Australian Hockey Centre Development

Transport Impact Assessment

Stantec

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Prepared by:
Stantec Australia Pty Ltd

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300304837

Stantec Australia Pty Ltd

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Prepared by

Signature

Seb Cano

Printed Name

Reviewed by

Signature

Desmond Ho

Printed Name

Approved by

Signature

Richard Isted

Printed Name

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1 Introduction

1.1 Background

Stantec has been commissioned by Hunt Architects Pty Ltd on behalf of the Department of Finance ('the Client') to undertake a Transport Impact Assessment (TIA) for a proposed redevelopment of the State Hockey Centre on the Curtin University site located within the suburb of Bentley ('Site') in the Town of Victoria Park.

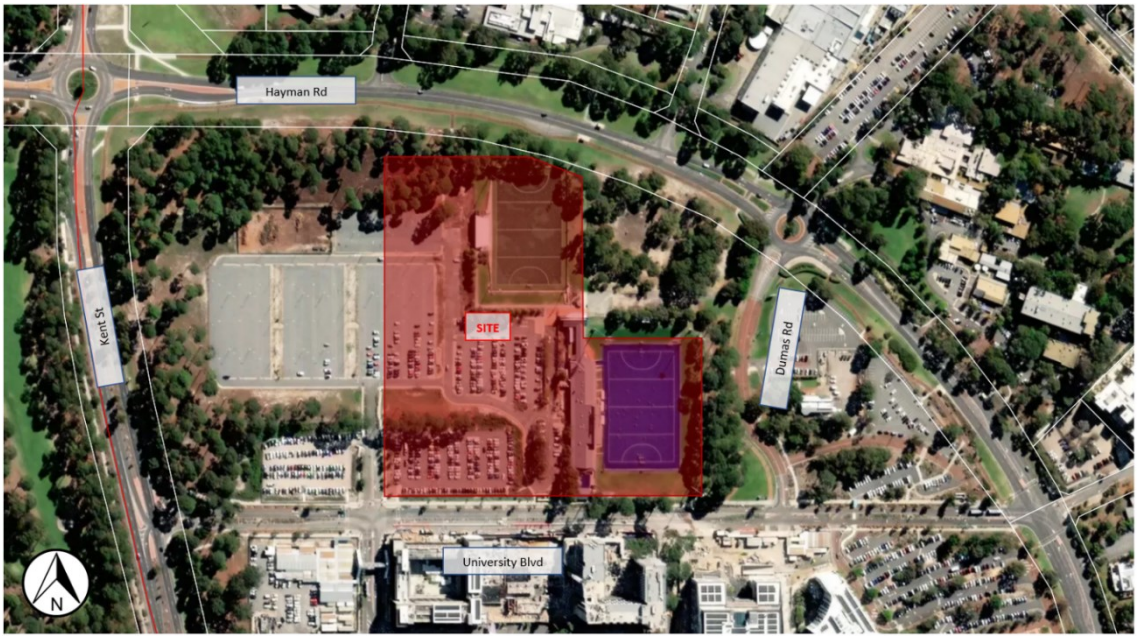
This report aims to assess the impact of the development on the adjacent road network. The report will focus on access, public transport, pedestrian and cycle networks, circulation, car parking, with a focus on traffic operations.

This report has been prepared in accordance with the *Western Australian Planning Commission (WAPC) Transport Impact Assessment Guidelines for Developments: Volume 4 – Individual Developments (2016)* and the checklist is included in **Appendix A**.

1.2 Site Location

The Site is located on the Curtin University site within the Town of Victoria Park. **Figure 1-1** shows an aerial image of the Site. The Site is bounded by University Boulevard to the south, Dumas Road to the east, and Hayman Road to the north.

Figure 1-1: Aerial Image of Site

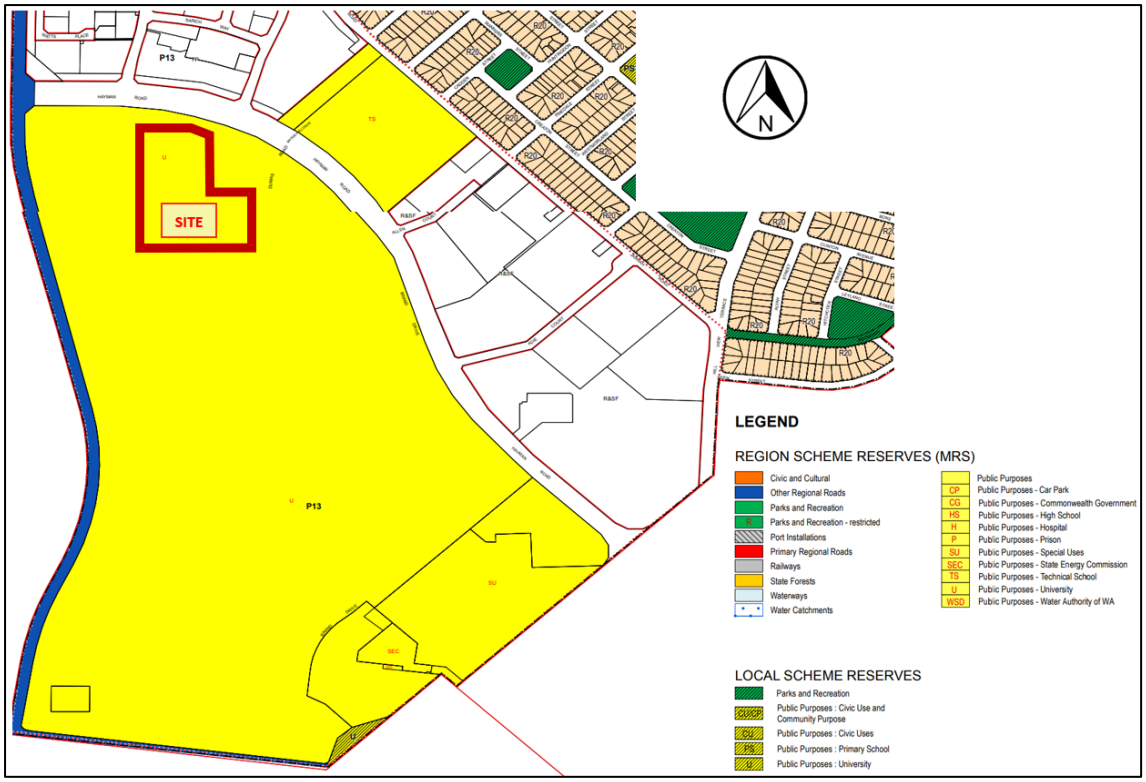


Source: Metromap (2024)

1.3 Surrounding Land Uses

The Site is zoned as 'Public Purposes – University' under the *Town of Victoria Park Town Planning Scheme No.1* a s shown in **Figure 1-2**. Areas surrounding the Site are zoned for residential dwellings and for parks and recreation.

Figure 1-2: Zoning Map



Source: Town of Victoria Park Town Planning Scheme No. 1

1.4 Existing Road Network

Road classifications are defined in the Main Roads Functional Hierarchy as follows:

- **Primary Distributors (light blue):** Form the regional and inter-regional grid of Main Roads WA traffic routes and carry large volumes of fast-moving traffic. Some are strategic freight routes, and all are National or State roads. They are managed by Main Roads.
- **Regional Distributors (red):** Roads that are not Primary Distributors, but which link significant destinations and are designed for efficient movement of people and goods within and beyond regional areas. They are managed by Local Government.
- **District Distributor A (green):** These carry traffic between industrial, commercial and residential areas and connect to Primary Distributors. These are likely to be truck routes and provide only limited access to adjoining property. They are managed by Local Government.
- **District Distributor B (dark blue):** Perform a similar function to District Distributor A but with reduced capacity due to flow restrictions from access to and roadside parking alongside adjoining property. These are often older roads with traffic demand in excess of that originally intended. District Distributor A and B roads run between land-use cells and not through them,

forming a grid that would ideally be around 1.5 kilometres apart. They are managed by Local Government.

- **Local Distributors (orange):** Carry traffic within a cell and link District Distributors at the boundary to access roads. The route of the Local Distributor discourages through traffic so that the cell formed by the grid of District Distributors only carries traffic belonging to or serving the area. These roads should accommodate buses but discourage trucks. They are managed by Local government.
- **Access Roads (grey):** Provide access to abutting properties with amenity, safety and aesthetic aspects having priority over the vehicle movement function. These roads are bicycle and pedestrian friendly. They are managed by Local government.

The Site is bounded by Hayman Road to the north, University Boulevard to the South, and Dumas Road to the east. The surrounding road network is further described in **Table 1-1** and **Figure 1-3** shows the hierarchy as per the Main Roads WA Road Information Mapping System.

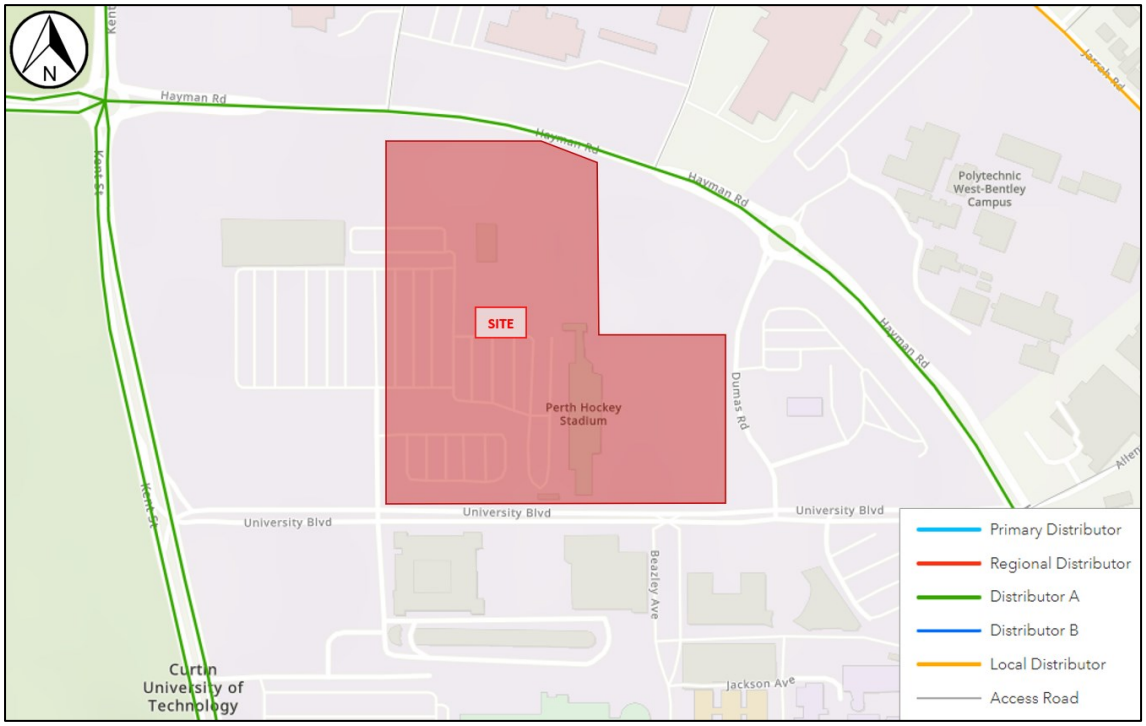
Table 1-1. Road Network Classification

Road Name	Road Hierarchy	Jurisdiction	No. of Lanes	No. of Footpaths	Width (m)	Speed Limit (km/h)
Hayman Road (1290004)	Distributor A	Local Government	2	1	10.0m	60
Kent Street (1290077)	Distributor A	Local Government	4	1	26.0m (incl. 7.0m median)	70
University Boulevard	N/A	N/A	2	2	18.0m (incl. 2.0m median)	≤50
Karrak Drive	N/A	N/A	2	2	Approx. 6.0m-15.0m	≤50
Dumas Road	N/A	N/A	2	2	12.0m	≤50

Source: Main Roads WA Road Information Mapping System (2024)

Three roads (i.e., University Boulevard, Karrak Drive, and Dumas Road) are noted to not have any classification according to the Main Roads WA Road Information Mapping System. However, Curtin University's online information indicate that these roads are public roads that runs through the Bentley campus and that these three roads are part of the campus infrastructure but remains under public ownership and management.

Figure 1-3: Road Hierarchy



Source: Main Roads WA Road Information Mapping System

1.5 Existing Intersections

1.5.1 Hayman Road and Kent Street

Hayman Road and Kent Street intersection is located to the northwest of the Site. It is a four-legged roundabout-controlled intersection as shown in **Figure 1-4**.

Figure 1-4: Existing Hayman Road / Kent Street Intersection

Source: Metromap (2024)

1.5.2 Hayman Road and Brodie-Hall Drive

Hayman Road and Brodie-Hall Drive intersection is located to the north of the Site. Its current configuration is a three-legged priority-controlled intersection as shown in **Figure 1-5**.

Figure 1-5: Existing Hayman Road / Brodie-Hall Drive Intersection

Source: Metromap (2024)

1.5.3 Hayman Road and Dumas Road

Hayman Road and Dumas Road intersection is located to the northeast of the Site and is a four-legged roundabout-controlled intersection as shown in **Figure 1-6**.

Figure 1-6: Existing Hayman Road / Dumas Road Intersection

Source: Metromap (2024)

1.5.4 Kent Street and University Boulevard

University Boulevard and Kent Street intersection is located to the southwest of the Site. It is a three-legged priority-controlled intersection as shown in **Figure 1-7**.

Figure 1-7: Existing Kent Street / University Boulevard Intersection

Source: Metromap (2024)

1.5.5 University Boulevard and Karrak Drive

University Boulevard and Karrak Drive intersection is adjacent to and located south of the subject Site. It is a four-legged signalised intersection as shown in **Figure 1-8**.

Figure 1-8: Existing University Boulevard / Karrak Drive Intersection

Source: Metromap (2024)

1.5.6 University Boulevard and Dumas Road

University Boulevard and Dumas Road intersection is located to the east of the Site. It is a three-legged priority-controlled intersection as shown in **Figure 1-9**.

Figure 1-9: Existing University Boulevard / Dumas Road Intersection

Source: Metromap (2024)

1.6 Existing Traffic Volumes

1.6.1 MRWA Traffic Map Volumes

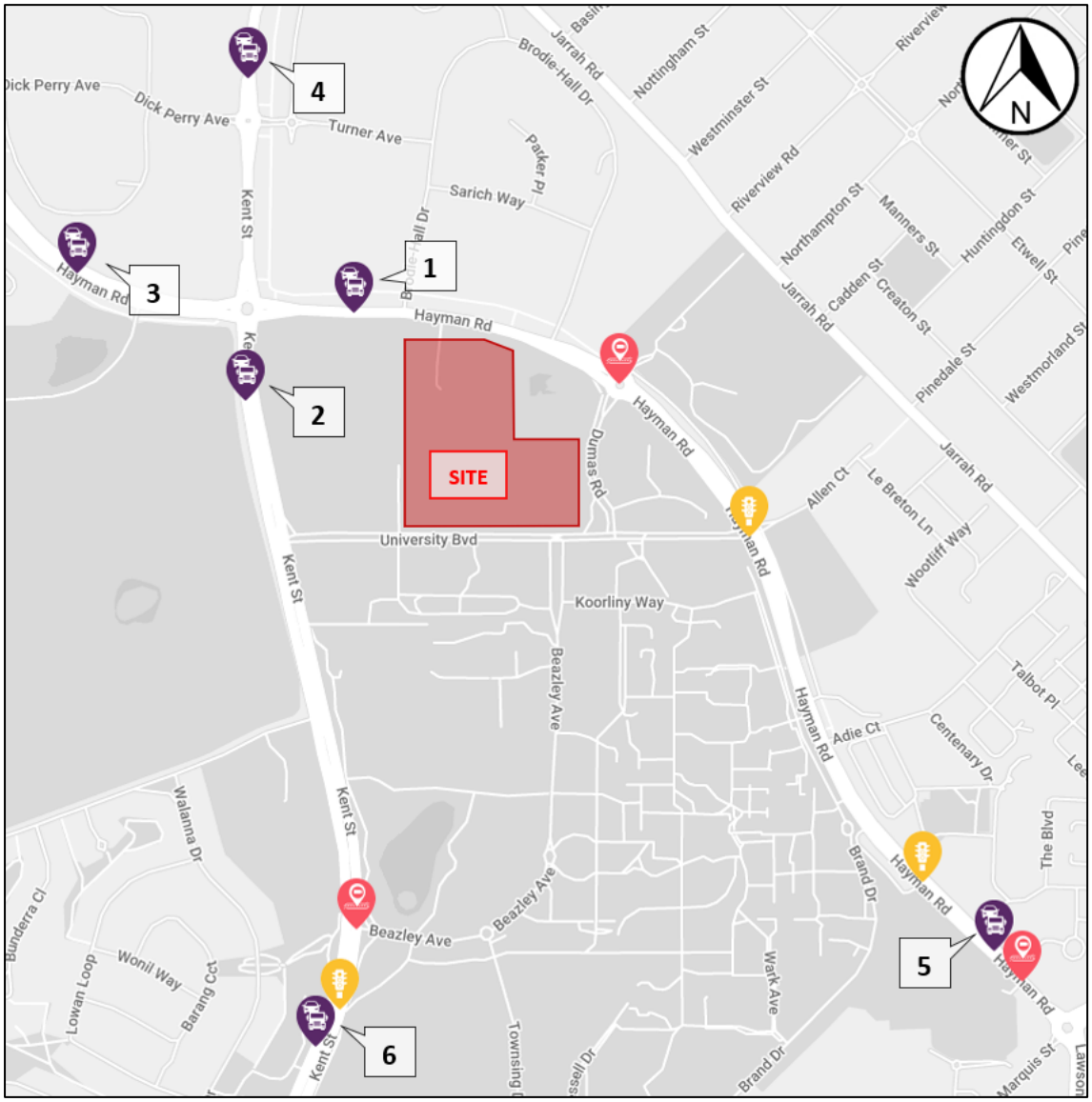
Existing traffic volumes surrounding the Site were sourced from the Main Roads WA Traffic Map database as shown in **Figure 1-10** and are summarised in **Table 1-2**.

Table 1-2. Existing Traffic Volumes

Number	Road Name	Date	Average Two-way Daily Traffic Volume (Weekday)	Average Two-way AM Peak Traffic Volume	Average Two-way PM Peak Traffic Volume
1	Hayman Road (East of Kent Street)	2020/21	9,517	944	875
2	Kent Street (South of Hayman Road)	2020/21	17,366	1,451	1,591
3	Hayman Road (West of Kent Street)	2021/22	19,244	1,893	1,713
4	Kent Street (South of Jarrah Road)	2020/21	10,812	1,008	1,038
5	Hayman Road (North of Marquis Street)	2020/21	11,699	1,148	1,042
6	Kent Street (North of Manning Road)	2020/21	18,693	1,428	1,566

Source: MRWA Traffic Map Database

Figure 1-10: MRWA Traffic Map Volumes



Source: MRWA Traffic Map Database

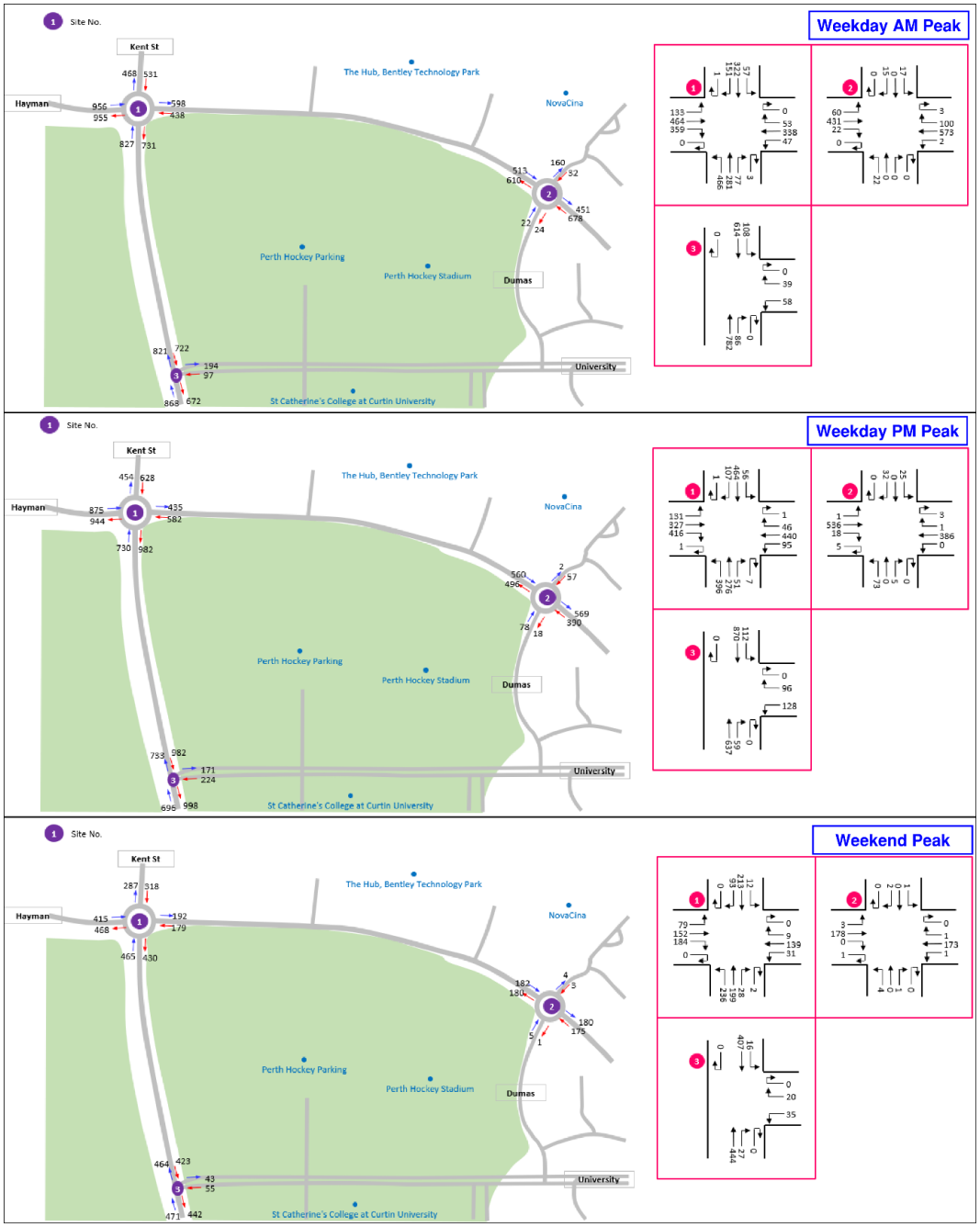
1.6.2 Surveyed Traffic Volumes

A traffic survey was conducted on Thursday, November 2, 2023, from 7:30 am to 9:30 am and from 4:00 pm to 6:00 pm, as well as on Saturday, November 4, 2023, from 7:00 am to 9:00 am at the following key intersections:

- Hayman Road / Kent Street Intersection
- Hayman Road / Dumas Road Intersection
- Kent Street / University Boulevard Intersection

Figure 1-11 illustrates the peak-hour traffic counts at these intersections.

Figure 1-11: Survey Traffic Volumes (November 2023)

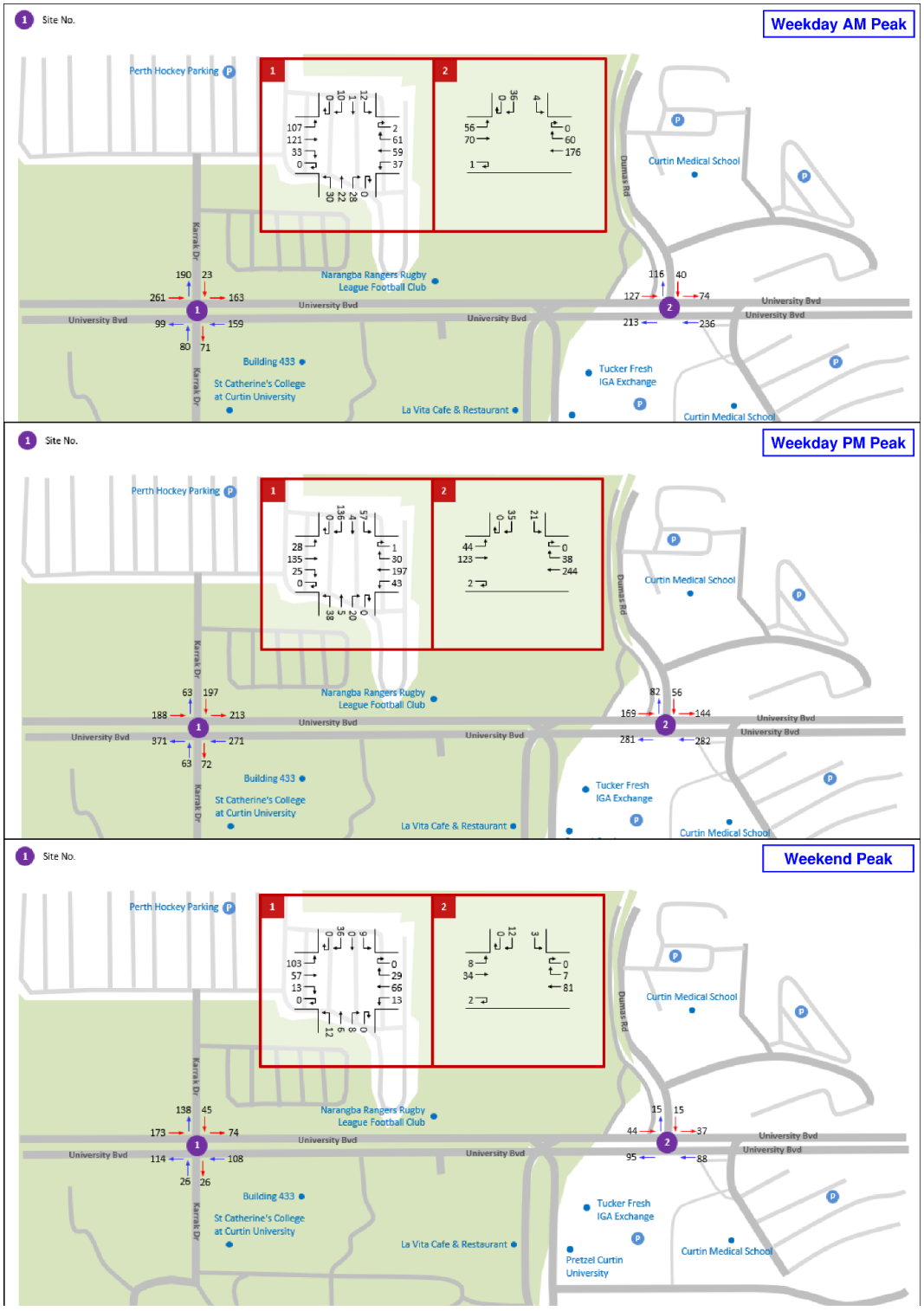


Additional traffic survey was conducted on Thursday, September 12, 2024, from 7:30 am to 9:30 am and from 4:00 pm to 6:00 pm, as well as on Saturday, September 14, 2024, from 7:00 am to 9:00 am at the following intersections.

- University Boulevard / Karrak Drive Intersection, and
- University Boulevard / Dumas Road Intersection

Peak-hour traffic counts at these intersections are shown in **Figure 1-12**.

Figure 1-12: Survey Traffic Volumes (September 2024)



1.7 Crash Assessment

A crash assessment for the surrounding road network of the Site has been completed using the Main Roads WA Reporting Centre. The assessment covers all the recorded accidents for the 5-year period between 01 January 2019 to 31 December 2023.

The crashes for the following road sections and intersections have been extracted:

- University Boulevard (Kent St to Hayman Rd)
- Kent Street (Hayman Road to University Blvd)
- Hayman Road (Kent St to University Blvd)
- Kent Street & Hayman Road Intersection
- Kent Street & University Boulevard Intersection
- Hayman Road & University Boulevard Intersection

The results of the crash assessment are summarised in **Table 1-3** to **Table 1-5**, and **Figure 1-13** illustrates the severity and location of these crashes relative to the Site.

Table 1-3. Total Crashes

Crash Type (RUM Code)	Fatal	Hospital	Medical	Major Property Damage	Minor Property Damage	Total Crashes
Right Turn Thru	-	-	2	4	4	**10**
Sideswipe Same Direction	-	-	-	5	3	**8**
Right Angle	-	-	3	20	12	**35**
Rear End	-	-	-	13	3	**16**
Hit Object	-	-	-	1	-	**1**
Unspecified	-	1	-	-	-	**1**
Total	**-**	**1**	**5**	**43**	**22**	***71***

Table 1-4. Intersection Crashes

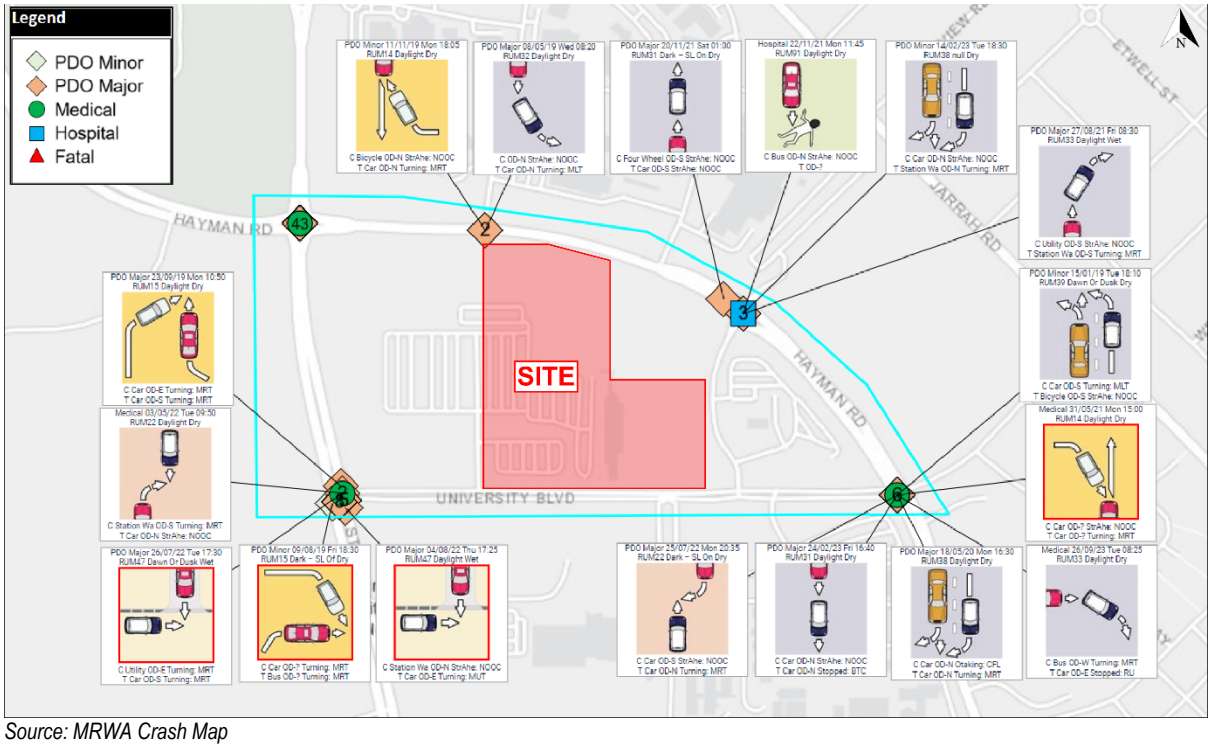
Intersection Name	Fatal	Hospital	Medical	Major Property Damage	Minor Property Damage	Total Crashes
Hayman Rd - Kent St & Hayman Rd	-	-	3	23	17	**43**
Hayman Rd - Brodie - Hall Dr	-	-	-	1	1	**2**
Hayman Rd - Curtin Uni Access North - Dumas Rd & Bentley Tafe Campus Access	-	1	-	1	1	**3**

Hayman Rd - Allen Ct	-	-	1	3	1	**5**
Kent St - Kent St & University Blvd	-	-	-	7	1	**8**
Total	**-**	**1**	**4**	**35**	**21**	***61***

Table 1-5. Midblock Crashes

Road Name	Fatal	Hospital	Medical	Major Property Damage	Minor Property Damage	Total Crashes
Hayman Rd	-	-	-	1	-	**1**
Kent St	-	-	1	7	1	**9**
Total	**-**	**-**	**1**	**8**	**1**	***10***

Figure 1-13: Crash Severity Map



Source: MRWA Crash Map

A summary of the crash assessment is as follows:

- A total of 71 crashes were recorded in the vicinity of the Site.
- No fatal or serious crashes recorded; one (1) crash incident resulted in hospitalisation.
- Five (5) reported crashes required medical attention.
- 43 crashes resulted in major property damages while 22 minor property damages were recorded.
- 43 crashes were recorded to have occurred at the Kent Street / Hayman Road intersection.

The number of crashes that occurred within the surrounding area of the Site appears to be high. In particular, a significant number of the reported incidents (i.e., 43 crashes) were concentrated at the Kent Street / Hayman Road intersection. In addition, 35 right angled crashes were recorded which was the most common type of crash to be reported. These can be addressed through improvements in pavement markings, signage and visibility in order to enhance traffic safety and prevent further accidents. Based on the expected number of trips to be generated by the Site, it is unlikely that the proposed development will further deteriorate the overall safety of the existing road network.

2 Public Transport Facilities

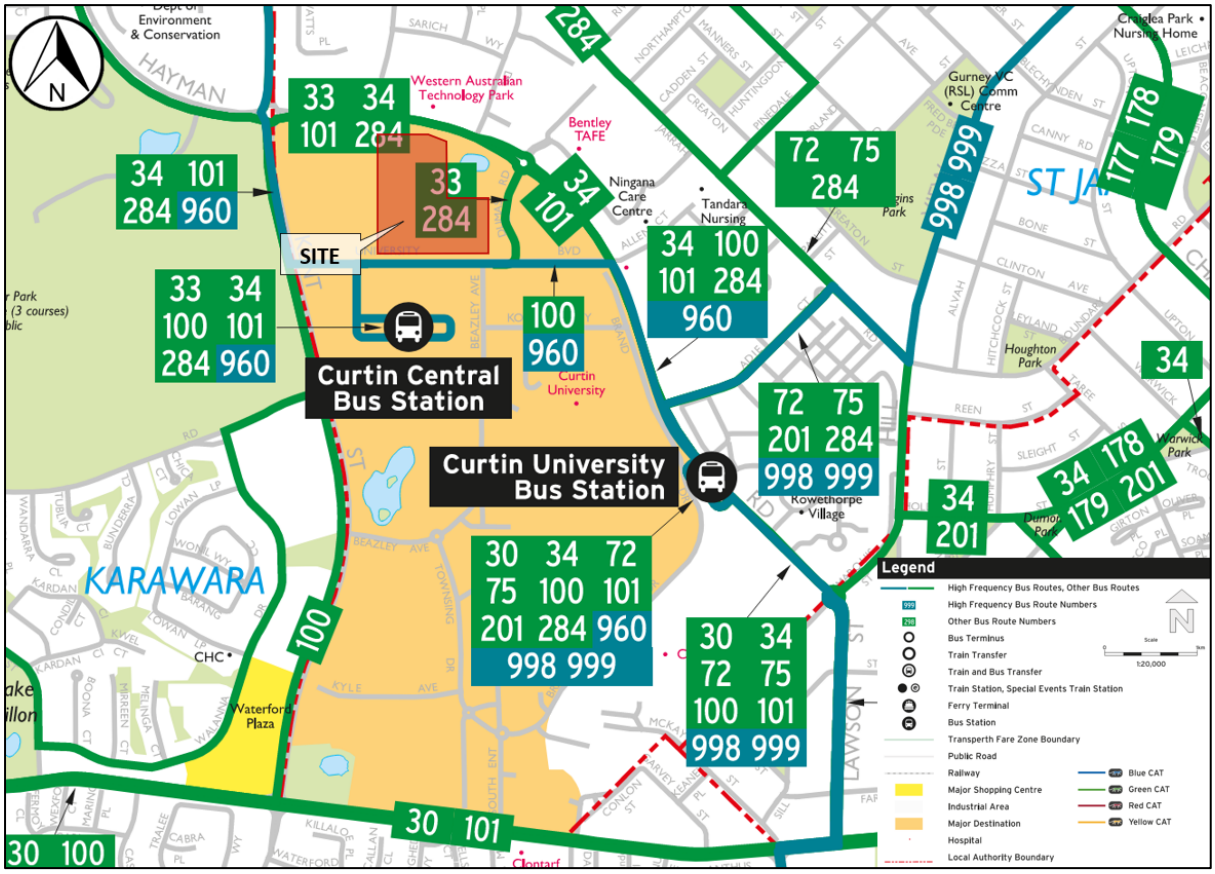
2.1 Existing Public Transport Facilities

Several bus stops are located within close proximity to the Site as shown in **Figure 2-1**. Existing bus stops can be found along Hayman Road and Kent Street while the Curtin Central Bus Station is located to the south of the Site. The Curtin Central Bus Station is serviced by Bus Routes 33, 34, 100, 101, 284, and 960. These bus routes are shown in **Figure 2-2**, while service frequencies are summarised in **Table 2-1**.

Figure 2-1: Existing Bus Stops

Source: Google Maps (2024)

Figure 2-2: Existing Bus Routes



Source: Transperth

Table 2-1. Bus Routes and Service Frequency

Bus Route	Route Description	Service Frequencies		
		Weekdays	Saturdays	Sundays & Public Holidays
33	Elizabeth Quay Bus Station - Karawara via Kensington and Curtin Central Bus Station	30 minutes to 1 hour	1 hour	1 hour
34	Perth Bus port - Cannington Station via Como, Curtin Central and Curtin University Bus Stations	20 minutes to 1 hour	30 minutes to 1 hour	30 minutes to 1 hour
100	Canning Bridge Station - Cannington Station via Kent St Curtin Central and Curtin University Bus Stations	30 minutes	30 minutes	30 minutes
101	Canning Bridge Station - Curtin Central Bus Station via Lawson St and Curtin University Bus Station	30 minutes	30 minutes	30 minutes
284	Belmont Forum Shopping Centre - Curtin University Bus Station via	2 hours	No Service	No Service

	Albany Hwy and Curtin University Bus Station			
960	Mirrabooka Bus Station to Curtin University Bus Station via ECU Mt Lawley and Perth	20 minutes to 1 hour	30 minutes to 1 hour	30 minutes to 1 hour

Source: Transperth

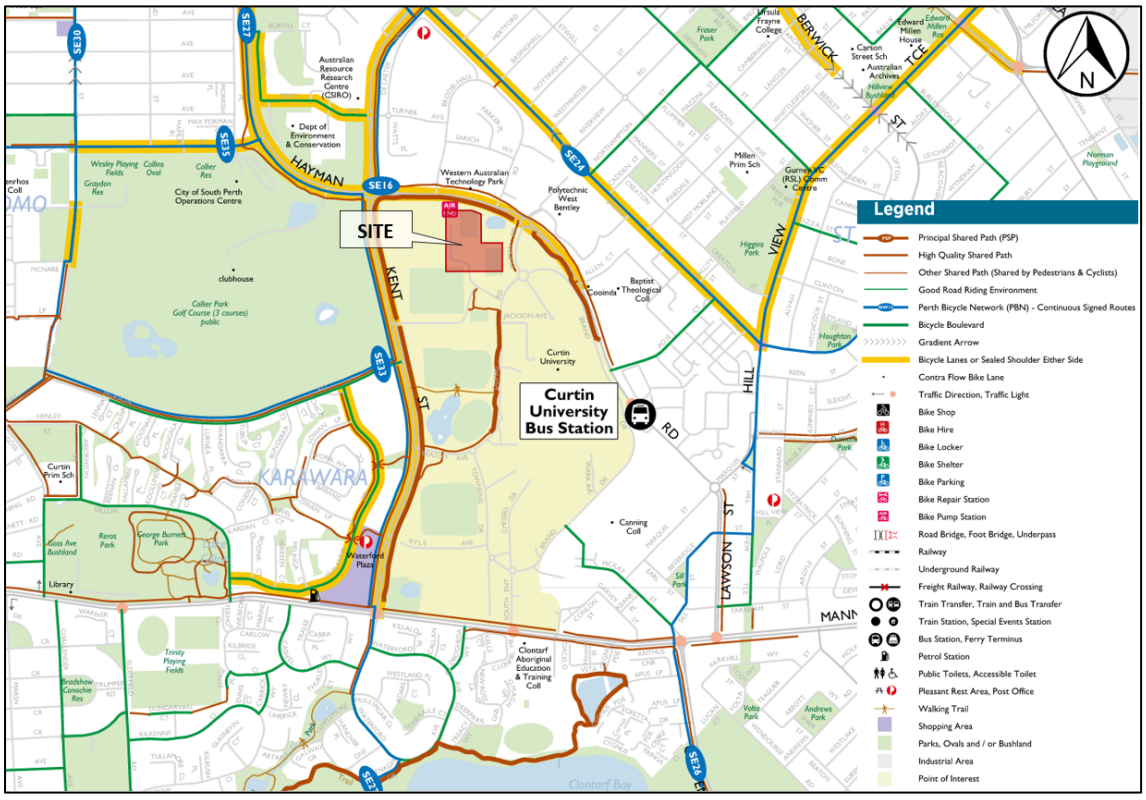
Overall, the Site appears to be highly accessible by public transport due to the provision of several bus stops in close proximity and the extensive bus routes running along the surrounding road network.

3 Pedestrian and Cycling Facilities

3.1 Existing Pedestrian and Cycling Facilities

Figure 3-1 shows the existing cycling network and facilities within the surrounding area of the Site. Generally, the Site is accessible to cyclists and pedestrians as Kent Street and Hayman Road have cycling lanes (or sealed shoulder) and high-quality shared paths. Other roads surrounding the Site, such as University Boulevard, are also equipped with bicycle facilities such as bike racks, bicycle lanes, and shared paths that are suitable for the students and workers arriving and departing from the University.

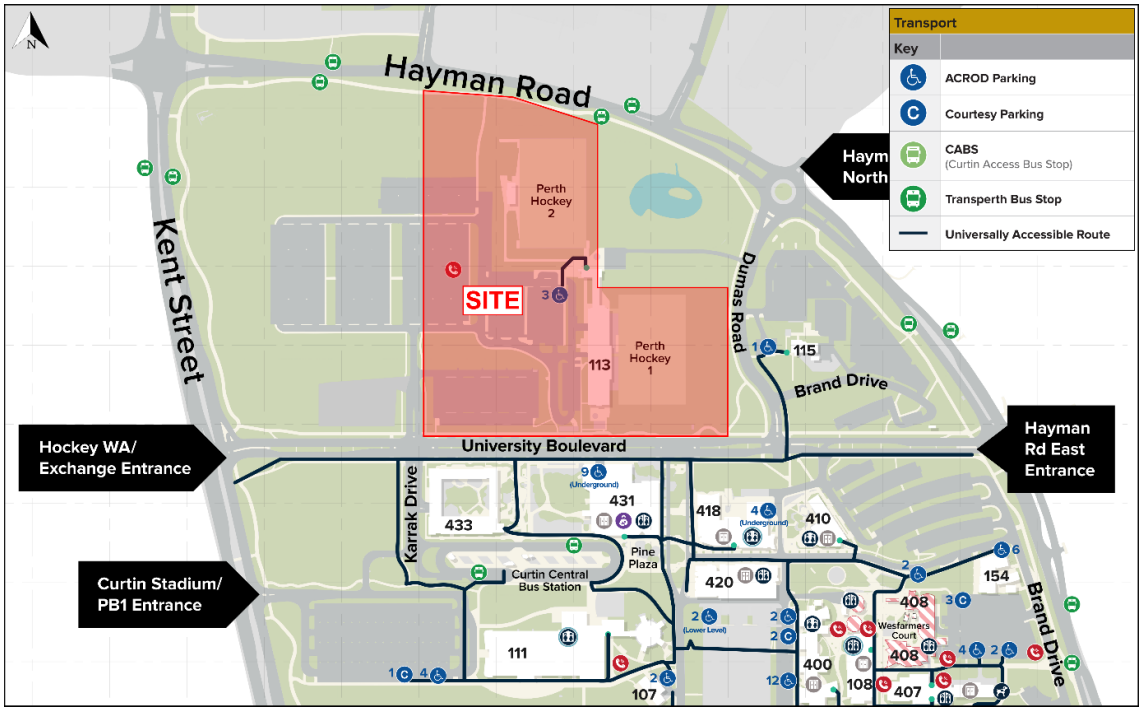
Figure 3-1: Existing Cycling Network



Source: Department of Transport

In addition, Curtin University's *Perth Campus Access and Inclusion Map* shown in **Figure 3-2**, indicates that the footpath on the southern side of University Boulevard is classified as 'universally accessible' and that it further connects to a campus-wide network of accessible routes for users in wheelchairs. There is an opportunity to further extend this network either along Kent Street, Hayman Road, or Dumas Road.

Figure 3-2: Curtin University Perth campus – Access and Inclusion Map



Source: Curtin University

4 Proposed Development

4.1 Proposed Development

The proposed redevelopment of the existing Hockey Centre is to include the following facilities:

- New pitches summarised as follows:
  - » West Pitch
  - » South Pitch,
  - » East Pitch, and
  - » Kids Play Pitch
- Retention of existing North Pitch and its existing stand.
- Stadium / High Performance Building.
- Indoor Centre Administration
- Ancillary buildings and other structures (such as a goalie training and storage sheds)
- Arrival Plaza with bus drop off bay and parallel car parking bays
- 60 car parking bays (exclusive for use by staff and national team players) comprising:
  - » North car park with 39 car parking bays (including 2 ACROD bays).
  - » South car park with 21 car parking bays (including 1 ACROD bay).
- Bus drop-off bay and parallel car parking bays along Karrak Drive extension.

Figure 4-1 shows the proposed site layout plan of the redevelopment. A large-scale version of this plan is also provided in **Appendix B**.

Figure 4-1: Site Plan

Source: Hunt Architects (November 2024)

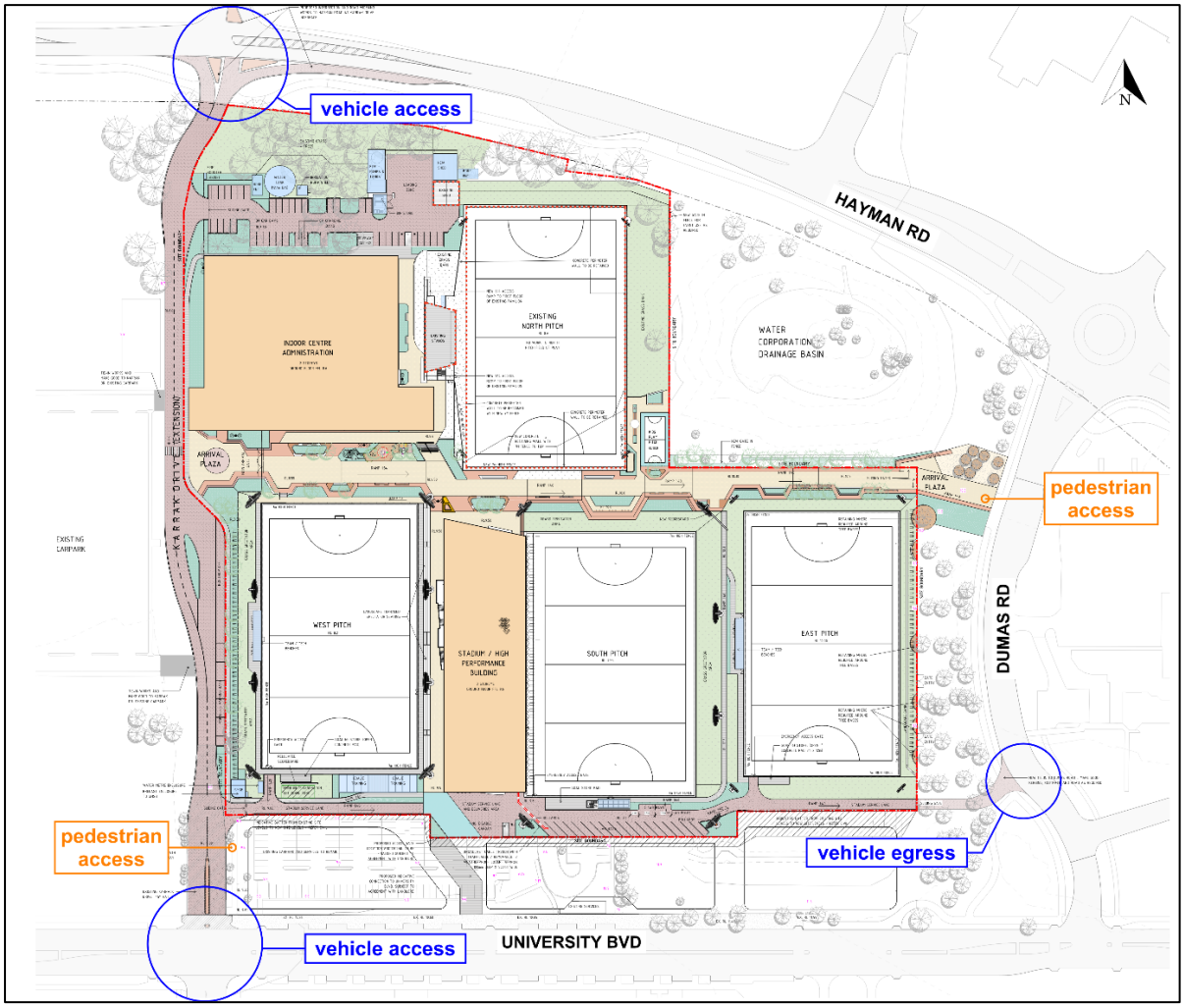
4.2 Access Arrangements

Vehicular access to the to the Site is proposed to be primarily via Karrak Drive on the western side of the subject Site as shown in **Figure 4-2**. Karrak Drive will provide access to the proposed car parks, bus drop-off bays, and parallel parking bays. Vehicles are also proposed to exit the southern car park via Dumas Road.

The proposed redevelopment of the Site also includes the extension of Karrak Drive from University Boulevard and connecting with Hayman Road to the north. Discussion on the proposed intersection configuration at the Hayman Rd/ proposed Karrak Drive extension is detailed in **Section 6.1**.

Pedestrian access is proposed via existing footpaths along University Boulevard and Karrak Drive which are anticipated to tie-in with footpaths within the Site. The arrival plaza is also anticipated to provide pedestrian access along Dumas Road. This wide pedestrian facility is expected to connect the proposed Karrak Drive extension and Dumas Road.

