX Response: Reference should be made to the swept path analysis provided in **Attachment 2** showing the amended southern access driveway layout via O'Connell Street which accommodates the largest size vehicle being a 12.5 metre heavy rigid vehicle (HRV) passing a B99 design vehicle at the site boundary. The amended access driveway has been designed in accordance with AS2890.1 (2004) and AS2890.2 (2018). It is noteworthy that the access driveway is not subject to Austroads Guidelines as it is a private driveway and is required to be assess with the requirements of AS 2890.1 and AS 2890.2 in this regard. Notwithstanding, it is emphasised that any requirement for a 12.5m HRV to pass a B99 design vehicle at the driveway crossover will be minimal since HRV's are expected to access the subject development approximately once every two (2) weeks and will arrive and depart outside of TAFE student peak times. The amended vehicle crossover will comfortably accommodate all vehicles accessing the subject site under all scenarios.

Penrith City Council Response to Submissions Dated 24th June 2021

Traffic Management Considerations

Concerns previously raised regarding local road / intersection service levels of "D" as a result of this development remain of concern. Comments raised in Council's previous submission regarding this aspect are considered to require resolution including investigation into mitigation measures / infrastructure upgrades to ensure that the service level is not reduced or adversely impacted upon as a consequence of this proposal.

TRAFFIX Response: As previously noted, in accordance with Section 4.2.2 of the RMS Guide to Traffic Generating Developments (2002), the modelling of the intersection confirms the intersection will continue to operate within its capacity under all future scenarios. It is again noted that intersection performance is not measured based on the performance of individual movements for signalised intersections as per the RMS guidelines.

In addition to the above, reference should be made to the response provided to TfNSW relating to background traffic growth rate and critical intersection analysis. It is emphasised that the traffic along the Great Western Highway has been decreasing over the past 7 years which is a representation of the traffic volumes of the local area. It is considered appropriate to assume a growth rate of 0% due to the declining traffic volumes. TfNSW has only identified the critical scenario being the intersection of Great Western Highway / French Street / O'Connell Street during the morning peak period. This scenario (0% growth rate with 84% car driver) results in a level of service B with acceptable delays and spare capacity noting an average delay of 27.2 seconds. Therefore, the operation of this intersection of GWH / French Street / O'Connell Street is considered acceptable and is indicative of a worst-case scenario in any case.



Further the access arrangements into the site are considered to require further analysis to inform the design arrangement and local road works necessary to accommodate the development. To address this critical aspect, the following is necessary and should be submitted for detailed assessment. The Traffic and Car Parking Assessment Report should ensure the following has been addressed:

- Intensification of use on the site – traffic volumes overall for the site (existing and proposed, as well as growth forecast to 2030)

TRAFFIX Response: Reference should be made to Section 7.3 of the TIA (reference: 20.456r02v08) prepared separately for existing traffic generation volumes and Section 7.5 for growth forecast to 2026 and 2030 in relation to the subject development.

- Potential connection to proposed future road on adjacent site immediately to the south.

TRAFFIX Response: Reference should be made to Environmental Impact Statement Appendix F Section 6.4 Current Structure Plan which identifies possible future connections to the south of the Campus. It should be noted however that there is currently no approved plan for a road to the South of the site and any future connections would be the subject of further planning approvals.

- Demonstrated compliance with relevant standards (such as AS2890.1 / AS2890.2 / AS2890.6), technical directions and guidelines for car parking and access

TRAFFIX Response: Reference should be made to Section 8 of the TIA (reference: 20.456r02v08) for compliance with the relevant Australian Standards. In summary, internal configuration of the car park has been designed in accordance with AS2890.1 (2004), AS2890.2 (2002), AS 2890.3 (2015) and AS2890.6 (2009).

