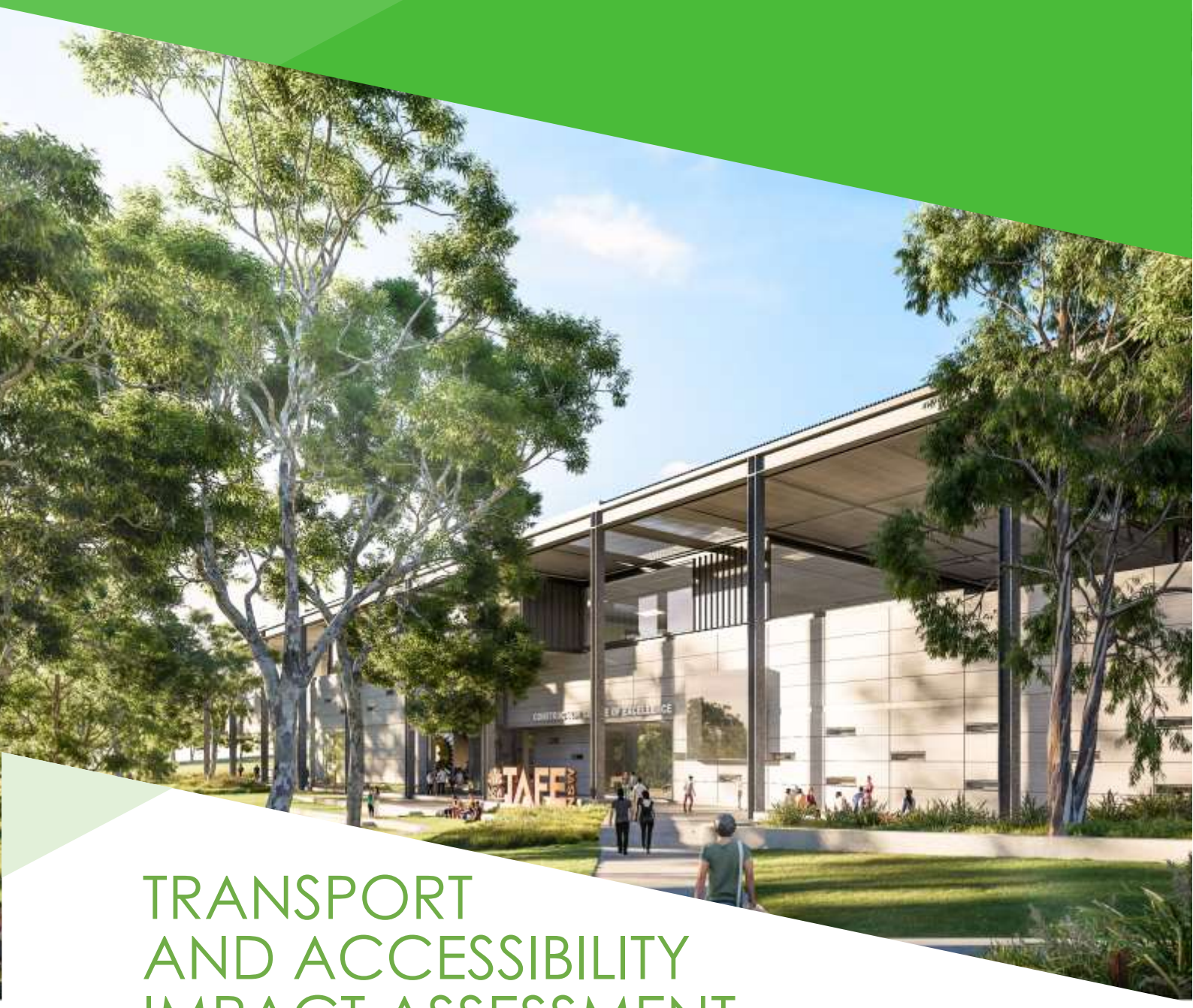

TRANSPORT AND ACCESSIBILITY IMPACT ASSESSMENT

TAFE NSW Construction Centre of Excellence
Nepean Kingswood Campus – 2-44 O'Connell Street, Kingswood

Reference: 20.456r02v06
Date: March 2021

TRAFFIX
TRAFFIC & TRANSPORT PLANNERS

Suite 2.08, 50 Holt St
Surry Hills, NSW 2010

t: (02) 8324 8700
w: www.traffix.com.au

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v06	11/03/2021	Justin Pindar	Vince Doan	

CONTENTS

Appendices

1. INTRODUCTION

TRAFFIX has been commissioned by Cadence Australia Pty Ltd on behalf of TAFE NSW to prepare a Transport and Accessibility Impact Assessment report in relation to the proposed TAFE NSW Construction Centre of Excellence at the Nepean Kingswood campus at 2-44 O'Connell Street, Kingswood. The development will be assessed by the Department of Planning, Industry and Environment for determination.

The student and staff populations are projected to increase over a 7-year period following construction of the proposed development. This report assesses the impacts associated with the expansion of the existing TAFE campus having regard for two forecast population scenarios over time: 2023 and 2030. The development is a State Significant Development (SSD) and therefore is required to respond to the Secretary's Environmental Assessment Requirements (SEARs) as provided by the Department of Planning and Environment.

This report documents the findings of our investigations and should be read in the context of the Statement of Environmental Effects (SEE) prepared separately. Reference should also be made to the SEARs (Application Number SSD-8571481).

The report is structured as follows:

- Section 2: Describes the site and its location
- Section 3: Documents existing traffic conditions
- Section 4: Describes the proposed development
- Section 5: Assesses the parking requirements
- Section 6: Assesses traffic impacts
- Section 7: Discusses access and internal design aspects
- Section 8: Addresses the SEARs
- Section 9: Presents the overall study conclusion

2. LOCATION AND SITE

The subject site is located within the TAFE NSW Nepean Kingswood campus at 2-44 O'Connell Street, Kingswood (Lot 1 in DP866081). More specifically, it is situated along the eastern boundary of the campus, north of 'Building T' and adjacent 'Building BA' of the Western Sydney University (WSU) Werrington South campus.

The site is rectangular in configuration with a total site area of approximately 2.1 hectares. It has a northern boundary to recreational area and a southern boundary to Building T of the TAFE that measure approximately 100 metres. The remaining eastern and western boundaries measure approximately 210 metres to the internal road/Building BA of WSU and recreational area of the TAFE, respectively.

Vehicular access to the wider TAFE site is currently provided via the following vehicular crossings which provide access to two separate carparking areas:

- Gate 1 Access: O'Connell Street (northern access); and
- Gate 2 Access: O'Connell Street (southern access).

Vehicular access to the subject site is proposed via the Gate 2 O'Connell Street access driveway.

A Location Plan is presented in **Figure 1**, with a Site Plan presented in **Figure 2**. Reference should also be made to the photographic record presented in **Appendix A**, which provides an appreciation of the general character of roads and other key attributes in proximity to the site.

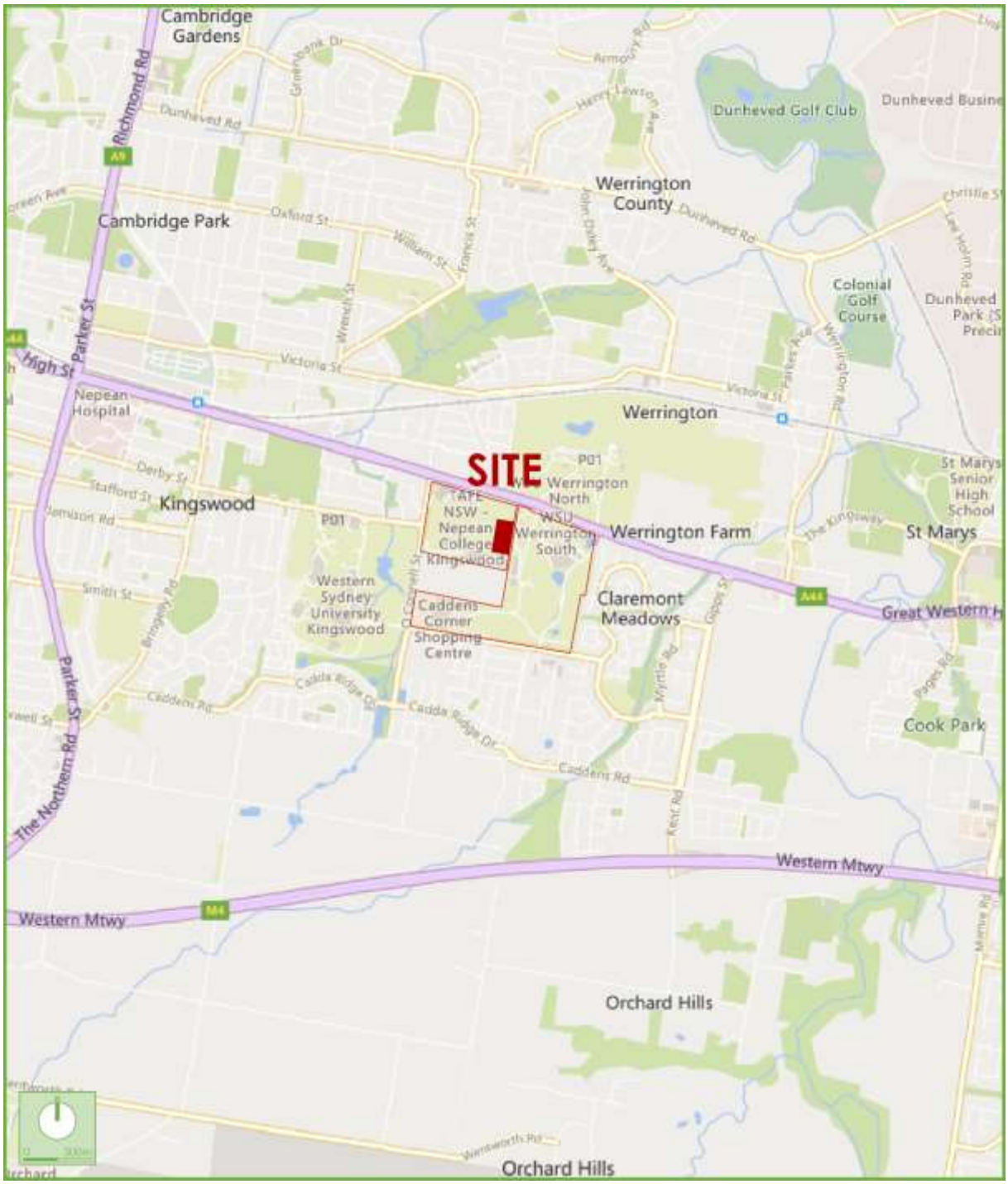


Figure 1: Location Plan

Figure 2: Site Plan

3. EXISTING TRAFFIC CONDITIONS

3.1 Road Network

The road hierarchy in the vicinity of the site is shown in **Figure 3** with the following roads of particular interest:

- Great Western Highway: an RMS highway (HW5) that traverses east-west between Sydney in the east and Bathurst in the west. Within the vicinity of the site, it is generally subject to 80km/h speed zoning (60km/h within proximity of the O'Connell Street intersection) and accommodates 2-3 lanes of traffic in each direction. Great Western Highway does not permit on-street parking and has been identified by the RMS as an approved 26.0m B-Double route.
- Gipps Street: a local road that traverses north-south between the Great Western Highway (HW5) in the north and Kent Road in the south. It is subject to 80km/h speed zoning and accommodates two (2) lanes of traffic in each direction. Gipps Street does not permit on-street parking along both sides of the road.
- O'Connell Street: a local road that traverses north-east between the Great Western Highway (HW5) in the north and Sunflower Drive in the east. It is generally subject to 50-60km/h speed zoning and accommodates a single lane of traffic in each direction. O'Connell Street permits on-street parking along both sides of the road.
- Bringelly Road: a local collector road that traverses north-south between the Great Western Highway (HW5) in the north and The Northern Road / Parker Street in the south. It is subject to 50km/h speed zoning and accommodates a single lane of traffic in each direction within an undivided carriageway. Parallel parking is generally permitted along both kerbside of Bringelly Road.

- Caddens Road: a local collector road that traverses east-west forming a cul-de-sac in the east and connecting to Bringelly Road in the west. It is noted that Caddens Road is not a continuous road and provides sections of road break. It is subject to 50km/h speed zoning and accommodates a single lane of traffic in each direction within an undivided carriageway. On-street parking is generally not permitted west of Ulm Road.
- Kent Road: a local collector road that traverses north-south between Caddens Road in the north and Landsdowne Road in the south. It is subject to 80km/h speed zoning and accommodates two (2) lanes of traffic in each direction within a divided carriageway in the vicinity of its intersection with Caddens Road. On-street parking is not permitted along its length in either direction.

It can be seen from **Figure 3** that the site is conveniently located with respect to the main arterial road network serving the region being the Great Western Highway. As such, traffic can effectively be distributed onto the wider road network, minimising traffic impacts.

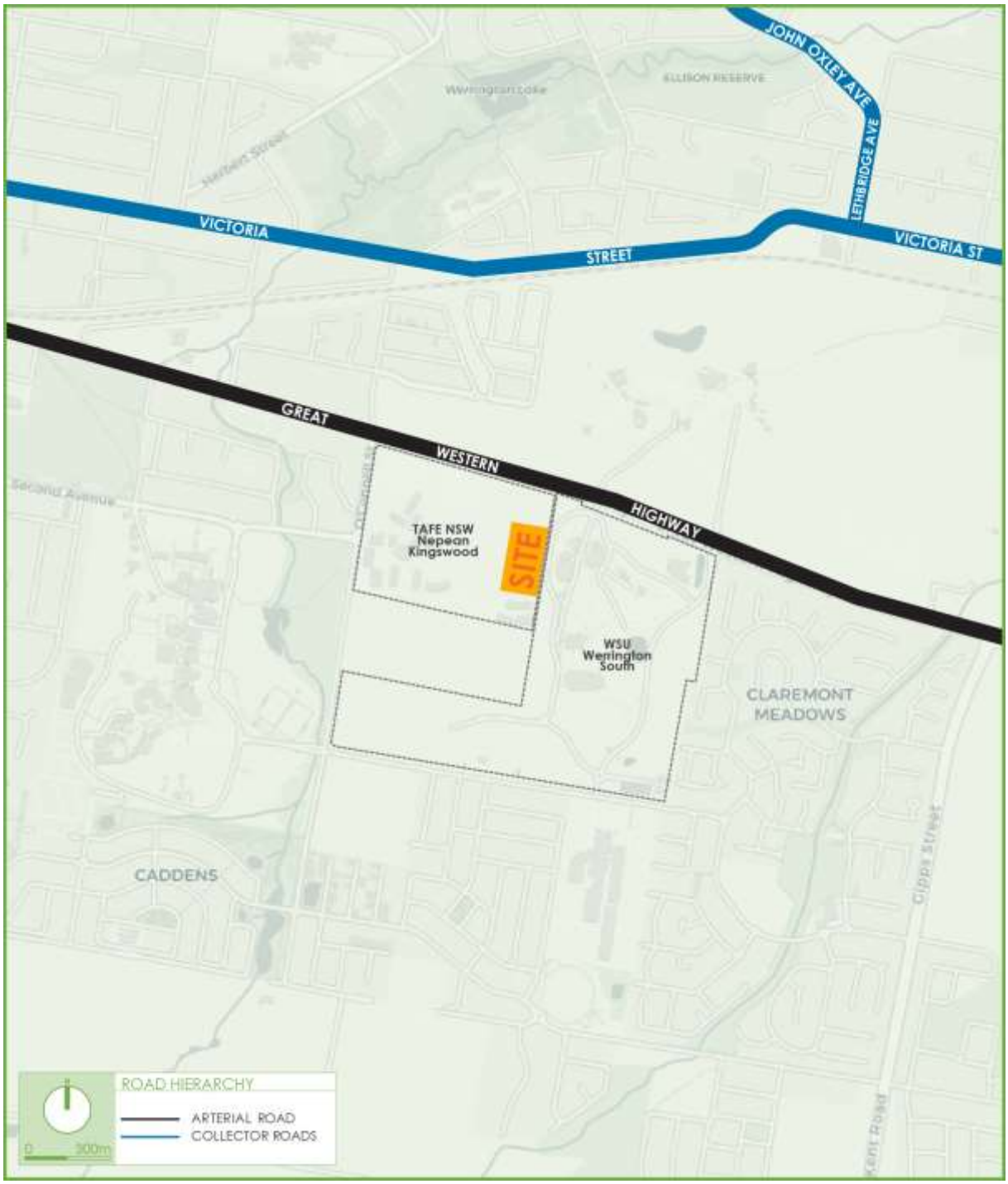


Figure 3: Road Hierarchy

3.2 Key Intersections

The key intersections in the vicinity of the site are shown below and provide an understanding of the existing road geometry and alignment in the locality.

3.2.1 Great Western Highway, O'Connell Street and French Street

Figure 4: Intersection of Great Western Highway, O'Connell Street and French Street

It can be seen from **Figure 4** that the intersection of Great Western Highway, O'Connell Street and French Street is a four-legged signalised intersection, with the east and west legs providing signalised pedestrian crossings. The main attributes of each approach are outlined below.

- Great Western Highway (east-west)
  - The eastern approach provides two (2) through lanes, one (1) through lane from which left turns can be made and one (1) right-turn only lane.
  - The western approach provides two (2) through lanes, one (1) through lane from which left turns can be made and one (1) right-turn only lane.
- O'Connell Street (south)
  - The southern approach provides one (1) through lane from which left turns can be made and one (1) through lane from which right turns can be made.

- French Street (north)
  - The northern approach provides one (1) through lane from which through, left and right turns can be made.

3.2.2 Great Western Highway and Bringelly Road

Figure 5: Intersection of Great Western Highway and Bringelly Road

It can be seen from **Figure 5** that the intersection of Great Western Highway and Bringelly Road is a three-legged signalised T-intersection, with signalised pedestrian crossings provided along all legs. The main attributes of each approach are outlined below.

- Great Western Highway (east-west)
  - The eastern approach provides two (2) through lanes and one (1) through lane from which left turns can be made.
  - The western approach provides three (3) through lanes, and one (1) right turn only lane.
- Bringelly Road (south)
  - The southern approach provides one (1) left turn lane and one (1) right turn lane.

Figure 6: Intersection of Gipps Street, Kent Road and Caddens Road

It can be seen from **Figure 6** that the intersection of Caddens Road, Gipps Street and Kent Road is a four-legged signalised intersection, with signalised pedestrian crossings provided along all legs. The main attributes of each approach are outlined below.

- Caddens Road (east-west)
  - The eastern approach provides one (1) right turn only lane and one (1) shared through lane from which left turns can be made
  - The western approach provides one (1) right turn only lane and one (1) shared through lane from which let turns can be made.
- Kent Road (south)
  - The southern approach provides one (1) through lane, one (1) shared through lane from which left turns can be made and one (1) right turn only lane.
- Kent Road (south)
  - The southern approach provides one (1) through lane, one (1) shared through lane from which left turns can be made and one (1) right turn only lane.

- Gipps Street (north)
  - The northern approach provides one (1) through lane, one (1) shared through lane from which left turns can be made and one (1) right turn only lane.

The assessment of the existing performance of the above key intersections during the critical morning and evening network peaks is discussed in Section 6.

3.3 Public Transport

3.3.1 Bus Services

The subject site is within optimal walking distance (400 metres) of several bus services operating along O'Connell Street and the Great Western Highway. These bus services are presented in **Figure 7**, with the service frequencies during peak periods outlined in **Table 1** below.

Table 1: Bus Routes and Service Frequencies

Bus No.	Route	Service Frequency	
		Weekdays	Saturdays
770	Mount Druitt to Penrith via St Marys	Every 20-30 minutes	Every 60 minutes
775	Mount Druitt to Penrith via Erskine Park	Every 30 minutes	Every 60 minutes
776	Mount Druitt to Penrith via St Clair	Every 20-30 minutes	Every 60 minutes
835	UWS to Prairiewood	Every 30 minutes	-

Furthermore, these above bus services provide regular services to Penrith, St Marys and Mount Druitt railway stations, which provide railway services along the following lines:

- T1 – North Shore and Western Line
- T5 – Cumberland Line
- BML – Blue Mountains Line
- Regional – Western NSW Line

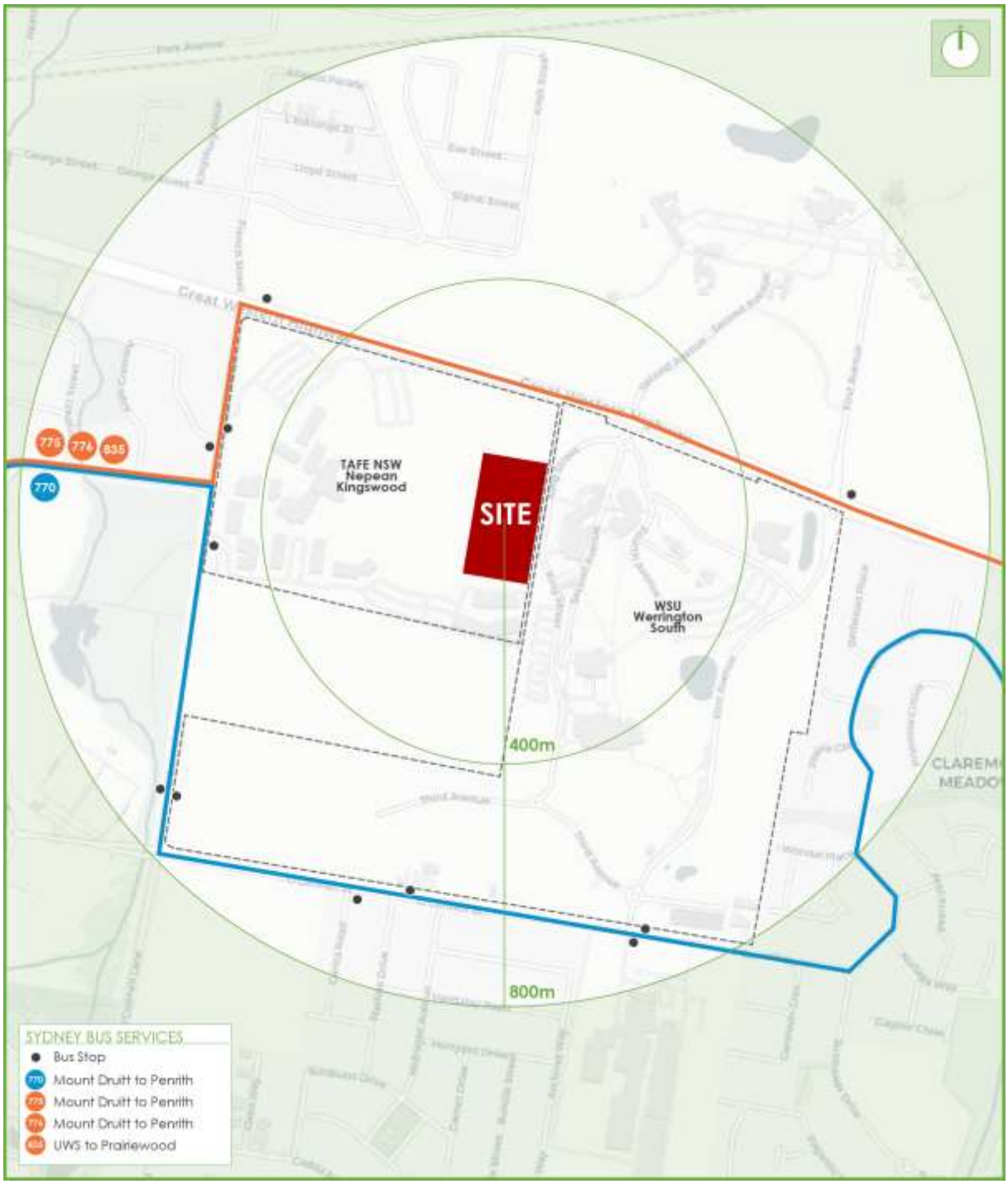


Figure 7: Bus Services

3.3.2 Metro Services

It is likely that St Mary's Train Station will be extended under the South West Rail Link Extension to connect the existing passenger rail line from St Mary's to the Aerotropolis which is now part of the Sydney Metro Greater West – Nancy Bird Walton International Airport project.

In future, students and staff who may live in other suburbs can take advantage of the metro service to get to the site and services will be frequent (approximately every 5-10 minutes, in line with other Sydney Metro projects). This is presented in **Figure 8** below and will significantly alter current modal splits, which are heavily weighted to private car travel.

Figure 8: Metro Services

3.3.3 Shuttle Bus Services

The existing WSU campus provides a private shuttle bus service for existing WSU students and staff between Kingswood Railway Station and the WSU Werrington and Kingswood campus. A proposal is in place to provide a shared shuttle bus service for WSU and TAFE students and staff with regular services between Kingswood Station in the west and the TAFE / WSU in the east. The shuttle bus would pick up and drop off students via the existing internal roadway access via the WSU vehicular access to Great Western Highway. The pick-up and drop off area are to be DDA compliant thereby ensuring ease of access to mobility impaired passengers. It is noted that the estimated time between services is 30 minutes operating from 7:00am to 7:00pm Monday to Friday with the following bus stops:

- Kingswood Station (Great Western Highway, slightly East of the entrance to the Station)
- Kingswood Campus (Kingswood Campus Student Plaza)
- Werrington South Campus (buildings BA, BD)
- Werrington Corporate Park
- Kingswood Campus (Student Residential College, Library and Building F)

The indictive proposed shuttle bus route and internal pick up and drop off for the TAFE students is shown in **Figure 9** below.

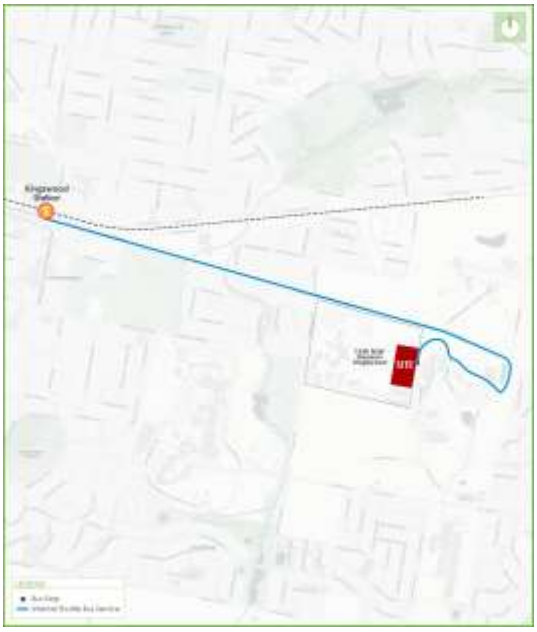


Figure 9: Shuttle Bus Route

3.4 Sustainable Transport

The area surrounding the subject site is well developed with established road and pedestrian footpath networks connecting the site with nearby public transport infrastructure as well as neighbouring residential developments. In addition, the bicycle network in the locality is shown in **Figure 10** below.