Figure 4-2: Access Arrangements



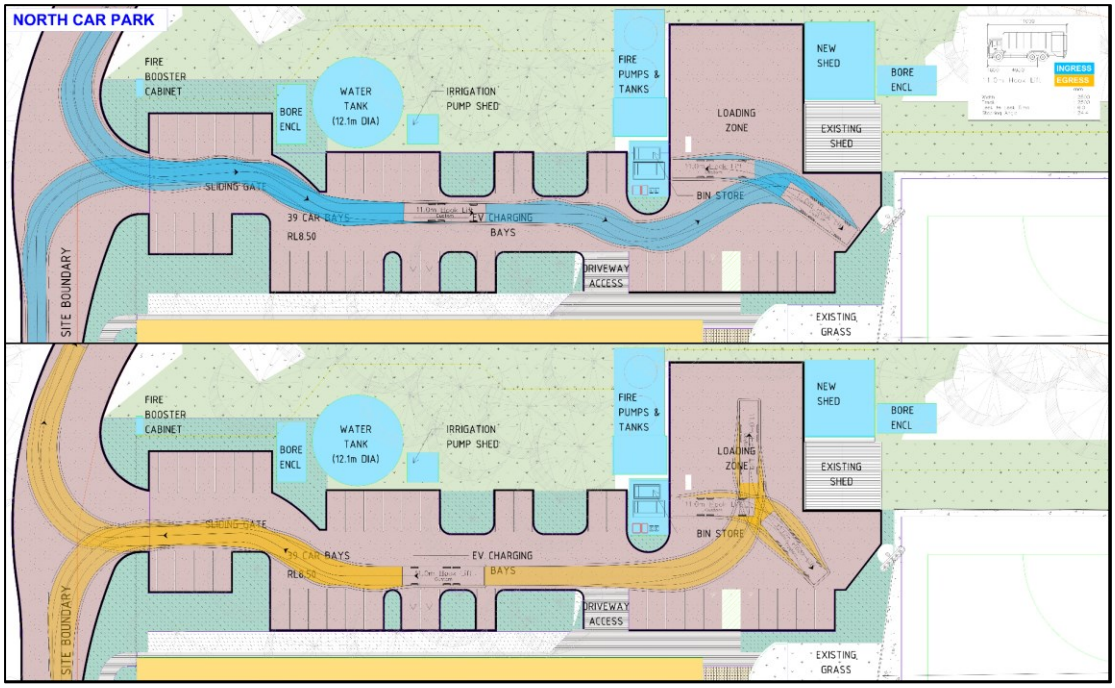
Source: Hunt Architects (November 2024)

4.3 Provision for Service Vehicles

4.3.1 Waste Collection

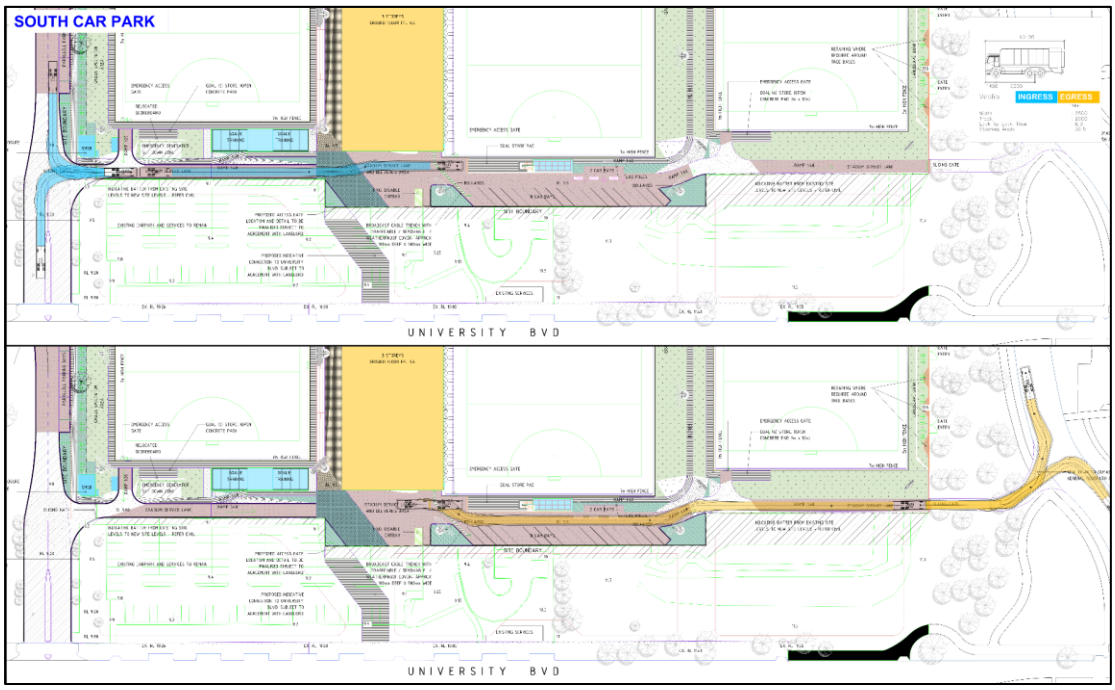
Waste collection is anticipated to be primarily undertaken at the service yard in the northern car park where ancillary facilities such as bin stores, water tanks, and sheds are proposed to be located. Waste vehicles is envisaged to approach the subject site from either Hayman Road or University Boulevard then turning into Karrak Drive to access the northern car park. A swept path assessment for an 11.0m waste collection vehicle (hook-lift) was conducted and the analysis indicated that this vehicle is able to adequately enter, manoeuvre through the car park and exit the proposed northern car park in forward gear as illustrated Figure **4-3**.

Figure 4-3: Swept Paths – 11.0m Waste Collection Vehicle (Northern Car Park)



A swept path assessment for a 10.1m waste collection vehicle was also undertaken in the southern car park and is illustrated in **Figure 4-4**. The swept path analysis indicates no encroachments are expected within the southern car park.

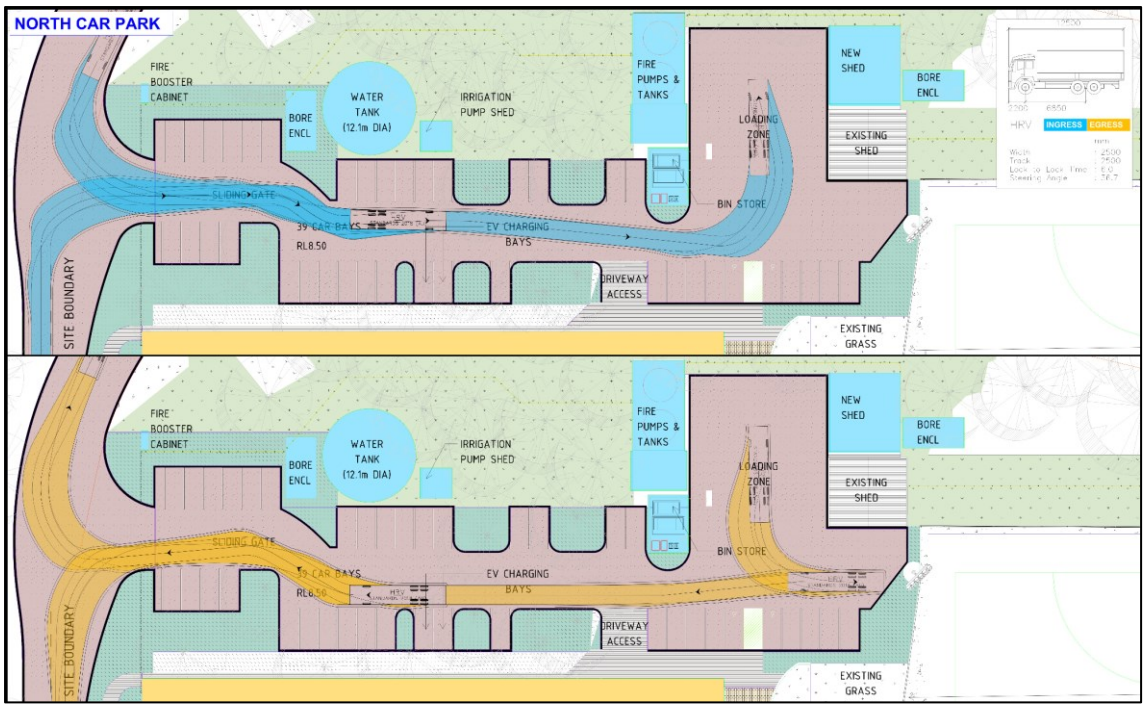
Figure 4-4: Swept Paths – 10.1m Waste Collection Vehicle (Southern Car Park)



4.3.2 Delivery Trucks

A loading zone is proposed within the northern car park for deliveries and other services that may be required by the proposed development. A swept path analysis was conducted for a 12.5m truck (HRV) and the assessment indicated that this design vehicle is able to adequately enter and exit this carpark as illustrated in **Figure 4-5**.

Figure 4-5: Swept Paths – 12.5m HRV Truck (Northern Car Park)

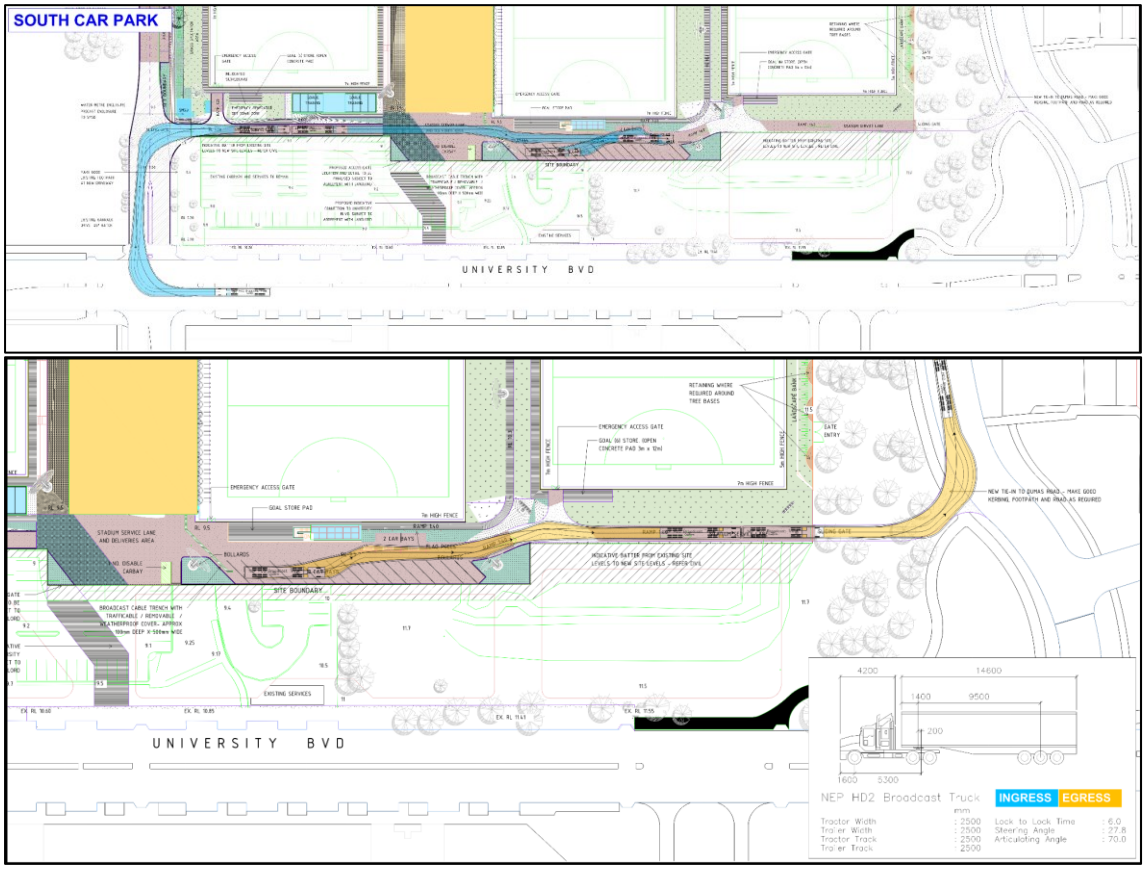


4.3.3 Broadcast Truck

A broadcast truck delivering equipment for live coverage of major events has also been assessed. The swept path analysis for a modified broadcast truck (i.e., NEP HD2 broadcast truck) was undertaken in the southern car park and it indicated that this vehicle is able to manoeuvre within the car park as shown in **Figure 4-6.** It should be noted that the broadcast truck is only able to enter the southern car park from the University Boulevard eastern approach as it is unable to enter this carpark without encroachments from the Hayman Road direction. It is suggested that appropriate signage be installed to restrict the broadcast truck from entering the subject site from the western approach of University Boulevard.

In addition, it is recommended that the broadcast truck exit the site onto Dumas Road and head northwards towards the Hayman Road and Dumas Road intersection since the broadcast truck is unable to turn into University Boulevard from Dumas Road without encroaching onto the existing kerbs. It is suggested that appropriate signage be installed to restrict the broadcast truck from entering the subject site from Hayman Road and exiting onto University Boulevard.

Figure 4-6: Swept Paths – Broadcast Truck (South Car Park)



4.3.4 Other Service Vehicles

Other service vehicles that are anticipated to visit the proposed development included fire trucks, ambulances and chartered buses. Swept path assessments were also conducted for these design vehicles which indicated no encroachments were identified and these vehicles are able to adequately enter and exit the subject site.

Figure 4-7 to **Figure 4-11** illustrates the swept path diagrams for a fire truck and an ambulance within the proposed car parks as well as for a 12.5m bus accessing the designated bus drop-off bay which is located adjacent to the arrival plaza.

Figure 4-7: Swept Paths – Fire Truck (Northern Car Park)

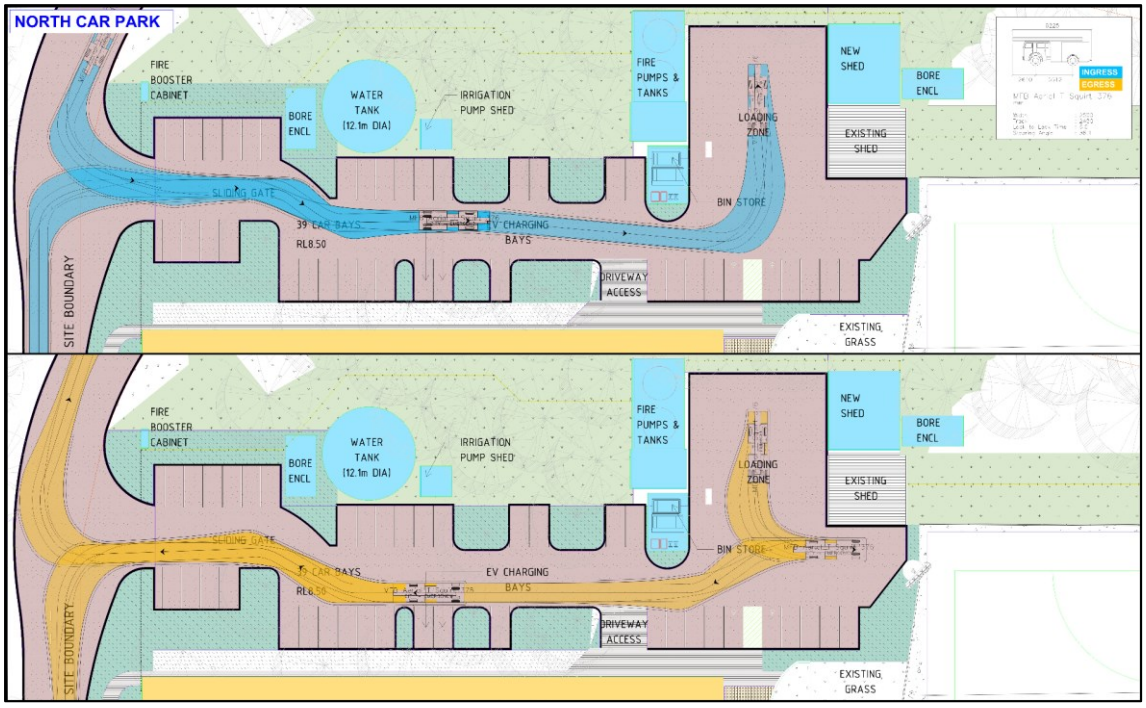


Figure 4-8: Swept Paths – Fire Truck (Southern Car Park)

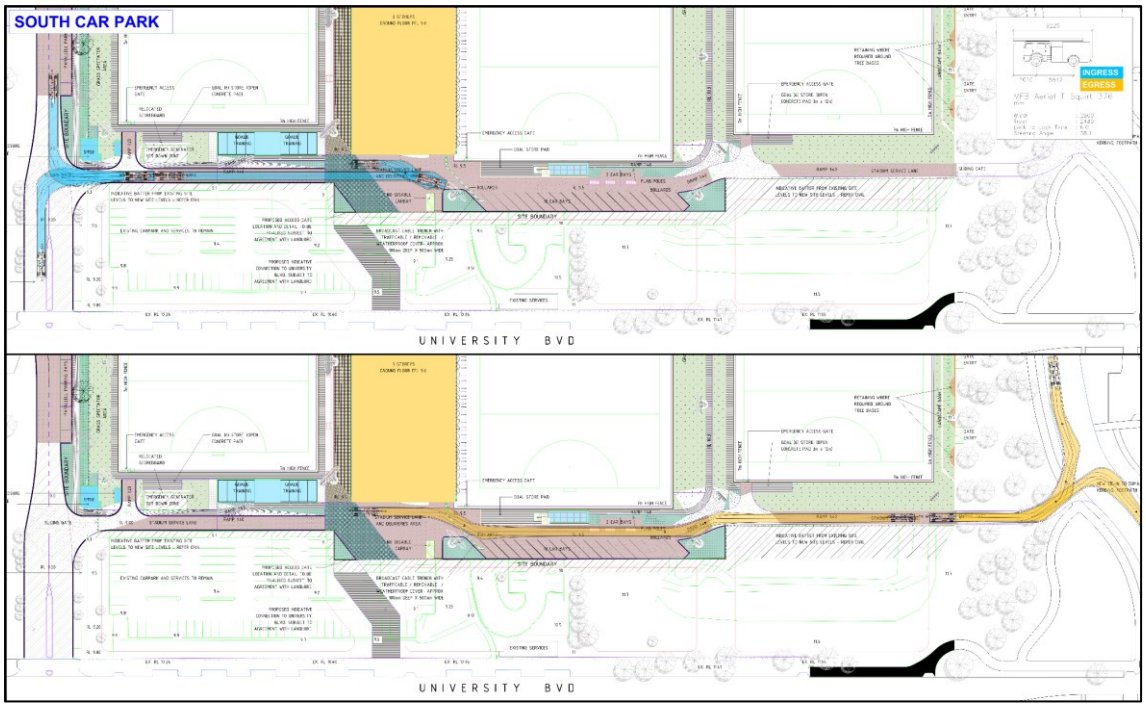


Figure 4-9: Swept Paths – Ambulance Van (Northern Car Park)

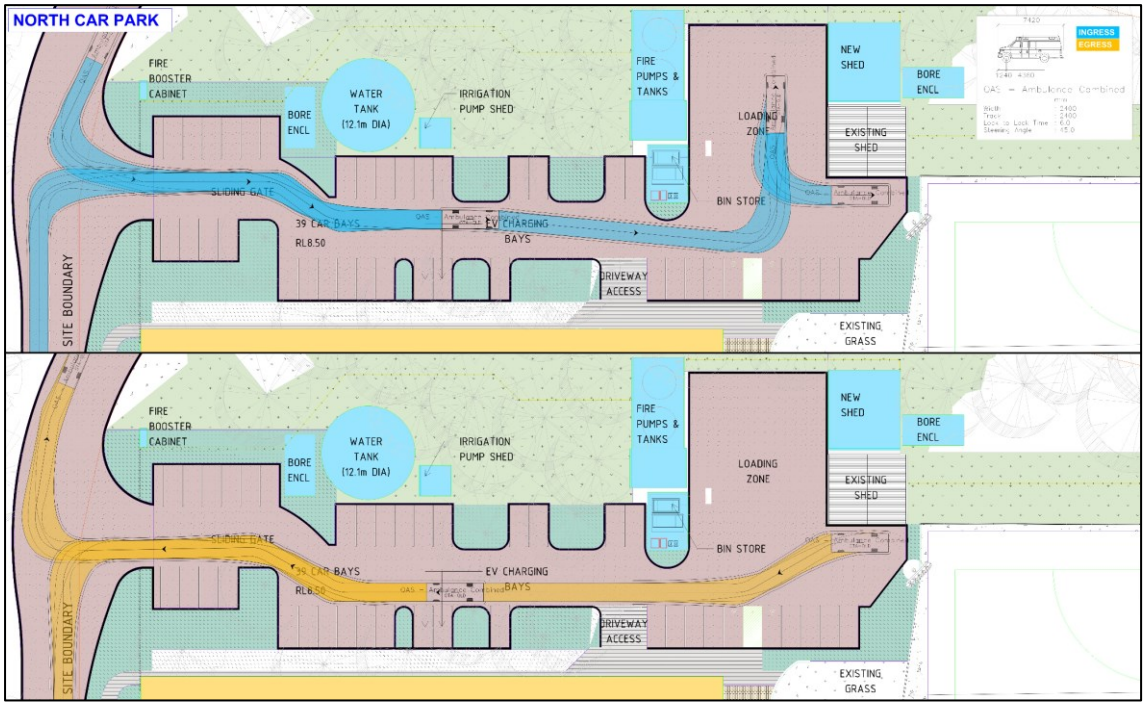


Figure 4-10: Swept Paths – Ambulance Van (Southern Car Park)

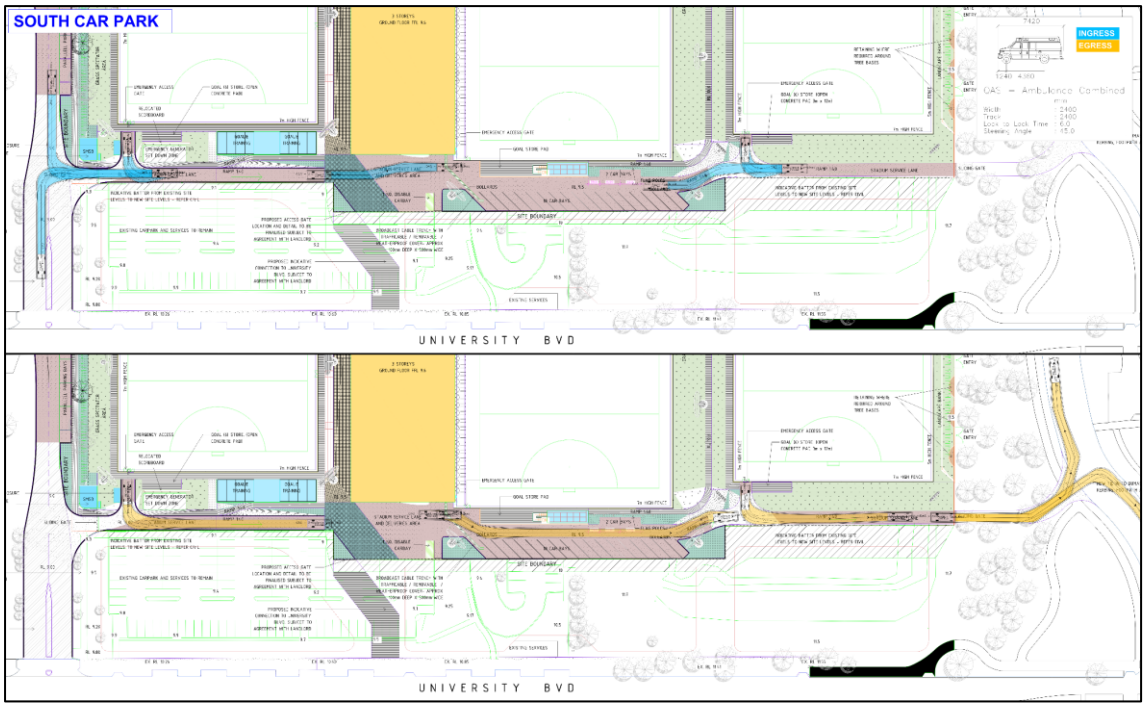
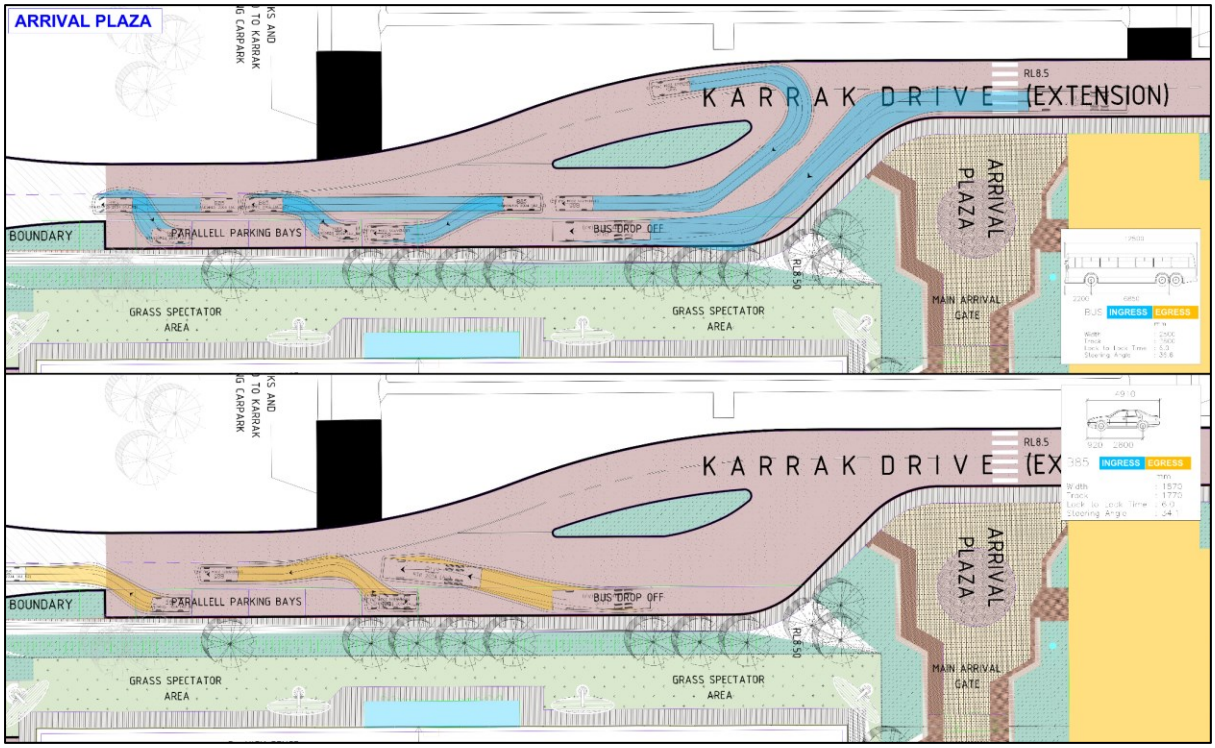


Figure 4-11: Swept Paths – 12.5m Bus (Arrival Plaza)



In addition to the 12.5m bus swept paths, the above diagram also shows the swept path for a B85 design vehicle entering and exiting the proposed (5) parallel parking bays along Karrak Drive.

Larger scaled high-resolution swept path diagrams are also included in **Appendix C**.

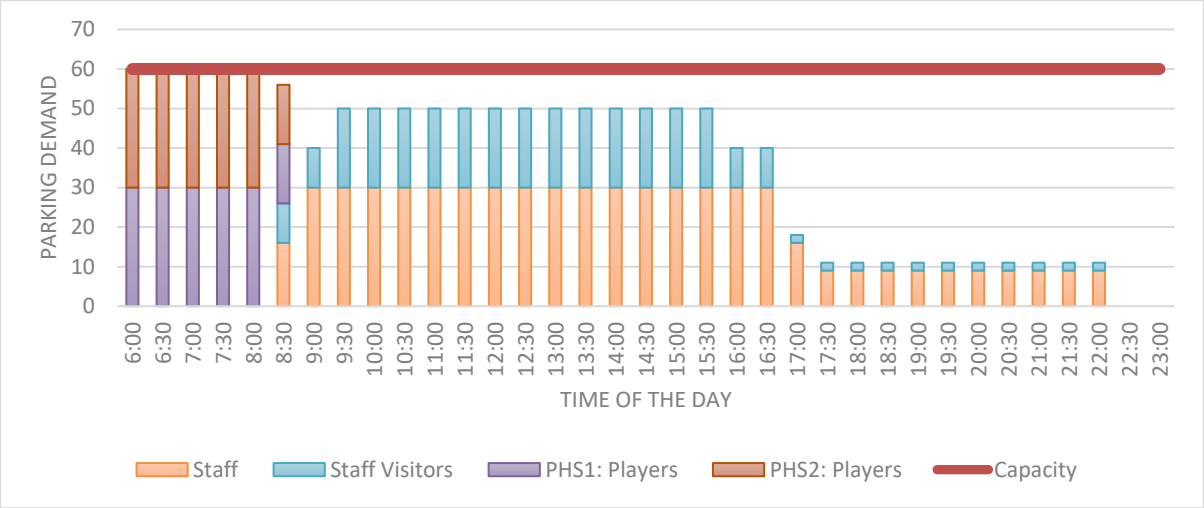
5 Parking Requirements and Compliance

5.1 Parking Requirements & Provision

The Town of Victoria Park Planning Policy No. 23 does not stipulate any applicable parking requirements for a 'hockey centre'. Hence, the parking requirements have been determined based on first principles using the anticipated day-to-day operations of the Site provided by WA Hockey.

Based on the information provided, the anticipated parking demand profile for the proposed development is shown in **Figure 5-1**.

Figure 5-1: Parking Demand Profile



The proposed 60-car parking capacity (refer to **Section 4.1**) would appear to adequately accommodate the parking needs of the staff, visitors, contractors, and national team player user groups. The peak demand occurs during the early morning hours before typical office hours, when all 60 national team players attend the training sessions. Parking occupancy decreases once these sessions end and staff members start arriving for work at around 08:30 AM. In addition, five (5) parallel car parking bays are proposed along Karrak Drive extension near the arrival plaza and bus drop-off bay. These on-street parking bays are anticipated to be utilised for short-term parking (e.g. for pickup and drop-off only).

It should also be noted that the parking bays provided within the development are anticipated to be used exclusively by staff and national team players, with occasional exemption for visitors and contractors.

Venue West conducted a preliminary parking demand analysis based on a macroanalysis of the preliminary schedules provided by WA Hockey. The calculation relies on the average attendance numbers and operational hours of the hockey stadium to derive an average parking turnover per hour which does not take into consideration the variability in hourly behavior during a typical day.

Venue West's analysis estimated that 296 individuals per hour would visit the proposed Hockey facility as shown in **Table 5-1** which translates to 148 vehicles (assuming an average of 2 people per vehicle). Additionally, it was assumed arrivals and departures were back-to-back, resulting in a total of 296 parking spaces per hour being required during the weekend.

Table 5-1. Venue West Parking Calculation

	Weekday	Weekend
Average Attendees	1498	4437
Operation Hours (decimal)	16	15
Average Attendance per hour	94	296

Additionally, assuming some people stay after games and some activity in the indoor courts, it was estimated that a total parking requirement of 350 bays would be adequate.

It is anticipated that the remainder of the existing Curtin University parking adjacent to the Site will be utilised by visitors during normal activities associated with the proposed hockey facility (e.g., seasonal games). With the redevelopment of the Hockey Centre, the remainder of the existing Curtin University parking is anticipated to be utilised by the public visiting the proposed development. It is estimated that approximately 430 car parking bays would be available on the existing Curtin University car park area after the proposed redevelopment. **Table 5-2** summarises the Site's parking provision.

Table 5-2. Car Parking Provision and Curtin University Parking

	Provided Bays	Intended Users
North Car Park	39	Staff / Players
South Car Park	21	Staff / Players
Karrak Drive (on-street bays)	5	Visitors (pick-up & drop-off)
	Retained Bays	
Curtin University Parking	430	Public / Visitors

Based on the above assessment, it would appear that the parking provided on the subject site and on the existing Curtin University parking would meet the anticipated demand for the proposed development.

5.2 Recommended Parking Mitigation Measures

The proposed redevelopment of the state hockey centre has projected only 60 parking bays for office staff, and national team players. The proposed new parking bays would appear to be able to meet the demand generated by the office staff, visitors, and national team players. However, it is advisable that consideration be given to introducing parking management strategies to further reduce reliance on parking spaces for the purposes of sustainability, especially for staff and players, considering the proposed State Hockey Centre is in a location where excellent public transport services and a wide range of bicycle and pedestrian facilities can be utilised by these users. During the early hours, parking utilisation is expected to be at maximum capacity because of the national team training

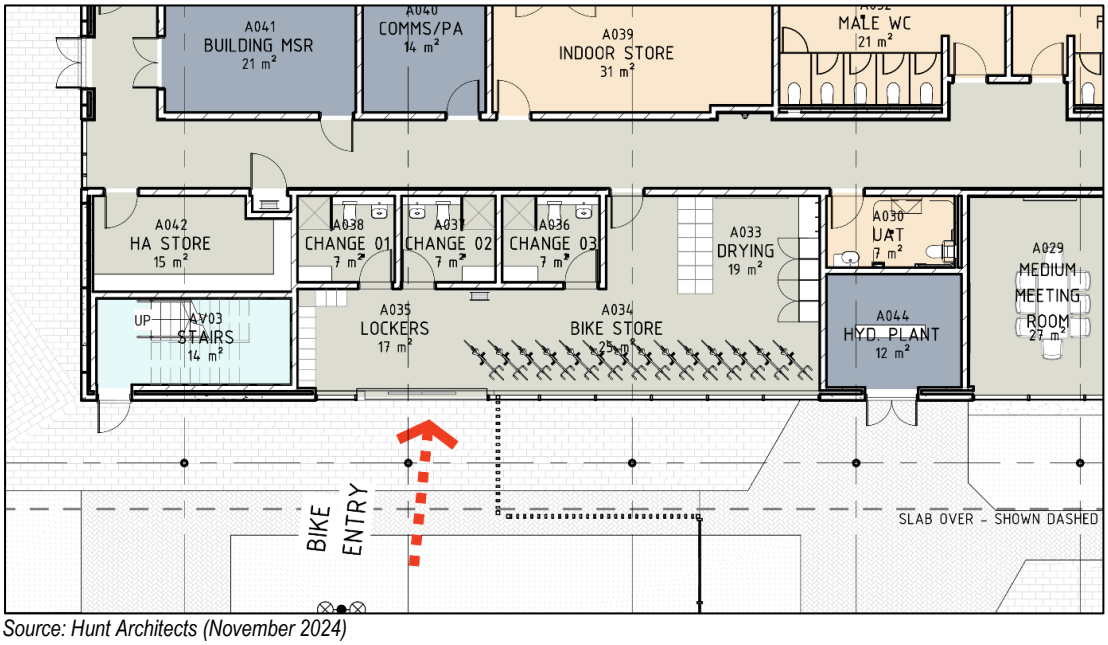
sessions. However, it is anticipated that the available parking would increase as national players depart after their training sessions. The following parking management strategies could also be considered to minimise the impact on parking:

- Staff could be advised to park temporarily at other available parking areas on the Curtin University Campus during the peak parking demand periods, with the intent to move their vehicles later in the day. Consideration could also be given to implementing flexible working hours for staff which could minimise the potential of parking demand overlap between staff and the national players.
- A shuttle service could be provided for staff or players to discourage car usage to the proposed office/hockey centre parking.
- Encouraging car sharing and implementing carpooling programs for the staff can help reduce the number of vehicles requiring parking at the proposed office/facility.
- Incentives such as prizes can be offered to staff who choose to use alternative transport and not to drive to work. This approach promotes sustainability and encourages the use of public transportation, cycling or walking to the proposed Hockey Centre.
- Raising employee awareness about the benefits of using alternative transport and the drawbacks of excessive car use can be disseminated through internal communication, workshops, or seminars. These activities would inform employees about the environmental, health, and cost advantages of alternative transportation.

5.2.1 Provision of Cycling Transport Facilities

The proposed redevelopment of the hockey centre includes end-of-trip (EOT) facilities for staff and players who opt to use their bicycles to reach the Site as shown in **Figure 5-2**. Bike store, change areas, and lockers are provided within the indoor centre administration building. In addition, it is proposed that at least 20 bike racks are allocated for public use externally and within the Site's boundaries.

Figure 5-2: End of Trip (EOT) Facilities



Source: Hunt Architects (November 2024)

5.3 Parking Compliance

5.3.1 Proposed Northern Car Park

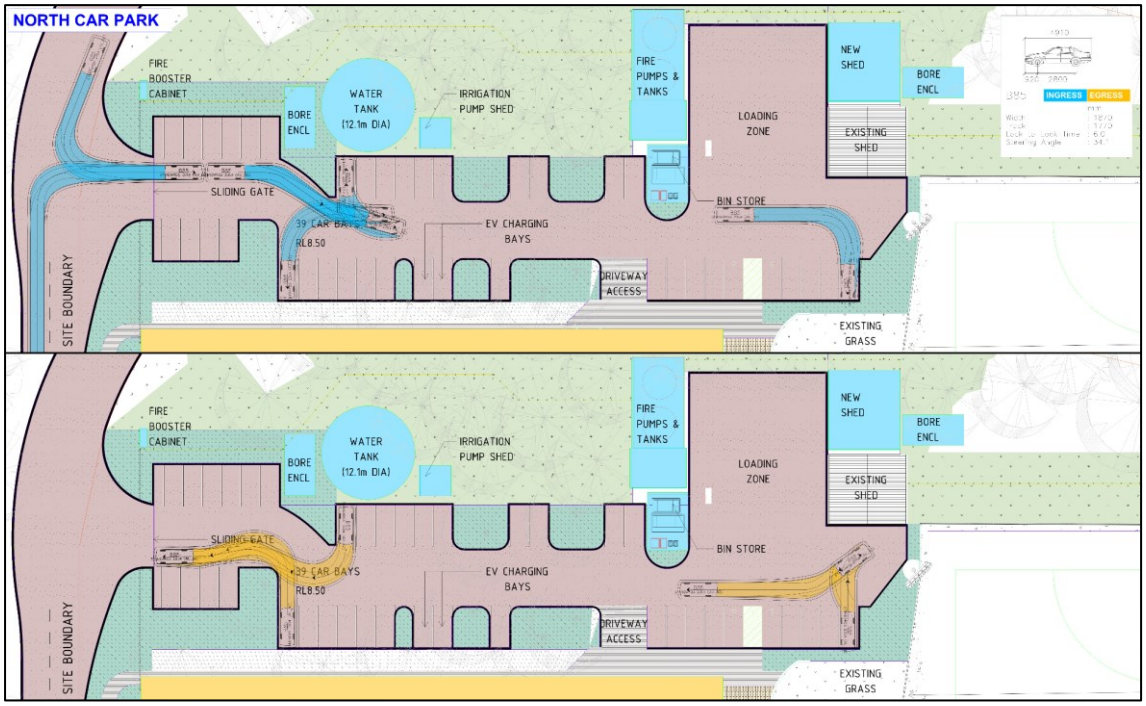
The proposed car park located to the north of the Site consists of 39 car parking bays including 2 ACROD bays and were assessed for a User Class 1A and Class 4 facility in accordance with the requirements in AS2890.1 and AS2890.6 respectively. **Table 5-3** summarises the findings of the compliance assessment.

Table 5-3. Parking Compliance – Northern Car Park

	Staff / Player Parking (User Class 1A)			ACROD Parking (User Class 4)		
Parameter	**Provided**	**Required**	**Remarks**	**Provided**	**Required**	**Remarks**
Bay Width, m	**2.5**	2.4	**Compliant**	**2.5**	2.4	**Compliant**
Bay Length, m	**5.4**	5.4	**Compliant**	**5.4**	5.4	**Compliant**
Aisle Width, m	**7.2**	5.8	**Compliant**			
Circulation Roadway, m	**7.2**	3.0 (one-way)	**Compliant**			
		5.5 (two-way)	**Compliant**			
Access Width, m	**7.8**	3.0 – 5.5 (Category 1)	**Compliant**			
Shared Area Width, m				**2.5**	2.4	**Compliant**
Shared Area Length, m				**5.4**	5.4	**Compliant**
Bollard from Aisle, mm				**800**	800±50	**Compliant**

In general, there were no non-compliances identified for all the proposed parking bays in the northern car park. A swept path assessment for a B85 design vehicle was also conducted and illustrated in **Figure 5-3**.

Figure 5-3: Swept Paths – B85 Design Vehicle (North Car Park)



5.3.2 Proposed Southern Car Park

The proposed car park located to the south of the subject Site consists of 21 car parking bays, including 1 ACROD bay and 2 parallel parking bays. These bays were assessed for a User Class 1A and Class 4 facility in accordance with the requirements in AS2890.1 and AS2890.6 respectively. **Table 5-4** and **Table 5-5** summarises the findings of the compliance assessment.

Table 5-4. Parking Compliance – Southern Car Park (for angled and 90-degree bays)

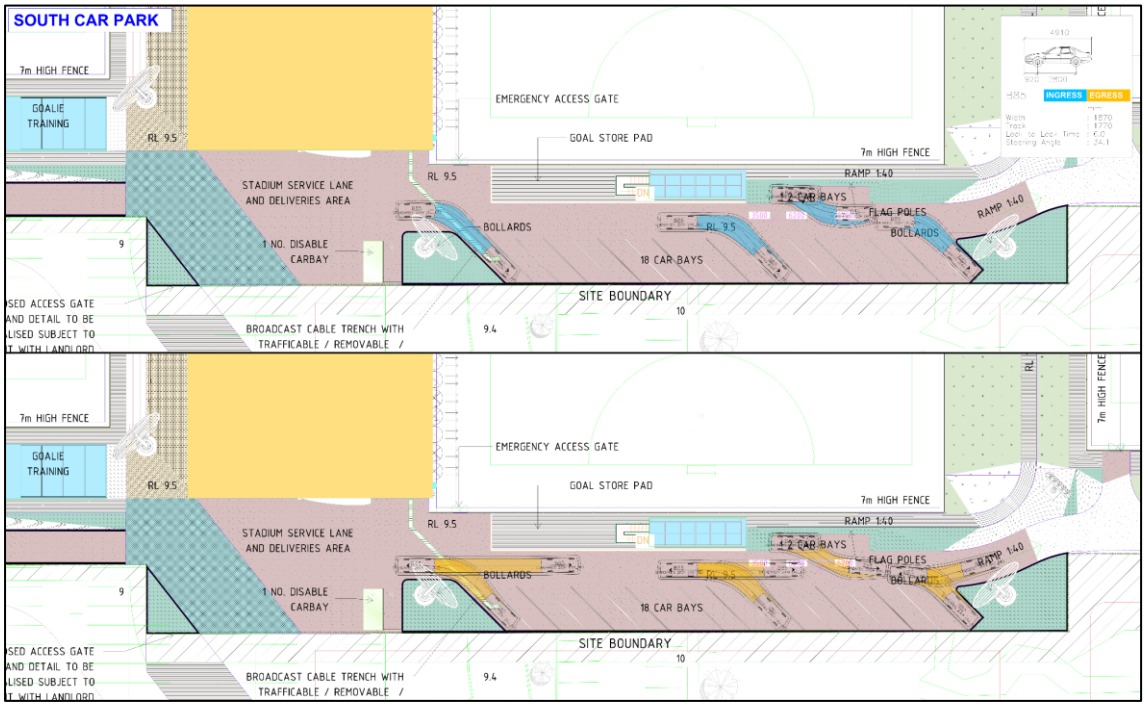
	Angled Parking Bays (User Class 1A)			ACROD Parking (User Class 4)		
Parameter	**Provided**	**Required**	**Remarks**	**Provided**	**Required**	**Remarks**
Bay Width, m	**2.4**	2.4	**Compliant**	**2.4**	2.4	**Compliant**
Bay Length, m	**5.5**	5.4	**Compliant**	**5.4**	5.4	**Compliant**
Aisle Width, m	**4.6**	3.9	**Compliant**			
Parameter B, m	**3.5**	3.4	**Compliant**			
Parameter C, m	**5.7**	5.5	**Compliant**			
Shared Area Width, m				**2.5**	2.4	**Compliant**
Shared Area Length, m				**5.4**	5.4	**Compliant**
Bollard from Aisle, mm				**800**	800±50	**Compliant**

Table 5-5. Parking Compliance – Southern Car Park (for parallel bays)

	Parallel Parking Bays		
Parameter	**Provided**	**Required**	**Remarks**
Bay Width, m	**2.2**	2.1	**Compliant**
Bay Length, m (obstructed ends)	**6.2**	6.2	**Compliant**
Aisle Width, m	**4.6**	3.6	**Compliant**

In general, no non-compliances were identified for all the proposed parking bays within the proposed southern car park. A swept path assessment for a B85 design vehicle was also conducted as illustrated in **Figure 5-4**.

Figure 5-4: Swept Paths – B85 Design Vehicle (Southern Car Park)



5.3.3 Karrak Drive Parallel Parking Bays

A-t least five (5) parallel parking bays are proposed along Karrak Drive adjacent to the bus drop-off area. These bays were assessed in accordance with the requirements in AS2890.5 and the results are summarised in **Table 5-6**.

Table 5-6. Parking Compliance – Karrak Drive Parallel Parking Bays

		Parallel Parking Bays (On-Street Parking)	
Parameter	**Provided**	**Required**	**Remarks**
Bay Width, m (inc. safety buffer)	**3.5**	2.0 – 2.3	**Compliant**
Bay Length, m (unobstructed end)	**7.2**	5.4	**Compliant**
Bay Length, m (intermediate space, Z)		6.0 – 6.7	**Compliant**
Bay Length, m (obstructed end)		6.3 or Length Z	**Compliant**

No non-compliances were identified for the parallel parking bays proposed on Karrak Drive.

6 Changes to Surrounding Network

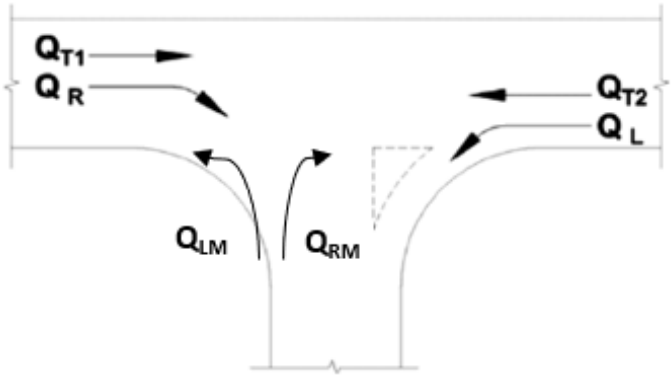
6.1 Road Network

As part of the proposed redevelopment of the hockey centre, the existing Karrak Drive is anticipated to be extended northwards to intersect with Hayman Road and Brodie-Hall Drive forming a new intersection. A turn warrant assessment based on Main Roads WA's Supplement to the Austroads Guide to Traffic Management was undertaken to identify the appropriate turn treatments along Hayman Road for the proposed new intersection with Karrak Drive extension. Estimated traffic volumes along Hayman Road and Karrak Drive for the 2029 and 2039 design years were considered in this assessment. It should be noted that these design traffic volumes were estimated using available traffic counts indicated in **Section 1.6**. Main Roads WA's turn warrant assessment traffic flow diagram is illustrated in **Figure 6-1**, while results are summarised below in **Table 6-1**.

Table 6-1. Turn Warrant Assessments along Hayman Road

	2029 Design Volumes		**2039 Design Volumes**	
	AM Peak	**PM Peak**	**AM Peak**	**PM Peak**
Design Speed, km/h	70	70	70	70
Splitter Island	No	No	No	No
Dual Carriageway	No	No	No	No
Movement Volume Inputs				
Q_{T1}	544	460	595	503
Q_R	16	2	16	2
Q_{T1}	464	568	508	622
Q_L	15	2	15	2
Q_{LM}	104	117	104	117
Q_{RM}	112	108	112	108
Right Turn Assessment				
Q_m	1023	1030	1118	1127
%HV	8.00	8.00	8.00	8.00
X	3.86	1.67	4.18	1.81
Treatment	**CHR**	**SR**	**CHR**	**SR**
Left Turn Assessment				
Q_m	464	568	508	622
%HV	8.00	8.00	8.00	8.00
X	1.83	0.97	1.98	1.05
Treatment	**AUL(S)**	**SL**	**AUL(S)**	**SL**

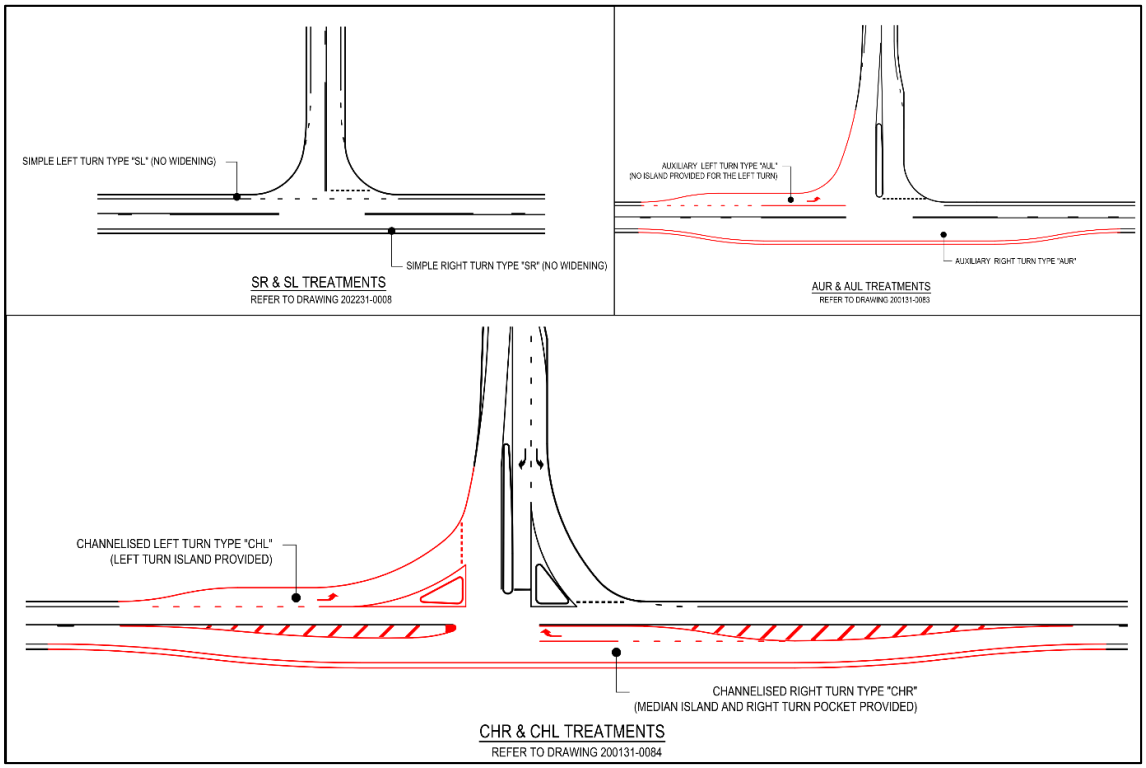
Figure 6-1: Turn Warrant Assessment – Traffic Flow Inputs



Source: Austroads Guide to Traffic Management Part 6 (2017)

The results of the turn warrant assessment indicates that a channelised right turn (CHR) treatment would be required along Hayman Road for both the 2029 and 2039 design year. Similarly, a short auxiliary left turn lane [AUL(S)] would be required along Hayman Road to accommodate left turns into Karrak Drive. The results would recommend a higher-order turn treatment during the AM peak period when compared to the PM peak period. **Figure 6-2** illustrates the Main Roads WA's intersection turn treatments associated with this assessment.

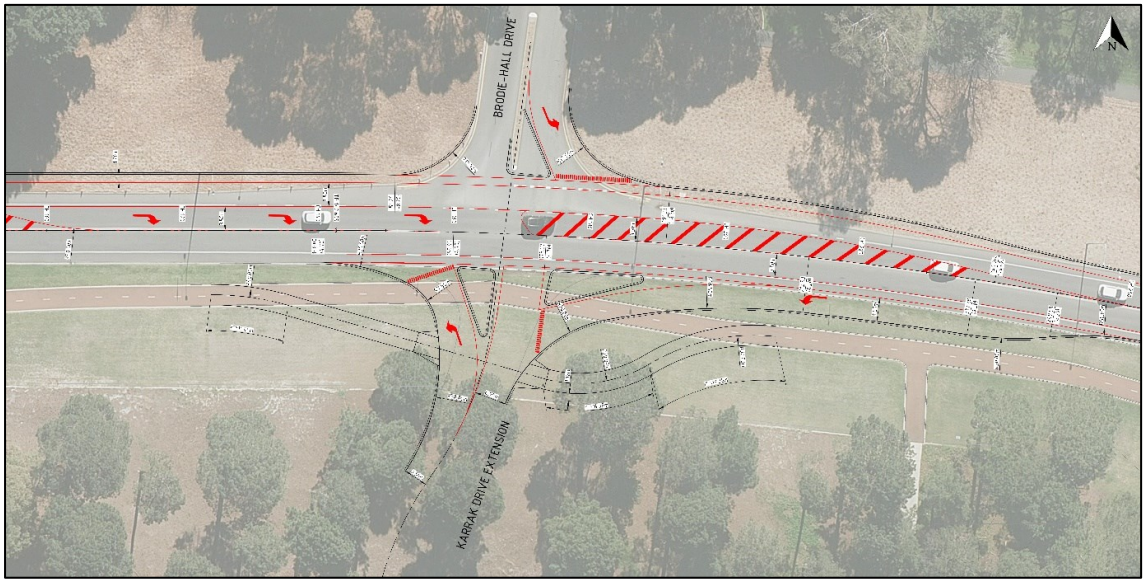
Figure 6-2: MRWA Intersection Turn Treatments



Source: MRWA Drawing Number 202231-0007-2

The proposed geometric configuration for the proposed Karrak Drive and Hayman Road intersection is illustrated in **Figure 6-3**. A high-resolution version of this intersection plan is provided in **Appendix D**.

Figure 6-3: Proposed Intersection Arrangement – Hayman Road & Karrak Drive



It should be noted that a channelised right turn treatment (CHR) on Hayman Road and a channelised lane (CHL) instead of the short auxiliary lane (AUL) is being proposed. In addition, the Karrak Drive and Brodie Hall Drive approaches are to be restricted to left out turns only.

6.2 Pedestrian and Cycling Network

Figure 6-3 also illustrates the potential realignment of the existing high-quality shared path along Hayman Road as a result of the proposed new intersection arrangement. The realigned path is anticipated to directly intersect Karrak Drive to provide the shortest possible crossing distance.

In addition, Stantec contacted the Town of Victoria Park and was advised that there are no known changes to the pedestrian and cycling facilities in the area in the near future. However, it is understood that there is a possibility for the continuation of existing shared path on Holder Street to Hill View Terrace.

6.3 Public Transport Network

Stantec contacted Transperth and was advised that there are no short to medium term plans to significantly change the existing bus route network or service frequencies around Curtin University.

The Town of Victoria Park has also advised that METRONET is currently exploring mid-tier transport (i.e., high frequency bus) routes on Kent Street (and potentially Manning Road) for implementation in the medium to longer term.

7 Integration with Surrounding Area

The Site is situated within Curtin University grounds which can be considered as a major generator and attractor of trips within the Bentley suburb. **Figure 7-1** illustrates an aerial overview of the Site and its surrounding areas.