- Assessment of potential need to upgrade existing driveway access as unsignalised intersection with regard to Austroads Guide to Road Design basic turn treatments or auxiliary lane treatments needed?
 - Sight distances for vehicles exiting site
 - Sight distances for vehicles approaching queued/propped vehicles on O'Connell Street
 - Auxiliary turning lanes needed? – deceleration/acceleration
 - Warrants for turn treatments on the major road at unsignalised intersections (Warrants for BA, AU and CH Turn Treatments)
 - Vehicle turning volumes in vph (existing and proposed growth)
 - Meets minimum stopping sight distances (min. SSD)
 - Queue lengths
 - Up to date relevant traffic volume surveys for O'Connell Street and site access

TRAFFIX Response: The subject developments access driveway is required to be assessed under AS2890.1 and AS2890.2 being an Australian Standard and is assessed in Section 8.1 of the TIA (reference: 20.456r02v08) prepared separately. Austroads Guidelines are a guideline and is not applicable, given the driveway is not a public road and is therefore subject to AS2890 requirements.

With regard to available sight distances, the southern access driveway via O'Connell Street is an existing vehicular crossing and the changes proposed to widen the driveway are minor. As a result, the sight distances will remain unchanged to the already approved and currently satisfactorily operating vehicular access.

Existing traffic volumes were obtained from survey results at the intersection of Great Western Highway / French Street / O'Connell Street as provided in the TIA (reference: 20.456r02v08). TRAFFIX undertook turning count movements of vehicles entering and exiting the southern access driveway as part of the



initial site inspections undertaken in 2020. The 2030 development traffic volumes were added to existing traffic volumes in order to assess traffic impacts at the intersection for the 2030 development scenario, as discussed in more details below.

The existing southern access driveway via O'Connell Street was modelled using SIDRA 9 Intersection modelling software to assess the traffic impacts at this intersection in relation to the 2030 development scenario. SIDRA 9 Intersection modelling results for the existing and future scenarios during the peak TAFE morning and afternoon periods are presented in **Table 2** below:

Table 2: O'Connell Street Southern Access Driveway SIDRA Intersection 9 Modelling Results

Intersection	Control	Scenario	Period	Degree of Saturation (DoS)	Average Delay	Level of Service*
Southern Access Driveway / O'Connell Street	Priority*	Base Case	AM	0.251	8.9	A
			PM	0.160	6.3	A
		2030 + Development	AM	0.320	10.7	A
			PM	0.175	6.7	A

* LoS for priority intersections based on the worst performing movement in accordance with RMS Guide (2002).

It can be seen from **Table 2** above that the access driveway operates at a Level of Service A under the existing and 2030 + development during both morning and afternoon peak period scenarios, demonstrating that the southern access driveway will continue to operate at a good operational level with an average delay of no more than 10.7 seconds during network peak times. Therefore, the driveway access will continue to operate satisfactorily. Reference should be made to the SIDRA 9 Intersection modelling results presented in **Attachment 3** for reference.

- *Provision of CTMP (construction traffic management plan) – although it is noted that this could be conditioned.*

TRAFFIX Response: TRAFFIX supports the requirement for a comprehensive CTMP to be conditioned, as considered appropriate.

We consider that the above responses satisfy all remaining issues. Please contact the undersigned should you have any queries or require any further information. In the event Council officers have any remaining concerns, noting we request an opportunity to discuss these with Council officers prior to any determination being made in the event of any further concerns.

Yours faithfully,

Traffic

Vince Doan
Executive Engineer

Encl: Attachment 1 – SIDRA 9 Output – Great Western Highway / French Street / O'Connell Street
Attachment 2 – Swept Path Analysis
Attachment 3 – SIDRA 9 Output – O'Connell Street / Southern Site Access