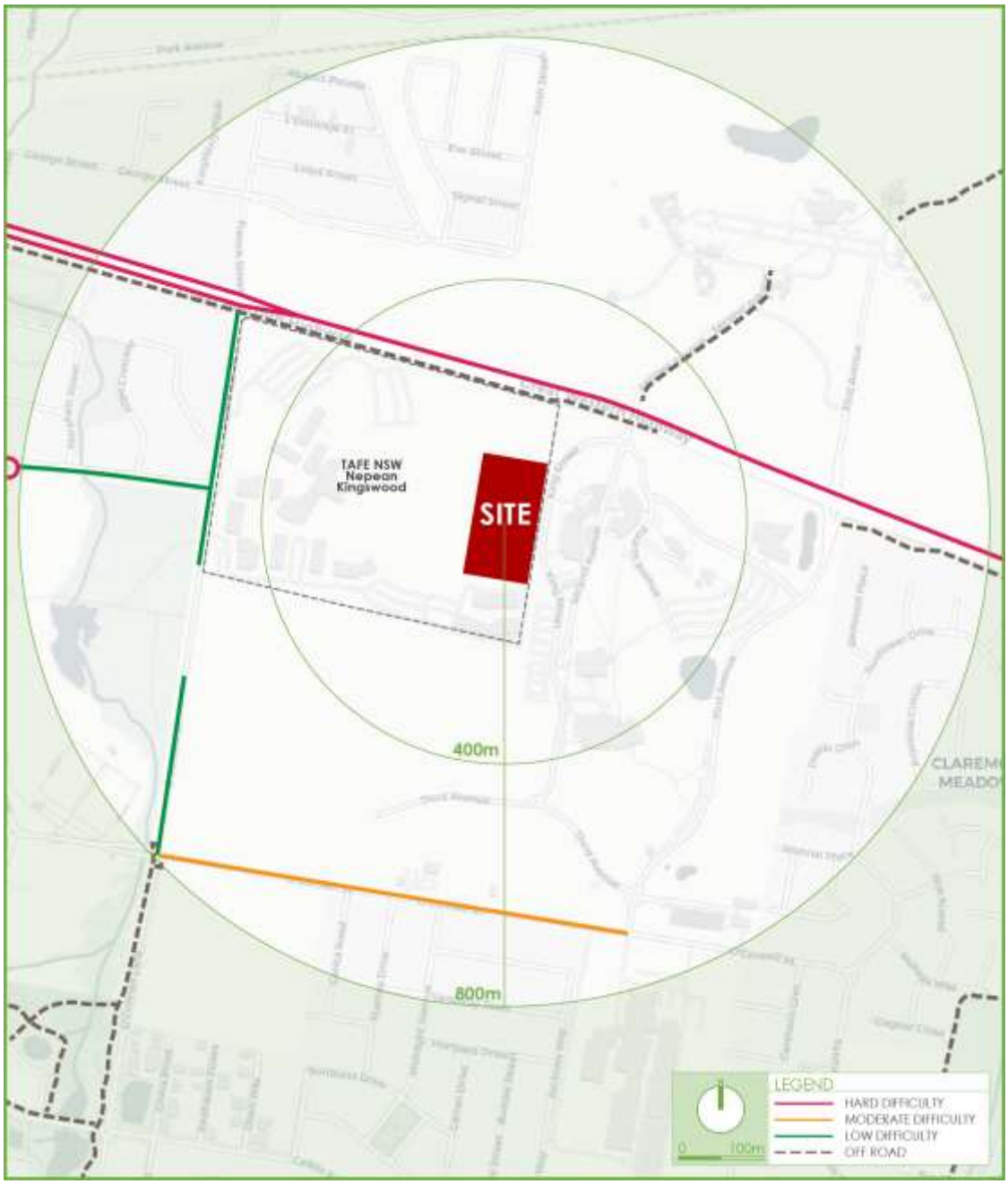


Figure 10: Cycleways

The TAFE proposes to retain the following accesses to the site, comprising:

- 1 x main pedestrian and vehicular access via O'Connell Street (northern access)
- 1 x vehicular access via O'Connell Street (southern access).

Finally, a new shared path is proposed connecting the new Construction Centre of Excellence Building in the eastern sector of the site with the existing TAFE building in the western sector of the site, thereby encouraging more sustainable modes of transport.

3.5 Existing Modal Splits

Existing travel modal splits has been determined based on interview questionnaire survey responses which were distributed to existing staff and students. The results are summarised in **Table 2** as follows:

Table 3: Existing Travel Modal Splits

Travel Mode	Travel Percentage
Car Driver[1]	84%
Car Passenger[2]	6%
Train	4%
Bus	4%
Bicycle	2%
Walk	0%
Train & Shuttle Bus	0%

1 – Car driver includes motorcyclists.
2 – Includes car passenger dropped off and car passenger's carpooling with other students or staff.

It can be seen from **Table 3** above that the vast majority of staff and students (84%) drove and parked whilst only 10% of arrivals were by other modes of transport (public transport, cycle or walk).

4. DESCRIPTION OF PROPOSED DEVELOPMENT

The subject development involves construction of a new Construction Centre of Excellence (CCoE) Building within the northeast corner of the existing TAFE NSW Nepean Kingswood Campus. The development is proposed to be completed by 2023 with student and staff populations projected to grow over a 7-year period. This report focuses on the traffic impacts associated with projected student and staff populations in the following years:

- Existing (2020) 6,000 students enrolments annually
- 2023 an additional 1,750 projected students from CCoE
  Projected TAFE NSW Kingswood Campus annual student population of 7,750
- 2030 an additional 3,500 projected students over existing (2020) from CCoE
  Projected TAFE NSW Kingswood Campus annual student population of 9,500

The above related to student enrolments through the year. However, these enrolments are dispersed throughout the week and daytime activity relating to the number of staff and students on a typical peak weekday between 7.30am - 5.00pm are summarised in **Table 4**.

Table 4: On Site Peak Attendances

Year	Staff	Students	Total
2020	39	998	1037
2023	61	1185	1246
2030	78	1439	1517

It can be seen from Table 4 that at full development, the site will need to accommodate an additional 480 persons daily over the 7-year forecast population growth timeframe. It is important to note that not all of these staff and students will be on site at one time over this period. In addition, the development will incorporate:

- New carparking comprising 16 car parking spaces for students and staff;
- Loading area south of the proposed Construction Centre of Excellence Building;
- New shared path connecting the existing TAFE buildings to the west of the site with the proposed Construction Centre of Excellence Building.

Reference should be made to the plans submitted separately to Council which are presented at reduced scale in **Appendix B**.

5. PARKING REQUIREMENTS

5.1 Car Parking

5.1.1 Council Controls & RMS Guidance

Penrith City Council's Development Control Plan (DCP) and the RMS Guide to Traffic Generating Developments 2002 have been reviewed; however, neither of these guidelines assess the tertiary educational uses proposed by the subject development. it is noted that the Penrith City Council DCP 2014 Section C10 (Transport Access & Parking) states as follows:

"(f)) In the absence of specific requirements relevant to particular developments, the parking requirements in the RTA's "Guide to Traffic Generating Developments" (as updated) and Australian Standard AS 2890.1 and 2 - 2004 should be referred to as a guide. In the absence of all data, the applicant should revert to the use of first principles."

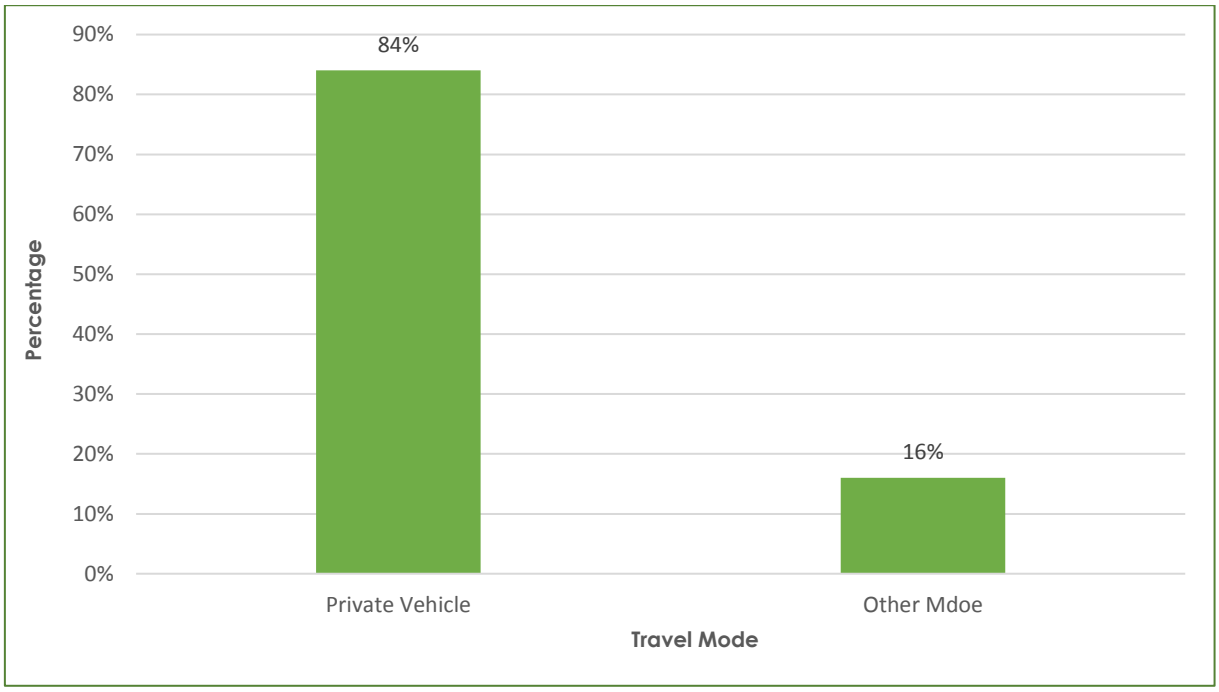
A superior methodology is a 'survey based' assessment and this has been undertaken to determine the future parking demand and corresponding on-site parking requirement associated with the proposed development, which is the preferred methodology based on RMS Guidelines and appropriate where the expansion of an existing facility is proposed.

5.1.2 Survey Based Assessment

Online interview/questionnaire surveys were undertaken of staff and students at the existing TAFE campus, between 27th November and 15th December 2020. These surveys were designed to establish existing modal splits and travel behaviour of staff and students. A total of 291 interview questionnaire surveys were returned, comprising 191 student responses and 100 staff responses.

The results are shown in **Chart 1** below for the combined TAFE population, noting that the results for staff and students were similar.

Chart 1: Student and Staff Modal Choice to and From Campus



It can be seen from **Chart 1** that the following is evident:

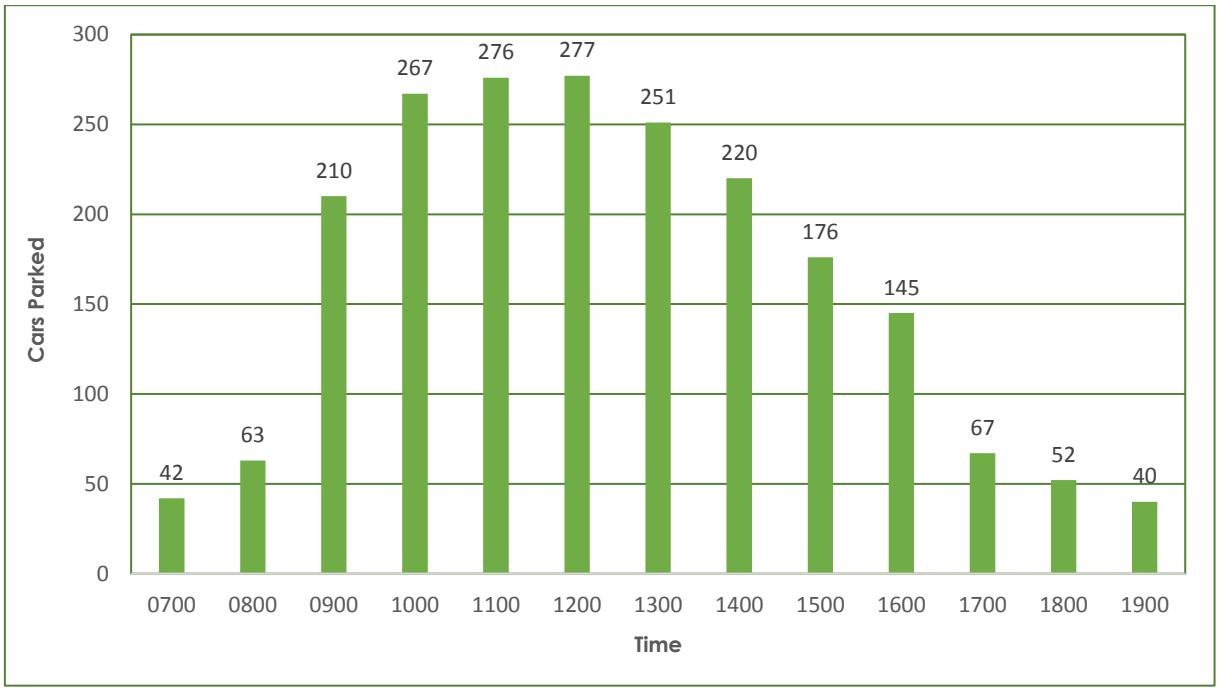
- Coincidentally, 84% of students and staff drove and parked within the subject site.
- These drivers arrived prior to 9:30am;
- The balance of 16% of arrivals occurred after 9:30am; and
- 36% of departures occurred prior to 4:00pm, outside the on-street commuter peak.

Therefore, the peak parking demand occurred after 9:30am, was sustained until about 1:00pm and decreased progressively after that time.

5.1.3 On-site Parking Survey

The peak parking demand timeframe (after 9:30am) has been validated by separate parking surveys within the internal campus carparks. These were undertaken on Thursday 26th November 2020 between 7:00am and 7:00pm. The results are summarised in **Chart 2** below.

Chart 2: Weekday On-Site Parking Occupancy



It is evident from **Chart 2** that the parking demand at 9:30am is approximately 238 spaces. This is 86% of the peak demand that occurs at midday, which is very close to the 84% of arrivals prior to 9:30am based on the questionnaire surveys. It is emphasised that the above results reflect conditions during COVID restrictions, which therefore reflects a lower attendance level. However, the spread of activity (demand profile) across the day is expected to be similar to that shown in **Chart 2**. Accordingly, the above results have been applied to the existing TAFE population based on pre-COVID attendance levels and this is discussed further in the following section.

5.1.4 Existing 'Pre-COVID' Parking Demand

TAFE has provided student and staff attendance data from pre-COVID conditions. Under these normal conditions a total of 1037 staff and students were on site between 7:30am and 5:00pm, comprising 998 students and 39 staff. Not all of these staff and students are present at one time (due to part time courses, on-line participation, excursions, work commitments etc.) and a modest 10% discount has been assumed for the peak attendance. That is, 90% of all day students attending between 7.30am and 5.00pm are assumed to be on-site at any one time,

typically between 9.30am and midday. Absentee rates are a separate factor and it may be assumed that this would be in the order of 5%. Accordingly, the peal person accumulation is presently expected to be in the order of 880 students and staff and this is considered to be conservatively high. These persons would generate a peak parking demand of in the order of 740 car spaces, based on 84% arriving as a car driver. This is in accordance with observed conditions over several years at the campus and equates to a parking demand rate of one space per 1.4 daily attendees (staff and students).

There are presently a total of 907 spaces within the existing campus, demonstrating that existing peak parking demands are readily accommodated on-site, with a surplus of about 170 spaces. Importantly, this demand profile is not expected to continue in the future, with opportunities available to change modal splits and also spread on-site activity more generally and this is discussed further in the following sections.

5.1.5 2023 Development Scenario Parking Demand

The 2023 development scenario is projected to relate to an additional 210 staff and students, from 1037 to 1247. Based on the existing demand profile of 1 space per 1.4 daily persons in attendance (derived above), this would result in a net additional 150 car spaces. This can be readily accommodated by the existing parking surplus of 170 spaces.

Nevertheless, it is highly noteworthy that this assumes no change in current travel behaviour. In addition, the Green Travel Plan accompanying this report, together with other factors, is expected to reduce demand and hence deliver a higher parking surplus in 2023.

5.1.6 2030 Development Scenario Parking Demand

The 2030 development scenario (full development) is projected to relate to an additional 480 staff and students (over and above existing), from 1,037 to 1,517. It is expected however that a reduced parking demand profile will result as a consequence of the following factors:

- The lessons and behavioural changes arising from post COVID conditions is expected to result in an increase in online study patterns and a greater spread of traffic activity generally due to flexible working and study conditions.
- State and Local Governments have a clear mandate, with associated underpinning policy objectives, to reduce car dependency in order to deliver sustainable travel outcomes. Even if the provision of additional on-site parking were to be pursued to meet the 'unfettered'

peak demand, this is considered a flawed policy position that would undermine these objectives. This recognises that parking policy (restricting parking supply) is perhaps the single most policy tool to deliver on these objectives.

- In principle agreement has apparently been reached between the adjacent WSU Werrington South Campus to the east, with the subject TAFE Nepean site, to create a shared WSU/TAFE campus. This amalgamation will comprise an alignment of internal streets, pedestrian pathways and active transport links cross both campuses in addition to a shared campus shuttle route and joint advocacy around mass transit. This proposal will have significant implications in terms of reducing demand for on-site parking overtime and taking advantage of synergies which exist between the two campuses.
- The provision of improved internal cycleway / pedestrian linkages and facilities will encourage travel to and from the subject site by more sustainable modes of transport, particularly for students and staff residing within walking/cycling distance. This is particularly relevant considering that only 1.4% of students and staff cycled to the and form the subject site and 0% walked. Therefore, a unique opportunity exists to encourage a greater uptake of travel to and from the site by more sustainable modes of travel.
- Adoption of active policies aimed at suppressing private car usage generally. In this regard, restrictive parking policies are a key factor in achieving behavioural change. This may be contrasted where the current situation permits the unfettered demand for parking to be accommodated.
- A review of existing onsite parking pricing strategies to encourage more sustainable modes of transport to and from campus.
- Implementation of a Green Travel Plan (provided separately) outline travel mode targets based on, but not necessarily limited to, the above measures.

The cumulative effect of the above factors is expected to result in a significant reduction in car dependency which is considered sound planning practice.

In response to the above, it is considered that the adoption of a 'target' car driver modal split of 70% is achievable for the entire campus by 2030, compared with the existing 84%. This is only a 14% reduction that is considered not only readily achievable, but necessary and in the public interest. It will also ensure that Government resources are not wasted, not only in overcoming the cost of constructing new parking areas, but the potential erosion of patronage on public transport infrastructure which is made available at high cost.

The resultant parking demand for the population on attendance at one time on a typical weekday (1,290 persons being 85% of the total daily population) will be about 900 spaces. This result is fundamentally due to the fact that the modal split change will apply to the entire campus population, not just the proposed additional staff and students.

In response, the development proposes to construct an additional 16 spaces, which will increase the parking supply from 907 spaces to 923 spaces. This is more than the expected demand of 900 spaces and will provide a safety margin.

In summary, the adopted parking strategy and target modal splits are strongly supported and will deliver a sustainable planning outcome that is in the public interest. It is considered of critical importance that the current travel behaviour is not replicated in 2030, to drive a more sustainable planning outcome as a matter of good policy.

5.2 Accessible Parking

The proposed development will provide an additional accessible parking space within the new carpark adjacent to the new Construction Centre of Excellence Building.

5.3 Bicycle Parking

The Penrith City Council DCP defers to the Planning Guidelines for Walking and Cycling' (NSW Government 2004) to determine minimum bicycle parking requirements. The Planning Guidelines provide the following bicycle parking rates for tertiary education establishments, universities and TAFE's:

- Staff: 3-5% of staff,
- Students: 5-10% of fulltime students.
- Visitors: 5-10% of staff.

At this stage, the number of fulltime student enrolments is unknown. However, application of the above bicycle parking rates to the maximum number of students and staff onsite at any one time for the 2030 development scenario (441 additional students and 39 additional staff) results in the requirement for approximately 26-48 bicycle spaces (2 x staff spaces, 22-44 student spaces and 2 visitor spaces).

Application of the long-term bicycle travel mode target for staff and students (4%) to the 2030 development scenario staff and student population results in a requirement for 19 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 are to be provided on the lower ground floor. These future bicycle facilities are to be detailed at CC Stage.

5.4 Shuttle Bus

The development proposes to utilise WSU existing shuttle bus services to Kingswood Railway Station. A shuttle bus stop is proposed via the USW internal road network which runs adjacent (to the east) of the subject development. This is discussed in more detail in the Green Travel Plan prepared separately.

5.5 Refuse Collection and Servicing

The proposed loading bay to the south of the proposed Construction Centre of Excellence building can accommodate vehicles up to a 12.5m heavy rigid vehicle (HRV) and will readily accommodate any standard waste collection vehicle. Reference should be made to the swept path analysis provided in **Appendix C.**

5.6 Emergency Vehicle Access

The proposed internal road network and loading bay to the south of the proposed Construction Centre of Excellence building can readily accommodate all emergency service vehicles, thereby ensuring all emergency vehicles are able to access the site when required.

5.7 Pick up and Drop Off Arrangements

Questionnaire survey results demonstrated that only 6% of staff and students were car passengers which includes car passenger dropped off and car passenger's carpooling with other staff and students. For a conservative assessment, say all 6% were dropped off /picked up and application of this modal split was applied to the 2030 development scenario, approximately 29 staff and students would be dropped off and picked up. Importantly, pick ups and drop offs will be spread throughout the day and it is envisaged that all pickup/drop

arrivals can be accommodated safely within an available parking space or within the circulation aisle of the proposed carpark, accordingly. This arrangement is considered supportable.

6. TRAFFIC AND TRANSPORT IMPACTS

6.1 Assumptions from Surveys

For consistency across the assessed intersections the following assumptions were made based on the travel mode surveys and intersection surveys:

- The network peak hour used for this assessment was based on the combined peak hourly traffic volume at all assessed intersections. This was determined as 7:45am to 8:45am in the morning (AM) peak and 4:45pm to 5:45pm in the evening (PM) peak.
- The travel mode survey of the students was used to determine the percentage of students arriving/departing during the peak periods. As the question for arrivals and departures was based on 30-minute intervals, the two highest percentages of the three overlapping intervals were summed to determine the percentage of vehicles in the peak period. During the AM peak 54% vehicles arrived or departed during the peak hour and 28% during the PM peak hour.

6.2 Data Analysis

Due to uncertainty regarding the reliability of traffic volumes during the time intersection surveys were undertaken due to potential COVID-19 impacts, it was necessary to compare traffic data from 2019 (without COVID-19 impacts) with 2020 traffic data (with COVID-19 impacts) during both morning and afternoon peak periods. TRAFFIX received SCATS data from TfNSW for the intersection of Great Western Highway and O'Connell Street for the following dates:

- Tuesday 26th November 2019
- Tuesday 24th November 2020

SCATS data revealed there was a slight increase in traffic volumes at the intersection of Great Western Highway and O'Connell Street from 2019 to 2020 during peak morning (7:45am-8:45am) and afternoon (4:45pm-5:45pm) times as summarised below:

- Morning peak hour: + 103 vehicles
- Afternoon peak hour: +75 vehicles.

As a result, existing traffic volumes were not required to be factored to account for COVID-19 impacts. TRAFFIX consulted with TfNSW to confirm the validity of the above methodology and reference should be made to **Appendix D** in this regard.

6.3 Existing Site Generation

The subject site currently accommodates the existing TAFE development. Accordingly, TRAFFIX has undertaken a site inspection on Thursday 3rd December 2020 between 8:30am to 9:30am and 4:30pm to 5:30pm noting the following traffic generations:

- 235 vehicle trips per hour in the morning peak period (189 in, 46 out); and
- 107 vehicle trips per hour in the afternoon peak period (35 in, 72 out).

It should be noted that this traffic generation of the existing development is captured within the existing survey data and traffic modelling.

6.4 Growth Rates

A growth rate of 2% per annum compounding has been assumed for the background traffic in the 2026 and 2030 scenarios. This is considered a conservative 'worst-case' scenario for the following reasons:

- The traffic counting station on the Great Western Highway has shown the traffic volumes decreasing each year since 2017. Therefore, the 2% background growth is considered unlikely to occur in the foreseeable future.
- A cumulative assessment of the development potential of the Quarter Precinct Masterplan and Western Sydney University Redevelopment Plan is not considered feasible due to a lack of publicly available information to assess these developments. However, the 2% growth rate is considered sufficient to account for the development potential of these developments with current background traffic in decline.

The SEARs requests 2031 and 2036 scenarios to be assessed however as the development will be fully operational by 2030 this is considered sufficient to determine the impact of the proposed development. Any assessment of years beyond will be assessing the background growth rather than the development based on a conservative growth rate, which is not considered necessary for a development of this size or scale.

6.5 Development Trip Generation

The impacts of the proposed development on the external road network have been assessed having regard for the projected student and staff population data provided by TAFE in conjunction with the interview questionnaire survey results based on the existing staff and student population. These relate as close as possible to the Year Scenarios 2026, 2031 and 2036 as required under the SEARS.

6.5.1 2026 Development Scenario

Student and staff population data provided by TAFE demonstrates that 209 additional students and staff per day are projected to attend campus in the 2023 development scenario which will also be relevant to the 2026 scenario as indicated by SEARS.

This equates to:

- +96 vehicle trips (77 arrivals and 19 departures) during the morning network peak hour period (7:45am-8:45am), and:
- +49 vehicle trips (15 arrivals and 34 departures) during the afternoon network peak hour period (4:45pm-5:45pm).

6.5.2 2030 Development Scenario

Student and staff population data provided by TAFE demonstrates that 480 additional students and staff per day are projected to attend campus in the 2030 development scenario.

This equates to:

- +218 vehicle trips (174 arrivals and 44 departures) during the morning network peak hour period (7:45am-8:45am), and:
- +113 vehicle trips (33 arrivals and 80 departures) during the afternoon network peak hour period (4:45pm-5:45pm).

6.5.3 2036 Development Scenario

The subject development will be completed in 2030 and no additional trips relating to the subject development will be added after 2030. Therefore, any increase in trips will be the result of background traffic growth not attributed to the subject development.

6.6 Assessed Network

In order to determine the impact of these additional trips on the surrounding road network, the below critical intersections have been assessed based on the SEARs, noting that there are no other intersections considered of interest:

- Great Western Highway / French Street / O'Connell Street
- Great Western Highway / Bringelly Road
- Caddens Road / Gipps Street

Impacts to the above key intersections as a result of the proposed development are discussed below.

6.7 Traffic Distributions

The distribution of the traffic generation has been based on surveys of the existing vehicular accesses. The following disruption percentages were determined by the surveys.

- Departures: 70% north along O'Connell Street, 30% south along O'Connell Street
- Arrivals: 70% north along O'Connell Street, 30 % south along O'Connell Street

The distribution of the traffic on to the wider network was based on the following assumptions:

- The traffic at the intersection of Great Western Highway, O'Connell Street and French Street was based on the percentage of volumes to and from O'Connell Street in each direction.
- The traffic to and from the west was assumed to be continue along the Great Western Highway at its intersection with Bringelly Road.
- All traffic to the south was assumed to originate from the M4 Motorway via the intersection of Caddens Road, Gipps Street and Kent Road.
- Based on these assumptions in Sections 6.5 and 6.6 the following distribution diagrams in Figures 11 -12 were developed for input into the SIDRA Intersection 9 model.

Figure 11: 2026 Trip Distribution

Figure 12: 2030 Trip Distribution

6.8 Modelling Methodology

In order to assess the potential traffic impacts of the proposed development, the following modelling was undertaken:

- Existing 2020;
- Future 2026 growth only;
- Future 2026 + Development;
- Future 2030 growth only;
- Future 2030 + Development.

Traffic surveys were undertaken of the intersections mentioned above, which are considered to be most critical in relation to the site and are the required intersection to be assessed in accordance with SEAR's. These counts were undertaken on Tuesday 17th November and Thursday 19th November 2020 between 7:30am-9:30am and 4:00am-6:00pm. The traffic volumes in these surveys formed the base case volumes for software modelling undertaken to assess intersection performance characteristics under existing traffic conditions. The SIDRA Intersection 9 model produces a range of outputs, the most useful of which are the Degree of Saturation (DoS) and Average Vehicle Delay per vehicle (AVD). The AVD is in turn related to a level of service (LoS) criteria. These performance measures can be interpreted using the following explanations as summarised in **Table 5** below:

DoS the DoS is a measure of the operational performance of individual intersections. As both queue length and delay increase rapidly as DoS approaches 1, it is usual to attempt to keep DoS to less than 0.9. When DoS exceeds 0.9 residual queues can be anticipated, as occurs at many major intersections throughout the metropolitan area during peak periods. In this regard, a practical limit at 1.1 can be assumed. For intersections controlled by roundabout or give way/stop control, satisfactory intersection operation is generally indicated by a DoS of 0.8 or less.

AVD the AVD for individual intersections provides a measure of the operational performance of an intersection. In general, levels of acceptability of AVD for individual intersections depend on the time of day (motorists generally accept higher delays during peak commuter periods) and the road system being modelled (motorists are more likely to accept longer delays on side streets than on the main road system).

LoS this is a comparative measure which provides an indication of the operating performance of an intersection.

Table 5: Intersection Performance Indicators (RMS)

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout
A	Less than 14	**Good operation**
B	15 to 28	**Good with acceptable delays and spare capacity**
C	29 to 42	**Satisfactory**
D	43 to 56	**Operating near capacity**
E	57 to 70	**At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode**
F	**More than 70**	**Unsatisfactory and requires additional capacity**

6.9 Network Performance

The traffic impacts arising from the proposed development during the morning and afternoon peak periods in the existing and future scenarios have been assessed by loading the distributed traffic volumes into the SIDRA Intersection model. The results of this software modelling for the base case, future and base case plus development traffic is summarised in **Table 6** below. The detailed outputs are provided in **Appendix E**.