Figure 7-1: Surrounding Attractors and Generators

Source: Metromap (2024)

The Site is surrounded by a variety of establishments within proximity to it as shown in the figure above. The most popular key generators/attractors are located along Hayman Road and Kent Street.

These attractors/generators include the following:

- Nearby educational institutions – Curtin University, Curtin Primary School, Millen Primary School, and South Metropolitan TAFE,
- Nearby industrial facilities such as the Bentley Technology Park,
- Surrounding residential areas within Kensington, Como, East Victoria Park, Waterford, and
- Various restaurants/cafes and office/commercial businesses.

8 Transport Analysis

8.1 Analysis Overview

This analysis focuses on the trips generated by the redevelopment of the existing Hockey Centre. Specifically, it focuses on the day-to-day operation of the Site, including office activities, training, and small game fixtures. The redevelopment will introduce 60 parking spaces exclusively for the use of players, staff, volunteers, and officials of the Hockey Centre. The vehicle trips of spectators and visitors associated with the in-season and off-season activities are not included in this analysis, as they are already included in the existing background traffic within the road network surrounding the Curtin University grounds. It is assumed that potential visitors and game spectators will be aware of the limited parking space available within the Site and will continue to park in the remaining Curtin University parking or the surrounding pay parking facilities near the Site. Additionally, it is expected that most visitors and spectators will utilise the excellent public transport services available.

Furthermore, the impact of special events on traffic has not been considered in this report, as these events are infrequent and not representative of the Site's day-to-day operations. Site access and traffic operations during special events are expected to be managed by a special events traffic management plan.

8.2 Assessment Years and Time Periods

Several traffic survey counts were conducted between November 2023 and September 2024 on a typical weekday and weekend at key intersections mentioned in the body of this report (refer to **Section 1.6.2**). Based on the collected data, the peak time periods for the road network were observed to be between 7:45 am to 8:45 am and 4:15 pm to 5:15 pm during the morning and afternoon peak hour periods respectively. Additionally, the weekend peak (i.e., Saturday) was identified to occur between 8:00 am to 9:00 am.

The following scenarios have been analysed as part of this assessment:

- Scenario 1 – 2024 Existing Year Traffic (Weekday AM, Weekday PM, and Weekend peaks)
- Scenario 2 – 2029 Background Traffic with the Development-generated Traffic (Weekday AM, Weekday PM, and Weekend peaks), and
- Scenario 3 – 2039 Background Traffic with the Development-generated Traffic (Weekday AM, Weekday PM, and Weekend peaks)

It should be noted that Scenario 2 considers a 5-year development period for the Site and 2029 is the anticipated opening year of the redeveloped hockey centre. A 10-year post-opening design year (Scenario 3) is also considered.

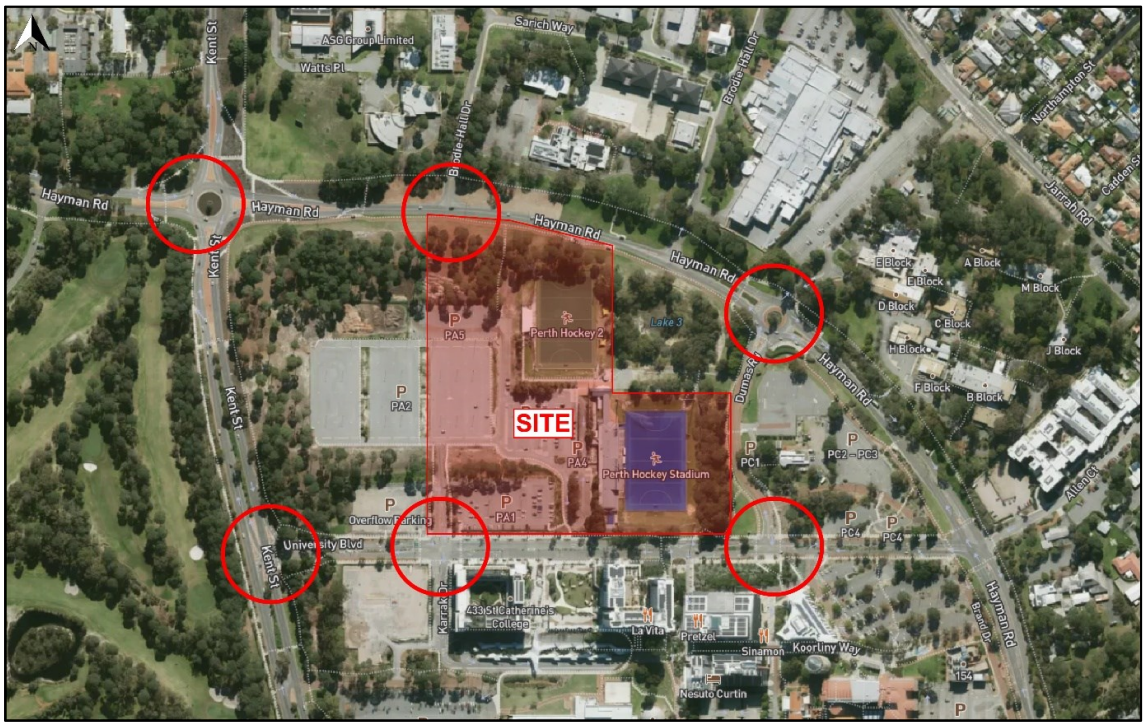
8.3 Key Intersections

In order to assess the potential impacts of Site-generated traffic on the surrounding road network, the following key intersections have been considered in this assessment:

- Hayman Road and Kent Street,
- Hayman Road and Brodie-Hall Drive (existing and post-development configuration),
- Hayman Road and Dumas Road,
- University Boulevard and Kent Street,
- University Boulevard and Karrak Drive, and
- University Boulevard and Dumas Road.

The location of the abovementioned intersections in relation to the Site is illustrated in **Figure 8-1**.

Figure 8-1: Location of Key Intersections



Source: Metromap (2024)

8.4 Key Assumptions

The following assumptions were made as part of the traffic analysis:

- The assumed opening year of the proposed redeveloped hockey centre is in 2029,
- The 10-year horizon period is usually considered after a development's opening year. For this assessment, the 10-year post-opening horizon period is assumed to be in 2039,
- It is assumed that the traffic generated by the proposed development will be derived from the available car parking spaces reflecting the day-to-day operations of the Site which will mostly comprise of trips made by staff, personnel, and players only.
- The distribution of the development-generated trips across the surrounding road network were based on turning volumes and proportions of key intersection that were surveyed between November 2023 and September 2024.

- Based on available historical traffic data from the Main Roads WA Traffic Map, a conservative 1.0% growth rate per annum was adopted to estimate the existing (2024) traffic volumes at key intersections and in estimating background traffic volumes for Scenario 2 (2029) and Scenario 3 (2039).
- Information on the signal phasing and timing of the existing signalised intersection of University Boulevard and Karrak Drive was not publicly available. As such, the following assumptions are made:
    - » It is assumed that the nearby signalised intersection of University Boulevard and Hayman Road (with signal information available in Traffic Map) are similar in terms of signal operations and geometric design, both being a four-legged intersection,
    - » Traffic signal information from the University Boulevard and Hayman Road intersection was adopted to supplement the missing signal information at the University Boulevard/Karrak Drive intersection.
    - » The adopted signal phasing information is assumed to be also applicable in the 2029 and 2039 assessment year scenarios.
- The percentage of heavy vehicles within the immediate road network were estimated based on the traffic survey counts conducted. The estimated heavy vehicle proportions were assumed to be identical across all three assessment year scenarios.

8.5 Development Trip Generation

8.5.1 Overview

The trip generation for the Site was calculated using first principles and based on information provided by WA Hockey. The redevelopment of the Site will generate the users such as staff, visitors/spectators, and players. It should be noted that the development proposes to provide 60 on-site parking bays exclusively for the use of staff and national team players. Visitors and spectators are expected to utilise the existing Curtin University parking spaces located to the west of the Site or walk, use public transport or alternative modes to reach the Site.

This traffic generation analysis focuses on the new trips generated by the 60 parking bays as a result of the redevelopment on the existing Site. The vehicle trips of spectators and visitors associated with the in-season and off-season activities are not included in this analysis, as they are less than the number of vehicles generated by the university traffic and is assumed to be included in the existing background traffic within the road network surrounding the Curtin University.

Furthermore, the traffic impact as a result of special events have not been assessed as these events only occur rarely and do not represent the day-to-day operations for the Site. It is anticipated that access to the Site for special events would be under a separate traffic management plan.

8.5.2 Staff and National Team Players

The trip generation was computed based on the anticipated number of staff and national team players, as well as additional information provided by the client. The following information, including assumptions, were considered in this analysis:

- The estimated daily influx of staff and visitors to the site comprises 35 staff members and 20 visitors (i.e., contractors, suppliers).

- Based on the ABS Census data, it is assumed that 85% of the staff will use their private cars, while the remaining 15% will opt for public transport due to the excellent availability of walking/cycling facilities and public transportation services.
- Staff are expected to gradually arrive around 8:30am and stay in the office until the late afternoon. Some staff may start to depart from the office at 4:30pm but most staff members will depart after office hours at 5:00pm.
- Approximately 10 staff members are estimated to arrive at 5:00pm and stay until 10:00pm for scheduled training sessions or evening games.
- It is anticipated that there will be 60 national team players participating in the training sessions, although on certain days, only 30 players are expected.
- It is assumed that all players will have their own cars to drive to the training sessions.
- National Team Player training sessions are conducted every day during the early morning hours between 6:00am to 8:00am, with some players possibly staying until 8:30am.

Based on the above, the peak-hour traffic generation is anticipated to commence at 6:00am when all the national team players arrive. The afternoon peak hour for the site is anticipated to commence at 5:00pm when most of the staff depart the office and when the additional 10 staff members arrive for the evening activities. The anticipated traffic to be generated by the proposed development is summarised in **Table 8-1**.

Table 8-1. Development Trip Generation – Peak Hour

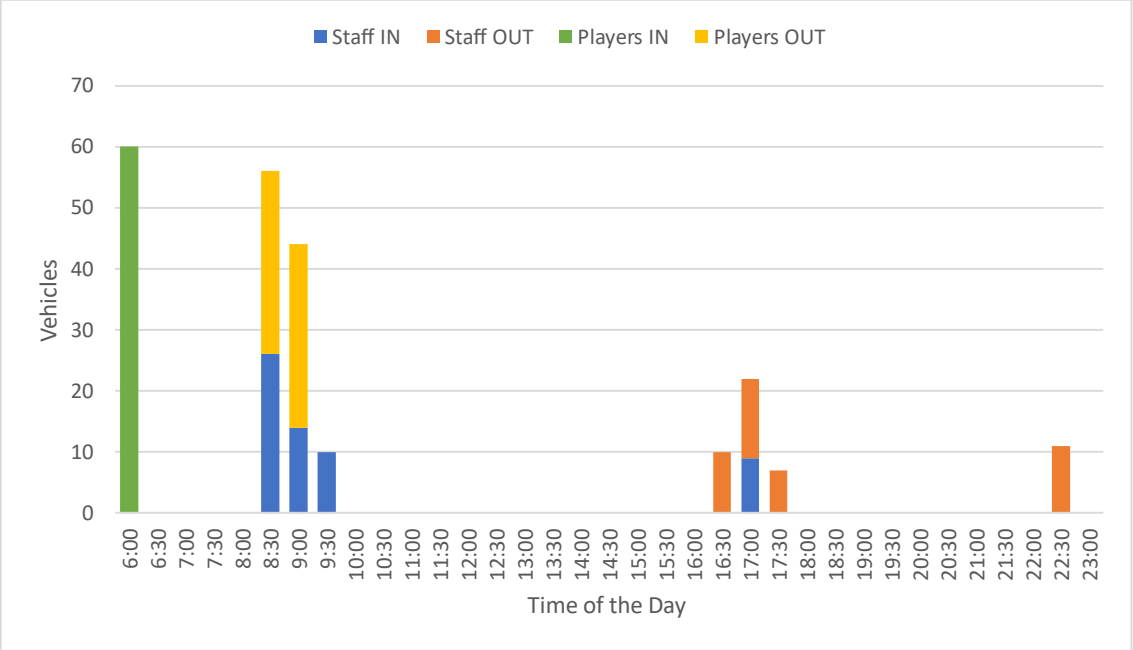
	AM Peak Period		PM Peak Period	
	In	**Out**	**In**	**Out**
Staff	0	0	9	13
Players	60	0	0	0
Total	**60**		**22**	

It should be noted that the ingress of national team players will not coincide with the staff's ingress, as their activities occur outside of the surrounding road network peak hours. Similarly, the egress of national team players will not coincide with that of the staff, as players are expected to depart the proposed development at 8:00 am, while staff members are expected to leave the site during the PM peak hour. The anticipated arrival and departure movements of each user group is graphically represented in **Figure 8-2**.

A total of 60 vehicle trips during AM peak and 22 vehicle trips during the PM peak hour trip is anticipated which represents the highest number of vehicle movements anticipated to enter and exit the subject site. There are no training sessions and hockey centre office operations on weekends as such that car parks are closed. On weekends, it is expected that staff, players, and visitors will utilise the parking facilities of Curtin University instead.

According to WAPC Transport Impact Assessment Guidelines, developments generating between 10 and 100 trips during the peak-hour periods falls under the ‘moderate impact’ category and is not considered to have any substantial impact on the surrounding road network.

Figure 8-2: Anticipated Trip Movements



8.5.3 Remaining Curtin University Parking

With the redevelopment of the Hockey Centre, Curtin University is anticipated to retain some of the existing parking bays on the existing Site. A remote investigation of the Site and the adjacent Curtin University car park indicates that approximately 430 parking bays will still be available after redevelopment of the hockey centre.

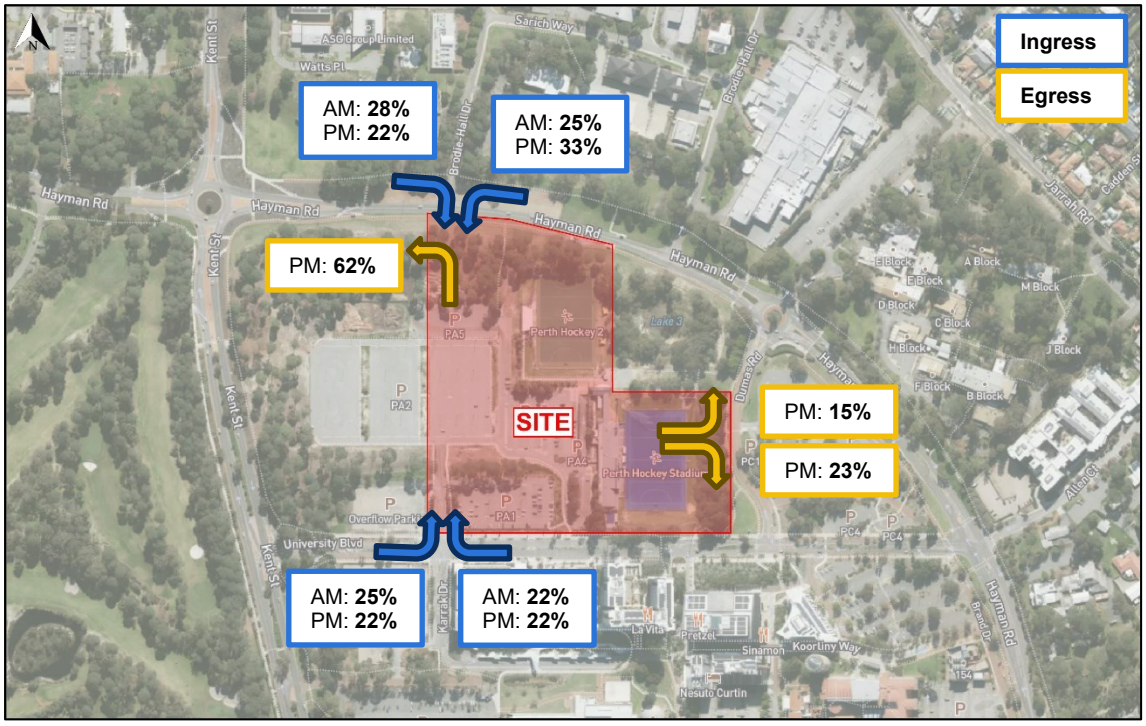
The traffic survey counts conducted in September 2024 includes the intersection of University Boulevard and Karrak Drive, whereby the northern leg provides the closest approximation of the existing car park's occupancy and traffic movements during the peak-hour periods. This information is detailed in **Section 1.6.2**. Curtin University car park activities have been incorporated into the background traffic. The existing car park's peak-hour volumes in 2024 were factored using a conservative growth rate to estimate the background traffic volumes for the 2029 and 2039 scenarios.

8.6 Trip Distribution

Vehicle trips have been distributed across all access points on the proposed Karrak Drive extension, taking into consideration the parking provisions and the expected origin and destination routes within the surrounding road network. Additionally, limitations on traffic movements at each access point have been considered.

Based on the turning movement from the traffic survey counts conducted in November 2023 and September 2024, **Figure 8-3** illustrates the assumed trip distribution of development generated trips.

Figure 8-3: Development Trip Distribution



Source: Metromap (base map)

8.7 Intersection Performance Analysis

The key intersections have been analysed using the SIDRA analysis software program. This program calculates the performance of intersections based on input parameters, including geometry and traffic volumes. As an output SIDRA provides values for the Degree of Saturation (DOS), queue lengths, delays, level of service, and 95th Percentile Queue. These parameters are defined as follows:

- Degree of Saturation (DOS): is the ratio of the arrival traffic flow to the capacity of the approach during the same period. The theoretical intersection capacity is exceeded for an un-signalized intersection where DOS > 0.80;
- 95% Queue: is the statistical estimate of the queue length up to or below which 95% of all observed queues would be expected;
- Average Delay: is the average of all travel time delays for vehicles through the intersection. An unsignalised intersection can be considered to be operating at capacity where the average delay exceeds 40 seconds for any movement; and
- Level of Service (LOS): is the qualitative measure describing operational conditions within a traffic stream and the perception by motorists and/or passengers. The different levels of service can generally be described as shown in **Table 8-2**.

Table 8-2. Level of Service (LoS) Performance Criteria

LOS	Description	Signalised Intersection	Unsignalised Intersection
A	Free-flow operations (best condition)	≤10 sec	≤10 sec
B	Reasonable free-flow operations	10-20 sec	10-15 sec
C	At or near free-flow operations	20-35 sec	15-25 sec
D	Decreasing free-flow levels	35-55 sec	25-35 sec
E	Operations at capacity	55-80 sec	35-50 sec
F	A breakdown in vehicular flow (worst condition)	≥80 sec	≥50 sec

An LOS exceeding these values indicates that the road section is exceeding its practical capacity. Above these values, users of the intersection are likely to experience unsatisfactory queueing and delays during the peak hour periods.

8.7.1 Traffic Volumes

Turning movement volumes of the subject intersections for each of the peak periods for the existing (2024) and future (2039 and 2026) scenarios, with the development-generated trips, are provided in **Appendix E**. Turning volume data was sourced from the traffic survey counts and traffic volumes obtained from the Main Roads WA Traffic Map database.

8.8 SIDRA Analysis

Appendix F provides the detailed SIDRA results for each of the assessment scenarios considered.

8.8.1 Scenario 1: 2024 Existing Year

8.8.1.1 Hayman Road and Kent Street

The following presents the results of the SIDRA assessment of Kent Street and Hayman Road intersection. Figure 8-4 shows the SIDRA site layout of the intersection and the analysis results are presented in Table 8-3.

Figure 8-4: Scenario 1 – Hayman Road and Kent Street Intersection

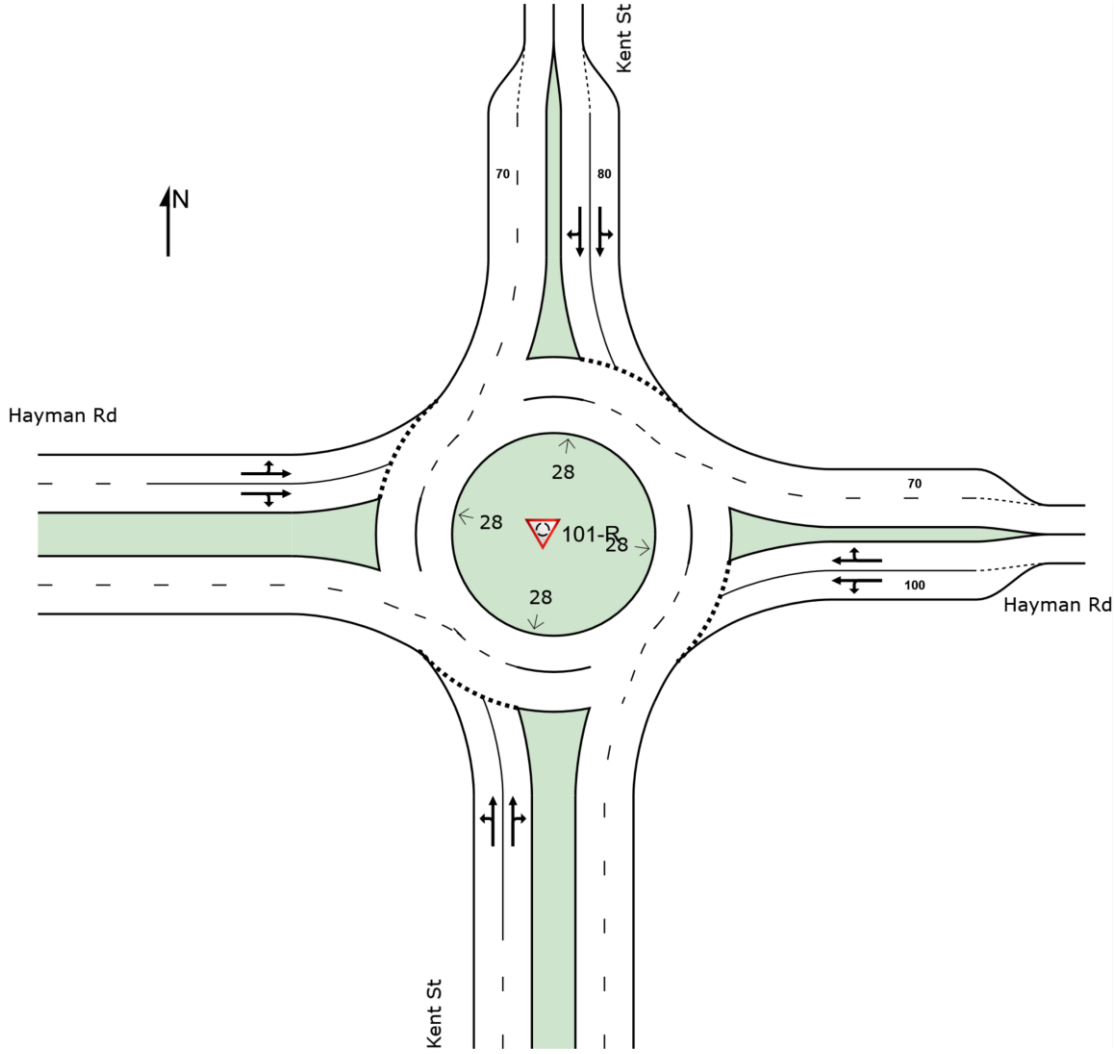


Table 8-3. Scenario 1 – Hayman Road and Kent Street Intersection

Intersection Approach		Weekday AM peak				Weekday PM Peak				Saturday Peak			
		DOS	Delay (Sec)	LOS	95% Queue (m)	DOS	Delay (Sec)	LOS	95% Queue (m)	DOS	Delay (Sec)	LOS	95% Queue (m)
South: Kent St	L	0.43	6.8	A	18.3	0.439	7.1	A	19.2	0.196	5.5	A	6.6
	T	0.429	7.5	A	17.9	0.408	7.7	A	16.5	0.205	5.9	A	6.9
	R	0.429	13.1	B	17.9	0.408	13.3	B	16.5	0.205	11.5	B	6.9
	Approach	0.43	7.7	A	18.3	0.439	7.7	A	19.2	0.205	6	A	6.9
East: Hayman Rd	L	0.29	6.5	A	11.6	0.418	7.5	A	18.8	0.09	5.1	A	2.8
	T	0.29	6.7	A	11.6	0.418	8	A	18.8	0.09	5.2	A	2.8
	R	0.29	12.6	B	10.8	0.418	14	B	17.7	0.09	10.8	B	2.7

	Approach	0.29	7.4	A	11.6	0.418	8.4	A	18.8	0.09	5.4	A	2.8
North: Kent St	L	0.411	9.1	A	20.5	0.393	7.3	A	17.9	0.15	5.1	A	5.2
	T	0.411	8.3	A	20.5	0.393	7.1	A	17.9	0.15	4.9	A	5.2
	R	0.411	14.5	B	19.1	0.393	13	B	17	0.15	10.5	B	5
	Approach	0.411	10.1	B	20.5	0.393	8.2	A	17.9	0.15	6.5	A	5.2
West: Hayman Rd	L	0.383	8.5	A	16.7	0.31	7.8	A	12.7	0.133	6.3	A	4.6
	T	0.698	9.5	A	57.8	0.564	7.6	A	34	0.243	6	A	9.5
	R	0.698	15.3	B	57.8	0.564	13	B	34	0.243	11.5	B	9.5
	Approach	0.698	11.5	B	57.8	0.564	10.2	B	34	0.243	8.5	A	9.5
All Vehicles		**0.698**	**9.5**	**A**	**57.8**	**0.564**	**8.7**	**A**	**34**	**0.243**	**6.8**	**A**	**9.5**

The results indicate that this intersection is performing satisfactorily for all peak hour periods.

8.8.1.2 Hayman Road and Brodie-Hall Drive

The following presents the results of the SIDRA assessment of Hayman Road and Brodie-Hall Drive intersection. Figure 8-5 shows the SIDRA site layout of the intersection and the analysis results are presented in Table 8-4.

Figure 8-5: Scenario 1 – Hayman Road and Brodie-Hall Drive Intersection

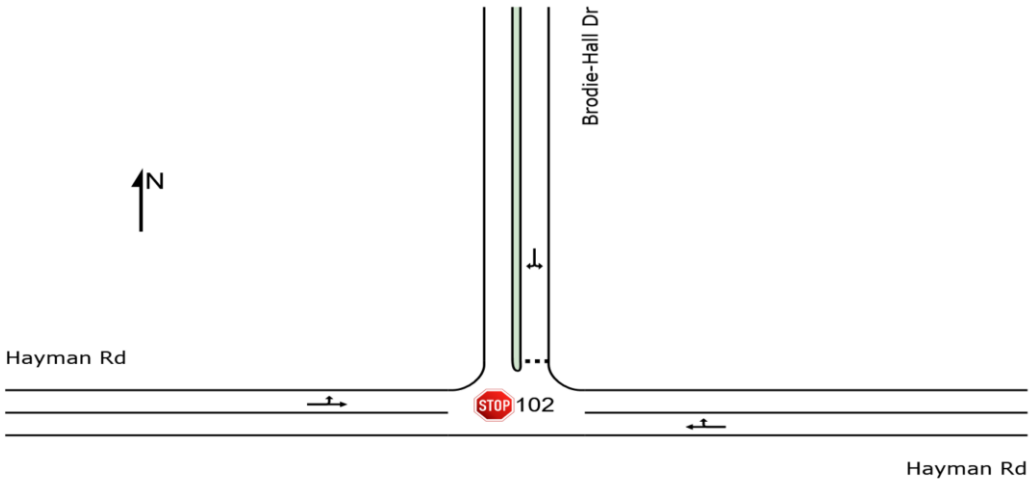


Table 8-4. Scenario 1 – Hayman Road and Brodie-Hall Drive Intersection

Intersection Approach		Weekday AM peak				Weekday PM Peak				Saturday Peak			
		DOS	Delay (Sec)	LOS	95% Queue (m)	DOS	Delay (Sec)	LOS	95% Queue (m)	DOS	Delay (Sec)	LOS	95% Queue (m)
East: Hayman Rd	T	0.313	0.9	A	5.8	0.302	0	A	0.1	0.099	0	A	0.1
	R	0.313	9.7	A	5.8	0.302	5.7	A	0.1	0.099	5.6	A	0.1
	Approach	0.313	1.8	A	5.8	0.302	0	A	0.1	0.099	0	A	0.1
North: Brodie-Hall Dr	L	0.004	7	A	0.1	0.226	6.6	A	5.8	0.002	5.1	A	0
	R	0.004	14.1	B	0.1	0.226	14.1	B	5.8	0.002	6.9	A	0
	Approach	0.004	10.5	B	0.1	0.226	9.8	A	5.8	0.002	6	A	0
West: Hayman Rd	L	0.347	5.6	A	0	0.227	5.6	A	0	0.106	5.6	A	0
	T	0.347	0.1	A	0	0.227	0	A	0	0.106	0	A	0
	Approach	0.347	0.6	A	0	0.227	0	A	0	0.106	0.2	A	0
All Vehicles		**0.347**	**1.1**	**A**	**5.8**	**0.302**	**1.2**	**A**	**5.8**	**0.106**	**0.1**	**A**	**0.1**

The results indicate that this intersection is performing satisfactorily for all the peak hour periods.

8.8.1.3 Hayman Road and Dumas Road

The following presents the results of the SIDRA assessment of Hayman Road and Dumas Road intersection. Figure 8-6 shows the SIDRA site layout of the intersection and the analysis results are presented in Table 8-5.

Figure 8-6: Scenario 1 – Hayman Road and Dumas Road Intersection

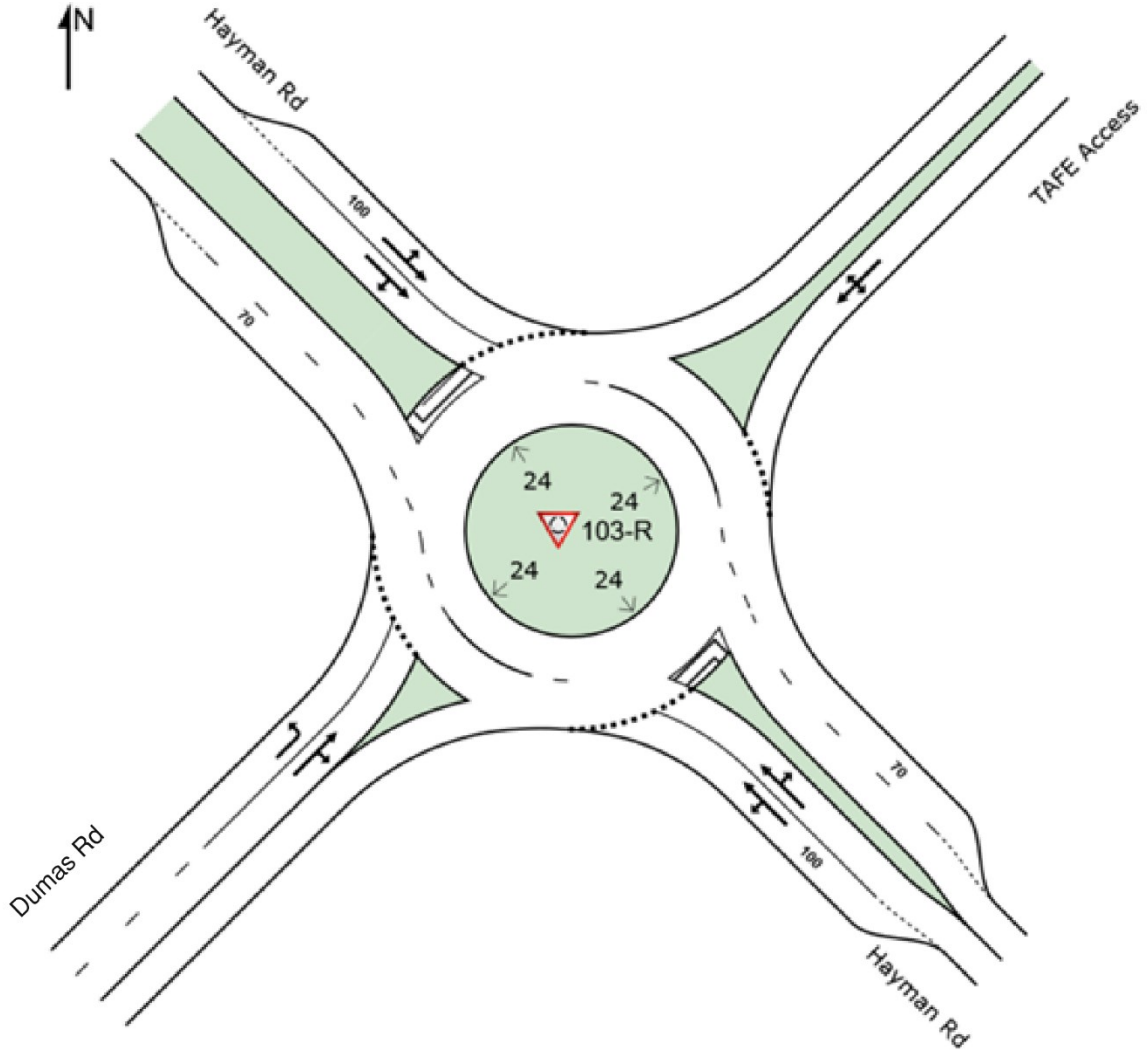


Table 8-5. Scenario 1 – Hayman Road and Dumas Road Intersection

Intersection Approach		Weekday AM peak				Weekday PM Peak				Saturday Peak			
		DOS	Delay (Sec)	LOS	95% Queue (m)	DOS	Delay (Sec)	LOS	95% Queue (m)	DOS	Delay (Sec)	LOS	95% Queue (m)
SouthEast: Hayman Rd	L	0.157	4.2	A	6.4	0.093	4.2	A	3.7	0.038	4	A	1.4
	T	0.307	4.4	A	14.8	0.182	4.3	A	8	0.075	3.9	A	2.9
	R	0.307	9.1	A	14.8	0.182	9.1	A	8	0.075	8.9	A	2.9
	Approach	0.307	5.1	A	14.8	0.182	4.3	A	8	0.075	4	A	2.9
NorthEast: TAFE Access	L	0.037	5	A	1.1	0.067	5.5	A	1.9	0.004	3.4	A	0.1
	T	0.037	4.1	A	1.1	0.067	4.5	A	1.9	0.004	3.1	A	0.1
	R	0.037	9	A	1.1	0.067	9.4	A	1.9	0.004	8	A	0.1

	Approach	0.037	6.8	A	1.1	0.067	7.6	A	1.9	0.004	5.6	A	0.1
NorthWest: Hayman Rd	L	0.132	4.6	A	5.3	0.121	4	A	5.1	0.04	4	A	1.5
	T	0.258	4.5	A	11.8	0.236	4.1	A	11.5	0.078	3.9	A	3
	R	0.258	9.4	A	11.8	0.236	9	A	11.5	0.078	8.9	A	3
	Approach	0.258	4.7	A	11.8	0.236	4.3	A	11.5	0.078	4	A	3
SouthWest: Dumas Rd	L	0.028	6.5	A	1	0.072	5	A	2.3	0.004	3.8	A	0.1
	T	0.004	7.2	A	0.1	0.01	5.1	A	0.3	0.002	3.3	A	0.1
	R	0.004	12.2	B	0.1	0.01	10	B	0.3	0.002	8.3	A	0.1
	Approach	0.028	6.8	A	1	0.072	5.3	A	2.3	0.004	4.5	A	0.1
All Vehicles		**0.307**	**5**	**A**	**14.8**	**0.236**	**4.5**	**A**	**11.5**	**0.078**	**4.0**	**A**	**3**

The results indicate that this intersection is performing satisfactorily for all peak hour periods.

8.8.1.4 University Boulevard and Kent Street

The following presents the results of the SIDRA assessment of University Boulevard and Kent Street intersection. Figure 8-7 shows the SIDRA layout of the intersection and the analysis results are presented in Table 8-6.

Figure 8-7: Scenario 1 – University Boulevard and Kent Street Intersection

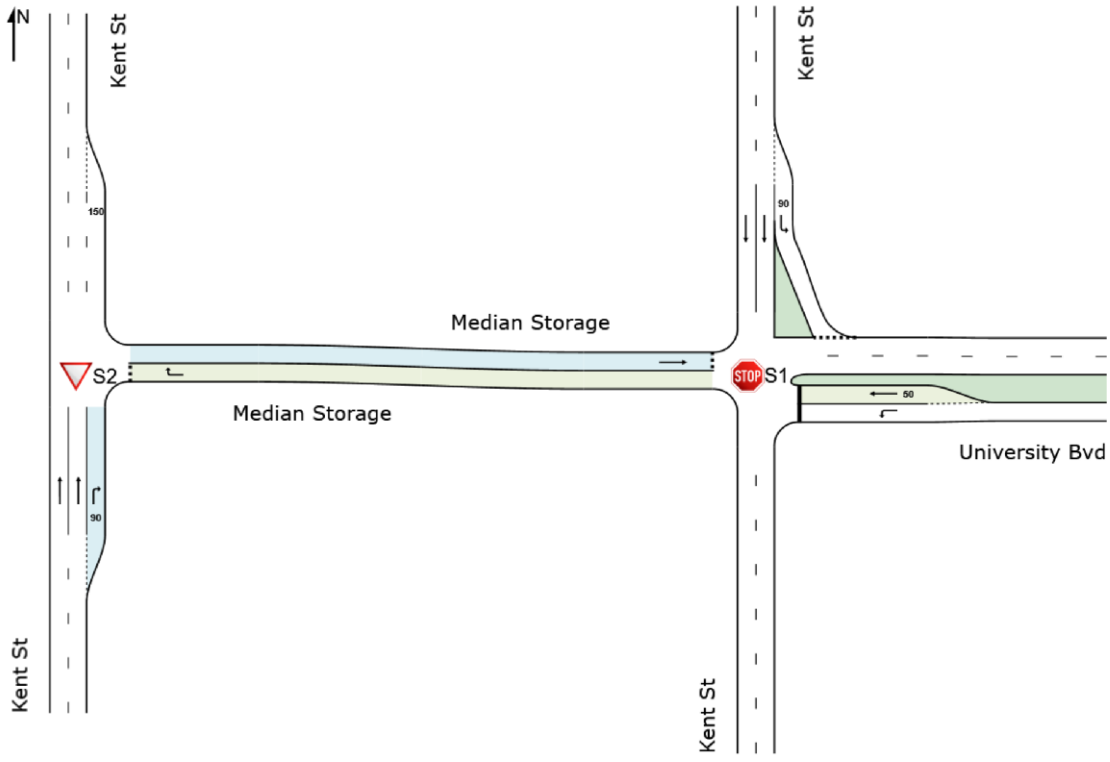


Table 8-6. Scenario 1 – University Boulevard and Kent Street Intersection

Intersection Approach		Weekday AM peak				Weekday PM Peak				Saturday Peak			
		DOS	Delay (Sec)	LOS	95% Queue (m)	DOS	Delay (Sec)	LOS	95% Queue (m)	DOS	Delay (Sec)	LOS	95% Queue (m)
East: University Bvd	L	0.072	10.3	B	2.3	0.35	12.2	B	5.7	0.086	9.4	A	2.8
	T	0.116	26.6	D	4.4	0.42	29.6	D	4.6	0.036	16.2	C	3.6
North: Kent St	L	0.11	7.2	A	3.3	0.089	6.8	A	1.1	0.022	7.1	A	0.6
	T	0.172	0	A	0	0.241	0	A	0	0.112	0	A	0
South: Kent St	T	0.217	0	A	0	0.175	0	A	0	0.122	0	A	0
	R	0.11	9.5	A	3.3	0.089	11.3	B	1.1	0.076	8.1	A	0.6
All Vehicles		**0.217**	**2.1**	**A**	**4.4**	**0.42**	**3.8**	**A**	**5.7**	**0.122**	**2.1**	**A**	**3.6**

The results indicate that this intersection is performing adequately during all the peak hour periods. The longest delay is anticipated during the PM peak period with an average of 29.6 seconds for right-turning traffic from University Boulevard into Kent Street.

8.8.1.5 University Boulevard and Karrak Drive

The following presents the results of the SIDRA assessment of University Boulevard and Karrak Drive intersection. Figure 8-8 shows the SIDRA site layout of the intersection and the analysis results are presented in Table 8-7.

Figure 8-8: Scenario 1 – University Boulevard and Karrak Drive Intersection

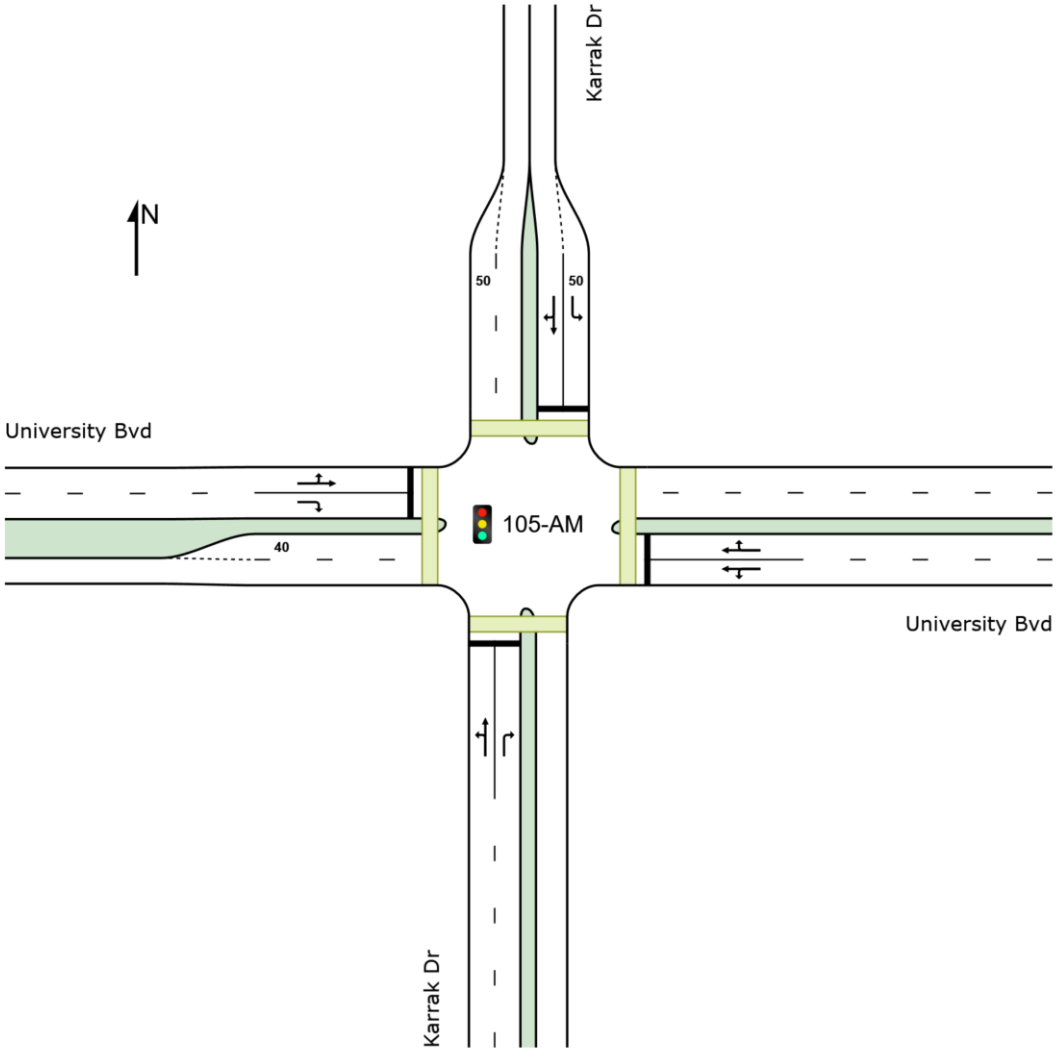


Table 8-7. Scenario 1 – University Boulevard and Karrak Drive Intersection

Intersection Approach		Weekday AM peak				Weekday PM Peak				Saturday Peak			
		DOS	Delay (Sec)	LOS	95% Queue (m)	DOS	Delay (Sec)	LOS	95% Queue (m)	DOS	Delay (Sec)	LOS	95% Queue (m)
South: Karrak Dr	L	0.215	38.4	D	14.3	0.121	24.2	C	7.2	0.074	37.8	D	4.7
	T	0.215	33.9	C	14.3	0.121	19.7	B	7.2	0.074	33.3	C	4.7
	R	0.195	40.1	D	14	0.095	25.5	C	6.2	0.056	39.5	D	3.9
	Approach	0.215	37.8	D	14.3	0.121	24.2	C	7.2	0.074	37.3	D	4.7
East: University Bvd	L	0.11	8.3	A	15.1	0.363	8.9	A	35.5	0.078	6.6	A	10.3
	T	0.11	12.1	B	15.1	0.363	15.7	B	35.5	0.078	8.1	A	10.3
	R	0.133	18.3	B	12	0.107	20	B	6.8	0.047	13.6	B	4.2

	Approach	0.133	13.6	B	15.1	0.363	15.1	B	35.5	0.078	9.4	A	10.3
North: Karrak Dr	L	0.043	35	D	3.1	0.162	24.4	C	9.7	0.041	38.6	D	2.4
	T	0.039	30.4	C	2.8	0.396	21.1	C	25.3	0.169	35	D	10
	R	0.039	35.1	D	2.8	0.396	26.1	C	25.3	0.169	39.7	D	10
	Approach	0.043	34.9	C	3.1	0.396	25.5	C	25.3	0.169	39.4	D	10
West: University Bvd	L	0.27	15.8	B	41.6	0.27	18.5	B	25.4	0.162	12.7	B	22.5
	T	0.270	10.9	B	41.6	0.27	13.8	B	25.4	0.162	8	A	22.5
	R	0.057	15.4	B	5.6	0.078	21.6	C	4.2	0.019	12.4	B	1.7
	Approach	0.27	13.4	B	41.6	0.27	15.6	B	25.4	0.162	11.1	B	22.5
All Vehicles		**0.27**	**18.2**	**B**	**41.6**	**0.396**	**18.9**	**B**	**35.5**	**0.169**	**16.2**	**B**	**22.5**

The results indicate that this intersection is performing at acceptable levels of service during all the peak hour periods.

8.8.1.6 University Boulevard and Dumas Road

The following presents the results of the SIDRA assessment of University Boulevard and Dumas Road intersection. Figure 8-9 shows the SIDRA site layout of the intersection and the analysis results are presented in Table 8-8.

Figure 8-9: Scenario 1 – University Boulevard and Dumas Road Intersection

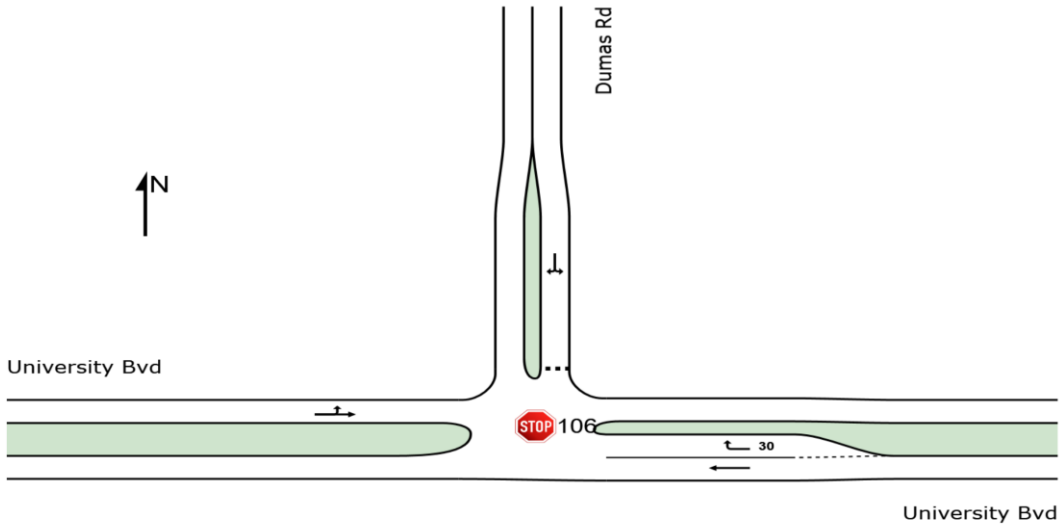


Table 8-8. Scenario 1 – University Boulevard and Dumas Road

Intersection Approach		Weekday AM peak				Weekday PM Peak				Saturday Peak			
		DOS	Delay (Sec)	LOS	95% Queue (m)	DOS	Delay (Sec)	LOS	95% Queue (m)	DOS	Delay (Sec)	LOS	95% Queue (m)
East: University Bvd	T	0.107	0	A	0	0.139	0	A	0	0.046	0	A	0
	R	0.045	5.3	A	1.7	0.028	5.3	A	0.9	0.005	4.8	A	0.2
	Approach	0.107	1.4	A	1.7	0.139	0.7	A	0.9	0.046	0.4	A	0.2
North: Dumas Rd	L	0.057	4.9	A	1.6	0.075	5.1	A	2.2	0.015	4.7	A	0.4
	R	0.057	7.5	A	1.6	0.075	8.4	A	2.2	0.015	5.4	A	0.4
	Approach	0.057	7.2	A	1.6	0.075	7.1	A	2.2	0.015	5.3	A	0.4
West: University Bvd	L	0.08	4.8	A	0	0.098	4.7	A	0	0.024	4.7	A	0
	T	0.08	0	A	0	0.098	0	A	0	0.024	0	A	0
	Approach	0.08	2.1	A	0	0.098	1.2	A	0	0.024	0.9	A	0
All Vehicles		**0.107**	**2.2**	**A**	**1.7**	**0.139**	**1.6**	**A**	**2.2**	**0.046**	**1.0**	**A**	**0.4**

The results indicate that this intersection is performing satisfactorily during all the peak hour periods.

8.8.2 Scenario 2: 2029 Traffic with Development Traffic

8.8.2.1 Hayman Road and Kent Street

The following presents the results of the SIDRA assessment of Kent Street and Hayman Road intersection. SIDRA site layout of this intersection for Scenario 2 is similar to Scenario 1. The analysis results are presented in Table 8-9.

Table 8-9. Scenario 2 – Hayman Road and Kent Street Intersection

Intersection Approach		Weekday AM peak				Weekday PM Peak				Saturday Peak			
		DOS	Delay (Sec)	LOS	95% Queue (m)	DOS	Delay (Sec)	LOS	95% Queue (m)	DOS	Delay (Sec)	LOS	95% Queue (m)
South: Kent St	L	0.464	7.2	A	21.1	0.508	8	A	24.8	0.211	5.7	A	7.2
	T	0.467	8	A	20.8	0.484	8.9	A	21.6	0.223	6	A	7.6
	R	0.467	13.6	B	20.8	0.484	14.5	B	21.6	0.223	11.6	B	7.6
	Approach	0.467	8.1	A	21.1	0.508	8.7	A	24.8	0.223	6.2	A	7.6
East: Hayman Rd	L	0.325	6.7	A	13.4	0.542	8.9	A	29	0.109	5.2	A	3.5
	T	0.325	6.9	A	13.4	0.542	9.4	A	29	0.109	5.2	A	3.5
	R	0.325	12.8	B	12.4	0.542	15.7	B	26.7	0.109	10.9	B	3.4
	U	0.325	15.2	B	12.4	0.542	18	B	26.7	0.109	13.2	B	3.4

	Approach	0.325	7.8	A	13.4	0.542	10.7	B	29	0.109	6.2	A	3.5
North: Kent St	L	0.474	10.5	B	26.1	0.471	9.4	A	25.1	0.163	5.4	A	5.7
	T	0.474	9.6	A	26.1	0.471	8.9	A	25.1	0.163	5.1	A	5.7
	R	0.474	16	B	23.8	0.471	15.1	B	23.3	0.163	10.7	B	5.6
	Approach	0.474	11.4	B	26.1	0.471	10.1	B	25.1	0.163	6.7	A	5.7
West: Hayman Rd	L	0.42	8.9	A	19.1	0.352	8.5	A	15	0.143	6.5	A	4.9
	T	0.765	11	B	75.1	0.642	9.2	A	47.1	0.261	6.2	A	10.4
	R	0.765	17.2	B	75.1	0.642	14.9	B	47.1	0.261	11.6	B	10.4
	Approach	0.765	12.9	B	75.1	0.642	11.8	B	47.1	0.261	8.7	A	10.4
All Vehicles		**0.765**	**10.4**	**B**	**75.1**	**0.642**	**10.4**	**B**	**47.1**	**0.261**	**7.0**	**A**	**10.4**

The results indicate that this intersection will still perform adequately during all the peak hour periods assessed with slightly longer delays anticipated.

8.8.2.2 Hayman Road and Karrak Drive

The following presents the results of the SIDRA assessment of Hayman Road, Karrak Drive, and Brodie-Hall Drive intersection. Figure 8-10 shows the SIDRA site layout of the intersection and the analysis results are presented in Table 8-10.