ATTACHMENT 1

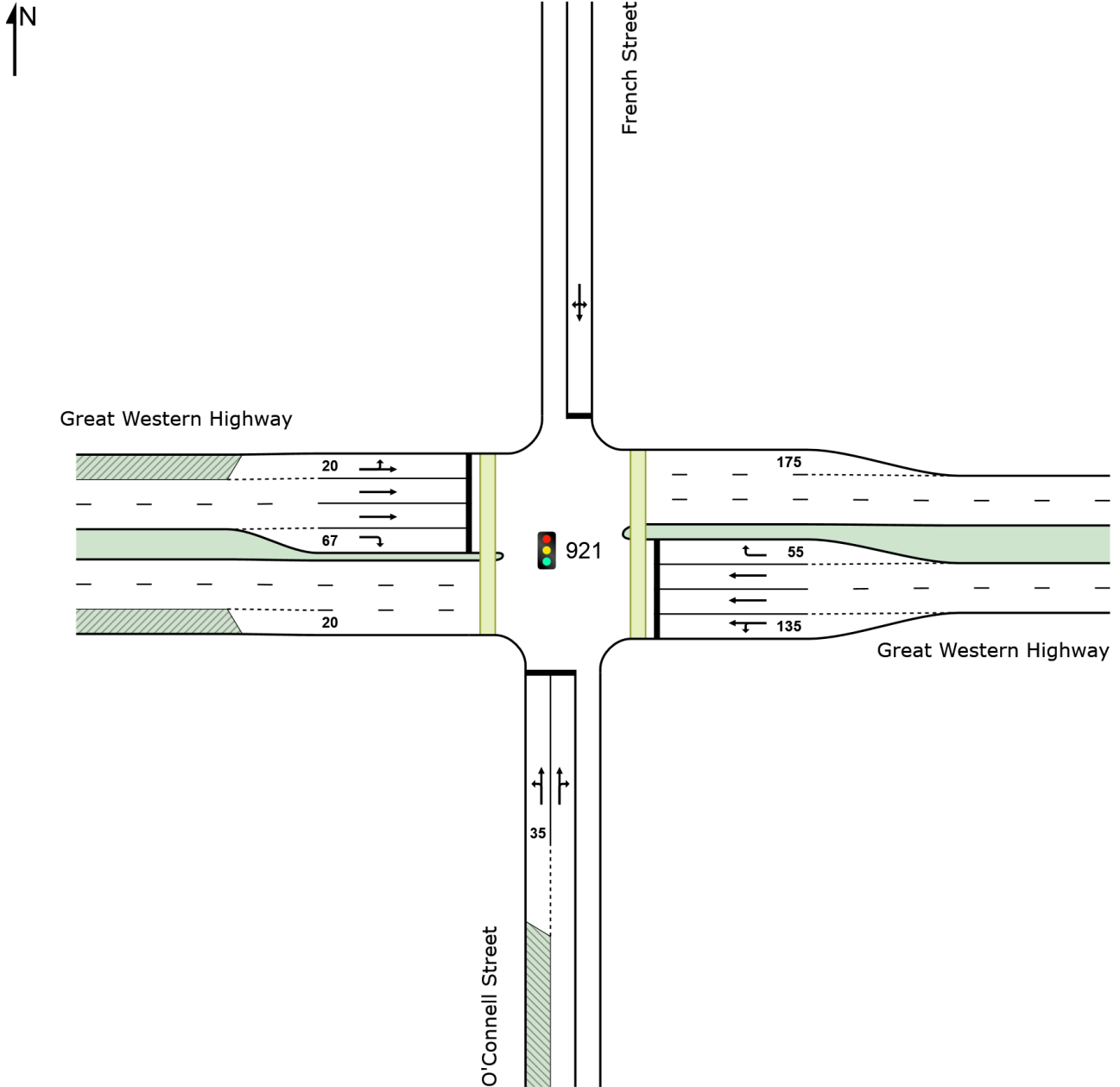
SIDRA 9 Intersection Output
Great Western Highway / French Street / O'Connell Street

SITE LAYOUT

Site: 921 [Great Western Highway x O'Connell Street x French Street 2030+DEV AM 0% /84%Drive (Site Folder: Future - 2030 +DEV)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 921 [Great Western Highway x O'Connell Street x French Street 2030+DEV AM 0% /84%Drive (Site Folder: Future - 2030 +DEV)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site User-Given Cycle Time)