Table 6: 2026 Base and Proposed Intersection Performance

Intersection	Control	Period	Scenario	Degree of Saturation (DoS)	Average Delay	Level of Service
Great Western Highway / French Street / O'Connell Street	Signal	AM	2020 Base	0.725	23.5	B
			2026	0.899	28.3	B
			2026+ Dev	0.918	26.6	B
			2030	0.985	33.8	C
			2030 + Dev	1.092	49.1	D
		PM	2020 Base	0.737	25.7	B
			2026	0.850	22.6	B
			2026+ Dev	0.893	29.1	C
			2030	0.937	38.9	C
			2030 + Dev	0.993	50.9	D
Great Western Highway / Bringelly Road	Signal	AM	2020 Base	0.674	23.7	B
			2026	0.850	22.6	B
			2026 + Dev	0.852	22.6	B
			2030	0.880	27.4	B
			2030 + Dev	0.885	27.6	B
		PM	2020 Base	0.652	24.7	B
			2026	0.881	23.1	B
			2026 + Dev	0.884	23.3	B
			2030	0.899	26.4	B
			2030 + Dev	0.876	24.9	B

Intersection	Control	Period	Scenario	Degree of Saturation (DoS)	Average Delay	Level of Service
Caddens Road / Gipps Street / Kent Road	Signal	AM	2020 Base	0.748	31.7	C
			2026	0.895	34.1	C
			2026 + Dev	0.889	34.6	C
			2030	0.907	48.3	D
			2030 + Dev	0.940	54.2	D
		PM	2020 Base	0.691	31.4	C
			2026	0.852	27.6	B
			2026 + Dev	0.865	28.0	B
			2030	0.894	35.3	C
			2030 + Dev	0.910	40.6	C

It can be seen from **Table 6** above that Great Western Highway operates at a Level of Service D with an average delay of 50.9 seconds in the 2030 + development scenario during the peak afternoon period (worst case scenario) and is operating near capacity however considered acceptable with an increase of 15.3 second increase in delay from the 2030 scenario.

The intersection of Great Western highway / Bringelly Road operates at a Level of Service B and an average delay of 27.6 seconds in the 2030 + Development scenario during the peak morning period with acceptable delays.

The intersection of Caddens Road / Gipps Road / Kent Road operates at a Level of Service D with an average delay of 54.2 seconds in the 2030 + Development scenario during the peak morning period (worst case scenario) and is operating near capacity however considered acceptable with an increase of 5.9 second increase in delay from the 2030 scenario.

Notwithstanding the conservatively high growth rates assumed, all intersections operate with a Level of Service D or better under all future scenarios. Therefore, all future traffic impacts resulting from the proposed development are considered manageable and no external road upgrades or improvements are considered necessary at any of the key intersections analysed under future scenarios as required under SEARs. This result is a consequence of the adopted parking strategy and target modal splits aimed at delivering a sustainable planning outcome that is in the public interest.

7. ACCESS AND INTERNAL DESIGN ASPECTS

7.1 Site Vehicular Access

No changes are proposed to the O'Connell Street Gate 1 access driveway as a result of the subject development.

The O'Connell Street Gate 2 access driveway will provide vehicular access to the proposed development with an additional 16 car parking spaces. AS 2890.1 requires access driveway widths to be designed in accordance with the number of car parking spaces effectively served by that access. As a result, the addition of 16 spaces is considered minor and therefore, the existing vehicular access is satisfactory. It is noted however minor works to remove the median is proposed to accommodate service vehicles up to a 12.5m long heavy rigid vehicle accessing the site. This is considered acceptable as service vehicles will only access the site out of operating hours and schedule times only. In addition, it is proposed that the roadway near the vehicular access within the development is to be widened slightly to accommodate a passing opportunity in the unlikely event that a truck and a car is required to pass.

In summary, the vehicular accesses for the TAFE will operate satisfactory and is designed in accordance with AS 2890.1 and AS 2890.2. Reference should be made to the swept path analysis presented in **Appendix C**.

7.2 Internal Design

The internal car park complies with the requirements of AS 2890.1 (2004), AS2890.2 (2002), AS 2890.3 (2015) and AS 2890.6 (2009), and the following characteristics are noteworthy:

7.2.1 **Parking Modules**

- All car parking spaces are to be designed in accordance with a User Class 2. These spaces are provided with a minimum space length of 5.4m, a minimum width of 2.5m and a minimum aisle width of 5.8m.
- All spaces located adjacent to obstructions of greater than 150mm in height are to be provided with an additional width of 300mm.
- Dead-end aisles are to be provided with the required 1.0m aisle extension in accordance with Figure 2.3 of AS2890.1 (2004) and turning bays when exceeding six spaces.

- All accessible parking spaces are to be designed in accordance with AS2890.6 (2009), being 2.4m wide, 5.4m long and situated immediately adjacent to a dedicated shared area or the circulating aisle.

7.2.2 Bicycle Parking

- All bicycle parking facilities are to be provided on the ground floor for ease of access. All bicycle parking facilities are to be designed in accordance with the minimum requirements of AS2890.3 (2015) and this can be dealt with during CC Stage.

7.2.3 Service Area Design

- The internal design of the service area is to be undertaken in accordance with the requirements of AS2890.2 for the maximum length vehicle permissible on-site being a 12.5m long HRV.

7.2.4 Wayfinding, Signage & Line Marking

- Internal vehicle movements, pedestrians and cyclists are to be managed safety and efficiently within the subject site in accordance with AS2890, Austroads Guidelines and standard traffic engineering principles. Reference should be made to the signage and wayfinding plan presented in **Appendix F** which provides a guide, to be finalised at Construction Certification Stage.

7.3 Summary

In summary, the 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). It is however envisaged that a condition of consent would be imposed requiring compliance with these standards and as such any minor amendments considered necessary (if any) can be dealt with prior to the release of a Construction Certificate.

8. SUMMARY OF RESPONSES TO SEARS

A response to each relevant requirement of the Secretary's Environmental Assessment Requirements (SEARs) is provided below, including references to sections of this report where applicable. Reference should also be made to the full copy of the SEARs provided in **Appendix G** and the below matters relate specifically to Item 7:

7. Transport and Accessibility

Include a transport and accessibility impact assessment, which details, but not limited to the following:

Accurate details of the current daily and peak hour vehicle, existing and future public transport networks and pedestrian and cycle movement provided on the road network located adjacent to the proposed development;

- **TRAFFIX Response:**

Reference should be made to Section 3 which provides an overview of the existing pedestrian and cycle infrastructure available within the vicinity of the subject site, including linkages to pedestrian and cycle infrastructure within the proposed development. Section 6.3 provides an overview of existing traffic volumes on the external road network within the vicinity of the subject site.

Details of estimated total daily and peak hour trips generated by the proposal, including vehicle, public transport, pedestrian and bicycle trips based on surveys of the existing TAFE NSW Nepean Kingswood Campus facilities and similar education facilities within the local area;

- **TRAFFIX Response:**

Reference should be made to Section 6 for future trips generated by the subject development and impacts to the surrounding external road network.

Cumulative impacts of all trips generated by the development and the existing TAFE NSW Nepean Kingswood Campus, as well as the development potential identified in the Quarter Precinct Master Plan and Western Sydney University Redevelopment Plan;

- **TRAFFIX Response:**

Reference should be made to Section 6.4

Existing car parking capacity and utilisation on streets within a 400 metre radius from the site on a typical weekday covering at least one hour before and after the proposed hours of operation (including night classes);

- **TRAFFIX Response:**

All parking is accommodated onsite and no reliance on on-street parking is proposed. Therefore, there will be no impact to existing on-street parking availability within the vicinity of the site. Reference should be made to Section 5 with weekday on-site parking survey shown in Chart 2.

The adequacy of existing public transport or any future public transport infrastructure and services within the vicinity of the site, pedestrian and bicycle networks and associated infrastructure to meet the likely future demand of the proposed development;

- **TRAFFIX Response:**

  Reference should be made to Section 3 which provides an assessment of the existing and future public transport infrastructure and services within the vicinity of the subject site.

Measures to integrate the development with the existing/future public transport network.

- **TRAFFIX Response:**

  Reference should be made to Section 3.

Impact of trips generated by the development on the area-wide network, with consideration of the cumulative impacts of the development on the surrounding roads and intersections in the context of any other approved planning proposals and developments in the precinct and surrounds, should be considered. Including the impact of nearby intersections and the need/associated funding for upgrading or road improvement works, if required;

- **TRAFFIX Response:**

  Impacts to surrounding road networks as a result of the proposed development are considered negligible with no improvements or upgrades to existing surrounding road

infrastructure considered necessary. Reference should be made to Section 6 for a detailed analysis. In addition, a growth rate of 2% per annum compounding has been assumed for the background traffic to account for future growth as discussed in Section 6.4.

An assessment of the forecast impacts on traffic volume generated on road safety and capacity of road network including consideration of cumulative impacts at key intersections using SIDRA or similar traffic model as prescribed by Transport for New South Wales (TfNSW). The traffic modelling should consider the scenarios of year 2026, 2031, 2036 and the year until the facility ceases operation. These should include, but not be limited to:

- ***Great Western Highway/O'Connell Street/French Street***
- ***Great Western Highway/Bringelly Road***
- ***Gipps Street (Werrington Arterial)/Caddens Road***

) **TRAFFIX Response:**

Reference should be made to Section 6.4 with modelling results provided in Section 6.9.

The identification of infrastructure required to ameliorate any impacts on traffic efficiency and road safety impacts associated with the proposed development, including details on improvements required to affected intersections, additional bus routes along bus capable roads (i.e. minimum 3.5 m wide travel lanes), additional bus stops or bus bays;

) **TRAFFIX Response:**

No infrastructure upgrades are considered necessary. References should be made to Section 6.9.

Details of travel demand management measures to minimise the impact on general traffic and bus operations, including details of a location-specific sustainable travel plan (Green Travel Plan and specific Workplace travel plan) and the provision of facilities to increase the non-car mode share for travel to and from the site;

) **TRAFFIX Response:**

Reference should be made to the Green Travel Plan prepared separately by TRAFFIX.

The proposed walking and cycling access arrangements and connections to public transport services;

- **TRAFFIX Response:**

  Reference should be made to Section 3.

The design of the proposed cycle and pedestrian entry connecting to the Great Western Highway shared path should ensure that there are clear sight lines between the cyclists from the development and the faster moving cyclists on the Great Western Highway;

- **TRAFFIX Response:**

  Cyclist and pedestrian access is provided using existing (approved) vehicular and pedestrian access locations via O'Connell Street. Reference should be made to the reduced plans presented in **Appendix B.**

The proposed access arrangements, including car and bus pick-up/drop-off facilities, and measures to mitigate any associated traffic impacts and impacts on public transport, pedestrian and bicycle networks, including pedestrian crossings and refuges and speed control devices and zones;

- **TRAFFIX Response:**

  Reference should be made to the reduced plans presented in **Appendix B.**

Proposed bicycle parking provision, including end of trip facilities, in secure, convenient, accessible areas close to main entries incorporating lighting and passive surveillance;

- **TRAFFIX Response:**

  All bicycle parking demands are able to be readily accommodated onsite. Reference should be made to Section 5.3.

Details of vehicle circulation, proposed number of on-site car parking spaces for staff, students and visitors and corresponding compliance with appropriate parking codes and justification for the level of car parking provided on-site;

- **TRAFFIX Response:**

Reference should be made to the internal design aspects discussed in Section 7 and the parking assessment presented in Section 5.

Any short term reduction of existing car spaces for staff, students and visitors due to the proposed construction works (if any), and the proposed location, operational and functional characteristics of the re-allocated staff, students and visitors car parking (if applicable);

- **TRAFFIX Response:**

  Not applicable.

Details of the proposed site access and the parking provisions associated with the proposed development including compliance with the requirements of the relevant Australian Standards (i.e. turn paths, sight distance requirements, aisle widths, etc.);

- **TRAFFIX Response:**

  Reference should be made to the internal design aspects discussed in Section 7.

An assessment of the cumulative on-street parking impacts of cars and bus pick-up/drop-off, staff parking and any other parking demands associated with the development and provide any associated recommendations to ameliorate any such impacts;

- **TRAFFIX Response:**

  Not applicable. All parking drop off and pick up requirements are to be accommodated without reliance on the public road network.

An assessment of road and pedestrian safety adjacent to the proposed development and the details of required road safety measures and personal safety in line with CPTED;

- **TRAFFIX Response:**

  Not applicable.

Emergency vehicle access, service vehicle access, delivery and loading arrangements and estimated service vehicle movements (including vehicle type and the likely arrival and departure times);

- **TRAFFIX Response:**

Refer to Section 5.6: Emergency vehicle access is provided throughout the subject site.

The preparation of a preliminary Construction Traffic and Pedestrian Management Plan to demonstrate the proposed management of the impact in relation to construction traffic addressing the following:

- ***Assessment of cumulative impacts associated with other construction activities (if any);***
- ***An assessment of road safety at key intersections and locations subject to heavy vehicle construction traffic movements and high pedestrian activity;***
- ***Details of construction program detailing the anticipated construction duration and highlighting significant and milestone stages and events during the construction process;***
- ***Details of anticipated peak hour and daily construction vehicle movements to and from the site;***
- ***Details of on-site car parking and access arrangements of construction vehicles, construction workers to and from the site, emergency vehicles and service vehicles; and***
- ***Details of temporary cycling and pedestrian access during construction.***

) **TRAFFIX Response:**

Reference should be made to the Preliminary CTPMP Report, prepared separately by TRAFFIX.

Alternate methods for gaining the most accurate traffic analysis data may be agreed with TfNSW, if required.

) **TRAFFIX Response:**

Reference should be made to Section 6.2.

9. CONCLUSIONS

In summary:

- The State Significant Development (SSD) application to which this report relates, seeks approval for the expansion of the existing TAFE Nepean Kingswood Campus located at 2-44 O'Connell Street, Kingswood. The expansion includes the construction of a new building known as the NSW Construction Centre of Excellence facility located in the eastern sector of the overall TAFE campus.
- TAFE NSW seeks approval to expand the existing campus to accommodate 1,750 additional students per semester by 2023 and an additional 3,500 students per semester by 2030 (over and above the existing 3,000 students per semester.
- The assessment relies upon enrolment data provided by TAFE, which has provided the context for this assessment.
- There are presently a total of 907 spaces within the existing campus, demonstrating that existing peak parking demands are readily accommodated on-site, with a surplus of about 170 spaces. This demand profile is not expected to continue into the future with opportunities to change modal splits and spread on-site activity across the day.
- The 2023 development scenario is projected to relate to an additional maximum of 210 staff and students onsite at any one time, from 1037 to 1247. Based on the existing demand profile of 1 space per 1.4 daily persons in attendance (derived above), this would result in a net additional 150 car spaces. This can be readily accommodated by the existing parking surplus of 170 spaces.

  The 2030 development scenario (full population) is projected to relate to an additional maximum of 480 staff and students (over and above existing) onsite at any one time, from 1,037 to 1,517. However, a reduced parking demand profile will result due to the factors discussed in Section 5.1.6, including the provision of a shared shuttle service with UWS to Kingswood Railway Station, so that adoption of a 'target' car driver modal split of 70% (14% reduction from existing) for the entire campus is considered conservative and achievable. The adopted parking strategy and target modal splits are strongly supported and will deliver a sustainable planning outcome that is in the public interest. This may be contrasted with a 'no intervention' approach where current travel behaviour remains unchanged in 2030,

failing to drive a sustainable planning outcome as a matter of good policy; and wasting Government resources.

- The subject development proposes to construct an additional 16 spaces, which will increase the parking supply from 907 spaces to 923 spaces. This is more than the expected demand of 900 spaces and will provide a buffer.
- TfNSW has requested that the assessment consider peak traffic conditions in 2026, 2031 and 2036. This has however been undertaken for 2020, 2026 and 2030, at which time the development is fully populated. That is, any increase in trips after 2030 will be the result of background traffic growth only with no development impacts beyond 2030 when the development is fully populated. There is no nexus between the development and increased network traffic beyond 2030.
- A growth rate of 2% per annum compounding has been assumed for the background traffic in the 2026 and 2030 scenarios. This is considered a conservative 'worst-case' scenario for the reasons discussed in Section 6.4.
- The Future Years Scenarios have been examined under 'Base Case' (without development) and 'Future' (base case year + development) for each year, in order to compare the relative impact of the proposed development with conditions that will occur in any event, absent the development. The assessment has taken account of growth in background traffic as above, as well as expected modal split changes that are based on reasonable and achievable targets, as discussed in Section 6. It is emphasised that the modal split changes will apply to the entire campus population, current and future, resulting in significant traffic demand suppression, which is sound policy.
- The 2026 Development Scenario equates to a net additional 95 vehicle trips (76 arrivals and 19 departures) during the morning network weekday peak (7:45am-8:45am), and 49 vehicle trips (15 arrivals and 34 departures) during the weekday afternoon network peak (4:45pm-5:45pm). These can be readily accommodated on the road network.
- The 2030 Development Scenario equates to a net additional 218 vehicle trips (174 arrivals and 44 departures) during the morning network peak hour period (7:45am-8:45am), and 113 vehicle trips (34 arrivals and 79 departures) during the afternoon network peak hour period (4:45pm-5:45pm). These increases can be similarly accommodated.
- Specifically, all intersections operate with a Level of Service D or better under all future scenarios, even based on a conservative 2% background traffic growth rate. Therefore, all

future traffic impacts resulting from the proposed development are considered manageable and no external road upgrades are considered necessary at any of the key intersections analysed under future scenarios identified in the SEARs.

- The design of accesses and parking areas will be appropriately located and have been assessed to comply with AS2890.1 (2004), AS2890.2 (2002) and AS2890.6 (2009).
- Each individual SEAR's requirement has been addressed as summarised in Section 8.
- The application is supported by a Draft Green Travel Plan in response to SEAR's requirements.
- The application is supported by a Preliminary Construction Traffic Management Plan prepared separately in response to SEAR's requirements.

This Transport and Accessibility Impact Assessment therefore demonstrates that the subject application is supportable on transport planning grounds. TRAFFIX anticipates an ongoing involvement during the development approval process.

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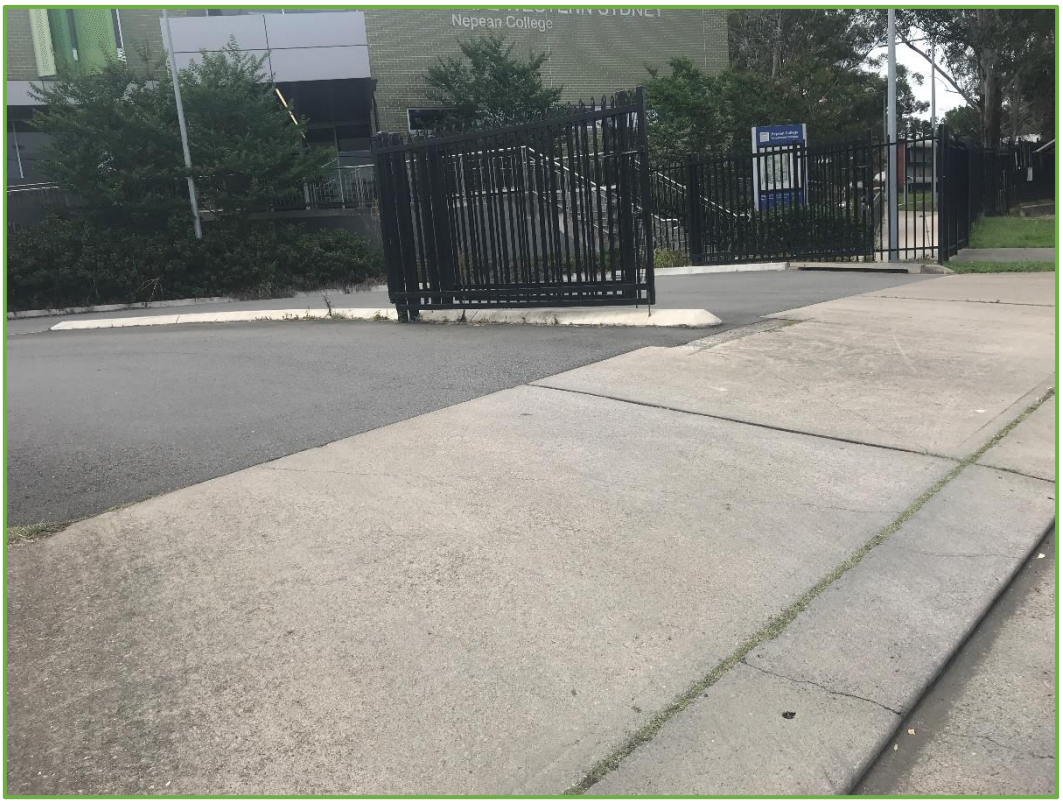
APPENDIX A

Photographic Record



View looking southwest at the access driveway of Gate 1

View looking northeast at the access driveway of Gate 1

View looking west at the pedestrian refuge island outside of Gate 1

View looking south at the access driveway of Gate 2

View looking north at the access driveway of Gate 2

View looking west at the pedestrian refuge island near Gate 2

APPENDIX B

Reduced Plans

LEGEND

- EXISTING PEDESTRIAN ACCESS
- EXISTING VEHICULAR ACCESS
- BOUNDARY LINE
- A — EXISTING BUILDING NAME
- PROPOSED VEHICULAR ROUTE CARPARK RECONFIGURATION
- PROPOSED PEDESTRIAN PATH
- EXTENT OF SSD SCOPE
- PROPOSED CONSTRUCTION HUB
- PROPOSED ROADS WALKWAYS AND RECONFIGURED CARPARK
- EXISTING ROADS, WALKWAYS AND CARPARKS
- 1 — SIGN TYPE 1

GRAY PUKSAND

REV	DESCRIPTION	DATE
A	Test of Adequacy Submission	10-02-21
P1	Issued for Information	04-03-21

PROJECT NO	220090
DRAWN	PW
CHECKED	SS
APPROVED	BH

TAFE NSW Construction Centre of Excellence
12-44 O'connell St, Kingswood NSW 2747

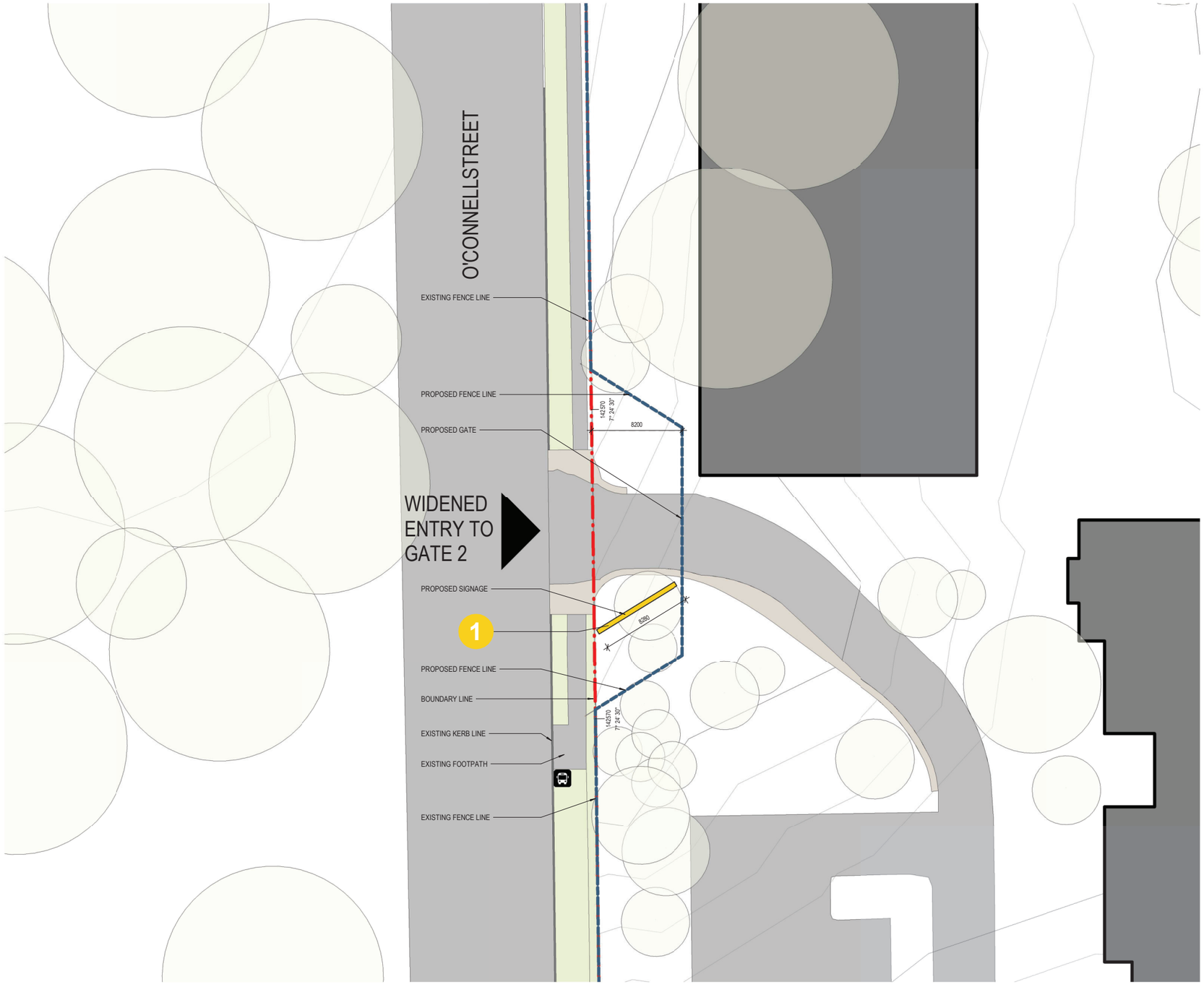
SSDA

SITE PLAN - PROPOSED

DWG # DA0103 REV P1

SCALE @ A1 As indicated

4/03/2021 11:23:29 AM BIM 360://Kingswood TAFE/220090_ TAFE NSW WSCH_Site_ C21.rvt



1 DA0103 SITE PLAN - PROPOSED - SSDA - PROPOSED ENTRY

SCALE 1 : 200

LEGEND

- EXISTING PEDESTRIAN ACCESS
- EXISTING VEHICULAR ACCESS
- BOUNDARY LINE
- A — EXISTING BUILDING NAME
- PROPOSED VEHICULAR ROUTE CARPARK RECONFIGURATION
- PROPOSED PEDESTRIAN PATH
- EXTENT OF SSD SCOPE
- PROPOSED CONSTRUCTION HUB
- PROPOSED ROADS WALKWAYS AND RECONFIGURED CARPARK
- EXISTING ROADS, WALKWAYS AND CARPARKS
- 1 — SIGN TYPE 1

GRAY PUKSAND

REV	DESCRIPTION	DATE
P1	Issued for Information	04-03-21

PROJECT NO	**220090**
DRAWN	**Author**
CHECKED	**Checker**
APPROVED	**Approver**

TAFE NSW Construction Centre of Excellence
12-44 O'connell St, Kingswood
NSW 2747

