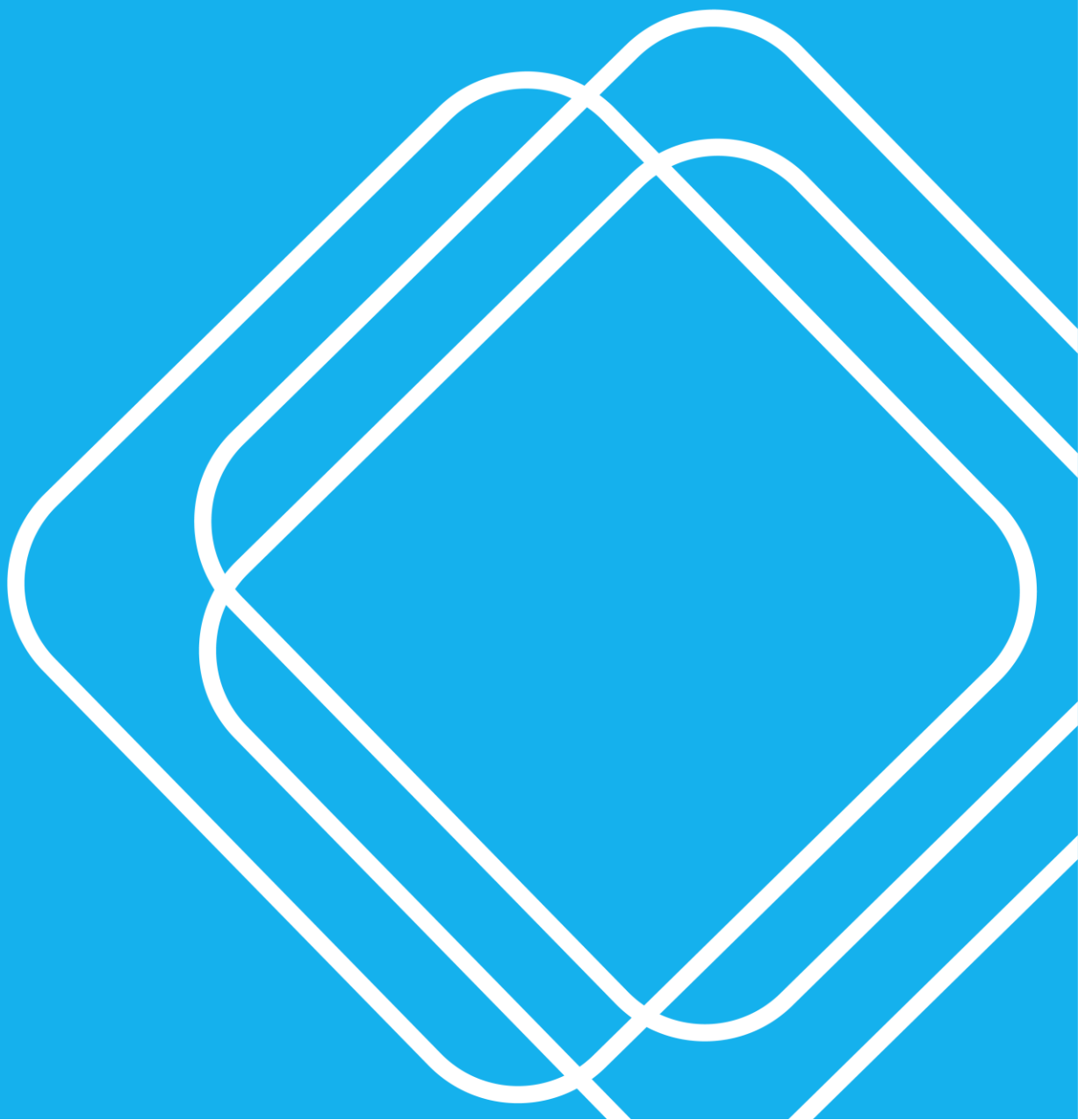
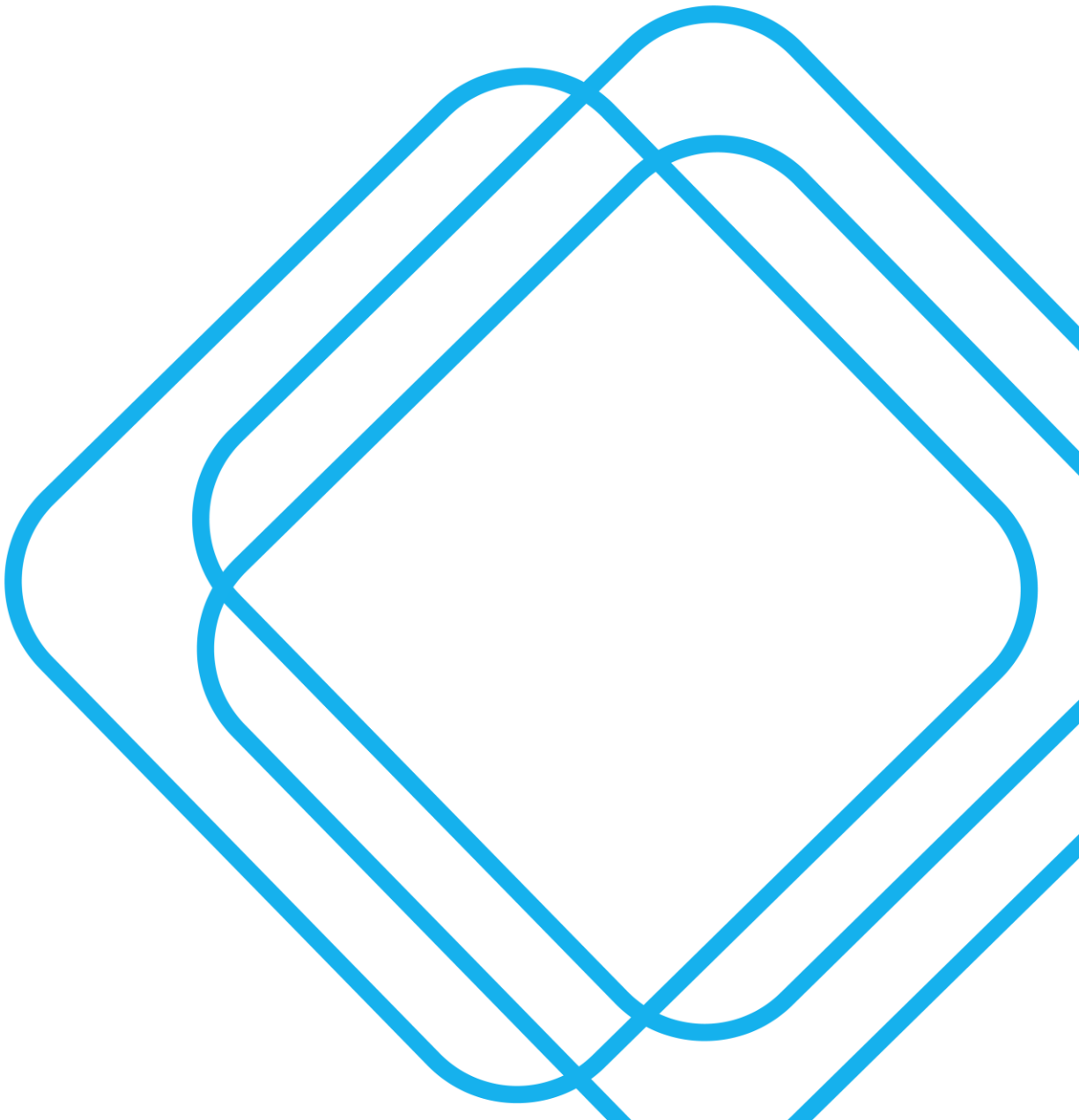
SCT Consulting

HILLS SHOWGROUND EAST PRECINCT ROAD NO.1

Traffic and Access Impact Assessment

19 NOVEMBER 2021





Quality Assurance

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Client:	Landcom	**ABN:**	79 268 260 688
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Document name:	Hills Showground East Precinct Road No.1
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1.0	1 October 2021	Draft report
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Appendices

Executive summary

Purpose of this report

SCT Consulting has been engaged by Landcom on behalf of Sydney Metro to prepare a Traffic and Parking Impact Assessment to support the Development Application (DA) for a new road that will provide vehicular access to and from future residential development lots within the site between De Clambe Drive and the intersection of Mandala Parade and Andalusian Way and a neighbourhood park ("Precinct East Park").

The proposal

The proposed development follows the approval of the Hills Showground State Significant Development Application (SSD-9653) and mainly includes the construction of a local road from De Clambe Drive to Andalusian Way and a new neighbourhood park of around 3,200 m^2.

The proposed local road (Road No. 1) will service the future residential development lots in Precinct East and the proposed neighbourhood park. Road No. 1 will create around 15 on-street parking spaces on the southeastern and northeastern sides of the road. Left-in left-out treatment is proposed at both intersections of Road No. 1 / De Clambe Drive and Road No. 1 / Andalusian Way (**Figure ES**).

Figure ES Indicative concept plan

A shared zone (with two-way traffic) is proposed from Andalusian Way and extended to the full park frontage along Road No. 1 to provide pedestrian priority outside the park and facilitate high pedestrian volumes generated between Precinct East and Hills Showground Station. The alignment and cross-section of the proposed road are generally consistent with what has been specified in the Hills Showground Station Precinct Urban Design Guidelines (UDG).

The two intersections of the proposed Road No.1 at Andalusian Way and De Clambe Drive would operate as left-in left-out intersections after close consultation with Transport for NSW (TfNSW) and The Hills Shire Council. The resultant access routing of vehicular trips for Precinct East via Road No. 1 is provided below.

Travel Origins / Destinations	Outbound	Inbound
Showground Road (North)	Turn left at the intersection of Andalusian Way/Road No. 1, turn left at Carrington Road and turn left at Showground Road	Turn right at the intersection of Showground Road/De Clambe Drive, turn left at Road No. 1/De Clambe Drive intersection
Showground Road (South)	Turn left at the intersection of Andalusian Way/Road No. 1, turn left at Carrington Road and turn right at Showground Road	Turn left at the intersection of Showground Road/De Clambe Drive, turn left at Road No. 1/De Clambe Drive intersection
Carrington Road (West)	Turn left at the intersection of De Clambe Drive/Road No. 1, turn left at Doran Drive and turn right at Carrington Road Alternatively, turn left at the intersection of Andalusian Way/Road No. 1, turn right Carrington Road	Turn left at the intersection of De Clambe Drive/Carrington Road, travel along De Clambe Drive and turn right at Andalusian Way, and turn left at the intersection of Road No. 1/ Andalusian Way

Source: SCT Consulting, 2021

Transport assessment

The delivery of Road No. 1 itself does not generate any additional traffic above that assessed and approved in the Hills Showground SSDA. Road No.1 would facilitate access to the Precinct East residential development that would generate 172 and 138 car trips during the AM and PM peak hours.

The neighbourhood park is a recreational facility within walking distance of the wider Showground Station Precinct, hence it is not expected to be generating large volumes of traffic, as most of the park users will be walking or cycling to the park. Given the availability of around 15 parking spaces along Road No. 1, it is estimated the park could be generating up to 15 trips per hour as a worst-case assuming park users who drive to the park would tend to stay longer for up to an hour.

A SIDRA modelling has been conducted to evaluate the impact of Road No. 1 and the Precinct East Park. The modelling assumed the left-in left-out treatment at both ends of Road No. 1 and resultant access routing of the residential development traffic. The assessment has also assumed intersection upgrades works committed and being delivered by TfNSW for Showground Road and Carrington Road.

For both scenarios assessed in 2026 and 2031, all eight intersections in the vicinity of the site would operate satisfactorily with a Level of Service (LoS) B and above (except an LoS C for Showground Road / Carrington Road and Carrington Road / Andalusian Way at PM peak hour in 2031).

The proposed Road No. 1 has a two-way shared zone close to Andalusian Way, which deviates from a one-way westbound shared zone identified in *Hills Showground Station Precinct Urban Design Guidelines*. The limited traffic (up to 94 vehicle trips during the 2031 AM peak hour) using the shared zone at this location are below the limit of 100 vehicles per hour or 1,000 vehicles per day. It meets the TfNSW warrant for a shared zone.

1.0 Introduction

1.1 Project background

Landcom on behalf of Sydney Metro received a concept State Significant Development Application (SSD-9653) approval for the Hills Showground Station Precinct (the Precinct) by the Department of Planning, Industry and Environment (DPIE) in January 2021.

The precinct will be a thriving local mixed-use centre; a walkable, lively place with strong connections to world-class transport and cultural and recreational activities at the Castle Hill Showground.

The concept SSDA approval included:

– a maximum of 1,620 homes, including a minimum of 5 per cent of Affordable Housing

– a mix of housing for people with different lifestyles, including one, two and three-bedroom homes

– a maximum of 14,000m^2 for retail, commercial and community uses, including a new supermarket

– green open spaces that encourage people to connect with the views over Cattai Creek and the wider Garden Shire

– improved connections and access to new open space including a village plaza and a neighbourhood park.

Development in the Precinct will be delivered in line with the approved concept SSDA and guided by a range of relevant documents including the Design Excellence Strategy, Urban Design Guidelines (UDG) and the Sydney Metro Northwest Places Public Art Guidelines to ensure high-quality architectural and urban design outcomes.

1.2 Site and context

The site, Lot 56 in DP 1253217, is located to the east of Hills Showground Station at 3 Andalusian Way, Castle Hill (the site). It is located in the eastern part of the Precinct, known as Hills Showground Precinct East. It is boarded by Showground Road to the northeast, Carrington Road to the south and south-east, Andalusian Way to the southwest and De Clambe Drive to the northwest.

The site is 25 kilometres north-west of the Sydney CBD and is connected by Metro North West Line (MNWL) to existing employment and retail centres at Castle Hill, Norwest Business Park, Rouse Hill Town Centre, Macquarie Park, Chatswood, St Leonards, North Sydney and the Sydney CBD.

The Hills Showground Station entrance is approximately 110 m from the site.

The site is approximately 2.82 ha and was the location of the former Baulkham Hills Shire Council Chambers and Administrative building. This building was demolished in 2020. The site is currently vacant and includes trees and a concrete ground level slab of the former Council building.

1.3 Summary of the development

Landcom is preparing a Development Application for a new road that will provide vehicular access to and from future residential development lots within the site between De Clambe Drive and the intersection of Mandala Parade and Andalusian Way and a neighbourhood park (“Precinct East Park”).

The Precinct East Park will be a focal point for the precinct providing a new local park to meet the passive recreational needs of the community, whilst retaining some existing trees on the site.

The proposed development (as shown in **Figure 1-1**) follows the approval to the concept SSDA and includes:

– The subdivision of Lot 56 in DP 1253217 into 5 lots which is consistent with the approved concept subdivision of Hills Showground Precinct East:

  - 3 lots for future development lots in accordance with the concept DA consent
  - 1 lot for a neighbourhood park
  - 1 lot for a local road

– Subdivision works comprising:

- The construction of a local road from De Clambe Drive to Andalusian Way
- Provision of utility services to each lot including water sewer, energy telecommunications
- Earthworks associated with the subdivision
- Public domain works on the new road

– Public domain works including:

- A new neighbourhood park of around 3,200 m^2 located on Lot 2 in the proposed plan of subdivision of Lot 56 in DP 1253217
- Public art
- Landscaping to the new road.

Figure 1-1 Proposed site boundary

Source: COX, 2021

1.4 Purpose of report

SCT Consulting has been engaged by Landcom on behalf of Sydney Metro to prepare a Traffic and Parking Impact Assessment to support the Development Application (DA) for a new road that will provide vehicular access to and from future residential development lots within the site between De Clambe Drive and the intersection of Mandala Parade and Andalusian Way and a neighbourhood park ("Precinct East Park").

The Traffic and Parking Impact Assessment report has considered the following scope of works:

– Review of relevant background documents and information including parking DCP and standards

– Undertake a desktop review of existing traffic and transport conditions, including the documentation of existing traffic

– Assess the preferred public domain and local road layout

– Estimate future traffic generation based on the *Roads and Maritime Services Guide to Traffic Generating Developments (2002)*

– Distribute trip generation to the surrounding road network based on the temporary and permanent access strategy and travel pattern

– Undertake SIDRA modelling to determine operational implications as a result of the proposal and Hills Showground Precinct East

– Assess the consistency of the traffic design when compared to the approved SSDA, and justify any changes from the SSDA approval if warranted

– Ensure compliance with the issued Development Consent

– Ensure the design of the public domain and the local road will cater for the trip generation demand for cars, heavy vehicles, pedestrians and cyclists.

1.5 Report structure

This report has been structured into the following sections:

– **Section 2** considers the future transport planning context.

– **Section 3** describes the existing transport conditions for all modes of transport.

– **Section 4** provides an overview of the proposed development and access requirements.

– **Section 5** outlines the indicative traffic and transport impact as a result of the proposed development.

– **Section 6** summarises the study findings and presents conclusions.

2.0 Strategic context

2.1 Hills Showground Station Precinct Urban Design Guidelines

The *Hills Showground Station Precinct Urban Design Guidelines* (UDG) apply specifically to the development lots within the Hills Showground Station Precinct. The UDG has been established to ensure the delivery of high quality built form and landscape outcomes via the area's transformation over time and provide a framework for meeting the intended vision and objectives for the Precinct.

The objectives of the Precinct East New Street (Road No. 1) include:

– To provide vehicular access to and from the residential development and the local park.

– To provide a vehicular and pedestrian connection between De Clambe Drive and the intersection of Mandala Parade and Andalusian Way

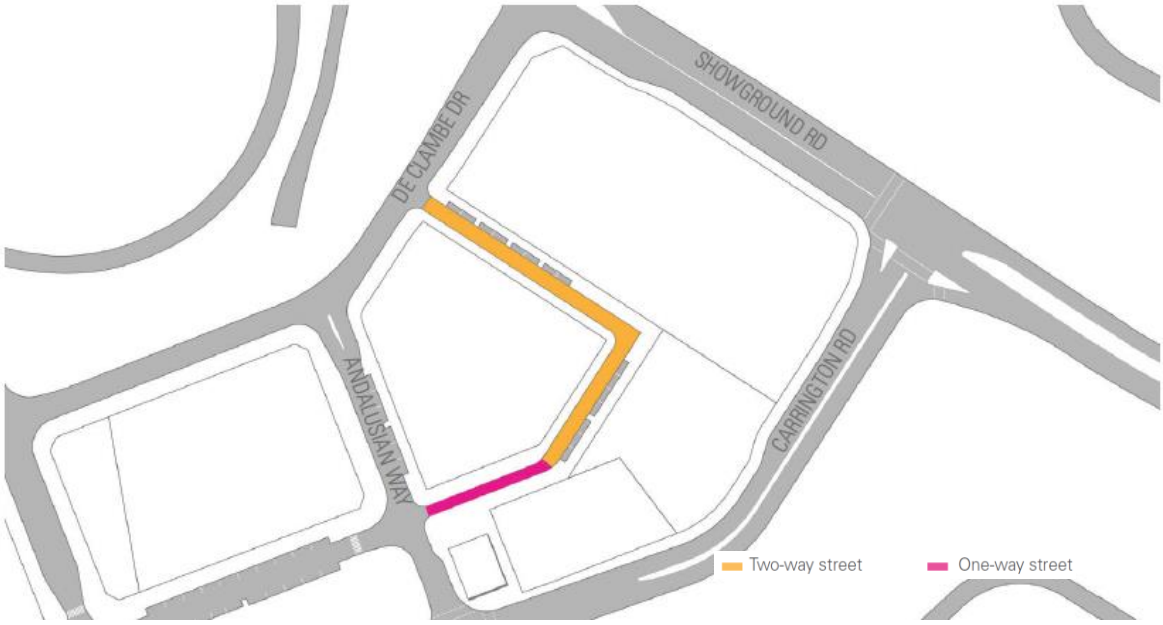
– To provide a pedestrian & cyclist connection between Hills Showground Station and the broader Showground Station Precinct.

The following controls would be applied on the planning and design of Road No. 1:

1. The design and construction of road infrastructure shall comply with The Hills Shire Council's Design Guidelines for Subdivisions / Development.

2. A new local street with a 17 m road reserve is to be provided within Precinct East as shown in **Figure 2-1** and **Figure 2-2**.

Figure 2-1 Precinct East - New Street (Road No. 1) Location



Source: Hills Showground Station Precinct Urban Design Guidelines, 2021

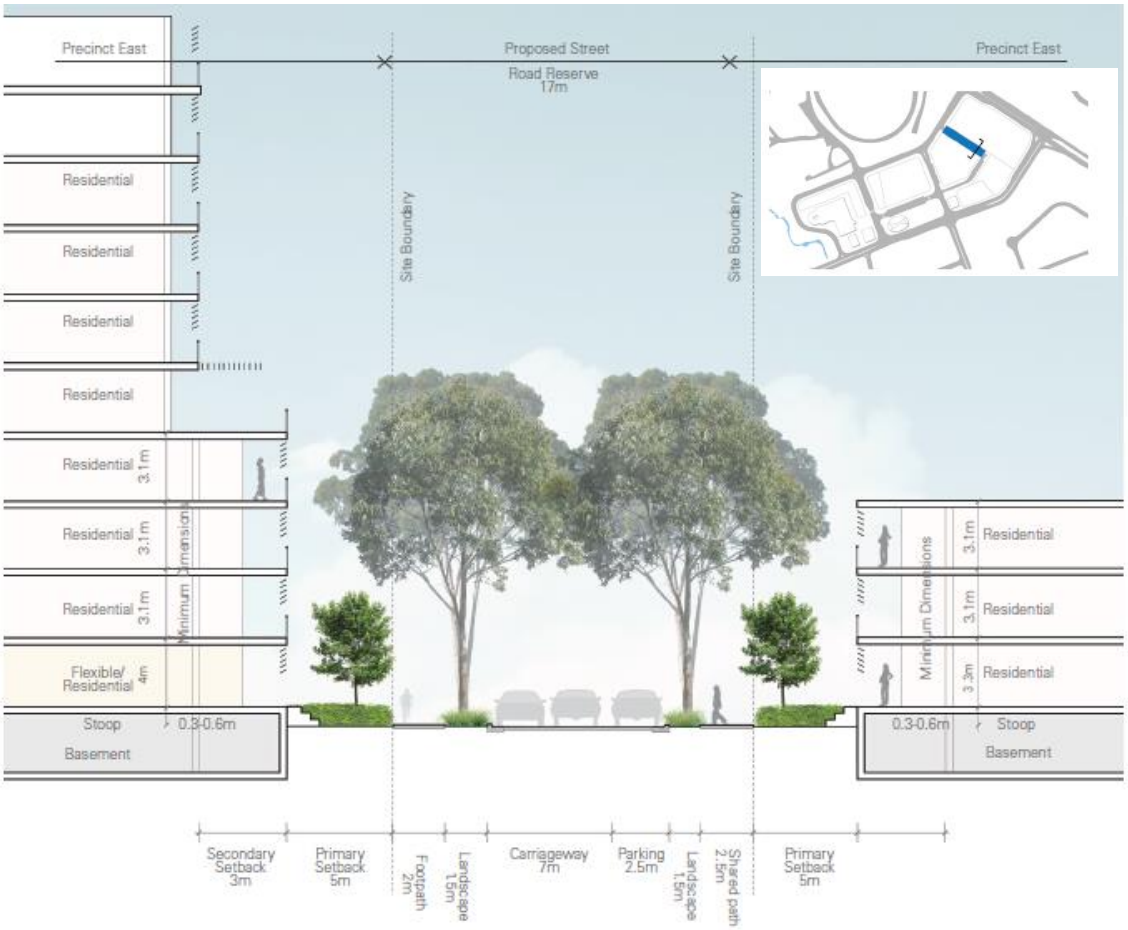
Note: Road No. 1 is now proposed to be a two-way local street in its full length but with left-in left-out intersections at both Andalusian Way and De Clambe Drive to minimise vehicular and pedestrian conflicts at both locations while providing appropriate access to Precinct East – this is further discussed in Section 4.0 and 5.0 of the report.