Design Life Analysis (Final Year): Results for 10 years

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: O'Connell Street														
1	L2	54	1	57	1.9	0.153	47.0	LOS D	3.4	23.8	0.81	0.72	0.81	29.6
2	T1	11	0	12	0.0	0.153	40.4	LOS C	3.4	23.8	0.81	0.72	0.81	28.3
3	R2	172	9	181	5.2	* 0.829	69.7	LOS E ¹¹	12.3	89.9	1.00	0.95	1.24	23.4
Approach		237	10	249	4.2	0.829	63.2	LOS E ¹¹	12.3	89.9	0.95	0.89	1.12	24.8
East: Great Western Highway														
4	L2	215	10	226	4.7	0.227	21.2	LOS B	7.2	52.2	0.54	0.73	0.54	39.2
5	T1	1458	45	1535	3.1	* 0.745	22.9	LOS B	35.9	257.7	0.81	0.74	0.81	43.6
6	R2	23	0	24	0.0	0.121	63.0	LOS E ¹¹	1.4	9.9	0.94	0.71	0.94	28.0
Approach		1696	55	1785	3.2	0.745	23.2	LOS B	35.9	257.7	0.78	0.74	0.78	42.8
North: French Street														
7	L2	49	0	52	0.0	0.486	56.1	LOS D	8.5	59.8	0.94	0.79	0.94	29.9
8	T1	31	0	33	0.0	0.486	50.5	LOS D	8.5	59.8	0.94	0.79	0.94	26.0
9	R2	62	0	65	0.0	0.486	55.0	LOS D	8.5	59.8	0.94	0.79	0.94	30.0
Approach		142	0	149	0.0	0.486	54.4	LOS D	8.5	59.8	0.94	0.79	0.94	29.2
West: Great Western Highway														
10	L2	8	0	8	0.0	0.591	22.2	LOS B	11.8	85.2	0.59	0.51	0.59	43.2
11	T1	1254	43	1320	3.4	0.633	18.4	LOS B	22.4	161.1	0.64	0.56	0.64	46.2
12	R2	129	7	136	5.4	* 0.705	69.5	LOS E ¹¹	8.8	64.4	1.00	0.84	1.09	23.8
Approach		1391	50	1464	3.6	0.705	23.1	LOS B	22.4	161.1	0.67	0.59	0.68	43.2
All Vehicles		3466	115	3648	3.3	0.829	27.2	LOS B	35.9	257.7	0.75	0.69	0.77	40.5

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.

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.

¹¹ Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
						[Ped ped	Dist] m					
East: Great Western Highway												
P2	Full	50	64	59.3	LOS E ¹²	0.2	0.2	0.96	0.96	234.0	227.1	0.97

West: Great Western Highway												
P4 Full	50	64	59.3	LOS E ¹²	0.2	0.2	0.96	0.96	233.2	226.1	0.97	
All Pedestrians	100	128	59.3	LOS E ¹²	0.2	0.2	0.96	0.96	233.6	226.6	0.97	