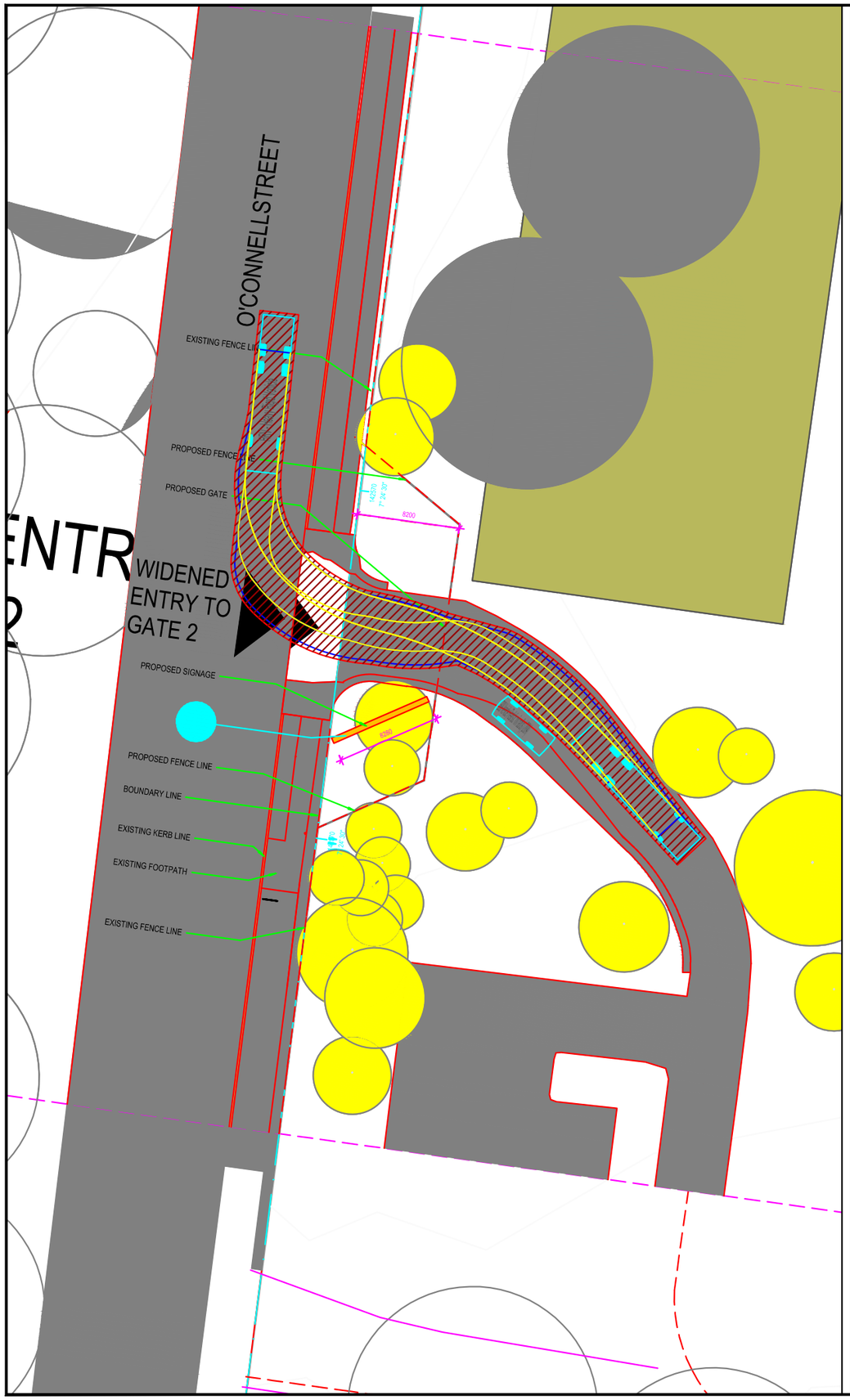
PROPOSED ENTRY

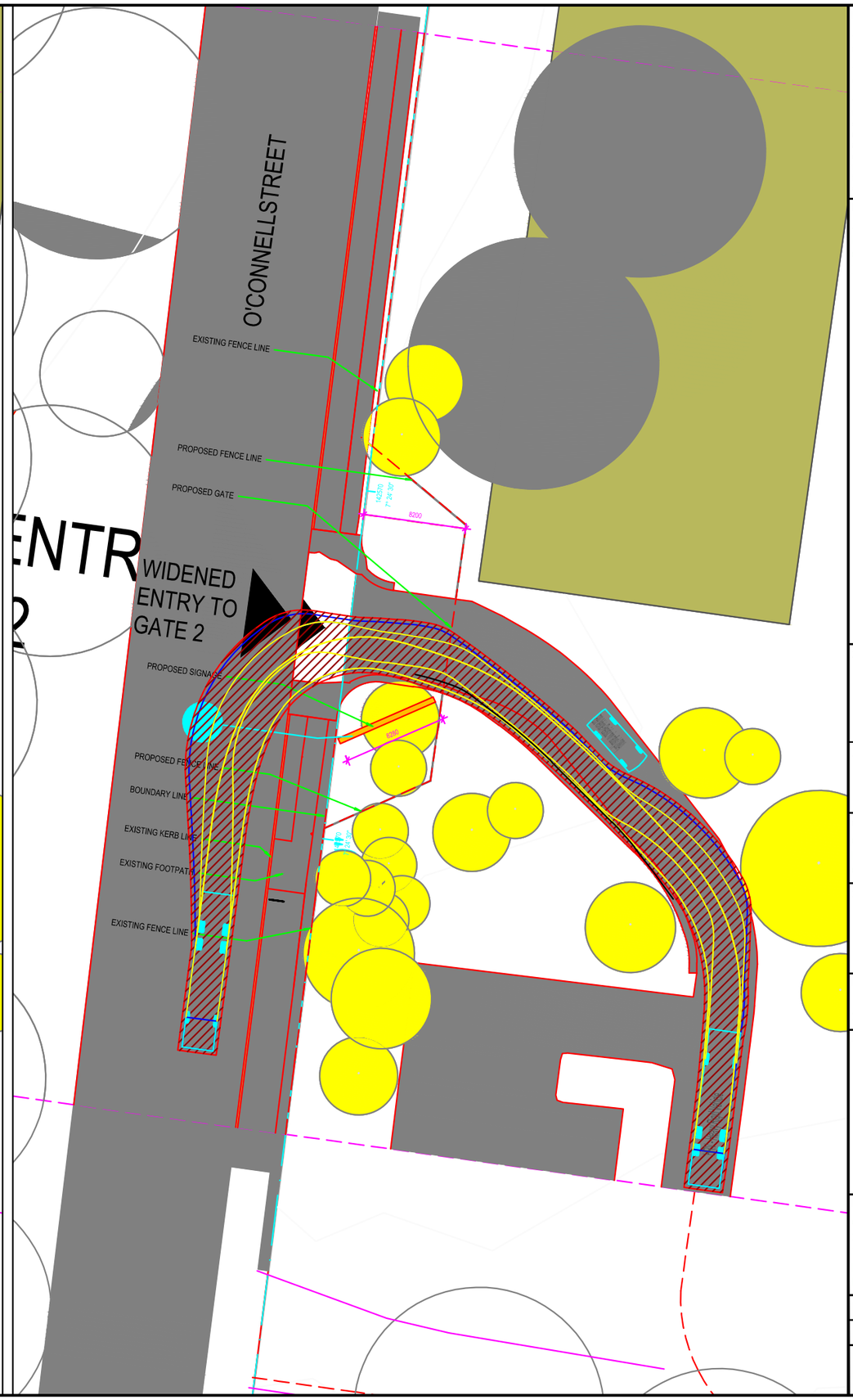
DWG # **DA0110** REV **P1**

SCALE @ A1 As indicated

APPENDIX C

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.

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Rev.	Revision Note	By.	Date
A	Initial Swept Paths Analysis	JP	21-01-21
B	Swept Paths Analysis	JP	08-02-21
C	Revised Swept Paths Analysis	VD	01-03-21
D	Revised Swept Paths Analysis	JP	05-03-21

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

0 4 8 12 16m
1:400 @ A3

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

Drawing Prepared By

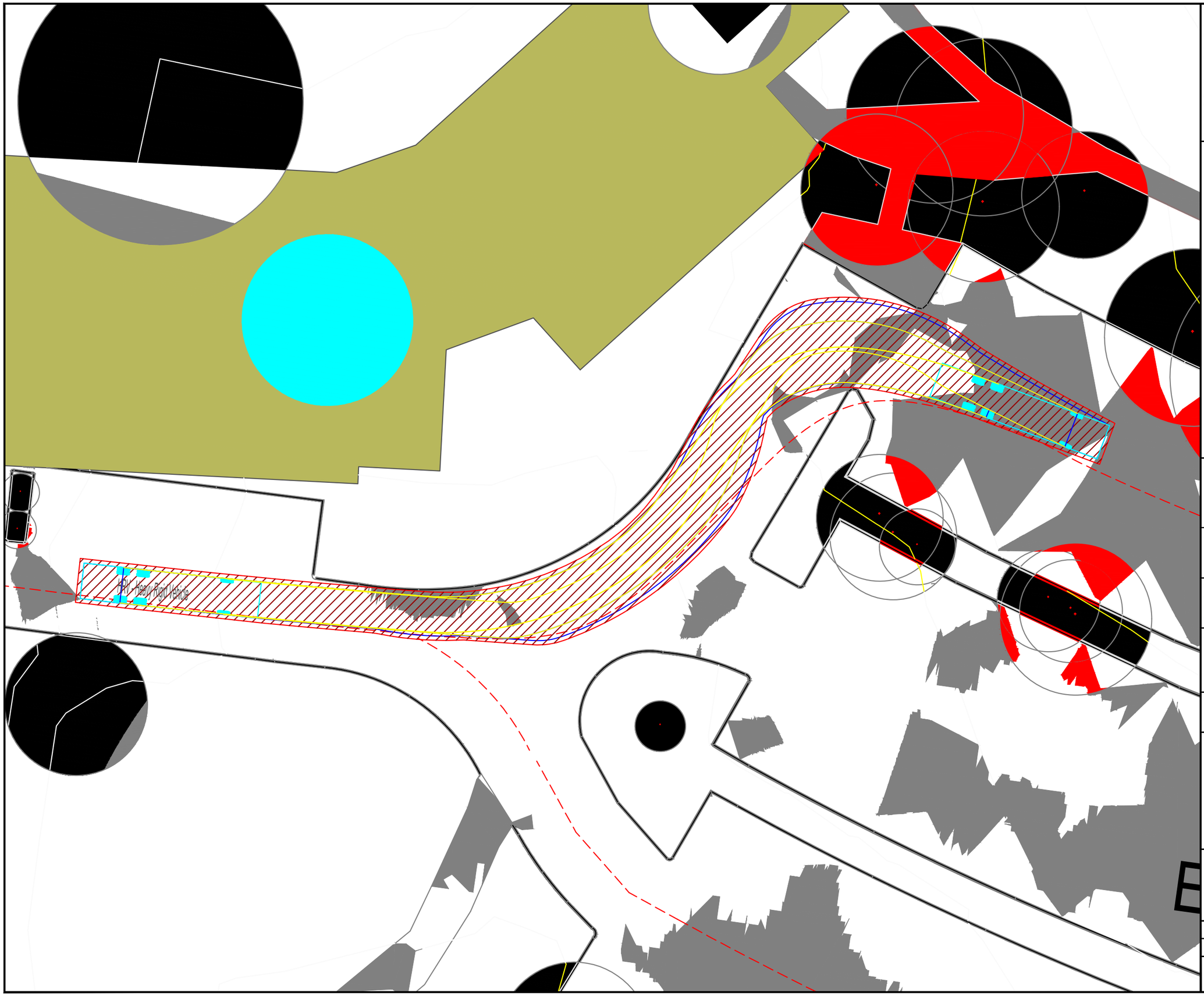
TRAFFIX
TRAFFIC & TRANSPORT PLANNERS
Suite 2.08, 50 Holt Street
Surry Hills, NSW 2010
PO Box 1124
Strawberry Hills, NSW 2012
t: +61 2 8324 8700
f: +61 2 9830 4481
w: www.traffix.com.au

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

Drawn:	Checked:	Date:
JP	VD	08-02-21

20.456d02v05 TRAFFIX [210205 Plans] Design Review SITE + ACCESS.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
20.456	DA	TX.10	A



Notes:

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Rev.	Revision Note	By.	Date
A	Swept Paths Analysis	JP	01-03-21
B	Revised Swept Paths Analysis	JP	05-03-21

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

0 2.5 5 7.5 10m
1:250 @ A3

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

Drawing Prepared By

TRAFFIX
TRAFFIC & TRANSPORT PLANNERS

Suite 2.08, 50 Holt Street
Surry Hills, NSW 2010
PO Box 1124
Strawberry Hills, NSW 2012

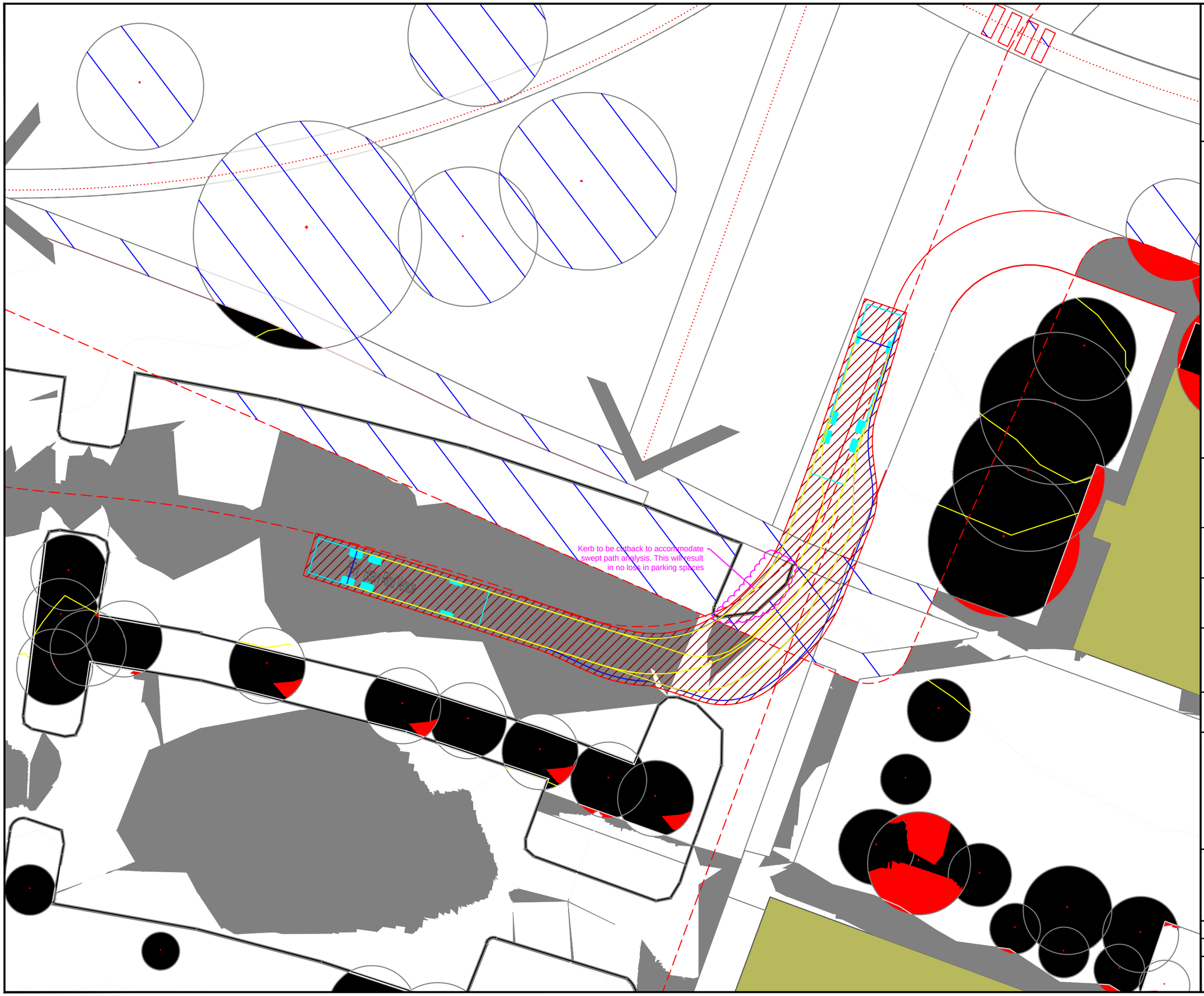
t: +61 2 8324 8700
f: +61 2 9830 4481
w: www.traffix.com.au

Drawing Title
Proposed Site Plan
Entry - 12.5m Heavy Rigid Vehicle
Swept Path Analysis

Drawn:	Checked:	Date:
JP	VD	01-03-21

20.456d02v05 TRAFFIX [210205 Plans] Design Review SITE + ACCESS.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
20.456	DA	TX.11	A



Notes:

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Rev.	Revision Note	By.	Date
A	Swept Paths Analysis	JP	01-03-21
B	Revised Swept Paths Analysis	JP	05-03-21

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

0 2.5 5 7.5 10m
1:250 @ A3

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

Drawing Prepared By

TRAFFIX
TRAFFIC & TRANSPORT PLANNERS

Suite 2.08, 50 Holt Street
Surry Hills, NSW 2010
PO Box 1124
Strawberry Hills, NSW 2012

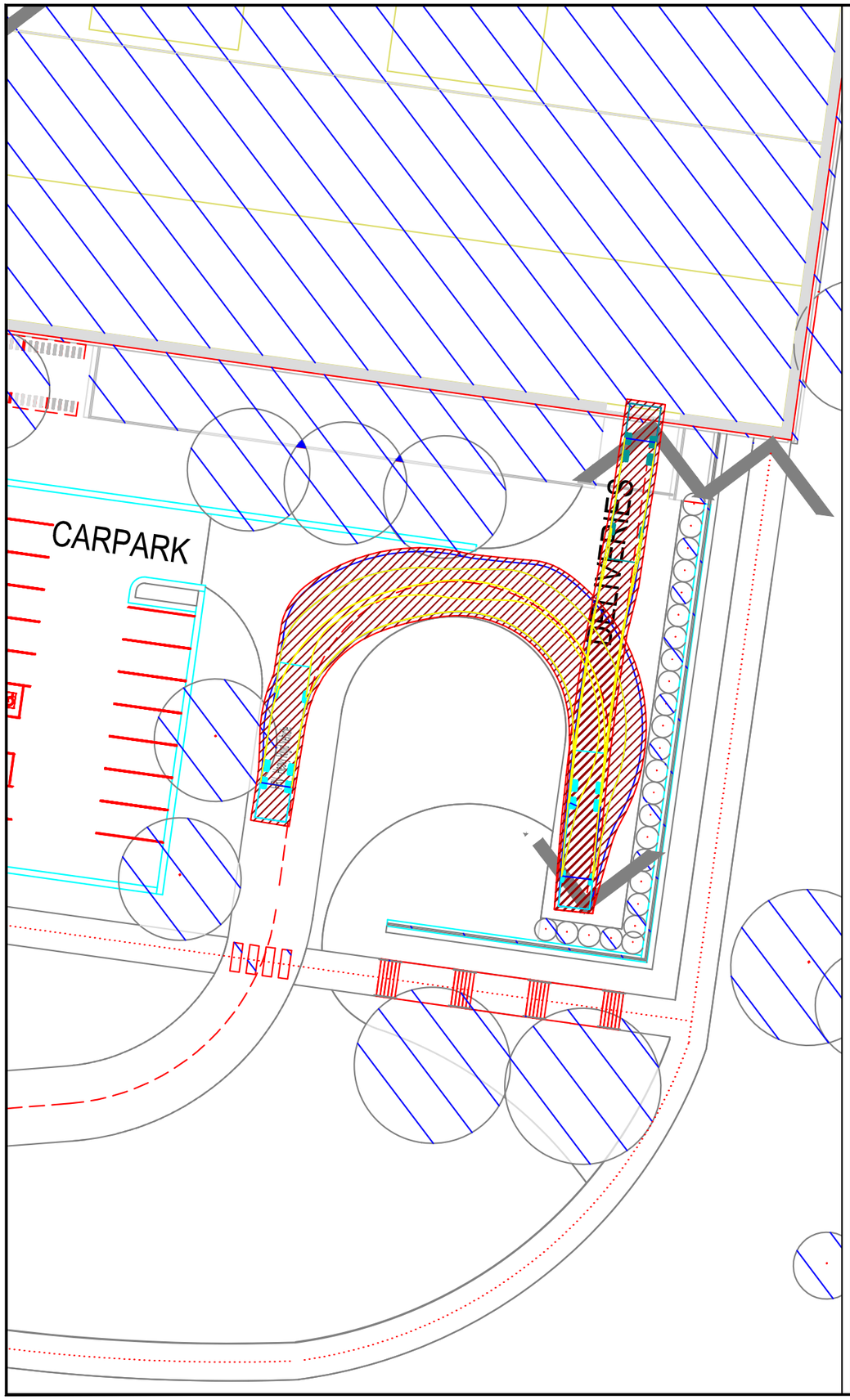
t: +61 2 8324 8700
f: +61 2 9830 4481
w: www.traffix.com.au

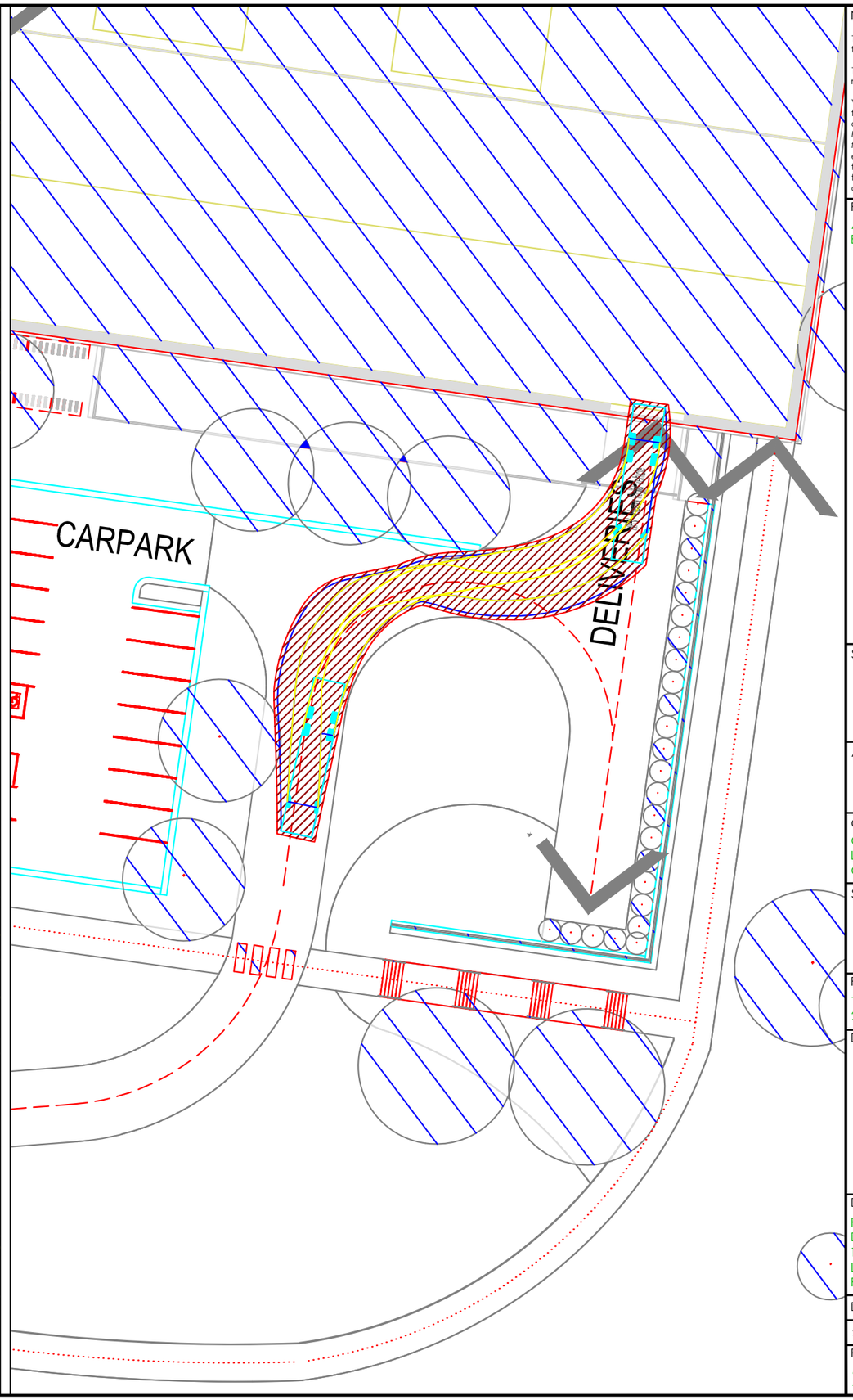
Drawing Title
Survey Plan
Entry - Top Car Park
12.5m Heavy Rigid Vehicle
Swept Path Analysis

Drawn:	Checked:	Date:
JP	VD	01-03-21

20.456d02v05 TRAFFIX [210205 Plans] Design Review SITE + ACCESS.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
20.456	DA	TX.12	A





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Rev.	Revision Note	By.	Date
A	Swept Paths Analysis	JP	01-03-21
B	Revised Swept Paths Analysis	JP	05-03-21

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

0 4 8 12 16m
1:400 @ A3

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

Drawing Prepared By

TRAFFIX
TRAFFIC & TRANSPORT PLANNERS

Suite 2.08, 50 Holt Street
Surry Hills, NSW 2010
PO Box 1124
Strawberry Hills, NSW 2012

t: +61 2 8324 8700
f: +61 2 9830 4481
w: www.traffix.com.au

Drawing Title
Proposed Site Plan
Delivery Bay
12.5m Heavy Rigid Vehicle - Swept Path Analysis
Left: Reverse Entry Manoeuvre
Right: Forward Exit Manoeuvre

Drawn:	Checked:	Date:
JP	VD	01-03-21

20.456d02v05 TRAFFIX [210205 Plans] Design Review SITE + ACCESS.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
20.456	DA	TX.13	A

Notes:

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Rev.	Revision Note	By.	Date
A	Swept Paths Analysis	JP	01-03-21
B	Revised Swept Paths Analysis	JP	05-03-21

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

0 2.5 5 7.5 10m

1:250 @ A3

Project Description

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

Drawing Prepared By

TRAFFIX
TRAFFIC & TRANSPORT PLANNERS

Suite 2.08, 50 Holt Street
Surry Hills, NSW 2010
PO Box 1124
Strawberry Hills, NSW 2012

t: +61 2 8324 8700
f: +61 2 9830 4481
w: www.traffix.com.au

Drawing Title

Survey Plan
Exit - Bottom Car Park
12.5m Heavy Rigid Vehicle
Swept Path Analysis

Drawn:	Checked:	Date:
JP	VD	01-03-21

20.456d02v05 TRAFFIX [210205 Plans] Design Review SITE + ACCESS.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
20.456	DA	TX.14	A

269910
282° 00' 00"

Notes:

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Rev.	Revision Note	By.	Date
A	Swept Paths Analysis	JP	01-03-21
B	Swept Paths Analysis	JP	05-03-21

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

0 2.5 5 7.5 10m
1:250 @ A3

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

Drawing Prepared By

TRAFFIX
TRAFFIC & TRANSPORT PLANNERS

Suite 2.08, 50 Holt Street
Surry Hills, NSW 2010
PO Box 1124
Strawberry Hills, NSW 2012

t: +61 2 8324 8700
f: +61 2 9830 4481
w: www.traffix.com.au

Drawing Title
Survey Plan
Carpark Exit - 12.5m Heavy Rigid Vehicle
Swept Path Analysis

Drawn:	Checked:	Date:
JP	VD	01-03-21

20.456d02v05 TRAFFIX [210205 Plans] Design Review SITE + ACCESS.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
20.456	DA	TX.15	A

APPENDIX D

TfNSW Correspondence

Vince Doan

Subject: FW: [20.456] TAFE NSW Nepean Kingswood: 2-44 O'Connell Street, Kingswood

From: Vince Doan
Sent: Friday, 4 December 2020 4:37 PM
To: Laura Van putten
Cc: Justin Pindar
Subject: RE: [20.456] TAFE NSW Nepean Kingswood: 2-44 O'Connell Street, Kingswood

Hi Laura,

Thank you for the chat on Thursday (26/11/2020). We have now requested and received SCATS data. As discussed, the following will be our modelling methodology:

- Compare the intersection volume from this year and last year
- If last year volumes were greater than this year, we will use the SCATS data and the turning counts will be based on this years turning counts percentage on each approach
- If this year surveys are greater, we will use the surveys.

Please let me know if you have any other comments however, I do assume that is this the general approach for traffic modelling during this period (COVID-19).

Regards,

Vince Doan
Executive Engineer

TRAFFIX

From: Laura Van putten
Sent: Wednesday, 25 November 2020 9:44 AM
To: Vince Doan
Subject: RE: [20.456] TAFE NSW Nepean Kingswood: 2-44 O'Connell Street, Kingswood

Hi Vince

Happy to discuss – I will be available to chat in the morning tomorrow please feel free to contact me my details are below.

If for whatever reason I may be away from the phone just flick me a quick email and I will call you back.

Kind regards,

Laura van Putten

From: Vince Doan
Sent: Wednesday, 25 November 2020 8:27 AM
To: Laura Van putten
Cc: Development Sydney; Justin Pindar
Subject: RE: [20.456] TAFE NSW Nepean Kingswood: 2-44 O'Connell Street, Kingswood

Hi Laura,

Will you be free Thursday before 3pm or Friday (anytime) to have a quick chat either via the phone or teams?

Just wanted to have a quick discussion about the methodology of the proposal.

Regards,

Vince Doan
Executive Engineer

TRAFFIX

From: Sharon Verhoeven **On Behalf Of** Development Sydney
Sent: Friday, 20 November 2020 12:40 PM
To: Vince Doan
Cc: Laura Van putten
Subject: RE: [20.456] TAFE NSW Nepean Kingswood: 2-44 O'Connell Street, Kingswood

Hi Vince

It will be Laura Van Putten looking after this referral.