Figure 8-10: Scenario 2 – Hayman Road and Karrak Drive Intersection

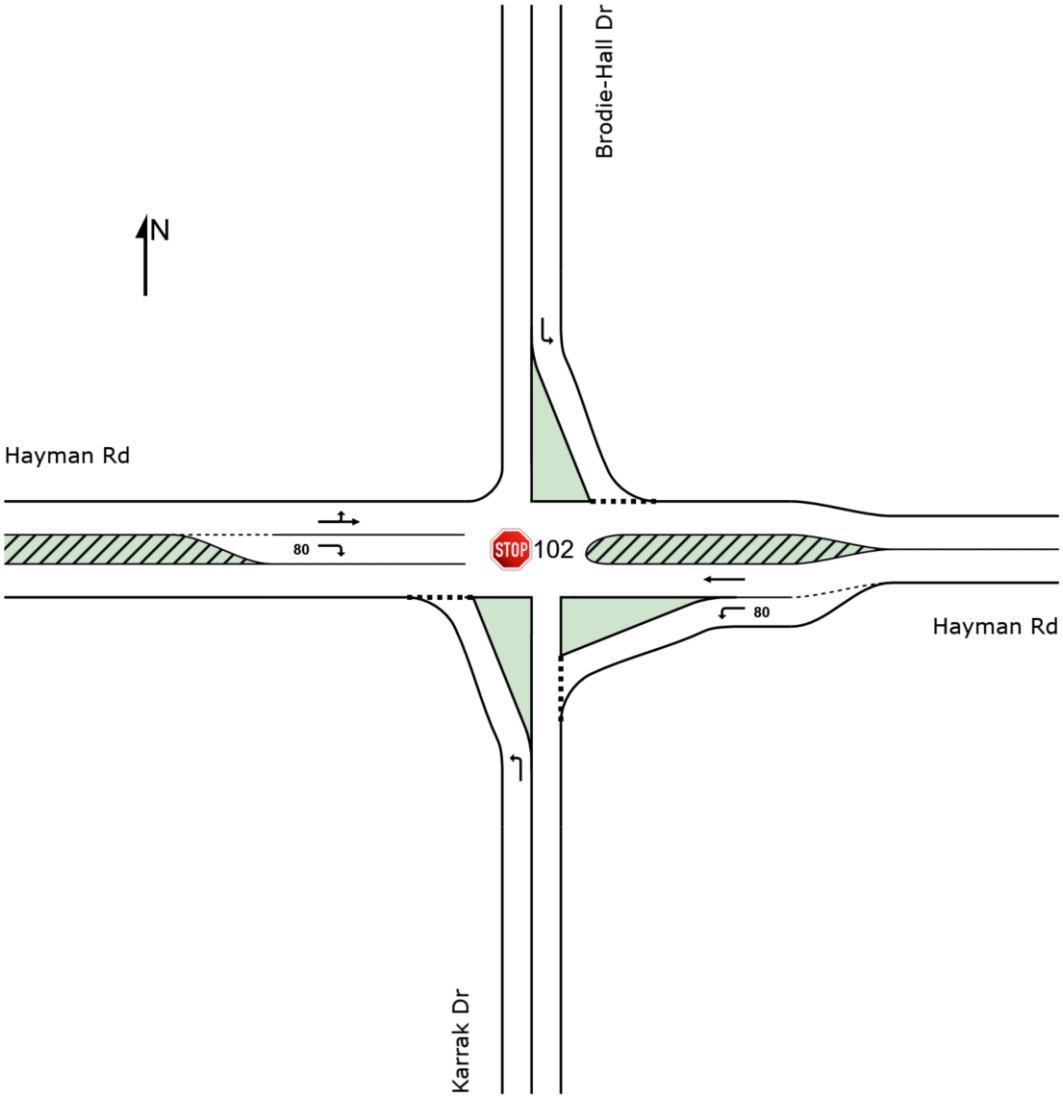


Table 8-10. Scenario 2 – Hayman Road and Karrak Drive Intersection

Intersection Approach		Weekday AM peak				Weekday PM Peak				Saturday Peak			
		DOS	Delay (Sec)	LOS	95% Queue (m)	DOS	Delay (Sec)	LOS	95% Queue (m)	DOS	Delay (Sec)	LOS	95% Queue (m)
South: Karrak Dr	L	0.026	6.5	A	0.7	0.255	7.5	A	7.6	0.036	5	A	1
	Approach	0.026	6.5	A	0.7	0.255	7.5	A	7.6	0.036	5	A	1
East: Hayman Rd	L	0.018	5.7	A	0.5	0.076	6	A	2.3	0.016	5.7	A	0.5
	T	0.244	0	A	0	0.284	0.1	A	0	0.088	0	A	0
	Approach	0.244	0.4	A	0.5	0.284	1	A	2.3	0.088	0.7	A	0.5
	L	0.016	7.6	A	0.4	0.186	6.6	A	5.4	0.019	5.1	A	0.5

North: Brodie-Hall Dr	Approach	0.016	7.6	A	0.4	0.186	6.6	A	5.4	0.019	5.1	A	0.5
West: Hayman Rd	L	0.355	5.6	A	0	0.231	5.6	A	0	0.108	5.6	A	0
	T	0.355	0.1	A	0	0.231	0	A	0	0.108	0	A	0
	R	0.029	7.5	A	0.8	0.117	8.1	A	3.5	0.017	6	A	0.5
	Approach	0.355	0.8	A	0.8	0.231	1.6	A	3.5	0.108	0.8	A	0.5
All Vehicles		**0.355**	**0.8**	**A**	**0.8**	**0.284**	**2.8**	**A**	**7.6**	**0.108**	**1.4**	**A**	**1**

The results indicate that this intersection will perform satisfactorily during all the peak hour periods.

8.8.2.3 Hayman Road and Dumas Road

The following presents the results of the SIDRA assessment of Hayman Road and Dumas Road intersection. SIDRA site layout of this intersection for Scenario 2 is similar to Scenario 1. The results are presented in Table 8-11.

Table 8-11. Scenario 2 – Hayman Road and Dumas Road Intersection

Intersection Approach		Weekday AM peak				Weekday PM Peak				Saturday Peak			
		DOS	Delay (Sec)	LOS	95% Queue (m)	DOS	Delay (Sec)	LOS	95% Queue (m)	DOS	Delay (Sec)	LOS	95% Queue (m)
SouthEast: Hayman Rd	L	0.169	4.2	A	7	0.099	4.2	A	4	0.04	4	A	1.5
	T	0.329	4.4	A	16.4	0.193	4.3	A	8.6	0.078	3.9	A	3
	R	0.329	9.1	A	16.4	0.193	9.1	A	8.6	0.078	8.9	A	3
	Approach	0.329	5.1	A	16.4	0.193	4.3	A	8.6	0.078	4	A	3
NorthEast: TAFE Access	L	0.041	5.2	A	1.2	0.077	6.3	A	2.2	0.004	3.6	A	0.1
	T	0.041	4.2	A	1.2	0.077	4.9	A	2.2	0.004	3.2	A	0.1
	R	0.041	9.2	A	1.2	0.077	9.9	A	2.2	0.004	8.1	A	0.1
	Approach	0.041	7	A	1.2	0.077	8.2	A	2.2	0.004	5.7	A	0.1
NorthWest: Hayman Rd	L	0.143	4.7	A	5.7	0.149	4	A	6.6	0.047	4	A	1.7
	T	0.278	4.6	A	13	0.291	4.3	A	15.2	0.091	3.9	A	3.5
	R	0.278	9.4	A	13	0.291	9	A	15.2	0.091	8.9	A	3.5
	Approach	0.278	4.8	A	13	0.291	4.4	A	15.2	0.091	4	A	3.5
SouthWest: Duams Rd	L	0.03	6.8	A	1.1	0.076	5.1	A	2.5	0.004	3.8	A	0.1
	T	0.004	7.4	A	0.1	0.013	5.2	A	0.4	0.002	3.4	A	0.1
	R	0.004	12.5	B	0.1	0.013	10.2	B	0.4	0.002	8.4	A	0.1
	Approach	0.03	7.1	A	1.1	0.076	5.5	A	2.5	0.004	4.5	A	0.1
All Vehicles		**0.329**	**5.1**	**A**	**16.4**	**0.291**	**4.6**	**A**	**15.2**	**0.091**	**4.0**	**A**	**3.5**

The results indicate that this intersection will perform satisfactorily during all the peak hour periods.

8.8.2.4 University Boulevard and Kent Street

The following presents the results of the SIDRA assessment of University Boulevard and Kent Street intersection. SIDRA site layout of this intersection for Scenario 2 is similar to Scenario 1. The results are presented in Table 8-12.

Table 8-12. Scenario 2 – University Boulevard and Kent Street Intersection

Intersection Approach		Weekday AM peak				Weekday PM Peak				Saturday Peak			
		DOS	Delay (Sec)	LOS	95% Queue (m)	DOS	Delay (Sec)	LOS	95% Queue (m)	DOS	Delay (Sec)	LOS	95% Queue (m)
East: University Bvd	L	0.077	10.4	B	2.5	0.387	13	B	16.5	0.092	9.5	A	3
	T	0.132	28.9	D	5.4	0.526	34.2	D	14	0.04	16.8	C	3.9
North: Kent St	L	0.119	7.3	A	3.6	0.094	6.9	A	2.8	0.023	7.1	A	0.6
	T	0.181	0	A	0	0.258	0	A	0	0.119	0	A	0
South: Kent St	T	0.229	0.1	A	0	0.184	0	A	0	0.128	0	A	0
	R	0.119	9.8	A	3.6	0.094	12	B	2.8	0.08	8.2	A	0.6
All Vehicles		**0.229**	**2.3**	**A**	**5.4**	**0.526**	**4.1**	**A**	**16.5**	**0.128**	**2.1**	**A**	**3.9**

The results indicate that this intersection will perform adequately during all the peak hour periods. The longest delay is still anticipated during the PM peak period with an average of 34.2 seconds for right-turning traffic from University Boulevard into Kent Street.

8.8.2.5 University Boulevard and Karrak Drive

The following presents the results of the SIDRA assessment of University Boulevard and Karrak Drive intersection. SIDRA site layout of this intersection for Scenario 2 is similar to Scenario 1. The results are presented in Table 8-13.

Table 8-13. Scenario 2 – University Boulevard and Karrak Drive Intersection

Intersection Approach		Weekday AM peak				Weekday PM Peak				Saturday Peak			
		DOS	Delay (Sec)	LOS	95% Queue (m)	DOS	Delay (Sec)	LOS	95% Queue (m)	DOS	Delay (Sec)	LOS	95% Queue (m)
South: Karrak Dr	L	0.227	38.5	D	15.1	0.127	24.2	C	7.6	0.078	37.9	D	5
	T	0.227	34	C	15.1	0.127	19.7	B	7.6	0.078	33.3	C	5
	R	0.202	40.2	D	14.5	0.1	25.5	C	6.6	0.056	39.5	D	3.9
	Approach	0.227	37.8	D	15.1	0.127	24.3	C	7.6	0.078	37.3	D	5
	L	0.116	8.3	A	15.9	0.388	8.9	A	38.3	0.082	6.6	A	10.9
	T	0.116	12.2	B	15.9	0.388	15.9	B	38.3	0.082	8.2	A	10.9

East: University Bvd	R	0.179	19.3	B	16.1	0.114	19.9	B	7	0.049	13.6	B	4.4
	Approach	0.179	14.5	B	16.1	0.388	15.3	B	38.3	0.082	9.4	A	10.9
North: Karrak Dr	L	0.046	35.1	D	3.3	0.17	24.5	C	10.2	0.041	38.6	D	2.4
	T	0.043	30.4	C	3.1	0.416	21.2	C	26.7	0.178	35.1	D	10.6
	R	0.043	35.2	D	3.1	0.416	26.3	C	26.7	0.178	39.8	D	10.6
	Approach	0.046	34.9	C	3.3	0.416	25.6	C	26.7	0.178	39.5	D	10.6
West: University Bvd	L	0.302	16	B	47.3	0.287	18.6	B	27.1	0.17	12.8	B	23.8
	T	0.302	11.1	B	47.3	0.287	13.9	B	27.1	0.170	8.1	A	23.8
	R	0.061	15.4	B	6	0.083	21.6	C	4.4	0.02	12.4	B	1.9
	Approach	0.302	13.8	B	47.3	0.287	15.7	B	27.1	0.17	11.2	B	23.8
All Vehicles		**0.302**	**18.4**	**B**	**47.3**	**0.416**	**19.0**	**B**	**38.3**	**0.178**	**16.2**	**B**	**23.8**

The results indicate that this intersection will perform at acceptable levels of service during all the peak hour periods.

8.8.2.6 University Boulevard and Dumas Road

The following presents the results of the SIDRA assessment of University Boulevard and Dumas Road intersection. SIDRA site layout of this intersection for Scenario 2 is similar to Scenario 1. The results are presented in Table 8-14.

Table 8-14. Scenario 2 – University Boulevard and Dumas Road

Intersection Approach		Weekday AM peak				Weekday PM Peak				Saturday Peak			
		DOS	Delay (Sec)	LOS	95% Queue (m)	DOS	Delay (Sec)	LOS	95% Queue (m)	DOS	Delay (Sec)	LOS	95% Queue (m)
East: University Bvd	T	0.12	0	A	0	0.147	0	A	0	0.049	0	A	0
	R	0.048	5.4	A	1.8	0.03	5.3	A	1	0.005	4.8	A	0.2
	Approach	0.12	1.3	A	1.8	0.147	0.8	A	1	0.049	0.4	A	0.2
North: Dumas Rd	L	0.063	4.9	A	1.8	0.084	5.1	A	2.4	0.016	4.8	A	0.5
	R	0.063	7.8	A	1.8	0.084	8.7	A	2.4	0.016	5.4	A	0.5
	Approach	0.063	7.6	A	1.8	0.084	7.3	A	2.4	0.016	5.3	A	0.5
West: University Bvd	L	0.085	4.8	A	0	0.103	4.7	A	0	0.026	4.7	A	0
	T	0.085	0	A	0	0.103	0	A	0	0.026	0	A	0
	Approach	0.085	2.1	A	0	0.103	1.2	A	0	0.026	0.9	A	0
All Vehicles		**0.12**	**2.2**	**A**	**1.8**	**0.147**	**1.7**	**A**	**2.4**	**0.049**	**1.0**	**A**	**0.5**

The results indicate that this intersection will still perform satisfactorily during all the peak hour periods.

8.8.3 Scenario 3: 2039 Traffic with Development Traffic

8.8.3.1 Hayman Road and Kent Street

The following presents the results of the SIDRA assessment of Kent Street and Hayman Road intersection. SIDRA site layout of this intersection for Scenario 3 is similar to Scenario 1. The analysis results are presented in Table 8-15.

Table 8-15. Scenario 3 – Hayman Road and Kent Street Intersection

Intersection Approach		Weekday AM peak				Weekday PM Peak				Saturday Peak			
		DOS	Delay (Sec)	LOS	95% Queue (m)	DOS	Delay (Sec)	LOS	95% Queue (m)	DOS	Delay (Sec)	LOS	95% Queue (m)
South: Kent St	L	0.529	7.8	A	26.9	0.596	8.9	A	32.6	0.236	5.8	A	8.2
	T	0.538	8.8	A	26.7	0.575	10.1	B	28.6	0.25	6.2	A	8.7
	R	0.538	14.4	B	26.7	0.575	15.7	B	28.6	0.25	11.7	B	8.7
	Approach	0.538	8.9	A	26.9	0.596	9.8	A	32.6	0.25	6.3	A	8.7
East: Hayman Rd	L	0.385	7.3	A	17.2	0.653	11.2	B	40.8	0.123	5.3	A	4
	T	0.385	7.7	A	17.2	0.653	11.8	B	40.8	0.123	5.4	A	4
	R	0.385	13.8	B	16.1	0.653	18.4	B	36.6	0.123	11.1	B	3.9
	U	0.385	16.1	B	16.1	0.653	20.7	C	36.6	0.123	13.4	B	3.9
	Approach	0.385	8.6	A	17.2	0.653	13.2	B	40.8	0.123	6.4	A	4
North: Kent St	L	0.599	13.8	B	38.8	0.583	11.9	B	36.8	0.183	5.6	A	6.6
	T	0.599	12.8	B	38.8	0.583	11.4	B	36.8	0.183	5.2	A	6.6
	R	0.599	19.6	B	34.5	0.583	17.8	B	33.2	0.183	10.9	B	6.4
	Approach	0.599	14.7	B	38.8	0.583	12.6	B	36.8	0.183	6.9	A	6.6
West: Hayman Rd	L	0.485	10.2	B	25.2	0.408	9.2	A	18.6	0.161	6.7	A	5.7
	T	0.883	16	B	129.1	0.744	11.1	B	69.5	0.293	6.4	A	12.2
	R	0.883	23.5	C	129.1	0.744	17.5	B	69.5	0.293	11.8	B	12.2
	Approach	0.883	17.8	B	129.1	0.744	13.8	B	69.5	0.293	8.8	A	12.2
All Vehicles		**0.883**	**13.2**	**B**	**129.1**	**0.744**	**12.4**	**B**	**69.5**	**0.293**	**7.2**	**A**	**12.2**

The results indicate that this intersection will still perform adequately during all he peak hour periods assessed, with slightly longer delays anticipated. However, significant queueing on the west approach is anticipated for the through and right-turning vehicles in the AM peak period.

8.8.3.2 Hayman Road and Karrak Drive

The following presents the results of the SIDRA assessment of Hayman Road, Karrak Drive, and Brodie-Hall Drive intersection. SIDRA site layout of this intersection for Scenario 3 is similar to Scenario 2. The analysis results are presented in Table 8-16.

Table 8-16. Scenario 3 – Hayman Road and Karrak Drive Intersection

Intersection Approach		Weekday AM peak				Weekday PM Peak				Saturday Peak			
		DOS	Delay (Sec)	LOS	95% Queue (m)	DOS	Delay (Sec)	LOS	95% Queue (m)	DOS	Delay (Sec)	LOS	95% Queue (m)
South: Karrak Dr	L	0.031	6.8	A	0.8	0.303	8.3	A	9.8	0.04	5.1	A	1.1
	Approach	0.031	6.8	A	0.8	0.303	8.3	A	9.8	0.04	5.1	A	1.1
East: Hayman Rd	L	0.019	5.7	A	0.5	0.084	6	A	2.5	0.017	5.7	A	0.5
	T	0.268	0	A	0	0.312	0.1	A	0	0.097	0	A	0
	Approach	0.268	0.4	A	0.5	0.312	1	A	2.5	0.097	0.7	A	0.5
North: Brodie-Hall Dr	L	0.02	8.1	A	0.5	0.217	6.9	A	6.3	0.021	5.2	A	0.6
	Approach	0.02	8.1	A	0.5	0.217	6.9	A	6.3	0.021	5.2	A	0.6
West: Hayman Rd	L	0.39	5.6	A	0	0.254	5.6	A	0	0.119	5.6	A	0
	T	0.39	0.1	A	0	0.254	0	A	0	0.119	0	A	0
	R	0.032	7.8	A	0.9	0.138	8.6	A	4.1	0.018	6.1	A	0.6
	Approach	0.39	0.8	A	0.9	0.254	1.7	A	4.1	0.119	0.8	A	0.6
All Vehicles		**0.39**	**0.8**	**A**	**0.9**	**0.312**	**2.9**	**A**	**9.8**	**0.119**	**1.4**	**A**	**1.1**

The results indicate that this intersection will still perform satisfactorily during all the peak hour periods.

8.8.3.3 Hayman Road and Dumas Road

The following presents the results of the SIDRA assessment of Hayman Road and Dumas Road intersection. SIDRA site layout of this intersection for Scenario 3 is similar to Scenario 1. The results are presented in Table 8-17.

Table 8-17. Scenario 3 – Hayman Road and Dumas Road Intersection

Intersection Approach		Weekday AM peak				Weekday PM Peak				Saturday Peak			
		DOS	Delay (Sec)	LOS	95% Queue (m)	DOS	Delay (Sec)	LOS	95% Queue (m)	DOS	Delay (Sec)	LOS	95% Queue (m)
SouthEast: Hayman Rd	L	0.187	4.2	A	7.8	0.11	4.3	A	4.4	0.044	4	A	1.7
	T	0.364	4.5	A	18.9	0.214	4.4	A	9.8	0.086	3.9	A	3.4
	R	0.364	9.1	A	18.9	0.214	9.2	A	9.8	0.086	8.9	A	3.4
	Approach	0.364	5.2	A	18.9	0.214	4.4	A	9.8	0.086	4	A	3.4
NorthEast: TAFE Access	L	0.046	5.5	A	1.4	0.086	6.8	A	2.5	0.004	3.7	A	0.1
	T	0.046	4.4	A	1.4	0.086	5.2	A	2.5	0.004	3.2	A	0.1
	R	0.046	9.4	A	1.4	0.086	10.1	B	2.5	0.004	8.2	A	0.1
	Approach	0.046	7.2	A	1.4	0.086	8.6	A	2.5	0.004	5.8	A	0.1
NorthWest: Hayman Rd	L	0.159	4.7	A	6.5	0.165	4	A	7.4	0.051	4	A	1.9
	T	0.31	4.7	A	15	0.321	4.3	A	17.6	0.1	4	A	4
	R	0.31	9.5	A	15	0.321	9	A	17.6	0.1	8.9	A	4
	Approach	0.31	4.9	A	15	0.321	4.4	A	17.6	0.1	4	A	4
SouthWest: Dumas Rd	L	0.035	7.3	A	1.3	0.086	5.4	A	2.8	0.004	3.9	A	0.1
	T	0.005	7.8	A	0.2	0.015	5.4	A	0.4	0.002	3.6	A	0.1
	R	0.005	12.9	B	0.2	0.015	10.4	B	0.4	0.002	8.6	A	0.1
	Approach	0.035	7.5	A	1.3	0.086	5.8	A	2.8	0.004	4.5	A	0.1
All Vehicles		**0.364**	**5.2**	**A**	**18.9**	**0.321**	**4.7**	**A**	**17.6**	**0.1**	**4.0**	**A**	**4**

The results indicate that this intersection will still perform satisfactorily during all the peak hour periods.

8.8.3.4 University Boulevard and Kent Street

The following presents the results of the SIDRA assessment of University Boulevard and Kent Street intersection. SIDRA site layout of this intersection for Scenario 3 is similar to Scenario 1. The results are presented in Table 8-18.

Table 8-18. Scenario 3 – University Boulevard and Kent Street Intersection

Intersection Approach		Weekday AM peak				Weekday PM Peak				Saturday Peak			
		DOS	Delay (Sec)	LOS	95% Queue (m)	DOS	Delay (Sec)	LOS	95% Queue (m)	DOS	Delay (Sec)	LOS	95% Queue (m)
East: University Bvd	L	0.089	10.8	B	2.8	0.462	14.4	B	21.4	0.104	9.6	A	3.4
	T	0.173	33.5	D	6.7	0.786	48.2	E	22	0.047	18.1	C	4.6
North: Kent St	L	0.132	7.4	A	4	0.104	6.9	A	3.1	0.026	7.2	A	0.7
	T	0.199	0	A	0	0.285	0.1	A	0	0.131	0	A	0
South: Kent St	T	0.252	0.1	A	0	0.203	0	A	0	0.141	0	A	0
	R	0.132	10.6	B	4	0.104	13.3	B	3.1	0.088	8.5	A	0.7
All Vehicles		**0.252**	**2.5**	**A**	**6.7**	**0.786**	**5.1**	**A**	**22**	**0.141**	**2.2**	**A**	**4.6**

The results indicate that this intersection will perform adequately during all the peak hour periods. The longest delay is still anticipated during the PM peak period with an average of 48.2 seconds for right-turning traffic from University Boulevard into Kent Street.

8.8.3.5 University Boulevard and Karrak Drive

The following presents the results of the SIDRA assessment of University Boulevard and Karrak Drive intersection. SIDRA site layout of this intersection for Scenario 3 is similar to Scenario 1. The results are presented in Table 8-19.

Table 8-19. Scenario 3 – University Boulevard and Karrak Drive Intersection

Intersection Approach		Weekday AM peak				Weekday PM Peak				Saturday Peak			
		DOS	Delay (Sec)	LOS	95% Queue (m)	DOS	Delay (Sec)	LOS	95% Queue (m)	DOS	Delay (Sec)	LOS	95% Queue (m)
South: Karrak Dr	L	0.248	38.6	D	16.5	0.141	24.3	C	8.5	0.086	37.9	D	5.5
	T	0.248	34.2	C	16.5	0.141	19.8	B	8.5	0.086	33.4	C	5.5
	R	0.223	40.3	D	16.1	0.11	25.6	C	7.2	0.064	39.5	D	4.4
	Approach	0.248	38	D	16.5	0.141	24.3	C	8.5	0.086	37.4	D	5.5
East: University Bvd	L	0.127	8.3	A	17.6	0.43	9	A	43.3	0.09	6.6	A	12
	T	0.127	12.3	B	17.6	0.430	16.2	B	43.3	0.09	8.2	A	12
	R	0.203	19.6	B	17.6	0.126	20.9	C	7.7	0.056	14.1	B	5
	Approach	0.203	14.5	B	17.6	0.43	15.6	B	43.3	0.09	9.6	A	12
North: Karrak Dr	L	0.050	35.1	D	3.6	0.187	24.6	C	11.3	0.046	38.6	D	2.6
	T	0.046	30.5	C	3.3	0.459	21.4	C	29.8	0.197	35.2	D	11.7

	R	0.046	35.2	D	3.3	0.459	26.6	C	29.8	0.197	39.9	D	11.7
	Approach	0.05	35	C	3.6	0.459	25.9	C	29.8	0.197	39.6	D	11.7
West: University Bvd	L	0.33	16.3	B	52.8	0.315	18.8	B	30.2	0.187	12.9	B	26.5
	T	0.330	11.3	B	52.8	0.315	14.1	B	30.2	0.187	8.2	A	26.5
	R	0.067	15.5	B	6.5	0.099	22.6	C	5	0.022	12.4	B	2
	Approach	0.33	14	B	52.8	0.315	15.9	B	30.2	0.187	11.3	B	26.5
All Vehicles		**0.33**	**18.6**	**B**	**52.8**	**0.459**	**19.3**	**B**	**43.3**	**0.197**	**16.4**	**B**	**26.5**

The results indicate that this intersection will still perform at acceptable levels of service during all the peak hour periods assessed, with slightly longer delays anticipated.

8.8.3.6 University Boulevard and Dumas Road

The following presents the results of the SIDRA assessment of University Boulevard and Dumas Road intersection. SIDRA site layout of this intersection for Scenario 3 is similar to Scenario 1. The results are presented in Table 8-20.

Table 8-20. Scenario 3 – University Boulevard and Dumas Road

Intersection Approach		Weekday AM peak				Weekday PM Peak				Saturday Peak			
		DOS	Delay (Sec)	LOS	95% Queue (m)	DOS	Delay (Sec)	LOS	95% Queue (m)	DOS	Delay (Sec)	LOS	95% Queue (m)
East: University Bvd	T	0.132	0	A	0	0.162	0	A	0	0.054	0	A	0
	R	0.053	5.4	A	2	0.033	5.4	A	1.1	0.005	4.8	A	0.2
	Approach	0.132	1.3	A	2	0.162	0.8	A	1.1	0.054	0.4	A	0.2
North: Dumas Rd	L	0.075	5	A	2.1	0.097	5.2	A	2.8	0.018	4.8	A	0.5
	R	0.075	8.3	A	2.1	0.097	9.4	A	2.8	0.018	5.5	A	0.5
	Approach	0.075	7.9	A	2.1	0.097	7.7	A	2.8	0.018	5.4	A	0.5
West: University Bvd	L	0.093	4.8	A	0	0.113	4.7	A	0	0.028	4.7	A	0
	T	0.093	0	A	0	0.113	0	A	0	0.028	0	A	0
	Approach	0.093	2.1	A	0	0.113	1.3	A	0	0.028	0.9	A	0
All Vehicles		**0.132**	**2.2**	**A**	**2.1**	**0.162**	**1.7**	**A**	**2.8**	**0.054**	**1.0**	**A**	**0.5**

The results indicate that this intersection will still perform satisfactorily during all the peak hour periods.

8.9 SIDRA Results Summary

8.9.1 Existing Year Performance

In general, the existing year (2024) SIDRA results indicate that all the key intersections assessed are operating at acceptable levels of service during all the peak hour periods. The analysis can be summarised as follows:

- The intersection of Hayman Road and Kent Street appears to operate at satisfactory levels of service, with minimal delays and short queueing.
- The current configuration of Hayman Road and Brodie-Hall Drive (three-legged priority-controlled) is performing adequately with minor delays anticipated in the AM peak period for right-turning traffic from Brodie-Hall Drive.
- The intersection of Hayman Road and Dumas Road appears to operate at satisfactory levels of service, with minimal delays and short queues.
- The intersection of University Boulevard and Kent Street is expected to perform adequately. The longest delay is anticipated during the PM peak hour period for the right-turning traffic from University Boulevard into Kent Street.
- The signalised intersection of University Boulevard and Karrak Drive appears to be operating at an acceptable level of service, with minor delays and minimal queueing.
- The intersection of University Boulevard and Dumas Road appears to be operating at a satisfactory level of service, with minimal delays and short queues during all peak hour periods assessed.

8.9.2 Future Year Performance

The SIDRA results of key intersections in the future scenarios (2029 and 2039) indicate that these intersections are operating at acceptable levels of service during all peak hour periods. The analysis can be summarised as follows:

- The intersection of Hayman Road and Kent Street appears is anticipated to still operate at a satisfactory level of service, with minor delays and minimal queueing.
- The proposed Hayman Road, Karrak Drive, and Brodie-Hall Drive intersection is expected to perform at a satisfactory level of service, with minor delays and minimal queueing.
- The intersection of Hayman Road and Dumas Road is also expected to operate at satisfactory levels of service, with minimal delays and short queueing.
- The intersection of University Boulevard and Kent Street is anticipated to perform adequately in the future. The longest delay is expected during the PM peak period for right-turning traffic from University Boulevard into Kent Street.
- The signalised intersection of University Boulevard and Karrak Drive is also anticipated to operate at an acceptable level of service, with minor delays and minimal queueing.
- The intersection of University Boulevard and Dumas Road is also anticipated to operate at a satisfactory level of service, with minimal delays and short queues during all peak hour periods.

9 Conclusions

This Transport Impact Assessment (TIA) outlines the transport aspects of the proposed redevelopment of the State Hockey Centre focusing on the aspects of traffic operations, access, pedestrians, cycling, parking, and public transport. This assessment has been prepared in accordance with the Western Australian Planning Commission (WAPC) Transport Impact Assessment Guidelines for Developments: Volume 4 – Individual Developments (2016).

Based on the assessment of the abovementioned aspects, the following conclusions are made:

- The Site is located within the existing hockey centre adjacent to the Curtin University grounds in Bentley, Town of Victoria Park.
- The crash assessment indicates that a significant number of crashes have occurred along the Site's surrounding road network. However, based on the anticipated day-to-day operations of the development, it is not expected to further affect the overall safety and traffic operations of the existing road network.
- The Site appears to be highly accessible by public transport due to the presence of several bus stops and the frequent bus routes running along the surrounding road network. The Site is also highly accessible for pedestrians and cyclists due to the extensive presence of high-quality shared paths in the surrounding road network.
- The proposed development intends providing only 60-car parking bays exclusively allocated for staff/employees and national team players. This is considered to be adequate as visitors are anticipated to utilise parking facilities outside of the Site or use public transport, cycling, and pedestrian facilities.
- The proposed parking layouts within the development have been assessed and is able to accommodate service vehicles, emergency vehicles and broadcast trucks.
- The Site is anticipated to generate 60 vehicle trips and 22 vehicle trips during the AM and PM peak hour periods respectively. This represents the highest number of vehicle movements anticipated to enter and exit the subject site on any typical day.
- The key intersections considered in this report are generally performing at an acceptable level of service during the base year (2024) scenario.
- The key intersections are anticipated to perform adequately with minimal delays and minor queueing in the future 2029 and 2039 design years.

Overall, the proposed redevelopment of the hockey centre is expected to have minimal impact on the traffic safety, operations, and performance of the surrounding road network.

Appendices

Appendix A

WAPC Checklist

Appendix A WAPC Checklist

Item	Section	Comments/Proposals
Proposed development	Section 4	
Proposed land use	Section 4	
Existing land uses	Section 1	
Context with surrounds	Section 1 / 7	
Vehicular access and parking	Section 4 / 5	
Access arrangements	Section 4	
Public, private, disabled parking set down / pick up	Section 4	
Service vehicles (non-residential)	Section 4	
Access arrangements	Section 4	
On/off-site loading facilities	Section 4	
Service vehicles (residential)	N/A	
Rubbish collection and emergency vehicle access	Section 4	
Hours of operation (non-residential only)	N/A	
Traffic volumes	Section 1 / 8	
Daily or peak traffic volumes	Section 1 / 8	
Type of vehicles (e.g. Cars, trucks)	N/A	
Traffic management on frontage streets	N/A	
Public transport access	Section 2	
Nearest bus/train routes	Section 2	
Nearest bus stops/train stations	Section 2	
Pedestrian/cycle links to bus stops/train station	Section 2 / 3	
Pedestrian access/facilities	Section 3	
Existing pedestrian facilities within the development (if any)	Section 3 / 6	
Existing pedestrian facilities on surrounding roads	Section 1 / 3	
Proposals to improve pedestrian access	Section 6	
Cycle access/facilities	Section 3	
Existing cycle facilities within the development (if any)	Section 1 / 3	
Existing cycle facilities on surrounding roads	Section 3	
Safety issues	Section 1	
Identify issues	N/A	
Remedial measures	N/A	

Appendix B

Site Plan

1 SITE PLAN
SCALE 1 : 500

TOWN OF VICTORIA PARK
Received: 07/01/2025

LEGEND

- PROPOSED BUILDINGS
- ANCILLARY BUILDINGS / STRUCTURES
- TIE-IN ROAD WORKS TO CONNECT TO EXISTING FEATURES
- EXISTING SITE FEATURES TO BE RETAINED
- PROJECT LEASE BOUNDARY

GENERAL NOTES:
THE LEASE AREA BOUNDARY IS NOTIONAL AND NEEDS TO BE CONFIRMED BY A LICENCED SURVEYOR

NO NEW WORKS TO TAKE PLACE WITHIN WATER CORPORATION DRAINAGE BASIN WITHOUT ARBORIST APPROVAL, IDENTIFICATION AND PROTECTION OF SIGNIFICANT NATIVE VEGETATION

ALL EXISTING TREES SHOWN ON SITE PLAN TO BE PROTECTED IN ACCORDANCE WITH ARBORIST RECOMENDATIONS FOR TPZ / SRZ SET-BACKS

ALL WORKS OUTSIDE OF LEASE BOUNDARY WILL REQUIRE THE APPROVAL OF THE LANDLORD

EXISTING CAMPUS OPERATIONAL AREAS SUCH AS CARPARKS AND ROADWAYS TO REMAIN IN FULL OPERATION AND PUBLICLY ACCESSIBLE DURING THE WORKS

FENCES AND GATES SHOWN INDICATIVELY ON ARCHITECTURAL SITE PLAN. FOR DETAILED ALIGNMENT, HEIGHT AND TYPE OF FENCING REFER TO LANDSCAPE ARCHITECTS DRAWINGS

REFER TO LANDSCAPE SITE PLAN FOR DETAILED HARD AND SOFTSCAPE FINISHES AND MATERIALS

HAYMAN ROAD INTERSECTION WORKS SUBJECT TO AGREEMENT WITH THE TOWN OF VICTORIA PARK

ALL MAKE GOOD WORKS TO AREA SOUTH OF THE PROJECT SITE SUBJECT TO AGREEMENT WITH THE LANDLORD

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	BY
T	01.11.2024	ISSUE FOR DD COORDINATION	SS
S	28.10.2024	ISSUE FOR DD COORDINATION	SP
R	25.10.2024	ISSUE FOR DD COORDINATION	SS
Q	04.10.2024	ISSUE FOR COORDINATION	AG
P	27.09.2024	ISSUE FOR COORDINATION	AG
O	20.09.2024	ISSUE FOR 50% DD	SS
N	18.09.2024	ISSUED FOR COORDINATION	AG
M	30.08.2024	ISSUE FOR DD COORDINATION	SS
L	16.08.2024	ISSUE FOR DD COORDINATION	SS
K	12.07.2024	SCHEMATIC DESIGN	SS

HUNT ARCHITECTS
Perth Studio Whadjuk Nation
Level 1, 241 Murray Street,
Perth, WA 6000
+618 9322 6655
perth@huntarchitects.com.au

Government of Western Australia
Department of Finance
Major Projects

ARCHITECTURAL
DEPARTMENT OF FINANCE
AUSTRALIAN HOCKEY CENTRE
KENT ST, BENTLEY WA 6102
OVERALL SITE PLAN
SITE PLAN

DRAWN	SH	DESIGNED Designer	REDUCTION 0
CHECKED	SS	PRINCIPAL	
APPROVED	SS		
SCALE	As indicated @ A0	DATE 01.11.2024	DRAWING No. DD-1103 REV. T
PROJECT No	2310	OF FILE No	

THIS IS A CADD DRAWING DO NOT AMEND MANUALLY
XXXDD-1103

Appendix C

Swept Path Diagrams

NORTH CAR PARK

FIRE BOOSTER CABINET
BORE ENCL
WATER TANK (12.1m DIA)
IRRIGATION PUMP SHED
FIRE PUMPS & TANKS
LOADING ZONE
NEW SHED
BORE ENCL
EXISTING SHED
SLIDING GATE
HRV STANDARDS 2018 (AU)
39 CAR BAYS
RL8.50
EV CHARGING BAYS
BIN STORE
DRIVEWAY ACCESS
EXISTING GRASS
SITE BOUNDARY

12500
2200 6850

HRV INGRESS EGRESS

	mm
Width	: 2500
Track	: 2500
Lock to Lock Time	: 6.0
Steering Angle	: 36.7

TOWN OF VICTORIA PARK
Received: 07/01/2025

FIRE BOOSTER CABINET
BORE ENCL
WATER TANK (12.1m DIA)
IRRIGATION PUMP SHED
FIRE PUMPS & TANKS
LOADING ZONE
NEW SHED
BORE ENCL
EXISTING SHED
SLIDING GATE
HRV STANDARDS 2018 (AU)
39 CAR BAYS
RL8.50
EV CHARGING BAYS
BIN STORE
DRIVEWAY ACCESS
EXISTING GRASS
SITE BOUNDARY

Stantec
Stantec Australia Pty Ltd | ABN 17 007 820 322
Ground Floor, 226 Adelaide Terrace
Perth WA 6000
Tel: 08 6222 7000

NORTH

DATE PLOTTED: 6 November 2024 2:42 PM BY : CANO, SEBASTIAN
CAD File: C:\Users\scano\OneDrive - Stantec\Desktop\Work Files\WIP\TIA_300304837_Australian Hockey Centre\23 Oct\041124_Swept Paths.dwg

NORTH CAR PARK

FIRE BOOSTER CABINET

BORE ENCL

WATER TANK (12.1m DIA)

IRRIGATION PUMP SHED

FIRE PUMPS & TANKS

LOADING ZONE

NEW SHED

BORE ENCL

EXISTING SHED

10100

1400 5200

Veolia INGRESS EGRESS

mm

Width	: 2500
Track	: 2500
Lock to Lock Time	: 6.0
Steering Angle	: 35.5

SLIDING GATE

39 CAR BAYS

RL8.50

Veolia Custom

EV CHARGING BAYS

BIN STORE

SITE BOUNDARY

DRIVEWAY ACCESS

EXISTING GRASS

TOWN OF VICTORIA PARK
Received: 07/01/2025

FIRE BOOSTER CABINET

BORE ENCL

WATER TANK (12.1m DIA)

IRRIGATION PUMP SHED

FIRE PUMPS & TANKS

LOADING ZONE

NEW SHED

BORE ENCL

EXISTING SHED

SLIDING GATE

39 CAR BAYS

RL8.50

Veolia Custom

EV CHARGING BAYS

BIN STORE

SITE BOUNDARY

DRIVEWAY ACCESS

EXISTING GRASS

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NORTH CAR PARK

FIRE BOOSTER CABINET

BORE ENCL

WATER TANK (12.1m DIA)

IRRIGATION PUMP SHED

FIRE PUMPS & TANKS

NEW SHED

BORE ENCL

LOADING ZONE

EXISTING SHED

BIN STORE

SLIDING GATE

39 CAR BAYS

RL8.50

MFB Aerial T Squirt 376 CITY EMERGENCY

EV CHARGING BAYS

DRIVEWAY ACCESS

SITE BOUNDARY

EXISTING GRASS

9225

2610 5512

INGRESS

EGRESS

MFB Aerial T Squirt 376

mm

Width	: 2500
Track	: 2480
Lock to Lock Time	: 6.0
Steering Angle	: 38.1

TOWN OF VICTORIA PARK
Received: 07/01/2025

NORTH CAR PARK

FIRE BOOSTER CABINET

BORE ENCL

WATER TANK (12.1m DIA)

IRRIGATION PUMP SHED

FIRE PUMPS & TANKS

NEW SHED

BORE ENCL

LOADING ZONE

EXISTING SHED

BIN STORE

SLIDING GATE

39 CAR BAYS

RL8.50

MFB Aerial T Squirt 376 CITY EMERGENCY

EV CHARGING BAYS

DRIVEWAY ACCESS

SITE BOUNDARY

EXISTING GRASS

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NORTH CAR PARK

FIRE BOOSTER CABINET

BORE ENCL

WATER TANK (12.1m DIA)

IRRIGATION PUMP SHED

FIRE PUMPS & TANKS

NEW SHED

BORE ENCL

LOADING ZONE

EXISTING SHED

QAS – Ambulance Combined GTA–QLD

SLIDING GATE

39 CAR BAYS

RL8.50

EV CHARGING BAYS

BIN STORE

QAS – Ambulance Combined GTA–QLD

QAS – Ambulance Combined GTA–QLD

DRIVEWAY ACCESS

SITE BOUNDARY

EXISTING GRASS

7420

1240 4360

INGRESS

EGRESS

QAS – Ambulance Combined

mm

Width	: 2400
Track	: 2400
Lock to Lock Time	: 6.0
Steering Angle	: 45.0

TOWN OF VICTORIA PARK
Received: 07/01/2025

FIRE BOOSTER CABINET
BORE ENCL
WATER TANK (12.1m DIA)
IRRIGATION PUMP SHED
FIRE PUMPS & TANKS
NEW SHED
BORE ENCL
LOADING ZONE
EXISTING SHED
SLIDING GATE
39 CAR BAYS
RL8.50
EV CHARGING BAYS
BIN STORE
QAS – Ambulance Combined GTA–QLD
QAS – Ambulance Combined GTA–QLD
DRIVEWAY ACCESS
SITE BOUNDARY
EXISTING GRASS

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NORTH

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NORTH CAR PARK

FIRE BOOSTER CABINET

BORE ENCL

WATER TANK (12.1m DIA)

IRRIGATION PUMP SHED

FIRE PUMPS & TANKS

LOADING ZONE

NEW SHED

BORE ENCL

EXISTING SHED

B85 STANDARDS 2004 (AU_NZ)

SLIDING GATE

39 CAR BAYS

RL8.50

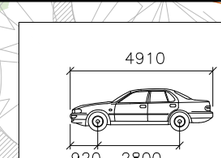
EV CHARGING BAYS

BIN STORE

DRIVEWAY ACCESS

EXISTING GRASS

SITE BOUNDARY



B85 INGRESS EGRESS

	mm
Width	: 1870
Track	: 1770
Lock to Lock Time	: 6.0
Steering Angle	: 34.1

TOWN OF VICTORIA PARK
Received: 07/01/2025

FIRE BOOSTER CABINET
BORE ENCL
WATER TANK (12.1m DIA)
IRRIGATION PUMP SHED
FIRE PUMPS & TANKS
LOADING ZONE
NEW SHED
BORE ENCL
EXISTING SHED
B85 STANDARDS 2004 (AU_NZ)
SLIDING GATE
39 CAR BAYS
RL8.50
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EXISTING GRASS
SITE BOUNDARY

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CAD File: C:\Users\scano\OneDrive - Stantec\Desktop\Work Files\WIP\TIA_300304837_Australian Hockey Centre\23 Oct\041124_Swept Paths.dwg

NORTH CAR PARK

FIRE BOOSTER CABINET

BORE ENCL

WATER TANK (12.1m DIA)

IRRIGATION PUMP SHED

FIRE PUMPS & TANKS

LOADING ZONE

NEW SHED

EXISTING SHED

BIN STORE

SLIDING GATE

39 CAR BAYS

RL8.50

EV CHARGING BAYS

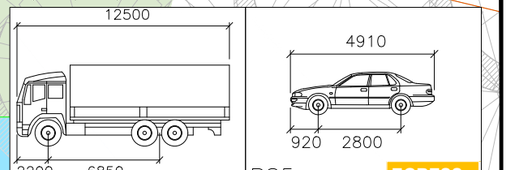
HRV STANDARDS 2018 (AU)

B85 STANDARDS 2004 (AU_NZ)

DRIVEWAY ACCESS

SITE BOUNDARY

EXISTING GRASS



HRV — INGRESS

	mm
Width	: 2500
Track	: 2500
Lock to Lock Time	: 6.0
Steering Angle	: 36.7

B85 — EGRESS

	mm
Width	: 1870
Track	: 1770
Lock to Lock Time	: 6.0
Steering Angle	: 34.1

TOWN OF VICTORIA PARK
Received: 07/01/2025

FIRE BOOSTER CABINET
BORE ENCL
WATER TANK (12.1m DIA)
IRRIGATION PUMP SHED
FIRE PUMPS & TANKS
LOADING ZONE
NEW SHED
EXISTING SHED
BIN STORE
SLIDING GATE
39 CAR BAYS
RL8.50
EV CHARGING BAYS
HRV STANDARDS 2018 (AU)
B85 STANDARDS 2004 (AU_NZ)
DRIVEWAY ACCESS
SITE BOUNDARY
EXISTING GRASS

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NORTH

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CAD File: C:\Users\scano\OneDrive - Stantec\Desktop\Work Files\WIP\TIA_300304837_Australian Hockey Centre\23 Oct\041124_Swept Paths.dwg

NORTH CAR PARK

FIRE BOOSTER CABINET

BORE ENCL

WATER TANK (12.1m DIA)

IRRIGATION PUMP SHED

FIRE PUMPS & TANKS

LOADING ZONE

NEW SHED

EXISTING SHED

BIN STORE

SLIDING GATE

39 CAR BAYS

RL8.50

EV CHARGING BAYS

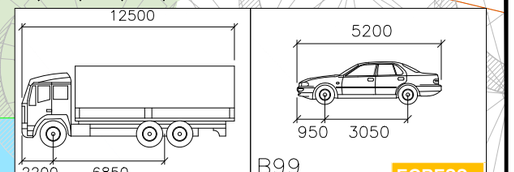
HRV STANDARDS 2018 (AU)

B99 STANDARDS 2004 (AU_NZ)

DRIVEWAY ACCESS

SITE BOUNDARY

EXISTING GRASS



HRV — INGRESS

	mm
Width	: 2500
Track	: 2500
Lock to Lock Time	: 6.0
Steering Angle	: 36.7

B99 — EGRESS

	mm
Width	: 1940
Track	: 1840
Lock to Lock Time	: 6.0
Steering Angle	: 33.9

TOWN OF VICTORIA PARK
Received: 07/01/2025

FIRE BOOSTER CABINET
BORE ENCL
WATER TANK (12.1m DIA)
IRRIGATION PUMP SHED
FIRE PUMPS & TANKS
LOADING ZONE
NEW SHED
EXISTING SHED
BIN STORE
SLIDING GATE
39 CAR BAYS
RL8.50
EV CHARGING BAYS
HRV STANDARDS 2018 (AU)
B99 STANDARDS 2004 (AU_NZ)
DRIVEWAY ACCESS
SITE BOUNDARY
EXISTING GRASS

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NORTH CAR PARK

FIRE BOOSTER CABINET

BORE ENCL

WATER TANK (12.1m DIA)

IRRIGATION PUMP SHED

FIRE PUMPS & TANKS

NEW SHED

BORE ENCL

LOADING ZONE

EXISTING SHED

11000

1650 4950

11.0m Hook Lift

INGRESS

EGRESS

mm

Width	: 2500
Track	: 2500
Lock to Lock Time	: 6.0
Steering Angle	: 24.4

SLIDING GATE

39 CAR BAYS

RL8.50

11.0m Hook Lift Custom

EV CHARGING BAYS

BIN STORE

11.0m Hook Lift Custom

11.0m Hook Lift Custom

SITE BOUNDARY

DRIVEWAY ACCESS

EXISTING GRASS

TOWN OF VICTORIA PARK
Received: 07/01/2025

FIRE BOOSTER CABINET

BORE ENCL

WATER TANK (12.1m DIA)

IRRIGATION PUMP SHED

FIRE PUMPS & TANKS

NEW SHED

BORE ENCL

LOADING ZONE

EXISTING SHED

SLIDING GATE

39 CAR BAYS

RL8.50

11.0m Hook Lift Custom

EV CHARGING BAYS

BIN STORE

11.0m Hook Lift Custom

11.0m Hook Lift Custom

SITE BOUNDARY

DRIVEWAY ACCESS

EXISTING GRASS

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SOUTH CAR PARK

7m HIGH FENCE

GOALIE TRAINING

RL 9.5

EMERGENCY ACCESS GATE

GOAL STORE PAD

7m HIGH FENCE

RL 9.5

STADIUM SERVICE LANE AND DELIVERIES AREA

RAMP 1:40

DN

B85 STANDARDS 2004 (AU_NZ)

BOLLARDS

1 NO. DISABLE CARBAY

18 CAR BAYS

3500

6200

FLAG POLES

BOLLARDS

RAMP 1:40

9

SITE BOUNDARY

10

SED ACCESS GATE
AND DETAIL TO BE
LISED SUBJECT TO
T WITH LANDLORD

BROADCAST CABLE TRENCH WITH TRAFFICABLE / REMOVABLE /

9.4

4910

920 2800

B85 INGRESS EGRESS

	mm
Width	: 1870
Track	: 1770
Lock to Lock Time	: 6.0
Steering Angle	: 34.1

7m HIGH FENCE

GOALIE TRAINING

RL 9.5

EMERGENCY ACCESS GATE

GOAL STORE PAD

7m HIGH FENCE

RL 9.5

STADIUM SERVICE LANE AND DELIVERIES AREA

RAMP 1:40

DN

B85 STANDARDS 2004 (AU_NZ)

BOLLARDS

1 NO. DISABLE CARBAY

18 CAR BAYS

FLAG POLES

BOLLARDS

RAMP 1:40

9

SITE BOUNDARY

10

SED ACCESS GATE
AND DETAIL TO BE
LISED SUBJECT TO
T WITH LANDLORD

BROADCAST CABLE TRENCH WITH TRAFFICABLE / REMOVABLE /

9.4

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TOWN OF VICTORIA PARK
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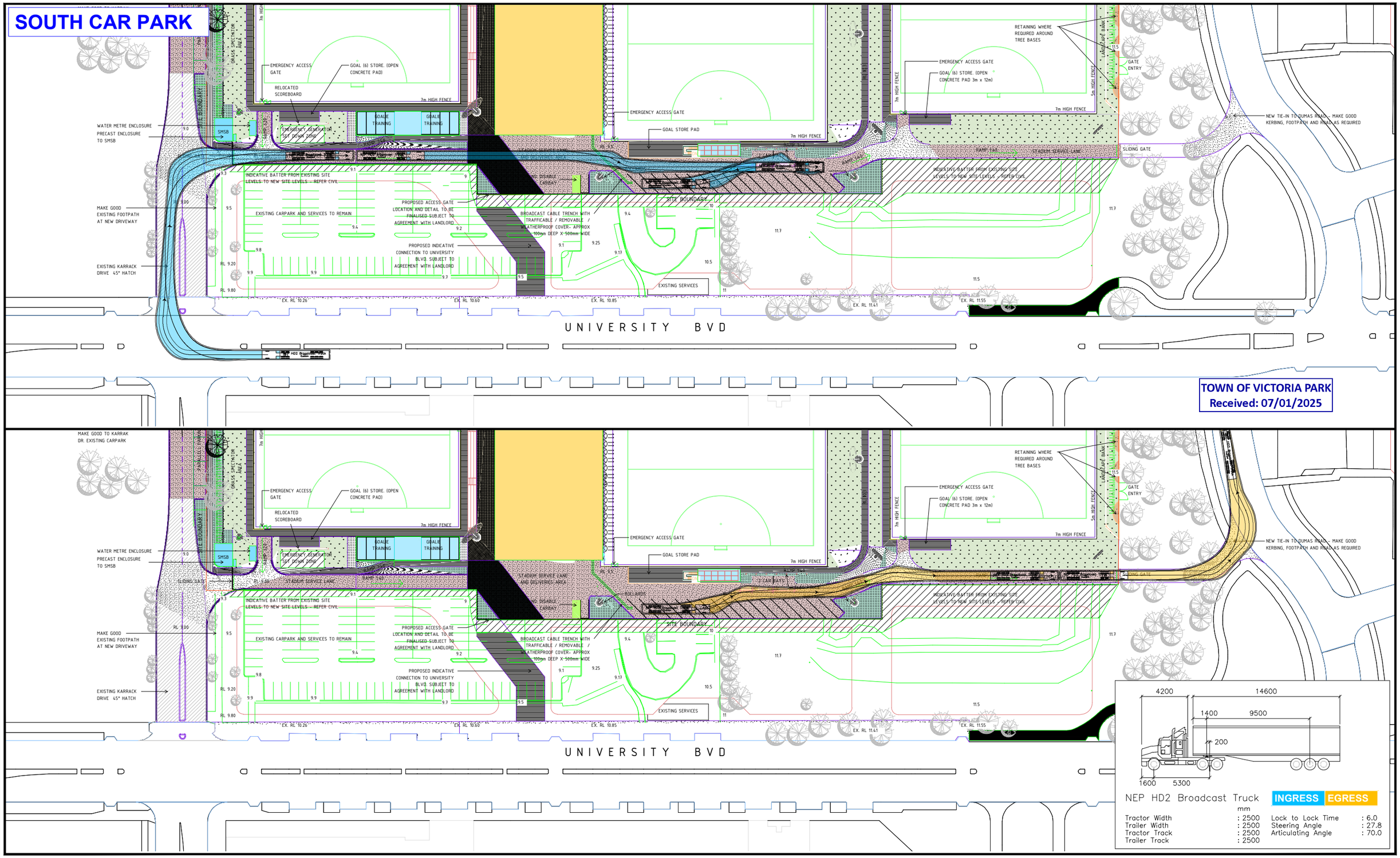
SOUTH CAR PARK