3. The new local street is to be two-way to provide vehicular access to the residential development lots, with a one-way from the development lot to Andalusian Way to reduce the amount of traffic using Andalusian Way to access Precinct East.

   (*Road No. 1 is now proposed to be a two-way local street in its full length but with left-in left-out intersections at both Andalusian Way and De Clambe Drive to minimise vehicular and pedestrian conflicts at both locations while providing appropriate access to Precinct East – this is further discussed in Section 4.0 and 5.0 of the report*).

4. The new street is to have insitu concrete paths as per the existing surrounding streets, with shared paths differentiated using coloured concrete as per Council's standard approach in the Hills Shire Council Public Domain Plan Showground Station Planned Precinct.
5. The road carriageway may be paved with different materials clearly distinguishable by colour, texture and / or materials at thresholds and key points to emphasise a slow speed and high pedestrian movement zone.
6. On-street parking is to be provided on the northern side from De Clambe Drive and the southern side adjoining the park.
7. A minimum 2 m wide footpath is required on the southern side of the street.
8. A 2.5 m shared path is required on the northern side of the street to provide access to the park.
9. A minimum 5 m primary setback is to be provided to both sides of the street.

Figure 2-2 New Local Street Interface (north section only)



Source: Hills Showground Station Precinct Urban Design Guidelines, 2021

2.2 Hills Showground SSDA Traffic and Transport Assessment

SCT Consulting was engaged by Landcom on behalf of Sydney Metro to carry out a Traffic and Transport Assessment to support a State Significant Development Application (SSDA) for the Hills Showground Station Precinct.

The concept proposal is a transit-oriented mixed-use development that could comprise up to 1,620 dwellings and up to a maximum of 13,940 m^2 of non-residential including commercial, retail and community space. The concept proposal responds to the opportunity to create a transit-oriented centre by reducing the amount of car parking, reflecting the higher level of public transport services and providing walking and cycling facilities to enhance seamless connections with the regional facilities, in this case, the Metro North West Line and its connecting bus network.

The concept proposal would generate 702 and 964 peak hour vehicular trips during the AM and PM peak hours respectively. The proposed cap on vehicular parking spaces significantly below the typical requirements of the rates suggested in The Hills Development Control Plan as well as the location of the site's proximity to frequent metro services are tools used to reduce the traffic impacts of this proposal.

Residential developments (a maximum of 873 dwellings) in Precinct East are expected to generate 172 and 138 vehicular trips during the AM and PM peak hours. Traffic modelling suggested that the internal existing road network within the Hills Showground Station Precinct would cater for the concept proposal. The external network such as Carrington Road and Showground Road will require further upgrades by TfNSW and Council to cater for background traffic growth and the development traffic by 2031, which includes the works being delivered by TfNSW at Showground Road and Carrington Road as described in **Section 2.3**.

2.3 Intersection upgrade Showground Road and Carrington Road, Castle Hill

The Australian Government and NSW Governments are jointly funding upgrades on Showground Road, Castle Hill to improve the reliability and efficiency of bus services in the area while easing congestion and improving safety for all road users.

These upgrades will also improve access to the Hills Showground Station. The main feature of the project would include (**Figure 2-3**):

- Widening the north side of Showground Road to provide two eastbound through lanes and an additional right turn lane into Carrington Road.
- Installing a westbound bus lane along Showground Road about 60 m on either side of the intersection with De Clambe Drive.
- Adding a dedicated westbound left turn lane, buses excepted, on Showground Road into Carrington Road.
- Widening the west side of Carrington Road at the approach to Showground Road to three lanes to provide two right turn lanes into Showground Road eastbound and a left turn lane into Showground Road westbound.
- Upgrading the intersection of Showground Road and Carrington Road with new traffic islands and new traffic lights with a signalised pedestrian crossing.
- Upgrading the intersection of Showground Road and De Clambe Drive with new medians on either side of the intersection and new traffic lights with a signalised pedestrian crossing.
- Providing a 2.5 m wide concrete footpath along the northern side of Showground Road.
- Maintaining the 1.5 m wide footpath along the southern side of Showground Road to the east of Carrington Road and maintaining the existing 2.5 m existing shared user path on the western side of Carrington Road relocating the utility services.
- Removing the northbound bus stop ID 215447 on Carrington Road and diverting customers to access the alternate bus stop at Showground Road ID 215417 or the bus stop at Middleton Avenue ID 215453.
- These alternative bus stops are within reasonable walking distance.
- Installing a pedestrian fence on the Showground Road median between De Clambe Drive and Carrington Road and to the east of Carrington Road.

Figure 2-3 Showground Road and Carrington Road upgrade works

Source: Transport for NSW, 2020

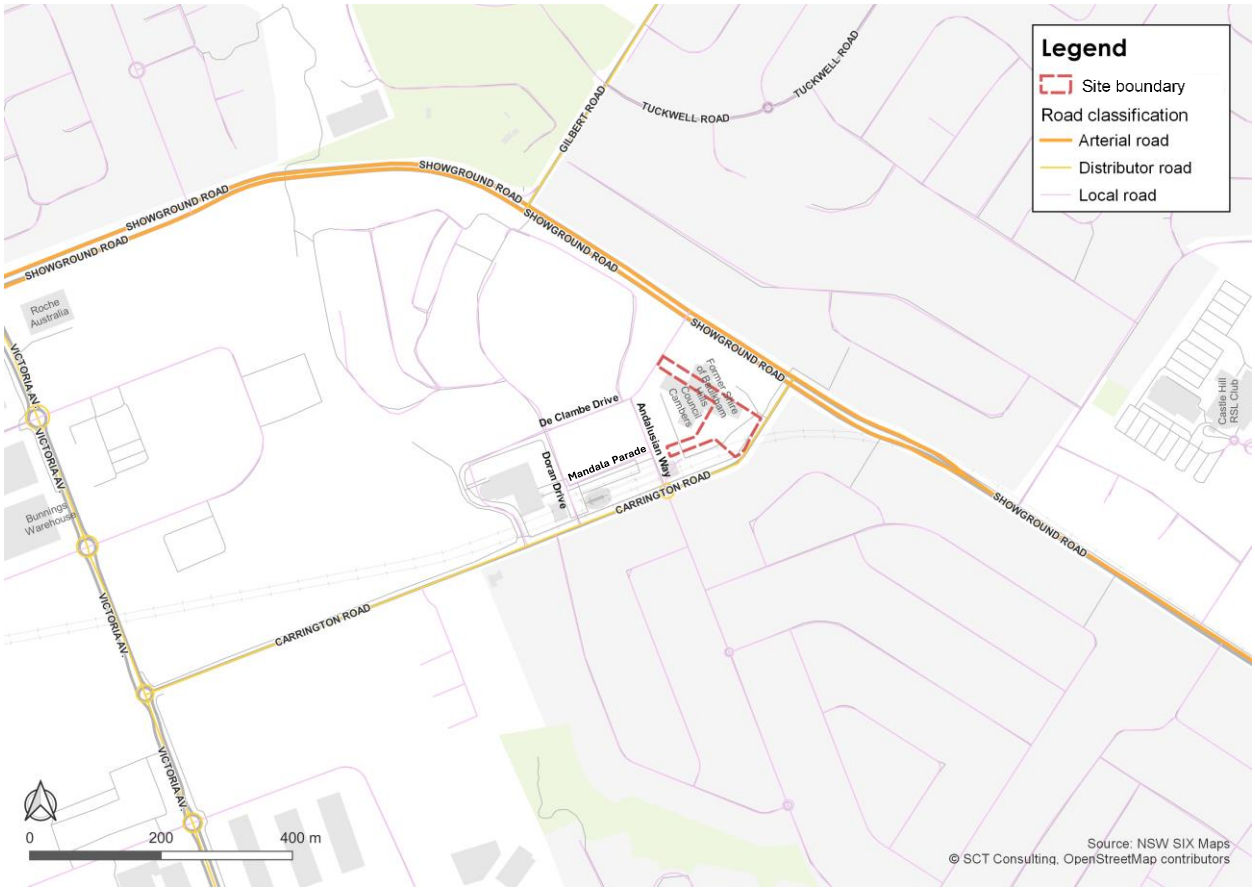
3.0 Existing conditions

The purpose of this chapter is to provide an understanding of the current traffic and transport conditions in the vicinity of the site, which is located in proximity to the Hills Showground Station.

3.1 Road network

Key roads around the site include Carrington Road to the south, Showground Road to the east, De Clambe Drive to the north and west and multiple local roads such as Doran Drive, Andalusian Way and Mandala Parade.

Figure 3–1 Road network surrounding the site



The characteristics of the key road network, as shown in **Figure 3–1**, surrounding the subject site are:

– **Showground Road** is a 4-lane arterial road that runs from Windsor Road to Old Northern Road. Showground Road provides regional connections to Windsor Road in the west, Old Northern Road to the east and to Gilbert Road to the north. The site can be accessed from Showground Road via the signalised intersections at De Clambe Drive and Carrington Road. The signposted speed limit is 60 km/h. Clearway is implemented on both sides of the road to improve road capacity during peak hours. There is a footpath on the eastern side of the road whereas a shared path on the western side.

– **Carrington Road** is a 4-lane distributor which provides a connection between Showground Road and Victoria Avenue. Carrington Road between Victoria Avenue and De Clambe Drive has a bus lane in each direction improving public transport access and reliability to Hills Showground Station. A footpath is provided on both sides of the road and on-street parking is prohibited. The signposted speed limit is 50 km/h.

– **De Clambe Drive** is a local street with one lane in each direction that connects Carrington Road with Showground Road, while providing access to the commuter car park for the Hills Showground Station as well as access to future developments within the precinct. It connects with Carrington Road as a left-in left-out priority intersection, intersects with Doran Drive and Andalusian Way as priority intersections and with a signalised

intersection at Showground Road. The section of De Clambe Drive between Doran Drive and Showground Road services all bus route access to Hills Showground Station. On-street parking is not allowed between Andalusian Way and Showground Road. The signposted speed limit is 50 km/h and footpaths are available on both sides of the road.

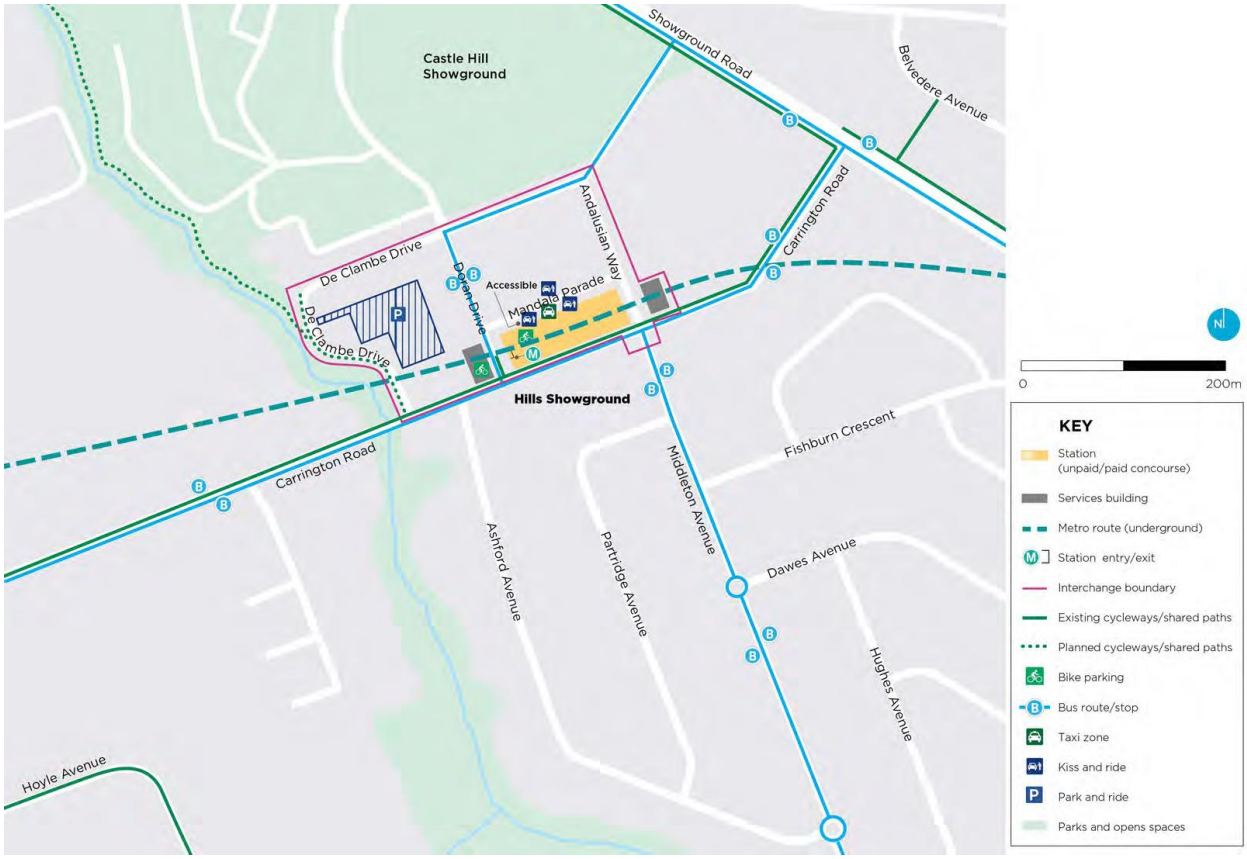
– **Andalusian Way** is also a local street that connects De Clambe Drive and Carrington Road, with one traffic lane in each direction. Time-restricted on-street parking is provided on both sides of the road. The signposted speed limit is 50 km/h.

– **Doran Drive** and **Mandala Parade** are local streets that provide interchange functions to support access to Hills Showground Station by buses and vehicular pick-up drop-off respectively. Disabled parking spaces are also located on Mandala Parade. Both streets are designated as high pedestrian zones with a 40 km/h speed limit.

3.2 Public transport network

The site has direct access to the Hills Showground Station. The station entry is accessed via Doran Drive as shown in **Figure 3–2**.

Figure 3–2 Hills Showground Interchange Access Plan



Source: Sydney Metro North West Interchange Access Plan

The MNWL delivers fast travel time to major destinations. For example, it only takes approximately two minutes to access Castle Hill station, 11 minutes to Epping station, 17 minutes to Macquarie Park station, 26 minutes to Chatswood station, and 46 minutes to Wynyard station[1]. The increased network coverage, train frequency, journey-time reliability and improved customer offering of Sydney Metro, has been shown to encourage rail network usage and increase journey to work trips by non-car modes.

Hills Showground Station is a bus-rail interchange station serving the local residents and a multi-storey park-and-ride facility, that will reduce vehicle kilometres travelled and promote switching to sustainable transport.

[1] These are indicative travel times source from publicly available travel apps

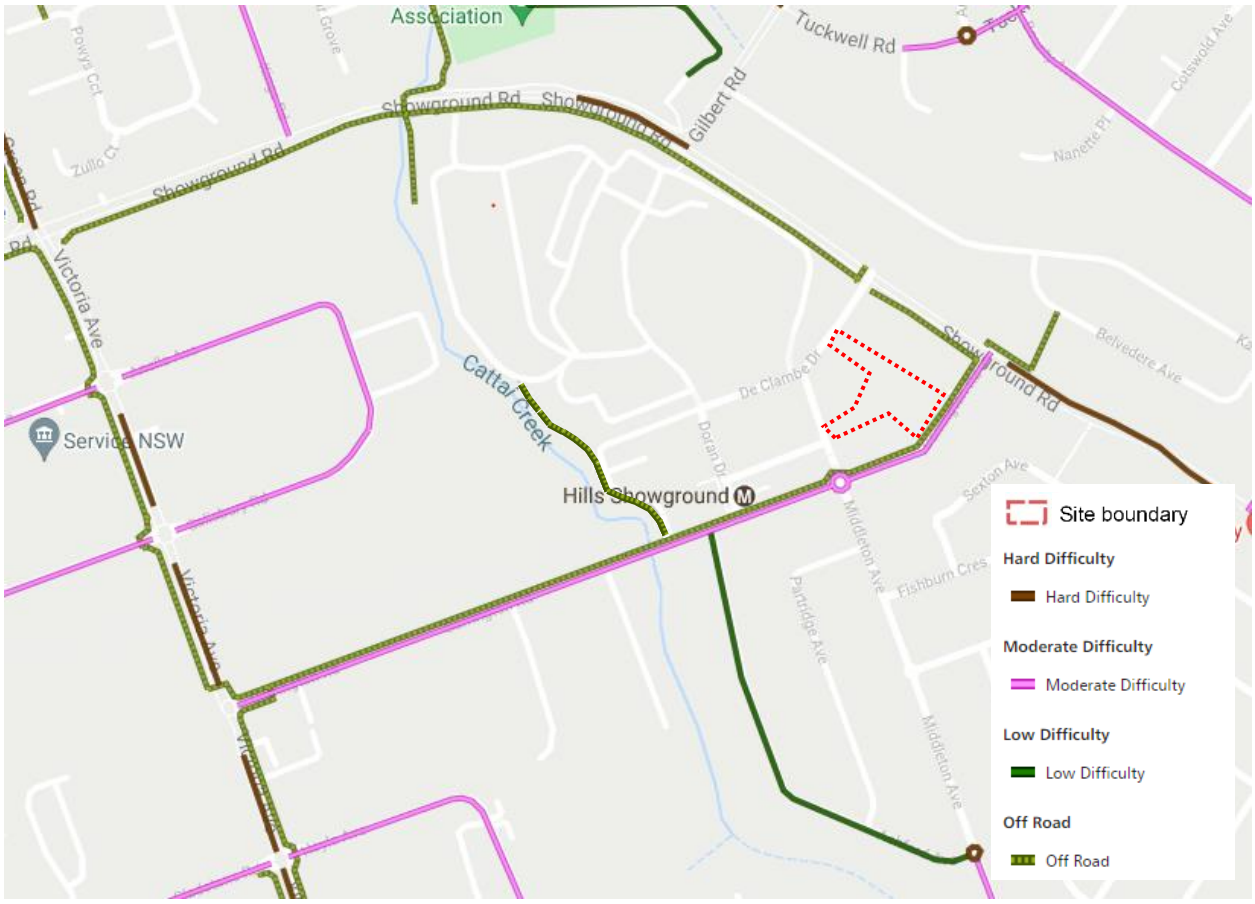
Bus stops are generally within short walking distance on Doran Drive, Carrington Road and Showground Road as shown in **Figure 3–2**.

The bus routes that operate around Hills Showground Station typically run between a variety of places such as Dural, Rouse Hill, Castle Hill, Pennant Hills, Kellyville, Epping, Castlewood, Blacktown and Parramatta, via Castle Hill, Cherrybrook, Kellyville, Norwest, Glenwood, Baulkham Hills, and other adjacent suburbs providing a wide array of local accessibility. The frequency of seven bus services available in the proximity of the site, being routes 601, 604, 626, 633, 651, 660 and 730, range from four to eight services per hour. Hence, there are up to an average of 35 bus services (in both directions) that is currently serving the Hills Showground Station during the weekday AM and PM peak hour.

3.3 Active transport

The cycle infrastructure in the vicinity of the site is shown in **Figure 3–3**.

Figure 3–3 Cycling facilities around the site



Source: Cycleway Finder (nsw.gov.au), 2021

An off-road cycle path exists on Carrington Road De Clambe Drive along Cattai Creek and Showground Road. There is a bike shed for 35 bicycles, with electronic access facility and bike racks for 10 bicycles, located in the vicinity of the station entrance.

Pedestrian crossings are provided on Doran Drive, Mandala Parade and two signal intersections on Carrington Road, i.e. Andalusian Way and Doran Drive, indicating an excellent walking environment and safe pedestrian network.

4.0 The proposal

4.1 Summary of the development

The subject site is located in the Precinct East of the Hills Showground Station Precinct. An indicative concept plan of the site boundary is shown in **Figure 4-1**.

Figure 4-1 Indicative concept plan

Source: rpsgroup, 2021

The proposed development follows the approval to the concept SSDA and includes:

– The subdivision of Lot 56 in DP 1253217 into 5 lots which is consistent with the approved concept subdivision of Hills Showground Precinct East:
  - 3 lots for future development lots in accordance with the concept DA consent
  - 1 lot for a neighbourhood park
  - 1 lot for a local road
– Subdivision works comprising:
  - The construction of a local road from De Clambe Drive to Andalusian Way
  - Provision of utility services to each lot including water sewer, energy telecommunications
  - Earthworks associated with the subdivision and public domain works on the new road
– Public domain works include:
  - A new neighbourhood park of around 3,200 m^2 located on Lot 2 in the proposed plan of subdivision of Lot 56 in DP 1253217
  - Public Art and landscaping to the new road.

4.2 Proposed Road No. 1

The local street in the Precinct East evolved from the *Showground Precinct DCP* (a connection between De Clambe Dr and Carrington Road in parallel with Showground Road) and *Hills Showground Station Precinct Urban Design Guidelines* (as discussed in **Section 2.1**). The approved Hills Showground SSDA had changed the alignment of the local street from *Showground Precinct DCP* to *Hills Showground Station Precinct Urban Design Guidelines*, to minimise the amount of rat-running traffic using the local street and the impacts of the intersection with Carrington Road. The proposed Road No. 1 for this subject DA would keep generally the alignment as approved in the *Hills Showground Station Precinct Urban Design Guidelines* but partially change the traffic circulation.

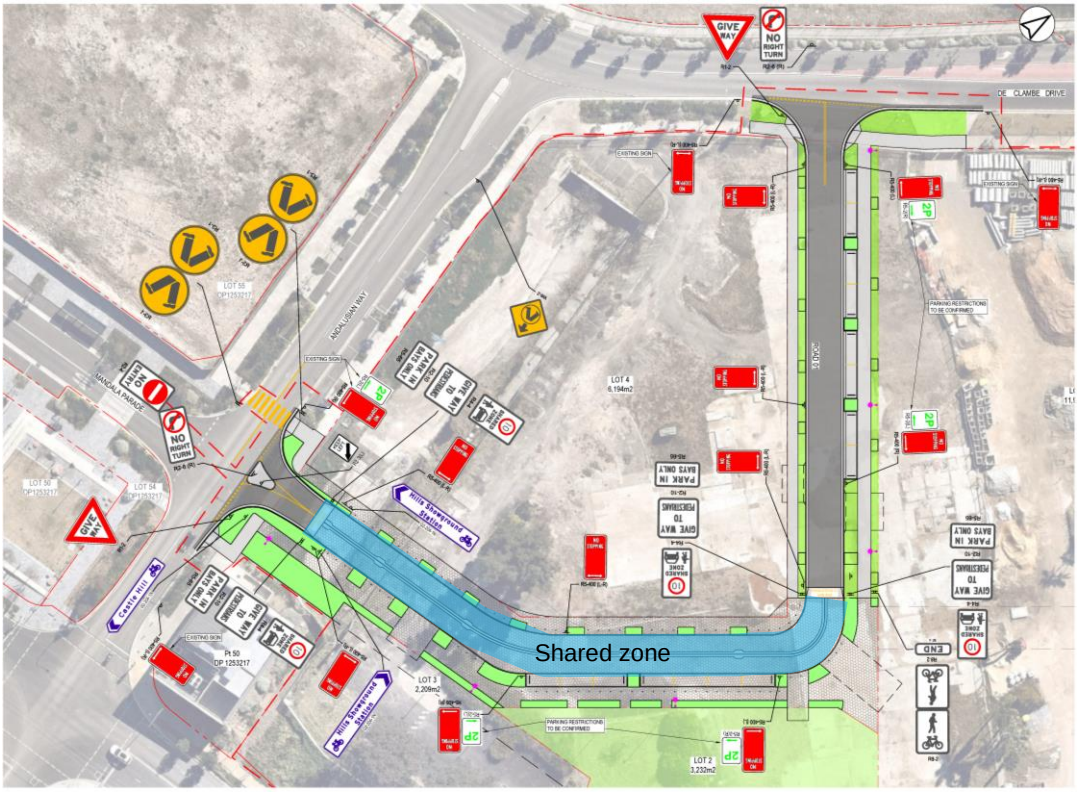
The proposed local road (Road No. 1) will service the future residential development lots in Precinct East and the proposed neighbourhood park. Road No. 1 will create about 15 on-street parking spaces on the southeastern and northeastern sides of the road. Left-in left-out treatment is proposed at both intersections of Road No. 1 / De Clambe Drive and Road No. 1 / Andalusian Way. The latest design of Road No. 1 is shown in **Figure 4-2**.