Kind regards
Sharon

From: Vince Doan
Sent: Friday, 20 November 2020 12:18 PM
To: Development Sydney
Cc: Justin Pindar
Subject: RE: [20.456] TAFE NSW Nepean Kingswood: 2-44 O'Connell Street, Kingswood
Importance: High

Hi,

Yet to receive anything. Could you please advise who is the best contact?

Regards,

Vince Doan
Executive Engineer

TRAFFIX

From: Vince Doan
Sent: Wednesday, 11 November 2020 4:33 PM
To: Development Sydney
Cc: Justin Pindar
Subject: [20.456] TAFE NSW Nepean Kingswood: 2-44 O'Connell Street, Kingswood

To whom it may concern,

We have been engaged by TAFE NSW as the traffic engineers for works on the TAFE Nepean Kingswood Campus. The proposal is an SSD (SSD-8571481 attached).

Could you please advise who is the best contact moving forward? In addition, I would like to arrange a quick telephone chat sometime next week to just discuss the methodology.

Please contact me should you have any queries.

Regards,

Vince Doan
Executive Engineer

TRAFFIX

APPENDIX E-1

SIDRA Modelling Outputs – Intersection Layouts

USER REPORT FOR SITE

All Movement Classes

Project: 20.456m01v01 TRAFFIX **Template: Layouts**

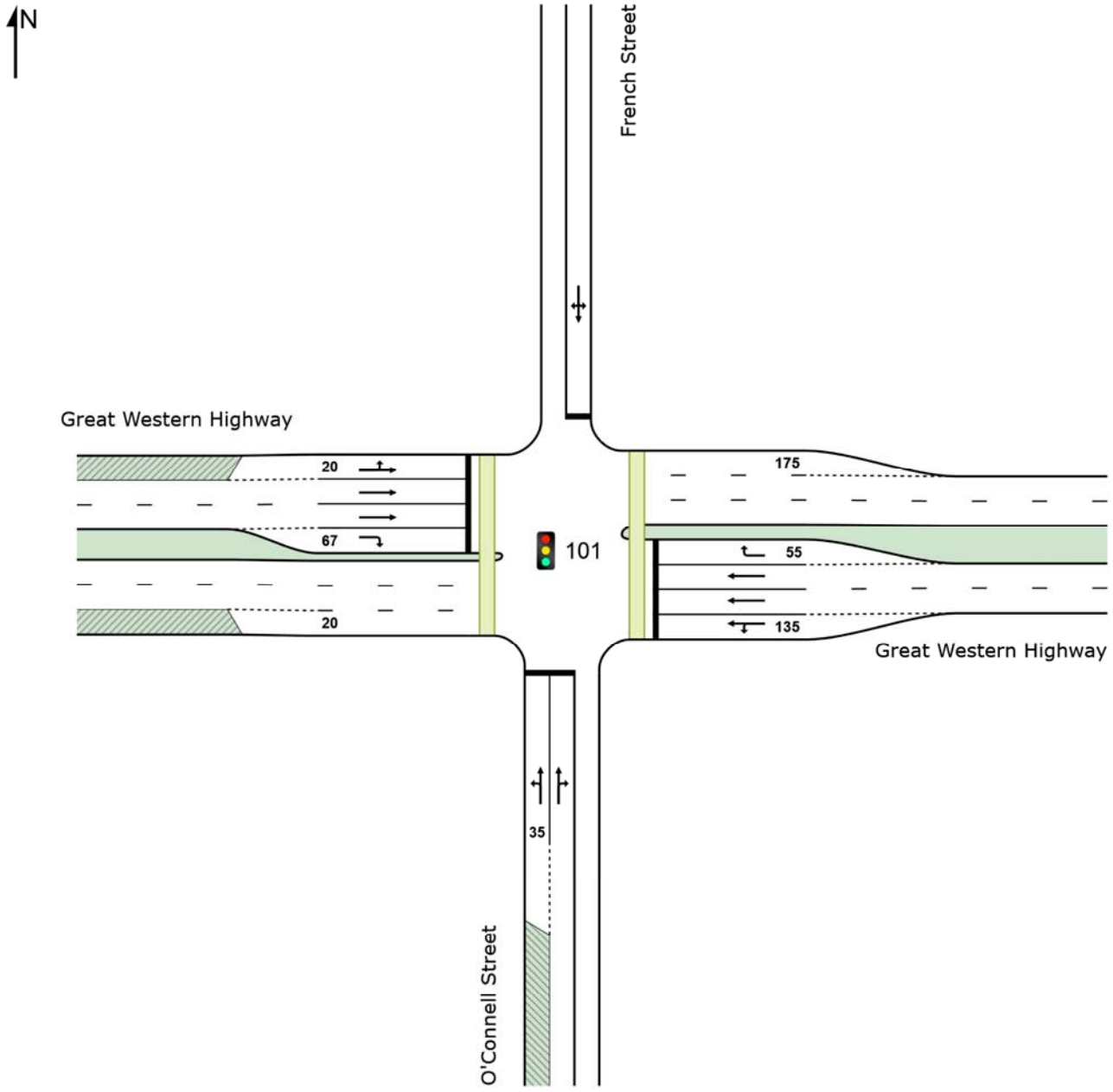
Site: 101 [Great Western Highway x O'Connell Street x French Street Existing AM (Site Folder: Exisitng (2020))]

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

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: TCS
Reference Phase: Phase A
Input Phase Sequence: A, B*, C*, D, E, E1*, E2*
Output Phase Sequence: A, D, E
(* Variable Phase)

Site Layout

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


N
French Street
Great Western Highway
20
67
20
101
175
55
135
Great Western Highway
35
O'Connell Street

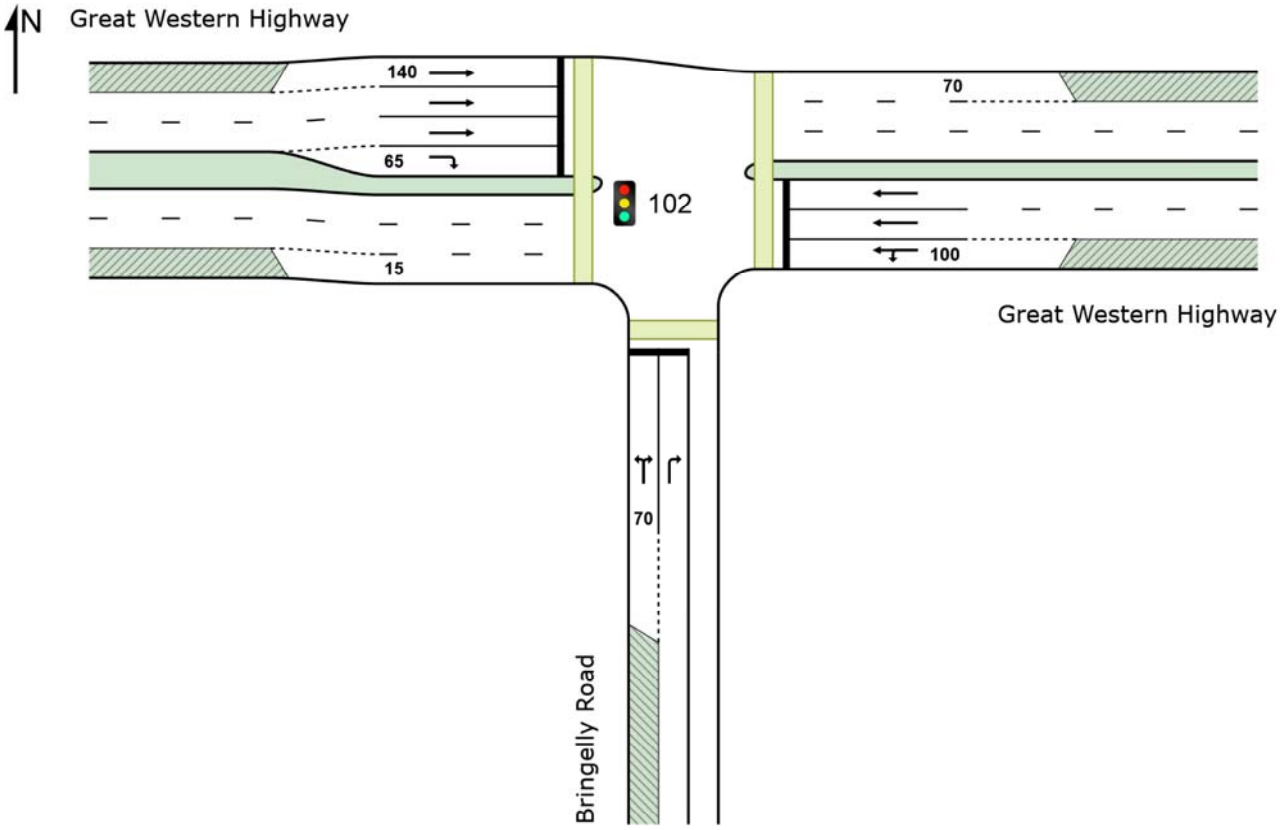
Site: 102 [Great Western Highway x Bringelly Road Exsting AM (Site Folder: Exisitng (2020))]

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

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Site Layout

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



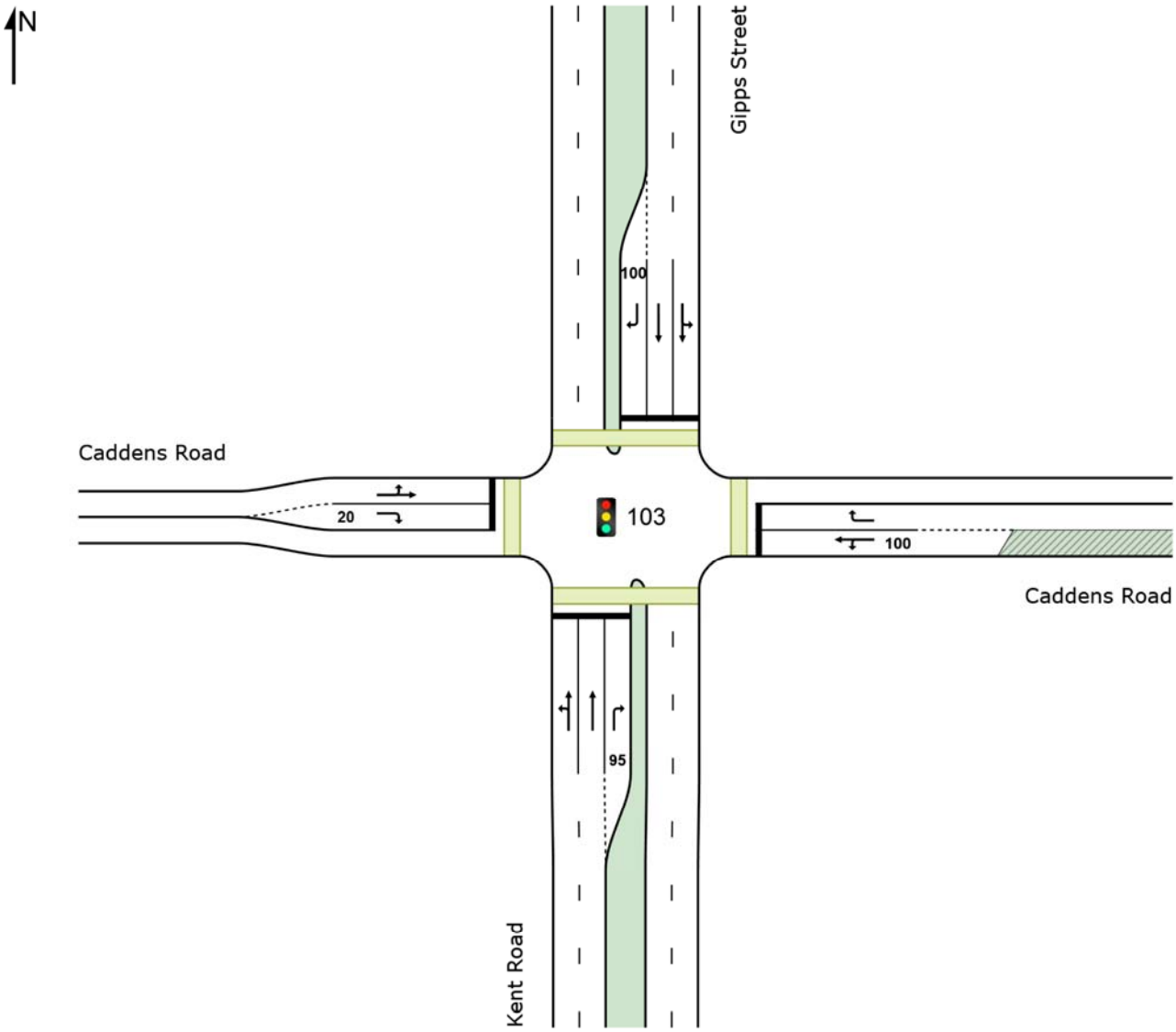
Site: 103 [Caddens Road x Gipps Street x Kent Road Existing AM (Site Folder: Exisitng (2020))]

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

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: TCS
Reference Phase: Phase A
Input Phase Sequence: A, B*, C*, D, E, E1*, E2*
Output Phase Sequence: A, D, E
(* Variable Phase)

Site Layout

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



APPENDIX E-2

SIDRA Modelling Outputs – 2020 Base Case Scenario

USER REPORT FOR SITE

All Movement Classes

Project: 20.456m01v01 TRAFFIX

Template: Movement Summaries

Site: 101 [Great Western Highway x O'Connell Street x French Street Existing AM (Site Folder: Exisitng (2020))]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: TCS
Reference Phase: Phase A
Input Phase Sequence: A, B*, C*, D, E, E1*, E2*
Output Phase Sequence: A, D, E
(* Variable Phase)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: O'Connell Street														
1	L2	44	1	46	2.3	0.130	44.0	LOS D	2.6	18.6	0.81	0.71	0.81	30.4
2	T1	11	0	12	0.0	0.130	37.5	LOS C	2.6	18.6	0.81	0.71	0.81	29.1
3	R2	169	9	178	5.3	*0.725	58.3	LOS E	10.4	76.2	0.99	0.87	1.09	25.8
Approach		224	10	236	4.5	0.725	54.5	LOS D	10.4	76.2	0.95	0.83	1.02	26.7
East: Great Western Highway														
4	L2	204	10	215	4.9	0.211	19.1	LOS B	6.1	44.3	0.52	0.72	0.52	40.3
5	T1	1458	45	1535	3.1	*0.718	20.0	LOS B	32.7	234.9	0.78	0.72	0.78	45.2
6	R2	23	0	24	0.0	0.174	63.8	LOS E	1.4	9.7	0.97	0.71	0.97	27.8
Approach		1685	55	1774	3.3	0.718	20.5	LOS B	32.7	234.9	0.76	0.72	0.76	44.3
North: French Street														
7	L2	49	0	52	0.0	0.438	50.9	LOS D	7.4	51.6	0.92	0.79	0.92	31.1
8	T1	24	0	25	0.0	0.438	45.3	LOS D	7.4	51.6	0.92	0.79	0.92	26.9
9	R2	62	0	65	0.0	0.438	49.9	LOS D	7.4	51.6	0.92	0.79	0.92	31.2
Approach		135	0	142	0.0	0.438	49.4	LOS D	7.4	51.6	0.92	0.79	0.92	30.4
West: Great Western Highway														
10	L2	8	0	8	0.0	0.558	20.1	LOS B	10.7	77.0	0.57	0.50	0.57	44.4
11	T1	1254	43	1320	3.4	0.598	16.1	LOS B	20.5	147.4	0.62	0.55	0.62	47.6
12	R2	90	7	95	7.8	*0.718	69.2	LOS E	5.9	43.8	1.00	0.84	1.16	23.7
Approach		1352	50	1423	3.7	0.718	19.6	LOS B	20.5	147.4	0.64	0.57	0.65	45.2
All Vehicles		3396	115	3575	3.4	0.725	23.5	LOS B	32.7	234.9	0.73	0.67	0.74	42.3

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)

Site: 201 [Great Western Highway x O'Connell Street x French Street Existing PM (Site Folder: Exisitng (2020))]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: TCS
Reference Phase: Phase A
Input Phase Sequence: A, B*, C*, D, E, E1*, E2*
Output Phase Sequence: A, D, E
(* Variable Phase)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: O'Connell Street														
1	L2	55	4	58	7.3	0.144	40.6	LOS C	3.1	22.9	0.78	0.71	0.78	31.3
2	T1	17	0	18	0.0	0.722	37.8	LOS C	12.0	86.9	0.83	0.75	0.84	28.9
3	R2	198	8	208	4.0	*0.722	53.3	LOS D	12.0	86.9	0.97	0.87	1.04	27.0
Approach		270	12	284	4.4	0.722	49.8	LOS D	12.0	86.9	0.92	0.83	0.98	27.9
East: Great Western Highway														
4	L2	216	9	227	4.2	0.236	21.4	LOS B	7.0	50.6	0.57	0.73	0.57	39.0
5	T1	1220	25	1284	2.0	0.655	20.8	LOS B	27.8	198.2	0.76	0.68	0.76	44.7
6	R2	73	0	77	0.0	0.552	66.4	LOS E	4.6	32.1	1.00	0.77	1.01	27.3
Approach		1509	34	1588	2.3	0.655	23.1	LOS B	27.8	198.2	0.74	0.70	0.74	42.6
North: French Street														
7	L2	40	1	42	2.5	0.338	46.8	LOS D	6.0	42.5	0.87	0.77	0.87	32.2
8	T1	18	0	19	0.0	0.338	40.9	LOS C	6.0	42.5	0.87	0.77	0.87	28.0
9	R2	58	1	61	1.7	0.338	45.5	LOS D	6.0	42.5	0.87	0.77	0.87	32.3
Approach		116	2	122	1.7	0.338	45.2	LOS D	6.0	42.5	0.87	0.77	0.87	31.7
West: Great Western Highway														
10	L2	19	1	20	5.3	0.688	22.9	LOS B	12.9	91.4	0.62	0.55	0.62	42.8
11	T1	1441	24	1517	1.7	*0.737	19.9	LOS B	29.0	205.9	0.71	0.63	0.71	45.4
12	R2	85	4	89	4.7	*0.664	68.0	LOS E	5.5	39.8	1.00	0.82	1.10	23.9
Approach		1545	29	1626	1.9	0.737	22.5	LOS B	29.0	205.9	0.72	0.64	0.73	43.6
All Vehicles		3440	77	3621	2.2	0.737	25.7	LOS B	29.0	205.9	0.75	0.68	0.76	41.2

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.
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)

Site: 102 [Great Western Highway x Bringelly Road Exsting AM (Site Folder: Exisitng (2020))]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bringelly Road														
1	L2	177	10	186	5.6	0.661	52.5	LOS D	14.6	106.1	0.96	0.84	0.96	31.8
3	R2	299	9	315	3.0	*0.661	53.8	LOS D	14.6	106.1	0.98	0.83	0.98	26.0
Approach		476	19	501	4.0	0.661	53.3	LOS D	14.6	106.1	0.97	0.83	0.97	28.3
East: Great Western Highway														
4	L2	167	4	176	2.4	0.199	24.3	LOS B	5.8	41.3	0.61	0.73	0.61	37.0
5	T1	1163	40	1224	3.4	*0.674	25.1	LOS B	27.6	198.6	0.82	0.74	0.82	45.4
Approach		1330	44	1400	3.3	0.674	25.0	LOS B	27.6	198.6	0.79	0.74	0.79	44.7
West: Great Western Highway														
11	T1	1151	47	1212	4.1	0.375	7.3	LOS A	11.5	83.2	0.42	0.37	0.42	55.0
12	R2	185	10	195	5.4	*0.459	40.6	LOS C	9.8	71.6	0.91	0.92	0.91	35.1
Approach		1336	57	1406	4.3	0.459	11.9	LOS A	11.5	83.2	0.48	0.45	0.48	51.8
All Vehicles		3142	120	3307	3.8	0.674	23.7	LOS B	27.6	198.6	0.69	0.63	0.69	44.8

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)

Site: 202 [Great Western Highway x Bringelly Road Exsting PM (Site Folder: Exisitng (2020))]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bringelly Road														
1	L2	165	5	174	3.0	0.639	49.8	LOS D	15.7	111.9	0.95	0.84	0.95	32.6
3	R2	379	6	399	1.6	*0.639	50.0	LOS D	15.7	111.9	0.95	0.84	0.95	27.0
Approach		544	11	573	2.0	0.639	49.9	LOS D	15.7	111.9	0.95	0.84	0.95	28.9
East: Great Western Highway														
4	L2	197	1	207	0.5	0.240	25.9	LOS B	7.2	50.5	0.64	0.75	0.64	36.3
5	T1	1098	30	1156	2.7	*0.652	26.0	LOS B	25.9	185.4	0.82	0.74	0.82	45.0
Approach		1295	31	1363	2.4	0.652	26.0	LOS B	25.9	185.4	0.79	0.74	0.79	44.1
West: Great Western Highway														
11	T1	1181	22	1243	1.9	0.404	9.6	LOS A	13.5	96.3	0.48	0.42	0.48	53.6
12	R2	166	3	175	1.8	*0.442	40.1	LOS C	9.0	63.8	0.92	0.88	0.92	35.4
Approach		1347	25	1418	1.9	0.442	13.4	LOS A	13.5	96.3	0.53	0.48	0.53	51.1
All Vehicles		3186	67	3354	2.1	0.652	24.7	LOS B	25.9	185.4	0.71	0.65	0.71	44.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
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)

Site: 103 [Caddens Road x Gipps Street x Kent Road Existing AM (Site Folder: Exisitng (2020))]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: TCS
Reference Phase: Phase A
Input Phase Sequence: A, B*, C*, D, E, E1*, E2*
Output Phase Sequence: A, D, E
(* Variable Phase)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kent Road														
1	L2	194	4	204	2.1	0.748	36.2	LOS C	30.2	219.8	0.89	0.83	0.89	43.4
2	T1	991	59	1043	6.0	*0.748	29.1	LOS C	30.2	219.8	0.89	0.81	0.89	47.2
3	R2	20	0	21	0.0	0.170	66.5	LOS E	1.2	8.5	0.98	0.71	0.98	30.0
Approach		1205	63	1268	5.2	0.748	30.8	LOS C	30.2	219.8	0.89	0.81	0.89	46.0
East: Caddens Road														
4	L2	61	0	64	0.0	0.143	31.6	LOS C	3.7	26.7	0.70	0.67	0.70	40.5
5	T1	31	2	33	6.5	0.143	27.0	LOS B	3.7	26.7	0.70	0.67	0.70	38.0
6	R2	68	3	72	4.4	0.202	40.2	LOS C	3.2	23.4	0.80	0.74	0.80	32.8
Approach		160	5	168	3.1	0.202	34.3	LOS C	3.7	26.7	0.74	0.70	0.74	36.7
North: Gipps Street														
7	L2	28	1	29	3.6	0.542	32.6	LOS C	19.4	141.0	0.78	0.70	0.78	40.1
8	T1	849	37	894	4.4	0.542	25.6	LOS B	19.5	141.5	0.78	0.69	0.78	50.1
9	R2	77	2	81	2.6	*0.667	70.5	LOS E	5.0	35.7	1.00	0.80	1.11	26.9
Approach		954	40	1004	4.2	0.667	29.4	LOS C	19.5	141.5	0.80	0.70	0.81	46.7
West: Caddens Road														
10	L2	137	3	144	2.2	0.323	30.1	LOS C	6.1	43.9	0.69	0.73	0.69	39.7
11	T1	18	1	19	5.6	0.323	25.7	LOS B	6.1	43.9	0.69	0.73	0.69	37.9
12	R2	212	8	223	3.8	*0.728	46.7	LOS D	11.6	84.1	0.89	0.85	0.97	36.1
Approach		367	12	386	3.3	0.728	39.5	LOS C	11.6	84.1	0.81	0.80	0.85	37.3
All Vehicles		2686	120	2827	4.5	0.748	31.7	LOS C	30.2	219.8	0.84	0.77	0.85	44.1

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)

Site: 203 [Caddens Road x Gipps Street x Kent Road Existing PM (Site Folder: Exisitng (2020))]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: TCS
Reference Phase: Phase A
Input Phase Sequence: A, B*, C*, D, E, E1*, E2*
Output Phase Sequence: A, D, E
(* Variable Phase)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kent Road														
1	L2	230	8	242	3.5	0.687	33.8	LOS C	27.3	196.3	0.85	0.80	0.85	44.3
2	T1	897	25	944	2.8	*0.687	26.4	LOS B	27.3	196.3	0.84	0.76	0.84	48.9
3	R2	48	0	51	0.0	0.297	63.8	LOS E	2.9	20.1	0.97	0.75	0.97	30.6
Approach		1175	33	1237	2.8	0.687	29.4	LOS C	27.3	196.3	0.84	0.77	0.84	46.6
East: Caddens Road														
4	L2	38	1	40	2.6	0.095	33.9	LOS C	2.3	16.6	0.72	0.67	0.72	39.1
5	T1	16	2	17	12.5	0.095	29.3	LOS C	2.3	16.6	0.72	0.67	0.72	37.0
6	R2	59	3	62	5.1	0.176	42.1	LOS C	2.8	20.8	0.81	0.74	0.81	32.1
Approach		113	6	119	5.3	0.176	37.5	LOS C	2.8	20.8	0.77	0.70	0.77	35.1
North: Gipps Street														
7	L2	82	2	86	2.4	0.593	32.1	LOS C	22.6	160.7	0.79	0.73	0.79	40.0
8	T1	927	17	976	1.8	0.593	25.1	LOS B	22.8	161.9	0.79	0.72	0.79	50.2
9	R2	111	1	117	0.9	*0.691	67.7	LOS E	7.1	49.8	1.00	0.82	1.10	27.6
Approach		1120	20	1179	1.8	0.691	29.8	LOS C	22.8	161.9	0.81	0.73	0.82	45.8
West: Caddens Road														
10	L2	63	0	66	0.0	0.144	34.7	LOS C	3.6	25.6	0.73	0.71	0.73	38.1
11	T1	22	2	23	9.1	0.144	30.3	LOS C	3.6	25.6	0.73	0.71	0.73	36.4
12	R2	209	2	220	1.0	*0.672	47.0	LOS D	11.4	80.2	0.91	0.83	0.93	36.3
Approach		294	4	309	1.4	0.672	43.1	LOS D	11.4	80.2	0.86	0.80	0.87	36.6
All Vehicles		2702	63	2844	2.3	0.691	31.4	LOS C	27.3	196.3	0.83	0.75	0.84	44.3

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)

APPENDIX E-3

SIDRA Modelling Outputs – 2026 Base Case Scenario

USER REPORT FOR SITE

All Movement Classes

Project: 20.456m01v01 TRAFFIX

Template: Movement Summaries

Site: 301 [Great Western Highway x O'Connell Street x French Street 2026 AM (Site Folder: Future - 2026)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.
Design Life Analysis (Final Year): Results for 6 years

Timings based on settings in the Site Phasing & Timing dialog (Demand & Sensitivity Analysis overrides)
Phase Times determined by the program
Phase Sequence: TCS
Reference Phase: Phase A
Input Phase Sequence: A, B*, C*, D, E, E1*, E2*
Output Phase Sequence: A, D, E
(* Variable Phase)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: O'Connell Street														
1	L2	44	1	52	2.3	0.141	34.3	LOS C	2.2	15.6	0.80	0.71	0.80	34.1
2	T1	11	0	13	0.0	0.141	27.3	LOS B	2.2	15.6	0.80	0.71	0.80	32.4
3	R2	169	9	200	5.3	*0.760	47.3	LOS D	9.2	67.6	1.00	0.92	1.17	28.6
Approach		224	10	266	4.5	0.760	43.7	LOS D	9.2	67.6	0.95	0.87	1.08	29.7
East: Great Western Highway														
4	L2	204	10	242	4.9	0.264	18.9	LOS B	6.0	43.4	0.60	0.74	0.60	40.4
5	T1	1458	45	1728	3.1	*0.899	34.0	LOS C	42.6	306.2	0.97	1.04	1.16	38.5
6	R2	23	0	27	0.0	0.189	49.8	LOS D	1.2	8.3	0.97	0.71	0.97	31.2
Approach		1685	55	1997	3.3	0.899	32.4	LOS C	42.6	306.2	0.92	1.00	1.09	38.5
North: French Street														
7	L2	49	0	58	0.0	0.498	40.7	LOS C	6.4	44.8	0.93	0.79	0.93	34.1
8	T1	24	0	28	0.0	0.498	34.8	LOS C	6.4	44.8	0.93	0.79	0.93	29.9
9	R2	62	0	73	0.0	0.498	39.4	LOS C	6.4	44.8	0.93	0.79	0.93	34.2
Approach		135	0	160	0.0	0.498	39.0	LOS C	6.4	44.8	0.93	0.79	0.93	33.5
West: Great Western Highway														
10	L2	8	0	9	0.0	0.690	20.3	LOS B	10.6	76.5	0.66	0.58	0.67	44.3
11	T1	1254	43	1487	3.4	0.739	17.0	LOS B	21.3	153.3	0.73	0.66	0.74	47.1
12	R2	90	7	107	7.8	*0.780	55.7	LOS D	5.2	38.6	1.00	0.90	1.30	26.7
Approach		1352	50	1603	3.7	0.780	19.6	LOS B	21.3	153.3	0.75	0.67	0.78	45.2
All Vehicles		3396	115	4026	3.4	0.899	28.3	LOS B	42.6	306.2	0.85	0.85	0.96	40.1