TOWN OF VICTORIA PARK
Received: 07/01/2025

NEP HD2 Broadcast Truck — INGRESS EGRESS

	mm		
Tractor Width	: 2500	Lock to Lock Time	: 6.0
Trailer Width	: 2500	Steering Angle	: 27.8
Tractor Track	: 2500	Articulating Angle	: 70.0
Trailer Track	: 2500		

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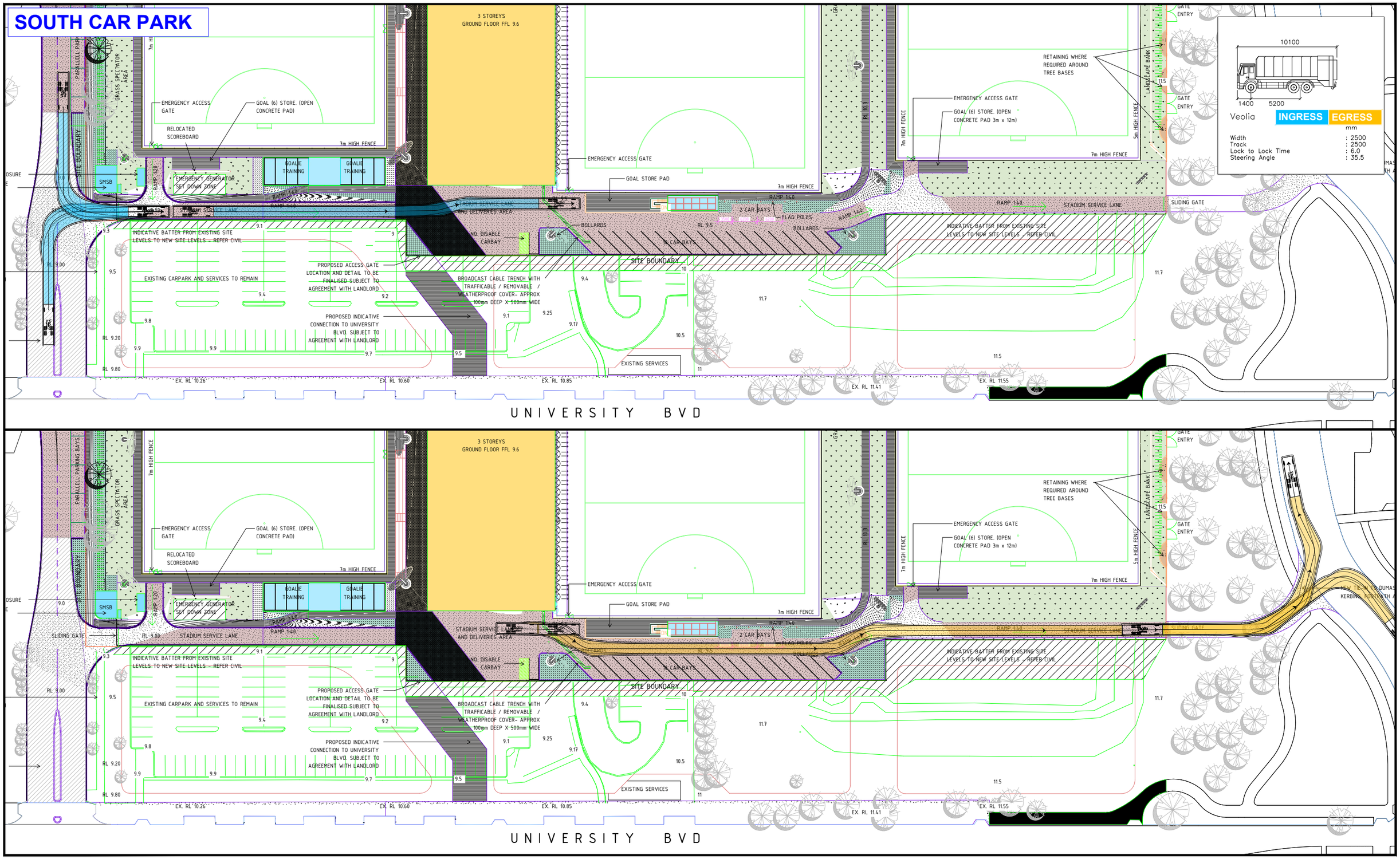
SOUTH CAR PARK



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SOUTH CAR PARK

3 STOREYS
GROUND FLOOR FFL 9.6

EMERGENCY ACCESS GATE
GOAL (6) STORE. (OPEN CONCRETE PAD)
RELOCATED SCOREBOARD
7m HIGH FENCE
PARALLEL PARKING BAYS
GRASS SPECTATOR AREA
SITE BOUNDARY
SMSB
EMERGENCY GENERATOR SET DOWN ZONE
GOALIE TRAINING
GOALIE TRAINING
RAMP 1:20
RAMP 1:40
STADIUM SERVICE LANE AND DELIVERIES AREA
EMERGENCY ACCESS GATE
GOAL STORE PAD
RL 9.5
RL 10.3
2 CAR BAYS
FLAG POLES
BOLLARDS
NO. DISABLE CARBAY
18 CAR BAYS
SITE BOUNDARY
RETAINING WHERE REQUIRED AROUND TREE BASES
EMERGENCY ACCESS GATE
GOAL (6) STORE. (OPEN CONCRETE PAD 3m x 12m)
5m HIGH FENCE
LANDSCAPE BANK
GATE ENTRY
SLIDING GATE
STADIUM SERVICE LANE
RAMP 1:40
INDICATIVE BATTER FROM EXISTING SITE LEVELS TO NEW SITE LEVELS - REFER CIVIL
EXISTING CARPARK AND SERVICES TO REMAIN
PROPOSED ACCESS GATE LOCATION AND DETAIL TO BE FINALISED SUBJECT TO AGREEMENT WITH LANDLORD
PROPOSED INDICATIVE CONNECTION TO UNIVERSITY BLVD, SUBJECT TO AGREEMENT WITH LANDLORD
BROADCAST CABLE TRENCH WITH TRAFFICABLE / REMOVABLE / WEATHERPROOF COVER- APPROX 100mm DEEP X 500mm WIDE
EXISTING SERVICES
RL 9.00
RL 9.20
RL 9.80
EX. RL 10.26
EX. RL 10.60
EX. RL 10.85
EX. RL 11.41
EX. RL 11.55

9225
2610
5512
INGRESS
EGRESS
MFB Aerial T Squirt 376 mm

Width	: 2500
Track	: 2480
Lock to Lock Time	: 6.0
Steering Angle	: 38.1

UNIVERSITY BVD

3 STOREYS
GROUND FLOOR FFL 9.6
EMERGENCY ACCESS GATE
GOAL (6) STORE. (OPEN CONCRETE PAD)
RELOCATED SCOREBOARD
7m HIGH FENCE
PARALLEL PARKING BAYS
GRASS SPECTATOR AREA
SITE BOUNDARY
SMSB
EMERGENCY GENERATOR SET DOWN ZONE
GOALIE TRAINING
GOALIE TRAINING
RAMP 1:20
RAMP 1:40
STADIUM SERVICE LANE AND DELIVERIES AREA
EMERGENCY ACCESS GATE
GOAL STORE PAD
RL 9.5
RL 10.3
2 CAR BAYS
FLAG POLES
BOLLARDS
NO. DISABLE CARBAY
18 CAR BAYS
SITE BOUNDARY
RETAINING WHERE REQUIRED AROUND TREE BASES
EMERGENCY ACCESS GATE
GOAL (6) STORE. (OPEN CONCRETE PAD 3m x 12m)
5m HIGH FENCE
LANDSCAPE BANK
GATE ENTRY
SLIDING GATE
STADIUM SERVICE LANE
RAMP 1:40
INDICATIVE BATTER FROM EXISTING SITE LEVELS TO NEW SITE LEVELS - REFER CIVIL
EXISTING CARPARK AND SERVICES TO REMAIN
PROPOSED ACCESS GATE LOCATION AND DETAIL TO BE FINALISED SUBJECT TO AGREEMENT WITH LANDLORD
PROPOSED INDICATIVE CONNECTION TO UNIVERSITY BLVD, SUBJECT TO AGREEMENT WITH LANDLORD
BROADCAST CABLE TRENCH WITH TRAFFICABLE / REMOVABLE / WEATHERPROOF COVER- APPROX 100mm DEEP X 500mm WIDE
EXISTING SERVICES
RL 9.00
RL 9.20
RL 9.80
EX. RL 10.26
EX. RL 10.60
EX. RL 10.85
EX. RL 11.41
EX. RL 11.55
UNIVERSITY BVD

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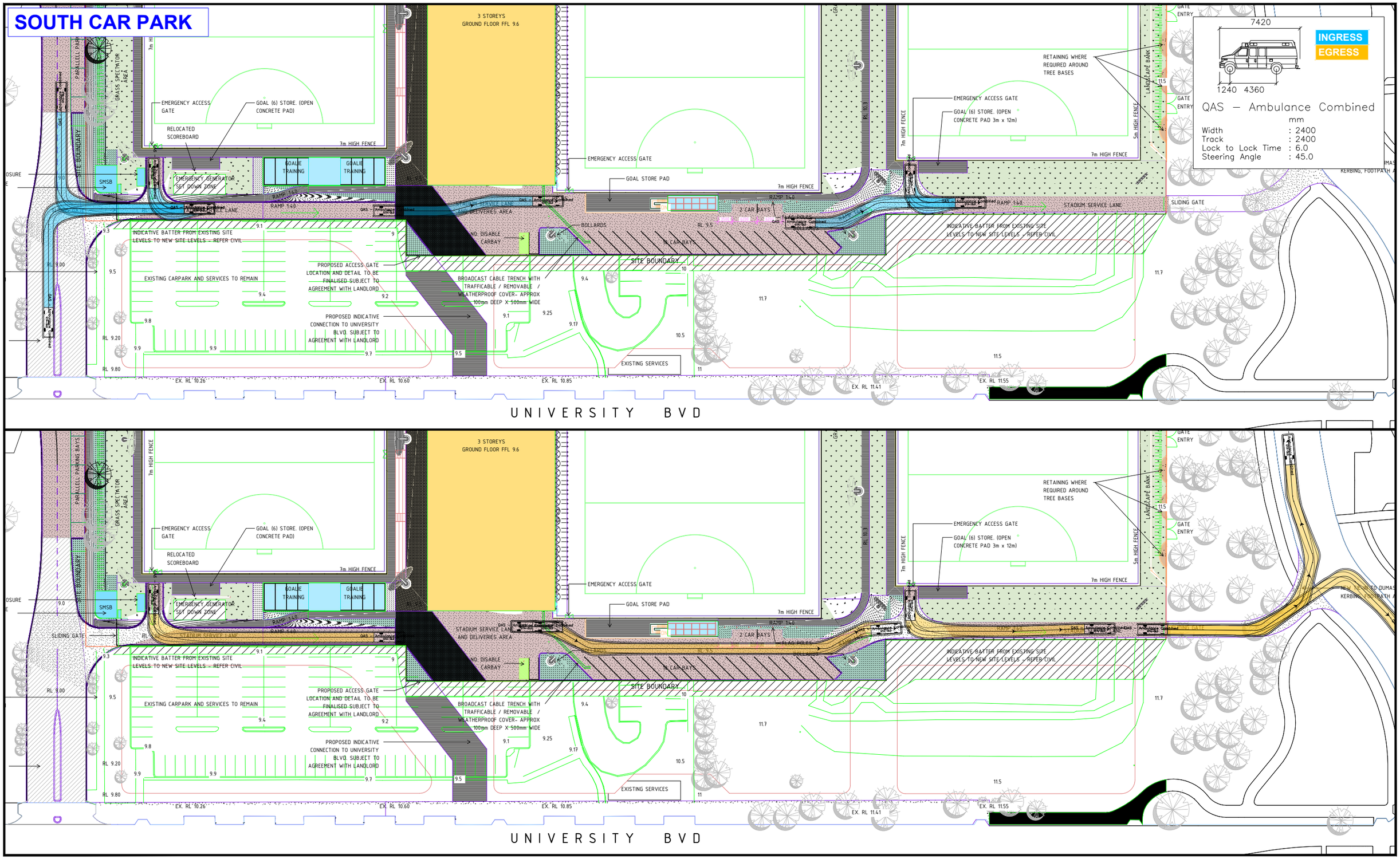
SOUTH CAR PARK



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ARRIVAL PLAZA

TOWN OF VICTORIA PARK
Received: 07/01/2025

KARRAK DRIVE (EXTENSION)

RL8.5

BOUNDARY

PARALLELL PARKING BAYS

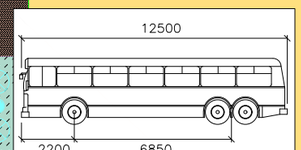
BUS DROP OFF

ARRIVAL PLAZA

MAIN ARRIVAL GATE

GRASS SPECTATOR AREA

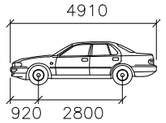
GRASS SPECTATOR AREA



BUS INGRESS EGRESS

mm

Width	: 2500
Track	: 2500
Lock to Lock Time	: 6.0
Steering Angle	: 36.6



B85 INGRESS EGRESS

mm

Width	: 1870
Track	: 1770
Lock to Lock Time	: 6.0
Steering Angle	: 34.1

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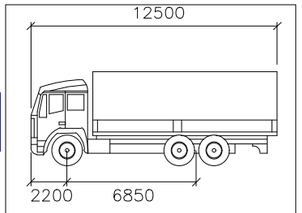
HAYMAN RD / KARRAK DR INTERSECTION

PROPOSED INTERSECTION AND ROAD WIDENING WORKS TO HAYMAN ROAD AT KARRAK DRIVE INTERFACE

TOWN OF VICTORIA PARK
Received: 07/01/2025



HRV	INGRESS	EGRESS
	mm	
Width	: 2500	
Track	: 2500	
Lock to Lock Time	: 6.0	
Steering Angle	: 36.7	

HRV STANDARDS 2018 (AU)

HRV STANDARDS 2018 (AU)

HRV STANDARDS 2018 (AU)

SITE BOUNDARY

UNIVERSITY BVD / KARRAK DR

WATER METRE ENCLOSURE
PRECAST ENCLOSURE TO SMSB

SMSB

EMERGENCY GENERATOR SET DOWN ZONE

7m HIGH FENCE

GOALIE TRAINING

GOALIE TRAINING

RAMP 1:20

RAMP 1:40

INDICATIVE BATTER FROM EXISTING SITE LEVELS TO NEW SITE LEVELS - REFER CIVIL

MAKE GOOD EXISTING FOOTPATH AT NEW DRIVEWAY

EXISTING CARPARK AND SERVICES TO REMAIN

PROPOSED ACCESS GATE LOCATION AND DETAIL TO BE FINALISED SUBJECT TO AGREEMENT WITH LANDLORD

PROPOSED INDICATIVE CONNECTION TO UNIVERSITY BLVD SUBJECT TO AGREEMENT WITH LANDLORD

EXISTING KARRACK DRIVE 45° HATCH

RL 9.20

RL 9.80

EX. RL 10.26

EX. RL 10.60

NRP HV2 Broadcast Truck

HD2 Broadcast Truck

SOUTH CARPARK EGRESS / DUMAS RD

TEAM / TECH BENCHES

RETAINING WHERE REQUIRED AROUND TREE BASES

RETAINING WHERE REQUIRED AROUND TREE BASES

GATE ENTRY

GATE ENTRY

EMERGENCY ACCESS GATE

GOAL (6) STORE. (OPEN CONCRETE PAD 3m x 12m)

7m HIGH FENCE

5m HIGH FENCE

7m HIGH FENCE

LANDSCAPE BANK

RAMP 1:40

STADIUM SERVICE

SLIDING GATE

INDICATIVE BATTER FROM EXISTING SITE LEVELS TO NEW SITE LEVELS - REFER CIVIL

NEW TIE-IN TO DUMAS ROAD - MAKE GOOD KERBING, FOOTPATH AND ROAD AS REQUIRED

DUMAS RD

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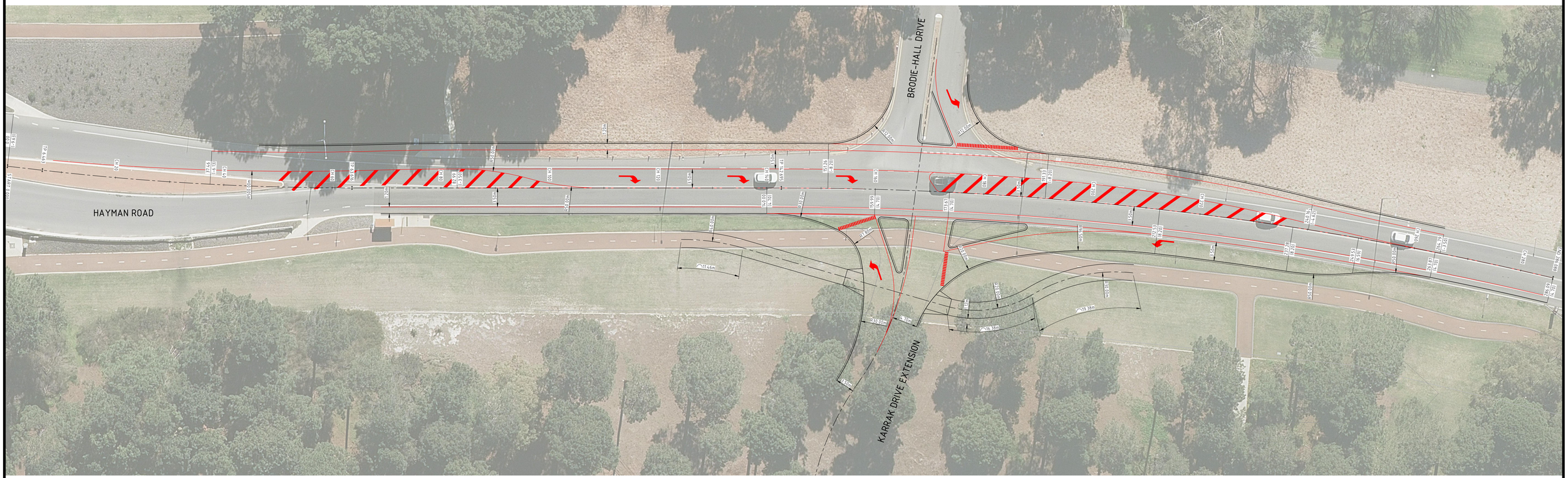
Appendix D

Intersection Design Plan



HAYMAN ROAD INTERSERSECTION PLAN

1:250

DESIGN CRITERIA

HAYMAN ROAD POSTED 60kph = DESIGN 70kph

AUSTROADS - GUIDE TO ROAD DESIGN PART 4A - UNSIGNALISED AND SIGNALISED INTERSECTIONS
TABLE 5.2 - LENGTH OF DECELERATION LANE =75m

3.5m LANE WIDTH
1.2m CYCLE LANE WIDTH
12.5m SINGLE UNIT TRUCK USED FOR TURNING MOVEMENTS

50m RADIUS REVERSE CURVES FOR LANE TRANSITIONS
(MRWA SUPPLEMENT TO AUSTROADS GTRD PART 4A - PART 5.2.1)

LANE ARRANGEMENT FROM MRWA DRAWING 200131-0084:
GUIDELINE DRAWING
MAIN ROADS CHANNELISED RIGHT TURN TYPE "CHR"
MAIN ROADS CHANNELISED LEFT TURN TYPE "CHL"
INTERSECTIONS AT GRADE SHEET 6 OF 10

SPLITTER ISLANDS SHOWN ARE INDICATIVE, PEDESTRIAN MOVEMENT MAY DICTATE FURTHER REQUIREMENTS FOR INCREASED SPLITTER ISLAND SIZES OR MEDIAN REFUGE RATHER THAN PAVEMENT MARKING.

3m PATH DIVERSION SHOWN IS:
TO AT LEAST 1m FROM THE ROAD RESERVE BOUNDARY
DIRECT CROSSING ACROSS ROAD
(MRWA SUPPLEMENT TO AUSTROADS GTRD PART 6A - PART 5.3)
MINIMUM RADIUS LENGTH 11m (ASSUMED 20KPH SPEED APPROACHING CROSSING) RADII SELECTED TO ACHIEVE MIN LENGTH

1:250 2.5 0 2.5 5 7.5 10 12.5 A0
1:500 A2

DOCUMENTATION BY:
STANTEC AUSTRALIA PTY LTD.
226 ADELAIDE TERRACE PERTH, WA, AUSTRALIA 6000

Government of Western Australia
Department of Finance
Major Projects

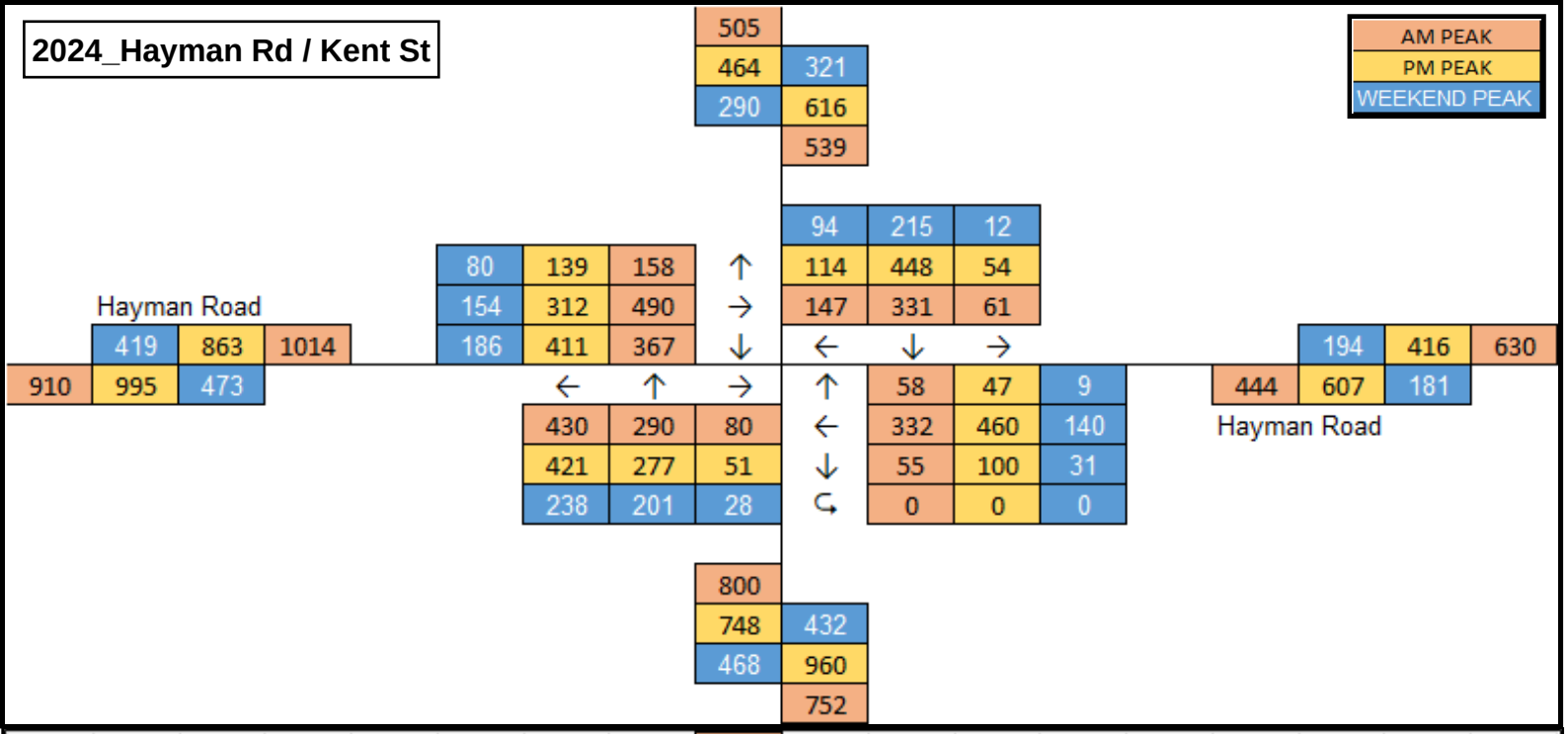
AUSTRALIAN HOCKEY CENTRE
HAYMAN ROAD INTERSECTION PLAN

DRAWN AS	DESIGNED TS	REDUCTION 0 5	
CHECKED JY	PRINCIPAL ST		
APPROVED ST			
SCALE 1:250	DATE 20.09.2024	DRAWING No. C18	
DF PROJ No. 15429	DF FILE No. AHCC18AS		

THIS IS A CADD DRAWING DO NOT AMEND MANUALLY NAME TIME DATE

Appendix E

Design Traffic Volumes


2024_Hayman Rd / Kent St
AM PEAK
PM PEAK
WEEKEND PEAK
Hayman Road
Hayman Road
505
464
321
290
616
539
94
215
12
80
139
158
114
448
54
154
312
490
147
331
61
186
411
367
419
863
1014
194
416
630
910
995
473
444
607
181
58
47
9
430
290
80
332
460
140
421
277
51
55
100
31
238
201
28
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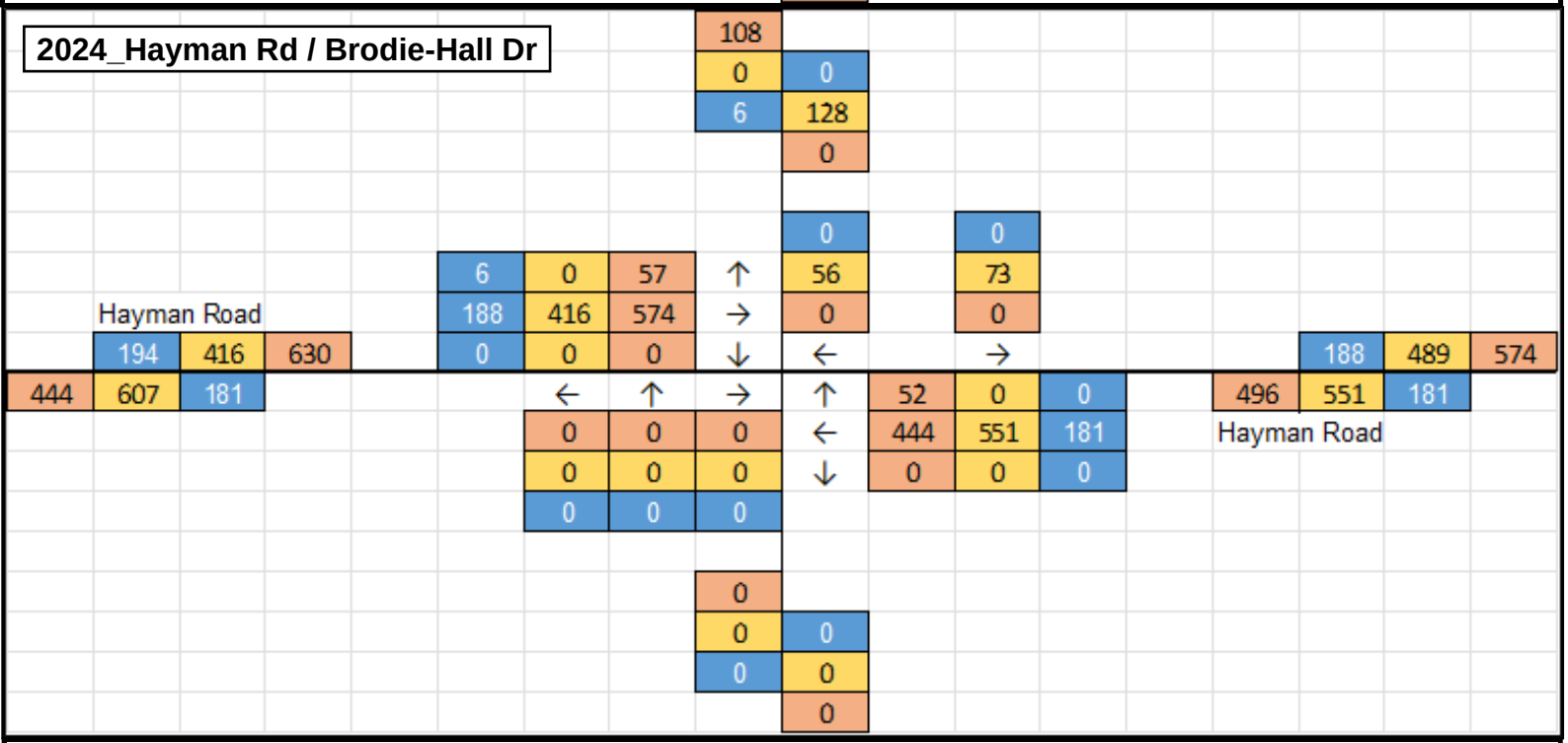
0
0
800
748
432
468
960
752


2024_Hayman Rd / Brodie-Hall Dr
Hayman Road
Hayman Road
108
0
0
6
128
0
0
0
6
0
57
56
73
188
416
574
0
0
194
416
630
188
489
574
444
607
181
52
0
0
0
0
0
444
551
181
496
551
181
0
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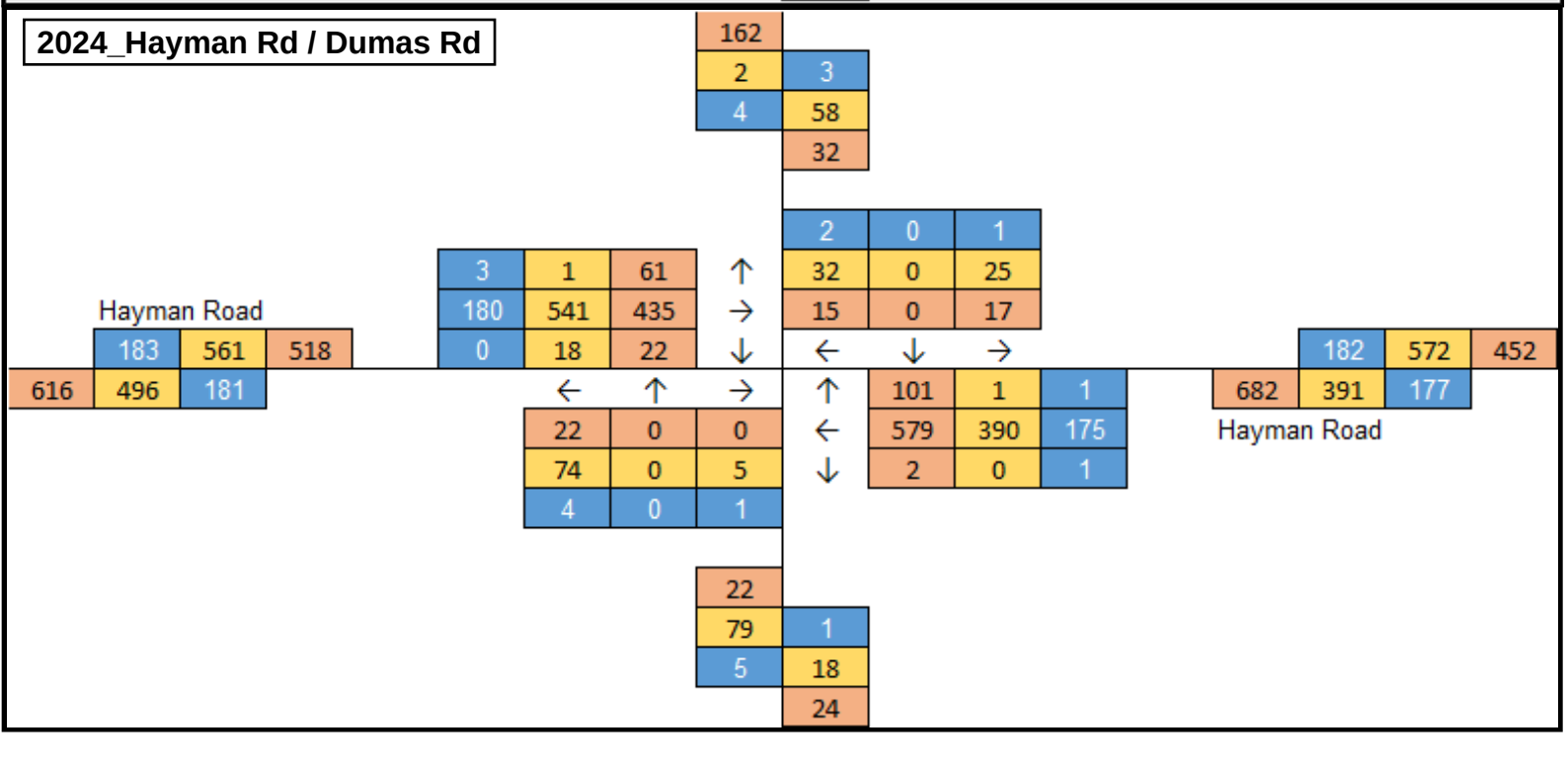
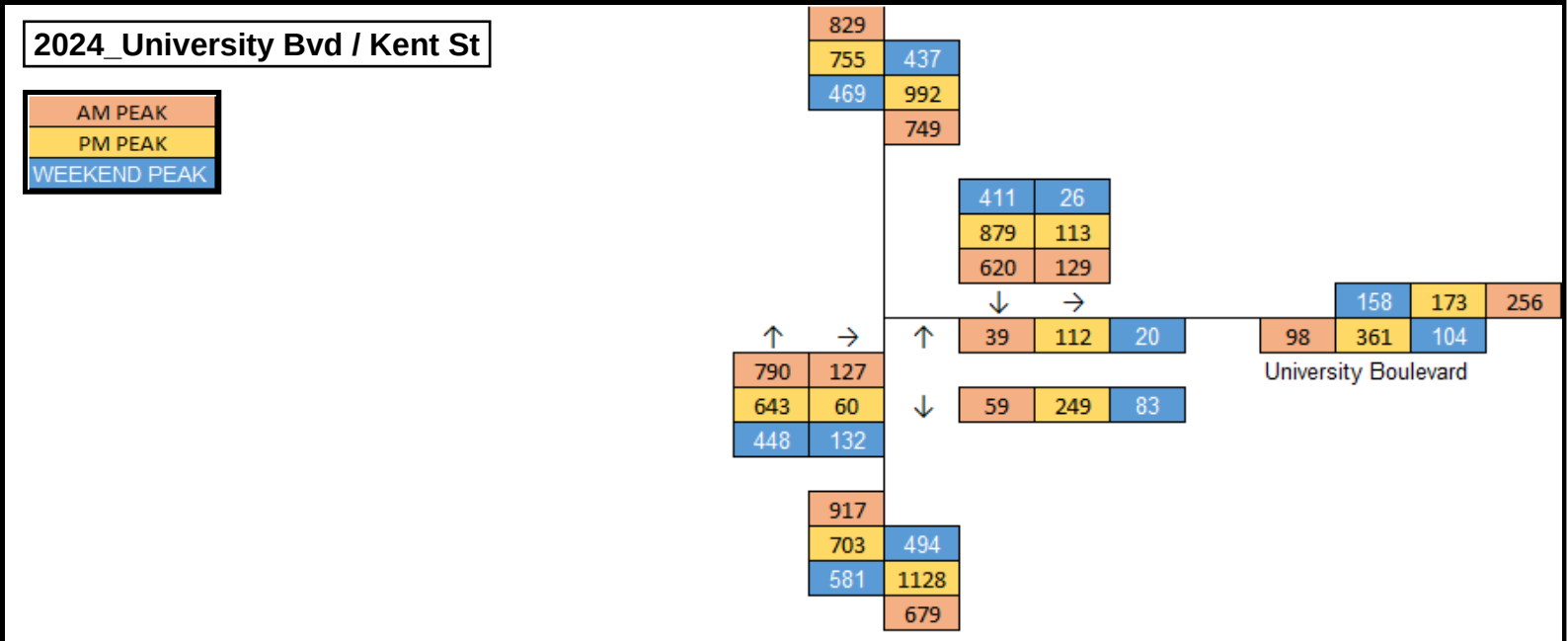
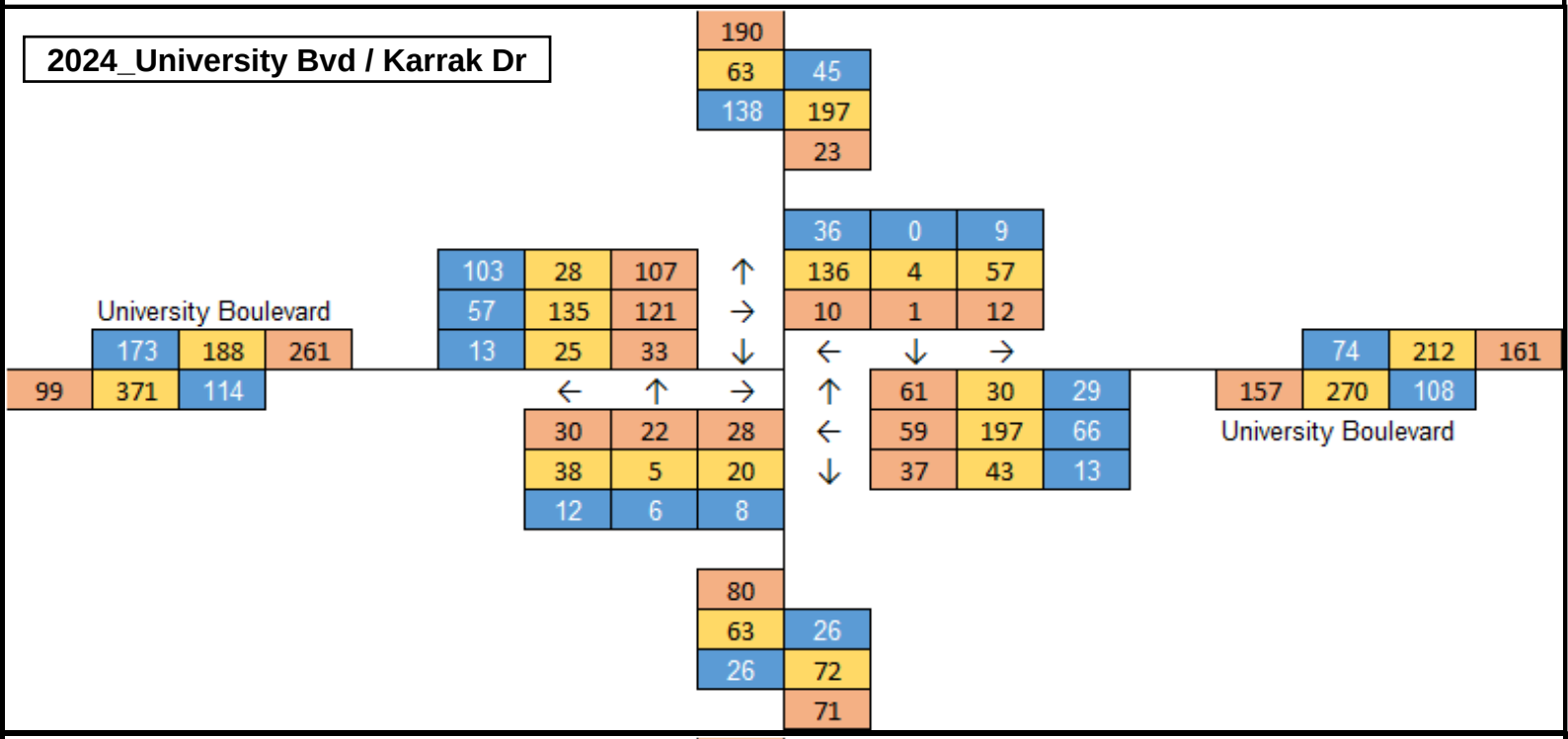

2024_Hayman Rd / Dumas Rd
Hayman Road
Hayman Road
162
2
3
4
58
32
2
0
1
3
1
61
32
0
25
180
541
435
15
0
17
0
18
22
183
561
518
182
572
452
616
496
181
101
1
1
682
391
177
22
0
0
579
390
175
74
0
5
2
0
1
4
0
1
22
79
1
5
18
24