A shared zone (highlighted in blue in **Figure 4-2**) is proposed from Andalusian Way and extended to the full park frontage along Road No. 1 to provide pedestrian priority outside the park and facilitate high pedestrian volumes generated between Precinct East and Hills Showground Station. The shared zone extends from Andalusian Way to the bend of Road No. 1 in the east which covers the entire park frontage. There would be traffic calming treatments along the shared zone to prioritise active transport such that vehicle speeds would be reduced and a transition between the park and local roads can be created. This provides a safer environment for cyclists and pedestrians across the precinct.

The proposed two-way shared zone deviates from a one-way westbound shared zone identified in *Hills Showground Station Precinct Urban Design Guidelines*. The intent of the one-way shared zone was to reduce traffic volumes, minimising vehicles and pedestrian conflicts at this location. The same goal can be achieved with the two-way shared zone and left-in left-out intersection treatment at Andalusian Way / Road No. 1. The limited traffic (up to 94 vehicle trips during the 2031 AM peak hour as discussed in **Section 5.1**) using the proposed shared zone at this location are below the limit of 100 vehicles per hour or 1,000 vehicles per day. It meets the TfNSW warrant for a shared zone.

A zebra pedestrian crossing is also proposed at Andalusian Way (just north of Road No.1 and Mandala Parade) to facilitate safe crossing opportunities between Precinct East and Hills Showground Station. Justification for the zebra crossing is provided in **Section 5.3** of the report.

Figure 4-2 Civil design



Source: Makereng, 2021

4.3 Proposed access

The two intersections of the proposed Road No.1 at Andalusian Way and De Clambe Drive would operate as left-in left-out intersections after close consultation with TfNSW and The Hills Shire Council. The approved and proposed layouts of the two intersections are summarised in **Table 4-1**.

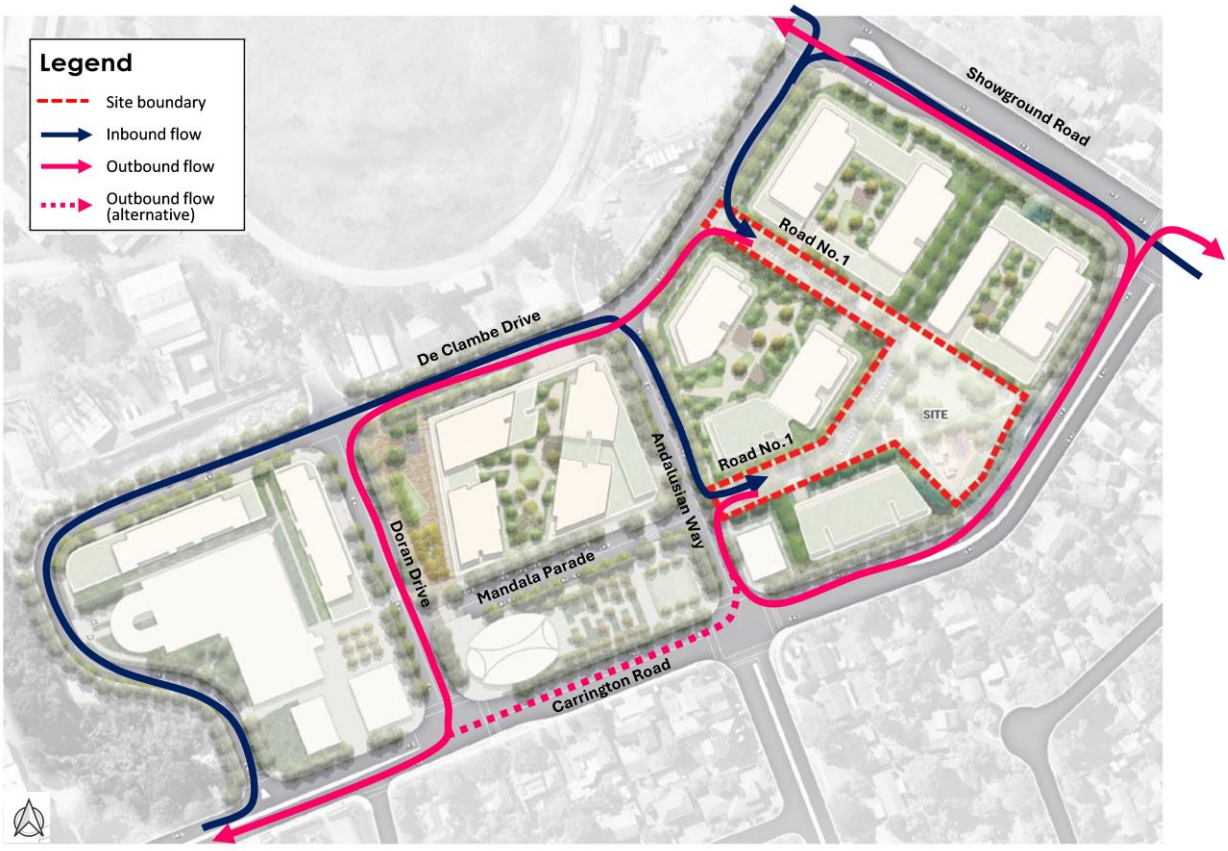
Table 4-1 Approved and proposed intersection layouts

Intersection	Approved (in SSDA)	Proposed (in this DA)	Reasons / justifications for the changes
Andalusian Way / Road No.1	Exit only from Road No. 1 with left and right turns to Andalusian Way	Left-in left-out only	– Minimise vehicular conflicts by reducing traffic movements at a 4-way intersection – Introduce the left turn entry movement to avoid significant detour of traffic with the right turn ban from De Clambe Drive into Road No. 1 – Minimise amount of traffic using the shared zone to provide pedestrian priority outside the park and facilitate high pedestrian volumes generated between Precinct East and Hills Showground Station
De Clambe Drive / Road No. 1	All movements permitted	Left-in left-out only	– Avoid conflicts with bus lane at De Clambe Drive

Source: SCT Consulting, 2021

The resultant access routing of vehicular trips for Precinct East via Road No. 1 is provided in **Table 4-2** and **Figure 4-3**, which are reflected in the traffic modelling.

Figure 4-3 Access route



Source: SCT Consulting, 2021

Table 4-2 Proposed access routing

Travel Origins / Destinations	Outbound	Inbound
Showground Road (North)	Turn left at the intersection of Andalusian Way/Road No. 1, turn left at Carrington Road and turn left at Showground Road	Turn right at the intersection of Showground Road/De Clambe Drive, turn left at Road No. 1/De Clambe Drive intersection
Showground Road (South)	Turn left at the intersection of Andalusian Way/Road No. 1, turn left at Carrington Road and turn right at Showground Road	Turn left at the intersection of Showground Road/De Clambe Drive, turn left at Road No. 1/De Clambe Drive intersection
Carrington Road (West)	Turn left at the intersection of De Clambe Drive/Road No. 1, turn left at Doran Drive and turn right at Carrington Road Alternatively, turn left at the intersection of Andalusian Way/Road No. 1, turn right Carrington Road	Turn left at the intersection of De Clambe Drive/Carrington Road, travel along De Clambe Drive and turn right at Andalusian Way, and turn left at the intersection of Road No. 1/ Andalusian Way

Source: SCT Consulting, 2021

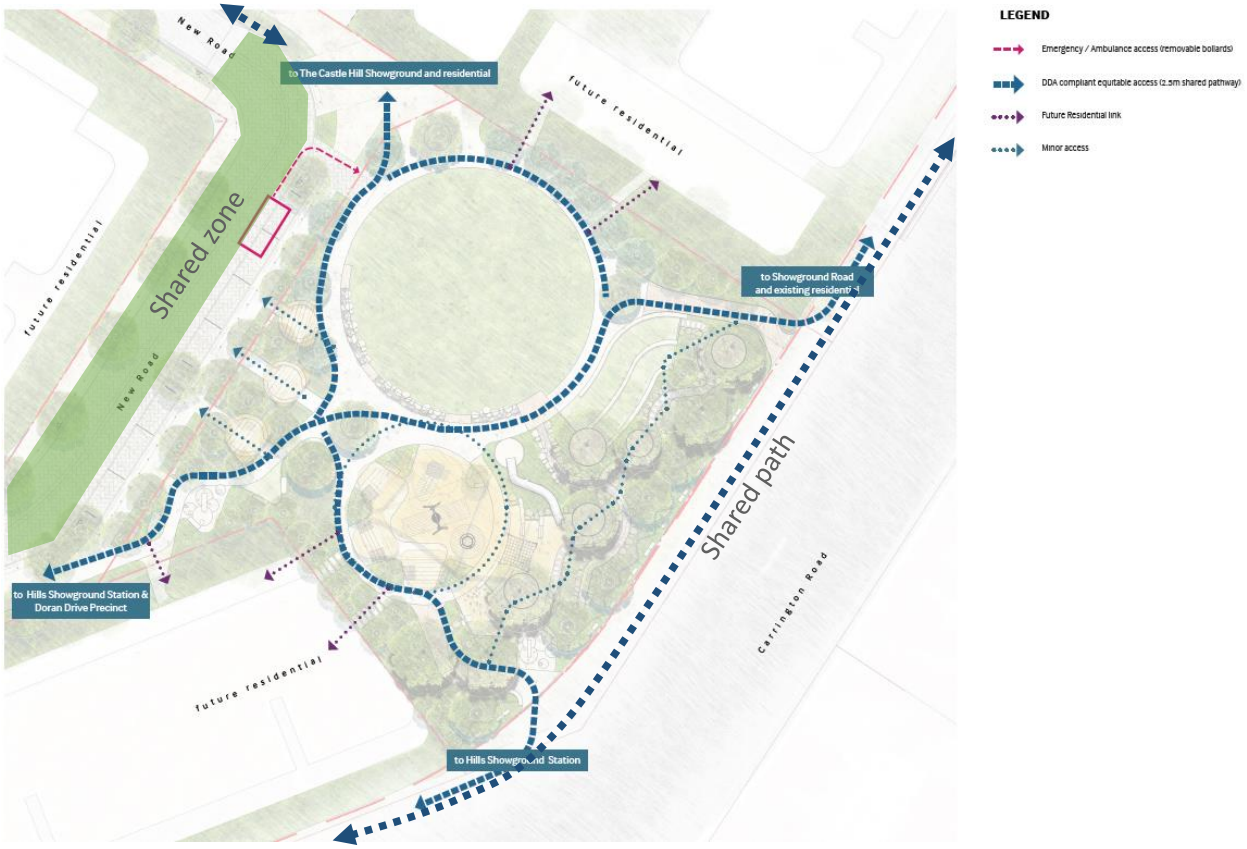
4.4 Service vehicle access

According to Austroads Guide to Road Design Part 4: Intersections and Crossings – General, a typical Austroads standard design vehicle for local residential roads is 8.8 m long service vehicle while typical vehicle for checking design is a single unit truck/bus (12.5 m). The proposed road design is compliant with the Austroads requirements and Road No. 1 will accommodate a garbage truck, which is larger than the length of an 8.8 m long medium rigid vehicle. A swept path for 12.5 m heavy rigid vehicle has been carried out as design check vehicles. Swept path analysis of both design and design check vehicles are included in **Appendix A**.

4.5 Shared path network

As shown in **Figure 4-4**, the shared pathway network of the proposed park connects with the off-road cycle path along Carrington Road as well as the shared zone to Andalusian Way (towards Hills Showground Station) and the shared path along Road No. 1 to De Clambe Drive. Multiple residential links and minor accesses provide permeability and accessibility for residential buildings and on-street parking on Road No. 1.

Figure 4-4 Shared path connection



Source: SCT Consulting based on rpsgroup, 2021

4.6 Cross-section

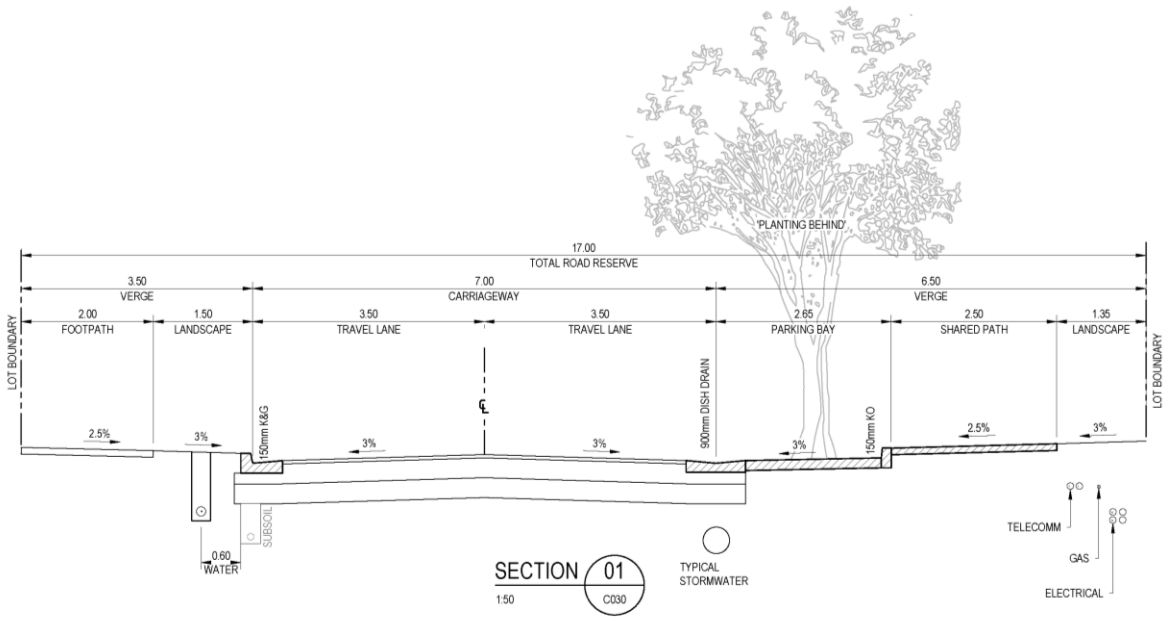
There are two cross-sections for the proposed Road No.1:

– **Section 1** is a cross-section between De Clambe Drive and the bend. Within the 17 m road reserve, there are two travel lanes with parking bays proposed on the northeastern side of the road. A 2.0m footpath and a 2.5 m shared path are also proposed. This cross-section is generally consistent with the UDG, as shown in **Figure 4-5**, with a slightly wider parking lane (2.65m) based on feedback from Council.

– **Section 2** is a cross-section between Andalusian Way and the bend (as shown in **Figure 4-6**), which is a shared zone. Although in a shared zone environment, each of the street features are not fully delineated under a slow speed environment (10 km/hr), the following are provided:

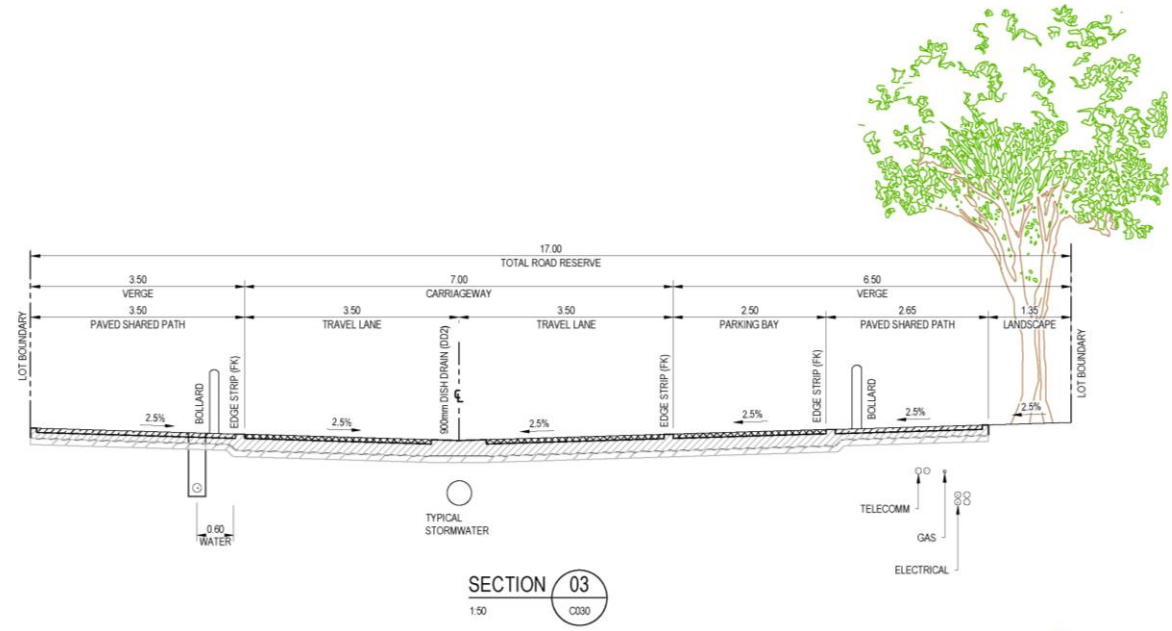
- Two travel lanes with parking bays proposed on the southeastern side of the road along the park frontage.
- Flexible zones to accommodate paved shared paths (for pedestrians and cyclists) with bollards along the edge of the trafficable area to encourage lower speeds / improve pedestrian safety.

Figure 4-5 Cross section of Road No. 1 (north-south section)



Source: Makereng, 2021

Figure 4-6 Cross section of Road No. 1 (shared zone section)



Source: Makereng, 2021

5.0 Traffic impact assessment

5.1 Traffic modelling approach and assumptions

5.1.1 Key assumptions for future year model

The SIDRA model network for this study was developed based on the approved Hills Showground SSDA traffic model. The geometry of the intersections of Showground Road/Carrington Road and Showground Road/De Clambe Drive has been updated based on the *Intersection upgrade of Showground Road and Carrington Road* (**Section 2.3**). New intersections have been added to assess the implication of the proposed Road No. 1 including:

– De Clambe Drive / Road No.1 (left in left out for Road No. 1)

– De Clambe Drive / Andalusian Way (Give way)

– Mandala Parade / Andalusian Way / Road No. 1 (left in left out for Road No. 1).

It is acknowledged that the background traffic volumes in 2021 for the intersection of De Clambe Drive / Andalusian Way were extracted from *Doran Drive Precinct – Proposed Mixed-Use Development*, which also informs the mid-block traffic volumes on Andalusian Way and De Clambe Drive. It is expected that there is limited traffic growth on local streets. Hence, the extracted traffic volumes are considered appropriate for future year traffic modelling.

The modelled scenarios include the future years of 2026 and 2031, as requested by Transport for NSW based on email correspondence on 15 September 2021:

– **Future year 2026**: According to the staging plan of Hills Showground Precinct development, only Precinct West and Precinct Doran Drive would open before 2029. Therefore, the 2026 scenario would consider the impact of the proposed park for Precinct East, i.e. a peak hour trip generation of 15 vehicles per direction based on the on-street parking provision. The residential development for Precinct East is excluded.

– **Future year 2031**: This would consider a full development of Hills Showground Precinct.

5.1.2 Intersection level of service

Intersection Level of Service (LoS) is a typical design tool used by traffic engineers to identify when roads are congested. The Level of Service as defined in TfNSW Traffic Modelling Guidelines is provided in **Table 5-1**.

Table 5-1 Level of Service definitions

Level of Service	Average delay per vehicle (seconds)	Performance explanation
A	Less than 14.5	Good operation
B	14.5 to 28.4	Good with acceptable delays and spare capacity
C	28.5 to 42.4	Satisfactory
D	42.5 to 56.4	Operating near capacity
E	56.5 to 70.4	At capacity, at signals incidents will cause excessive delays. Roundabouts require other control method.
F	70.5 or greater	At capacity, at signals incidents will cause excessive delays. Roundabouts require other control method.

Source: Roads and Maritime Services (2002), Traffic Modelling Guidelines

In addition, the following measure of performance is included to complement Level of Service:

– **Degree of Saturation (DoS):** a measure of the volume/capacity for the worst turning movement at the intersection. DoS is 1 implies the turning movement is at capacity.

5.1.3 Traffic generation

The delivery of Road No. 1 itself does not generate any additional traffic above that assessed and approved in the Hills Showground SSDA. Road No.1 would facilitate access to the Precinct East residential development that would generate 172 and 138 car trips during the AM and PM peak hours.

Given the proposed 857 units and 16 townhouses in Precinct East (as approved in Hills Showground SSDA), the expected car trips are estimated using trip rates approved in the SSDA, as shown in **Table 5-2**.

Table 5-2 Car trip generation

Land use	Yields	Trip generation rates	AM peak hour	PM peak hour
Residential apartment	857 dwellings	0.19 (AM) / 0.15 (PM) trips per dwelling	163 trips	129 trips
Townhouse	16 dwellings	0.55 trips per dwelling	9 trips	9 trips
Total	**-**		**172 trips**	**138 trips**

Source: SCT Consulting, 2021

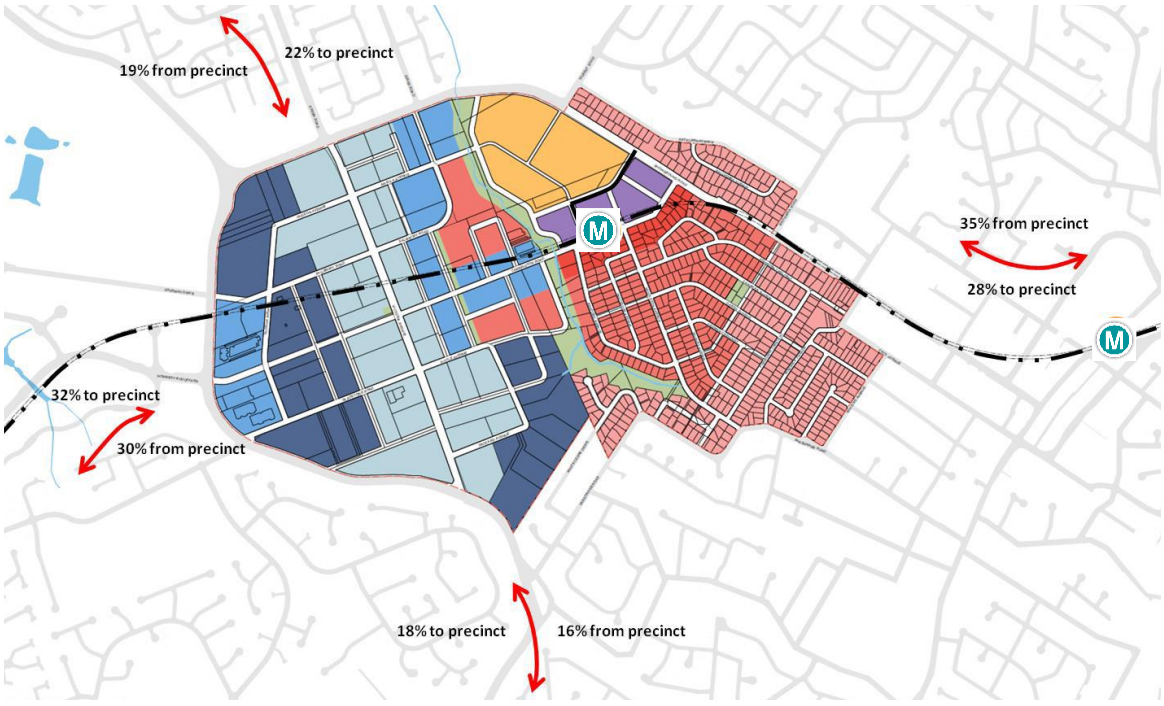
The neighbourhood park is a recreational facility within walking distance of the wider Hills Showground Precinct, hence it is not expected to be generating large volumes of traffic. Most park users will be walking or cycling to the park. Given the availability of the 15 parking spaces along Road No. 1, it is estimated the park could be generating up to 15 trips per hour (during the peak hours assessed) as a worst-case assuming park users who drive to the park would tend to stay longer for up to an hour.