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)

Site: 401 [Great Western Highway x O'Connell Street x French Street 2026 PM (Site Folder: Future - 2026)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.
Design Life Analysis (Final Year): Results for 6 years

Timings based on settings in the Site Phasing & Timing dialog (Demand & Sensitivity Analysis overrides)
Phase Times determined by the program
Phase Sequence: TCS
Reference Phase: Phase A
Input Phase Sequence: A, B*, C*, D, E, E1*, E2*
Output Phase Sequence: A, D, E
(* Variable Phase)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: O'Connell Street														
1	L2	55	4	65	7.3	0.171	30.5	LOS C	2.5	18.1	0.80	0.71	0.80	35.3
2	T1	17	0	20	0.0	*0.856	27.6	LOS B	10.8	78.5	0.83	0.77	0.90	32.3
3	R2	198	8	235	4.0	0.856	48.2	LOS D	10.8	78.5	1.00	1.04	1.39	28.4
Approach		270	12	320	4.4	0.856	43.3	LOS D	10.8	78.5	0.95	0.95	1.24	29.8
East: Great Western Highway														
4	L2	216	9	256	4.2	0.291	18.7	LOS B	6.0	43.2	0.64	0.75	0.64	40.5
5	T1	1220	25	1446	2.0	0.800	21.0	LOS B	26.4	187.9	0.89	0.85	0.95	44.6
6	R2	73	0	87	0.0	0.621	47.9	LOS D	3.6	25.1	1.00	0.80	1.10	31.7
Approach		1509	34	1789	2.3	0.800	22.0	LOS B	26.4	187.9	0.86	0.83	0.91	43.2
North: French Street														
7	L2	40	1	47	2.5	0.424	35.9	LOS C	4.8	33.9	0.90	0.78	0.90	35.7
8	T1	18	0	21	0.0	0.424	29.7	LOS C	4.8	33.9	0.90	0.78	0.90	31.5
9	R2	58	1	69	1.7	0.424	34.2	LOS C	4.8	33.9	0.90	0.78	0.90	35.9
Approach		116	2	138	1.7	0.424	34.1	LOS C	4.8	33.9	0.90	0.78	0.90	35.2
West: Great Western Highway														
10	L2	19	1	23	5.3	0.829	29.5	LOS C	14.4	102.6	0.71	0.76	0.92	39.7
11	T1	1441	24	1708	1.7	*0.888	30.0	LOS C	33.2	235.6	0.82	0.91	1.07	40.3
12	R2	85	4	101	4.7	*0.748	50.0	LOS D	4.3	31.6	1.00	0.87	1.27	28.2
Approach		1545	29	1831	1.9	0.888	31.1	LOS C	33.2	235.6	0.83	0.91	1.08	39.6
All Vehicles		3440	77	4078	2.2	0.888	28.1	LOS B	33.2	235.6	0.85	0.87	1.01	40.1

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)

Site: 302 [Great Western Highway x Bringelly Road 2026 AM (Site Folder: Future - 2026)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Practical Cycle Time)
Design Life Analysis (Final Year): Results for 6 years

Timings based on settings in the Site Phasing & Timing dialog (Demand & Sensitivity Analysis overrides)
Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bringelly Road														
1	L2	177	10	210	5.6	0.657	36.0	LOS C	11.1	80.6	0.94	0.84	0.95	37.4
3	R2	299	9	354	3.0	*0.657	37.0	LOS C	11.1	80.6	0.96	0.84	0.99	31.4
Approach		476	19	564	4.0	0.657	36.6	LOS C	11.1	80.6	0.95	0.84	0.97	33.8
East: Great Western Highway														
4	L2	167	4	198	2.4	0.255	21.5	LOS B	5.0	35.6	0.68	0.75	0.68	38.6
5	T1	1163	40	1379	3.4	*0.850	29.2	LOS C	28.2	202.9	0.97	0.99	1.12	43.7
Approach		1330	44	1577	3.3	0.850	28.3	LOS B	28.2	202.9	0.93	0.96	1.07	43.3
West: Great Western Highway														
11	T1	1151	47	1364	4.1	0.470	8.0	LOS A	11.4	82.6	0.54	0.48	0.54	54.6
12	R2	185	10	219	5.4	*0.621	36.9	LOS C	7.7	56.3	0.96	0.92	0.98	36.4
Approach		1336	57	1584	4.3	0.621	12.0	LOS A	11.4	82.6	0.60	0.54	0.60	51.8
All Vehicles		3142	120	3725	3.8	0.850	22.6	LOS B	28.2	202.9	0.79	0.76	0.85	45.3

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)

Site: 402 [Great Western Highway x Bringelly Road 2026 PM (Site Folder: Future - 2026)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 70 seconds (Site Practical Cycle Time)
Design Life Analysis (Final Year): Results for 6 years

Timings based on settings in the Site Phasing & Timing dialog (Demand & Sensitivity Analysis overrides)
Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bringelly Road														
1	L2	165	5	196	3.0	0.714	34.1	LOS C	11.4	81.4	0.96	0.87	1.04	38.1
3	R2	379	6	449	1.6	*0.714	34.0	LOS C	11.4	81.4	0.97	0.87	1.06	32.6
Approach		544	11	645	2.0	0.714	34.0	LOS C	11.4	81.4	0.97	0.87	1.05	34.5
East: Great Western Highway														
4	L2	197	1	234	0.5	0.327	22.0	LOS B	5.7	39.8	0.75	0.77	0.75	38.4
5	T1	1098	30	1302	2.7	*0.881	32.1	LOS C	26.0	185.9	1.00	1.08	1.27	42.5
Approach		1295	31	1535	2.4	0.881	30.6	LOS C	26.0	185.9	0.96	1.04	1.19	42.1
West: Great Western Highway														
11	T1	1181	22	1400	1.9	0.505	8.7	LOS A	11.4	81.3	0.59	0.53	0.59	54.2
12	R2	166	3	197	1.8	*0.557	32.0	LOS C	6.0	42.3	0.95	0.86	0.95	38.5
Approach		1347	25	1597	1.9	0.557	11.5	LOS A	11.4	81.3	0.64	0.57	0.64	52.1
All Vehicles		3186	67	3777	2.1	0.881	23.1	LOS B	26.0	185.9	0.83	0.81	0.93	44.9

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)

Site: 303 [Caddens Road x Gipps Street x Kent Road 2026 AM (Site Folder: Future - 2026)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.
Design Life Analysis (Final Year): Results for 6 years

Timings based on settings in the Site Phasing & Timing dialog (Demand & Sensitivity Analysis overrides)
Phase Times determined by the program
Phase Sequence: TCS
Reference Phase: Phase A
Input Phase Sequence: A, B*, C*, D, E, E1*, E2*
Output Phase Sequence: A, D, E
(* Variable Phase)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kent Road														
1	L2	194	4	230	2.1	0.895	45.7	LOS D	35.5	258.5	1.00	1.05	1.23	34.8
2	T1	991	59	1175	6.0	*0.895	38.7	LOS C	35.5	258.5	1.00	1.04	1.22	36.8
3	R2	20	0	24	0.0	0.191	52.5	LOS D	1.0	7.3	0.98	0.71	0.98	29.5
Approach		1205	63	1428	5.2	0.895	40.0	LOS C	35.5	258.9	1.00	1.04	1.22	36.2
East: Caddens Road														
4	L2	61	0	72	0.0	0.167	25.9	LOS B	3.3	23.4	0.72	0.68	0.72	38.7
5	T1	31	2	37	6.5	0.167	21.4	LOS B	3.3	23.4	0.72	0.68	0.72	40.4
6	R2	68	3	81	4.4	0.248	34.8	LOS C	2.9	21.3	0.84	0.75	0.84	34.7
Approach		160	5	190	3.1	0.248	28.8	LOS C	3.3	23.4	0.77	0.71	0.77	37.2
North: Gipps Street														
7	L2	28	1	33	3.6	0.650	29.3	LOS C	18.2	132.0	0.85	0.76	0.85	41.7
8	T1	849	37	1006	4.4	0.650	22.3	LOS B	18.2	132.5	0.85	0.76	0.85	47.9
9	R2	77	2	91	2.6	*0.751	57.1	LOS E[11]	4.4	31.5	1.00	0.85	1.26	30.3
Approach		954	40	1131	4.2	0.751	25.4	LOS B	18.2	132.5	0.87	0.77	0.89	45.2
West: Caddens Road														
10	L2	137	3	162	2.2	0.313	24.9	LOS B	5.4	38.4	0.71	0.74	0.71	42.4
11	T1	18	1	21	5.6	0.313	20.6	LOS B	5.4	38.4	0.71	0.74	0.71	40.0
12	R2	212	8	251	3.8	*0.866	50.8	LOS D	12.4	89.3	0.94	0.99	1.32	30.7
Approach		367	12	435	3.3	0.866	39.7	LOS C	12.4	89.3	0.84	0.88	1.06	34.8
All Vehicles		2686	120	3184	4.5	0.895	34.1	LOS C	35.5	258.9	0.92	0.90	1.05	38.7

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)

Site: 403 [Caddens Road x Gipps Street x Kent Road 2026 PM (Site Folder: Future - 2026)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 70 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.
Design Life Analysis (Final Year): Results for 6 years

Timings based on settings in the Site Phasing & Timing dialog (Demand & Sensitivity Analysis overrides)
Phase Times determined by the program
Phase Sequence: TCS
Reference Phase: Phase A
Input Phase Sequence: A, B*, C*, D, E, E1*, E2*
Output Phase Sequence: A, D, E
(* Variable Phase)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kent Road														
1	L2	230	8	273	3.5	0.852	34.5	LOS C	24.4	175.6	0.97	0.99	1.17	39.6
2	T1	897	25	1063	2.8	*0.852	27.4	LOS B	24.9	178.5	0.97	0.98	1.17	43.4
3	R2	48	0	57	0.0	0.357	42.0	LOS C	2.0	13.8	0.98	0.74	0.98	32.7
Approach		1175	33	1393	2.8	0.852	29.3	LOS C	24.9	178.5	0.97	0.97	1.16	41.9
East: Caddens Road														
4	L2	38	1	45	2.6	0.117	23.2	LOS B	1.6	11.5	0.74	0.67	0.74	39.7
5	T1	16	2	19	12.5	0.117	18.6	LOS B	1.6	11.5	0.74	0.67	0.74	41.5
6	R2	59	3	70	5.1	0.228	30.1	LOS C	2.1	15.0	0.86	0.74	0.86	36.5
Approach		113	6	134	5.3	0.228	26.1	LOS B	2.1	15.0	0.81	0.71	0.81	38.2
North: Gipps Street														
7	L2	82	2	97	2.4	0.753	27.5	LOS B	18.3	130.5	0.91	0.85	0.97	42.4
8	T1	927	17	1099	1.8	0.753	20.5	LOS B	18.5	131.4	0.91	0.84	0.96	49.3
9	R2	111	1	132	0.9	*0.832	48.0	LOS D	5.2	36.4	1.00	0.92	1.45	33.2
Approach		1120	20	1328	1.8	0.832	23.7	LOS B	18.5	131.4	0.92	0.85	1.01	46.0
West: Caddens Road														
10	L2	63	0	75	0.0	0.175	24.5	LOS B	2.5	18.1	0.76	0.72	0.76	43.2
11	T1	22	2	26	9.1	0.175	20.2	LOS B	2.5	18.1	0.76	0.72	0.76	40.5
12	R2	209	2	248	1.0	*0.827	40.5	LOS C	9.4	66.4	0.98	0.97	1.32	34.4
Approach		294	4	349	1.4	0.827	35.6	LOS C	9.4	66.4	0.92	0.90	1.16	36.5
All Vehicles		2702	63	3203	2.3	0.852	27.6	LOS B	24.9	178.5	0.94	0.90	1.08	42.5

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.

* Critical Movement (Signal Timing)

APPENDIX E-4

SIDRA Modelling Outputs – 2026 Base Case + Dev Scenario

USER REPORT FOR SITE

All Movement Classes

Project: 20.456m01v01 TRAFFIX

Template: Movement Summaries

Site: 501 [Great Western Highway x O'Connell Street x French Street 2026+DEV AM (Site Folder: Future - 2026 + DEV)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 100 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.
Design Life Analysis (Final Year): Results for 6 years

Timings based on settings in the Site Phasing & Timing dialog (Demand & Sensitivity Analysis overrides)
Phase Times determined by the program
Phase Sequence: TCS
Reference Phase: Phase A
Input Phase Sequence: A, B*, C*, D, E, E1*, E2*
Output Phase Sequence: A, D, E
(* Variable Phase)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: O'Connell Street														
1	L2	46	1	54	2.2	0.162	39.6	LOS C	2.7	18.9	0.83	0.72	0.83	32.1
2	T1	12	0	14	0.0	0.162	32.6	LOS C	2.7	18.9	0.83	0.72	0.83	30.8
3	R2	179	9	211	5.1	*0.918	67.9	LOS E[11]	12.7	93.1	1.00	1.10	1.53	23.8
Approach		237	10	279	4.2	0.918	60.6	LOS E[11]	12.7	93.1	0.96	1.00	1.36	25.3
East: Great Western Highway														
4	L2	240	10	280	4.2	0.287	18.9	LOS B	7.3	53.3	0.58	0.74	0.58	40.6
5	T1	1458	45	1728	3.1	*0.859	26.7	LOS B	39.8	285.7	0.91	0.90	1.00	41.7
6	R2	23	0	27	0.0	0.184	54.0	LOS D	1.3	9.1	0.97	0.71	0.97	30.1
Approach		1721	55	2035	3.2	0.859	26.0	LOS B	39.8	285.7	0.87	0.88	0.94	41.3
North: French Street														
7	L2	49	0	58	0.0	0.526	45.5	LOS D	7.3	51.3	0.94	0.80	0.94	32.7
8	T1	27	0	32	0.0	0.526	39.7	LOS C	7.3	51.3	0.94	0.80	0.94	28.6
9	R2	62	0	73	0.0	0.526	44.2	LOS D	7.3	51.3	0.94	0.80	0.94	32.8
Approach		138	0	163	0.0	0.526	43.8	LOS D	7.3	51.3	0.94	0.80	0.94	32.0
West: Great Western Highway														
10	L2	8	0	9	0.0	0.664	19.7	LOS B	10.9	78.5	0.62	0.54	0.62	44.6
11	T1	1254	43	1487	3.4	0.711	16.0	LOS B	21.9	157.8	0.69	0.61	0.69	47.7
12	R2	105	7	122	6.8	*0.864	64.5	LOS E[11]	6.8	50.6	1.00	0.98	1.45	24.7
Approach		1367	50	1618	3.7	0.864	19.7	LOS B	21.9	157.8	0.71	0.64	0.74	45.1
All Vehicles		3463	115	4096	3.3	0.918	26.6	LOS B	39.8	285.7	0.81	0.79	0.89	40.8

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.

11 Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.
* Critical Movement (Signal Timing)

Site: 601 [Great Western Highway x O'Connell Street x French Street 2026+DEV PM (Site Folder: Future - 2026 + DEV)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.
Design Life Analysis (Final Year): Results for 6 years

Timings based on settings in the Site Phasing & Timing dialog (Demand & Sensitivity Analysis overrides)
Phase Times determined by the program
Phase Sequence: TCS
Reference Phase: Phase A
Input Phase Sequence: A, B*, C*, D, E, E1*, E2*
Output Phase Sequence: A, D, E
(* Variable Phase)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: O'Connell Street														
1	L2	60	4	70	6.7	0.179	32.6	LOS C	2.9	21.2	0.79	0.72	0.79	34.6
2	T1	18	0	21	0.0	0.893	31.3	LOS C	13.6	98.5	0.83	0.79	0.92	31.2
3	R2	216	8	254	3.7	*0.893	56.6	LOS E[11]	13.6	98.5	1.00	1.07	1.44	26.3
Approach		294	12	345	4.1	0.893	50.1	LOS D	13.6	98.5	0.95	0.98	1.28	27.9
East: Great Western Highway														
4	L2	223	9	263	4.1	0.292	19.7	LOS B	6.7	48.7	0.62	0.75	0.62	40.0
5	T1	1220	25	1446	2.0	0.782	20.7	LOS B	27.8	198.1	0.87	0.80	0.89	44.8
6	R2	73	0	87	0.0	0.699	54.7	LOS D	4.1	28.8	1.00	0.83	1.19	29.9
Approach		1516	34	1796	2.2	0.782	22.2	LOS B	27.8	198.1	0.84	0.80	0.87	43.1
North: French Street														
7	L2	41	1	48	2.4	0.400	38.6	LOS C	5.3	37.6	0.89	0.77	0.89	34.8
8	T1	18	0	21	0.0	0.400	32.3	LOS C	5.3	37.6	0.89	0.77	0.89	30.7
9	R2	58	1	69	1.7	0.400	36.8	LOS C	5.3	37.6	0.89	0.77	0.89	35.0
Approach		117	2	139	1.7	0.400	36.7	LOS C	5.3	37.6	0.89	0.77	0.89	34.3
West: Great Western Highway														
10	L2	19	1	23	5.3	0.819	29.5	LOS C	15.0	106.5	0.69	0.72	0.86	39.7
11	T1	1441	24	1708	1.7	*0.877	29.5	LOS C	34.9	248.0	0.80	0.86	1.00	40.5
12	R2	88	4	104	4.6	*0.867	60.2	LOS E[11]	5.3	38.5	1.00	0.97	1.52	25.6
Approach		1548	29	1835	1.9	0.877	31.3	LOS C	34.9	248.0	0.81	0.87	1.02	39.5
All Vehicles		3475	77	4115	2.2	0.893	29.1	LOS C	34.9	248.0	0.84	0.84	0.97	39.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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)

Site: 502 [Great Western Highway x Bringelly Road 2026+DEV AM (Site Folder: Future - 2026 + DEV)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Practical Cycle Time)
Design Life Analysis (Final Year): Results for 6 years

Timings based on settings in the Site Phasing & Timing dialog (Demand & Sensitivity Analysis overrides)
Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bringelly Road														
1	L2	177	10	210	5.6	0.657	36.0	LOS C	11.1	80.6	0.94	0.84	0.95	37.4
3	R2	299	9	354	3.0	*0.657	37.0	LOS C	11.1	80.6	0.96	0.84	0.99	31.4
Approach		476	19	564	4.0	0.657	36.6	LOS C	11.1	80.6	0.95	0.84	0.97	33.8
East: Great Western Highway														
4	L2	167	4	198	2.4	0.255	21.5	LOS B	5.0	35.6	0.68	0.75	0.68	38.6
5	T1	1165	40	1381	3.4	*0.852	29.4	LOS C	28.3	203.8	0.97	0.99	1.13	43.6
Approach		1332	44	1579	3.3	0.852	28.4	LOS B	28.3	203.8	0.93	0.96	1.07	43.2
West: Great Western Highway														
11	T1	1166	47	1380	4.0	0.475	8.1	LOS A	11.6	84.0	0.54	0.48	0.54	54.6
12	R2	185	10	219	5.4	*0.621	36.9	LOS C	7.7	56.3	0.97	0.92	0.98	36.4
Approach		1351	57	1600	4.2	0.621	12.0	LOS A	11.6	84.0	0.60	0.54	0.60	51.8
All Vehicles		3159	120	3743	3.8	0.852	22.6	LOS B	28.3	203.8	0.79	0.76	0.85	45.3

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)

Site: 602 [Great Western Highway x Bringelly Road 2026+DEV PM (Site Folder: Future - 2026 + DEV)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 70 seconds (Site Practical Cycle Time)
Design Life Analysis (Final Year): Results for 6 years

Timings based on settings in the Site Phasing & Timing dialog (Demand & Sensitivity Analysis overrides)
Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bringelly Road														
1	L2	165	5	196	3.0	0.714	34.1	LOS C	11.4	81.4	0.96	0.87	1.04	38.1
3	R2	379	6	449	1.6	*0.714	34.0	LOS C	11.4	81.4	0.97	0.87	1.06	32.6
Approach		544	11	645	2.0	0.714	34.0	LOS C	11.4	81.4	0.97	0.87	1.05	34.5
East: Great Western Highway														
4	L2	197	1	234	0.5	0.327	22.0	LOS B	5.7	39.8	0.75	0.77	0.75	38.4
5	T1	1103	30	1307	2.7	*0.884	32.6	LOS C	26.3	188.4	1.00	1.09	1.28	42.3
Approach		1300	31	1540	2.4	0.884	31.0	LOS C	26.3	188.4	0.96	1.04	1.20	42.0
West: Great Western Highway														
11	T1	1184	22	1403	1.9	0.506	8.7	LOS A	11.5	81.5	0.60	0.53	0.60	54.2
12	R2	166	3	197	1.8	*0.558	32.0	LOS C	6.0	42.4	0.95	0.86	0.95	38.4
Approach		1350	25	1600	1.9	0.558	11.6	LOS A	11.5	81.5	0.64	0.57	0.64	52.1
All Vehicles		3194	67	3785	2.1	0.884	23.3	LOS B	26.3	188.4	0.83	0.81	0.94	44.9

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)

Site: 503 [Caddens Road x Gipps Street x Kent Road 2026+DEV AM (Site Folder: Future - 2026 + DEV)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 100 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.
Design Life Analysis (Final Year): Results for 6 years

Timings based on settings in the Site Phasing & Timing dialog (Demand & Sensitivity Analysis overrides)
Phase Times determined by the program
Phase Sequence: TCS
Reference Phase: Phase A
Input Phase Sequence: A, B*, C*, D, E, E1*, E2*
Output Phase Sequence: A, D, E
(* Variable Phase)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kent Road														
1	L2	217	4	254	1.9	0.875	43.5	LOS D	37.0	269.4	0.98	0.99	1.13	35.6
2	T1	991	59	1175	6.0	*0.875	36.5	LOS C	37.0	269.4	0.98	0.99	1.13	37.8
3	R2	20	0	24	0.0	0.213	58.3	LOS E[11]	1.2	8.2	0.98	0.71	0.98	28.0
Approach		1228	63	1453	5.1	0.875	38.1	LOS C	37.0	269.4	0.98	0.98	1.12	37.1
East: Caddens Road														
4	L2	61	0	72	0.0	0.165	27.9	LOS B	3.6	25.7	0.72	0.68	0.72	37.8
5	T1	31	2	37	6.5	0.165	23.3	LOS B	3.6	25.7	0.72	0.68	0.72	39.5
6	R2	68	3	81	4.4	0.244	36.8	LOS C	3.2	23.1	0.83	0.75	0.83	34.0
Approach		160	5	190	3.1	0.244	30.8	LOS C	3.6	25.7	0.76	0.71	0.76	36.4
North: Gipps Street														
7	L2	28	1	33	3.6	0.624	30.2	LOS C	19.5	141.5	0.83	0.74	0.83	41.3
8	T1	849	37	1006	4.4	0.624	23.2	LOS B	19.5	141.9	0.83	0.74	0.83	47.2
9	R2	77	2	91	2.6	*0.834	65.5	LOS E[11]	5.0	36.0	1.00	0.89	1.42	28.1
Approach		954	40	1131	4.2	0.834	26.8	LOS B	19.5	141.9	0.84	0.75	0.88	44.1
West: Caddens Road														
10	L2	137	3	162	2.2	0.363	27.0	LOS B	5.9	42.6	0.71	0.74	0.71	41.3
11	T1	18	1	21	5.6	0.363	22.6	LOS B	5.9	42.6	0.71	0.74	0.71	39.1
12	R2	218	8	258	3.7	*0.889	58.4	LOS E[11]	14.4	104.3	0.94	1.00	1.35	28.6
Approach		373	12	441	3.2	0.889	45.1	LOS D	14.4	104.3	0.84	0.89	1.09	32.9
All Vehicles		2715	120	3215	4.4	0.889	34.6	LOS C	37.0	269.4	0.90	0.87	1.01	38.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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)

Site: 603 [Caddens Road x Gipps Street x Kent Road 2026+DEV AM (Site Folder: Future - 2026 + DEV)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 70 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.
Design Life Analysis (Final Year): Results for 6 years

Timings based on settings in the Site Phasing & Timing dialog (Demand & Sensitivity Analysis overrides)
Phase Times determined by the program
Phase Sequence: TCS
Reference Phase: Phase A
Input Phase Sequence: A, B*, C*, D, E, E1*, E2*
Output Phase Sequence: A, D, E
(* Variable Phase)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kent Road														
1	L2	234	8	277	3.4	0.854	34.8	LOS C	24.7	177.2	0.97	0.99	1.18	39.4
2	T1	897	25	1063	2.8	*0.854	27.7	LOS B	25.1	180.3	0.97	0.99	1.17	43.2
3	R2	48	0	57	0.0	0.357	42.0	LOS C	2.0	13.8	0.98	0.74	0.98	32.7
Approach		1179	33	1397	2.8	0.854	29.6	LOS C	25.1	180.3	0.97	0.98	1.17	41.7
East: Caddens Road														
4	L2	38	1	45	2.6	0.117	23.2	LOS B	1.6	11.5	0.74	0.67	0.74	39.7
5	T1	16	2	19	12.5	0.117	18.6	LOS B	1.6	11.5	0.74	0.67	0.74	41.5
6	R2	59	3	70	5.1	0.228	30.1	LOS C	2.1	15.0	0.86	0.74	0.86	36.5
Approach		113	6	134	5.3	0.228	26.1	LOS B	2.1	15.0	0.81	0.71	0.81	38.2
North: Gipps Street														
7	L2	82	2	97	2.4	0.753	27.5	LOS B	18.3	130.5	0.91	0.85	0.97	42.4
8	T1	927	17	1099	1.8	0.753	20.5	LOS B	18.5	131.4	0.91	0.84	0.96	49.3
9	R2	111	1	132	0.9	*0.832	48.0	LOS D	5.2	36.4	1.00	0.92	1.45	33.2
Approach		1120	20	1328	1.8	0.832	23.7	LOS B	18.5	131.4	0.92	0.85	1.01	46.0
West: Caddens Road														
10	L2	63	0	75	0.0	0.175	24.5	LOS B	2.5	18.1	0.76	0.72	0.76	43.2
11	T1	22	2	26	9.1	0.175	20.2	LOS B	2.5	18.1	0.76	0.72	0.76	40.5
12	R2	219	2	258	0.9	*0.865	44.1	LOS D	10.4	73.3	0.99	1.02	1.44	33.1
Approach		304	4	359	1.3	0.865	38.3	LOS C	10.4	73.3	0.93	0.94	1.25	35.4
All Vehicles		2716	63	3218	2.3	0.865	28.0	LOS B	25.1	180.3	0.94	0.91	1.10	42.2

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.
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)

APPENDIX E-5

SIDRA Modelling Outputs – 2030 Base Case Scenario

USER REPORT FOR SITE

All Movement Classes

Project: 20.456m01v01 TRAFFIX

Template: Movement Summaries

Site: 701 [Great Western Highway x O'Connell Street x French Street 2030 AM (Site Folder: Future - 2030)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.
Design Life Analysis (Final Year): Results for 10 years