2024_University Bvd / Kent St

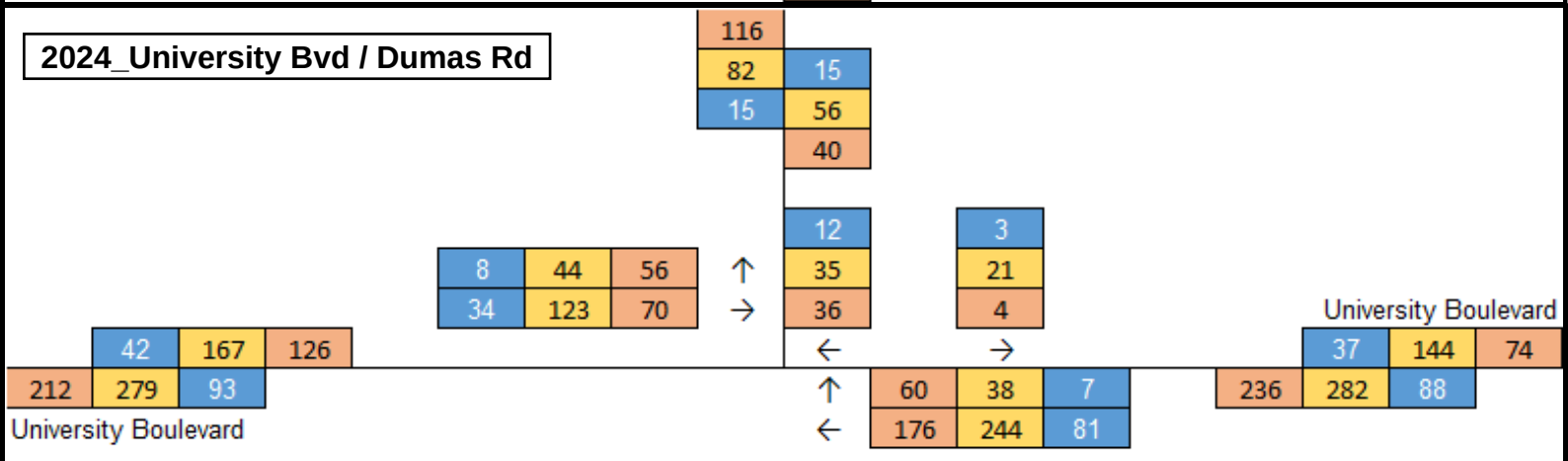
AM PEAK
PM PEAK
WEEKEND PEAK

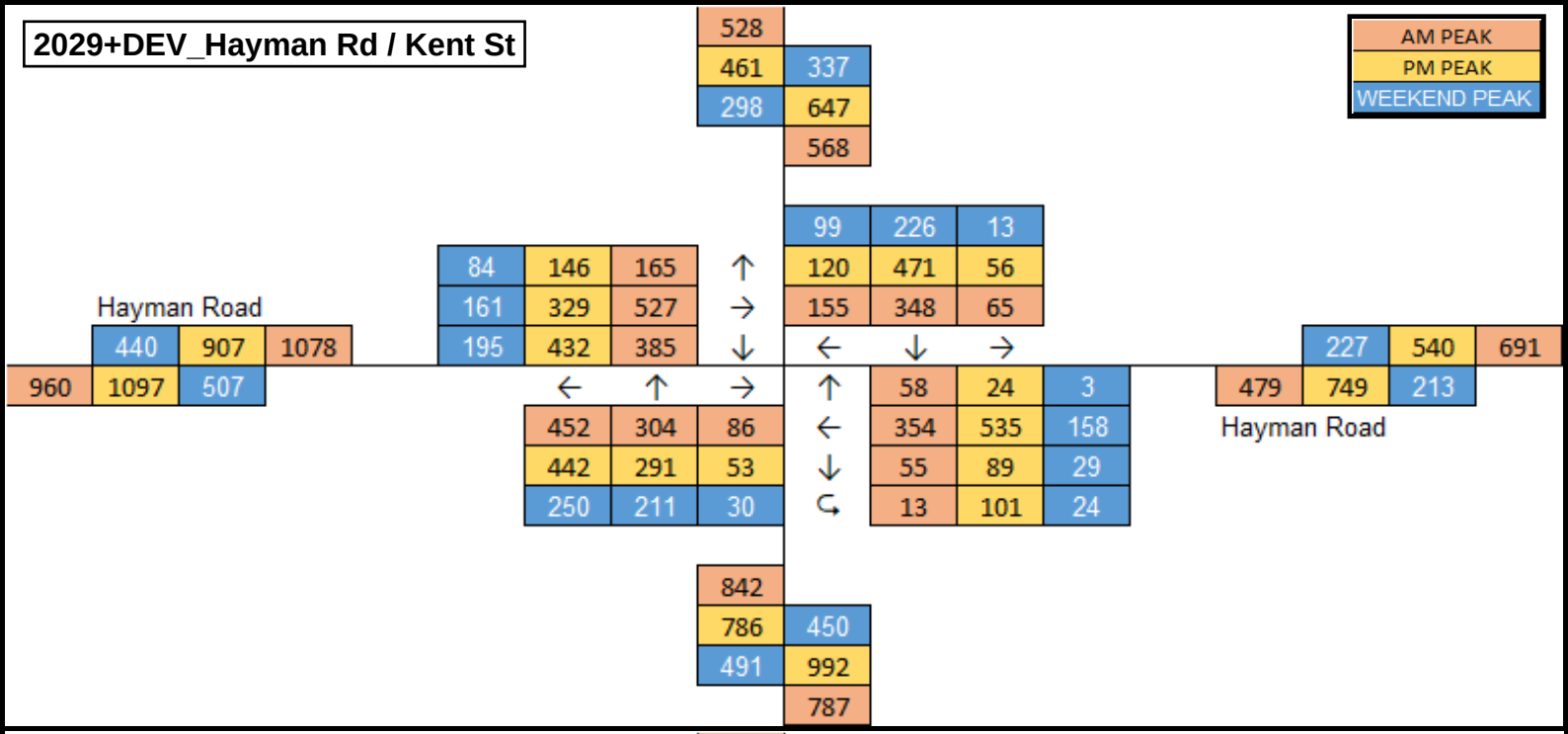


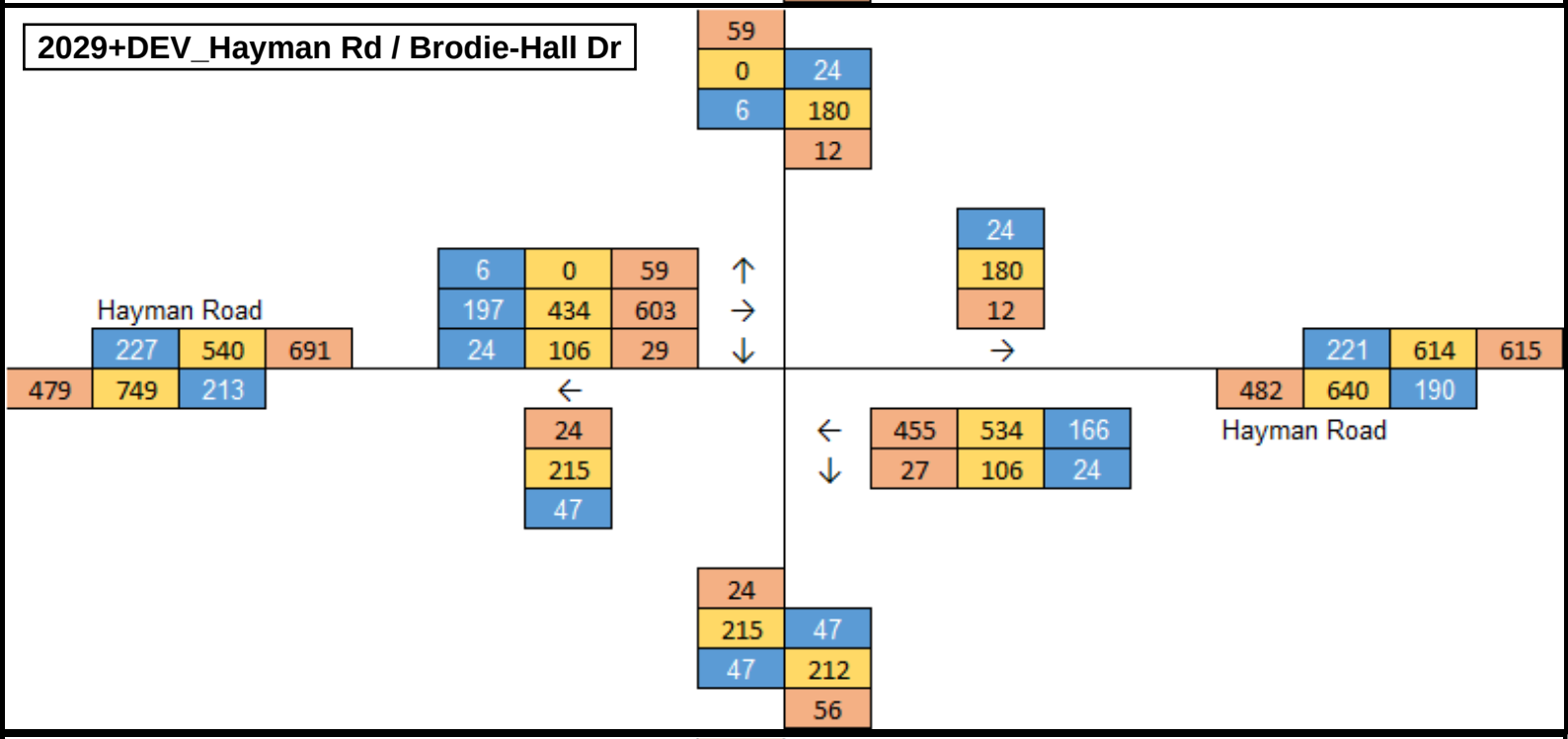
2024_University Bvd / Karrak Dr



2024_University Bvd / Dumas Rd




2029+DEV_Hayman Rd / Kent St
AM PEAK
PM PEAK
WEEKEND PEAK
Hayman Road
Hayman Road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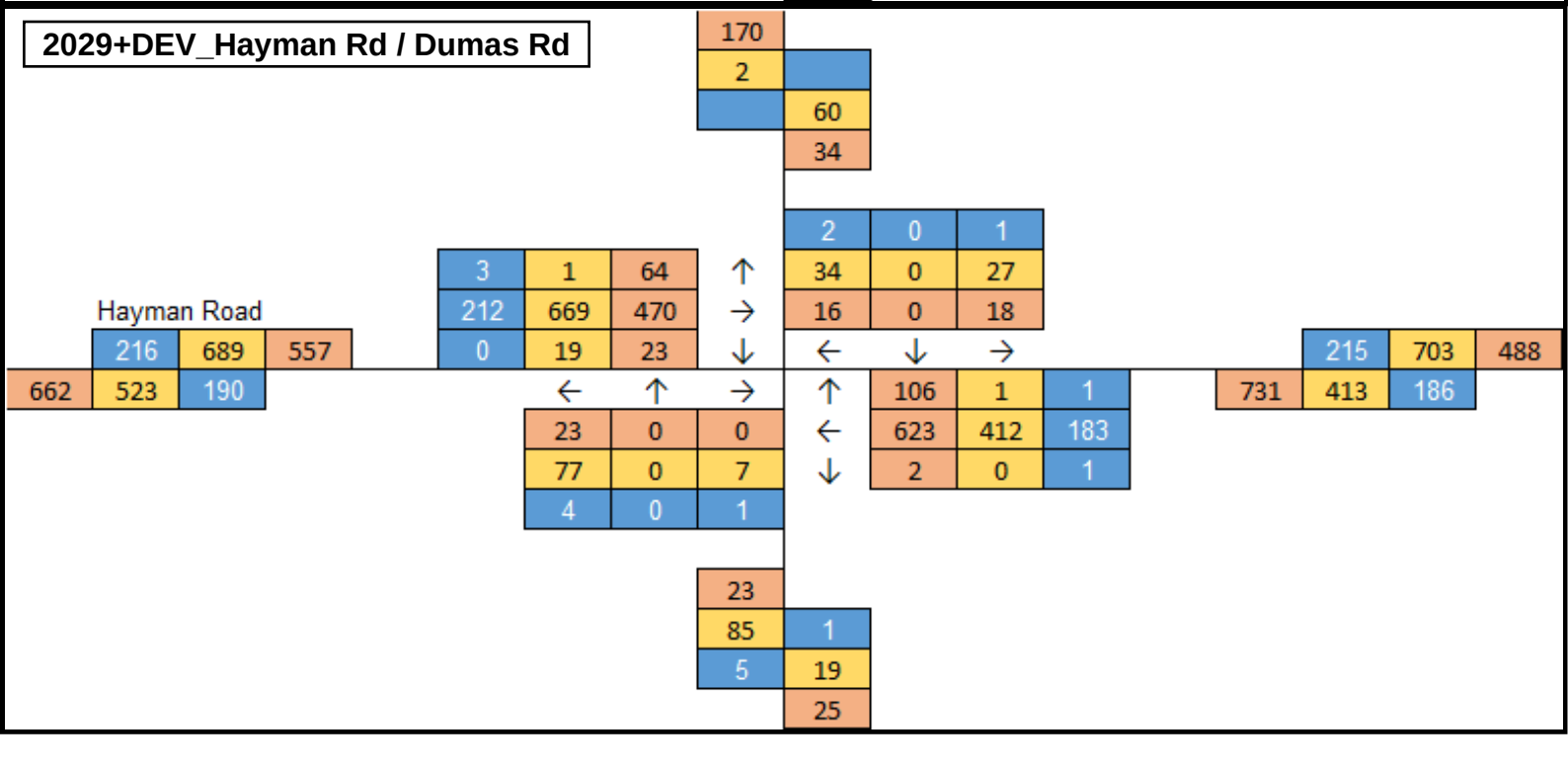
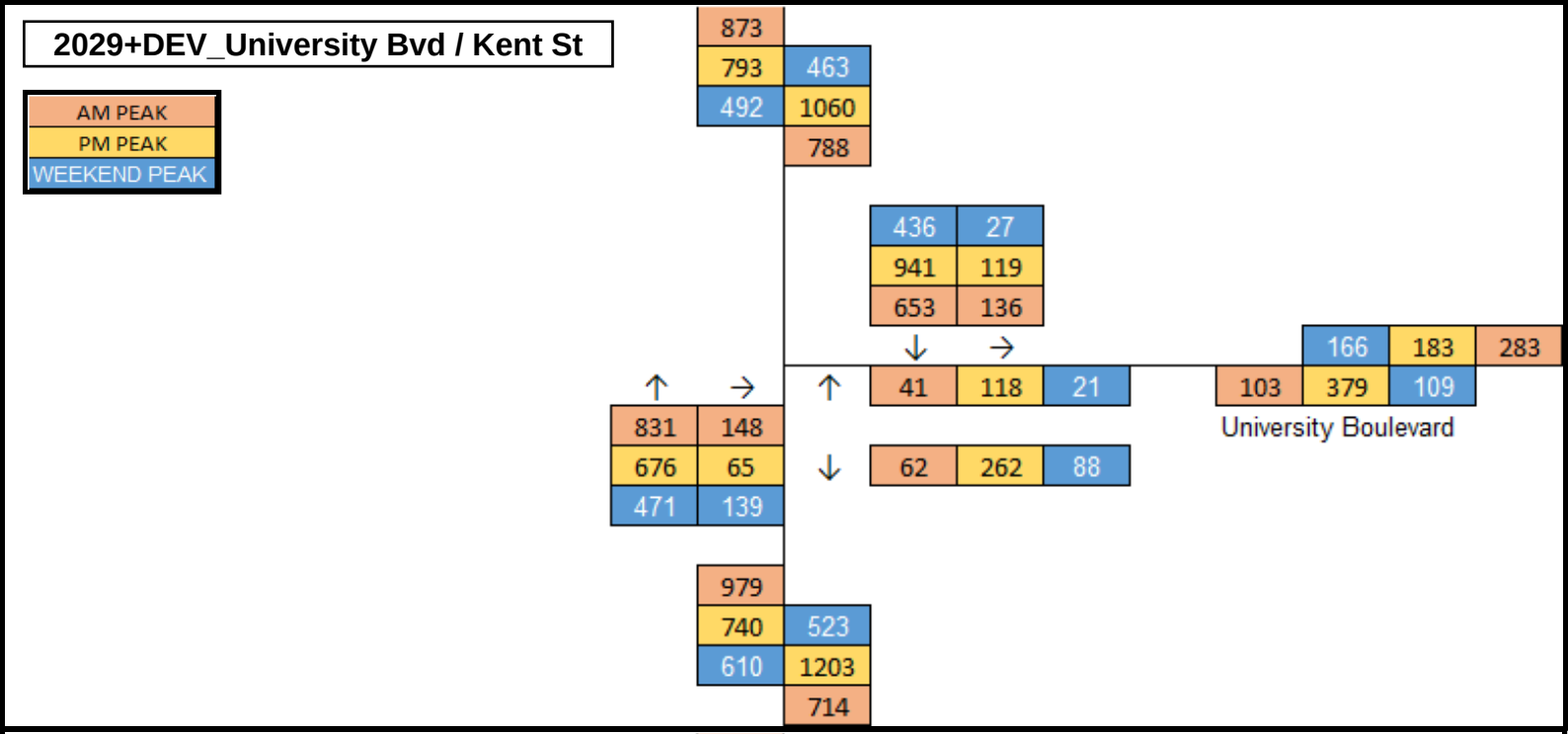
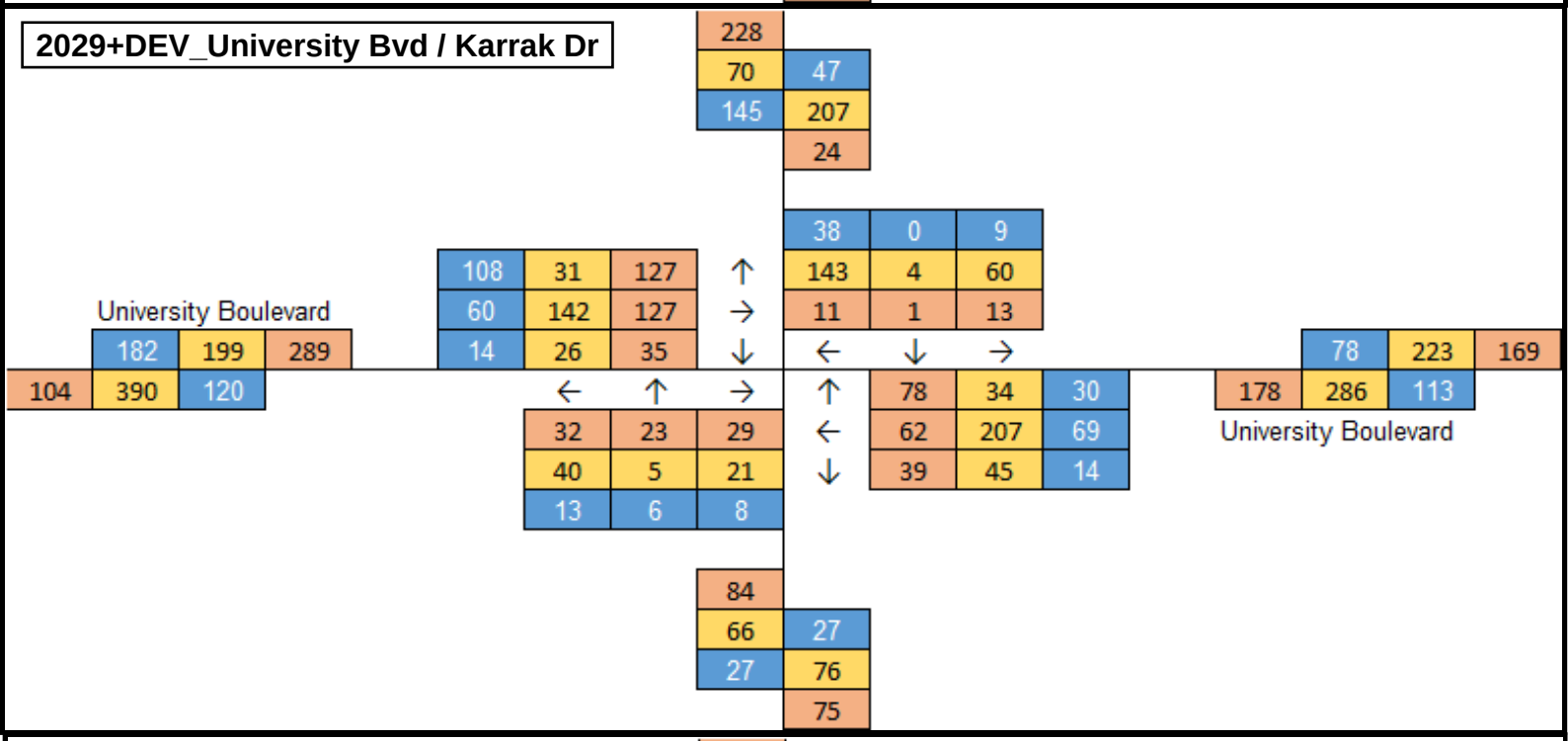
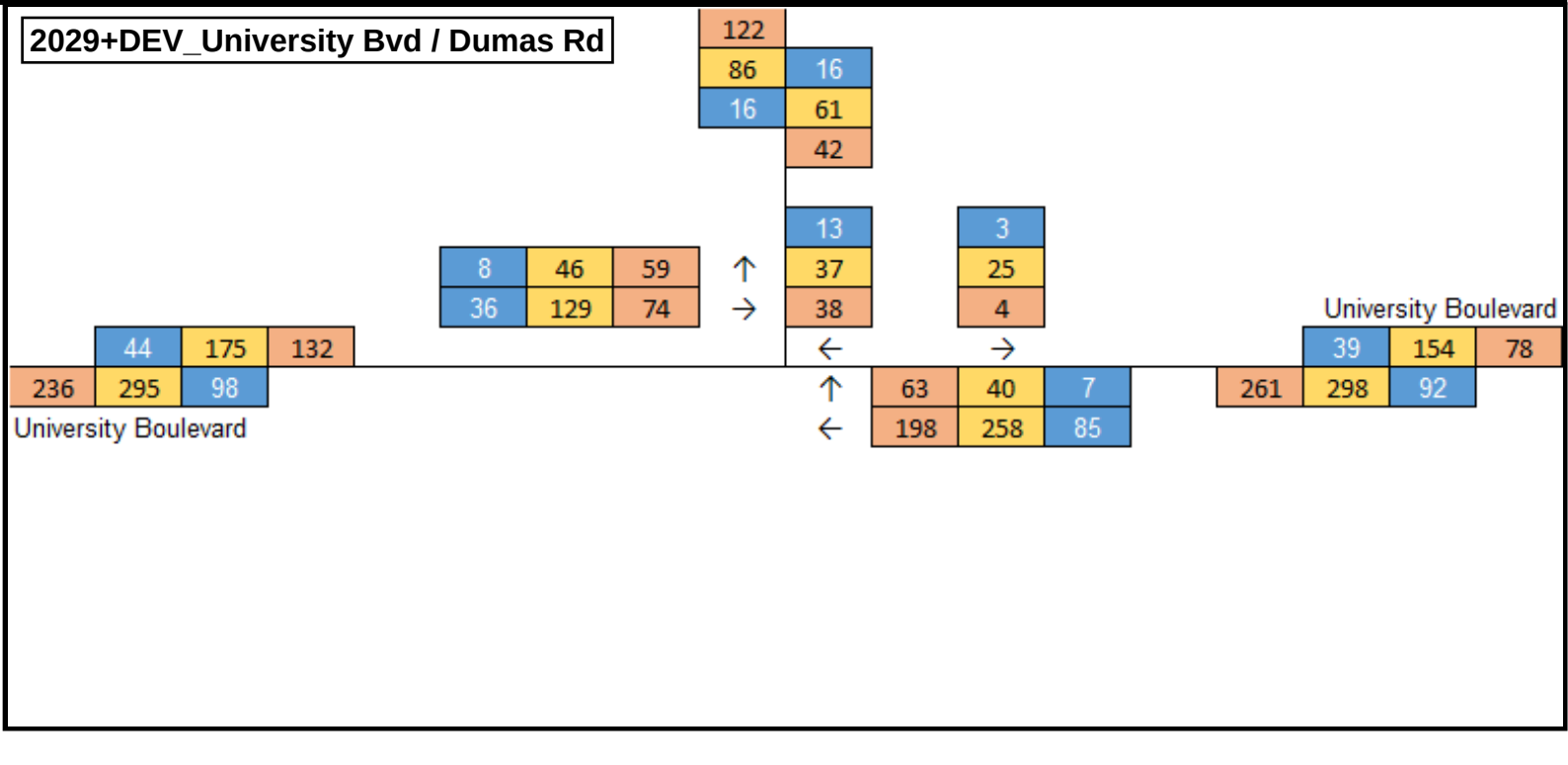
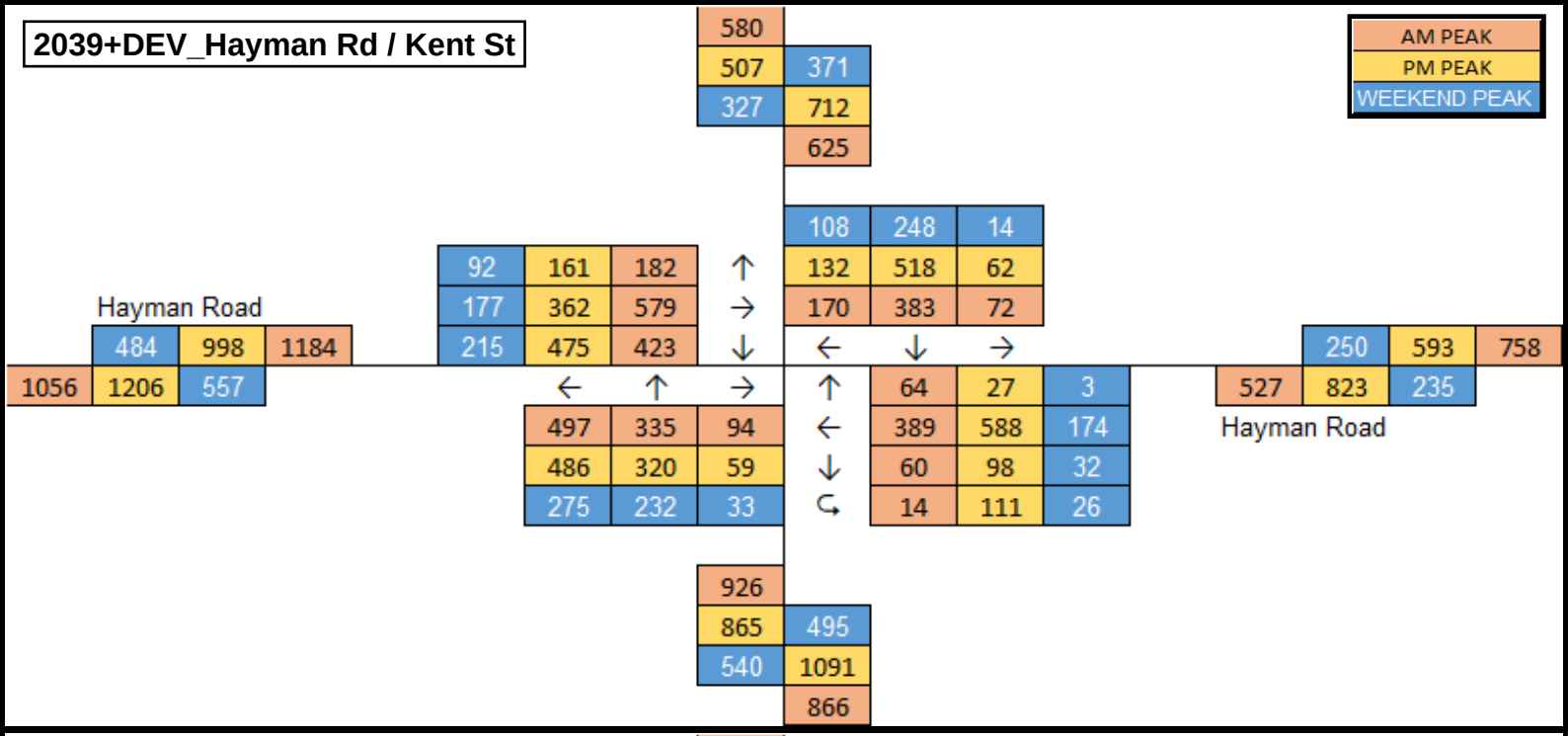
Hayman Road
Hayman Road

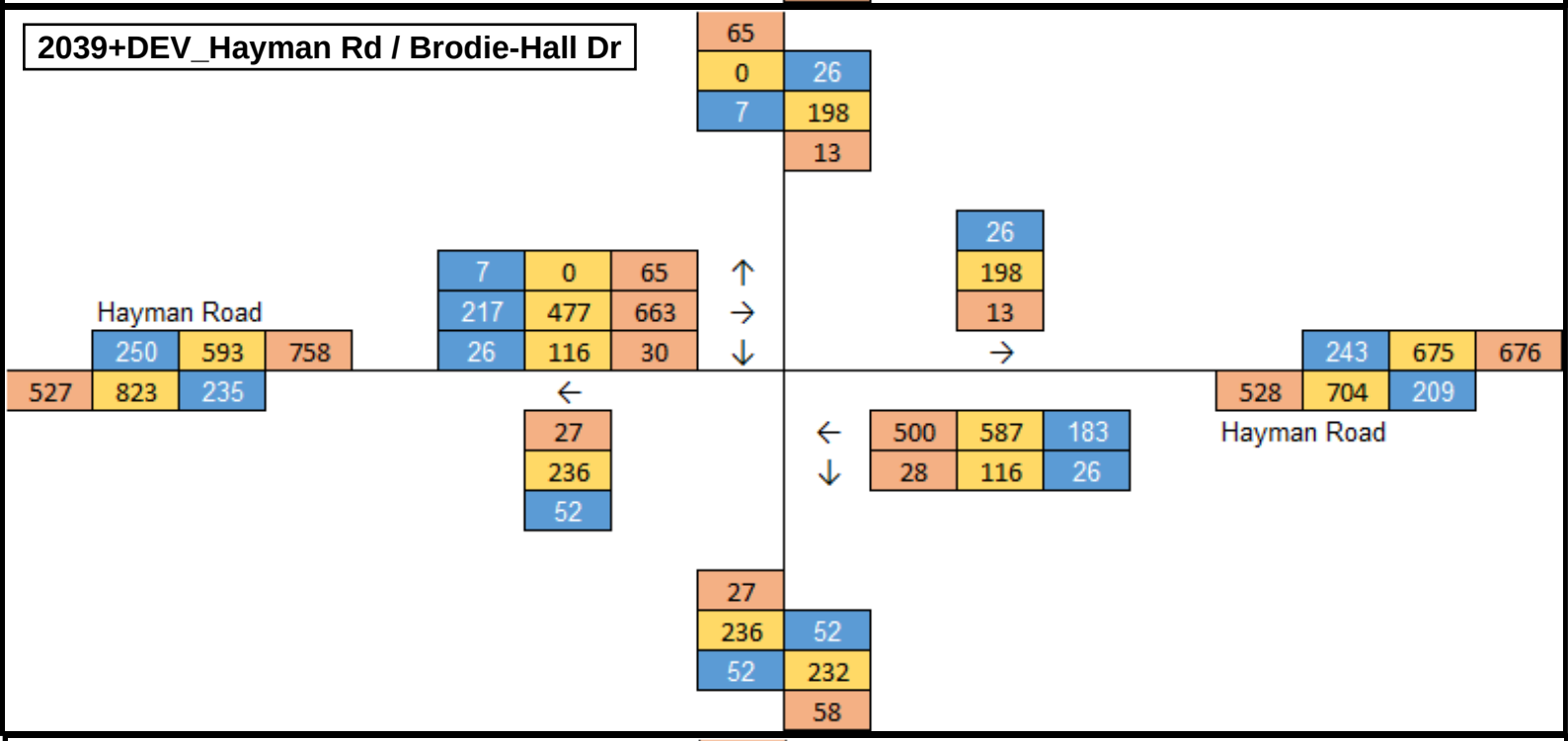

2029+DEV_Hayman Rd / Dumas Rd
Hayman Road
Hayman Road

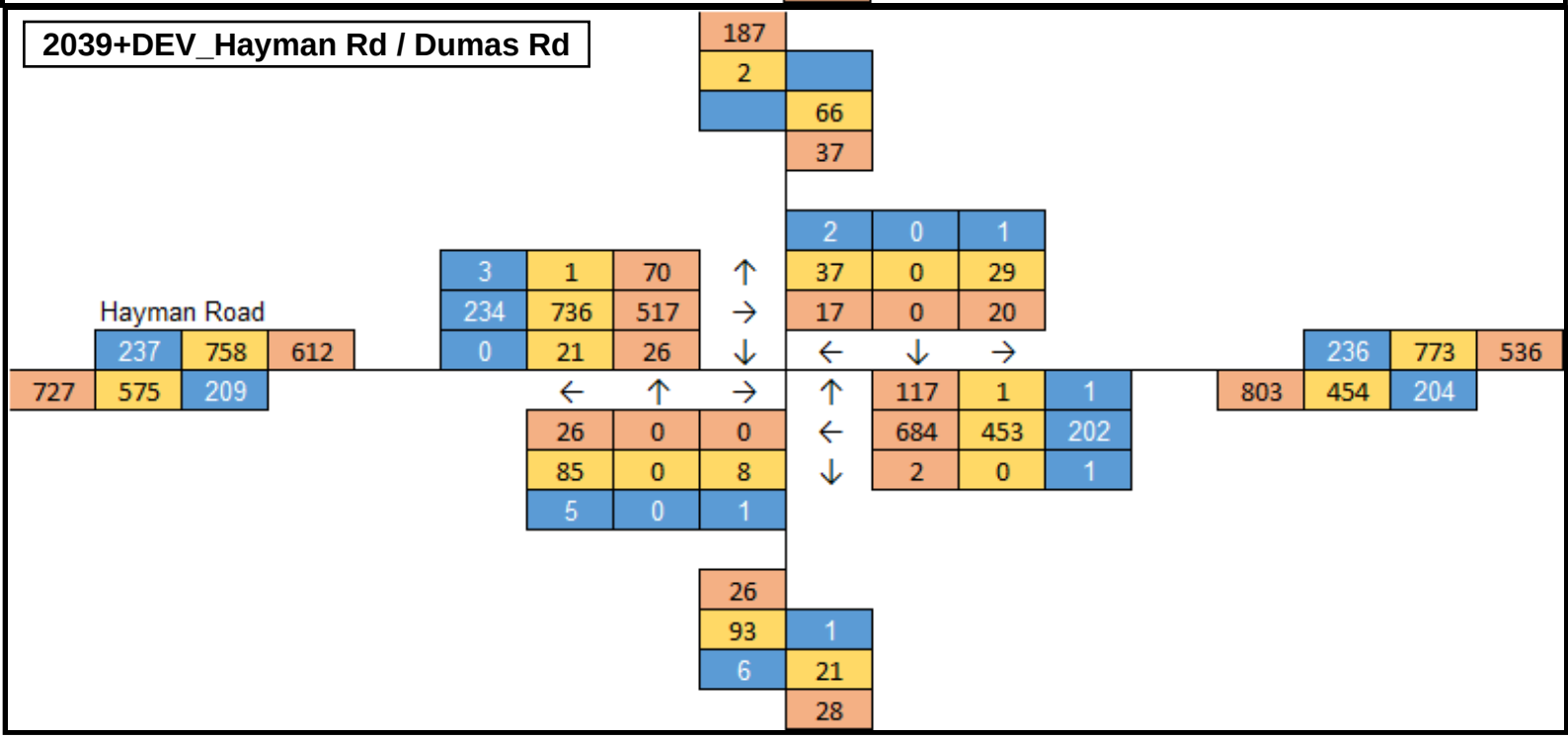

2029+DEV_University Bvd / Kent St
AM PEAK
PM PEAK
WEEKEND PEAK
873
793 463
492 1060
788
436 27
941 119
653 136
166 183 283
41 118 21
103 379 109
University Boulevard
831 148
676 65
471 139
62 262 88
979
740 523
610 1203
714


2029+DEV_University Bvd / Karrak Dr
228
70 47
145 207
24
38 0 9
143 4 60
11 1 13
108 31 127
60 142 127
14 26 35
University Boulevard
182 199 289
104 390 120
78 223 169
78 34 30
62 207 69
39 45 14
178 286 113
University Boulevard
32 23 29
40 5 21
13 6 8
84
66 27
27 76
75


2029+DEV_University Bvd / Dumas Rd
122
86 16
16 61
42
13 3
37 25
38 4
8 46 59
36 129 74
University Boulevard
44 175 132
236 295 98
39 154 78
63 40 7
198 258 85
261 298 92
University Boulevard

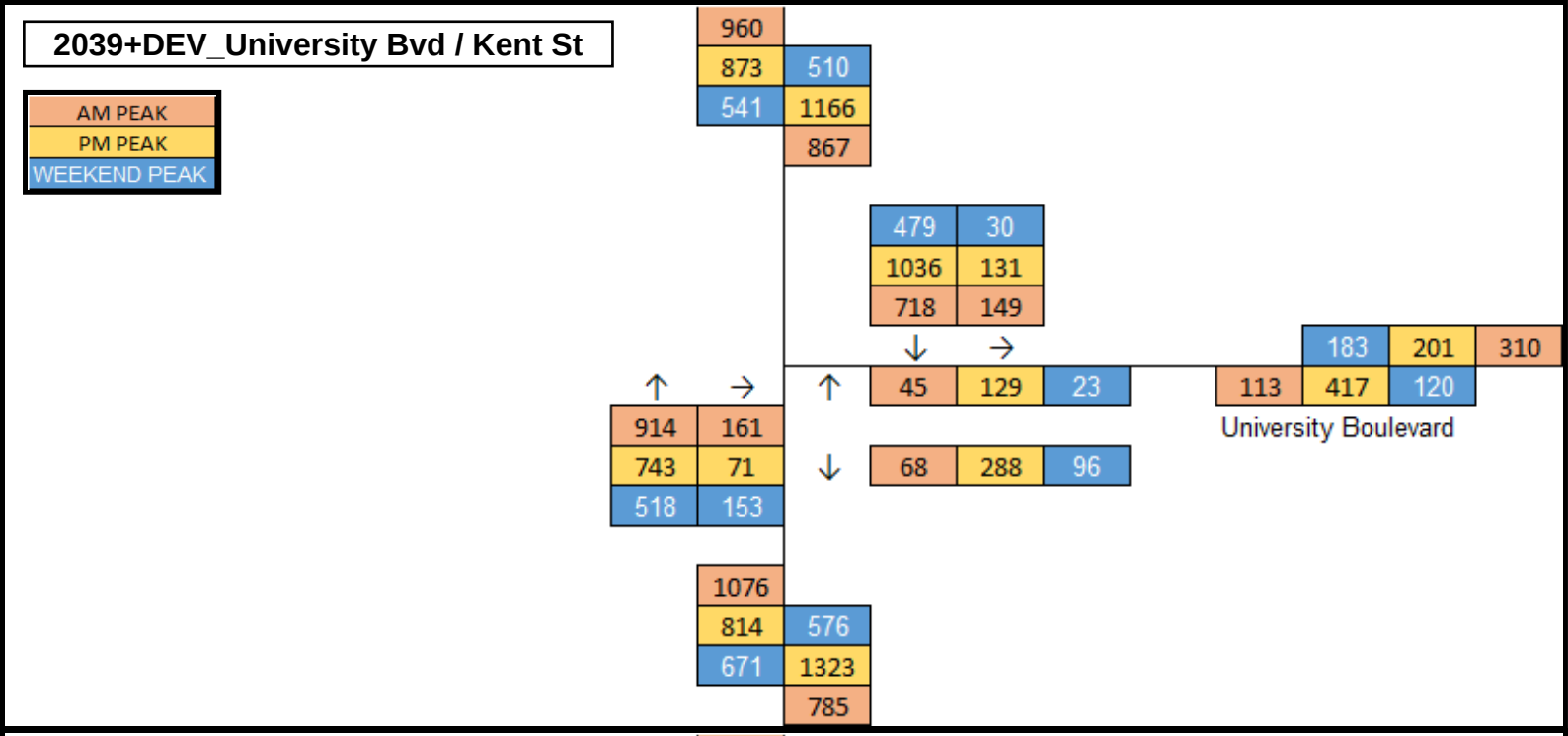

2039+DEV_Hayman Rd / Kent St
AM PEAK
PM PEAK
WEEKEND PEAK
Hayman Road
Hayman Road


2039+DEV_Hayman Rd / Brodie-Hall Dr
Hayman Road
Hayman Road

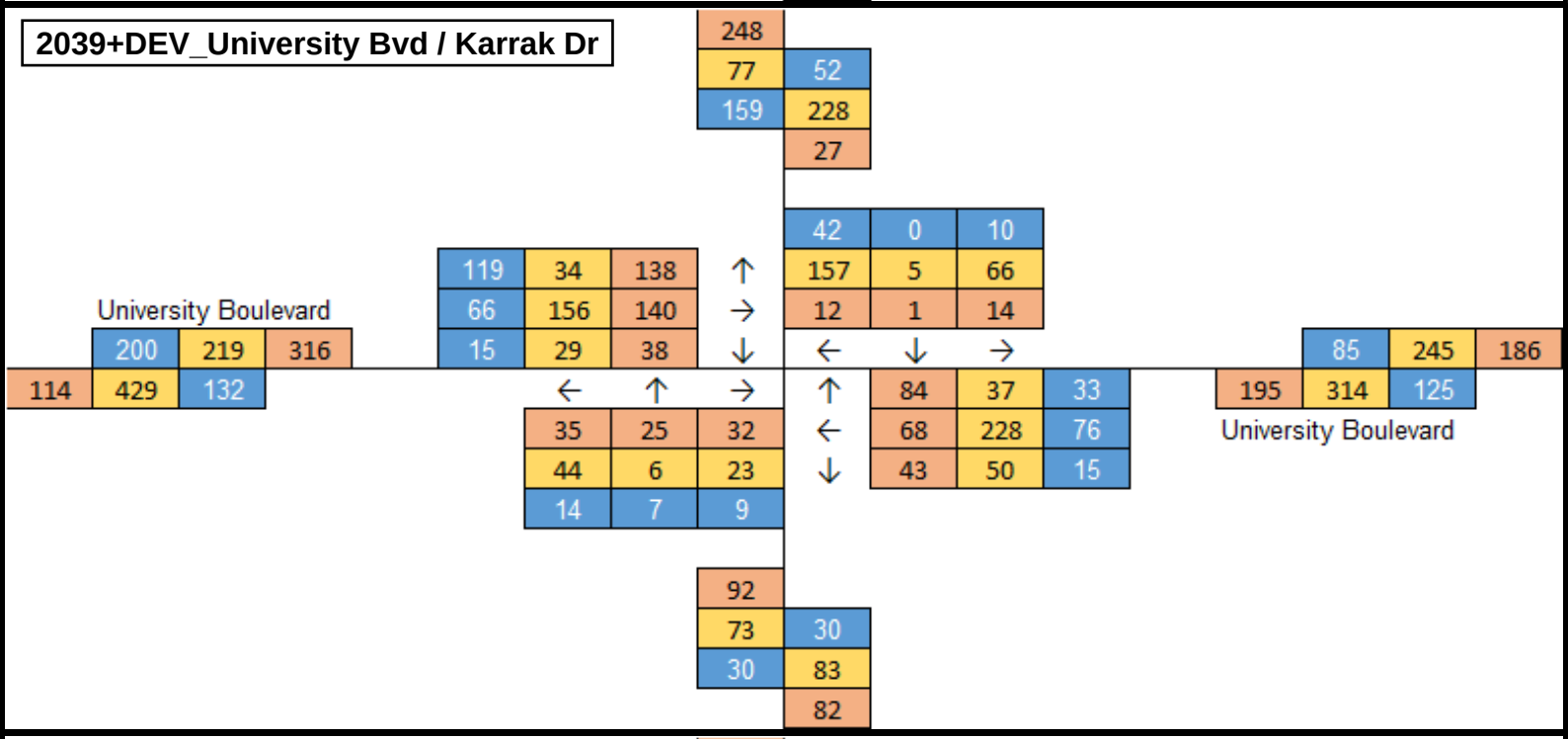

2039+DEV_Hayman Rd / Dumas Rd
Hayman Road

2039+DEV_University Bvd / Kent St

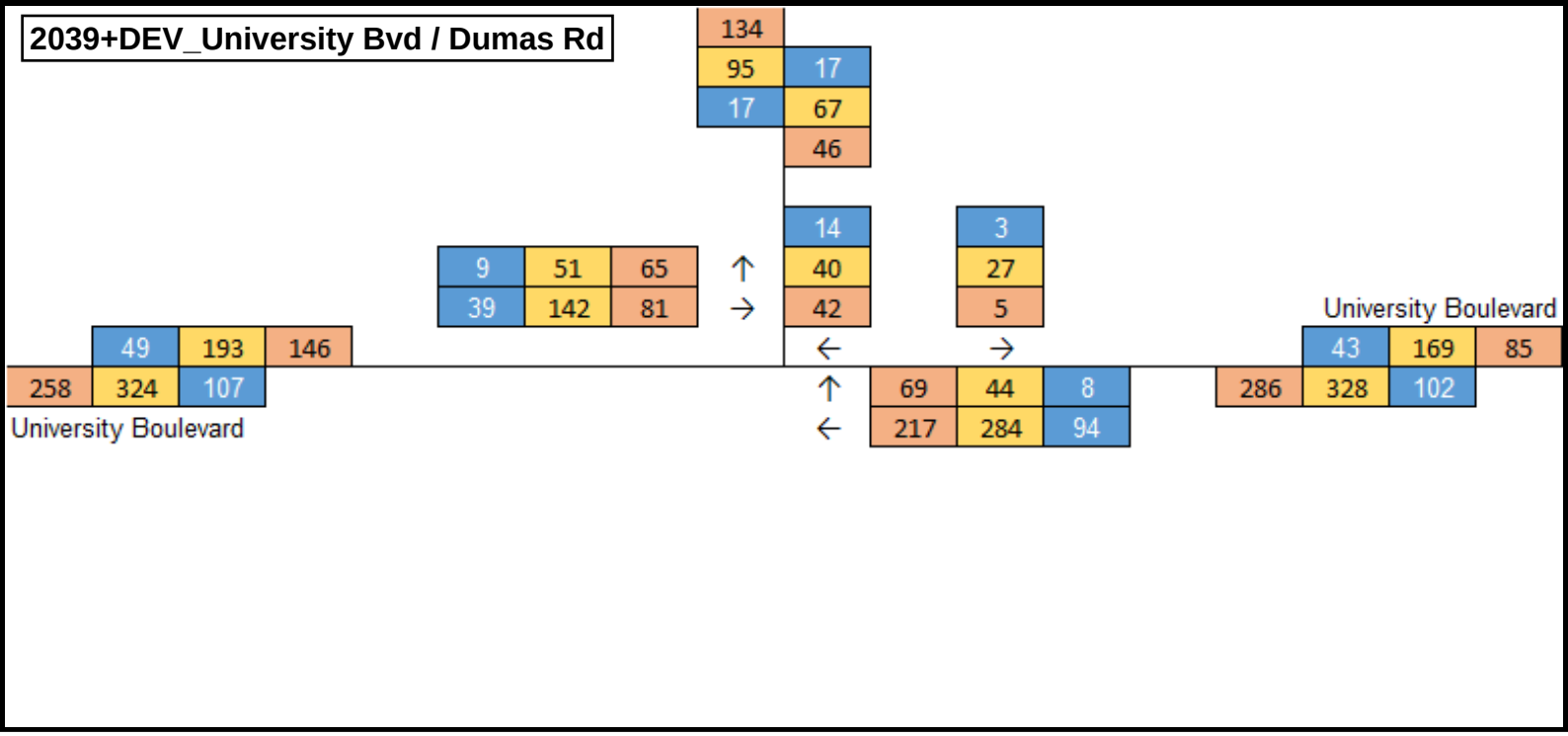
AM PEAK
PM PEAK
WEEKEND PEAK



2039+DEV_University Bvd / Karrak Dr



2039+DEV_University Bvd / Dumas Rd



Appendix F

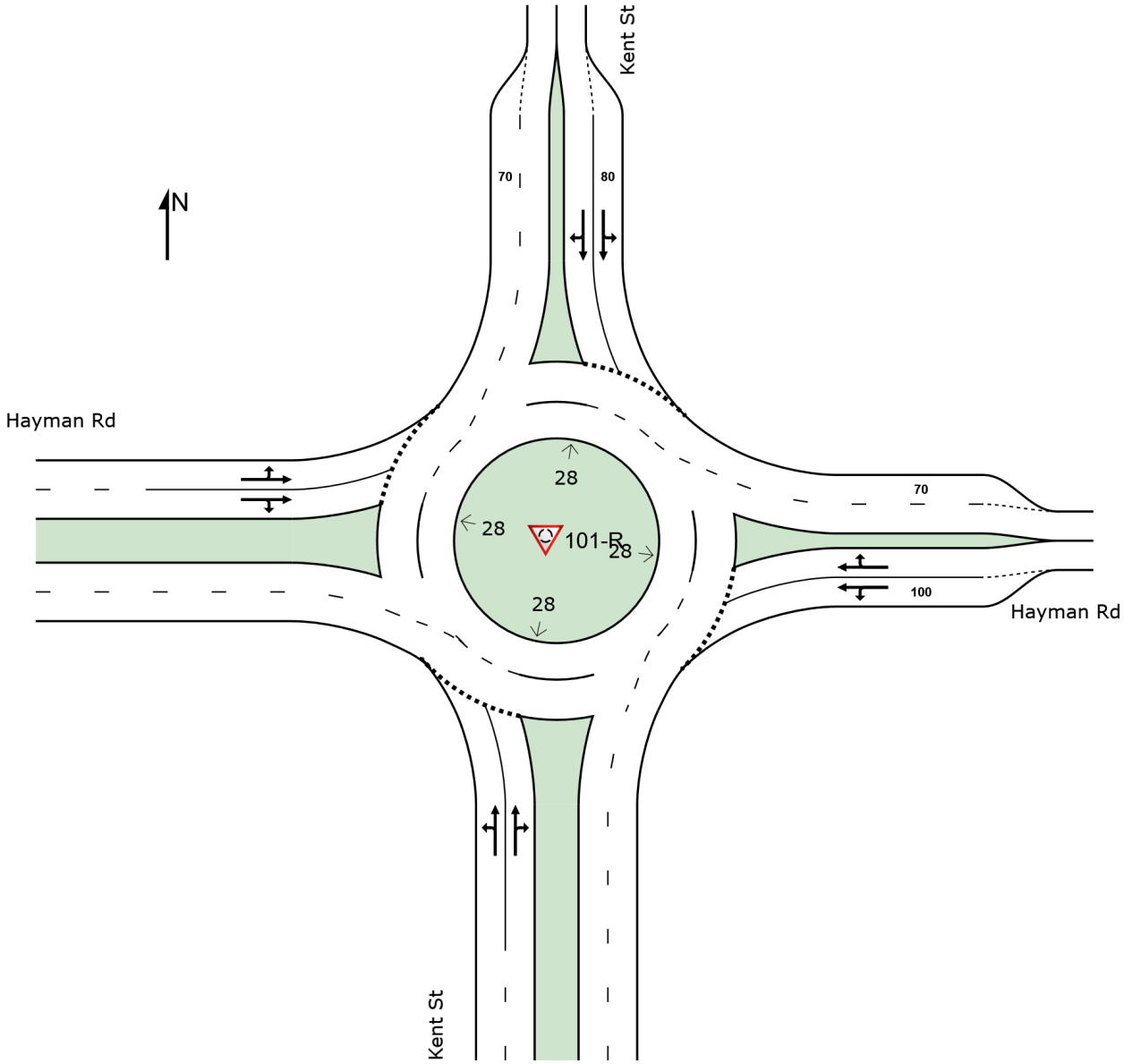
SIDRA Results

SITE LAYOUT

Site: 101-R [Hayman Rd / Kent St (Site Folder: 2024_AM)]

NA
Site Category: (None)
Roundabout

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



MOVEMENT SUMMARY

Site: 101-R [Hayman Rd / Kent St (Site Folder: 2024_AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kent St															
1	L2	All MCs	453	4.3	453	4.3	0.430	6.8	LOS A	2.4	18.3	0.62	0.68	0.63	55.9
2	T1	All MCs	305	4.4	305	4.4	0.429	7.5	LOS A	2.3	17.9	0.63	0.70	0.66	51.6
3	R2	All MCs	84	4.4	84	4.4	0.429	13.1	LOS B	2.3	17.9	0.63	0.70	0.66	48.0
Approach			842	4.3	842	4.3	0.430	7.7	LOS A	2.4	18.3	0.62	0.69	0.64	53.6
East: Hayman Rd															
4	L2	All MCs	58	3.9	58	3.9	0.290	6.5	LOS A	1.5	11.6	0.68	0.65	0.68	49.3
5	T1	All MCs	349	3.9	349	3.9	0.290	6.7	LOS A	1.5	11.6	0.68	0.68	0.68	52.1
6	R2	All MCs	61	3.9	61	3.9	0.290	12.6	LOS B	1.4	10.8	0.69	0.73	0.69	46.9
Approach			468	3.9	468	3.9	0.290	7.4	LOS A	1.5	11.6	0.68	0.68	0.68	51.1
North: Kent St															
7	L2	All MCs	64	2.9	64	2.9	0.411	9.1	LOS A	2.7	20.5	0.82	0.78	0.87	48.6
8	T1	All MCs	348	2.9	348	2.9	0.411	8.3	LOS A	2.7	20.5	0.82	0.80	0.88	51.4
9	R2	All MCs	155	2.9	155	2.9	0.411	14.5	LOS B	2.5	19.1	0.81	0.85	0.89	50.5
Approach			567	2.9	567	2.9	0.411	10.1	LOS B	2.7	20.5	0.82	0.81	0.88	50.9
West: Hayman Rd															
10	L2	All MCs	166	1.8	166	1.8	0.383	8.5	LOS A	2.2	16.7	0.65	0.65	0.65	54.8
11	T1	All MCs	516	1.8	516	1.8	0.698	9.5	LOS A	7.7	57.8	0.77	0.76	0.90	51.1
12	R2	All MCs	386	1.8	386	1.8	0.698	15.3	LOS B	7.7	57.8	0.82	0.80	1.00	52.0
Approach			1068	1.8	1068	1.8	0.698	11.5	LOS B	7.7	57.8	0.77	0.76	0.90	52.1
All Vehicles			2946	3.1	2946	3.1	0.698	9.5	LOS A	7.7	57.8	0.72	0.74	0.79	52.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101-R [Hayman Rd / Kent St (Site Folder: 2024_PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kent St															
1	L2	All MCs	443	2.6	443	2.6	0.439	7.1	LOS A	2.6	19.2	0.66	0.72	0.69	56.4
2	T1	All MCs	292	2.6	292	2.6	0.408	7.7	LOS A	2.2	16.5	0.66	0.71	0.69	52.1
3	R2	All MCs	54	2.6	54	2.6	0.408	13.3	LOS B	2.2	16.5	0.66	0.71	0.69	48.4
Approach			788	2.6	788	2.6	0.439	7.7	LOS A	2.6	19.2	0.66	0.71	0.69	54.2
East: Hayman Rd															
4	L2	All MCs	105	2.9	105	2.9	0.418	7.5	LOS A	2.5	18.8	0.75	0.77	0.82	49.1
5	T1	All MCs	484	2.9	484	2.9	0.418	8.0	LOS A	2.5	18.8	0.75	0.79	0.83	52.0
6	R2	All MCs	49	2.9	49	2.9	0.418	14.0	LOS B	2.3	17.7	0.75	0.82	0.85	47.1
Approach			639	2.9	639	2.9	0.418	8.4	LOS A	2.5	18.8	0.75	0.79	0.83	51.2
North: Kent St															
7	L2	All MCs	57	1.8	57	1.8	0.393	7.3	LOS A	2.4	17.9	0.74	0.68	0.75	49.3
8	T1	All MCs	472	1.8	472	1.8	0.393	7.1	LOS A	2.4	17.9	0.74	0.71	0.76	52.3
9	R2	All MCs	120	1.8	120	1.8	0.393	13.0	LOS B	2.3	17.0	0.74	0.77	0.77	52.1
Approach			648	1.8	648	1.8	0.393	8.2	LOS A	2.4	17.9	0.74	0.72	0.76	52.0
West: Hayman Rd															
10	L2	All MCs	146	1.0	146	1.0	0.310	7.8	LOS A	1.7	12.7	0.58	0.62	0.58	55.3
11	T1	All MCs	328	1.0	328	1.0	0.564	7.6	LOS A	4.6	34.0	0.65	0.67	0.67	52.3
12	R2	All MCs	433	1.0	433	1.0	0.564	13.0	LOS B	4.6	34.0	0.69	0.70	0.73	53.0
Approach			907	1.0	907	1.0	0.564	10.2	LOS B	4.6	34.0	0.66	0.67	0.68	53.2
All Vehicles			2983	2.0	2983	2.0	0.564	8.7	LOS A	4.6	34.0	0.70	0.72	0.73	52.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101-R [Hayman Rd / Kent St (Site Folder: 2024_SAT)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kent St															
1	L2	All MCs	251	2.1	251	2.1	0.196	5.5	LOS A	0.9	6.6	0.36	0.54	0.36	58.0
2	T1	All MCs	212	2.1	212	2.1	0.205	5.9	LOS A	0.9	6.9	0.37	0.53	0.37	54.0
3	R2	All MCs	29	2.1	29	2.1	0.205	11.5	LOS B	0.9	6.9	0.37	0.53	0.37	50.6
Approach			492	2.1	492	2.1	0.205	6.0	LOS A	0.9	6.9	0.36	0.53	0.36	55.8
East: Hayman Rd															
4	L2	All MCs	33	3.0	33	3.0	0.090	5.1	LOS A	0.4	2.8	0.45	0.52	0.45	51.3
5	T1	All MCs	147	3.0	147	3.0	0.090	5.2	LOS A	0.4	2.8	0.46	0.53	0.46	54.2
6	R2	All MCs	9	3.0	9	3.0	0.090	10.8	LOS B	0.4	2.7	0.46	0.54	0.46	49.0
Approach			189	3.0	189	3.0	0.090	5.4	LOS A	0.4	2.8	0.46	0.53	0.46	53.5
North: Kent St															
7	L2	All MCs	13	2.0	13	2.0	0.150	5.1	LOS A	0.7	5.2	0.43	0.48	0.43	50.9
8	T1	All MCs	226	2.0	226	2.0	0.150	4.9	LOS A	0.7	5.2	0.43	0.52	0.43	53.9
9	R2	All MCs	99	2.0	99	2.0	0.150	10.5	LOS B	0.7	5.0	0.44	0.62	0.44	53.0
Approach			338	2.0	338	2.0	0.150	6.5	LOS A	0.7	5.2	0.44	0.55	0.44	53.5
West: Hayman Rd															
10	L2	All MCs	84	1.1	84	1.1	0.133	6.3	LOS A	0.6	4.6	0.39	0.53	0.39	56.2
11	T1	All MCs	162	1.1	162	1.1	0.243	6.0	LOS A	1.3	9.5	0.40	0.59	0.40	53.5
12	R2	All MCs	196	1.1	196	1.1	0.243	11.5	LOS B	1.3	9.5	0.40	0.61	0.40	54.4
Approach			442	1.1	442	1.1	0.243	8.5	LOS A	1.3	9.5	0.40	0.59	0.40	54.5
All Vehicles			1461	1.9	1461	1.9	0.243	6.8	LOS A	1.3	9.5	0.40	0.55	0.40	54.5

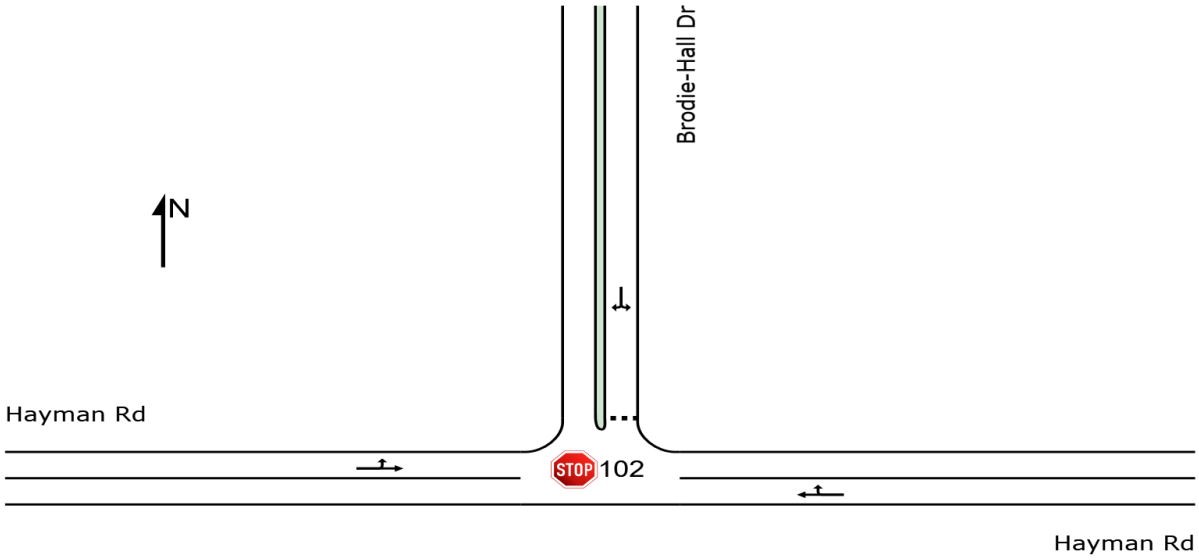
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: 102 [Hayman Rd / Karrak Dr / Brodie-Hall Dr (Site Folder: 2024_AM)]

NA
Site Category: (None)
Stop (Two-Way)

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



MOVEMENT SUMMARY

Site: 102 [Hayman Rd / Karrak Dr / Brodie-Hall Dr (Site Folder: 2024_AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Hayman Rd															
5	T1	All MCs	467	4.4	467	4.4	0.313	0.9	LOS A	0.8	5.8	0.19	0.24	0.19	57.0
6	R2	All MCs	55	4.4	55	4.4	0.313	9.7	LOS A	0.8	5.8	0.19	0.24	0.19	54.7
Approach			522	4.4	522	4.4	0.313	1.8	NA	0.8	5.8	0.19	0.24	0.19	56.6
North: Brodie-Hall Dr															
7	L2	All MCs	1	0.0	1	0.0	0.004	7.0	LOS A	0.0	0.1	0.63	0.68	0.63	45.4
9	R2	All MCs	1	0.0	1	0.0	0.004	14.1	LOS B	0.0	0.1	0.63	0.68	0.63	43.6
Approach			2	0.0	2	0.0	0.004	10.5	LOS B	0.0	0.1	0.63	0.68	0.63	44.6
West: Hayman Rd															
10	L2	All MCs	60	3.9	60	3.9	0.347	5.6	LOS A	0.0	0.0	0.00	0.05	0.00	55.6
11	T1	All MCs	604	3.9	604	3.9	0.347	0.1	LOS A	0.0	0.0	0.00	0.05	0.00	58.9
Approach			664	3.9	664	3.9	0.347	0.6	NA	0.0	0.0	0.00	0.05	0.00	58.5
All Vehicles			1188	4.1	1188	4.1	0.347	1.1	NA	0.8	5.8	0.08	0.13	0.08	57.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 102 [Hayman Rd / Karrak Dr / Brodie-Hall Dr (Site Folder: 2024_PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Hayman Rd															
5	T1	All MCs	580	3.3	580	3.3	0.302	0.0	LOS A	0.0	0.1	0.00	0.00	0.00	60.0
6	R2	All MCs	1	0.0	1	0.0	0.302	5.7	LOS A	0.0	0.1	0.00	0.00	0.00	56.7
Approach			581	3.2	581	3.2	0.302	0.0	NA	0.0	0.1	0.00	0.00	0.00	60.0
North: Brodie-Hall Dr															
7	L2	All MCs	77	2.7	77	2.7	0.226	6.6	LOS A	0.8	5.8	0.61	0.80	0.63	45.5
9	R2	All MCs	59	2.7	59	2.7	0.226	14.1	LOS B	0.8	5.8	0.61	0.80	0.63	43.6
Approach			136	2.7	136	2.7	0.226	9.8	LOS A	0.8	5.8	0.61	0.80	0.63	44.7
West: Hayman Rd															
10	L2	All MCs	1	0.0	1	0.0	0.227	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	56.5
11	T1	All MCs	438	2.9	438	2.9	0.227	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			439	2.9	439	2.9	0.227	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.8
All Vehicles			1156	3.0	1156	3.0	0.302	1.2	NA	0.8	5.8	0.07	0.09	0.07	56.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 102 [Hayman Rd / Karrak Dr / Brodie-Hall Dr (Site Folder: 2024_SAT)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Hayman Rd															
5	T1	All MCs	191	3.0	191	3.0	0.099	0.0	LOS A	0.0	0.1	0.00	0.00	0.00	59.9
6	R2	All MCs	1	0.0	1	0.0	0.099	5.6	LOS A	0.0	0.1	0.00	0.00	0.00	56.7
Approach			192	3.0	192	3.0	0.099	0.0	NA	0.0	0.1	0.00	0.00	0.00	59.9
North: Brodie-Hall Dr															
7	L2	All MCs	1	0.0	1	0.0	0.002	5.1	LOS A	0.0	0.0	0.32	0.52	0.32	48.5
9	R2	All MCs	1	0.0	1	0.0	0.002	6.9	LOS A	0.0	0.0	0.32	0.52	0.32	46.9
Approach			2	0.0	2	0.0	0.002	6.0	LOS A	0.0	0.0	0.32	0.52	0.32	47.8
West: Hayman Rd															
10	L2	All MCs	6	3.0	6	3.0	0.106	5.6	LOS A	0.0	0.0	0.00	0.02	0.00	56.2
11	T1	All MCs	198	3.0	198	3.0	0.106	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.6
Approach			204	3.0	204	3.0	0.106	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.5
All Vehicles			398	3.0	398	3.0	0.106	0.1	NA	0.0	0.1	0.00	0.01	0.00	59.6