The flow diagram of the future year 2026 and 2031 are shown in **Appendix B**.

5.1.4 Traffic distribution

The traffic distribution was adopted from the Transport for NSW transport plan, which has the best distribution information available in the area as it accounts for the benefits of Sydney Metro. The trip distribution pattern was used for the SSDA traffic assessment and is shown in **Figure 5–1**.

Figure 5–1 Showground Station Precinct Transport Plan trip distribution



Source: Transport for NSW, 2019

5.2 Road network assessment

Given the traffic modelling is generally consistent with the approved Hills Showground SSDA with minor rerouting associated with the proposed left-in left-out intersections at both ends of Road No. 1, the intersections assessed for this study will include a total of eight intersections in the close vicinity of Precinct East:

– De Clambe Drive / Road No.1 (new intersection)

– De Clambe Drive / Andalusian Way (new intersection)

– Mandala Parade / Andalusian Way / Road No. 1 (new intersection)

– Carrington Road / Andalusian Way

– Showground Road / Carrington Road

– Showground Road / De Clambe Drive

– Carrington Road / Doran Drive

– Carrington Road / De Clambe Drive.

The proposed two-way shared zone deviates from a one-way westbound shared zone identified in *Hills Showground Station Precinct Urban Design Guidelines*. The intent of the one-way shared zone was to reduce traffic volumes, minimising vehicles and pedestrian conflicts at this location. The limited traffic (up to 94 vehicle trips during the 2031 AM peak hour) using the shared zone at this location are below the limit of 100 vehicles per hour or 1,000 vehicles per day. It meets the TfNSW warrant for a shared zone.

The AM and PM peak hour intersection performance are summarised in **Table 5-3**.

Table 5-3 Intersection performance

Intersection	AM Peak			PM Peak		
	Delay	LoS	DoS	Delay	LoS	DoS
Future year 2026						
De Clambe Drive / Road No.1	4.2s	A	0.08	4.2s	A	0.24
De Clambe Drive / Andalusian Way	5.2s	A	0.13	6s	A	0.27
Showground Road / Carrington Road	19.9s	B	0.52	27.8s	B	0.76
Showground Road / De Clambe Drive	7.4s	A	0.65	7.5s	A	0.66
Carrington Road / Andalusian Way	24.3s	B	0.67	25s	B	0.73
Mandala Parade / Andalusian Way / Road No. 1	8.3s	A	0.10	8.3s	A	0.20
Carrington Road / Doran Drive	15.5s	B	0.54	19.1s	B	0.73
Carrington Road / De Clambe Drive	4.7s	A	0.29	8.6s	A	0.99
Future year 2031						
De Clambe Drive / Road No.1	4.2s	A	0.09	4.2s	A	0.30
De Clambe Drive / Andalusian Way	5.4s	A	0.17	6.4s	A	0.33
Showground Road / Carrington Road	23s	B	0.79	36.1s	C	0.89
Showground Road / De Clambe Drive	9.6s	A	0.75	8.9s	A	0.79
Carrington Road / Andalusian Way	24.8s	B	0.78	28.5s	C	0.85
Mandala Parade / Andalusian Way / Road No. 1	8.3s	A	0.12	8.4s	A	0.25
Carrington Road / Doran Drive	19.4s	B	0.62	24.1s	A	0.85
Carrington Road / De Clambe Drive	4.7s	A	0.33	4.7s	A	0.61

Source: SCT Consulting, 2021

As shown in **Table 5-3**, all eight intersections would operate satisfactorily with LoS B and above (except an LoS C for Showground Road / Carrington Road and Carrington Road / Andalusian Way at PM peak hour in 2031). The detailed SIDRA movement summary for each intersection is included in **Appendix C**.

5.3 Pedestrian crossing warrants

A zebra pedestrian crossing is also proposed at Andalusian Way (just north of Road No.1 and Mandala Parade) to facilitate safe crossing opportunities between Precinct East and Hills Showground Station. Justification for the zebra crossing is provided below.

Based on *Supplement to Austroads Guide to Traffic Management Part 10: Traffic Control and Communication Devices (2016)* by Roads and Maritime Services, the practice for numerical warrants for pedestrian (zebra) crossings is, in each of three separate one hour periods in a typical day:

– The pedestrian flow per hour (P) crossing the road is greater than or equal to 30 and

– The vehicular flow per hour (V) through the site is greater than or equal to 500 and

– The product PV is greater than or equal to 60,000.

Based on the 873 dwellings approved for the Precinct East, it is expected around 370 and 324 public transport-related trips would be forecast for the AM and PM peak hours respectively. The majority of the residents would use this location for crossing to access public transport. The pedestrian volumes expected to be crossing at this location would even be higher if we account for the residential catchment on the other side of Showground Road accessing the station and bus interchange.

The mid-block volume on Andalusian Way is 382 and 602 vehicles during the 2031 AM and PM peak hours, respectively.

5.3.1 Pedestrian demand

Usually, during a typical 3.5-hour pedestrian movement analysis, 55 per cent of the total demand would take place in the peak one hour, and each of the remaining hour would account for around 18 per cent assuming an average distribution. Hence, the hourly pedestrian demand for the three hours in the pm period would be 106 (3:00-4:00 pm), 106 (4:00-5:00 pm) and 324 (5:00-6:00 pm).

5.3.2 Vehicle demand

Based on the SCATS data collected on 18 Jun 2019 for the intersection of Andalusian Way/Carrington Road, the demand for PM peak hour (602 vehicles) was factored to the other two hours based on the daily variation profile. Hence, the vehicle demand would be 575 (3:00-4:00 pm), 644 (4:00-5:00 pm) and 602 (5:00-6:00 pm).

Table 5-4 summarises the warrants review and confirms that pedestrian crossing is warranted at the north leg of the Andalusian Way/Mandala Parade intersection.

Table 5-4 Pedestrian crossing warrants

Time period	Criteria	3:00-4:00 pm	4:00-5:00 pm	5:00-6:00 pm	Meet criteria?
Pedestrian demand (P)	≥30	106	106	324	Yes
Vehicle demand (V)	≥500	575	644	602	Yes
P x V	≥60,000	60,894	68,226	194,808	Yes

Source: SCT Consulting, 2021

It is acknowledged that crossings in local streets do not require to meet warrants. However, being located close to public transport interchange and services, there would be high pedestrian activities around the proposed pedestrian crossing, resulting in potential conflicts between pedestrians and vehicles. A pedestrian crossing would bring safety benefits and promote sustainable transport mode share.

6.0 Conclusion

6.1 Conclusion

The proposed development follows the approval of the concept SSDA and includes a new road (between De Clambe Drive and the intersection of Mandala Parade / Andalusian Way) that will provide vehicular access to and from future residential development lots and Precinct East Park. In summary:

- The alignment and cross-section of the proposed road are generally consistent with what has been specified in the UDG.
- Left-in left-out intersection treatment is proposed at intersections of Road No.1 / De Clambe Drive and Road No.1 / Andalusian Way / Mandala Parade, to minimise vehicular conflicts by reducing traffic movements at the 4-way intersection with Andalusian Way / Mandala Parade and to avoid conflicts with bus lane at De Clambe Drive.
- The delivery of Road No. 1 itself does not generate any additional traffic above that assessed and approved in the Hills Showground SSDA. Road No.1 would facilitate access to the Precinct East residential development that would generate 172 and 138 car trips during the AM and PM peak hours. The park could be generating up to 15 trips per hour as a worst case assuming park users who drive to access the park would tend to stay longer for up to an hour.
- The proposed Road No. 1 has a two-way shared zone close to Andalusian Way, which deviates from a one-way westbound shared zone identified in *Hills Showground Station Precinct Urban Design Guidelines*. The limited traffic (up to 94 vehicle trips during the 2031 AM peak hour) using the shared zone at this location are below the limit of 100 vehicles per hour or 1,000 vehicles per day. It meets the TfNSW warrant for a shared zone.
- For both scenarios in 2026 and 2031, all eight intersections in the vicinity of the site would operate satisfactorily with an LoS B and above (except an LoS C for Showground Road / Carrington Road and Carrington Road / Andalusian Way at PM peak hour in 2031).
- This development application is considered compliant with the requirement in the Development Consent associated with the approved SSDA.

6.2 Compliance with Development Consent

Development consent was issued together with the approval of Hills Showground SSDA. The key transport matters raised for consideration in any subsequent DA are outlined in **Table 6-1**. This development application is considered compliant with the requirement in the Development Consent.

Table 6-1 Issued development consent – key transport matters

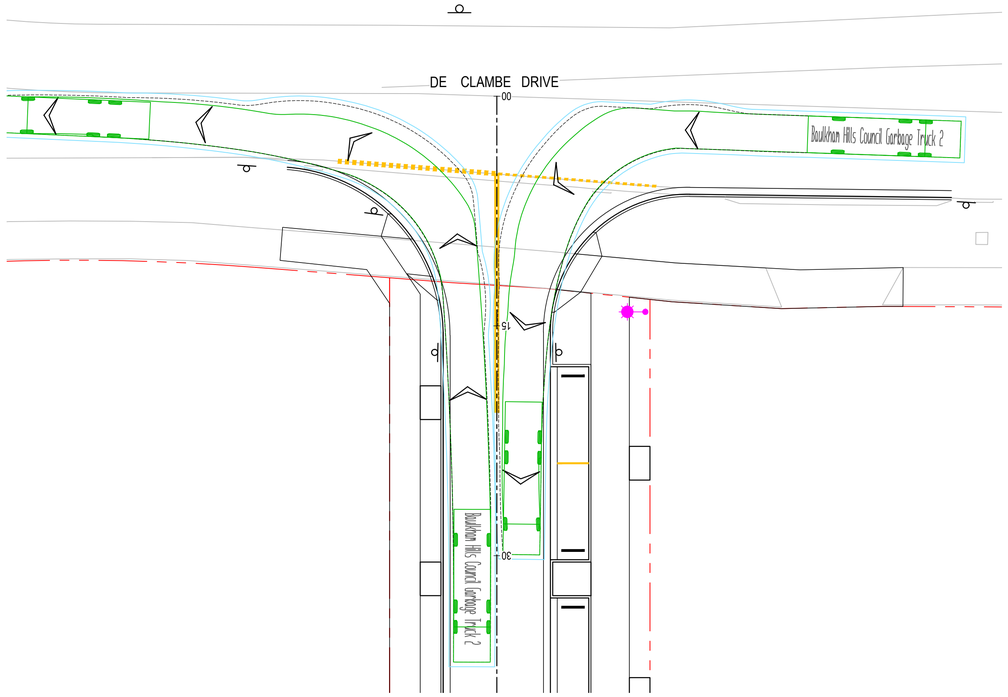
No.	Requirement	Response
C6	The rates of car parking and bicycle parking spaces for future development applications are to be in accordance with the maximum rates and caps established under the Urban Design Guidelines endorsed pursuant to Condition B1, i.e. Prior to the lodgement of the first detailed development application, the Applicant shall revise the Urban Design Guidelines to the satisfaction of the Planning Secretary as follows: – remove the visitor car parking rates for Doran Drive Precinct and Precinct West – impose a maximum visitor car parking cap of 43 spaces for Precinct East – impose a maximum cap of residential car spaces of 1,663 for the site (inclusive of residential car spaces and residential visitor car spaces) or the maximum residential car parking rates, whichever is lower – include provisions to accommodate shared parking arrangements for the visitor and non-residential car parking spaces.	Not relevant for this DA

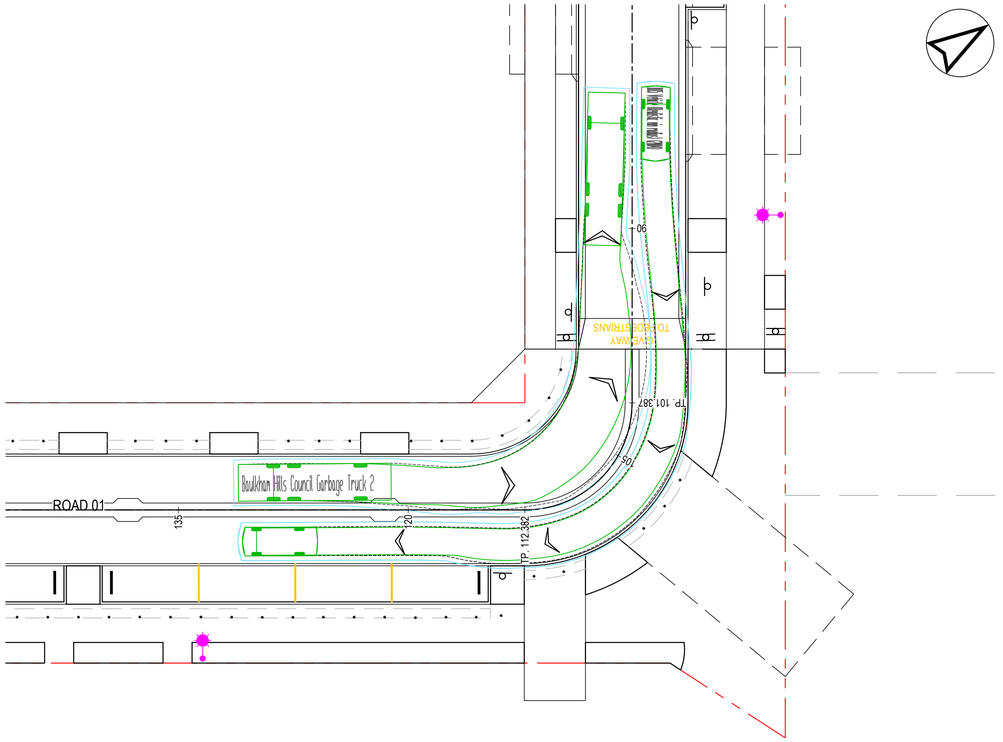
No.	Requirement	Response
C7	Future development applications shall be accompanied by a Green Travel Plan consistent with the framework and initiatives in Section 4.3 of the Traffic and Transport Impact Statement dated 16 September 2020 prepared by SCT Consulting.	Not relevant for this DA
C15	Future development applications shall be accompanied by detailed Traffic and Transport Impact Assessment.	Addressed in this report
C16	Future development applications shall detail the timing and commitments of road network upgrades to mitigate any impacts of the development. This must include evidence of consultation and agreement with the relevant road authority on the responsibility, scope and timing of any works	This DA does not trigger any additional road network upgrade. The timing and commitments of the upgrade are consistent with what have been approved in the SSDA.
C18	Independent road safety audits are to be undertaken for all stages of detailed design involving road operations and traffic issues. Any issues identified by the audits shall be closed out in consultation with Transport for NSW and Hills Shire Council to the satisfaction of the relevant road authority.	Refer to Road Safety Audit report

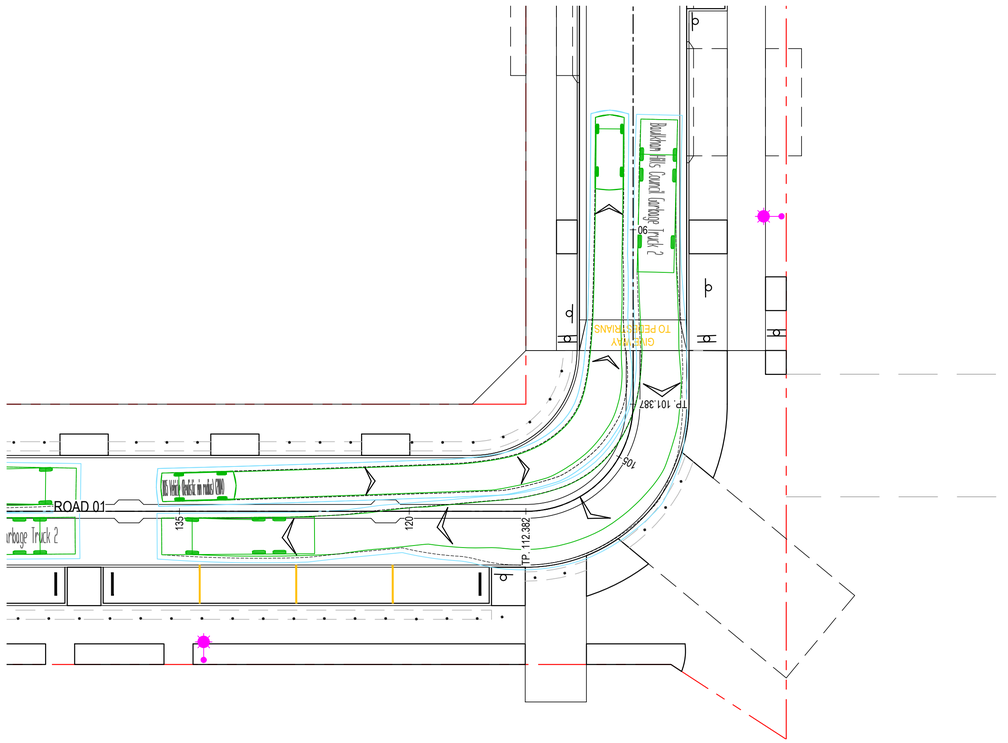
Source: SCT Consulting, 2021

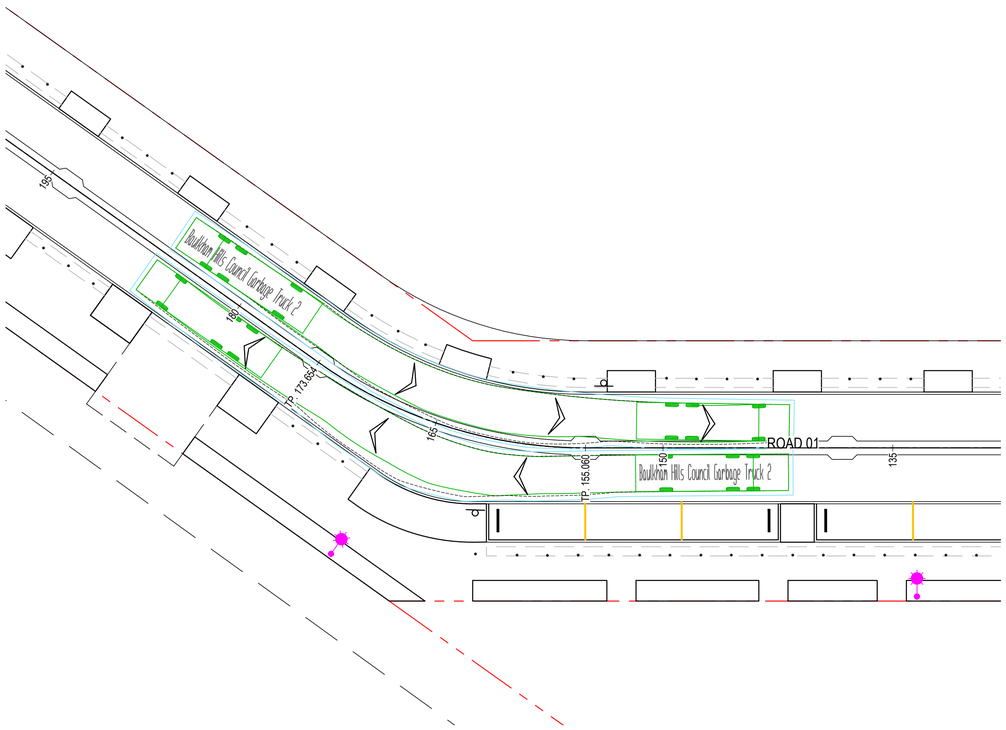
APPENDIX A

Swept path analysis









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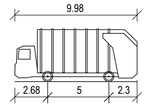
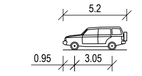


BAULKHAM HILLS COUNCIL GARBAGE TRUCK
OVERALL LENGTH 9.977M
OVERALL WIDTH 2.400M
OVERALL BODY HEIGHT 4.300M
MIN BODY GROUND CLEARANCE 0.286M
TRACK WIDTH 2.400M
LOCK-TO-LOCK TIME 1.00S
CURB TO CURB TURNING RADIUS 11.000M

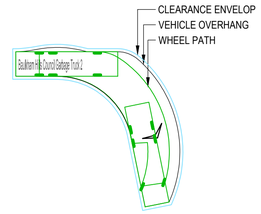
DESIGN VEHICLE

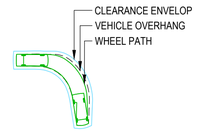


B99 VEHICLE

OVERALL LENGTH	5.200m
OVERALL WIDTH	1.940m
OVERALL BODY HEIGHT	1.878m
MIN BODY GROUND CLEARANCE	0.272m
TRACK WIDTH	1.840m
LOCK-TO-LOCK TIME	4.00s
KERB TO KERB TURNING RADIUS	6.250m

DESIGN VEHICLE





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2	02.11.21	ISSUED FOR APPROVAL	MAH	MJR
1	15.10.21	ISSUED FOR APPROVAL	MAH	MJR

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SCALE 1:200 AT ORIGINAL SIZE

LANDCOM

MAKER ENG
SURVEY DESIGN DELIVER

DRAWN: M.HULME	DESIGNED: M.HULME
DRAFT CHECK:	DESIGN CHECK: M.ROCHE
APPROVED: M.ROCHE	
NOT FOR CONSTRUCTION	

HILLS SHOWGROUND PRECINCT EAST
CASTLE HILL
SWEPT PATH LAYOUT PLAN
DESIGN VEHICLES

DRAWING NUMBER	SHEET No.	ORIG. SIZE	REVISION
MKR00157-20-C205	1 OF 4	A1	4

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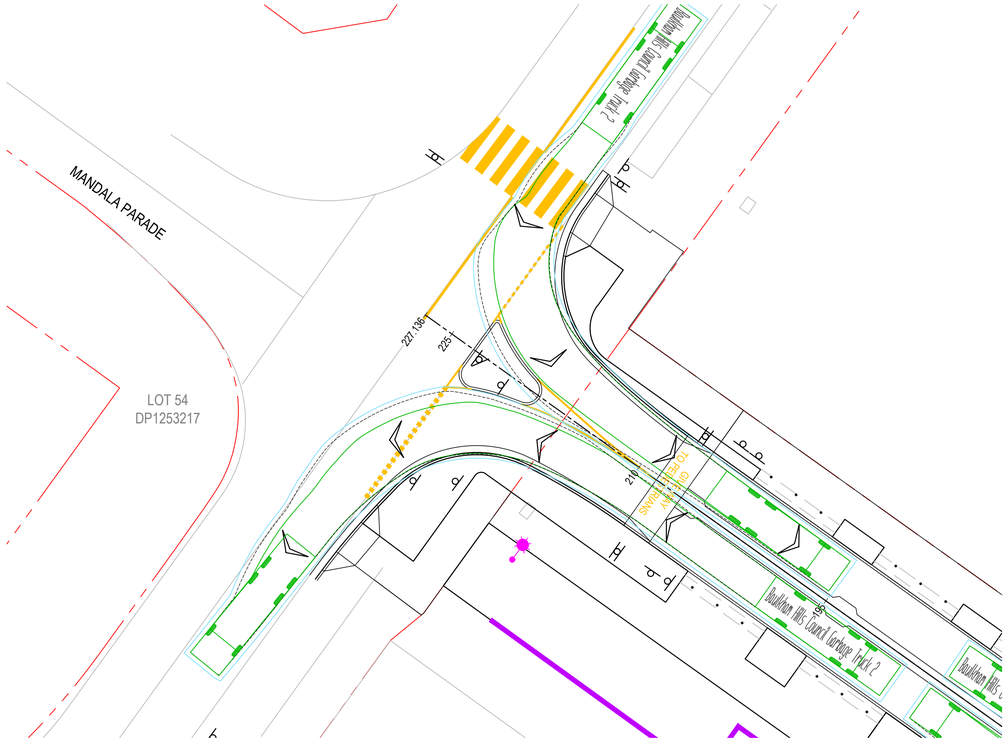