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

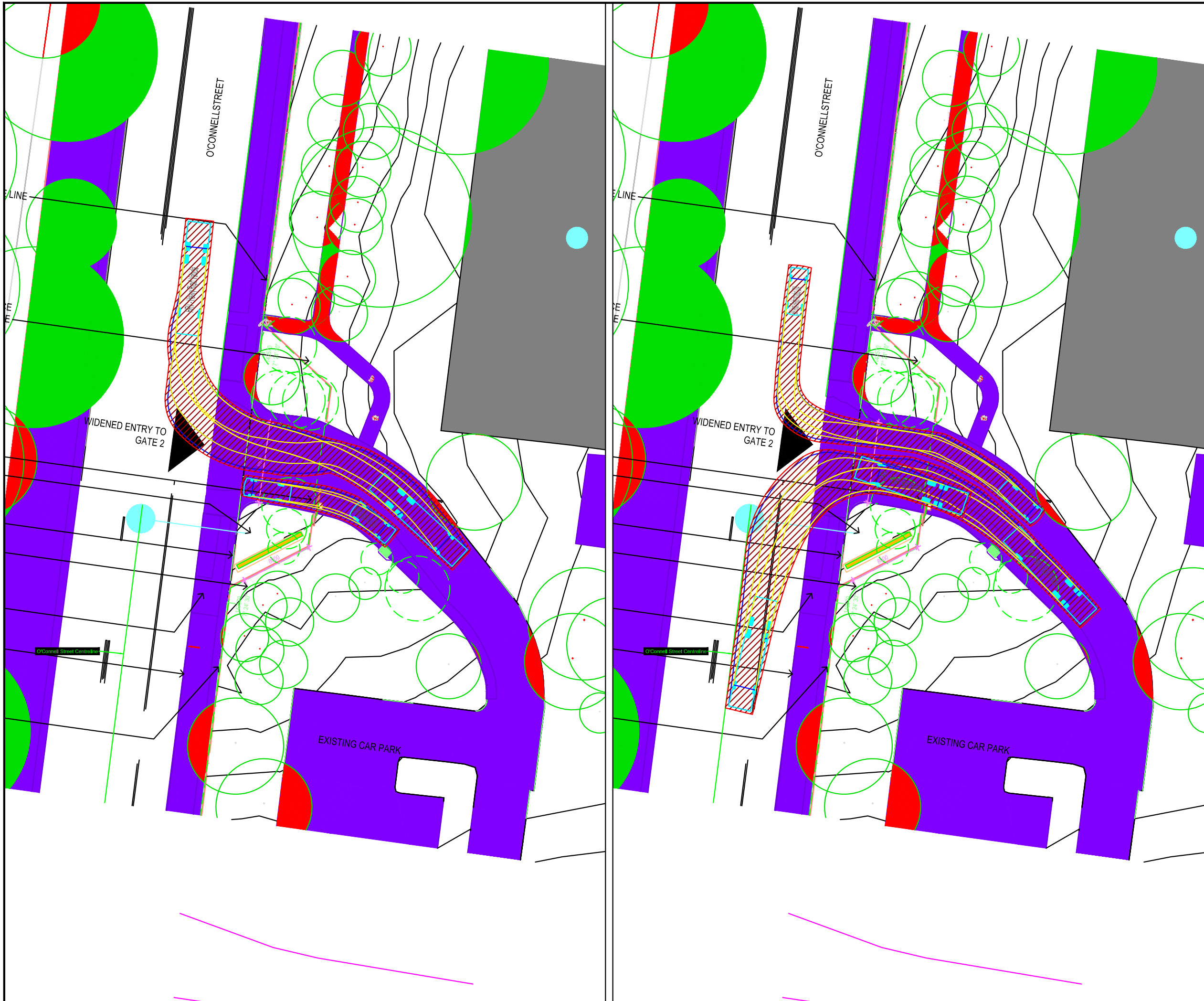
Pedestrian movement LOS values are based on average delay per pedestrian movement.

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

¹² Level of Service is worse than the Pedestrian Level of Service Target specified in the Parameter Settings dialog.

ATTACHMENT 2

Swept Path Analysis



Notes:
 This drawing is prepared for information purposes only. It is not to be used for construction.
 TRAFFIX is responsible for vehicle swept path diagrams and/or drawing mark-ups only. Base drawing prepared by others.
 Vehicle swept path diagrams prepared using computer generated turning path software and associated CAD drawing platforms. Vehicle data based upon relevant Australian Standards (AS/NZS 2890.1:2004 Parking facilities - Off-street car parking; and/or AS2890.2:2002 Parking facilities - Off-street commercial vehicle facilities). These standards embody a degree of tolerance, however the vehicle characteristics in these standards represent a suitable design vehicle and do not account for all variations in vehicle dimensions / specifications and/or driver ability or behaviour.