Timings based on settings in the Site Phasing & Timing dialog (Demand & Sensitivity Analysis overrides)
Phase Times determined by the program
Phase Sequence: TCS
Reference Phase: Phase A
Input Phase Sequence: A, B*, C*, D, E, E1*, E2*
Output Phase Sequence: A, D, E
(* Variable Phase)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: O'Connell Street														
1	L2	44	1	56	2.3	0.160	48.4	LOS D	3.5	24.9	0.82	0.72	0.82	29.2
2	T1	11	0	14	0.0	0.160	41.2	LOS C	3.5	24.9	0.82	0.72	0.82	28.0
3	R2	169	9	217	5.3	*0.985	106.5	LOS F[11]	19.0	139.3	1.00	1.17	1.65	18.0
Approach		224	10	287	4.5	0.985	91.9	LOS F[11]	19.0	139.3	0.96	1.06	1.45	19.8
East: Great Western Highway														
4	L2	204	10	262	4.9	0.253	20.0	LOS B	8.1	58.7	0.53	0.73	0.53	39.8
5	T1	1458	45	1871	3.1	*0.903	34.9	LOS C	60.0	430.8	0.90	0.91	1.00	38.1
6	R2	23	0	30	0.0	0.207	68.4	LOS E[11]	1.8	12.7	0.97	0.72	0.97	26.9
Approach		1685	55	2162	3.3	0.903	33.5	LOS C	60.0	430.8	0.86	0.89	0.94	38.1
North: French Street														
7	L2	49	0	63	0.0	0.542	57.2	LOS E[11]	10.0	70.2	0.95	0.81	0.95	29.6
8	T1	24	0	31	0.0	0.542	51.1	LOS D	10.0	70.2	0.95	0.81	0.95	25.5
9	R2	62	0	80	0.0	0.542	55.6	LOS D	10.0	70.2	0.95	0.81	0.95	29.7
Approach		135	0	173	0.0	0.542	55.4	LOS D	10.0	70.2	0.95	0.81	0.95	29.0
West: Great Western Highway														
10	L2	8	0	10	0.0	0.691	21.1	LOS B	13.3	95.8	0.58	0.51	0.58	43.9
11	T1	1254	43	1609	3.4	0.740	18.2	LOS B	30.7	220.9	0.66	0.59	0.66	46.4
12	R2	90	7	115	7.8	*0.853	79.3	LOS F[11]	8.1	60.7	1.00	0.94	1.35	21.8
Approach		1352	50	1735	3.7	0.853	22.2	LOS B	30.7	220.9	0.68	0.62	0.71	43.8
All Vehicles		3396	115	4358	3.4	0.985	33.8	LOS C	60.0	430.8	0.80	0.79	0.88	37.7

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)

Site: 801 [Great Western Highway x O'Connell Street x French Street 2030 PM (Site Folder: Future - 2030)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.
Design Life Analysis (Final Year): Results for 10 years

Timings based on settings in the Site Phasing & Timing dialog (Demand & Sensitivity Analysis overrides)
Phase Times determined by the program
Phase Sequence: TCS
Reference Phase: Phase A
Input Phase Sequence: A, B*, C*, D, E, E1*, E2*
Output Phase Sequence: A, D, E
(* Variable Phase)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: O'Connell Street														
1	L2	55	4	71	7.3	0.186	50.3	LOS D	5.1	37.3	0.80	0.72	0.80	28.5
2	T1	17	0	22	0.0	0.186	43.7	LOS D	5.1	37.3	0.80	0.72	0.80	27.4
3	R2	198	8	254	4.0	*0.937	93.6	LOS F[11]	22.5	162.7	1.00	1.06	1.40	19.6
Approach		270	12	346	4.4	0.937	81.6	LOS F[11]	22.5	162.7	0.95	0.97	1.24	21.3
East: Great Western Highway														
4	L2	216	9	277	4.2	0.278	24.2	LOS B	10.5	75.8	0.56	0.74	0.56	37.6
5	T1	1220	25	1565	2.0	0.811	26.6	LOS B	42.5	302.4	0.82	0.75	0.82	41.7
6	R2	73	0	94	0.0	0.688	82.9	LOS F[11]	7.1	49.5	1.00	0.82	1.09	24.3
Approach		1509	34	1936	2.3	0.811	29.0	LOS C	42.5	302.4	0.79	0.75	0.79	39.8
North: French Street														
7	L2	40	1	51	2.5	0.405	57.7	LOS E[11]	9.2	65.0	0.89	0.78	0.89	29.6
8	T1	18	0	23	0.0	0.405	51.1	LOS D	9.2	65.0	0.89	0.78	0.89	25.5
9	R2	58	1	74	1.7	0.405	55.7	LOS D	9.2	65.0	0.89	0.78	0.89	29.7
Approach		116	2	149	1.7	0.405	55.7	LOS D	9.2	65.0	0.89	0.78	0.89	29.0
West: Great Western Highway														
10	L2	19	1	24	5.3	0.836	36.1	LOS C	20.8	148.1	0.62	0.63	0.72	37.1
11	T1	1441	24	1849	1.7	*0.896	37.0	LOS C	56.4	400.7	0.76	0.78	0.87	37.4
12	R2	85	4	109	4.7	*0.828	87.9	LOS F[11]	8.6	62.9	1.00	0.90	1.27	20.5
Approach		1545	29	1982	1.9	0.896	39.8	LOS C	56.4	400.7	0.78	0.78	0.89	36.1
All Vehicles		3440	77	4414	2.2	0.937	38.9	LOS C	56.4	400.7	0.80	0.78	0.87	35.7

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)

Site: 702 [Great Western Highway x Bringelly Road 2030 AM (Site Folder: Future - 2030)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 100 seconds (Site Practical Cycle Time)
Design Life Analysis (Final Year): Results for 10 years

Timings based on settings in the Site Phasing & Timing dialog (Demand & Sensitivity Analysis overrides)
Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bringelly Road														
1	L2	177	10	227	5.6	0.731	46.0	LOS D	15.5	112.7	0.97	0.87	1.03	33.9
3	R2	299	9	384	3.0	*0.731	46.7	LOS D	15.5	112.7	0.99	0.87	1.05	28.0
Approach		476	19	611	4.0	0.731	46.5	LOS D	15.5	112.7	0.98	0.87	1.04	30.4
East: Great Western Highway														
4	L2	167	4	214	2.4	0.255	23.2	LOS B	6.3	45.3	0.65	0.75	0.65	37.7
5	T1	1163	40	1492	3.4	*0.880	35.6	LOS C	39.9	287.9	0.96	0.99	1.11	41.2
Approach		1330	44	1707	3.3	0.880	34.1	LOS C	39.9	287.9	0.92	0.96	1.05	40.9
West: Great Western Highway														
11	T1	1151	47	1477	4.1	0.484	8.6	LOS A	14.4	104.7	0.51	0.45	0.51	54.3
12	R2	185	10	237	5.4	*0.671	47.5	LOS D	10.6	77.5	0.98	0.99	1.01	32.9
Approach		1336	57	1714	4.3	0.671	14.0	LOS A	14.4	104.7	0.57	0.53	0.58	50.7
All Vehicles		3142	120	4032	3.8	0.880	27.4	LOS B	39.9	287.9	0.78	0.76	0.85	43.1

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)

Site: 802 [Great Western Highway x Bringelly Road 2030 PM (Site Folder: Future - 2030)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Practical Cycle Time)
Design Life Analysis (Final Year): Results for 10 years

Timings based on settings in the Site Phasing & Timing dialog (Demand & Sensitivity Analysis overrides)
Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bringelly Road														
1	L2	165	5	212	3.0	0.790	41.4	LOS C	14.9	106.7	0.99	0.92	1.14	35.5
3	R2	379	6	486	1.6	*0.790	40.9	LOS C	14.9	106.7	1.00	0.92	1.16	29.9
Approach		544	11	698	2.0	0.790	41.0	LOS C	14.9	106.7	1.00	0.92	1.15	31.8
East: Great Western Highway														
4	L2	197	1	253	0.5	0.331	22.8	LOS B	6.7	47.3	0.72	0.77	0.72	38.0
5	T1	1098	30	1409	2.7	*0.899	36.9	LOS C	33.0	236.2	1.00	1.10	1.27	40.8
Approach		1295	31	1662	2.4	0.899	34.8	LOS C	33.0	236.2	0.96	1.05	1.19	40.5
West: Great Western Highway														
11	T1	1181	22	1515	1.9	0.525	9.0	LOS A	13.7	97.2	0.58	0.52	0.58	54.1
12	R2	166	3	213	1.8	*0.599	37.2	LOS C	7.4	52.7	0.96	0.91	0.96	36.4
Approach		1347	25	1728	1.9	0.599	12.5	LOS A	13.7	97.2	0.62	0.56	0.62	51.6
All Vehicles		3186	67	4088	2.1	0.899	26.4	LOS B	33.0	236.2	0.82	0.82	0.94	43.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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)

Site: 703 [Caddens Road x Gipps Street x Kent Road 2030 AM (Site Folder: Future - 2030)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.
Design Life Analysis (Final Year): Results for 10 years

Timings based on settings in the Site Phasing & Timing dialog (Demand & Sensitivity Analysis overrides)
Phase Times determined by the program
Phase Sequence: TCS
Reference Phase: Phase A
Input Phase Sequence: A, B*, C*, D, E, E1*, E2*
Output Phase Sequence: A, D, E
(* Variable Phase)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kent Road														
1	L2	194	4	249	2.1	0.907	59.3	LOS E[11]	58.5	426.2	1.00	0.99	1.11	30.2
2	T1	991	59	1272	6.0	*0.907	52.2	LOS D	58.5	426.2	0.99	0.99	1.11	31.1
3	R2	20	0	26	0.0	0.230	82.3	LOS F[11]	1.9	13.1	0.99	0.72	0.99	23.0
Approach		1205	63	1546	5.2	0.907	53.8	LOS D	58.5	426.2	1.00	0.99	1.11	30.7
East: Caddens Road														
4	L2	61	0	78	0.0	0.162	35.7	LOS C	5.5	39.1	0.68	0.67	0.68	34.5
5	T1	31	2	40	6.5	0.162	31.1	LOS C	5.5	39.1	0.68	0.67	0.68	36.4
6	R2	68	3	87	4.4	0.243	47.4	LOS D	4.8	35.1	0.80	0.75	0.80	30.6
Approach		160	5	205	3.1	0.243	39.8	LOS C	5.5	39.1	0.73	0.71	0.73	33.1
North: Gipps Street														
7	L2	28	1	36	3.6	0.690	41.6	LOS C	33.9	246.0	0.86	0.78	0.86	36.0
8	T1	849	37	1089	4.4	0.690	33.8	LOS C	33.9	246.0	0.84	0.76	0.84	39.8
9	R2	77	2	99	2.6	*0.903	97.1	LOS F[11]	8.2	58.9	1.00	0.92	1.45	22.1
Approach		954	40	1224	4.2	0.903	39.1	LOS C	33.9	246.0	0.85	0.77	0.89	36.8
West: Caddens Road														
10	L2	137	3	176	2.2	0.518	34.1	LOS C	9.1	65.1	0.68	0.74	0.68	37.9
11	T1	18	1	23	5.6	0.518	29.8	LOS C	9.1	65.1	0.68	0.74	0.68	36.4
12	R2	212	8	272	3.8	*0.895	74.8	LOS F[11]	21.3	154.1	0.91	0.96	1.21	24.8
Approach		367	12	471	3.3	0.895	57.4	LOS E[11]	21.3	154.1	0.81	0.86	0.98	29.2
All Vehicles		2686	120	3447	4.5	0.907	48.3	LOS D	58.5	426.2	0.90	0.88	0.99	32.5

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)

Site: 803 [Caddens Road x Gipps Street x Kent Road 2030 PM (Site Folder: Future - 2030)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.
Design Life Analysis (Final Year): Results for 10 years

Timings based on settings in the Site Phasing & Timing dialog (Demand & Sensitivity Analysis overrides)
Phase Times determined by the program
Phase Sequence: TCS
Reference Phase: Phase A
Input Phase Sequence: A, B*, C*, D, E, E1*, E2*
Output Phase Sequence: A, D, E
(* Variable Phase)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kent Road														
1	L2	230	8	295	3.5	0.894	44.9	LOS D	36.4	261.5	1.00	1.04	1.22	34.9
2	T1	897	25	1151	2.8	*0.894	37.7	LOS C	36.4	261.5	0.99	1.03	1.21	37.2
3	R2	48	0	62	0.0	0.373	51.0	LOS D	2.7	18.9	0.98	0.75	0.98	29.9
Approach		1175	33	1508	2.8	0.894	39.6	LOS C	36.4	261.5	0.99	1.02	1.20	36.3
East: Caddens Road														
4	L2	38	1	49	2.6	0.117	27.0	LOS B	2.1	15.5	0.73	0.67	0.73	37.8
5	T1	16	2	21	12.5	0.117	22.4	LOS B	2.1	15.5	0.73	0.67	0.73	39.8
6	R2	59	3	76	5.1	0.228	34.6	LOS C	2.7	19.9	0.84	0.75	0.84	34.7
Approach		113	6	145	5.3	0.228	30.3	LOS C	2.7	19.9	0.79	0.71	0.79	36.4
North: Gipps Street														
7	L2	82	2	105	2.4	0.779	32.1	LOS C	25.2	179.3	0.92	0.86	0.96	40.0
8	T1	927	17	1189	1.8	0.779	25.1	LOS B	25.4	180.6	0.92	0.85	0.96	45.4
9	R2	111	1	142	0.9	*0.868	60.2	LOS E[11]	7.2	50.8	1.00	0.94	1.46	29.5
Approach		1120	20	1437	1.8	0.868	29.1	LOS C	25.4	180.6	0.93	0.86	1.01	42.3
West: Caddens Road														
10	L2	63	0	81	0.0	0.177	28.4	LOS B	3.4	24.2	0.75	0.72	0.75	41.1
11	T1	22	2	28	9.1	0.177	24.1	LOS B	3.4	24.2	0.75	0.72	0.75	38.8
12	R2	209	2	268	1.0	*0.858	50.3	LOS D	13.1	92.7	0.97	0.98	1.31	31.0
Approach		294	4	377	1.4	0.858	43.7	LOS D	13.1	92.7	0.91	0.90	1.15	33.4
All Vehicles		2702	63	3467	2.3	0.894	35.3	LOS C	36.4	261.5	0.95	0.93	1.10	38.1

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.

11 Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.
* Critical Movement (Signal Timing)

APPENDIX E-6

SIDRA Modelling Outputs – 2030 Base Case + Dev Scenario

USER REPORT FOR SITE

All Movement Classes

Project: 20.456m01v01 TRAFFIX

Template: Movement Summaries

Site: 901 [Great Western Highway x O'Connell Street x French Street 2030+DEV AM (Site Folder: Future - 2030 +DEV)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.
Design Life Analysis (Final Year): Results for 10 years

Timings based on settings in the Site Phasing & Timing dialog (Demand & Sensitivity Analysis overrides)
Phase Times determined by the program
Phase Sequence: TCS
Reference Phase: Phase A
Input Phase Sequence: A, B*, C*, D, E, E1*, E2*
Output Phase Sequence: A, D, E
(* Variable Phase)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: O'Connell Street														
1	L2	50	1	63	2.0	0.172	53.7	LOS D	4.5	31.7	0.82	0.73	0.82	27.8
2	T1	13	0	16	0.0	0.172	46.6	LOS D	4.5	31.7	0.82	0.73	0.82	26.9
3	R2	192	9	241	4.8	*1.092	183.0	LOS F[11]	30.6	223.1	1.00	1.32	1.95	11.9
Approach		255	10	320	4.0	1.092	150.8	LOS F[11]	30.6	223.1	0.96	1.17	1.67	13.8
East: Great Western Highway														
4	L2	287	10	349	3.7	0.340	23.9	LOS B	13.4	96.8	0.58	0.75	0.58	38.1
5	T1	1458	45	1871	3.1	*0.951	54.7	LOS D	82.5	593.1	0.93	1.01	1.11	31.6
6	R2	23	0	30	0.0	0.170	74.4	LOS F[11]	2.0	14.2	0.96	0.72	0.96	25.8
Approach		1768	55	2249	3.1	0.951	50.2	LOS D	82.5	593.1	0.88	0.97	1.03	32.2
North: French Street														
7	L2	49	0	63	0.0	0.538	63.1	LOS E[11]	11.9	83.0	0.94	0.81	0.94	28.4
8	T1	31	0	38	0.0	0.538	56.9	LOS E[11]	11.9	83.0	0.94	0.81	0.94	24.5
9	R2	62	0	80	0.0	0.538	61.5	LOS E[11]	11.9	83.0	0.94	0.81	0.94	28.5
Approach		142	0	181	0.0	0.538	61.1	LOS E[11]	11.9	83.0	0.94	0.81	0.94	27.7
West: Great Western Highway														
10	L2	8	0	10	0.0	0.725	24.2	LOS B	15.5	111.7	0.59	0.52	0.59	42.2
11	T1	1254	43	1609	3.4	0.777	21.9	LOS B	35.6	256.8	0.68	0.61	0.68	44.3
12	R2	124	7	151	5.9	*0.910	94.2	LOS F[11]	12.7	93.3	1.00	0.98	1.40	19.7
Approach		1386	50	1771	3.6	0.910	28.0	LOS B	35.6	256.8	0.70	0.64	0.74	40.8
All Vehicles		3551	115	4521	3.3	1.092	49.1	LOS D	82.5	593.1	0.82	0.85	0.96	32.2

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.
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)

Site: 1001 [Great Western Highway x O'Connell Street x French Street 2030+DEV PM (Site Folder: Future - 2030 +DEV)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.
Design Life Analysis (Final Year): Results for 10 years

Timings based on settings in the Site Phasing & Timing dialog (Demand & Sensitivity Analysis overrides)
Phase Times determined by the program
Phase Sequence: TCS
Reference Phase: Phase A
Input Phase Sequence: A, B*, C*, D, E, E1*, E2*
Output Phase Sequence: A, D, E
(* Variable Phase)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: O'Connell Street														
1	L2	66	4	82	6.2	0.195	47.5	LOS D	5.7	41.6	0.78	0.72	0.78	29.5
2	T1	20	0	25	0.0	0.195	40.8	LOS C	5.7	41.6	0.78	0.72	0.78	28.6
3	R2	240	8	298	3.4	*0.993	117.0	LOS F[11]	29.9	215.7	1.00	1.14	1.56	16.9
Approach		326	12	405	3.8	0.993	98.2	LOS F[11]	29.9	215.7	0.94	1.03	1.35	19.1
East: Great Western Highway														
4	L2	232	9	294	3.9	0.309	26.7	LOS B	11.9	86.1	0.61	0.75	0.61	36.5
5	T1	1220	25	1565	2.0	0.860	33.3	LOS C	48.2	343.0	0.87	0.82	0.90	38.8
6	R2	73	0	94	0.0	0.688	82.9	LOS F[11]	7.1	49.5	1.00	0.82	1.09	24.3
Approach		1525	34	1953	2.2	0.860	34.7	LOS C	48.2	343.0	0.83	0.81	0.86	37.4
North: French Street														
7	L2	40	1	51	2.5	0.373	54.8	LOS D	8.9	63.5	0.86	0.78	0.86	30.3
8	T1	19	0	24	0.0	0.373	48.3	LOS D	8.9	63.5	0.86	0.78	0.86	26.2
9	R2	58	1	74	1.7	0.373	52.8	LOS D	8.9	63.5	0.86	0.78	0.86	30.4
Approach		117	2	150	1.7	0.373	52.8	LOS D	8.9	63.5	0.86	0.78	0.86	29.7
West: Great Western Highway														
10	L2	19	1	24	5.3	0.883	48.5	LOS D	24.7	176.0	0.65	0.73	0.84	32.9
11	T1	1441	24	1849	1.7	*0.945	55.0	LOS D	68.3	485.2	0.81	0.90	1.02	31.6
12	R2	91	4	115	4.4	*0.874	91.3	LOS F[11]	9.4	68.2	1.00	0.94	1.35	20.0
Approach		1551	29	1989	1.9	0.945	57.0	LOS E[11]	68.3	485.2	0.82	0.90	1.04	30.8
All Vehicles		3519	77	4497	2.2	0.993	50.9	LOS D	68.3	485.2	0.84	0.87	0.98	31.8

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.

11 Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.
* Critical Movement (Signal Timing)

Site: 902 [Great Western Highway x Bringelly Road 2030+DEV AM (Site Folder: Future - 2030 +DEV)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 100 seconds (Site Practical Cycle Time)
Design Life Analysis (Final Year): Results for 10 years

Timings based on settings in the Site Phasing & Timing dialog (Demand & Sensitivity Analysis overrides)
Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bringelly Road														
1	L2	177	10	227	5.6	0.731	46.0	LOS D	15.5	112.7	0.97	0.87	1.03	33.9
3	R2	299	9	384	3.0	*0.731	46.7	LOS D	15.5	112.7	0.99	0.87	1.05	28.0
Approach		476	19	611	4.0	0.731	46.5	LOS D	15.5	112.7	0.98	0.87	1.04	30.4
East: Great Western Highway														
4	L2	167	4	214	2.4	0.255	23.2	LOS B	6.3	45.3	0.65	0.75	0.65	37.7
5	T1	1169	40	1499	3.4	*0.885	36.4	LOS C	40.6	292.6	0.96	1.00	1.12	40.9
Approach		1336	44	1713	3.3	0.885	34.7	LOS C	40.6	292.6	0.92	0.97	1.06	40.7
West: Great Western Highway														
11	T1	1185	47	1513	4.0	0.495	8.7	LOS A	15.0	108.4	0.51	0.46	0.51	54.2
12	R2	185	10	237	5.4	*0.672	47.7	LOS D	10.6	77.4	0.98	0.99	1.01	32.8
Approach		1370	57	1750	4.2	0.672	14.0	LOS A	15.0	108.4	0.58	0.53	0.58	50.7
All Vehicles		3182	120	4074	3.8	0.885	27.6	LOS B	40.6	292.6	0.78	0.77	0.85	43.1

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)

Site: 1002 [Great Western Highway x Bringelly Road 2030+DEV PM (Site Folder: Future - 2030 +DEV)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Practical Cycle Time)
Design Life Analysis (Final Year): Results for 10 years

Timings based on settings in the Site Phasing & Timing dialog (Demand & Sensitivity Analysis overrides)
Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bringelly Road														
1	L2	165	5	212	3.0	0.791	41.4	LOS C	14.9	106.7	0.99	0.92	1.14	35.5
3	R2	379	6	486	1.6	*0.791	40.9	LOS C	14.9	106.7	1.00	0.92	1.16	29.9
Approach		544	11	698	2.0	0.791	41.1	LOS C	14.9	106.7	1.00	0.92	1.15	31.8
East: Great Western Highway														
4	L2	197	1	253	0.5	0.321	22.1	LOS B	6.6	46.3	0.71	0.77	0.71	38.4
5	T1	1109	30	1420	2.7	*0.876	32.5	LOS C	31.0	222.2	0.98	1.05	1.19	42.4
Approach		1306	31	1673	2.4	0.876	30.9	LOS C	31.0	222.2	0.94	1.00	1.12	42.0
West: Great Western Highway														
11	T1	1187	22	1522	1.9	0.527	9.0	LOS A	13.8	97.8	0.58	0.52	0.58	54.0
12	R2	166	3	213	1.8	*0.637	38.3	LOS C	7.6	54.2	0.97	0.93	1.01	36.0
Approach		1353	25	1735	1.8	0.637	12.6	LOS A	13.8	97.8	0.63	0.57	0.63	51.5
All Vehicles		3203	67	4106	2.1	0.876	24.9	LOS B	31.0	222.2	0.82	0.80	0.92	44.1

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)

Site: 903 [Caddens Road x Gipps Street x Kent Road 2030+DEV AM (Site Folder: Future - 2030 +DEV)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.
Design Life Analysis (Final Year): Results for 10 years

Timings based on settings in the Site Phasing & Timing dialog (Demand & Sensitivity Analysis overrides)
Phase Times determined by the program
Phase Sequence: TCS
Reference Phase: Phase A
Input Phase Sequence: A, B*, C*, D, E, E1*, E2*
Output Phase Sequence: A, D, E
(* Variable Phase)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kent Road														
1	L2	247	4	305	1.7	0.940	69.7	LOS E[11]	66.8	484.7	1.00	1.03	1.18	27.3
2	T1	991	59	1272	6.0	*0.940	62.7	LOS E[11]	66.8	484.7	1.00	1.05	1.18	27.6
3	R2	20	0	26	0.0	0.230	82.3	LOS F[11]	1.9	13.1	0.99	0.72	0.99	23.0
Approach		1258	63	1602	5.0	0.940	64.3	LOS E[11]	66.8	484.7	1.00	1.04	1.18	27.5
East: Caddens Road														
4	L2	61	0	78	0.0	0.162	35.7	LOS C	5.5	39.1	0.68	0.67	0.68	34.5
5	T1	31	2	40	6.5	0.162	31.1	LOS C	5.5	39.1	0.68	0.67	0.68	36.4
6	R2	68	3	87	4.4	0.243	47.4	LOS D	4.8	35.1	0.80	0.75	0.80	30.6
Approach		160	5	205	3.1	0.243	39.8	LOS C	5.5	39.1	0.73	0.71	0.73	33.1
North: Gipps Street														
7	L2	28	1	36	3.6	0.690	41.6	LOS C	33.9	245.9	0.86	0.78	0.86	36.0
8	T1	849	37	1089	4.4	0.690	33.8	LOS C	33.9	245.9	0.84	0.76	0.84	39.8
9	R2	77	2	99	2.6	*0.903	97.1	LOS F[11]	8.2	58.9	1.00	0.92	1.45	22.1
Approach		954	40	1224	4.2	0.903	39.1	LOS C	33.9	245.9	0.85	0.77	0.89	36.8
West: Caddens Road														
10	L2	137	3	176	2.2	0.533	34.1	LOS C	9.1	65.1	0.68	0.74	0.68	37.9
11	T1	18	1	23	5.6	0.533	29.8	LOS C	9.1	65.1	0.68	0.74	0.68	36.4
12	R2	225	8	286	3.6	*0.932	86.5	LOS F[11]	24.3	175.6	0.92	1.00	1.31	22.7
Approach		380	12	485	3.2	0.932	64.8	LOS E[11]	24.3	175.6	0.82	0.89	1.05	27.3
All Vehicles		2752	120	3516	4.4	0.940	54.2	LOS D	66.8	484.7	0.91	0.91	1.03	30.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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)

Site: 1003 [Caddens Road x Gipps Street x Kent Road 2030+DEV PM (Site Folder: Future - 2030 +DEV)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 100 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.
Design Life Analysis (Final Year): Results for 10 years

Timings based on settings in the Site Phasing & Timing dialog (Demand & Sensitivity Analysis overrides)
Phase Times determined by the program
Phase Sequence: TCS
Reference Phase: Phase A
Input Phase Sequence: A, B*, C*, D, E, E1*, E2*
Output Phase Sequence: A, D, E
(* Variable Phase)

Vehicle Movement Performance

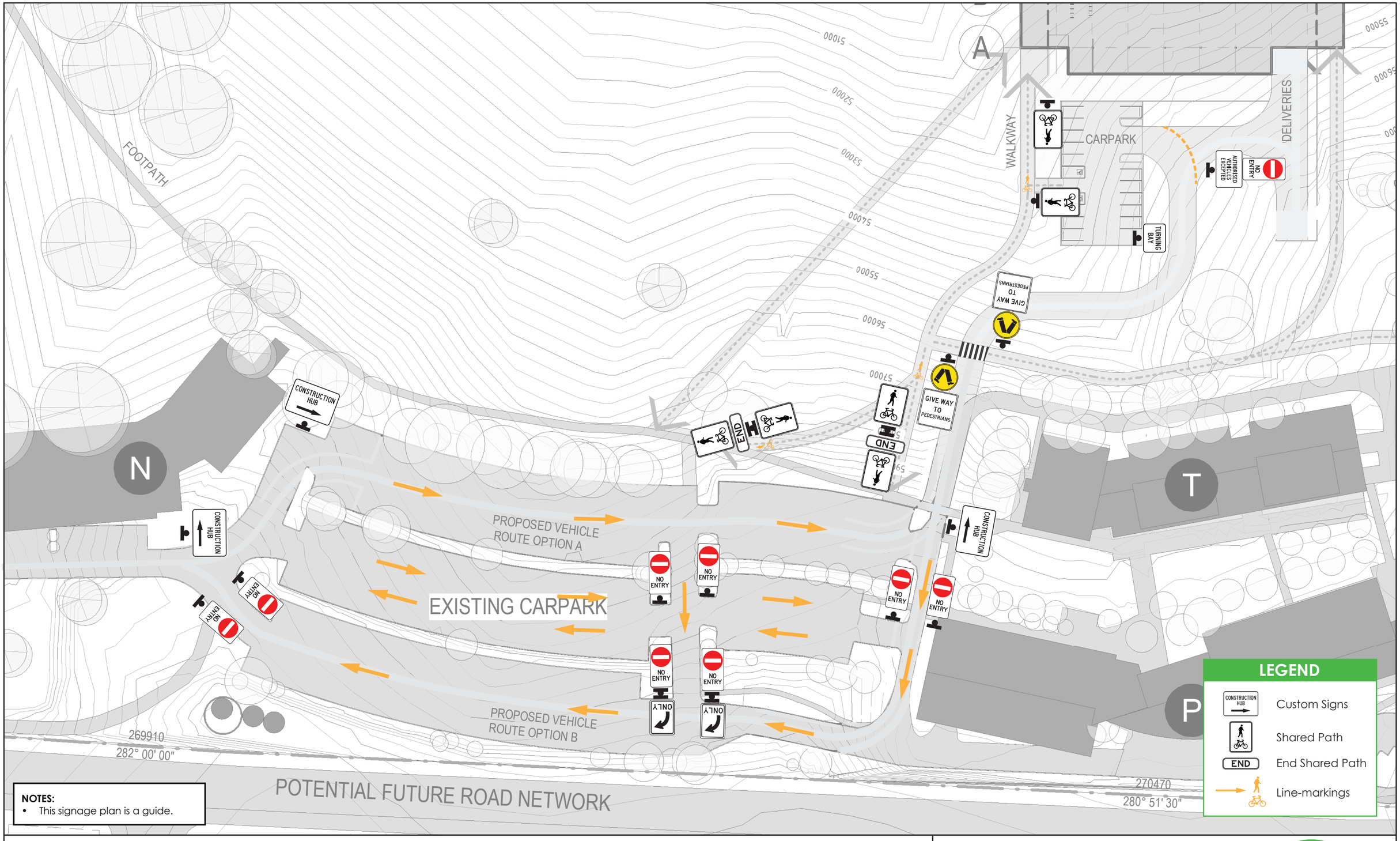
Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kent Road														
1	L2	240	8	306	3.4	0.910	51.0	LOS D	41.8	300.0	1.00	1.05	1.23	32.7
2	T1	897	25	1151	2.8	*0.910	43.8	LOS D	41.8	300.0	0.99	1.05	1.23	34.3
3	R2	48	0	62	0.0	0.368	55.4	LOS D	3.0	20.8	0.98	0.75	0.98	28.7
Approach		1185	33	1518	2.8	0.910	45.7	LOS D	41.8	300.0	0.99	1.04	1.22	33.6
East: Caddens Road														
4	L2	38	1	49	2.6	0.111	28.1	LOS B	2.3	16.7	0.71	0.67	0.71	37.3
5	T1	16	2	21	12.5	0.111	23.5	LOS B	2.3	16.7	0.71	0.67	0.71	39.3
6	R2	59	3	76	5.1	0.213	36.3	LOS C	2.9	21.5	0.82	0.74	0.82	34.1
Approach		113	6	145	5.3	0.213	31.8	LOS C	2.9	21.5	0.77	0.71	0.77	35.8
North: Gipps Street														
7	L2	82	2	105	2.4	0.815	37.1	LOS C	30.5	217.2	0.95	0.90	1.01	37.7
8	T1	927	17	1189	1.8	0.815	29.8	LOS C	30.5	217.2	0.93	0.88	0.99	42.1
9	R2	111	1	142	0.9	*0.858	64.4	LOS E[11]	7.9	55.4	1.00	0.92	1.40	28.4
Approach		1120	20	1437	1.8	0.858	33.7	LOS C	30.5	217.2	0.93	0.88	1.03	39.5
West: Caddens Road														
10	L2	63	0	81	0.0	0.168	28.9	LOS C	3.6	25.8	0.72	0.72	0.72	40.9
11	T1	22	2	28	9.1	0.168	24.6	LOS B	3.6	25.8	0.72	0.72	0.72	38.6
12	R2	233	2	293	0.9	*0.884	56.9	LOS E[11]	16.4	115.8	0.97	1.00	1.33	29.1
Approach		318	4	403	1.3	0.884	49.0	LOS D	16.4	115.8	0.90	0.92	1.16	31.6
All Vehicles		2736	63	3503	2.3	0.910	40.6	LOS C	41.8	300.0	0.95	0.95	1.12	35.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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)

APPENDIX F

Wayfinding, Signage & Line Marking Plan



NOTES:
- This signage plan is a guide.