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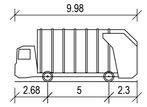

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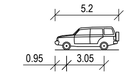

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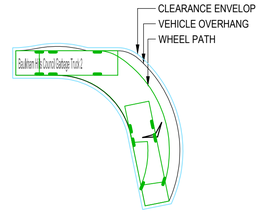

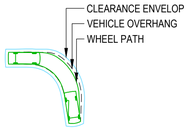

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2	02.11.21	ISSUED FOR APPROVAL	MAH	MJR
1	15.10.21	ISSUED FOR APPROVAL	MAH	MJR

0 2 4 6 8 10m
SCALE 1:200 AT ORIGINAL SIZE

LANDCOM

MAKER ENG
SURVEY DESIGN DELIVER

DRAWN: M.HULME	DESIGNED: M.HULME
DRAFT CHECK:	DESIGN CHECK: M.ROCHE
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NOT FOR CONSTRUCTION	

HILLS SHOWGROUND PRECINCT EAST
CASTLE HILL
SWEPT PATH LAYOUT PLAN
DESIGN VEHICLES

DRAWING NUMBER	SHEET No.	ORIG. SIZE	REVISION
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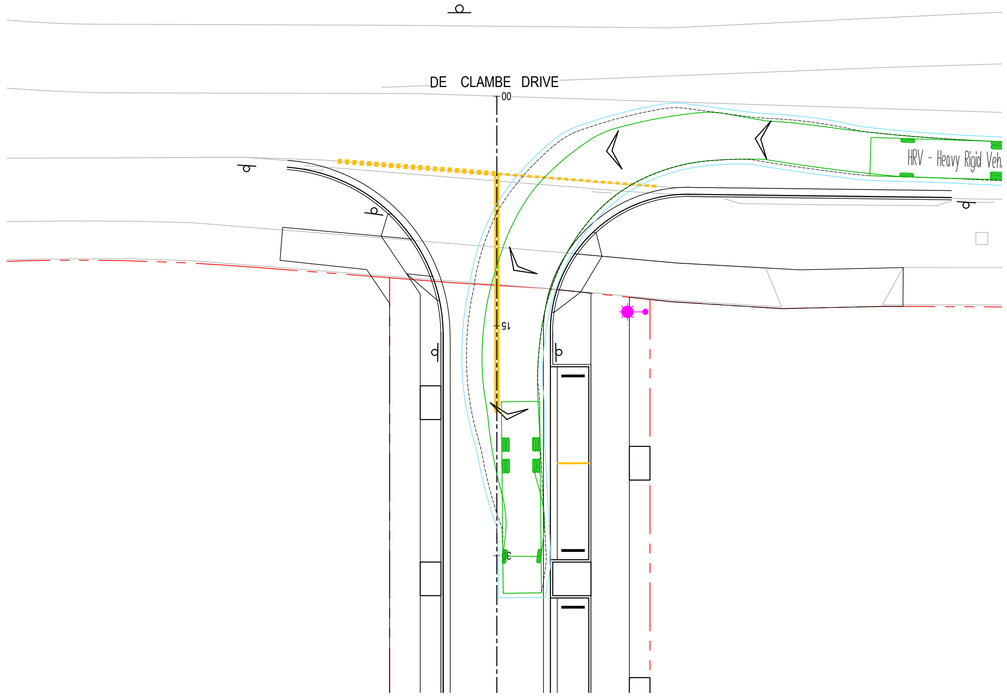

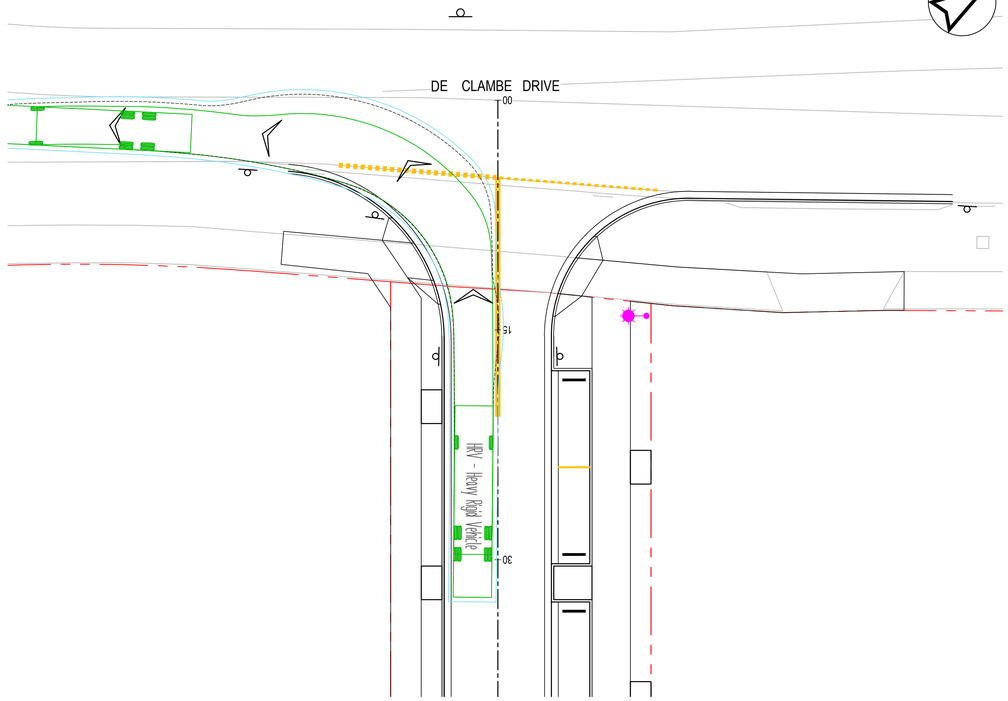

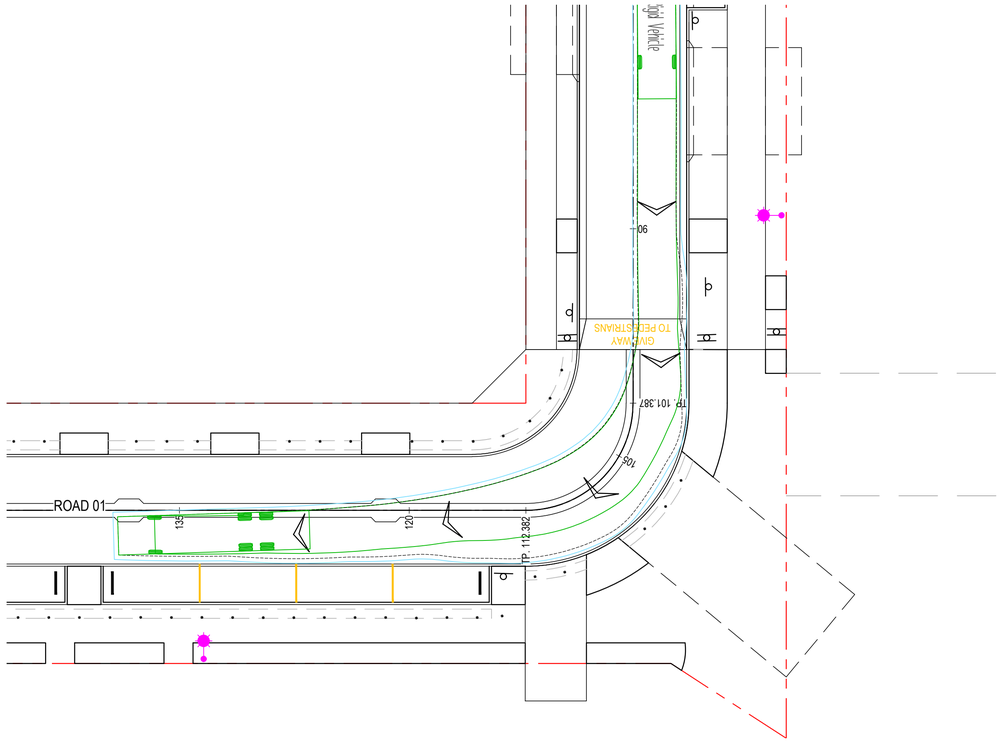

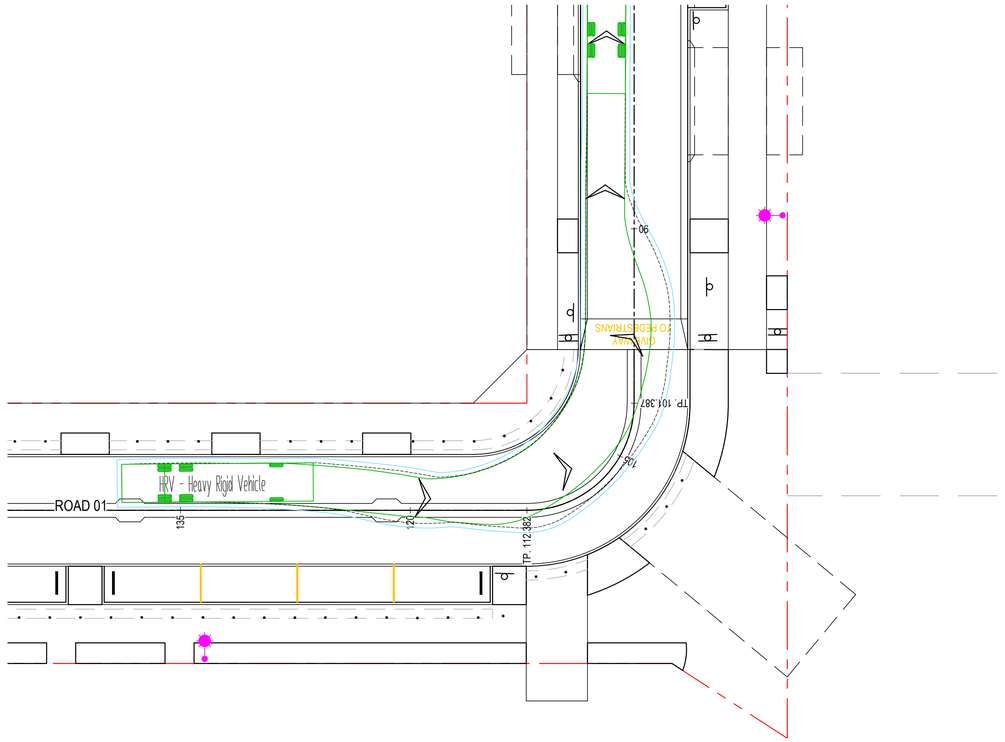

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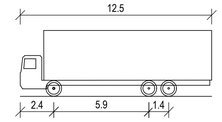
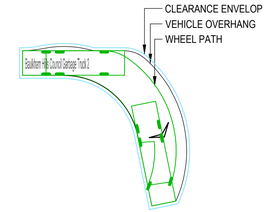


HRV - HEAVY RIGID VEHICLE	
OVERALL LENGTH	12.500m
OVERALL WIDTH	2.500m
OVERALL BODY HEIGHT	4.300m
MIN BODY GROUND CLEARANCE	0.417m
TRACK WIDTH	2.500m
LOCK-TO-LOCK TIME	6.00s
KERB TO KERB TURNING RADIUS	12.500m

CHECK VEHICLE



REV	DATE	DESCRIPTION	AMD BY	APP BY
4	08.11.21	ISSUED FOR APPROVAL	MR	MJR
3	04.11.21	ISSUED FOR APPROVAL	MAH	MJR
2	02.11.21	ISSUED FOR APPROVAL	MAH	MJR
1	15.10.21	ISSUED FOR APPROVAL	MAH	MJR

0 2 4 6 8 10m
SCALE 1:200 AT ORIGINAL SIZE

LANDCOM

MAKER ENG
SURVEY DESIGN DELIVER

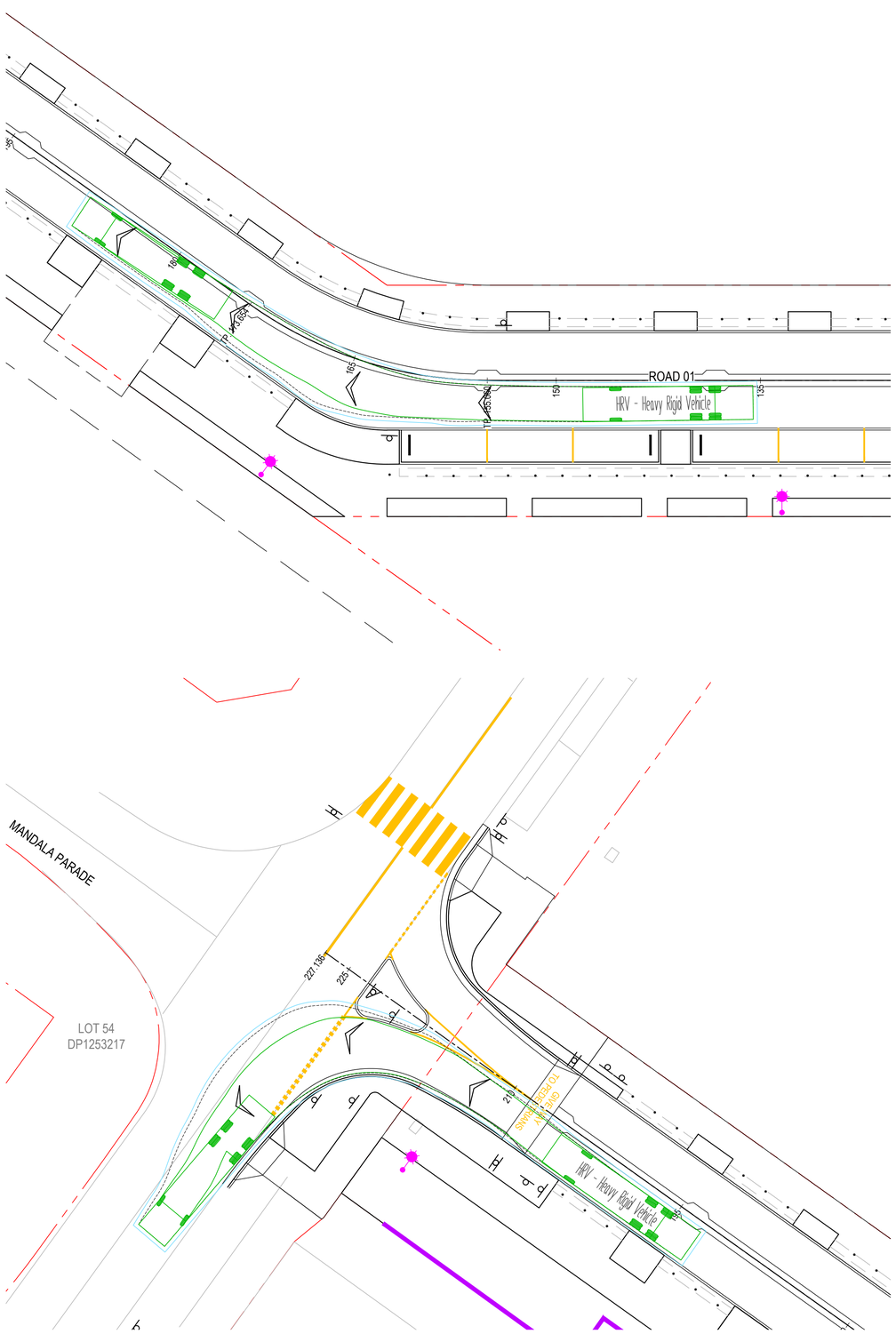
DRAWN: M.HULME	DESIGNED: M.HULME
DRAFT CHECK:	DESIGN CHECK: M.ROCHE
APPROVED: M.ROCHE	
NOT FOR CONSTRUCTION	

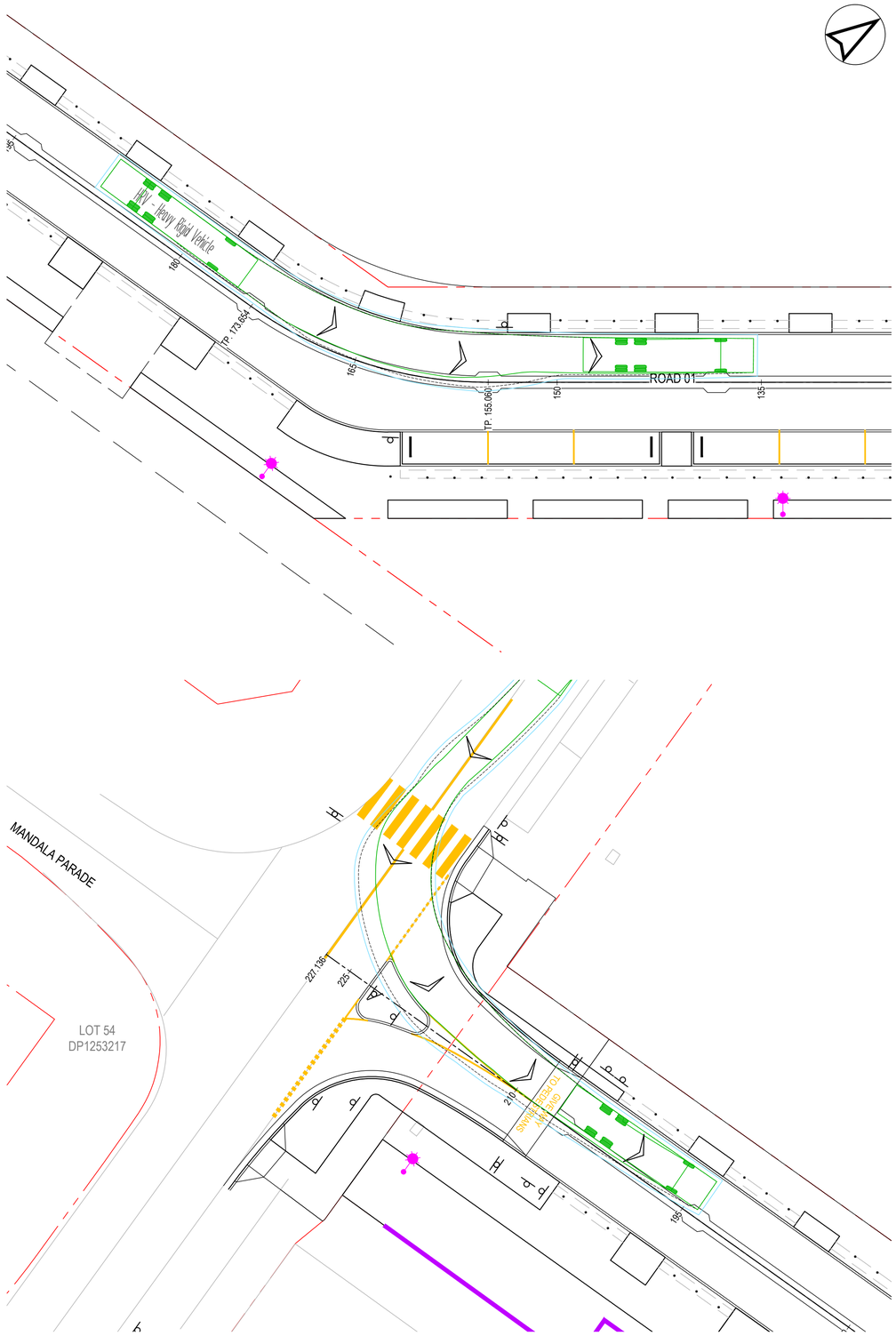
HILLS SHOWGROUND PRECINCT EAST
CASTLE HILL
SWEPT PATH LAYOUT PLAN
DESIGN VEHICLES

DRAWING NUMBER	SHEET No.	ORIG. SIZE	REVISION
MKR00157-20-C207	3 OF 4	A1	4

Mark Ruscoe, 11/8/2021 4:45 PM

G:\MKR00157 Hills Showground Recinct East & Road DA\20 Drawings\20 DA\MKR00157-20-C207.dwg





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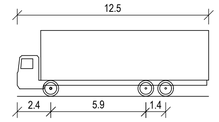
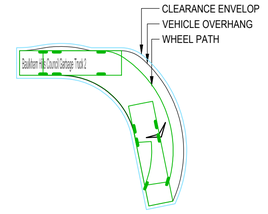


HRV - HEAVY RIGID VEHICLE	
OVERALL LENGTH	12.500m
OVERALL WIDTH	2.500m
OVERALL BODY HEIGHT	4.300m
MIN BODY GROUND CLEARANCE	0.417m
TRACK WIDTH	2.500m
LOCK-TO-LOCK TIME	6.00s
KERB TO KERB TURNING RADIUS	12.500m

CHECK VEHICLE



REV	DATE	DESCRIPTION	AMD BY	APP BY
4	08.11.21	ISSUED FOR APPROVAL	MR	MJR
3	04.11.21	ISSUED FOR APPROVAL	MAH	MJR
2	02.11.21	ISSUED FOR APPROVAL	MAH	MJR
1	15.10.21	ISSUED FOR APPROVAL	MAH	MJR