Rev.	Revision Note	By.	Date

Swept Path Legend	
	Wheel Path
	Vehicle Body Envelope
	Clearance Envelope (300mm)

Architect

Client
 Cadence Australia Pty Ltd
 Level 1, 10 Mallett Street
 Camperdown 2050

Scale / Plan Orientation

1:400 @ A3

Project Description
 TAFE NSW
 2-44 O'Connell Street, Kingswood, NSW, 2747

Drawing Prepared By

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Drawing Title
 O'Connell Street Access Driveway
 Swept Path Analysis
 12.5m HRV - Site Access & Passing Opportunity
 Left: HRV Entry Manoeuvre from North
 Right: HRV Egress Manoeuvre to South

Drawn: JP	Checked: VD	Date: 26-07-21
Project No. 20.456	Drawing Phase RTS	Drawing No. TX.01
		Rev. A

20.456d02v08 TRAFFIX [210726 Plans] Design Review SITE + ACCESS RTS.dwg

ATTACHMENT 3

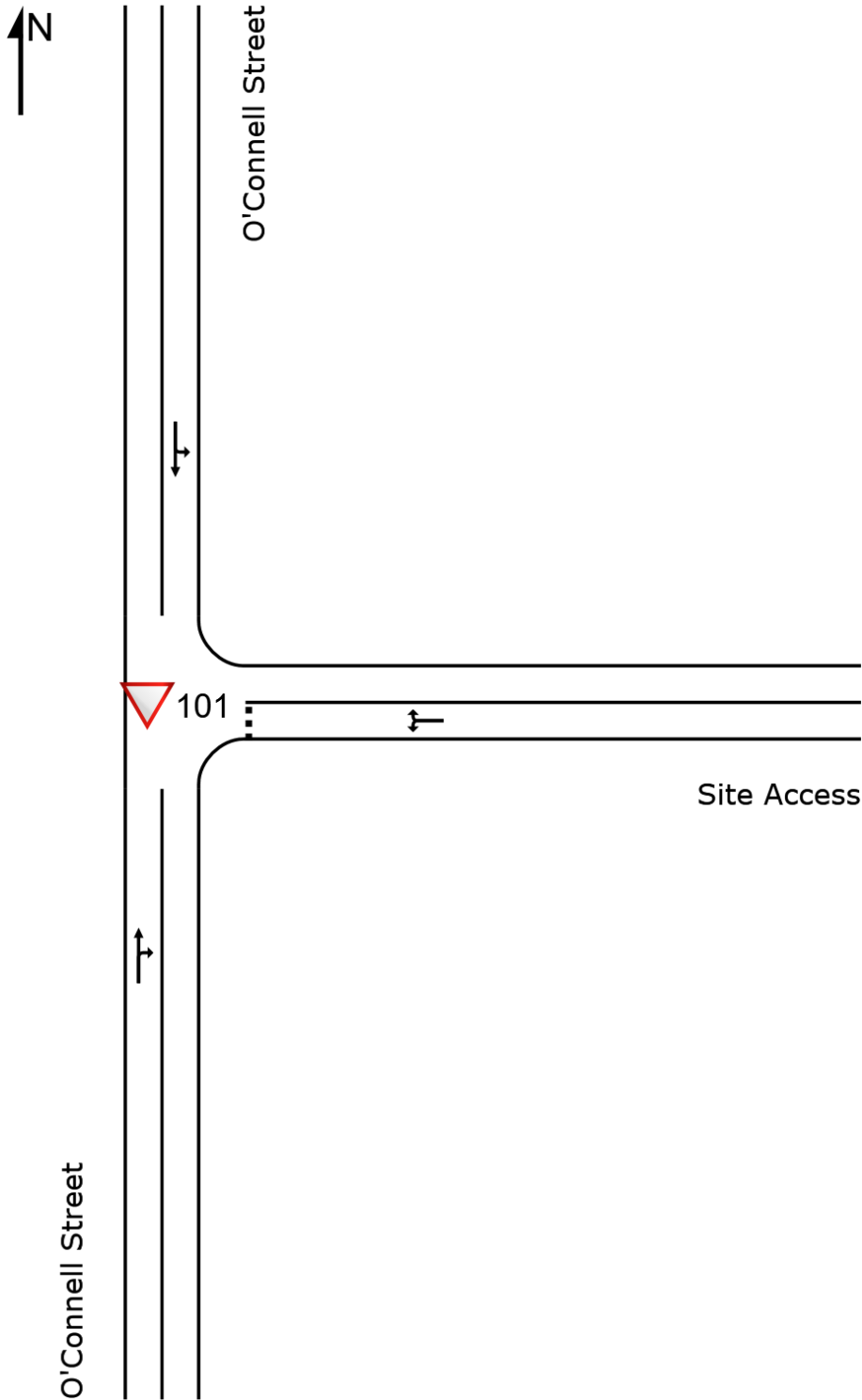
SIDRA 9 Intersection Output
O'Connell Street / Southern Site Access