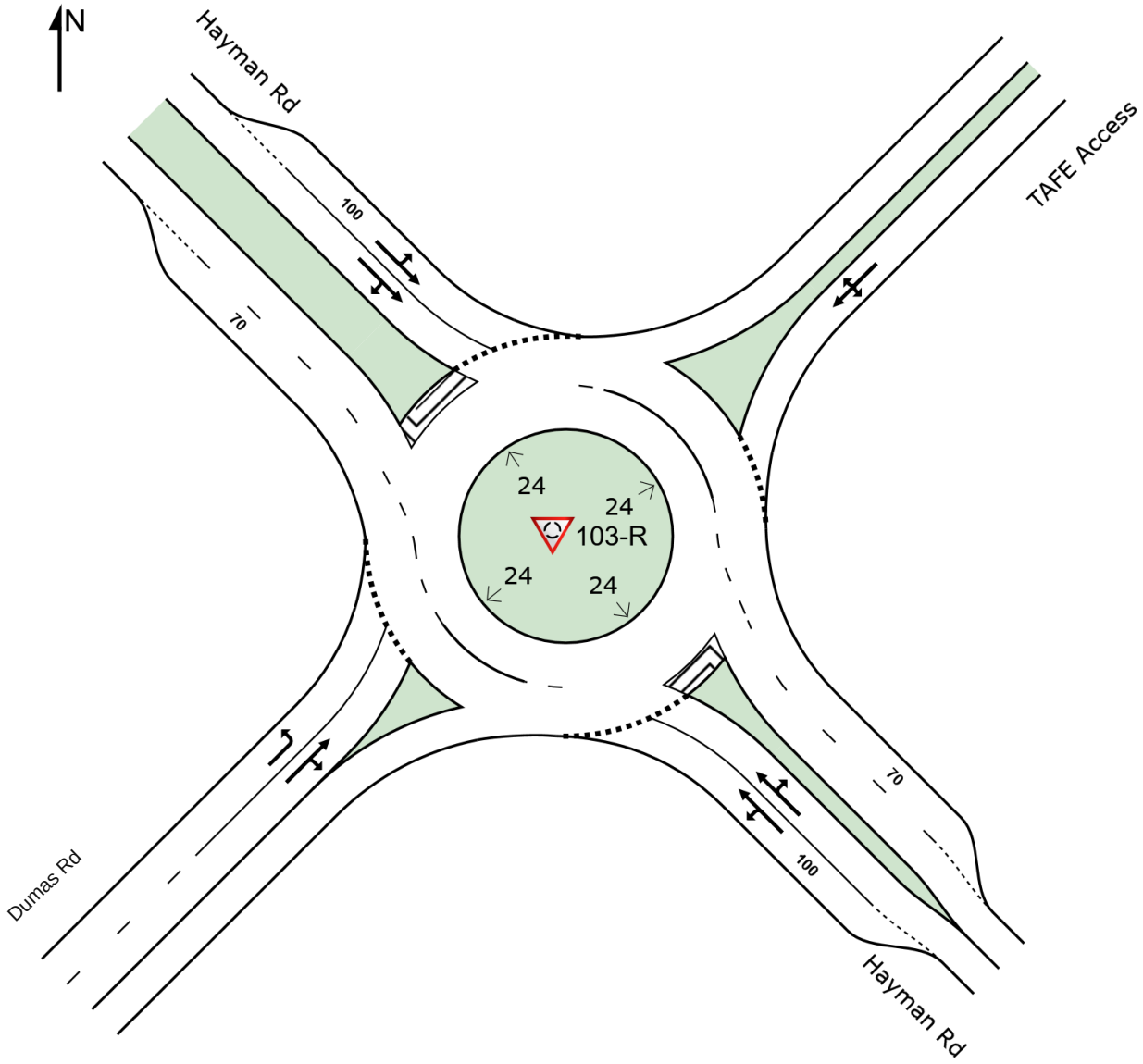
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: 103-R [Hayman Rd / Dumas Rd (Site Folder: 2024_AM)]

NA
Site Category: (None)
Roundabout

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



MOVEMENT SUMMARY

Site: 103-R [Hayman Rd / Dumas Rd (Site Folder: 2024_AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Hayman Rd															
4	L2	All MCs	2	3.0	2	3.0	0.157	4.2	LOS A	0.8	6.4	0.17	0.37	0.17	50.1
5	T1	All MCs	609	3.0	609	3.0	0.307	4.4	LOS A	2.0	14.8	0.17	0.41	0.17	52.7
6	R2	All MCs	106	3.0	106	3.0	0.307	9.1	LOS A	2.0	14.8	0.17	0.43	0.17	49.4
Approach			718	3.0	718	3.0	0.307	5.1	LOS A	2.0	14.8	0.17	0.41	0.17	52.1
NorthEast: TAFE Access															
7	L2	All MCs	18	0.0	18	0.0	0.037	5.0	LOS A	0.1	1.1	0.45	0.60	0.45	48.6
8	T1	All MCs	1	0.0	1	0.0	0.037	4.1	LOS A	0.1	1.1	0.45	0.60	0.45	44.3
9	R2	All MCs	16	0.0	16	0.0	0.037	9.0	LOS A	0.1	1.1	0.45	0.60	0.45	46.4
Approach			35	0.0	35	0.0	0.037	6.8	LOS A	0.1	1.1	0.45	0.60	0.45	47.5
NorthWest: Hayman Rd															
10	L2	All MCs	64	4.4	64	4.4	0.132	4.6	LOS A	0.7	5.3	0.29	0.44	0.29	48.2
11	T1	All MCs	458	4.4	458	4.4	0.258	4.5	LOS A	1.5	11.8	0.28	0.42	0.28	51.8
12	R2	All MCs	23	4.4	23	4.4	0.258	9.4	LOS A	1.5	11.8	0.28	0.41	0.28	46.0
Approach			545	4.4	545	4.4	0.258	4.7	LOS A	1.5	11.8	0.28	0.42	0.28	51.2
SouthWest: Duams Rd															
1	L2	All MCs	23	31.3	23	31.3	0.028	6.5	LOS A	0.1	1.0	0.51	0.58	0.51	40.1
2	T1	All MCs	1	31.3	1	31.3	0.004	7.2	LOS A	0.0	0.1	0.55	0.59	0.55	42.1
3	R2	All MCs	1	31.3	1	31.3	0.004	12.2	LOS B	0.0	0.1	0.55	0.59	0.55	38.0
Approach			25	31.3	25	31.3	0.028	6.8	LOS A	0.1	1.0	0.51	0.58	0.51	40.0
All Vehicles			1323	4.0	1323	4.0	0.307	5.0	LOS A	2.0	14.8	0.23	0.42	0.23	51.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 103-R [Hayman Rd / Dumas Rd (Site Folder: 2024_PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Hayman Rd															
4	L2	All MCs	1	2.7	1	2.7	0.093	4.2	LOS A	0.5	3.7	0.19	0.38	0.19	50.0
5	T1	All MCs	411	2.7	411	2.7	0.182	4.3	LOS A	1.1	8.0	0.19	0.37	0.19	53.2
6	R2	All MCs	1	2.7	1	2.7	0.182	9.1	LOS A	1.1	8.0	0.18	0.37	0.18	49.9
Approach			413	2.7	413	2.7	0.182	4.3	LOS A	1.1	8.0	0.19	0.37	0.19	53.2
NorthEast: TAFE Access															
7	L2	All MCs	26	0.0	26	0.0	0.067	5.5	LOS A	0.3	1.9	0.47	0.65	0.47	48.2
8	T1	All MCs	1	0.0	1	0.0	0.067	4.5	LOS A	0.3	1.9	0.47	0.65	0.47	43.9
9	R2	All MCs	34	0.0	34	0.0	0.067	9.4	LOS A	0.3	1.9	0.47	0.65	0.47	45.9
Approach			61	0.0	61	0.0	0.067	7.6	LOS A	0.3	1.9	0.47	0.65	0.47	47.0
NorthWest: Hayman Rd															
10	L2	All MCs	1	3.3	1	3.3	0.121	4.0	LOS A	0.7	5.1	0.06	0.37	0.06	49.2
11	T1	All MCs	569	3.3	569	3.3	0.236	4.1	LOS A	1.5	11.5	0.06	0.38	0.06	53.3
12	R2	All MCs	19	3.3	19	3.3	0.236	9.0	LOS A	1.5	11.5	0.06	0.38	0.06	47.7
Approach			589	3.3	589	3.3	0.236	4.3	LOS A	1.5	11.5	0.06	0.38	0.06	53.2
SouthWest: Duams Rd															
1	L2	All MCs	78	11.7	78	11.7	0.072	5.0	LOS A	0.3	2.3	0.41	0.52	0.41	44.5
2	T1	All MCs	1	11.7	1	11.7	0.010	5.1	LOS A	0.0	0.3	0.46	0.61	0.46	42.6
3	R2	All MCs	5	11.7	5	11.7	0.010	10.0	LOS B	0.0	0.3	0.46	0.61	0.46	42.6
Approach			84	11.7	84	11.7	0.072	5.3	LOS A	0.3	2.3	0.42	0.53	0.42	44.3
All Vehicles			1147	3.5	1147	3.5	0.236	4.5	LOS A	1.5	11.5	0.15	0.40	0.15	52.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 103-R [Hayman Rd / Dumas Rd (Site Folder: 2024_SAT)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Hayman Rd															
4	L2	All MCs	1	2.8	1	2.8	0.038	4.0	LOS A	0.2	1.4	0.04	0.37	0.04	50.8
5	T1	All MCs	184	2.8	184	2.8	0.075	3.9	LOS A	0.4	2.9	0.04	0.37	0.04	54.0
6	R2	All MCs	1	2.8	1	2.8	0.075	8.9	LOS A	0.4	2.9	0.04	0.37	0.04	50.5
Approach			186	2.8	186	2.8	0.075	4.0	LOS A	0.4	2.9	0.04	0.37	0.04	54.0
NorthEast: TAFE Access															
7	L2	All MCs	1	0.0	1	0.0	0.004	3.4	LOS A	0.0	0.1	0.27	0.48	0.27	49.0
8	T1	All MCs	1	0.0	1	0.0	0.004	3.1	LOS A	0.0	0.1	0.27	0.48	0.27	44.7
9	R2	All MCs	2	0.0	2	0.0	0.004	8.0	LOS A	0.0	0.1	0.27	0.48	0.27	46.7
Approach			4	0.0	4	0.0	0.004	5.6	LOS A	0.0	0.1	0.27	0.48	0.27	46.9
NorthWest: Hayman Rd															
10	L2	All MCs	3	3.0	3	3.0	0.040	4.0	LOS A	0.2	1.5	0.03	0.38	0.03	49.4
11	T1	All MCs	189	3.0	189	3.0	0.078	3.9	LOS A	0.4	3.0	0.03	0.38	0.03	53.7
12	R2	All MCs	1	3.0	1	3.0	0.078	8.9	LOS A	0.4	3.0	0.03	0.38	0.03	48.1
Approach			194	3.0	194	3.0	0.078	4.0	LOS A	0.4	3.0	0.03	0.38	0.03	53.6
SouthWest: Duams Rd															
1	L2	All MCs	4	16.7	4	16.7	0.004	3.8	LOS A	0.0	0.1	0.26	0.39	0.26	44.0
2	T1	All MCs	1	16.7	1	16.7	0.002	3.3	LOS A	0.0	0.1	0.28	0.45	0.28	44.4
3	R2	All MCs	1	16.7	1	16.7	0.002	8.3	LOS A	0.0	0.1	0.28	0.45	0.28	43.2
Approach			6	16.7	6	16.7	0.004	4.5	LOS A	0.0	0.1	0.27	0.41	0.27	43.9
All Vehicles			391	3.1	391	3.1	0.078	4.0	LOS A	0.4	3.0	0.04	0.38	0.04	53.5

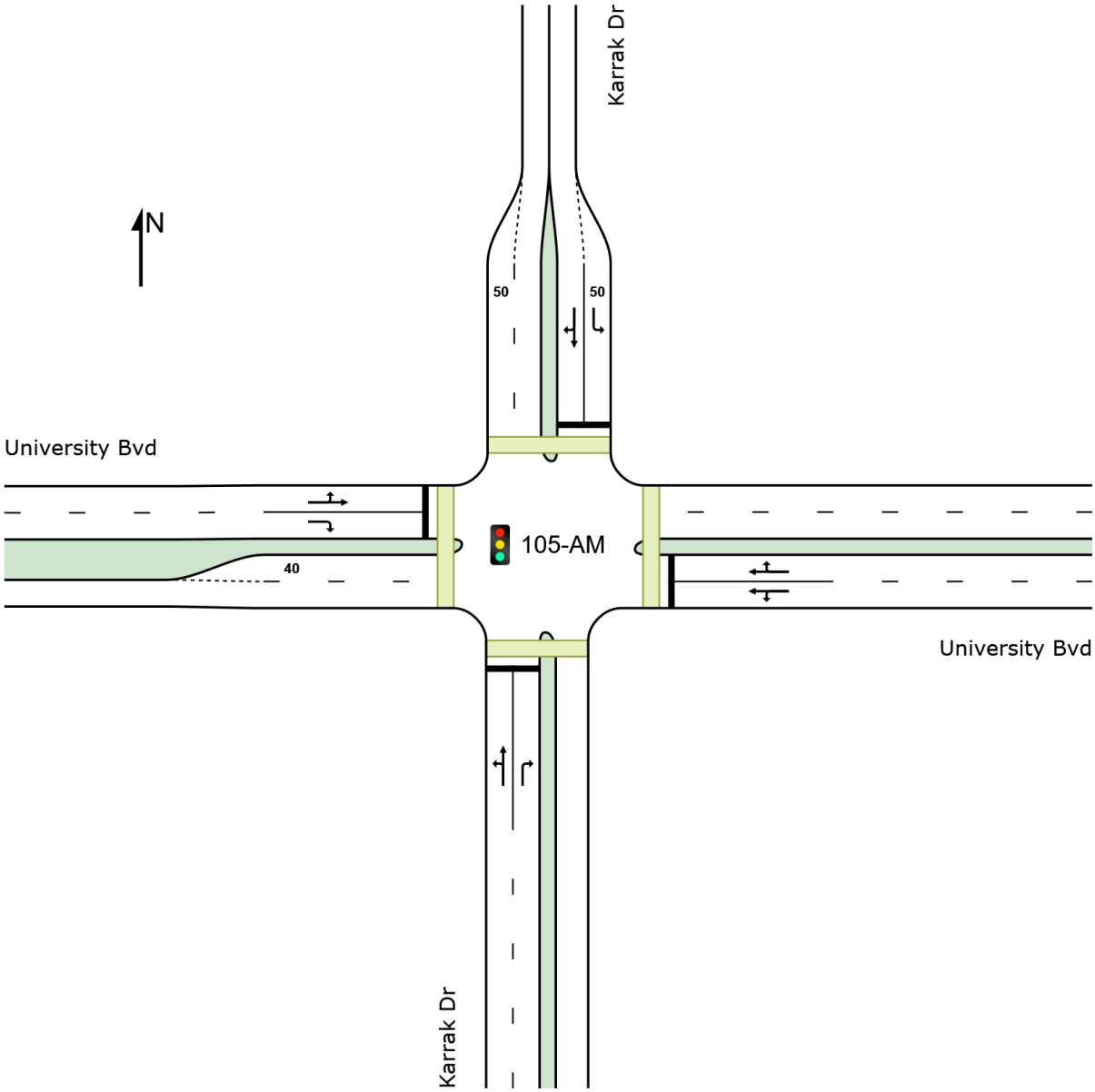
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: 105-AM [University Bvd / Karrak Dr (Site Folder: 2024_AM)]

Four-way intersection with 2-lane approaches (Signals)
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



MOVEMENT SUMMARY

Site: 105-AM [University Bvd / Karrak Dr (Site Folder: 2024_AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Four-way intersection with 2-lane approaches (Signals)
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 79 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Karrak Dr															
1	L2	All MCs	32	5.3	32	5.3	0.215	38.4	LOS D	1.9	14.3	0.92	0.72	0.92	27.7
2	T1	All MCs	23	5.3	23	5.3	* 0.215	33.9	LOS C	1.9	14.3	0.92	0.72	0.92	33.4
3	R2	All MCs	29	100.0	29	100.0	0.195	40.1	LOS D	1.1	14.0	0.92	0.72	0.92	28.5
Approach			84	38.5	84	38.5	0.215	37.8	LOS D	1.9	14.3	0.92	0.72	0.92	29.7
East: University Bvd															
4	L2	All MCs	39	21.0	39	21.0	0.110	8.3	LOS A	1.8	15.1	0.50	0.51	0.50	41.0
5	T1	All MCs	62	21.0	62	21.0	0.110	12.1	LOS B	1.8	15.1	0.50	0.51	0.50	38.0
6	R2	All MCs	64	21.0	64	21.0	0.133	18.3	LOS B	1.5	12.0	0.61	0.68	0.61	37.2
Approach			165	21.0	165	21.0	0.133	13.6	LOS B	1.8	15.1	0.54	0.57	0.54	38.4
North: Karrak Dr															
7	L2	All MCs	13	5.3	13	5.3	* 0.043	35.0	LOS D	0.4	3.1	0.87	0.67	0.87	30.7
8	T1	All MCs	1	5.3	1	5.3	0.039	30.4	LOS C	0.4	2.8	0.87	0.66	0.87	34.0
9	R2	All MCs	11	5.3	11	5.3	0.039	35.1	LOS D	0.4	2.8	0.87	0.66	0.87	28.4
Approach			24	5.3	24	5.3	0.043	34.9	LOS C	0.4	3.1	0.87	0.67	0.87	29.9
West: University Bvd															
10	L2	All MCs	113	20.7	113	20.7	0.270	15.8	LOS B	5.1	41.6	0.58	0.60	0.58	37.9
11	T1	All MCs	127	20.7	127	20.7	* 0.270	10.9	LOS B	5.1	41.6	0.58	0.60	0.58	36.1
12	R2	All MCs	35	20.7	35	20.7	0.057	15.4	LOS B	0.7	5.6	0.53	0.64	0.53	36.8
Approach			275	20.7	275	20.7	0.270	13.4	LOS B	5.1	41.6	0.58	0.60	0.58	37.0
All Vehicles			548	22.8	548	22.8	0.270	18.2	LOS B	5.1	41.6	0.63	0.62	0.63	35.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Karrak Dr												
P1	Full	50	53	14.0	LOS B	0.1	0.1	0.60	0.60	167.9	200.0	1.19
East: University Bvd												

P2	Full	50	53	33.8	LOS D	0.1	0.1	0.93	0.93	187.6	200.0	1.07
North: Karrak Dr												
P3	Full	50	53	15.2	LOS B	0.1	0.1	0.62	0.62	169.1	200.0	1.18
West: University Bvd												
P4	Full	50	53	33.8	LOS D	0.1	0.1	0.93	0.93	187.6	200.0	1.07
All Pedestrians		200	211	24.2	LOS C	0.1	0.1	0.77	0.77	178.1	200.0	1.12

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: 105-PM [University Bvd / Karrak Dr (Site Folder: 2024_PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Four-way intersection with 2-lane approaches (Signals)
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 54 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Karrak Dr															
1	L2	All MCs	40	2.7	40	2.7	0.121	24.2	LOS C	1.0	7.2	0.85	0.70	0.85	32.5
2	T1	All MCs	5	2.7	5	2.7	*0.121	19.7	LOS B	1.0	7.2	0.85	0.70	0.85	37.8
3	R2	All MCs	21	100.0	21	100.0	0.095	25.5	LOS C	0.5	6.2	0.84	0.69	0.84	33.3
Approach			66	33.6	66	33.6	0.121	24.2	LOS C	1.0	7.2	0.85	0.70	0.85	33.3
East: University Bvd															
4	L2	All MCs	45	9.9	45	9.9	0.363	8.9	LOS A	4.7	35.5	0.77	0.67	0.77	39.0
5	T1	All MCs	207	9.9	207	9.9	*0.363	15.7	LOS B	4.7	35.5	0.77	0.67	0.77	34.8
6	R2	All MCs	32	9.9	32	9.9	0.107	20.0	LOS B	0.9	6.8	0.74	0.66	0.74	37.5
Approach			284	9.9	284	9.9	0.363	15.1	LOS B	4.7	35.5	0.77	0.67	0.77	36.1
North: Karrak Dr															
7	L2	All MCs	60	2.7	60	2.7	0.162	24.4	LOS C	1.4	9.7	0.86	0.73	0.86	34.5
8	T1	All MCs	4	2.7	4	2.7	*0.396	21.1	LOS C	3.5	25.3	0.91	0.77	0.91	37.1
9	R2	All MCs	143	2.7	143	2.7	0.396	26.1	LOS C	3.5	25.3	0.91	0.77	0.91	31.9
Approach			207	2.7	207	2.7	0.396	25.5	LOS C	3.5	25.3	0.89	0.76	0.89	32.8
West: University Bvd															
10	L2	All MCs	29	10.9	29	10.9	0.270	18.5	LOS B	3.3	25.4	0.76	0.64	0.76	37.1
11	T1	All MCs	142	10.9	142	10.9	0.270	13.8	LOS B	3.3	25.4	0.76	0.64	0.76	34.9
12	R2	All MCs	26	10.9	26	10.9	0.078	21.6	LOS C	0.5	4.2	0.78	0.69	0.78	33.7
Approach			198	10.9	198	10.9	0.270	15.6	LOS B	3.3	25.4	0.76	0.65	0.76	35.1
All Vehicles			756	10.3	756	10.3	0.396	18.9	LOS B	4.7	35.5	0.81	0.69	0.81	34.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Karrak Dr												
P1	Full	50	53	18.8	LOS B	0.1	0.1	0.84	0.84	172.6	200.0	1.16
East: University Bvd												

P2	Full	50	53	21.4	LOS C	0.1	0.1	0.89	0.89	175.2	200.0	1.14
North: Karrak Dr												
P3	Full	50	53	20.5	LOS C	0.1	0.1	0.87	0.87	174.3	200.0	1.15
West: University Bvd												
P4	Full	50	53	21.4	LOS C	0.1	0.1	0.89	0.89	175.2	200.0	1.14
All Pedestrians		200	211	20.5	LOS C	0.1	0.1	0.87	0.87	174.4	200.0	1.15

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: 105-SAT [University Bvd / Karrak Dr (Site Folder: 2024_SAT)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Four-way intersection with 2-lane approaches (Signals)
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Karrak Dr															
1	L2	All MCs	13	1.3	13	1.3	0.074	37.8	LOS D	0.7	4.7	0.90	0.67	0.90	27.8
2	T1	All MCs	6	1.3	6	1.3	*0.074	33.3	LOS C	0.7	4.7	0.90	0.67	0.90	33.4
3	R2	All MCs	8	100.0	8	100.0	0.056	39.5	LOS D	0.3	3.9	0.90	0.67	0.90	28.7
Approach			27	31.7	27	31.7	0.074	37.3	LOS D	0.7	4.7	0.90	0.67	0.90	29.6
East: University Bvd															
4	L2	All MCs	14	11.4	14	11.4	0.078	6.6	LOS A	1.3	10.3	0.44	0.40	0.44	42.7
5	T1	All MCs	69	11.4	69	11.4	0.078	8.1	LOS A	1.3	10.3	0.44	0.40	0.44	40.5
6	R2	All MCs	31	11.4	31	11.4	0.047	13.6	LOS B	0.5	4.2	0.48	0.63	0.48	39.6
Approach			114	11.4	114	11.4	0.078	9.4	LOS A	1.3	10.3	0.45	0.46	0.45	40.5
North: Karrak Dr															
7	L2	All MCs	9	1.3	9	1.3	0.041	38.6	LOS D	0.3	2.4	0.90	0.66	0.90	29.6
8	T1	All MCs	1	1.3	1	1.3	*0.169	35.0	LOS D	1.4	10.0	0.93	0.72	0.93	32.5
9	R2	All MCs	38	1.3	38	1.3	0.169	39.7	LOS D	1.4	10.0	0.93	0.72	0.93	26.9
Approach			48	1.3	48	1.3	0.169	39.4	LOS D	1.4	10.0	0.92	0.71	0.92	27.6
West: University Bvd															
10	L2	All MCs	108	9.7	108	9.7	0.162	12.7	LOS B	3.0	22.5	0.48	0.58	0.48	39.3
11	T1	All MCs	60	9.7	60	9.7	*0.162	8.0	LOS A	3.0	22.5	0.48	0.58	0.48	37.7
12	R2	All MCs	14	9.7	14	9.7	0.019	12.4	LOS B	0.2	1.7	0.45	0.60	0.45	38.6
Approach			182	9.7	182	9.7	0.162	11.1	LOS B	3.0	22.5	0.48	0.58	0.48	38.8
All Vehicles			372	10.8	372	10.8	0.169	16.2	LOS B	3.0	22.5	0.56	0.57	0.56	36.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Karrak Dr												
P1	Full	50	53	11.6	LOS B	0.1	0.1	0.54	0.54	165.4	200.0	1.21
East: University Bvd												

P2	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
North: Karrak Dr												
P3	Full	50	53	12.7	LOS B	0.1	0.1	0.56	0.56	166.5	200.0	1.20
West: University Bvd												
P4	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
All Pedestrians		200	211	23.2	LOS C	0.1	0.1	0.74	0.74	177.1	200.0	1.13

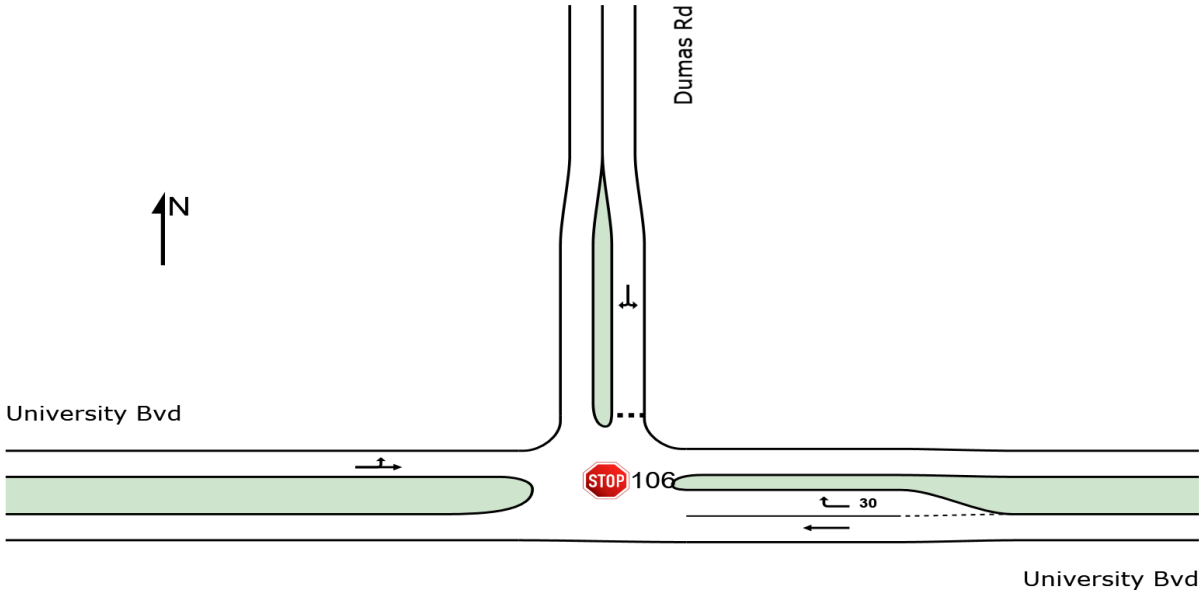
Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SITE LAYOUT

Site: 106 [University Bvd / Dumas Rd (Site Folder: 2024_AM)]

NA
Site Category: (None)
Stop (Two-Way)

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



MOVEMENT SUMMARY

Site: 106 [University Bvd / Dumas Rd (Site Folder: 2024_AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: University Bvd															
2	T1	All MCs	185	21.1	185	21.1	0.107	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
3	R2	All MCs	63	21.1	63	21.1	0.045	5.3	LOS A	0.2	1.7	0.27	0.52	0.27	43.4
Approach			248	21.1	248	21.1	0.107	1.4	NA	0.2	1.7	0.07	0.13	0.07	48.2
North: Dumas Rd															
4	L2	All MCs	4	10.6	4	10.6	0.057	4.9	LOS A	0.2	1.6	0.43	0.59	0.43	46.3
6	R2	All MCs	38	10.6	38	10.6	0.057	7.5	LOS A	0.2	1.6	0.43	0.59	0.43	42.7
Approach			42	10.6	42	10.6	0.057	7.2	LOS A	0.2	1.6	0.43	0.59	0.43	43.2
West: University Bvd															
7	L2	All MCs	59	24.4	59	24.4	0.080	4.8	LOS A	0.0	0.0	0.00	0.24	0.00	44.8
8	T1	All MCs	74	24.4	74	24.4	0.080	0.0	LOS A	0.0	0.0	0.00	0.24	0.00	48.3
Approach			133	24.4	133	24.4	0.080	2.1	NA	0.0	0.0	0.00	0.24	0.00	47.0
All Vehicles			423	21.1	423	21.1	0.107	2.2	NA	0.2	1.7	0.08	0.21	0.08	47.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 106 [University Bvd / Dumas Rd (Site Folder: 2024_PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: University Bvd															
2	T1	All MCs	257	10.0	257	10.0	0.139	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
3	R2	All MCs	40	10.0	40	10.0	0.028	5.3	LOS A	0.1	0.9	0.30	0.52	0.30	43.5
Approach			297	10.0	297	10.0	0.139	0.7	NA	0.1	0.9	0.04	0.07	0.04	49.0
North: Dumas Rd															
4	L2	All MCs	22	9.4	22	9.4	0.075	5.1	LOS A	0.3	2.2	0.42	0.58	0.42	46.4
6	R2	All MCs	37	9.4	37	9.4	0.075	8.4	LOS A	0.3	2.2	0.42	0.58	0.42	42.9
Approach			59	9.4	59	9.4	0.075	7.1	LOS A	0.3	2.2	0.42	0.58	0.42	44.4
West: University Bvd															
7	L2	All MCs	46	12.4	46	12.4	0.098	4.7	LOS A	0.0	0.0	0.00	0.14	0.00	46.0
8	T1	All MCs	129	12.4	129	12.4	0.098	0.0	LOS A	0.0	0.0	0.00	0.14	0.00	49.0
Approach			176	12.4	176	12.4	0.098	1.2	NA	0.0	0.0	0.00	0.14	0.00	48.4
All Vehicles			532	10.7	532	10.7	0.139	1.6	NA	0.3	2.2	0.07	0.15	0.07	48.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 106 [University Bvd / Dumas Rd (Site Folder: 2024_SAT)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: University Bvd															
2	T1	All MCs	85	10.9	85	10.9	0.046	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
3	R2	All MCs	7	10.9	7	10.9	0.005	4.8	LOS A	0.0	0.2	0.13	0.49	0.13	44.0
Approach			93	10.9	93	10.9	0.046	0.4	NA	0.0	0.2	0.01	0.04	0.01	49.5
North: Dumas Rd															
4	L2	All MCs	3	8.6	3	8.6	0.015	4.7	LOS A	0.1	0.4	0.21	0.49	0.21	47.7
6	R2	All MCs	13	8.6	13	8.6	0.015	5.4	LOS A	0.1	0.4	0.21	0.49	0.21	44.5
Approach			16	8.6	16	8.6	0.015	5.3	LOS A	0.1	0.4	0.21	0.49	0.21	45.3
West: University Bvd															
7	L2	All MCs	8	11.6	8	11.6	0.024	4.7	LOS A	0.0	0.0	0.00	0.10	0.00	46.4
8	T1	All MCs	36	11.6	36	11.6	0.024	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	49.3
Approach			44	11.6	44	11.6	0.024	0.9	NA	0.0	0.0	0.00	0.10	0.00	48.9
All Vehicles			153	10.9	153	10.9	0.046	1.0	NA	0.1	0.4	0.03	0.10	0.03	48.9

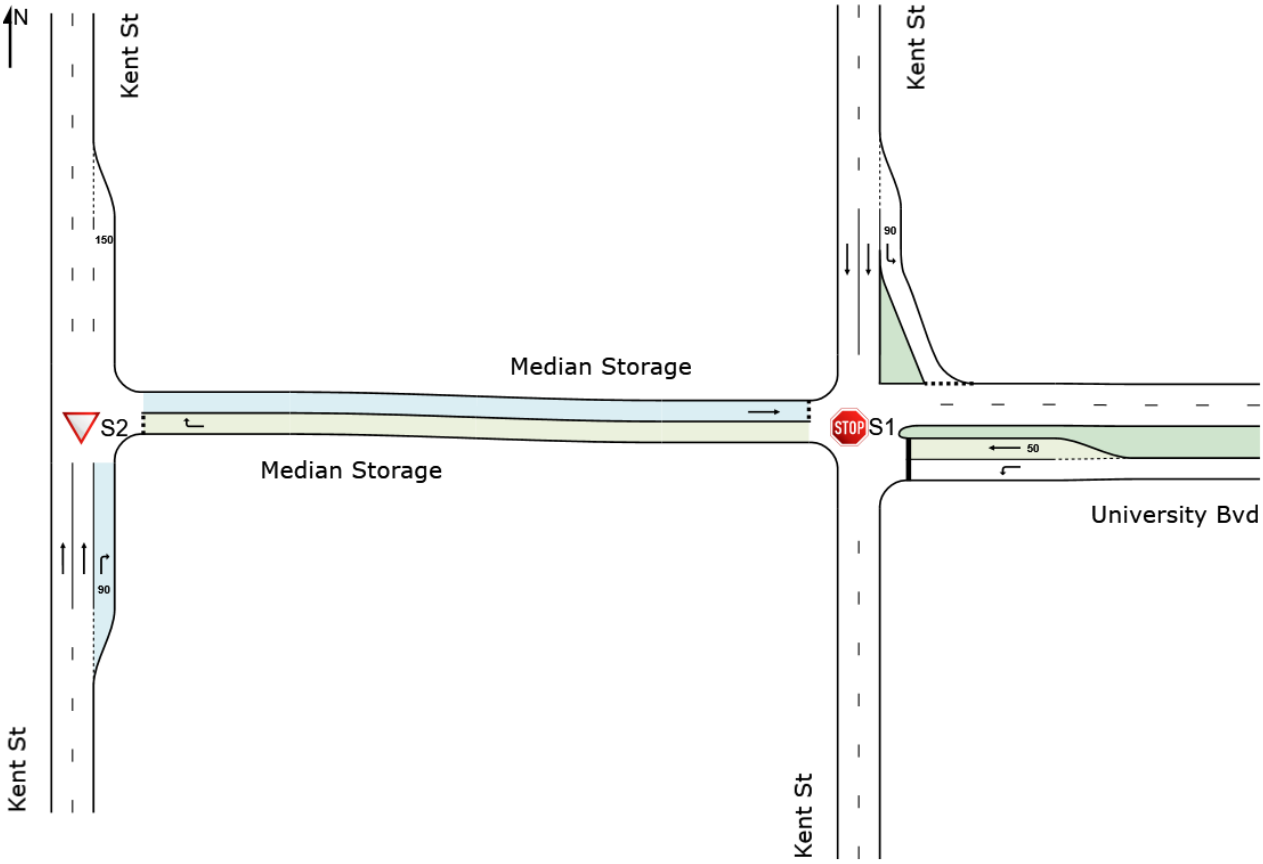
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

NETWORK LAYOUT

Network: N101 [AM_Kent St / University Bvd (Network Folder: 2024)]

New Network
Network Category: (None)

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



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
S1	NA	Kent St / University Bvd
S2	NA	Kent St / Univeristy Bvd

MOVEMENT SUMMARY

Site: S1 [Kent St / University Bvd (Site Folder: 2024_AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [AM_Kent St / University Bvd (Network Folder: 2024)]

Type A Two-Stage T-Intersection Crossing
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: University Bvd															
1	L2	All MCs	62	22.8	62	22.8	0.072	10.3	LOS B	0.3	2.3	0.43	0.91	0.43	42.3
2	T1	All MCs	41	22.8	41	22.8	0.108	15.7	LOS C	0.3	2.7	0.66	1.02	0.66	23.4
Approach			103	22.8	103	22.8	0.108	12.4	LOS B	0.3	2.7	0.52	0.95	0.52	38.0
North: Kent St															
3	L2	All MCs	136	4.3	136	4.3	0.110	7.2	LOS A	0.5	3.3	0.26	0.57	0.26	47.6
4	T1	All MCs	653	4.3	653	4.3	0.172	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
Approach			788	4.3	788	4.3	0.172	1.3	LOS A	0.5	3.3	0.04	0.10	0.04	66.4
West: Median Storage															
5	T1	All MCs	134	3.0	134	3.0	0.170	3.1	LOS A	0.6	4.4	0.54	0.51	0.54	31.2
Approach			134	3.0	134	3.0	0.170	3.1	LOS A	0.6	4.4	0.54	0.51	0.54	31.2
All Vehicles			1025	6.0	1025	6.0	0.172	2.6	NA	0.6	4.4	0.16	0.24	0.16	61.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: S2 [Kent St / Univeristy Bvd (Site Folder: 2024_AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [AM_Kent St / University Bvd (Network Folder: 2024)]

Type A Two-Stage T-Intersection Crossing
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kent St															
2	T1	All MCs	832	3.0	832	3.0	0.217	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
3	R2	All MCs	134	3.0	134	3.0	0.074	6.4	LOS A	0.0	0.0	0.00	0.66	0.00	56.4
Approach			965	3.0	965	3.0	0.217	0.9	NA	0.0	0.0	0.00	0.09	0.00	68.4
East: Median Storage															
1	R2	All MCs	41	22.8	41	22.8	0.116	10.9	LOS B	0.4	3.2	0.71	0.77	0.71	32.9
Approach			41	22.8	41	22.8	0.116	10.9	LOS B	0.4	3.2	0.71	0.77	0.71	32.9
All Vehicles			1006	3.8	1006	3.8	0.217	1.3	NA	0.4	3.2	0.03	0.12	0.03	67.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: S1 [Kent St / University Bvd (Site Folder: 2024_PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [PM_Kent St / University Bvd (Network Folder: 2024)]

Type A Two-Stage T-Intersection Crossing
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: University Bvd															
1	L2	All MCs	262	15.9	262	15.9	0.350	12.2	LOS B	0.7	5.7	0.59	1.01	0.71	42.5
2	T1	All MCs	118	15.9	118	15.9	0.420	21.7	LOS C	0.6	4.6	0.82	1.10	1.09	18.9
Approach			380	15.9	380	15.9	0.420	15.2	LOS C	0.7	5.7	0.66	1.03	0.83	37.8
North: Kent St															
3	L2	All MCs	119	2.7	119	2.7	0.089	6.8	LOS A	0.1	1.1	0.16	0.55	0.16	48.3
4	T1	All MCs	925	2.7	925	2.7	0.241	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
Approach			1044	2.7	1044	2.7	0.241	0.8	LOS A	0.1	1.1	0.02	0.06	0.02	67.7
West: Median Storage															
5	T1	All MCs	63	1.6	63	1.6	0.110	4.9	LOS A	0.1	1.1	0.64	0.64	0.64	28.7
Approach			63	1.6	63	1.6	0.110	4.9	LOS A	0.1	1.1	0.64	0.64	0.64	28.7
All Vehicles			1487	6.0	1487	6.0	0.420	4.7	NA	0.7	5.7	0.21	0.34	0.25	58.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: S2 [Kent St / Univeristy Bvd (Site Folder: 2024_PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [PM_Kent St / University Bvd (Network Folder: 2024)]

Type A Two-Stage T-Intersection Crossing
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kent St															
2	T1	All MCs	677	1.6	677	1.6	0.175	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
3	R2	All MCs	63	1.6	63	1.6	0.034	6.4	LOS A	0.0	0.0	0.00	0.66	0.00	56.4
Approach			740	1.6	740	1.6	0.175	0.6	NA	0.0	0.0	0.00	0.06	0.00	69.0
East: Median Storage															
1	R2	All MCs	118	15.9	118	15.9	0.233	7.9	LOS A	0.4	2.9	0.64	0.75	0.67	37.0
Approach			118	15.9	118	15.9	0.233	7.9	LOS A	0.4	2.9	0.64	0.75	0.67	37.0
All Vehicles			858	3.5	858	3.5	0.233	1.6	NA	0.4	2.9	0.09	0.15	0.09	65.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: S1 [Kent St / University Bvd (Site Folder: 2024_SAT)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [SAT_Kent St / University Bvd (Network Folder: 2024)]

Type A Two-Stage T-Intersection Crossing
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: University Bvd															
1	L2	All MCs	87	20.4	87	20.4	0.086	9.4	LOS A	0.3	2.8	0.34	0.90	0.34	43.4
2	T1	All MCs	21	20.4	21	20.4	0.036	11.7	LOS B	0.1	0.9	0.49	0.96	0.49	27.2
Approach			108	20.4	108	20.4	0.086	9.8	LOS A	0.3	2.8	0.37	0.91	0.37	42.0
North: Kent St															
3	L2	All MCs	27	2.1	27	2.1	0.022	7.1	LOS A	0.1	0.6	0.24	0.55	0.24	47.9
4	T1	All MCs	433	2.1	433	2.1	0.112	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
Approach			460	2.1	460	2.1	0.112	0.4	LOS A	0.1	0.6	0.01	0.03	0.01	68.8
West: Median Storage															
5	T1	All MCs	139	1.6	139	1.6	0.137	1.7	LOS A	0.5	3.6	0.43	0.35	0.43	33.8
Approach			139	1.6	139	1.6	0.137	1.7	LOS A	0.5	3.6	0.43	0.35	0.43	33.8
All Vehicles			707	4.8	707	4.8	0.137	2.1	NA	0.5	3.6	0.15	0.23	0.15	60.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: S2 [Kent St / Univeristy Bvd (Site Folder: 2024_SAT)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [SAT_Kent St / University Bvd (Network Folder: 2024)]

Type A Two-Stage T-Intersection Crossing
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kent St															
2	T1	All MCs	472	1.6	472	1.6	0.122	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
3	R2	All MCs	139	1.6	139	1.6	0.076	6.4	LOS A	0.0	0.0	0.00	0.66	0.00	56.4
Approach			611	1.6	611	1.6	0.122	1.5	NA	0.0	0.0	0.00	0.15	0.00	67.5
East: Median Storage															
1	R2	All MCs	21	20.4	21	20.4	0.032	4.5	LOS A	0.1	0.9	0.50	0.50	0.50	39.3
Approach			21	20.4	21	20.4	0.032	4.5	LOS A	0.1	0.9	0.50	0.50	0.50	39.3
All Vehicles			632	2.3	632	2.3	0.122	1.6	NA	0.1	0.9	0.02	0.16	0.02	66.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

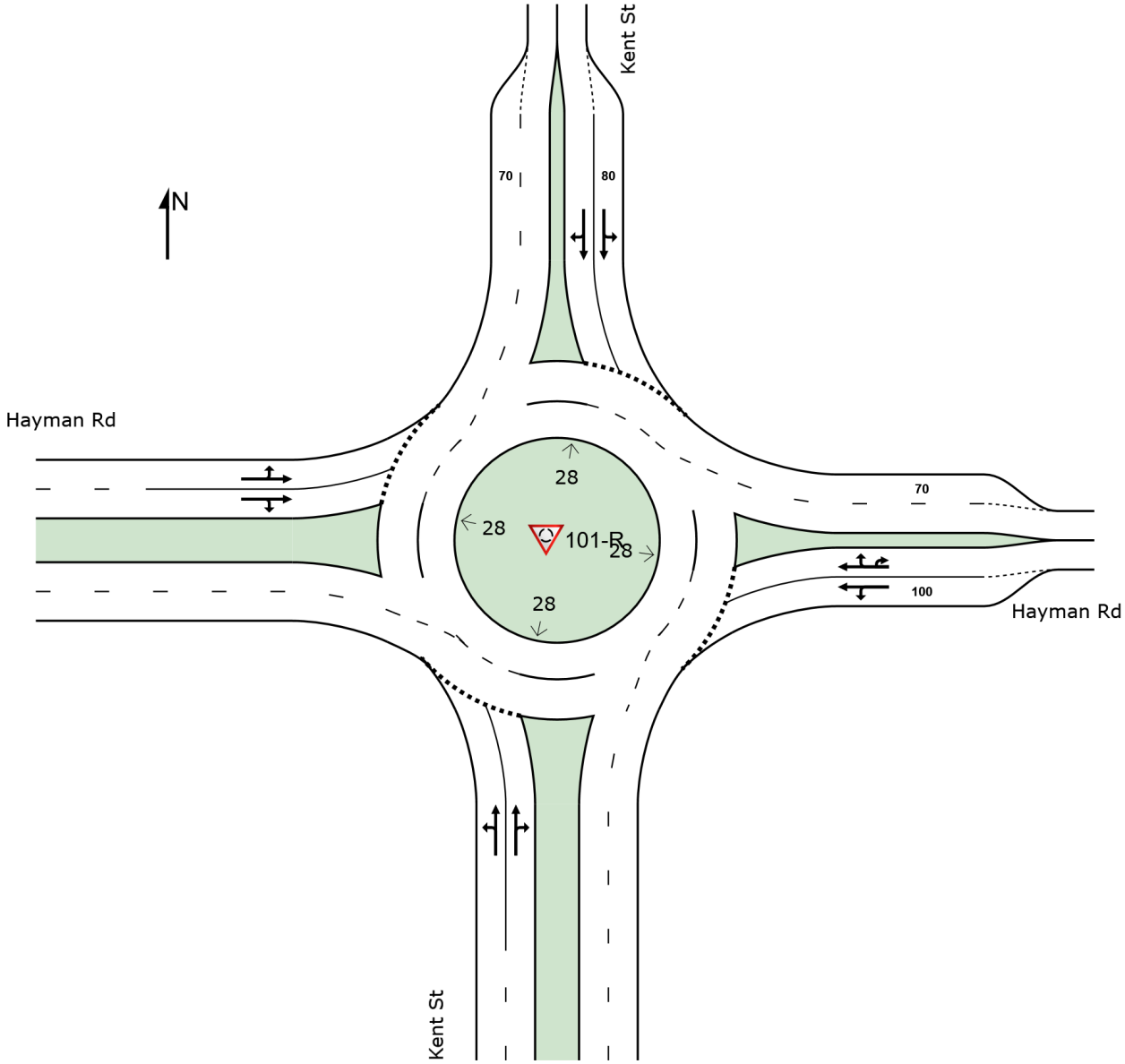
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: 101-R [Hayman Rd / Kent St (Site Folder: 2029 +DEV_AM)]

NA
Site Category: (None)
Roundabout

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



MOVEMENT SUMMARY

Site: 101-R [Hayman Rd / Kent St (Site Folder: 2029 +DEV_AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kent St															
1	L2	All MCs	476	4.4	476	4.4	0.464	7.2	LOS A	2.7	21.1	0.65	0.71	0.69	55.8
2	T1	All MCs	320	4.3	320	4.3	0.467	8.0	LOS A	2.7	20.8	0.67	0.74	0.73	51.4
3	R2	All MCs	91	4.4	91	4.4	0.467	13.6	LOS B	2.7	20.8	0.67	0.74	0.73	47.7
Approach			886	4.4	886	4.4	0.467	8.1	LOS A	2.7	21.1	0.66	0.73	0.71	53.4
East: Hayman Rd															
4	L2	All MCs	58	3.8	58	3.8	0.325	6.7	LOS A	1.7	13.4	0.71	0.66	0.71	49.1
5	T1	All MCs	373	3.9	373	3.9	0.325	6.9	LOS A	1.7	13.4	0.71	0.70	0.71	51.8
6	R2	All MCs	61	3.9	61	3.9	0.325	12.8	LOS B	1.6	12.4	0.71	0.76	0.71	46.5
6u	U	All MCs	14	3.8	14	3.8	0.325	15.2	LOS B	1.6	12.4	0.71	0.76	0.71	42.1
Approach			505	3.9	505	3.9	0.325	7.8	LOS A	1.7	13.4	0.71	0.71	0.71	50.6
North: Kent St															
7	L2	All MCs	68	2.9	68	2.9	0.474	10.5	LOS B	3.4	26.1	0.88	0.84	1.00	48.2
8	T1	All MCs	366	2.9	366	2.9	0.474	9.6	LOS A	3.4	26.1	0.87	0.86	1.00	50.8
9	R2	All MCs	163	2.9	163	2.9	0.474	16.0	LOS B	3.1	23.8	0.86	0.90	1.01	49.5
Approach			598	2.9	598	2.9	0.474	11.4	LOS B	3.4	26.1	0.87	0.87	1.01	50.1
West: Hayman Rd															
10	L2	All MCs	174	1.8	174	1.8	0.420	8.9	LOS A	2.6	19.1	0.68	0.68	0.69	54.5
11	T1	All MCs	555	1.8	555	1.8	0.765	11.0	LOS B	10.0	75.1	0.84	0.82	1.06	50.0
12	R2	All MCs	405	1.8	405	1.8	0.765	17.2	LOS B	10.0	75.1	0.90	0.88	1.20	50.8
Approach			1134	1.8	1134	1.8	0.765	12.9	LOS B	10.0	75.1	0.84	0.82	1.05	51.1
All Vehicles			3123	3.1	3123	3.1	0.765	10.4	LOS B	10.0	75.1	0.77	0.78	0.89	51.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101-R [Hayman Rd / Kent St (Site Folder: 2029 +DEV_PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kent St															
1	L2	All MCs	465	2.6	465	2.6	0.508	8.0	LOS A	3.3	24.8	0.75	0.80	0.85	56.0
2	T1	All MCs	306	2.6	306	2.6	0.484	8.9	LOS A	2.9	21.6	0.74	0.82	0.85	51.6
3	R2	All MCs	56	2.6	56	2.6	0.484	14.5	LOS B	2.9	21.6	0.74	0.82	0.85	47.7
Approach			827	2.6	827	2.6	0.508	8.7	LOS A	3.3	24.8	0.75	0.81	0.85	53.8
East: Hayman Rd															
4	L2	All MCs	94	2.9	94	2.9	0.542	8.9	LOS A	3.8	29.0	0.82	0.86	1.01	48.3
5	T1	All MCs	563	2.9	563	2.9	0.542	9.4	LOS A	3.8	29.0	0.82	0.89	1.02	50.5
6	R2	All MCs	25	2.9	25	2.9	0.542	15.7	LOS B	3.5	26.7	0.82	0.92	1.03	44.7
6u	U	All MCs	106	2.9	106	2.9	0.542	18.0	LOS B	3.5	26.7	0.82	0.92	1.03	39.6
Approach			788	2.9	788	2.9	0.542	10.7	LOS B	3.8	29.0	0.82	0.89	1.02	48.8
North: Kent St															
7	L2	All MCs	59	1.8	59	1.8	0.471	9.4	LOS A	3.4	25.1	0.83	0.80	0.94	48.6
8	T1	All MCs	496	1.8	496	1.8	0.471	8.9	LOS A	3.4	25.1	0.83	0.82	0.95	51.5
9	R2	All MCs	126	1.8	126	1.8	0.471	15.1	LOS B	3.1	23.3	0.82	0.86	0.96	51.1
Approach			681	1.8	681	1.8	0.471	10.1	LOS B	3.4	25.1	0.83	0.83	0.95	51.2
West: Hayman Rd															
10	L2	All MCs	154	1.0	154	1.0	0.352	8.5	LOS A	2.0	15.0	0.65	0.66	0.65	55.0
11	T1	All MCs	346	1.0	346	1.0	0.642	9.2	LOS A	6.3	47.1	0.75	0.74	0.84	51.2
12	R2	All MCs	455	1.0	455	1.0	0.642	14.9	LOS B	6.3	47.1	0.80	0.79	0.95	51.8
Approach			955	1.0	955	1.0	0.642	11.8	LOS B	6.3	47.1	0.76	0.75	0.86	52.2
All Vehicles			3252	2.0	3252	2.0	0.642	10.4	LOS B	6.3	47.1	0.78	0.82	0.91	51.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101-R [Hayman Rd / Kent St (Site Folder: 2029 +DEV_SAT)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kent St															
1	L2	All MCs	263	2.1	263	2.1	0.211	5.7	LOS A	1.0	7.2	0.39	0.55	0.39	57.8
2	T1	All MCs	222	2.1	222	2.1	0.223	6.0	LOS A	1.0	7.6	0.40	0.55	0.40	53.8
3	R2	All MCs	32	2.1	32	2.1	0.223	11.6	LOS B	1.0	7.6	0.40	0.55	0.40	50.4
Approach			517	2.1	517	2.1	0.223	6.2	LOS A	1.0	7.6	0.40	0.55	0.40	55.6
East: Hayman Rd															
4	L2	All MCs	31	3.0	31	3.0	0.109	5.2	LOS A	0.5	3.5	0.47	0.52	0.47	51.1
5	T1	All MCs	166	3.0	166	3.0	0.109	5.2	LOS A	0.5	3.5	0.47	0.56	0.47	53.5
6	R2	All MCs	3	3.0	3	3.0	0.109	10.9	LOS B	0.4	3.4	0.48	0.60	0.48	48.0
6u	U	All MCs	25	3.0	25	3.0	0.109	13.2	LOS B	0.4	3.4	0.48	0.60	0.48	43.8
Approach			225	3.0	225	3.0	0.109	6.2	LOS A	0.5	3.5	0.47	0.56	0.47	52.3
North: Kent St															
7	L2	All MCs	14	2.0	14	2.0	0.163	5.4	LOS A	0.8	5.7	0.46	0.49	0.46	50.8
8	T1	All MCs	238	2.0	238	2.0	0.163	5.1	LOS A	0.8	5.7	0.46	0.53	0.46	53.7
9	R2	All MCs	104	2.0	104	2.0	0.163	10.7	LOS B	0.7	5.6	0.47	0.63	0.47	52.8
Approach			356	2.0	356	2.0	0.163	6.7	LOS A	0.8	5.7	0.47	0.56	0.47	53.3
West: Hayman Rd															
10	L2	All MCs	88	1.1	88	1.1	0.143	6.5	LOS A	0.7	4.9	0.42	0.55	0.42	56.1
11	T1	All MCs	169	1.1	169	1.1	0.261	6.2	LOS A	1.4	10.4	0.43	0.60	0.43	53.3
12	R2	All MCs	205	1.1	205	1.1	0.261	11.6	LOS B	1.4	10.4	0.43	0.62	0.43	54.2
Approach			463	1.1	463	1.1	0.261	8.7	LOS A	1.4	10.4	0.43	0.60	0.43	54.3
All Vehicles			1561	1.9	1561	1.9	0.261	7.0	LOS A	1.4	10.4	0.43	0.57	0.43	54.2