0 2 4 6 8 10m
SCALE 1:200 AT ORIGINAL SIZE

LANDCOM

MAKER ENG
SURVEY DESIGN DELIVER

DRAWN: M.HULME	DESIGNED: M.HULME
DRAFT CHECK:	DESIGN CHECK: M.ROCHE
APPROVED: M.ROCHE	
NOT FOR CONSTRUCTION	

HILLS SHOWGROUND PRECINCT EAST
CASTLE HILL
SWEPT PATH LAYOUT PLAN
DESIGN VEHICLES

DRAWING NUMBER	SHEET No.	ORIG. SIZE	REVISION
MKR00157-20-C208	4 OF 4	A1	4

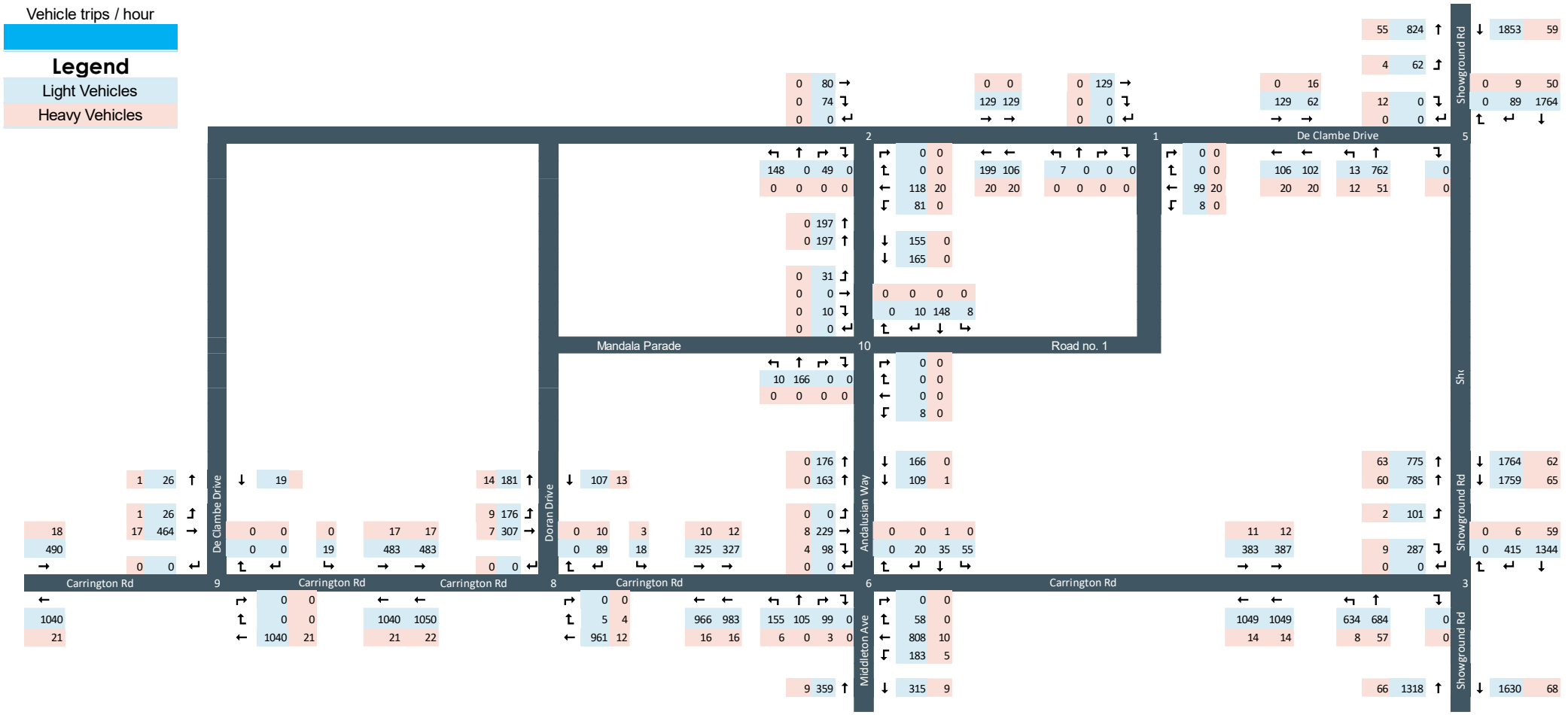
Mark Ruscoe, 11/8/2021 4:45 PM

G:\MKR00157 Hills Showground Recinct East & Road DA\20 Drawings\20 DA\MKR00157-20-C208.dwg

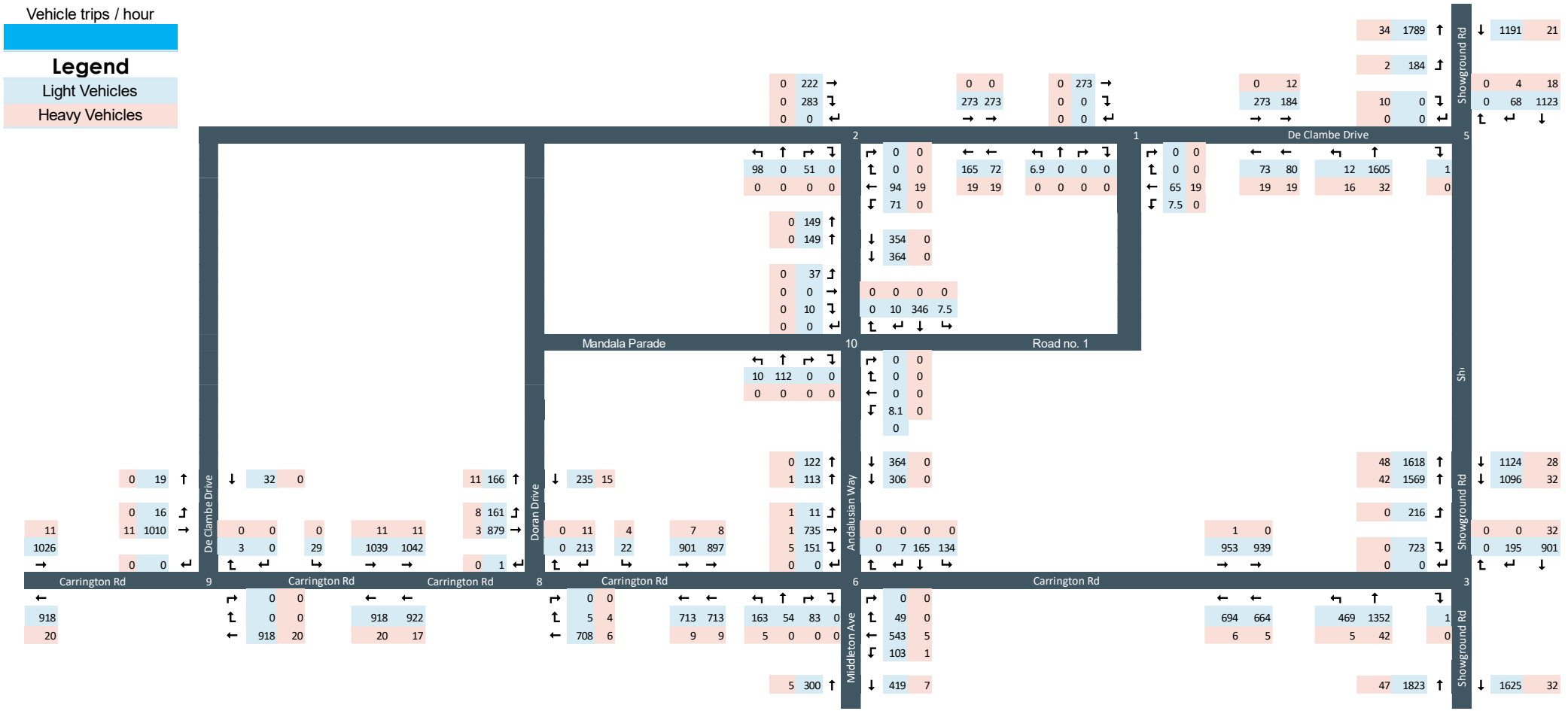
APPENDIX B

Flow diagram

2026 AM


Vehicle trips / hour
Legend
Light Vehicles
Heavy Vehicles
De Clambe Drive
Mandala Parade
Road no. 1
Carrington Rd
Doran Drive
Andalusian Way
Middleton Ave
Showground Rd

2026 PM


Vehicle trips / hour
Legend
Light Vehicles
Heavy Vehicles
De Clambe Drive
Showground Rd
Mandala Parade
Road no. 1
Doran Drive
Andalusian Way
Middleton Ave
Carrington Rd
1
2
3
5
6
8
9
10

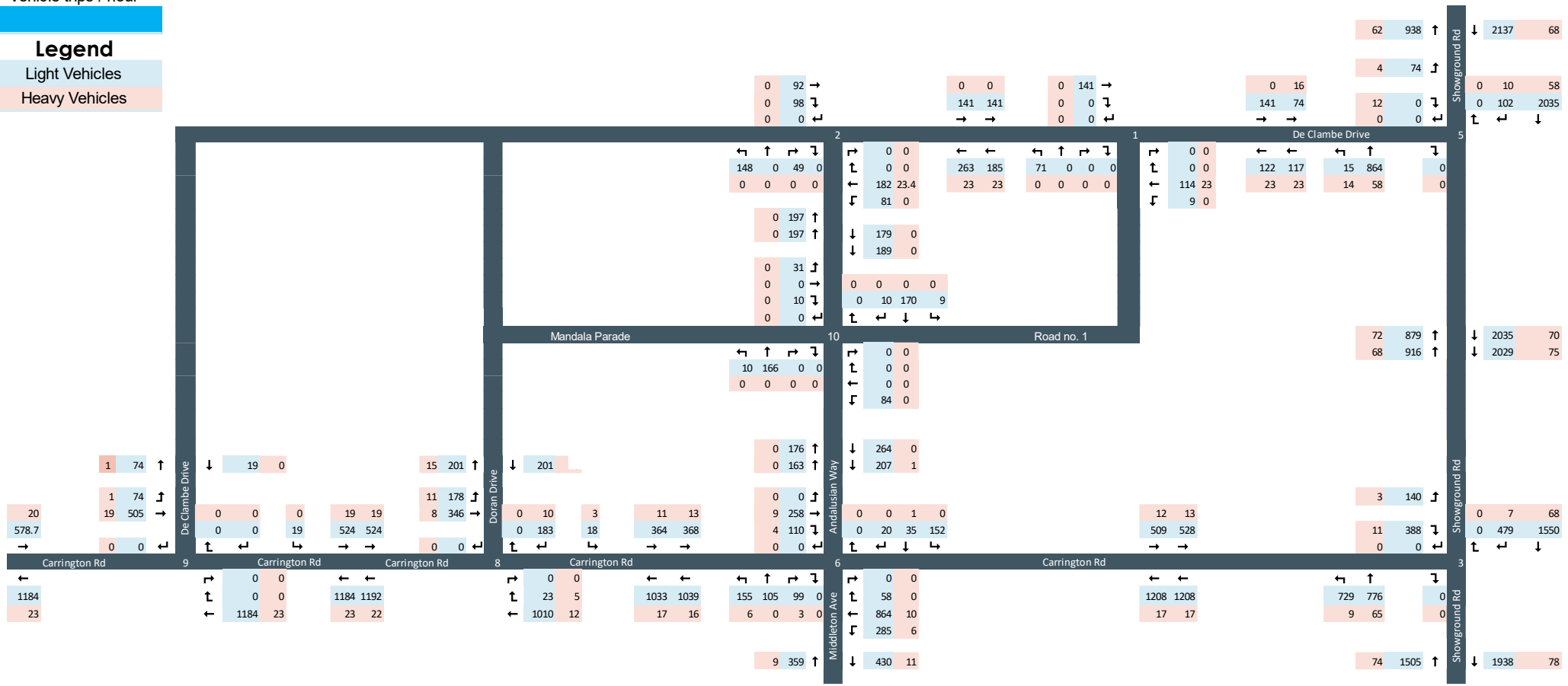
2031 AM

Vehicle trips / hour

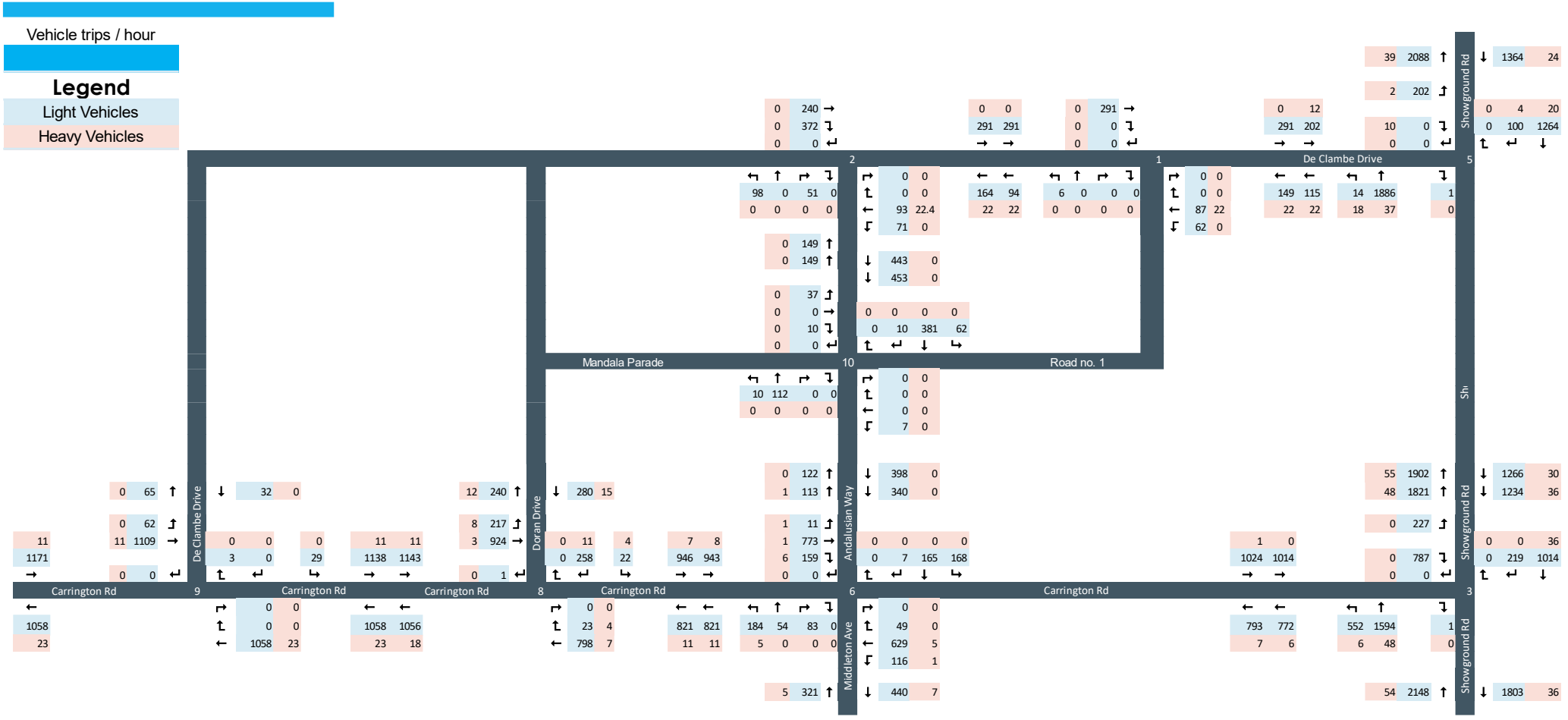
Legend

Light Vehicles

Heavy Vehicles



2031 PM


Vehicle trips / hour
Legend
Light Vehicles
Heavy Vehicles
De Clambe Drive
Doran Drive
Andalusian Way
Middleton Ave
Showground Rd
Mandala Parade
Road no. 1
Carrington Rd
1
2
3
5
6
8
9
10

APPENDIX C

SIDRA output

MOVEMENT SUMMARY

Site: 1AM [1AM De Clambe Drive/ Road No.1 2026]

Network: N101 [Network_am]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Road No.1														
1	L2	7	0.0	7	0.0	0.004	4.1	LOS A	0.0	0.1	0.23	0.47	0.23	25.2
Approach		7	0.0	7	0.0	0.004	4.1	LOS A	0.0	0.1	0.23	0.47	0.23	25.2
NorthEast: De Clambe Drive (e)														
4	L2	8	0.0	8	0.0	0.076	4.2	LOS A	0.0	0.0	0.00	0.03	0.00	39.9
5	T1	125	16.8	125	16.8	0.076	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	47.0
Approach		134	15.7	134	15.7	0.076	0.3	NA	0.0	0.0	0.00	0.03	0.00	46.1
SouthWest: De Clambe Drive (w)														
11	T1	136	0.0	136	0.0	0.070	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		136	0.0	136	0.0	0.070	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.0
All Vehicles		277	7.6	277	7.6	0.076	0.2	NA	0.0	0.1	0.01	0.03	0.01	47.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2AM [2AM De Clambe Drive/ Andalusian Way 2026]

Network: N101 [Network_am]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Andalusian Way (N)														
1	L2	156	0.0	156	0.0	0.123	5.0	LOS A	0.5	3.6	0.24	0.54	0.24	36.8
3	R2	52	0.0	52	0.0	0.123	5.2	LOS A	0.5	3.6	0.24	0.54	0.24	29.5
Approach		207	0.0	207	0.0	0.123	5.0	LOS A	0.5	3.6	0.24	0.54	0.24	35.7
East: De Clambe Drive (E)														
4	L2	85	0.0	85	0.0	0.127	4.6	LOS A	0.0	0.0	0.00	0.20	0.00	38.6
5	T1	145	14.5	145	14.5	0.127	0.0	LOS A	0.0	0.0	0.00	0.20	0.00	44.7
Approach		231	9.1	231	9.1	0.127	1.7	NA	0.0	0.0	0.00	0.20	0.00	43.4
West: De Clambe Drive (W)														
11	T1	84	0.0	84	0.0	0.084	0.4	LOS A	0.4	2.7	0.30	0.27	0.30	37.6
12	R2	78	0.0	78	0.0	0.084	5.2	LOS A	0.4	2.7	0.30	0.27	0.30	37.6
Approach		162	0.0	162	0.0	0.084	2.7	NA	0.4	2.7	0.30	0.27	0.30	37.6
All Vehicles		600	3.5	600	3.5	0.127	3.1	NA	0.5	3.6	0.16	0.33	0.16	38.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 3AM [3AM Showground Rd/Carrington Rd 2026]

Network: N101 [Network_am]

TCS2666
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Network Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Showground Road (South East)														
21	L2	676	1.2	676	1.2	0.522	14.5	LOS B	18.3	129.7	0.51	0.75	0.51	27.6
22	T1	780	7.7	780	7.7	0.456	23.7	LOS B	15.5	115.3	0.73	0.64	0.73	20.8
Approach		1456	4.7	1456	4.7	0.522	19.4	LOS B	18.3	129.7	0.63	0.69	0.63	23.5
NorthWest: Showground Road (North West)														
28	T1	1477	4.2	1477	4.2	0.455	3.5	LOS A	8.0	58.2	0.21	0.19	0.21	52.3
29	R2	443	1.4	443	1.4	0.510	52.0	LOS D	11.6	82.5	0.94	0.81	0.94	11.7
Approach		1920	3.6	1920	3.6	0.510	14.7	LOS B	11.6	82.5	0.38	0.33	0.38	35.5
SouthWest: Carrington Road														
30	L2	108	1.9	108	1.9	0.135	25.6	LOS B	3.7	26.4	0.63	0.69	0.63	22.2
32	R2	312	3.0	312	3.0	0.449	51.4	LOS D	8.2	58.8	0.93	0.80	0.93	19.9
Approach		420	2.8	420	2.8	0.449	44.8	LOS D	8.2	58.8	0.85	0.77	0.85	20.3
All Vehicles		3796	3.9	3796	3.9	0.522	19.9	LOS B	18.3	129.7	0.53	0.52	0.53	28.5

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P7	NorthWest Full Crossing	11	54.2	LOS E	0.0	0.0	0.95	0.95
P8	SouthWest Full Crossing	11	54.2	LOS E	0.0	0.0	0.95	0.95
P8B	SouthWest Slip/Bypass Lane Crossing	11	54.2	LOS E	0.0	0.0	0.95	0.95
All Pedestrians		32	54.2	LOS E			0.95	0.95

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

MOVEMENT SUMMARY

Site: 5AM [5AM Showground Rd/ De Clambe Drive 2026]

Network: N101 [Network_am]

TCS4569
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Network Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Showground Road (South East)														
21	L2	26	48.0	26	48.0	0.031	13.7	LOS A	0.6	6.4	0.54	0.66	0.54	28.8
22	T1	861	6.8	861	6.8	0.402	7.5	LOS A	9.0	66.5	0.29	0.26	0.29	47.6
Approach		887	8.1	887	8.1	0.402	7.7	LOS A	9.0	66.5	0.30	0.27	0.30	46.9
NorthWest: Showground Road (North West)														
28	T1	1909	2.8	1909	2.8	0.652	5.7	LOS A	23.7	169.6	0.47	0.44	0.47	44.6
29	R2	103	9.2	103	9.2	0.189	12.7	LOS A	2.2	16.7	0.44	0.68	0.44	34.1
Approach		2013	3.1	2013	3.1	0.652	6.0	LOS A	23.7	169.6	0.47	0.45	0.47	43.9
SouthWest: De Clambe Drive														
30	L2	69	6.1	69	6.1	0.140	40.0	LOS C	3.1	22.7	0.80	0.73	0.80	19.1
32	R2	5	100.0	5	100.0	0.095	67.9	LOS E	0.3	4.2	0.98	0.66	0.98	3.7
Approach		75	12.7	75	12.7	0.140	42.0	LOS C	3.1	22.7	0.81	0.72	0.81	17.8
All Vehicles		2975	4.8	2975	4.8	0.652	7.4	LOS A	23.7	169.6	0.43	0.40	0.43	43.5

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P7	NorthWest Full Crossing	11	54.2	LOS E	0.0	0.0	0.95	0.95
P8	SouthWest Full Crossing	11	54.2	LOS E	0.0	0.0	0.95	0.95
All Pedestrians		21	54.2	LOS E			0.95	0.95

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

MOVEMENT SUMMARY

Site: 6AM [6AM Carrington Rd/ Middleton Ave/ Andalusian Way 2026]

Network: N101 [Network_am]

TCS4700
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Middleton Avenue														
1	L2	169	3.7	169	3.7	0.596	31.0	LOS C	14.1	101.0	0.88	0.81	0.88	19.4
2	T1	111	0.0	111	0.0	0.596	26.4	LOS B	14.1	101.0	0.88	0.81	0.88	19.4
3	R2	107	2.9	107	2.9	0.596	31.0	LOS C	14.1	101.0	0.88	0.81	0.88	19.4
Approach		387	2.4	387	2.4	0.596	29.7	LOS C	14.1	101.0	0.88	0.81	0.88	19.4
East: Carrington Road (East)														
4	L2	198	2.7	198	2.7	0.670	26.5	LOS B	20.1	142.6	0.86	0.79	0.86	30.1
5	T1	861	1.2	861	1.2	0.670	21.2	LOS B	20.1	142.6	0.85	0.77	0.85	23.5
6	R2	61	0.0	61	0.0	0.670	25.3	LOS B	18.9	133.4	0.84	0.76	0.84	24.0
Approach		1120	1.4	1120	1.4	0.670	22.4	LOS B	20.1	142.6	0.85	0.77	0.85	25.1
North: Andalusian Way														
7	L2	58	0.0	58	0.0	0.190	26.9	LOS B	3.7	25.8	0.75	0.69	0.75	7.8
8	T1	38	2.8	38	2.8	0.190	23.0	LOS B	3.7	25.8	0.75	0.69	0.75	23.3
9	R2	21	0.0	21	0.0	0.190	26.9	LOS B	3.7	25.8	0.75	0.69	0.75	7.8
Approach		117	0.9	117	0.9	0.190	25.6	LOS B	3.7	25.8	0.75	0.69	0.75	14.5
West: Carrington Road (West)														
10	L2	1	0.0	1	0.0	0.286	20.4	LOS B	6.7	48.5	0.65	0.56	0.65	21.0
11	T1	249	3.4	249	3.4	0.286	15.8	LOS B	6.7	48.5	0.65	0.56	0.65	21.0
12	R2	107	3.9	107	3.9	0.642	42.9	LOS D	4.8	34.4	0.96	0.86	1.06	19.8
Approach		358	3.5	358	3.5	0.642	24.0	LOS B	6.7	48.5	0.75	0.65	0.78	20.4
All Vehicles		1982	2.0	1982	2.0	0.670	24.3	LOS B	20.1	142.6	0.83	0.75	0.84	22.6

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	39.3	LOS D	0.1	0.1	0.94	0.94
P2	East Full Crossing	53	39.3	LOS D	0.1	0.1	0.94	0.94
P3	North Full Crossing	53	39.3	LOS D	0.1	0.1	0.94	0.94
P4	West Full Crossing	53	39.3	LOS D	0.1	0.1	0.94	0.94
All Pedestrians		211	39.3	LOS D			0.94	0.94

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

MOVEMENT SUMMARY

Site: 8AM [8AM Carrington Rd/ Doran Drive 2026]

Network: N101 [Network_am]