SITE LAYOUT

▽ Site: 101 [O'Connell Street x Site Access AM Existing (Site Folder: Existing)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



USER REPORT FOR SITE

All Movement Classes

 Project: 20.456m02v01 TRAFFIX - Southern Site Access

Template: Movement Summaries

Site: 101 [O'Connell Street x Site Access AM Existing (Site Folder: Existing)]

New Site

Site Category: (None)

Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist m]				
South: O'Connell Street														
2	T1	261	0.0	275	0.0	0.196	0.7	LOS A	0.6	4.3	0.24	0.11	0.24	48.6
3	R2	56	0.0	59	0.0	0.196	6.9	LOS A	0.6	4.3	0.24	0.11	0.24	47.3
Approach		317	0.0	334	0.0	0.196	1.8	NA	0.6	4.3	0.24	0.11	0.24	48.4
East: Site Access														
4	L2	20	0.0	21	0.0	0.041	6.2	LOS A	0.1	1.0	0.48	0.67	0.48	44.1
6	R2	11	0.0	12	0.0	0.041	8.9	LOS A	0.1	1.0	0.48	0.67	0.48	42.5
Approach		31	0.0	33	0.0	0.041	7.2	LOS A	0.1	1.0	0.48	0.67	0.48	43.6
North: O'Connell Street														
7	L2	34	0.0	36	0.0	0.251	4.6	LOS A	0.0	0.0	0.00	0.04	0.00	48.8
8	T1	430	0.0	453	0.0	0.251	0.1	LOS A	0.0	0.0	0.00	0.04	0.00	49.6
Approach		464	0.0	488	0.0	0.251	0.4	NA	0.0	0.0	0.00	0.04	0.00	49.6
All Vehicles		812	0.0	855	0.0	0.251	1.2	NA	0.6	4.3	0.11	0.09	0.11	48.9

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.

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.

Site: 101 [O'Connell Street x Site Access PM Existing (Site Folder: Existing)]

New Site
 Site Category: (None)
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist m]				
South: O'Connell Street														
2	T1	278	0.0	293	0.0	0.160	0.0	LOS A	0.1	0.8	0.03	0.03	0.03	49.7
3	R2	14	0.0	15	0.0	0.160	5.0	LOS A	0.1	0.8	0.03	0.03	0.03	48.5
Approach		292	0.0	307	0.0	0.160	0.3	NA	0.1	0.8	0.03	0.03	0.03	49.7
East: Site Access														
4	L2	32	0.0	34	0.0	0.043	4.9	LOS A	0.2	1.1	0.22	0.54	0.22	45.2
6	R2	17	0.0	18	0.0	0.043	6.3	LOS A	0.2	1.1	0.22	0.54	0.22	43.8
Approach		49	0.0	52	0.0	0.043	5.4	LOS A	0.2	1.1	0.22	0.54	0.22	44.8
North: O'Connell Street														
7	L2	8	0.0	8	0.0	0.065	4.6	LOS A	0.0	0.0	0.00	0.04	0.00	49.0
8	T1	112	0.0	118	0.0	0.065	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	49.7
Approach		120	0.0	126	0.0	0.065	0.3	NA	0.0	0.0	0.00	0.04	0.00	49.7
All Vehicles		461	0.0	485	0.0	0.160	0.8	NA	0.2	1.1	0.04	0.08	0.04	49.2