Signage and Line-marking Plan

Project:	TAFE NSW Nepean Kingswood	**Date:**	05.03.2021
Project Number:	20.456	**Prepared By:**	Justin Pindar
Client:	Cadence Australia Pty Ltd	**Approved By:**	Vince Doan

TRAFFIC & TRANSPORT PLANNERS

Suite 2.08
50 Holt Street
Surry Hills NSW 2010

(02) 8324 8700
info@traffix.com.au

TRAFFIX

APPENDIX G

SEAR's Requirements

Planning Secretary's Environmental Assessment Requirements

Section 4.12(8) of the *Environmental Planning and Assessment Act 1979*
Schedule 2 of the Environmental Planning and Assessment Regulation 2000

Application Number	SSD-8571481
Proposal Name	TAFE NSW Western Sydney Construction Hub
Location	TAFE NSW Nepean Kingswood campus, 2-44 O'Connell Street, Kingswood
Applicant	TAFE NSW
Date of Issue	DRAFT
General Requirements	The Environmental Impact Statement (EIS) must be prepared in accordance with and meet the minimum requirements of clauses 6 and 7 of Schedule 2 the Environmental Planning and Assessment Regulation 2000 (the Regulation). Notwithstanding the key issues specified below, the EIS must include an environmental risk assessment to identify the potential environmental impacts associated with the development. Where relevant, the assessment of the key issues below, and any other significant issues identified in the risk assessment, must include: · adequate baseline data · consideration of potential cumulative impacts due to other development in the vicinity (completed, underway or proposed) · measures to avoid, minimise and if necessary, offset the predicted impacts, including detailed contingency plans for managing any significant risks to the environment. The EIS must be accompanied by a report from a qualified quantity surveyor providing: · a detailed calculation of the capital investment value (CIV) (as defined in clause 3 of the Regulation) of the proposal, including details of all assumptions and components from which the CIV calculation is derived · an estimate of the jobs that will be created by the future development during the construction and operational phases of the development · certification that the information provided is accurate at the date of preparation.
Key Issues	The EIS must address the following specific matters: **1. Statutory and Strategic Context** Address the statutory provisions contained in all relevant environmental planning instruments, including: · *Biodiversity Conservation Act 2016;* · State Environmental Planning Policy (State & Regional Development) 2011; · State Environmental Planning Policy (Infrastructure 2007); · State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017; · State Environmental Planning Policy No. 64 – Advertising and Signage; · State Environmental Planning Policy No.55 – Remediation of Land; · Draft State Environmental Planning Policy (Environment); and · Penrith Local Environmental Plan 2010 *Permissibility*

Detail the nature and extent of any prohibitions that apply to the development.

Development Standards
Identify compliance with the development standards applying to the site and provide justification for any contravention of the development standards.

Provisions
Adequately demonstrate and document in the EIS how each of the provisions in the listed instruments are addressed, including reference to necessary technical documents.

2. Policies
Address the relevant planning provisions, goals and strategic planning objectives in the following:

- NSW State Priorities;
- The Greater Sydney Regional Plan, A Metropolis of three cities
- Future Transport Strategy 2056 and supporting plans;
- State Infrastructure Strategy 2018 – 2038 Building the Momentum;
- Sydney's Cycling Future 2013;
- Sydney's Walking Future 2013;
- Sydney's Bus Future 2013;
- Crime Prevention Through Environmental Design (CPTED) Principles
- Better Placed: An integrated design policy for the built environment of New South Wales (Government Architect NSW (GANSW), 2017);
- Healthy Urban Development Checklist (NSW Health, 2009);
- Draft Greener Places Design Guide;
- Western Sydney District Plan; and
- Penrith Development Control Plan 2014.

3. Operation

- Provide details of the existing and proposed operations, including staff and student numbers, and hours of operation.
- Provide a detailed justification of suitability of the site to accommodate the proposal.

4. Built Form and Urban Design

- Address the height, density, bulk and scale, setbacks and interface of the proposal in relation to the surrounding development, topography, streetscape and any public open spaces.
- Address design quality and built form, with specific consideration of the overall site layout, streetscape, open spaces, façade, rooftop, massing, setbacks, building articulation, materials and colours.
- Provide details of any digital signage boards, including size, location and finishes.
- Detail how services, including but not limited to waste management, loading zones, and mechanical plant are integrated into the design of the development.
- Provide detailed site and context analysis to justify the proposed site planning and design approach including massing options and preferred strategy for future development.
- Provide a detailed site-wide landscape strategy, including consideration of integration with built form, security, shade, topography and existing vegetation.
- Provide a visual impact assessment that identifies any potential impacts on the surrounding built environment and landscape including views to and from the site and any adjoining heritage items.
- Address CPTED Principles.
- Provide details of integration with the wider campus site and the adjoining

Western Sydney University site (if relevant), including contextual integration and spatial arrangements, vehicle and pedestrian connections, landscaping, and consideration of significant view corridors & preservation of significant views and features, where relevant.

5. Environmental Amenity

- Assess amenity impacts on the surrounding locality, including solar access, visual privacy, visual amenity, overshadowing, wind impacts and acoustic impacts. A high level of environmental amenity for any surrounding residential land uses must be demonstrated.
- Conduct a view analysis to the site from key vantage points and streetscape locations (photomontages or perspectives should be provided showing the building and likely future development).
- Include a lighting strategy and measures to reduce spill into the surrounding sensitive receivers.

6. Staging

Provide details regarding the staging of the proposed development (if any).

7. Transport and Accessibility

Include a transport and accessibility impact assessment, which details, but not limited to the following:

- accurate details of the current daily and peak hour vehicle, existing and future public transport networks and pedestrian and cycle movement provided on the road network located adjacent to the proposed development;
- details of estimated total daily and peak hour trips generated by the proposal, including vehicle, public transport, pedestrian and bicycle trips based on surveys of the existing TAFE NSW Nepean Kingswood Campus facilities and similar education facilities within the local area;
- cumulative impacts of all trips generated by the development and the existing TAFE NSW Nepean Kingswood Campus, as well as the development potential identified in the Quarter Precinct Master Plan and Western Sydney University Redevelopment Plan;
- existing car parking capacity and utilisation on streets within a 400 metre radius from the site on a typical weekday covering at least one hour before and after the proposed hours of operation (including night classes);
- the adequacy of existing public transport or any future public transport infrastructure and services within the vicinity of the site, pedestrian and bicycle networks and associated infrastructure to meet the likely future demand of the proposed development;
- measures to integrate the development with the existing/future public transport network;
- impact of trips generated by the development on the area-wide network, with consideration of the cumulative impacts of the development on the surrounding roads and intersections in the context of any other approved planning proposals and developments in the precinct and surrounds, should be considered. Including the impact of nearby intersections and the need/associated funding for upgrading or road improvement works, if required;
- an assessment of the forecast impacts on traffic volume generated on road safety and capacity of road network including consideration of cumulative impacts at key intersections using SIDRA or similar traffic model as prescribed by Transport for New South Wales (TfNSW). The traffic modelling should consider the scenarios of year 2026, 2031, 2036 and the year until the facility ceases operation. These should include, but not be limited to:
  - Great Western Highway/O'Connell Street/French Street
  - Great Western Highway/Bringelly Road

- o Gipps Street (Werrington Arterial)/Caddens Road;
- the identification of infrastructure required to ameliorate any impacts on traffic efficiency and road safety impacts associated with the proposed development, including details on improvements required to affected intersections, additional bus routes along bus capable roads (i.e. minimum 3.5 m wide travel lanes), additional bus stops or bus bays;
- details of travel demand management measures to minimise the impact on general traffic and bus operations, including details of a location-specific sustainable travel plan (Green Travel Plan and specific Workplace travel plan) and the provision of facilities to increase the non-car mode share for travel to and from the site;
- the proposed walking and cycling access arrangements and connections to public transport services;
- the design of the proposed cycle and pedestrian entry connecting to the Great Western Highway shared path should ensure that there are clear sight lines between the cyclists from the development and the faster moving cyclists on the Great Western Highway;
- the proposed access arrangements, including car and bus pick-up/drop-off facilities, and measures to mitigate any associated traffic impacts and impacts on public transport, pedestrian and bicycle networks, including pedestrian crossings and refuges and speed control devices and zones;
- proposed bicycle parking provision, including end of trip facilities, in secure, convenient, accessible areas close to main entries incorporating lighting and passive surveillance;
- details of vehicle circulation, proposed number of on-site car parking spaces for staff, students and visitors and corresponding compliance with appropriate parking codes and justification for the level of car parking provided on-site;
- any short term reduction of existing car spaces for staff, students and visitors due to the proposed construction works (if any), and the proposed location, operational and functional characteristics of the re-allocated staff, students and visitors car parking (if applicable);
- details of the proposed site access and the parking provisions associated with the proposed development including compliance with the requirements of the relevant Australian Standards (i.e. turn paths, sight distance requirements, aisle widths, etc.);
- an assessment of the cumulative on-street parking impacts of cars and bus pick-up/drop-off, staff parking and any other parking demands associated with the development and provide any associated recommendations to ameliorate any such impacts;
- an assessment of road and pedestrian safety adjacent to the proposed development and the details of required road safety measures and personal safety in line with CPTED;
- emergency vehicle access, service vehicle access, delivery and loading arrangements and estimated service vehicle movements (including vehicle type and the likely arrival and departure times);
- the preparation of a preliminary Construction Traffic and Pedestrian Management Plan to demonstrate the proposed management of the impact in relation to construction traffic addressing the following:
  - o assessment of cumulative impacts associated with other construction activities (if any);
  - o an assessment of road safety at key intersections and locations subject to heavy vehicle construction traffic movements and high pedestrian activity;
  - o details of construction program detailing the anticipated construction duration and highlighting significant and milestone stages and events during the construction process;
  - o details of anticipated peak hour and daily construction vehicle movements to

and from the site;
- details of on-site car parking and access arrangements of construction vehicles, construction workers to and from the site, emergency vehicles and service vehicles; and
- details of temporary cycling and pedestrian access during construction.

· Alternate methods for gaining the most accurate traffic analysis data may be agreed with TfNSW, if required.

Relevant Policies and Guidelines:

· Guide to Traffic Generating Developments (Roads and Maritime Services, 2002)
· EIS Guidelines - Road and Related Facilities (Department of Urban Affairs and Planning (DUAP), 1996)
· Cycling Aspects of Austroads Guides
· NSW Planning Guidelines for Walking and Cycling (Department of Infrastructure, Planning and Natural Resources (DIPNR), 2004)
· Austroads Guide to Traffic Management Part 12: Traffic Impacts of Development
· Standards Australia AS2890.1 (Off-Street car parking)
· Standards Australia AS2890.2 (Parking Facilities Off-street commercial vehicle facilities)
· Standards Australia AS2890.3 (Bicycle Parking Facilities)
· Standards Australia AS2890.5 (On-street parking)
· Standards Australia AS2890.6 (Off-street parking for people with disabilities)
· Werrington Enterprise Living + Learning Precinct Strategy
· Penrith Health & Education Precinct Strategic Vision

8. Ecologically Sustainable Development (ESD)

· Detail how ESD principles (as defined in clause 7(4) of Schedule 2 of the Regulation) will be incorporated in the design and ongoing operation phases of the development;
· Include a framework for how the future development will be designed to consider and reflect national best practice sustainable building principles to improve environmental performance and reduce ecological impact. This should be based on a materiality assessment and include waste reduction design measures, future proofing, use of sustainable and low-carbon materials, energy and water efficient design (including water sensitive urban design) and technology and use of renewable energy;
· Include preliminary consideration of building performance and mitigation of climate change, including consideration of Green Star Performance;
· Include an assessment against an accredited ESD rating system or an equivalent program of ESD performance. This should include a minimum rating scheme target level; and
· Provide a statement regarding how the design of the future development is responsive to the CSIRO projected impacts of climate change, specifically:
  - hotter days and more frequent heatwave events
  - extended drought periods
  - more extreme rainfall events
  - gustier wind conditions
  - how these will inform landscape design, material selection and social equity aspects (respite/shelter areas).

Relevant Policies and Guidelines:

· NSW and ACT Government Regional Climate Modelling (NARCliM) climate change projections.

9. Heritage

· Provide a statement of significance and an assessment of the impact on the

heritage significance of the heritage items on the site in accordance with the guidelines in the NSW Heritage Manual (Heritage Office and DUAP, 1996); and
- Address any archaeological potential and significance on the site and the impacts the development may have on this significance.

10. Aboriginal Heritage
- Identify and describe the Aboriginal cultural heritage values that exist across the site and document these in an Aboriginal Cultural Heritage Assessment Report (ACHAR). This may include the need for surface survey and test excavation;
- Identify and address the Aboriginal cultural heritage values in accordance with the Guide to investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW (Office of Environment and Heritage (OEH), 2011) and Code of Practice for Archaeological Investigations of Aboriginal Objects in NSW (OEH, 2010), and in consultation with Heritage NSW;
- Document consultation with Aboriginal people in accordance with Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (Department of Environment, Climate Change and Water) (DECCW). The significance of cultural heritage values of Aboriginal people who have a cultural association with the land are to be documented in the ACHAR;
- Identify, assess and document all impacts on the Aboriginal cultural heritage values in the ACHAR;
- Demonstrate attempts to avoid any impact upon cultural heritage values and identify any conservation outcomes. Where impacts are unavoidable, the ACHAR and EIS must outline measures proposed to mitigate impacts. Any objects recorded as part of the assessment must be documented and notified to Heritage NSW and the Environment, Energy and Science Group of the Department of Planning, Industry and Environment; and
- Outline procedures to be followed if Aboriginal objects are found at any stage of the life of the project to formulate appropriate measures to manage unforeseen impacts.

11. Social Impacts
- Include an assessment of the social consequences of the building's relative location and decanting activities if proposed.

12. Noise and Vibration
- Identify and provide a quantitative assessment of the main noise and vibration generating sources during demolition, site preparation, bulk excavation, construction. Outline measures to minimise and mitigate the potential noise impacts on surrounding occupiers of land.
- Identify and assess operational noise, including consideration of any public-address system, workshop activities, mechanical services (e.g. air conditioning plant), use of site facilities for events, and any out of hours community use of facilities, and outline measures to minimise and mitigate the potential noise impacts on surrounding occupiers of land.

Relevant Policies and Guidelines:
- NSW Noise Policy for Industry 2017 (NSW Environment Protection Authority (EPA)
- Interim Construction Noise Guideline (Department of Environment and Climate Change, 2009)
- Assessing Vibration: A Technical Guideline 2006 (Department of Environment and Conservation, 2006)
- Development Near Rail Corridors and Busy Roads - Interim Guideline (Department of Planning, 2008)
- NSW Road Noise Policy (DECCW, 2011)

- Australian Standard 2363:1999 Acoustics - Measurement of noise from helicopter operations.

13. Contamination

- Assess and quantify any soil and groundwater contamination and demonstrate that the site is suitable for the proposed use in accordance with SEPP 55.

Relevant Policies and Guidelines:

- Managing Land Contamination: Planning Guidelines - SEPP 55 Remediation of Land (DUAP, 1998)
- Sampling Design Guidelines (EPA, 1995)
- Consultants reporting on contaminated land: Contaminated Land Guidelines (EPA, 2020)
- National Environment Protection (Assessment of Site Contamination) Measure (National Environment Protection Council, as amended 2013)

14. Utilities

- Prepare an Infrastructure Management Plan in consultation with relevant agencies, detailing information on the existing capacity and any augmentation and easement requirements of the development for the provision of utilities including staging of infrastructure;
- Detail impacts of any existing infrastructure assets of utility stakeholders from demolition/construction and any proposed mitigation/protection measures; and
- Prepare an Integrated Water Management Plan detailing any proposed alternative water supplies, proposed end uses of potable and non-potable water, and water sensitive urban design.

15. Water Quality

- Demonstrate that all practical measures to avoid or minimise water pollution and protect human health and the environment from harm are investigated and implemented; and
- Identify sensitive receiving environments and develop a strategy to avoid or minimise impacts on these environments.

Relevant Policies and Guidelines:

- ANZECC Guidelines and Water Quality Objectives in NSW (DEC, 2006)
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, 2018)
- Approved Methods for the Sampling and Analysis of Water Pollutants in NSW (DECC, 2008)
- Managing Urban Stormwater, Soils and Construction Volume 1 (Landcom 2004) and Volume 2 (A. Installation of Services; B. Waste Landfills; C. Unsealed Roads; D. Main Roads; E. Mines and Quarries) (DECC, 2008)
- NSW Water Quality and River Flow Objectives at http://www.environment.nsw.gov.au/ieo/index.htm

16. Water-related Infrastructure Requirements

- Determine service demands following servicing investigations and demonstrate that satisfactory arrangements for drinking water, wastewater, and if required, recycled water services have been made.
- Obtain endorsement and/or approval from Sydney Water to ensure that the proposed development does not adversely impact on any existing water, wastewater or stormwater main, or any other Sydney Water asset, including any easement of property.

17. Integrated Water Cycle Management

· Detail any sustainability initiatives that will minimise/reduce the demand for drinking water, including any alternative water supply and end uses of drinking and non-drinking water that may be proposed, and demonstrate water sensitive urban design (principles are used), and any water conservation measures that are likely to be proposed.

18. Stormwater Management

· Detail any steps/measures to be taken to protect existing stormwater assets, such as avoiding over and/or adjacent to stormwater assets and building bridges over stormwater assets, if required. Outline measures to minimise or eliminate flooding, degradation of water quality, and avoid adverse impacts on any heritage items, and create pipeline easements where required.

· Detail how the design of the proposal would ensure that post-development stormwater flows match pre-development flows. Provide, where applicable, a preliminary stormwater management plan for the development that:
  - is prepared by a suitably qualified person in consultation with Council and any other relevant drainage authority;
  - details of proposed drainage design for the site including on-site detention facilities, water quality measures and the nominated discharge point;
  - demonstrates compliance with Council or other drainage authority requirements; and
  - stormwater plans detailing the proposed methods of drainage without impacting on the downstream properties.

Relevant Policies and Guidelines:

· Guidelines for developments adjoining land managed by the Office of Environment and Heritage (OEH, 2013).

· Stormwater Drainage Specification for Building Developments (Penrith City Council, 2018)

· Water Sensitive Urban Design Policy (Penrith City Council, 2013) and Technical Guidelines (Penrith City Council, 2015).

19. Contributions

· Address Council's 'Section 7.11 Werrington Enterprise Living and Learning (WELL) Precinct Development Contributions Plan' and/or details of any Voluntary Planning Agreement which may be required to be amended because of the proposed development.

20. Drainage

· Detail measures to minimise operational water quality impacts on surface waters and groundwater.

Relevant Policies and Guidelines:

· Guidelines for developments adjoining land managed by the Office of Environment and Heritage (OEH, 2013).

21. Flooding

· Identify flood risk on-site (detailing the most recent flood studies for the project area) and consideration of any relevant provisions of the NSW Floodplain Development Manual (DIPNR, 2005) and Council flood studies, including the potential effects of climate change, sea level rise and an increase in rainfall intensity. If there is a material flood risk, include design solutions for mitigation.

22. Bushfire

· Prepare a Bush Fire Assessment Report that addresses the requirements for Special Fire Protection Purpose as detailed in Planning for Bush Fire Protection

	2019 (NSW RFS) (PBP-2019). The report must address the extent to which the proposed development conforms with or deviates from the specifications set out in PBP-2019, including a classification of the vegetation on and surrounding the development (out to a distance of 140 metres from the boundaries of the site). · Address the bush fire risk posed by existing grassland surrounds or areas subject to revegetation and demonstrate that the asset protections zones can comply with Table A1.12.1 of PBP-2019. **23. Biodiversity Assessment** · Provide a Biodiversity Development Assessment Report (BDAR) that assesses the biodiversity impacts of the proposed development in accordance with the requirements of the Biodiversity Conservation Act 2016, Biodiversity Conservation Regulation 2017 and Biodiversity Assessment Method, except where a BDAR waiver has been issued in relation to the development or the development is located on biodiversity certified land. · Where a BDAR is not required because a BDAR waiver has been issued in relation to the development, provide: - a copy of the BDAR waiver and demonstrate that the proposed development is consistent with that covered in the BDAR waiver; and - an assessment of flora and fauna impacts where significant vegetation or flora and fauna values would be affected by the proposed development. **24. Water and Soils** · Provide: o an assessment of potential impacts on surface and groundwater (quality and quantity), soil, related infrastructure and watercourse(s) where relevant; o details of measures and procedures to minimise and manage the generation and off-site transmission of sediment, dust and fine particles; and o an assessment of salinity and acid sulphate soil impacts, including a Salinity Management Plan and/or Acid Sulphate Soils Management Plan, where relevant. ***Relevant Policies and Guidelines:*** · Managing Urban Stormwater - Soils & Construction Volume 1 2004 (Landcom) · Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (EPA) · Guidelines for development adjoining land managed by the Office of Environment and Heritage (OEH, 2013) **25. Waste** Identify, quantify and classify the likely waste streams to be generated during construction and operation and describe the measures to be implemented to manage, reuse, recycle and safely dispose of this waste. Identify appropriate servicing arrangements (including but not limited to, waste management, loading zones, mechanical plant) for the site. ***Relevant Policies and Guidelines:*** · Waste Classification Guidelines (EPA, 2014) **26. Construction Hours** o Identify proposed construction hours and provide details of the instances where it is expected that works will be required to be carried out outside the standard construction hours.
Plans and Documents	The EIS must include all relevant plans, architectural drawings, diagrams and relevant documentation required under Schedule 1 of the Regulation. Provide these

as part of the EIS rather than as separate documents.

In addition, the EIS must include the following:

- A section 10.7(2) and (5) Planning Certificates (previously Section 149(2) and (5) Planning Certificate)
- Architectural drawings showing key dimensions, RLs, scale bar and north point, including:
  - plans, sections and elevation of the proposal at no less than 1:200;
  - illustrated materials schedule including physical or digital samples board with correct proportional representation of materials, nominated colours and finishes;
  - details of proposed signage, including size, location and finishes;
  - detailed annotated wall sections at 1:20 scale that demonstrate typical cladding, window and floor details, including materials and general construction quality;
  - site plans and operations statement;
- Site Survey Plan, showing existing levels, location and height of existing and adjacent structures / buildings and site boundaries;
- Site Analysis and Context Plans, including:
  - site and context plans that demonstrate principles for future development and expansion, built form character and open space network;
  - precinct scale plan showing relationship of the proposal to any proposed development on surrounding land;
  - active transport linkages with existing, proposed and potential footpaths and bicycle paths and public transport links; and
  - site and context plans that demonstrate principles for future network, active transport linkages with existing, proposed and potential footpaths and bicycle paths and public transport links.
- Sediment and Erosion Control Plan;
- Shadow Diagrams;
- View analysis, photomontages and architectural renders, including from those from public vantage points;
- Landscape architectural drawings showing key dimensions, RLs, scale bar and north point, including:
  - integrated landscape plans at appropriate scale, with detail of new and retained planting, shade structures, materials and finishes;
  - plan identifying significant trees, trees to be removed and trees to be retained or transplanted;
- Design report to demonstrate how design quality will be achieved in accordance with the above Key Issues including:
  - architectural design statement;
  - diagrams, structure plan, illustrations and drawings to clarify the design intent of the proposal;
  - detailed site and context analysis;
  - analysis of options considered to justify the proposed site planning and design approach;
  - visual impact assessment identifying potential impacts on the surrounding built environment and adjoining heritage items;
  - summary of feedback provided by GANSW and NSW State Design Review Panel (SDRP) and responses to this advice;
  - summary report of consultation with the community and response to any feedback provided; and
  - how Aboriginal culture and heritage has been considered and incorporated into the design;
- Geotechnical and Structural Report;
- Accessibility Report;

	· Arborist Report; · Salinity Investigation Report (where required); · Noise and Vibration Assessment; · Contamination Assessment; · Acid Sulphate Soils Management Plan (where required); and · Schedule of materials and finishes.
Consultation	During the preparation of the EIS, you must consult with the relevant local, State or Commonwealth Government authorities, service providers, community groups, special interest groups, including local Aboriginal land councils and registered Aboriginal stakeholders, and affected landowners. In particular, you must consult with: · Penrith City Council; · Government Architect NSW (through the NSW SDRP process) (GANSW); · Transport for NSW (TfNSW); · Transport for NSW (Roads and Maritime Services) (TfNSW RMS). Consultation with GANSW, TfNSW and TfNSW (RMS) should commence as soon as practicable to agree the scope of investigation. The EIS must outline and describe the consultation process undertaken and the issues raised, and identify where the design of the development has been amended in response to these issues. Where amendments have not been made to address an issue, a short explanation must be provided.
Further consultation after two years	If you do not lodge a development application and EIS for the development within two years of the issue date of these SEARs, you must consult further with the Planning Secretary in relation to the preparation of the EIS.
References	The assessment of the key issues listed above must consider relevant guidelines, policies, and plans as identified.