TCS4699
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Carrington Road (East)														
5	T1	1024	1.2	1024	1.2	0.362	4.3	LOS A	8.0	56.3	0.38	0.34	0.38	36.2
6	R2	9	44.4	9	44.4	0.362	9.8	LOS A	8.0	56.6	0.39	0.34	0.39	34.6
Approach		1034	1.6	1034	1.6	0.362	4.4	LOS A	8.0	56.6	0.38	0.34	0.38	36.2
North: Doran Drive														
7	L2	22	14.3	22	14.3	0.021	12.0	LOS A	0.4	3.2	0.44	0.58	0.44	13.2
9	R2	104	10.1	104	10.1	0.536	46.5	LOS D	4.6	34.7	0.99	0.78	0.99	4.4
Approach		126	10.8	126	10.8	0.536	40.4	LOS C	4.6	34.7	0.89	0.75	0.89	5.0
West: Carrington Road (West)														
10	L2	195	4.9	195	4.9	0.518	34.1	LOS C	9.5	68.9	0.89	0.79	0.89	10.2
11	T1	331	2.2	331	2.2	0.518	29.9	LOS C	10.1	72.2	0.89	0.76	0.89	10.4
Approach		525	3.2	525	3.2	0.518	31.4	LOS C	10.1	72.2	0.89	0.77	0.89	10.3
All Vehicles		1685	2.8	1685	2.8	0.536	15.5	LOS B	10.1	72.2	0.58	0.50	0.58	18.9

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P2	East Full Crossing	53	39.3	LOS D	0.1	0.1	0.94	0.94
P3	North Full Crossing	53	39.3	LOS D	0.1	0.1	0.94	0.94
All Pedestrians		105	39.3	LOS D			0.94	0.94

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

MOVEMENT SUMMARY

Site: 9AM [9AM Carrington Rd/ De Clambe Drive 2026]

Network: N101 [Network_am]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Carrington Rd (Northeast)														
5	T1	1119	2.0	1119	2.0	0.291	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		1119	2.0	1119	2.0	0.291	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.0
North: De Clambe Drive														
7	L2	20	0.0	20	0.0	0.015	4.5	LOS A	0.0	0.0	0.00	0.49	0.00	36.8
Approach		20	0.0	20	0.0	0.015	4.5	LOS A	0.0	0.0	0.00	0.49	0.00	36.8
West: Carrington Rd (Southwest)														
10	L2	28	3.7	28	3.7	0.021	4.7	LOS A	0.1	0.6	0.09	0.50	0.09	45.2
11	T1	508	3.5	508	3.5	0.267	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		537	3.5	537	3.5	0.267	0.3	NA	0.1	0.6	0.01	0.03	0.01	49.6
All Vehicles		1676	2.4	1676	2.4	0.291	0.2	NA	0.1	0.6	0.00	0.01	0.00	49.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 10AM [10AM Analusian Way/ Mandala Parade 2026]

Network: N101 [Network_am]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Andalusian Way (S)														
1	L2	11	0.0	11	0.0	0.096	4.0	LOS A	0.1	0.4	0.01	0.03	0.01	42.9
2	T1	175	0.0	175	0.0	0.096	0.0	LOS A	0.1	0.4	0.01	0.03	0.01	47.1
Approach		185	0.0	185	0.0	0.096	0.2	NA	0.1	0.4	0.01	0.03	0.01	46.4
East: Road No.1														
4	L2	8	0.0	8	0.0	0.004	0.3	LOS A	0.0	0.1	0.24	0.08	0.24	10.0
Approach		8	0.0	8	0.0	0.004	0.3	LOS A	0.0	0.1	0.24	0.08	0.24	10.0
North: Andalusian Way (N)														
7	L2	8	0.0	8	0.0	0.090	8.3	LOS A	0.1	1.0	0.05	0.09	0.05	11.6
8	T1	156	0.0	156	0.0	0.090	0.1	LOS A	0.1	1.0	0.05	0.09	0.05	44.9
9	R2	11	0.0	11	0.0	0.090	5.2	LOS A	0.1	1.0	0.05	0.09	0.05	41.1
Approach		175	0.0	175	0.0	0.090	0.8	NA	0.1	1.0	0.05	0.09	0.05	27.8
West: Mandala Parade (E)														
10	L2	33	0.0	33	0.0	0.028	4.0	LOS A	0.1	0.9	0.29	0.47	0.29	29.7
12	R2	11	0.0	11	0.0	0.028	4.3	LOS A	0.1	0.9	0.29	0.47	0.29	29.7
Approach		43	0.0	43	0.0	0.028	4.1	LOS A	0.1	0.9	0.29	0.47	0.29	29.7
All Vehicles		412	0.0	412	0.0	0.096	0.9	NA	0.1	1.0	0.06	0.10	0.06	26.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 1PM [1PM De Clambe Drive/ Road No.1 2026]

Network: N101 [Network_pm]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Road No.1														
1	L2	7	0.0	7	0.0	0.004	4.1	LOS A	0.0	0.1	0.19	0.47	0.19	25.5
Approach		7	0.0	7	0.0	0.004	4.1	LOS A	0.0	0.1	0.19	0.47	0.19	25.5
NorthEast: De Clambe Drive (e)														
4	L2	8	0.0	8	0.0	0.057	4.2	LOS A	0.0	0.0	0.00	0.05	0.00	39.4
5	T1	88	22.6	88	22.6	0.057	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	45.7
Approach		97	20.7	97	20.7	0.057	0.4	NA	0.0	0.0	0.00	0.05	0.00	44.7
SouthWest: De Clambe Drive (w)														
11	T1	287	0.0	287	0.0	0.240	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		287	0.0	287	0.0	0.240	0.0	NA	0.0	0.0	0.00	0.00	0.00	49.9
All Vehicles		392	5.1	392	5.1	0.240	0.2	NA	0.0	0.1	0.00	0.02	0.00	48.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2PM [2PM De Clambe Drive/ Andalusian Way 2026]

Network: N101 [Network_pm]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Andalusian Way (N)														
1	L2	103	0.0	103	0.0	0.105	4.9	LOS A	0.4	2.7	0.19	0.55	0.19	37.1
3	R2	54	0.0	54	0.0	0.105	6.0	LOS A	0.4	2.7	0.19	0.55	0.19	29.9
Approach		157	0.0	157	0.0	0.105	5.2	LOS A	0.4	2.7	0.19	0.55	0.19	35.5
East: De Clambe Drive (E)														
4	L2	75	0.0	75	0.0	0.108	4.6	LOS A	0.0	0.0	0.00	0.21	0.00	38.1
5	T1	119	16.8	119	16.8	0.108	0.0	LOS A	0.0	0.0	0.00	0.21	0.00	44.5
Approach		194	10.3	194	10.3	0.108	1.8	NA	0.0	0.0	0.00	0.21	0.00	43.0
West: De Clambe Drive (W)														
11	T1	234	0.0	234	0.0	0.270	0.5	LOS A	1.6	10.9	0.34	0.31	0.34	36.3
12	R2	298	0.0	298	0.0	0.270	5.2	LOS A	1.6	10.9	0.34	0.31	0.34	36.3
Approach		532	0.0	532	0.0	0.270	3.1	NA	1.6	10.9	0.34	0.31	0.34	36.3
All Vehicles		882	2.3	882	2.3	0.270	3.2	NA	1.6	10.9	0.24	0.33	0.24	37.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 3PM [3PM Showground Rd/Carrington Rd 2026]

Network: N101 [Network_pm]

TCS2666
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 130 seconds (Network Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Showground Road (South East)														
21	L2	499	1.1	499	1.1	0.318	7.8	LOS A	6.5	45.8	0.23	0.65	0.23	36.9
22	T1	1467	3.0	1467	3.0	0.730	25.4	LOS B	35.4	253.9	0.84	0.76	0.84	19.9
Approach		1966	2.5	1966	2.5	0.730	20.9	LOS B	35.4	253.9	0.68	0.73	0.68	22.5
NorthWest: Showground Road (North West)														
28	T1	982	3.4	982	3.4	0.338	11.8	LOS A	14.2	102.5	0.51	0.45	0.51	40.2
29	R2	205	0.0	205	0.0	0.760	75.6	LOS F	6.9	48.3	1.00	0.85	1.18	8.6
Approach		1187	2.8	1187	2.8	0.760	22.8	LOS B	14.2	102.5	0.59	0.52	0.62	29.4
SouthWest: Carrington Road														
30	L2	227	0.0	227	0.0	0.320	34.4	LOS C	10.0	70.0	0.75	0.76	0.75	18.6
32	R2	761	0.0	761	0.0	0.744	51.5	LOS D	22.3	156.2	0.97	0.87	0.99	20.0
Approach		988	0.0	988	0.0	0.744	47.6	LOS D	22.3	156.2	0.92	0.84	0.94	19.8
All Vehicles		4142	2.0	4142	2.0	0.760	27.8	LOS B	35.4	253.9	0.71	0.70	0.72	23.3

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P7	NorthWest Full Crossing	11	59.2	LOS E	0.0	0.0	0.95	0.95
P8	SouthWest Full Crossing	11	59.2	LOS E	0.0	0.0	0.95	0.95
P8B	SouthWest Slip/Bypass Lane Crossing	11	59.2	LOS E	0.0	0.0	0.95	0.95
All Pedestrians		32	59.2	LOS E			0.95	0.95

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

MOVEMENT SUMMARY

Site: 5PM [5PM Showground Rd/ De Clambe Drive 2026]

Network: N101 [Network_pm]

TCS4569
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 130 seconds (Network Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Showground Road (South East)														
21	L2	29	57.1	29	57.1	0.031	8.0	LOS A	0.2	2.2	0.16	0.59	0.16	37.3
22	T1	1728	2.3	1728	2.3	0.662	3.6	LOS A	14.1	100.3	0.21	0.19	0.21	53.3
Approach		1758	3.2	1758	3.2	0.662	3.7	LOS A	14.1	100.3	0.21	0.20	0.21	52.9
NorthWest: Showground Road (North West)														
28	T1	1201	1.6	1201	1.6	0.399	3.7	LOS A	10.6	75.1	0.31	0.28	0.31	49.0
29	R2	76	5.6	76	5.6	0.322	17.2	LOS B	2.6	18.7	0.58	0.73	0.58	29.5
Approach		1277	1.8	1277	1.8	0.399	4.5	LOS A	10.6	75.1	0.32	0.31	0.32	47.1
SouthWest: De Clambe Drive														
30	L2	196	1.1	196	1.1	0.600	58.7	LOS E	11.7	82.4	0.98	0.82	0.98	14.7
32	R2	5	100.0	5	100.0	0.103	73.8	LOS F	0.3	4.5	0.98	0.66	0.98	3.5
Approach		201	3.7	201	3.7	0.600	59.1	LOS E	11.7	82.4	0.98	0.81	0.98	14.4
All Vehicles		3236	2.7	3236	2.7	0.662	7.5	LOS A	14.1	100.3	0.30	0.28	0.30	44.9

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P7	NorthWest Full Crossing	11	59.2	LOS E	0.0	0.0	0.95	0.95
P8	SouthWest Full Crossing	11	59.2	LOS E	0.0	0.0	0.95	0.95
All Pedestrians		21	59.2	LOS E			0.95	0.95

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

MOVEMENT SUMMARY

Site: 6PM [6PM Carrington Rd/ Middleton Ave/ Andalusian Way 2026]

Network: N101 [Network_pm]

TCS4700
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Middleton Avenue														
1	L2	177	3.0	177	3.0	0.725	40.4	LOS C	13.6	96.8	0.98	0.87	1.04	16.1
2	T1	57	0.0	57	0.0	0.725	35.7	LOS C	13.6	96.8	0.98	0.87	1.04	16.1
3	R2	87	0.0	87	0.0	0.725	40.3	LOS C	13.6	96.8	0.98	0.87	1.04	16.1
Approach		321	1.6	321	1.6	0.725	39.5	LOS C	13.6	96.8	0.98	0.87	1.04	16.1
East: Carrington Road (East)														
4	L2	109	1.0	109	1.0	0.489	19.9	LOS B	14.2	100.4	0.70	0.65	0.70	34.2
5	T1	577	0.9	577	0.9	0.489	18.8	LOS B	14.2	100.4	0.75	0.68	0.75	24.9
6	R2	52	0.0	52	0.0	0.489	30.8	LOS C	8.5	59.6	0.85	0.74	0.85	21.0
Approach		738	0.9	738	0.9	0.489	19.8	LOS B	14.2	100.4	0.75	0.68	0.75	26.4
North: Andalusian Way														
7	L2	141	0.0	141	0.0	0.572	33.5	LOS C	11.7	81.6	0.91	0.79	0.91	6.6
8	T1	174	0.0	174	0.0	0.572	29.7	LOS C	11.7	81.6	0.91	0.79	0.91	20.8
9	R2	7	0.0	7	0.0	0.572	33.5	LOS C	11.7	81.6	0.91	0.79	0.91	6.6
Approach		322	0.0	322	0.0	0.572	31.5	LOS C	11.7	81.6	0.91	0.79	0.91	15.6
West: Carrington Road (West)														
10	L2	13	8.3	13	8.3	0.718	21.6	LOS B	24.1	169.4	0.82	0.74	0.82	20.1
11	T1	775	0.1	775	0.1	0.718	18.3	LOS B	24.1	169.4	0.83	0.75	0.83	19.0
12	R2	164	3.2	164	3.2	0.718	39.3	LOS C	9.6	68.4	0.95	0.89	1.06	21.2
Approach		952	0.8	952	0.8	0.718	22.0	LOS B	24.1	169.4	0.85	0.78	0.87	19.7
All Vehicles		2333	0.8	2333	0.8	0.725	25.0	LOS B	24.1	169.4	0.84	0.76	0.86	20.5

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	39.3	LOS D	0.1	0.1	0.94	0.94
P2	East Full Crossing	53	39.3	LOS D	0.1	0.1	0.94	0.94
P3	North Full Crossing	53	39.3	LOS D	0.1	0.1	0.94	0.94
P4	West Full Crossing	53	39.3	LOS D	0.1	0.1	0.94	0.94
All Pedestrians		211	39.3	LOS D			0.94	0.94

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

MOVEMENT SUMMARY

Site: 8PM [8PM Carrington Rd/ Doran Drive 2026]

Network: N101 [Network_pm]

TCS4699
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Carrington Road (East)														
5	T1	752	0.8	752	0.8	0.309	7.3	LOS A	7.3	51.6	0.47	0.41	0.47	30.5
6	R2	9	44.4	9	44.4	0.309	13.5	LOS A	7.2	51.0	0.50	0.43	0.50	29.6
Approach		761	1.4	761	1.4	0.309	7.4	LOS A	7.3	51.6	0.47	0.41	0.47	30.5
North: Doran Drive														
7	L2	27	15.4	27	15.4	0.046	20.3	LOS B	0.7	5.6	0.62	0.63	0.62	9.0
9	R2	236	4.9	236	4.9	0.730	43.1	LOS D	10.3	75.4	0.99	0.88	1.09	4.7
Approach		263	6.0	263	6.0	0.730	40.7	LOS C	10.3	75.4	0.95	0.86	1.04	4.9
West: Carrington Road (West)														
10	L2	178	4.7	178	4.7	0.711	25.0	LOS B	16.9	120.1	0.81	0.75	0.81	12.6
11	T1	928	0.3	928	0.3	0.711	21.4	LOS B	21.4	150.2	0.85	0.77	0.85	13.3
Approach		1106	1.0	1106	1.0	0.711	21.9	LOS B	21.4	150.2	0.85	0.77	0.85	13.2
All Vehicles		2131	1.8	2131	1.8	0.730	19.1	LOS B	21.4	150.2	0.73	0.65	0.74	15.6

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P2	East Full Crossing	53	39.3	LOS D	0.1	0.1	0.94	0.94
P3	North Full Crossing	53	39.3	LOS D	0.1	0.1	0.94	0.94
All Pedestrians		105	39.3	LOS D			0.94	0.94

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

MOVEMENT SUMMARY

Site: 9PM [9PM Carrington Rd/ De Clambe Drive 2026]

Network: N101 [Network_pm]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Carrington Rd (Northeast)														
5	T1	971	0.2	971	0.2	0.249	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		971	0.2	971	0.2	0.249	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.0
North: De Clambe Drive														
7	L2	31	0.0	31	0.0	0.032	4.5	LOS A	0.0	0.0	0.00	0.49	0.00	36.8
Approach		31	0.0	31	0.0	0.032	4.5	LOS A	0.0	0.0	0.00	0.49	0.00	36.8
West: Carrington Rd (Southwest)														
10	L2	17	0.0	17	0.0	0.012	4.7	LOS A	0.0	0.3	0.09	0.50	0.09	45.4
11	T1	1077	1.1	1077	1.1	0.994	8.6	LOS A	0.0	0.0	0.00	0.00	0.00	42.0
Approach		1094	1.1	1094	1.1	0.994	8.6	NA	0.0	0.3	0.00	0.01	0.00	42.0
All Vehicles		2095	0.7	2095	0.7	0.994	4.5	NA	0.0	0.3	0.00	0.01	0.00	45.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 10PM [10PM Analusian Way/ Mandala Parade 2026]

Network: N101 [Network_pm]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Andalusian Way (S)														
1	L2	11	0.0	11	0.0	0.067	4.0	LOS A	0.1	0.4	0.02	0.04	0.02	42.6
2	T1	118	0.0	118	0.0	0.067	0.0	LOS A	0.1	0.4	0.02	0.04	0.02	46.0
Approach		128	0.0	128	0.0	0.067	0.3	NA	0.1	0.4	0.02	0.04	0.02	45.2
East: Road No.1														
4	L2	8	0.0	8	0.0	0.011	0.9	LOS A	0.0	0.2	0.39	0.19	0.39	10.0
Approach		8	0.0	8	0.0	0.011	0.9	LOS A	0.0	0.2	0.39	0.19	0.39	10.0
North: Andalusian Way (N)														
7	L2	8	0.0	8	0.0	0.197	8.3	LOS A	0.5	3.6	0.03	0.04	0.03	11.6
8	T1	364	0.0	364	0.0	0.197	0.0	LOS A	0.5	3.6	0.03	0.04	0.03	47.4
9	R2	11	0.0	11	0.0	0.197	5.1	LOS A	0.5	3.6	0.03	0.04	0.03	42.0
Approach		383	0.0	383	0.0	0.197	0.4	NA	0.5	3.6	0.03	0.04	0.03	35.2
West: Mandala Parade (E)														
10	L2	39	0.0	39	0.0	0.039	3.8	LOS A	0.2	1.1	0.23	0.46	0.23	30.1
12	R2	11	0.0	11	0.0	0.039	4.9	LOS A	0.2	1.1	0.23	0.46	0.23	30.1
Approach		49	0.0	49	0.0	0.039	4.0	LOS A	0.2	1.1	0.23	0.46	0.23	30.1
All Vehicles		569	0.0	569	0.0	0.197	0.7	NA	0.5	3.6	0.05	0.08	0.05	30.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 1AM [1AM De Clambe Drive/ Road No.1 2031]

Network: N101 [Network_am]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Road No.1														
1	L2	75	0.0	75	0.0	0.040	4.2	LOS A	0.2	1.4	0.25	0.49	0.25	24.9
Approach		75	0.0	75	0.0	0.040	4.2	LOS A	0.2	1.4	0.25	0.49	0.25	24.9
NorthEast: De Clambe Drive (e)														
4	L2	9	0.0	9	0.0	0.087	4.2	LOS A	0.0	0.0	0.00	0.03	0.00	40.0
5	T1	144	16.8	144	16.8	0.087	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	47.0
Approach		154	15.8	154	15.8	0.087	0.3	NA	0.0	0.0	0.00	0.03	0.00	46.2
SouthWest: De Clambe Drive (w)														
11	T1	148	0.0	148	0.0	0.076	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		148	0.0	148	0.0	0.076	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.0
All Vehicles		377	6.4	377	6.4	0.087	0.9	NA	0.2	1.4	0.05	0.11	0.05	41.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2AM [2AM De Clambe Drive/ Andalusian Way 2031]

Network: N101 [Network_am]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Andalusian Way (N)														
1	L2	156	0.0	156	0.0	0.130	5.2	LOS A	0.5	3.8	0.30	0.56	0.30	36.5
3	R2	52	0.0	52	0.0	0.130	5.4	LOS A	0.5	3.8	0.30	0.56	0.30	29.0
Approach		207	0.0	207	0.0	0.130	5.2	LOS A	0.5	3.8	0.30	0.56	0.30	35.3
East: De Clambe Drive (E)														
4	L2	85	0.0	85	0.0	0.165	4.6	LOS A	0.0	0.0	0.00	0.15	0.00	40.8
5	T1	216	11.2	216	11.2	0.165	0.0	LOS A	0.0	0.0	0.00	0.15	0.00	45.9
Approach		301	8.0	301	8.0	0.165	1.3	NA	0.0	0.0	0.00	0.15	0.00	45.1
West: De Clambe Drive (W)														
11	T1	97	0.0	97	0.0	0.107	0.6	LOS A	0.5	3.7	0.37	0.30	0.37	36.5
12	R2	103	0.0	103	0.0	0.107	5.4	LOS A	0.5	3.7	0.37	0.30	0.37	36.5
Approach		200	0.0	200	0.0	0.107	3.1	NA	0.5	3.7	0.37	0.30	0.37	36.5
All Vehicles		708	3.4	708	3.4	0.165	3.0	NA	0.5	3.8	0.19	0.31	0.19	39.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 3AM [3AM Showground Rd/Carrington Rd 2031]

Network: N101 [Network_am]

TCS2666
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Network Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Showground Road (South East)														
21	L2	777	1.2	777	1.2	0.771	27.0	LOS B	33.8	240.4	0.81	0.85	0.81	18.8
22	T1	891	8.3	891	8.3	0.771	16.9	LOS B	33.8	240.4	0.64	0.56	0.64	25.6
Approach		1667	5.0	1667	5.0	0.771	21.6	LOS B	33.8	240.4	0.72	0.70	0.72	22.0
NorthWest: Showground Road (North West)														
28	T1	1703	4.2	1703	4.2	0.496	2.0	LOS A	6.2	45.0	0.14	0.13	0.14	55.4
29	R2	512	1.4	512	1.4	0.785	62.3	LOS E	15.3	108.4	1.00	0.88	1.12	10.1
Approach		2215	3.6	2215	3.6	0.785	15.9	LOS B	15.3	108.4	0.34	0.30	0.37	34.4
SouthWest: Carrington Road														
30	L2	151	2.1	151	2.1	0.236	34.0	LOS C	6.2	44.1	0.75	0.74	0.75	18.8
32	R2	420	2.8	420	2.8	0.773	61.8	LOS E	12.7	90.7	1.00	0.89	1.13	17.8
Approach		571	2.6	571	2.6	0.773	54.5	LOS D	12.7	90.7	0.93	0.85	1.03	17.9
All Vehicles		4453	4.0	4453	4.0	0.785	23.0	LOS B	33.8	240.4	0.56	0.52	0.58	26.4

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P7	NorthWest Full Crossing	11	54.2	LOS E	0.0	0.0	0.95	0.95
P8	SouthWest Full Crossing	11	54.2	LOS E	0.0	0.0	0.95	0.95
P8B	SouthWest Slip/Bypass Lane Crossing	11	54.2	LOS E	0.0	0.0	0.95	0.95
All Pedestrians		32	54.2	LOS E			0.95	0.95

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

MOVEMENT SUMMARY

Site: 5AM [5AM Showground Rd/ De Clambe Drive 2031]

Network: N101 [Network_am]