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.

Site: 101 [O'Connell Street x Site Access AM Future (Site Folder: Future (2030))]

New Site
 Site Category: (None)
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
		[Total veh/h]	[HV] veh/h	[Total veh/h]	[HV] %				[Veh. veh]	[Dist] m				
South: O'Connell Street														
2	T1	261	0	275	0.0	0.320	2.3	LOS A	2.0	14.2	0.52	0.31	0.59	46.7
3	R2	170	0	179	0.0	0.320	7.8	LOS A	2.0	14.2	0.52	0.31	0.59	45.4
Approach		431	0	454	0.0	0.320	4.5	NA	2.0	14.2	0.52	0.31	0.59	46.2
East: Site Access														
4	L2	49	0	52	0.0	0.108	6.3	LOS A	0.4	2.6	0.51	0.71	0.51	43.6
6	R2	26	0	27	0.0	0.108	10.7	LOS A	0.4	2.6	0.51	0.71	0.51	42.0
Approach		75	0	79	0.0	0.108	7.8	LOS A	0.4	2.6	0.51	0.71	0.51	43.1
North: O'Connell Street														
7	L2	94	0	99	0.0	0.285	4.6	LOS A	0.0	0.0	0.00	0.10	0.00	48.4
8	T1	430	0	453	0.0	0.285	0.1	LOS A	0.0	0.0	0.00	0.10	0.00	49.2
Approach		524	0	552	0.0	0.285	0.9	NA	0.0	0.0	0.00	0.10	0.00	49.1
All Vehicles		1030	0	1084	0.0	0.320	2.9	NA	2.0	14.2	0.25	0.23	0.28	47.4

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.

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.

▽ Site: 101 [O'Connell Street x Site Access PM Future (Site Folder: Future (2030))]

New Site
 Site Category: (None)
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
		[Total veh/h]	[HV] veh/h	[Total veh/h]	[HV] %				[Veh. veh]	[Dist] m				
South: O'Connell Street														
2	T1	278	0	293	0.0	0.175	0.1	LOS A	0.3	1.9	0.07	0.06	0.07	49.4
3	R2	36	0	38	0.0	0.175	5.1	LOS A	0.3	1.9	0.07	0.06	0.07	48.1
Approach		314	0	331	0.0	0.175	0.7	NA	0.3	1.9	0.07	0.06	0.07	49.2
East: Site Access														
4	L2	85	0	89	0.0	0.116	4.9	LOS A	0.4	3.1	0.23	0.55	0.23	45.2
6	R2	44	0	46	0.0	0.116	6.7	LOS A	0.4	3.1	0.23	0.55	0.23	43.8
Approach		129	0	136	0.0	0.116	5.5	LOS A	0.4	3.1	0.23	0.55	0.23	44.7
North: O'Connell Street														
7	L2	19	0	20	0.0	0.071	4.6	LOS A	0.0	0.0	0.00	0.08	0.00	48.6
8	T1	112	0	118	0.0	0.071	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	49.5
Approach		131	0	138	0.0	0.071	0.7	NA	0.0	0.0	0.00	0.08	0.00	49.4
All Vehicles		574	0	604	0.0	0.175	1.8	NA	0.4	3.1	0.09	0.18	0.09	48.3

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.

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.