TCS4569
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Network Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Showground Road (South East)														
21	L2	31	48.3	31	48.3	0.036	12.0	LOS A	0.5	4.7	0.34	0.63	0.34	31.0
22	T1	976	6.8	976	6.8	0.456	12.0	LOS A	14.0	103.5	0.45	0.40	0.45	42.1
Approach		1006	8.1	1006	8.1	0.456	12.0	LOS A	14.0	103.5	0.44	0.40	0.44	41.7
NorthWest: Showground Road (North West)														
28	T1	2203	2.8	2203	2.8	0.752	6.8	LOS A	32.7	234.3	0.56	0.53	0.56	42.5
29	R2	118	8.9	118	8.9	0.240	16.0	LOS B	3.2	24.1	0.54	0.72	0.54	30.6
Approach		2321	3.1	2321	3.1	0.752	7.3	LOS A	32.7	234.3	0.56	0.54	0.56	41.7
SouthWest: De Clambe Drive														
30	L2	82	5.1	82	5.1	0.164	40.3	LOS C	3.7	26.8	0.80	0.74	0.80	19.0
32	R2	5	100.0	5	100.0	0.095	67.9	LOS E	0.3	4.2	0.98	0.66	0.98	3.7
Approach		87	10.8	87	10.8	0.164	42.0	LOS C	3.7	26.8	0.82	0.73	0.82	18.0
All Vehicles		3415	4.7	3415	4.7	0.752	9.6	LOS A	32.7	234.3	0.53	0.50	0.53	40.4

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P7	NorthWest Full Crossing	11	54.2	LOS E	0.0	0.0	0.95	0.95
P8	SouthWest Full Crossing	11	54.2	LOS E	0.0	0.0	0.95	0.95
All Pedestrians		21	54.2	LOS E			0.95	0.95

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

MOVEMENT SUMMARY

Site: 6AM [6AM Carrington Rd/ Middleton Ave/ Andalusian Way 2031]

Network: N101 [Network_am]

TCS4700
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Middleton Avenue														
1	L2	169	3.7	169	3.7	0.704	35.7	LOS C	15.5	110.8	0.95	0.85	0.97	17.7
2	T1	111	0.0	111	0.0	0.704	31.0	LOS C	15.5	110.8	0.95	0.85	0.97	17.7
3	R2	107	2.9	107	2.9	0.704	35.6	LOS C	15.5	110.8	0.95	0.85	0.97	17.7
Approach		387	2.4	387	2.4	0.704	34.3	LOS C	15.5	110.8	0.95	0.85	0.97	17.7
East: Carrington Road (East)														
4	L2	306	2.1	306	2.1	0.705	25.1	LOS B	22.6	160.4	0.86	0.80	0.86	30.6
5	T1	920	1.1	920	1.1	0.705	19.4	LOS B	22.6	160.4	0.84	0.77	0.84	24.5
6	R2	61	0.0	61	0.0	0.705	23.3	LOS B	21.6	152.8	0.83	0.76	0.83	25.3
Approach		1287	1.3	1287	1.3	0.705	20.9	LOS B	22.6	160.4	0.84	0.78	0.84	26.5
North: Andalusian Way														
7	L2	160	0.0	160	0.0	0.408	31.9	LOS C	7.8	55.1	0.85	0.78	0.85	6.6
8	T1	38	2.8	38	2.8	0.408	28.1	LOS B	7.8	55.1	0.85	0.78	0.85	20.8
9	R2	21	0.0	21	0.0	0.408	31.9	LOS C	7.8	55.1	0.85	0.78	0.85	6.6
Approach		219	0.5	219	0.5	0.408	31.3	LOS C	7.8	55.1	0.85	0.78	0.85	10.0
West: Carrington Road (West)														
10	L2	1	0.0	1	0.0	0.294	18.1	LOS B	7.1	50.9	0.61	0.53	0.61	22.9
11	T1	281	3.4	281	3.4	0.294	13.5	LOS A	7.1	50.9	0.61	0.53	0.61	22.9
12	R2	120	3.5	120	3.5	0.784	50.4	LOS D	6.0	43.3	1.00	0.99	1.33	18.0
Approach		402	3.4	402	3.4	0.784	24.5	LOS B	7.1	50.9	0.73	0.66	0.83	20.1
All Vehicles		2296	1.8	2296	1.8	0.784	24.8	LOS B	22.6	160.4	0.84	0.77	0.86	22.4

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	39.3	LOS D	0.1	0.1	0.94	0.94
P2	East Full Crossing	53	39.3	LOS D	0.1	0.1	0.94	0.94
P3	North Full Crossing	53	39.3	LOS D	0.1	0.1	0.94	0.94
P4	West Full Crossing	53	39.3	LOS D	0.1	0.1	0.94	0.94
All Pedestrians		211	39.3	LOS D			0.94	0.94

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

MOVEMENT SUMMARY

Site: 8AM [8AM Carrington Rd/ Doran Drive 2031]

Network: N101 [Network_am]

TCS4699
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Carrington Road (East)														
5	T1	1076	1.2	1076	1.2	0.443	8.1	LOS A	11.9	84.6	0.53	0.47	0.53	29.2
6	R2	29	17.9	29	17.9	0.443	13.7	LOS A	11.9	84.6	0.55	0.48	0.55	28.9
Approach		1105	1.6	1105	1.6	0.443	8.3	LOS A	11.9	84.6	0.53	0.47	0.53	29.2
North: Doran Drive														
7	L2	22	14.3	22	14.3	0.021	11.1	LOS A	0.4	3.0	0.42	0.57	0.42	13.9
9	R2	203	5.2	203	5.2	0.615	40.5	LOS C	8.4	61.5	0.96	0.81	0.97	5.0
Approach		225	6.1	225	6.1	0.615	37.6	LOS C	8.4	61.5	0.91	0.79	0.91	5.3
West: Carrington Road (West)														
10	L2	199	5.8	199	5.8	0.614	36.5	LOS C	10.8	78.9	0.93	0.81	0.93	9.8
11	T1	373	2.3	373	2.3	0.614	32.3	LOS C	11.6	82.7	0.94	0.80	0.94	9.7
Approach		572	3.5	572	3.5	0.614	33.8	LOS C	11.6	82.7	0.93	0.80	0.93	9.8
All Vehicles		1902	2.7	1902	2.7	0.615	19.4	LOS B	11.9	84.6	0.69	0.61	0.70	16.3

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P2	East Full Crossing	53	39.3	LOS D	0.1	0.1	0.94	0.94
P3	North Full Crossing	53	39.3	LOS D	0.1	0.1	0.94	0.94
All Pedestrians		105	39.3	LOS D			0.94	0.94

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

MOVEMENT SUMMARY

Site: 9AM [9AM Carrington Rd/ De Clambe Drive 2031]

Network: N101 [Network_am]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Carrington Rd (Northeast)														
5	T1	1268	1.8	1268	1.8	0.329	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		1268	1.8	1268	1.8	0.329	0.0	NA	0.0	0.0	0.00	0.00	0.00	49.9
North: De Clambe Drive														
7	L2	20	0.0	20	0.0	0.015	4.5	LOS A	0.0	0.0	0.00	0.49	0.00	36.8
Approach		20	0.0	20	0.0	0.015	4.5	LOS A	0.0	0.0	0.00	0.49	0.00	36.8
West: Carrington Rd (Southwest)														
10	L2	78	1.4	78	1.4	0.056	4.7	LOS A	0.2	1.6	0.10	0.50	0.10	45.3
11	T1	560	3.4	560	3.4	0.293	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		638	3.1	638	3.1	0.293	0.6	NA	0.2	1.6	0.01	0.06	0.01	49.2
All Vehicles		1926	2.2	1926	2.2	0.329	0.3	NA	0.2	1.6	0.00	0.03	0.00	49.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 10AM [10AM Analusian Way/ Mandala Parade 2031]

Network: N101 [Network_am]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Andalusian Way (S)														
1	L2	11	0.0	11	0.0	0.096	4.0	LOS A	0.1	0.4	0.01	0.03	0.01	42.9
2	T1	175	0.0	175	0.0	0.096	0.0	LOS A	0.1	0.4	0.01	0.03	0.01	47.1
Approach		185	0.0	185	0.0	0.096	0.2	NA	0.1	0.4	0.01	0.03	0.01	46.4
East: Road No.1														
4	L2	88	0.0	88	0.0	0.056	0.4	LOS A	0.2	1.6	0.27	0.12	0.27	10.0
Approach		88	0.0	88	0.0	0.056	0.4	LOS A	0.2	1.6	0.27	0.12	0.27	10.0
North: Andalusian Way (N)														
7	L2	9	0.0	9	0.0	0.118	8.3	LOS A	0.1	1.0	0.05	0.08	0.05	11.6
8	T1	179	0.0	179	0.0	0.118	0.1	LOS A	0.1	1.0	0.05	0.08	0.05	45.2
9	R2	11	0.0	11	0.0	0.118	5.2	LOS A	0.1	1.0	0.05	0.08	0.05	41.2
Approach		199	0.0	199	0.0	0.118	0.7	NA	0.1	1.0	0.05	0.08	0.05	27.9
West: Mandala Parade (E)														
10	L2	33	0.0	33	0.0	0.030	4.0	LOS A	0.1	0.9	0.28	0.47	0.28	29.7
12	R2	11	0.0	11	0.0	0.030	4.6	LOS A	0.1	0.9	0.28	0.47	0.28	29.7
Approach		43	0.0	43	0.0	0.030	4.1	LOS A	0.1	0.9	0.28	0.47	0.28	29.7
All Vehicles		516	0.0	516	0.0	0.118	0.8	NA	0.2	1.6	0.09	0.10	0.09	15.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 1PM [1PM De Clambe Drive/ Road No.1 2031]

Network: N101 [Network_pm]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Road No.1														
1	L2	6	0.0	6	0.0	0.003	4.1	LOS A	0.0	0.1	0.22	0.46	0.22	25.2
Approach		6	0.0	6	0.0	0.003	4.1	LOS A	0.0	0.1	0.22	0.46	0.22	25.2
NorthEast: De Clambe Drive (e)														
4	L2	65	0.0	65	0.0	0.102	4.2	LOS A	0.0	0.0	0.00	0.20	0.00	35.4
5	T1	115	20.2	115	20.2	0.102	0.0	LOS A	0.0	0.0	0.00	0.20	0.00	37.1
Approach		180	12.9	180	12.9	0.102	1.5	NA	0.0	0.0	0.00	0.20	0.00	36.2
SouthWest: De Clambe Drive (w)														
11	T1	306	0.0	306	0.0	0.298	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		306	0.0	306	0.0	0.298	0.0	NA	0.0	0.0	0.00	0.00	0.00	49.9
All Vehicles		493	4.7	493	4.7	0.298	0.6	NA	0.0	0.1	0.00	0.08	0.00	43.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2PM [2PM De Clambe Drive/ Andalusian Way 2031]

Network: N101 [Network_pm]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Andalusian Way (N)														
1	L2	103	0.0	103	0.0	0.110	4.9	LOS A	0.4	2.8	0.20	0.56	0.20	37.0
3	R2	54	0.0	54	0.0	0.110	6.4	LOS A	0.4	2.8	0.20	0.56	0.20	29.8
Approach		157	0.0	157	0.0	0.110	5.4	LOS A	0.4	2.8	0.20	0.56	0.20	35.4
East: De Clambe Drive (E)														
4	L2	75	0.0	75	0.0	0.110	4.6	LOS A	0.0	0.0	0.00	0.21	0.00	38.1
5	T1	121	19.1	121	19.1	0.110	0.0	LOS A	0.0	0.0	0.00	0.21	0.00	44.4
Approach		196	11.8	196	11.8	0.110	1.7	NA	0.0	0.0	0.00	0.21	0.00	43.0
West: De Clambe Drive (W)														
11	T1	253	0.0	253	0.0	0.327	0.6	LOS A	2.1	14.4	0.38	0.34	0.38	35.5
12	R2	392	0.0	392	0.0	0.327	5.3	LOS A	2.1	14.4	0.38	0.34	0.38	35.5
Approach		644	0.0	644	0.0	0.327	3.4	NA	2.1	14.4	0.38	0.34	0.38	35.5
All Vehicles		997	2.3	997	2.3	0.327	3.4	NA	2.1	14.4	0.27	0.35	0.27	36.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 3PM [3PM Showground Rd/Carrington Rd 2031]

Network: N101 [Network_pm]

TCS2666
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 130 seconds (Network Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Showground Road (South East)														
21	L2	586	0.9	586	0.9	0.587	25.8	LOS B	24.0	170.2	0.70	0.80	0.70	19.4
22	T1	1733	3.2	1733	3.2	0.894	35.7	LOS C	58.3	418.3	0.90	0.91	1.00	15.6
Approach		2319	2.6	2319	2.6	0.894	33.2	LOS C	58.3	418.3	0.85	0.88	0.92	16.4
NorthWest: Showground Road (North West)														
28	T1	1104	3.3	1104	3.3	0.367	10.7	LOS A	15.5	111.7	0.49	0.44	0.49	41.4
29	R2	231	0.0	231	0.0	0.854	79.2	LOS F	8.0	56.2	1.00	0.93	1.34	8.2
Approach		1335	2.8	1335	2.8	0.854	22.6	LOS B	15.5	111.7	0.58	0.52	0.64	29.6
SouthWest: Carrington Road														
30	L2	239	0.0	239	0.0	0.358	37.0	LOS C	11.0	77.1	0.78	0.77	0.78	17.8
32	R2	828	0.0	828	0.0	0.883	66.1	LOS E	28.9	202.0	1.00	0.97	1.20	17.1
Approach		1067	0.0	1067	0.0	0.883	59.5	LOS E	28.9	202.0	0.95	0.93	1.11	17.2
All Vehicles		4721	2.1	4721	2.1	0.894	36.1	LOS C	58.3	418.3	0.80	0.79	0.88	19.7

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P7	NorthWest Full Crossing	11	59.2	LOS E	0.0	0.0	0.95	0.95
P8	SouthWest Full Crossing	11	59.2	LOS E	0.0	0.0	0.95	0.95
P8B	SouthWest Slip/Bypass Lane Crossing	11	59.2	LOS E	0.0	0.0	0.95	0.95
All Pedestrians		32	59.2	LOS E			0.95	0.95

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

MOVEMENT SUMMARY

Site: 5PM [5PM Showground Rd/ De Clambe Drive 2031]

Network: N101 [Network_pm]

TCS4569
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 130 seconds (Network Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Showground Road (South East)														
21	L2	34	56.3	34	56.3	0.035	9.1	LOS A	0.4	3.9	0.25	0.61	0.25	35.2
22	T1	2029	2.2	2029	2.2	0.786	5.2	LOS A	27.8	197.8	0.33	0.31	0.33	50.8
Approach		2063	3.1	2063	3.1	0.786	5.2	LOS A	27.8	197.8	0.33	0.31	0.33	50.5
NorthWest: Showground Road (North West)														
28	T1	1352	1.6	1352	1.6	0.449	4.0	LOS A	12.7	89.8	0.33	0.30	0.33	48.4
29	R2	109	3.8	109	3.8	0.511	40.3	LOS C	6.8	49.5	1.00	0.91	1.11	17.6
Approach		1461	1.7	1461	1.7	0.511	6.7	LOS A	12.7	89.8	0.38	0.35	0.39	42.7
SouthWest: De Clambe Drive														
30	L2	215	1.0	215	1.0	0.631	58.2	LOS E	12.8	90.3	0.98	0.82	0.98	14.8
32	R2	5	100.0	5	100.0	0.103	73.8	LOS F	0.3	4.5	0.98	0.66	0.98	3.5
Approach		220	3.3	220	3.3	0.631	58.6	LOS E	12.8	90.3	0.98	0.82	0.98	14.6
All Vehicles		3744	2.6	3744	2.6	0.786	8.9	LOS A	27.8	197.8	0.38	0.35	0.39	42.9

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P7	NorthWest Full Crossing	11	59.2	LOS E	0.0	0.0	0.95	0.95
P8	SouthWest Full Crossing	11	59.2	LOS E	0.0	0.0	0.95	0.95
All Pedestrians		21	59.2	LOS E			0.95	0.95

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

MOVEMENT SUMMARY

Site: 6PM [6PM Carrington Rd/ Middleton Ave/ Andalusian Way 2031]

Network: N101 [Network_pm]

TCS4700
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Middleton Avenue														
1	L2	199	2.6	199	2.6	0.821	45.9	LOS D	16.0	113.4	1.00	0.96	1.19	14.7
2	T1	56	0.0	56	0.0	0.821	41.3	LOS C	16.0	113.4	1.00	0.96	1.19	16.6
3	R2	87	0.0	87	0.0	0.821	45.9	LOS D	16.0	113.4	1.00	0.96	1.19	14.7
Approach		342	1.5	342	1.5	0.821	45.2	LOS D	16.0	113.4	1.00	0.96	1.19	15.0
East: Carrington Road (East)														
4	L2	123	0.9	123	0.9	0.600	21.2	LOS B	19.0	133.9	0.76	0.71	0.76	33.5
5	T1	667	0.8	667	0.8	0.600	20.8	LOS B	19.0	133.9	0.80	0.73	0.80	23.8
6	R2	52	0.0	52	0.0	0.600	37.2	LOS C	9.0	63.0	0.93	0.79	0.93	19.8
Approach		842	0.7	842	0.7	0.600	21.8	LOS B	19.0	133.9	0.81	0.73	0.81	25.2
North: Andalusian Way														
7	L2	177	0.0	177	0.0	0.646	34.4	LOS C	13.9	97.5	0.93	0.82	0.93	6.4
8	T1	174	0.0	174	0.0	0.646	30.5	LOS C	13.9	97.5	0.93	0.82	0.93	20.4
9	R2	7	0.0	7	0.0	0.646	34.4	LOS C	13.9	97.5	0.93	0.82	0.93	6.4
Approach		358	0.0	358	0.0	0.646	32.5	LOS C	13.9	97.5	0.93	0.82	0.93	14.5
West: Carrington Road (West)														
10	L2	13	8.3	13	8.3	0.813	25.6	LOS B	31.6	222.0	0.89	0.85	0.93	13.3
11	T1	815	0.1	815	0.1	0.813	21.0	LOS B	31.6	222.0	0.89	0.85	0.93	17.6
12	R2	174	3.6	174	3.6	0.852	54.9	LOS D	9.1	65.8	1.00	1.04	1.42	17.1
Approach		1001	0.8	1001	0.8	0.852	26.9	LOS B	31.6	222.0	0.91	0.88	1.02	17.3
All Vehicles		2543	0.8	2543	0.8	0.852	28.5	LOS B	31.6	222.0	0.89	0.83	0.96	19.0

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	39.3	LOS D	0.1	0.1	0.94	0.94
P2	East Full Crossing	53	39.3	LOS D	0.1	0.1	0.94	0.94
P3	North Full Crossing	53	39.3	LOS D	0.1	0.1	0.94	0.94
P4	West Full Crossing	53	39.3	LOS D	0.1	0.1	0.94	0.94
All Pedestrians		211	39.3	LOS D			0.94	0.94

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

MOVEMENT SUMMARY

Site: 8PM [8PM Carrington Rd/ Doran Drive 2031]

Network: N101 [Network_pm]

TCS4699
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Carrington Road (East)														
5	T1	847	0.9	847	0.9	0.401	10.5	LOS A	10.4	73.6	0.57	0.50	0.57	26.1
6	R2	28	14.8	28	14.8	0.401	19.6	LOS B	9.8	70.1	0.67	0.58	0.67	23.5
Approach		876	1.3	876	1.3	0.401	10.8	LOS A	10.4	73.6	0.57	0.50	0.57	26.0
North: Doran Drive														
7	L2	27	15.4	27	15.4	0.068	20.9	LOS B	0.7	5.7	0.63	0.63	0.63	8.8
9	R2	283	4.1	283	4.1	0.847	48.6	LOS D	13.6	98.7	1.00	0.99	1.28	4.2
Approach		311	5.1	311	5.1	0.847	46.1	LOS D	13.6	98.7	0.97	0.96	1.23	4.4
West: Carrington Road (West)														
10	L2	236	3.1	236	3.1	0.829	31.5	LOS C	19.0	134.7	0.79	0.85	0.95	10.9
11	T1	975	0.3	975	0.3	0.829	27.4	LOS B	22.3	156.7	0.90	0.90	1.01	11.1
Approach		1211	0.9	1211	0.9	0.829	28.2	LOS B	22.3	156.7	0.88	0.89	1.00	11.0
All Vehicles		2397	1.6	2397	1.6	0.847	24.1	LOS B	22.3	156.7	0.78	0.76	0.87	13.3

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P2	East Full Crossing	53	39.3	LOS D	0.1	0.1	0.94	0.94
P3	North Full Crossing	53	39.3	LOS D	0.1	0.1	0.94	0.94
All Pedestrians		105	39.3	LOS D			0.94	0.94

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

MOVEMENT SUMMARY

Site: 9PM [9PM Carrington Rd/ De Clambe Drive 2031]

Network: N101 [Network_pm]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Carrington Rd (Northeast)														
5	T1	1136	2.0	1136	2.0	0.295	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		1136	2.0	1136	2.0	0.295	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.0
North: De Clambe Drive														
7	L2	31	0.0	31	0.0	0.036	4.5	LOS A	0.0	0.0	0.00	0.49	0.00	36.8
Approach		31	0.0	31	0.0	0.036	4.5	LOS A	0.0	0.0	0.00	0.49	0.00	36.8
West: Carrington Rd (Southwest)														
10	L2	65	0.0	65	0.0	0.047	4.7	LOS A	0.2	1.3	0.10	0.50	0.10	45.4
11	T1	1178	1.0	1178	1.0	0.608	0.2	LOS A	6.8	48.0	0.00	0.00	0.00	49.8
Approach		1243	0.9	1243	0.9	0.608	0.4	NA	6.8	48.0	0.01	0.03	0.01	49.5
All Vehicles		2409	1.4	2409	1.4	0.608	0.3	NA	6.8	48.0	0.00	0.02	0.00	49.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 10PM [10PM Analusian Way/ Mandala Parade 2031]

Network: N101 [Network_pm]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Andalusian Way (S)														
1	L2	11	0.0	11	0.0	0.067	4.0	LOS A	0.1	0.5	0.03	0.04	0.03	42.5
2	T1	118	0.0	118	0.0	0.067	0.0	LOS A	0.1	0.5	0.03	0.04	0.03	45.7
Approach		128	0.0	128	0.0	0.067	0.3	NA	0.1	0.5	0.03	0.04	0.03	45.0
East: Road No.1														
4	L2	7	0.0	7	0.0	0.005	1.0	LOS A	0.0	0.1	0.41	0.21	0.41	10.5
Approach		7	0.0	7	0.0	0.005	1.0	LOS A	0.0	0.1	0.41	0.21	0.41	10.5
North: Andalusian Way (N)														
7	L2	65	0.0	65	0.0	0.250	8.4	LOS A	0.5	3.8	0.06	0.16	0.06	11.5
8	T1	401	0.0	401	0.0	0.250	0.1	LOS A	0.5	3.8	0.06	0.16	0.06	44.3
9	R2	11	0.0	11	0.0	0.250	5.1	LOS A	0.5	3.8	0.06	0.16	0.06	40.0
Approach		477	0.0	477	0.0	0.250	1.3	NA	0.5	3.8	0.06	0.16	0.06	21.4
West: Mandala Parade (E)														
10	L2	39	0.0	39	0.0	0.033	3.8	LOS A	0.1	0.9	0.24	0.47	0.24	30.0
12	R2	11	0.0	11	0.0	0.033	5.0	LOS A	0.1	0.9	0.24	0.47	0.24	30.3
Approach		49	0.0	49	0.0	0.033	4.0	LOS A	0.1	0.9	0.24	0.47	0.24	30.1
All Vehicles		662	0.0	662	0.0	0.250	1.3	NA	0.5	3.8	0.07	0.16	0.07	21.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.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