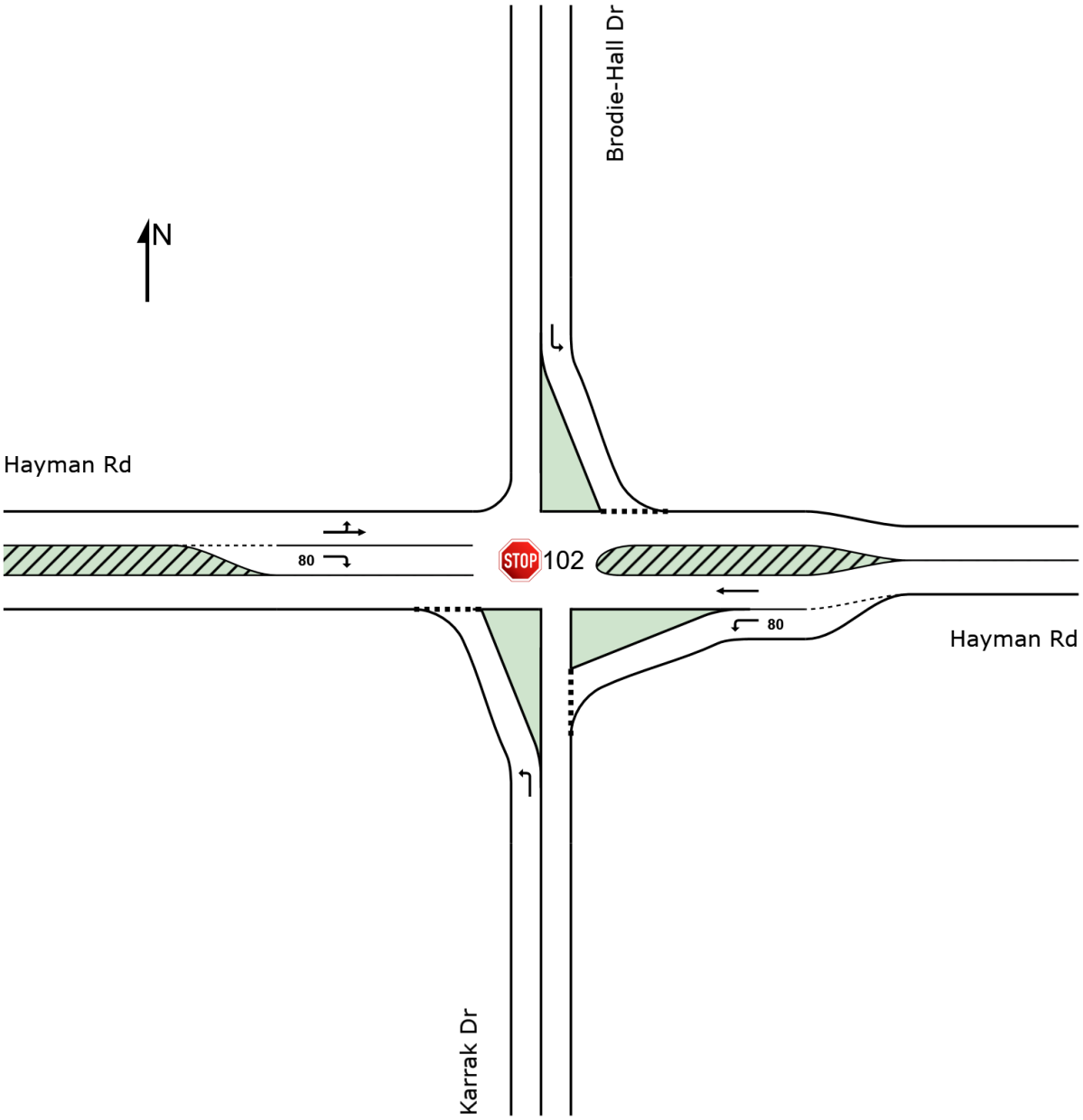
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: 102 [Hayman Rd / Karrak Dr / Brodie-Hall Dr (Site Folder: 2029+DEV_AM)]

NA
Site Category: (None)
Stop (Two-Way)

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



MOVEMENT SUMMARY

Site: 102 [Hayman Rd / Karrak Dr / Brodie-Hall Dr (Site Folder: 2029+DEV_AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Karrak Dr															
1	L2	All MCs	25	5.3	25	5.3	0.026	6.5	LOS A	0.1	0.7	0.47	0.60	0.47	44.3
Approach			25	5.3	25	5.3	0.026	6.5	LOS A	0.1	0.7	0.47	0.60	0.47	44.3
East: Hayman Rd															
4	L2	All MCs	28	4.4	28	4.4	0.018	5.7	LOS A	0.1	0.5	0.09	0.52	0.09	47.4
5	T1	All MCs	479	4.4	479	4.4	0.244	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			507	4.4	507	4.4	0.244	0.4	LOS A	0.1	0.5	0.01	0.03	0.01	58.6
North: Brodie-Hall Dr															
7	L2	All MCs	13	5.3	13	5.3	0.016	7.6	LOS A	0.1	0.4	0.54	0.65	0.54	45.5
Approach			13	5.3	13	5.3	0.016	7.6	LOS A	0.1	0.4	0.54	0.65	0.54	45.5
West: Hayman Rd															
10	L2	All MCs	62	3.9	62	3.9	0.355	5.6	LOS A	0.0	0.0	0.00	0.05	0.00	55.6
11	T1	All MCs	635	3.9	635	3.9	0.355	0.1	LOS A	0.0	0.0	0.00	0.05	0.00	58.9
12	R2	All MCs	31	3.9	31	3.9	0.029	7.5	LOS A	0.1	0.8	0.49	0.65	0.49	44.3
Approach			727	3.9	727	3.9	0.355	0.8	NA	0.1	0.8	0.02	0.08	0.02	57.5
All Vehicles			1273	4.1	1273	4.1	0.355	0.8	NA	0.1	0.8	0.03	0.07	0.03	57.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 102 [Hayman Rd / Karrak Dr / Brodie-Hall Dr (Site Folder: 2029+DEV_PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Karrak Dr															
1	L2	All MCs	226	2.7	226	2.7	0.255	7.5	LOS A	1.1	7.6	0.57	0.74	0.58	43.9
Approach			226	2.7	226	2.7	0.255	7.5	LOS A	1.1	7.6	0.57	0.74	0.58	43.9
East: Hayman Rd															
4	L2	All MCs	112	3.3	112	3.3	0.076	6.0	LOS A	0.3	2.3	0.21	0.53	0.21	47.0
5	T1	All MCs	562	3.3	562	3.3	0.284	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach			674	3.3	674	3.3	0.284	1.0	LOS A	0.3	2.3	0.04	0.09	0.04	56.3
North: Brodie-Hall Dr															
7	L2	All MCs	189	2.7	189	2.7	0.186	6.6	LOS A	0.8	5.4	0.50	0.67	0.50	46.1
Approach			189	2.7	189	2.7	0.186	6.6	LOS A	0.8	5.4	0.50	0.67	0.50	46.1
West: Hayman Rd															
10	L2	All MCs	1	2.9	1	2.9	0.231	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	56.3
11	T1	All MCs	457	2.9	457	2.9	0.231	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
12	R2	All MCs	112	2.9	112	2.9	0.117	8.1	LOS A	0.5	3.5	0.55	0.75	0.55	43.8
Approach			569	2.9	569	2.9	0.231	1.6	NA	0.5	3.5	0.11	0.15	0.11	55.0
All Vehicles			1659	3.0	1659	3.0	0.284	2.8	NA	1.1	7.6	0.19	0.26	0.19	51.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 102 [Hayman Rd / Karrak Dr / Brodie-Hall Dr (Site Folder: 2029+DEV_SAT)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Karrak Dr															
1	L2	All MCs	49	1.3	49	1.3	0.036	5.0	LOS A	0.1	1.0	0.26	0.49	0.26	45.3
Approach			49	1.3	49	1.3	0.036	5.0	LOS A	0.1	1.0	0.26	0.49	0.26	45.3
East: Hayman Rd															
4	L2	All MCs	25	3.0	25	3.0	0.016	5.7	LOS A	0.1	0.5	0.08	0.52	0.08	47.5
5	T1	All MCs	175	3.0	175	3.0	0.088	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			200	3.0	200	3.0	0.088	0.7	LOS A	0.1	0.5	0.01	0.07	0.01	57.2
North: Brodie-Hall Dr															
7	L2	All MCs	25	1.3	25	1.3	0.019	5.1	LOS A	0.1	0.5	0.29	0.49	0.29	46.8
Approach			25	1.3	25	1.3	0.019	5.1	LOS A	0.1	0.5	0.29	0.49	0.29	46.8
West: Hayman Rd															
10	L2	All MCs	6	3.0	6	3.0	0.108	5.6	LOS A	0.0	0.0	0.00	0.02	0.00	56.2
11	T1	All MCs	207	3.0	207	3.0	0.108	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.7
12	R2	All MCs	25	3.0	25	3.0	0.017	6.0	LOS A	0.1	0.5	0.28	0.55	0.28	45.0
Approach			239	3.0	239	3.0	0.108	0.8	NA	0.1	0.5	0.03	0.07	0.03	57.1
All Vehicles			514	2.8	514	2.8	0.108	1.4	NA	0.1	1.0	0.06	0.13	0.06	54.7

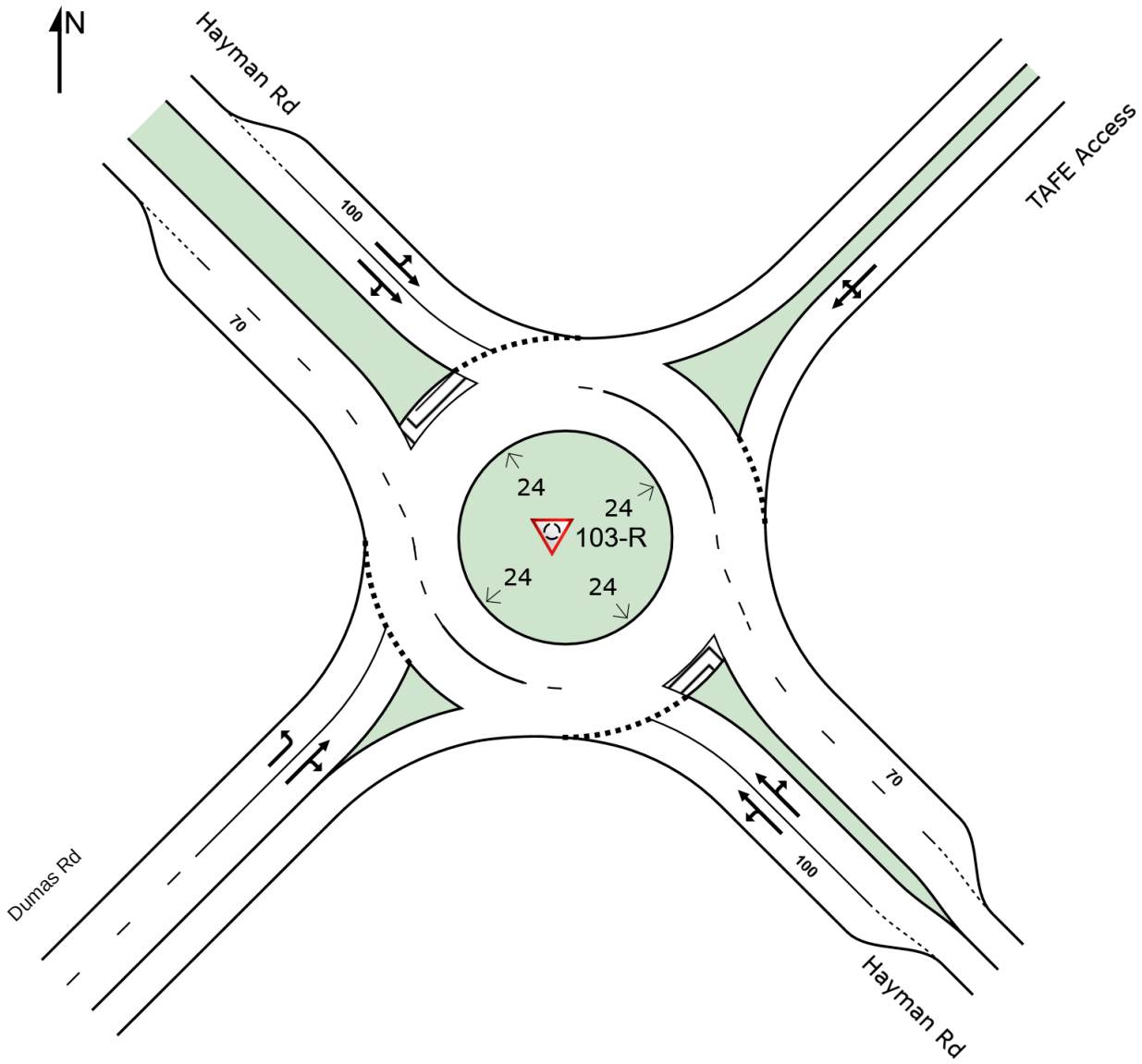
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: 103-R [Hayman Rd / Dumas Rd (Site Folder: 2029 +DEV_AM)]

NA
Site Category: (None)
Roundabout

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



MOVEMENT SUMMARY

Site: 103-R [Hayman Rd / Dumas Rd (Site Folder: 2029 +DEV_AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Hayman Rd															
4	L2	All MCs	2	3.0	2	3.0	0.169	4.2	LOS A	0.9	7.0	0.17	0.37	0.17	50.0
5	T1	All MCs	656	3.0	656	3.0	0.329	4.4	LOS A	2.2	16.4	0.18	0.41	0.18	52.7
6	R2	All MCs	112	3.0	112	3.0	0.329	9.1	LOS A	2.2	16.4	0.18	0.43	0.18	49.3
Approach			769	3.0	769	3.0	0.329	5.1	LOS A	2.2	16.4	0.18	0.41	0.18	52.1
NorthEast: TAFE Access															
7	L2	All MCs	19	0.0	19	0.0	0.041	5.2	LOS A	0.2	1.2	0.47	0.61	0.47	48.6
8	T1	All MCs	1	0.0	1	0.0	0.041	4.2	LOS A	0.2	1.2	0.47	0.61	0.47	44.2
9	R2	All MCs	17	0.0	17	0.0	0.041	9.2	LOS A	0.2	1.2	0.47	0.61	0.47	46.3
Approach			37	0.0	37	0.0	0.041	7.0	LOS A	0.2	1.2	0.47	0.61	0.47	47.5
NorthWest: Hayman Rd															
10	L2	All MCs	67	4.4	67	4.4	0.143	4.7	LOS A	0.7	5.7	0.30	0.44	0.30	48.2
11	T1	All MCs	495	4.4	495	4.4	0.278	4.6	LOS A	1.7	13.0	0.30	0.42	0.30	51.7
12	R2	All MCs	24	4.4	24	4.4	0.278	9.4	LOS A	1.7	13.0	0.30	0.41	0.30	46.0
Approach			586	4.4	586	4.4	0.278	4.8	LOS A	1.7	13.0	0.30	0.42	0.30	51.1
SouthWest: Duams Rd															
1	L2	All MCs	24	31.3	24	31.3	0.030	6.8	LOS A	0.1	1.1	0.53	0.60	0.53	39.9
2	T1	All MCs	1	31.3	1	31.3	0.004	7.4	LOS A	0.0	0.1	0.56	0.60	0.56	41.9
3	R2	All MCs	1	31.3	1	31.3	0.004	12.5	LOS B	0.0	0.1	0.56	0.60	0.56	37.9
Approach			26	31.3	26	31.3	0.030	7.1	LOS A	0.1	1.1	0.53	0.60	0.53	39.9
All Vehicles			1419	4.0	1419	4.0	0.329	5.1	LOS A	2.2	16.4	0.24	0.43	0.24	51.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 103-R [Hayman Rd / Dumas Rd (Site Folder: 2029 +DEV_PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Hayman Rd															
4	L2	All MCs	1	2.7	1	2.7	0.099	4.2	LOS A	0.5	4.0	0.20	0.38	0.20	49.9
5	T1	All MCs	434	2.7	434	2.7	0.193	4.3	LOS A	1.1	8.6	0.20	0.37	0.20	53.1
6	R2	All MCs	1	2.7	1	2.7	0.193	9.1	LOS A	1.1	8.6	0.19	0.37	0.19	49.8
Approach			436	2.7	436	2.7	0.193	4.3	LOS A	1.1	8.6	0.20	0.37	0.20	53.1
NorthEast: TAFE Access															
7	L2	All MCs	28	0.0	28	0.0	0.077	6.3	LOS A	0.3	2.2	0.51	0.68	0.51	48.0
8	T1	All MCs	1	0.0	1	0.0	0.077	4.9	LOS A	0.3	2.2	0.51	0.68	0.51	43.6
9	R2	All MCs	36	0.0	36	0.0	0.077	9.9	LOS A	0.3	2.2	0.51	0.68	0.51	45.7
Approach			65	0.0	65	0.0	0.077	8.2	LOS A	0.3	2.2	0.51	0.68	0.51	46.7
NorthWest: Hayman Rd															
10	L2	All MCs	1	3.3	1	3.3	0.149	4.0	LOS A	0.9	6.6	0.08	0.37	0.08	49.2
11	T1	All MCs	704	3.3	704	3.3	0.291	4.3	LOS A	2.0	15.2	0.08	0.37	0.08	53.3
12	R2	All MCs	20	3.3	20	3.3	0.291	9.0	LOS A	2.0	15.2	0.08	0.38	0.08	47.6
Approach			725	3.3	725	3.3	0.291	4.4	LOS A	2.0	15.2	0.08	0.37	0.08	53.1
SouthWest: Duams Rd															
1	L2	All MCs	81	11.7	81	11.7	0.076	5.1	LOS A	0.3	2.5	0.42	0.53	0.42	44.5
2	T1	All MCs	1	11.7	1	11.7	0.013	5.2	LOS A	0.0	0.4	0.47	0.63	0.47	42.4
3	R2	All MCs	7	11.7	7	11.7	0.013	10.2	LOS B	0.0	0.4	0.47	0.63	0.47	42.4
Approach			89	11.7	89	11.7	0.076	5.5	LOS A	0.3	2.5	0.43	0.54	0.43	44.2
All Vehicles			1316	3.5	1316	3.5	0.291	4.6	LOS A	2.0	15.2	0.16	0.40	0.16	52.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 103-R [Hayman Rd / Dumas Rd (Site Folder: 2029 +DEV_SAT)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Hayman Rd															
4	L2	All MCs	1	2.8	1	2.8	0.040	4.0	LOS A	0.2	1.5	0.04	0.37	0.04	50.8
5	T1	All MCs	193	2.8	193	2.8	0.078	3.9	LOS A	0.4	3.0	0.04	0.37	0.04	54.0
6	R2	All MCs	1	2.8	1	2.8	0.078	8.9	LOS A	0.4	3.0	0.04	0.37	0.04	50.5
Approach			195	2.8	195	2.8	0.078	4.0	LOS A	0.4	3.0	0.04	0.37	0.04	54.0
NorthEast: TAFE Access															
7	L2	All MCs	1	0.0	1	0.0	0.004	3.6	LOS A	0.0	0.1	0.29	0.49	0.29	48.9
8	T1	All MCs	1	0.0	1	0.0	0.004	3.2	LOS A	0.0	0.1	0.29	0.49	0.29	44.6
9	R2	All MCs	2	0.0	2	0.0	0.004	8.1	LOS A	0.0	0.1	0.29	0.49	0.29	46.7
Approach			4	0.0	4	0.0	0.004	5.7	LOS A	0.0	0.1	0.29	0.49	0.29	46.8
NorthWest: Hayman Rd															
10	L2	All MCs	3	3.0	3	3.0	0.047	4.0	LOS A	0.2	1.7	0.03	0.38	0.03	49.4
11	T1	All MCs	223	3.0	223	3.0	0.091	3.9	LOS A	0.5	3.5	0.03	0.38	0.03	53.7
12	R2	All MCs	1	3.0	1	3.0	0.091	8.9	LOS A	0.5	3.5	0.03	0.37	0.03	48.1
Approach			227	3.0	227	3.0	0.091	4.0	LOS A	0.5	3.5	0.03	0.38	0.03	53.6
SouthWest: Duams Rd															
1	L2	All MCs	4	16.7	4	16.7	0.004	3.8	LOS A	0.0	0.1	0.26	0.40	0.26	44.0
2	T1	All MCs	1	16.7	1	16.7	0.002	3.4	LOS A	0.0	0.1	0.29	0.45	0.29	44.4
3	R2	All MCs	1	16.7	1	16.7	0.002	8.4	LOS A	0.0	0.1	0.29	0.45	0.29	43.2
Approach			6	16.7	6	16.7	0.004	4.5	LOS A	0.0	0.1	0.27	0.42	0.27	43.9
All Vehicles			433	3.1	433	3.1	0.091	4.0	LOS A	0.5	3.5	0.04	0.38	0.04	53.6

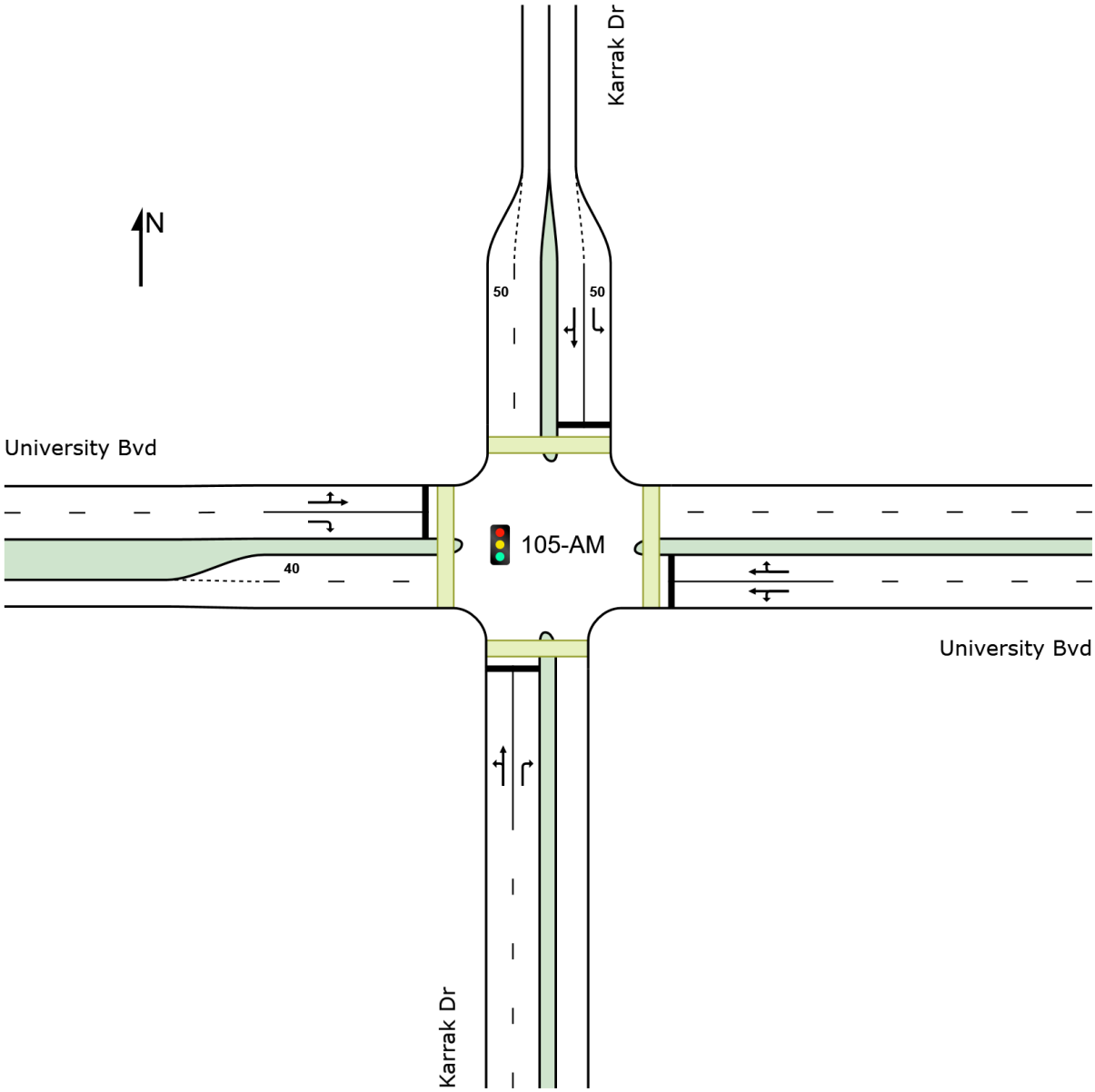
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: 105-AM [University Bvd / Karrak Dr (Site Folder: 2029 +DEV_AM)]

Four-way intersection with 2-lane approaches (Signals)
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



MOVEMENT SUMMARY

Site: 105-AM [University Bvd / Karrak Dr (Site Folder: 2029 +DEV_AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Four-way intersection with 2-lane approaches (Signals)
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 79 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Karrak Dr															
1	L2	All MCs	34	5.3	34	5.3	0.227	38.5	LOS D	2.1	15.1	0.93	0.72	0.93	27.6
2	T1	All MCs	24	5.3	24	5.3	* 0.227	34.0	LOS C	2.1	15.1	0.93	0.72	0.93	33.4
3	R2	All MCs	31	100.0	31	100.0	0.202	40.2	LOS D	1.1	14.5	0.92	0.72	0.92	28.5
Approach			88	38.0	88	38.0	0.227	37.8	LOS D	2.1	15.1	0.92	0.72	0.92	29.7
East: University Bvd															
4	L2	All MCs	41	21.0	41	21.0	0.116	8.3	LOS A	1.9	15.9	0.50	0.51	0.50	41.0
5	T1	All MCs	65	21.0	65	21.0	0.116	12.2	LOS B	1.9	15.9	0.50	0.51	0.50	38.0
6	R2	All MCs	82	21.0	82	21.0	0.179	19.3	LOS B	2.0	16.1	0.64	0.70	0.64	36.7
Approach			188	21.0	188	21.0	0.179	14.5	LOS B	2.0	16.1	0.56	0.59	0.56	38.0
North: Karrak Dr															
7	L2	All MCs	14	5.3	14	5.3	* 0.046	35.1	LOS D	0.5	3.3	0.87	0.67	0.87	30.7
8	T1	All MCs	1	5.3	1	5.3	0.043	30.4	LOS C	0.4	3.1	0.87	0.66	0.87	34.0
9	R2	All MCs	12	5.3	12	5.3	0.043	35.2	LOS D	0.4	3.1	0.87	0.66	0.87	28.4
Approach			26	5.3	26	5.3	0.046	34.9	LOS C	0.5	3.3	0.87	0.67	0.87	29.9
West: University Bvd															
10	L2	All MCs	134	20.7	134	20.7	0.302	16.0	LOS B	5.7	47.3	0.59	0.62	0.59	37.7
11	T1	All MCs	134	20.7	134	20.7	* 0.302	11.1	LOS B	5.7	47.3	0.59	0.62	0.59	35.8
12	R2	All MCs	37	20.7	37	20.7	0.061	15.4	LOS B	0.7	6.0	0.53	0.65	0.53	36.7
Approach			304	20.7	304	20.7	0.302	13.8	LOS B	5.7	47.3	0.59	0.62	0.59	36.8
All Vehicles			607	22.6	607	22.6	0.302	18.4	LOS B	5.7	47.3	0.64	0.63	0.64	35.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Karrak Dr												
P1	Full	50	53	14.0	LOS B	0.1	0.1	0.60	0.60	167.9	200.0	1.19
East: University Bvd												

P2	Full	50	53	33.8	LOS D	0.1	0.1	0.93	0.93	187.6	200.0	1.07
North: Karrak Dr												
P3	Full	50	53	15.2	LOS B	0.1	0.1	0.62	0.62	169.1	200.0	1.18
West: University Bvd												
P4	Full	50	53	33.8	LOS D	0.1	0.1	0.93	0.93	187.6	200.0	1.07
All Pedestrians		200	211	24.2	LOS C	0.1	0.1	0.77	0.77	178.1	200.0	1.12

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: 105-PM [University Bvd / Karrak Dr (Site Folder: 2029 +DEV_PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Four-way intersection with 2-lane approaches (Signals)
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 54 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Karrak Dr															
1	L2	All MCs	42	2.7	42	2.7	0.127	24.2	LOS C	1.1	7.6	0.85	0.71	0.85	32.5
2	T1	All MCs	5	2.7	5	2.7	*0.127	19.7	LOS B	1.1	7.6	0.85	0.71	0.85	37.8
3	R2	All MCs	22	100.0	22	100.0	0.100	25.5	LOS C	0.5	6.6	0.84	0.69	0.84	33.3
Approach			69	33.7	69	33.7	0.127	24.3	LOS C	1.1	7.6	0.85	0.70	0.85	33.3
East: University Bvd															
4	L2	All MCs	47	9.9	47	9.9	0.388	8.9	LOS A	5.0	38.3	0.78	0.68	0.78	38.9
5	T1	All MCs	218	9.9	218	9.9	*0.388	15.9	LOS B	5.0	38.3	0.78	0.68	0.78	34.7
6	R2	All MCs	36	9.9	36	9.9	0.114	19.9	LOS B	0.9	7.0	0.74	0.67	0.74	37.3
Approach			301	9.9	301	9.9	0.388	15.3	LOS B	5.0	38.3	0.77	0.67	0.77	36.0
North: Karrak Dr															
7	L2	All MCs	63	2.7	63	2.7	0.170	24.5	LOS C	1.4	10.2	0.86	0.73	0.86	34.5
8	T1	All MCs	4	2.7	4	2.7	*0.416	21.2	LOS C	3.7	26.7	0.91	0.78	0.91	37.1
9	R2	All MCs	151	2.7	151	2.7	0.416	26.3	LOS C	3.7	26.7	0.91	0.78	0.91	31.8
Approach			218	2.7	218	2.7	0.416	25.6	LOS C	3.7	26.7	0.90	0.76	0.90	32.8
West: University Bvd															
10	L2	All MCs	33	10.9	33	10.9	0.287	18.6	LOS B	3.5	27.1	0.76	0.65	0.76	37.0
11	T1	All MCs	149	10.9	149	10.9	0.287	13.9	LOS B	3.5	27.1	0.76	0.65	0.76	34.8
12	R2	All MCs	27	10.9	27	10.9	0.083	21.6	LOS C	0.6	4.4	0.79	0.69	0.79	33.6
Approach			209	10.9	209	10.9	0.287	15.7	LOS B	3.5	27.1	0.76	0.65	0.76	35.0
All Vehicles			798	10.3	798	10.3	0.416	19.0	LOS B	5.0	38.3	0.81	0.70	0.81	34.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Karrak Dr												
P1	Full	50	53	18.8	LOS B	0.1	0.1	0.84	0.84	172.6	200.0	1.16
East: University Bvd												

P2	Full	50	53	21.4	LOS C	0.1	0.1	0.89	0.89	175.2	200.0	1.14
North: Karrak Dr												
P3	Full	50	53	20.5	LOS C	0.1	0.1	0.87	0.87	174.3	200.0	1.15
West: University Bvd												
P4	Full	50	53	21.4	LOS C	0.1	0.1	0.89	0.89	175.2	200.0	1.14
All Pedestrians		200	211	20.5	LOS C	0.1	0.1	0.87	0.87	174.4	200.0	1.15

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: 105-SAT [University Bvd / Karrak Dr (Site Folder: 2029 +DEV_SAT)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Four-way intersection with 2-lane approaches (Signals)
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Karrak Dr															
1	L2	All MCs	14	1.3	14	1.3	0.078	37.9	LOS D	0.7	5.0	0.90	0.68	0.90	27.8
2	T1	All MCs	6	1.3	6	1.3	*0.078	33.3	LOS C	0.7	5.0	0.90	0.68	0.90	33.4
3	R2	All MCs	8	100.0	8	100.0	0.056	39.5	LOS D	0.3	3.9	0.90	0.67	0.90	28.7
Approach			28	30.6	28	30.6	0.078	37.3	LOS D	0.7	5.0	0.90	0.67	0.90	29.5
East: University Bvd															
4	L2	All MCs	15	11.4	15	11.4	0.082	6.6	LOS A	1.4	10.9	0.44	0.41	0.44	42.7
5	T1	All MCs	73	11.4	73	11.4	0.082	8.2	LOS A	1.4	10.9	0.44	0.41	0.44	40.5
6	R2	All MCs	32	11.4	32	11.4	0.049	13.6	LOS B	0.6	4.4	0.48	0.63	0.48	39.6
Approach			119	11.4	119	11.4	0.082	9.4	LOS A	1.4	10.9	0.45	0.47	0.45	40.5
North: Karrak Dr															
7	L2	All MCs	9	1.3	9	1.3	0.041	38.6	LOS D	0.3	2.4	0.90	0.66	0.90	29.6
8	T1	All MCs	1	1.3	1	1.3	*0.178	35.1	LOS D	1.5	10.6	0.93	0.72	0.93	32.5
9	R2	All MCs	40	1.3	40	1.3	0.178	39.8	LOS D	1.5	10.6	0.93	0.72	0.93	26.9
Approach			51	1.3	51	1.3	0.178	39.5	LOS D	1.5	10.6	0.92	0.71	0.92	27.6
West: University Bvd															
10	L2	All MCs	114	9.7	114	9.7	0.170	12.8	LOS B	3.1	23.8	0.49	0.58	0.49	39.3
11	T1	All MCs	63	9.7	63	9.7	*0.170	8.1	LOS A	3.1	23.8	0.49	0.58	0.49	37.7
12	R2	All MCs	15	9.7	15	9.7	0.020	12.4	LOS B	0.2	1.9	0.45	0.61	0.45	38.6
Approach			192	9.7	192	9.7	0.170	11.2	LOS B	3.1	23.8	0.48	0.58	0.48	38.8
All Vehicles			389	10.7	389	10.7	0.178	16.2	LOS B	3.1	23.8	0.56	0.57	0.56	36.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Karrak Dr												
P1	Full	50	53	11.6	LOS B	0.1	0.1	0.54	0.54	165.4	200.0	1.21
East: University Bvd												

P2	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
North: Karrak Dr												
P3	Full	50	53	12.7	LOS B	0.1	0.1	0.56	0.56	166.5	200.0	1.20
West: University Bvd												
P4	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
All Pedestrians		200	211	23.2	LOS C	0.1	0.1	0.74	0.74	177.1	200.0	1.13

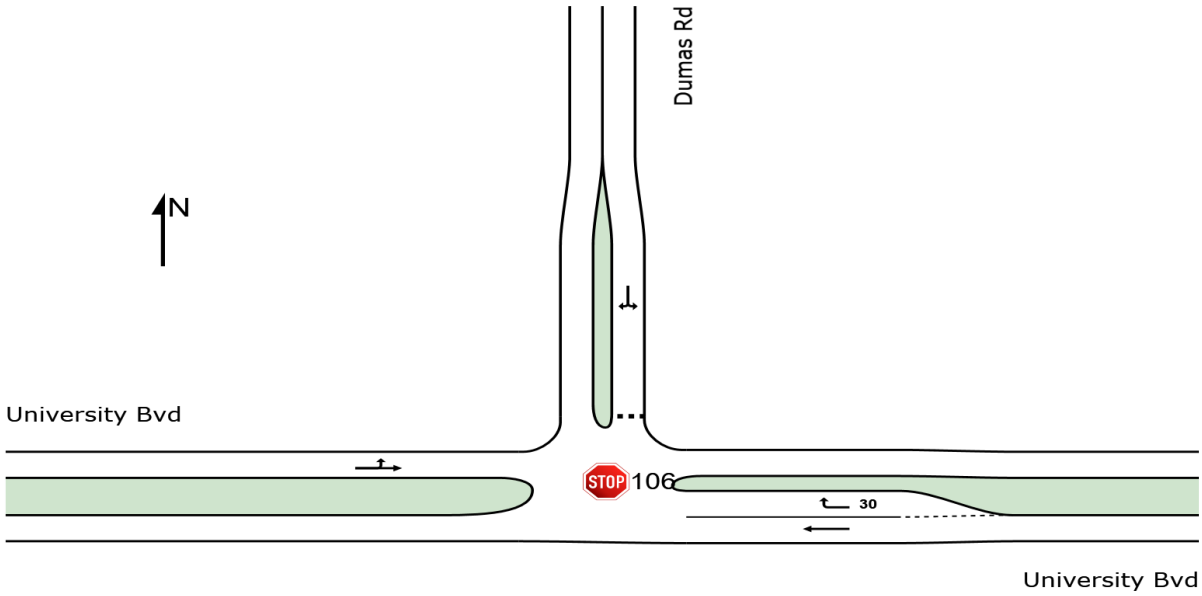
Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SITE LAYOUT

Site: 106 [University Bvd / Dumas Rd (Site Folder: 2029 +DEV_AM)]

NA
Site Category: (None)
Stop (Two-Way)

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



MOVEMENT SUMMARY

Site: 106 [University Bvd / Dumas Rd (Site Folder: 2029 +DEV_AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: University Bvd															
2	T1	All MCs	208	21.1	208	21.1	0.120	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
3	R2	All MCs	66	21.1	66	21.1	0.048	5.4	LOS A	0.2	1.8	0.28	0.52	0.28	43.4
Approach			275	21.1	275	21.1	0.120	1.3	NA	0.2	1.8	0.07	0.13	0.07	48.3
North: Dumas Rd															
4	L2	All MCs	4	10.6	4	10.6	0.063	4.9	LOS A	0.2	1.8	0.45	0.61	0.45	46.0
6	R2	All MCs	40	10.6	40	10.6	0.063	7.8	LOS A	0.2	1.8	0.45	0.61	0.45	42.4
Approach			44	10.6	44	10.6	0.063	7.6	LOS A	0.2	1.8	0.45	0.61	0.45	42.8
West: University Bvd															
7	L2	All MCs	62	24.4	62	24.4	0.085	4.8	LOS A	0.0	0.0	0.00	0.24	0.00	44.8
8	T1	All MCs	78	24.4	78	24.4	0.085	0.0	LOS A	0.0	0.0	0.00	0.24	0.00	48.3
Approach			140	24.4	140	24.4	0.085	2.1	NA	0.0	0.0	0.00	0.24	0.00	47.0
All Vehicles			459	21.1	459	21.1	0.120	2.2	NA	0.2	1.8	0.08	0.21	0.08	47.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 106 [University Bvd / Dumas Rd (Site Folder: 2029 +DEV_PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: University Bvd															
2	T1	All MCs	272	10.0	272	10.0	0.147	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
3	R2	All MCs	42	10.0	42	10.0	0.030	5.3	LOS A	0.1	1.0	0.30	0.52	0.30	43.5
Approach			314	10.0	314	10.0	0.147	0.8	NA	0.1	1.0	0.04	0.07	0.04	49.0
North: Dumas Rd															
4	L2	All MCs	26	9.4	26	9.4	0.084	5.1	LOS A	0.3	2.4	0.42	0.58	0.42	46.3
6	R2	All MCs	39	9.4	39	9.4	0.084	8.7	LOS A	0.3	2.4	0.42	0.58	0.42	42.7
Approach			65	9.4	65	9.4	0.084	7.3	LOS A	0.3	2.4	0.42	0.58	0.42	44.4
West: University Bvd															
7	L2	All MCs	48	12.4	48	12.4	0.103	4.7	LOS A	0.0	0.0	0.00	0.14	0.00	46.0
8	T1	All MCs	136	12.4	136	12.4	0.103	0.0	LOS A	0.0	0.0	0.00	0.14	0.00	49.0
Approach			184	12.4	184	12.4	0.103	1.2	NA	0.0	0.0	0.00	0.14	0.00	48.4
All Vehicles			563	10.7	563	10.7	0.147	1.7	NA	0.3	2.4	0.07	0.15	0.07	48.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 106 [University Bvd / Dumas Rd (Site Folder: 2029 +DEV_SAT)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: University Bvd															
2	T1	All MCs	89	10.9	89	10.9	0.049	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
3	R2	All MCs	7	10.9	7	10.9	0.005	4.8	LOS A	0.0	0.2	0.13	0.49	0.13	44.0
Approach			97	10.9	97	10.9	0.049	0.4	NA	0.0	0.2	0.01	0.04	0.01	49.5
North: Dumas Rd															
4	L2	All MCs	3	8.6	3	8.6	0.016	4.8	LOS A	0.1	0.5	0.22	0.49	0.22	47.7
6	R2	All MCs	14	8.6	14	8.6	0.016	5.4	LOS A	0.1	0.5	0.22	0.49	0.22	44.4
Approach			17	8.6	17	8.6	0.016	5.3	LOS A	0.1	0.5	0.22	0.49	0.22	45.2
West: University Bvd															
7	L2	All MCs	8	11.6	8	11.6	0.026	4.7	LOS A	0.0	0.0	0.00	0.10	0.00	46.5
8	T1	All MCs	38	11.6	38	11.6	0.026	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	49.3
Approach			46	11.6	46	11.6	0.026	0.9	NA	0.0	0.0	0.00	0.10	0.00	48.9
All Vehicles			160	10.9	160	10.9	0.049	1.0	NA	0.1	0.5	0.03	0.10	0.03	49.0

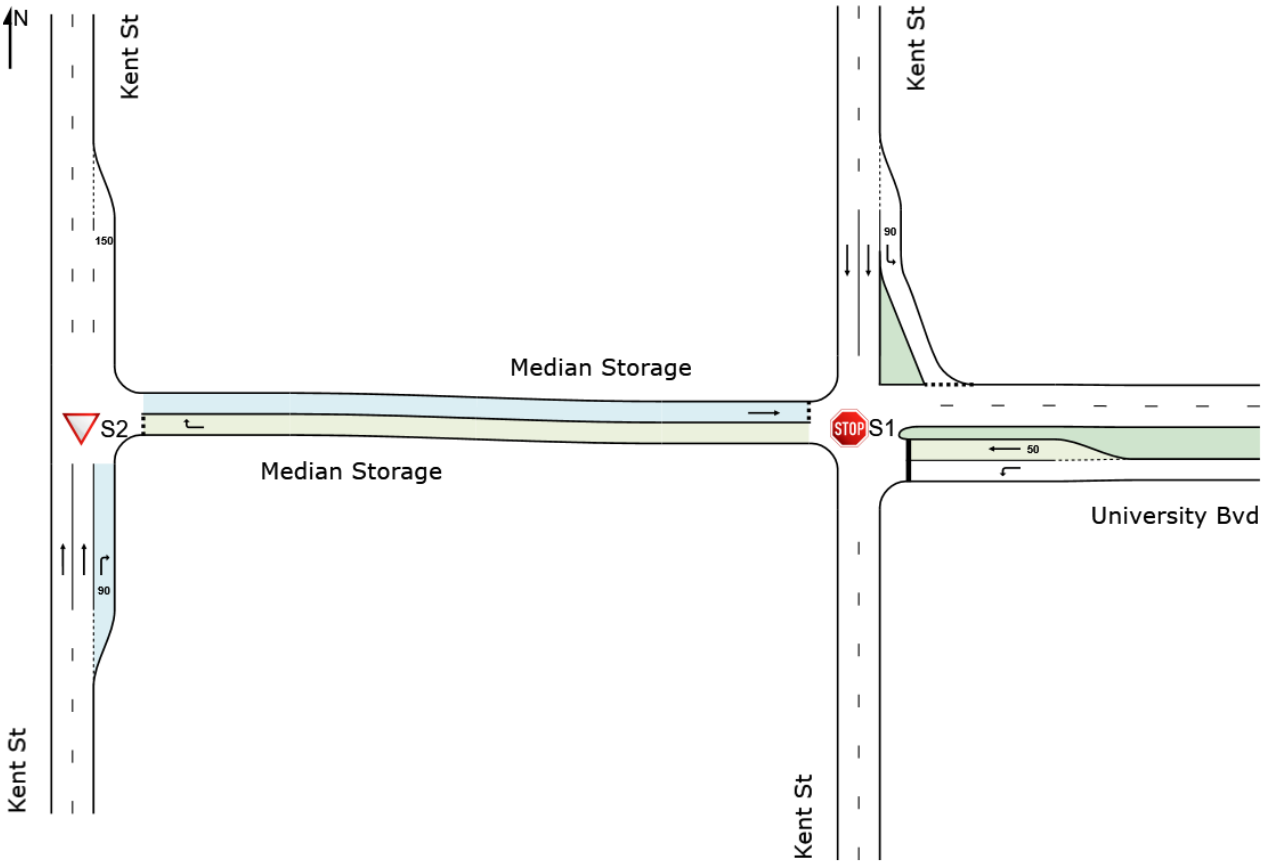
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

NETWORK LAYOUT

Network: N101 [AM_Kent St / University Bvd (Network Folder: 2029+DEV)]

New Network
Network Category: (None)

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



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
S1	NA	Kent St / University Bvd
S2	NA	Kent St / Univeristy Bvd

MOVEMENT SUMMARY

Site: S1 [Kent St / University Bvd (Site Folder: 2029 +DEV_AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [AM_Kent St / University Bvd (Network Folder: 2029+DEV)]

Type A Two-Stage T-Intersection Crossing
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: University Bvd															
1	L2	All MCs	65	22.8	65	22.8	0.077	10.4	LOS B	0.3	2.5	0.44	0.91	0.44	42.2
2	T1	All MCs	43	22.8	43	22.8	0.125	16.8	LOS C	0.4	3.1	0.69	1.02	0.69	22.5
Approach			108	22.8	108	22.8	0.125	13.0	LOS B	0.4	3.1	0.54	0.96	0.54	37.6
North: Kent St															
3	L2	All MCs	143	4.3	143	4.3	0.119	7.3	LOS A	0.5	3.6	0.28	0.58	0.28	47.4
4	T1	All MCs	687	4.3	687	4.3	0.181	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
Approach			831	4.3	831	4.3	0.181	1.3	LOS A	0.5	3.6	0.05	0.10	0.05	66.4
West: Median Storage															
5	T1	All MCs	156	3.0	156	3.0	0.207	3.4	LOS A	0.8	5.4	0.56	0.54	0.56	30.6
Approach			156	3.0	156	3.0	0.207	3.4	LOS A	0.8	5.4	0.56	0.54	0.56	30.6
All Vehicles			1095	5.9	1095	5.9	0.207	2.7	NA	0.8	5.4	0.17	0.25	0.17	60.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: S2 [Kent St / Univeristy Bvd (Site Folder: 2029 +DEV_AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [AM_Kent St / University Bvd (Network Folder: 2029+DEV)]

Type A Two-Stage T-Intersection Crossing
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kent St															
2	T1	All MCs	875	3.0	875	3.0	0.229	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
3	R2	All MCs	156	3.0	156	3.0	0.086	6.4	LOS A	0.0	0.0	0.00	0.66	0.00	56.4
Approach			1031	3.0	1031	3.0	0.229	1.0	NA	0.0	0.0	0.00	0.10	0.00	68.3
East: Median Storage															
1	R2	All MCs	43	22.8	43	22.8	0.132	12.1	LOS B	0.4	3.5	0.73	0.79	0.73	32.1
Approach			43	22.8	43	22.8	0.132	12.1	LOS B	0.4	3.5	0.73	0.79	0.73	32.1
All Vehicles			1074	3.8	1074	3.8	0.229	1.5	NA	0.4	3.5	0.03	0.13	0.03	66.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: S1 [Kent St / University Bvd (Site Folder: 2029 +DEV_PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [PM_Kent St / University Bvd (Network Folder: 2029+DEV)]

Type A Two-Stage T-Intersection Crossing
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: University Bvd															
1	L2	All MCs	276	15.9	276	15.9	0.387	13.0	LOS B	2.1	16.5	0.62	1.04	0.80	42.0
2	T1	All MCs	124	15.9	124	15.9	0.526	25.4	LOS D	1.8	14.0	0.86	1.13	1.26	17.0
Approach			400	15.9	400	15.9	0.526	16.8	LOS C	2.1	16.5	0.69	1.07	0.94	36.6
North: Kent St															
3	L2	All MCs	125	2.7	125	2.7	0.094	6.9	LOS A	0.4	2.8	0.17	0.55	0.17	48.2
4	T1	All MCs	991	2.7	991	2.7	0.258	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.8
Approach			1116	2.7	1116	2.7	0.258	0.8	LOS A	0.4	2.8	0.02	0.06	0.02	67.7
West: Median Storage															
5	T1	All MCs	68	1.6	68	1.6	0.130	5.6	LOS A	0.4	3.1	0.67	0.67	0.67	27.7
Approach			68	1.6	68	1.6	0.130	5.6	LOS A	0.4	3.1	0.67	0.67	0.67	27.7
All Vehicles			1584	6.0	1584	6.0	0.526	5.1	NA	2.1	16.5	0.22	0.34	0.28	58.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: S2 [Kent St / Univeristy Bvd (Site Folder: 2029 +DEV_PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [PM_Kent St / University Bvd (Network Folder: 2029+DEV)]

Type A Two-Stage T-Intersection Crossing
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kent St															
2	T1	All MCs	712	1.6	712	1.6	0.184	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
3	R2	All MCs	68	1.6	68	1.6	0.037	6.4	LOS A	0.0	0.0	0.00	0.66	0.00	56.4
Approach			780	1.6	780	1.6	0.184	0.6	NA	0.0	0.0	0.00	0.06	0.00	69.0
East: Median Storage															
1	R2	All MCs	124	15.9	124	15.9	0.260	8.8	LOS A	1.0	8.2	0.66	0.80	0.74	36.2
Approach			124	15.9	124	15.9	0.260	8.8	LOS A	1.0	8.2	0.66	0.80	0.74	36.2
All Vehicles			904	3.5	904	3.5	0.260	1.7	NA	1.0	8.2	0.09	0.16	0.10	65.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: S1 [Kent St / University Bvd (Site Folder: 2029 +DEV_SAT)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [SAT_Kent St / University Bvd (Network Folder: 2029+DEV)]

Type A Two-Stage T-Intersection Crossing
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: University Bvd															
1	L2	All MCs	93	20.4	93	20.4	0.092	9.5	LOS A	0.4	3.0	0.36	0.90	0.36	43.3
2	T1	All MCs	22	20.4	22	20.4	0.040	12.0	LOS B	0.1	1.0	0.51	0.97	0.51	26.8
Approach			115	20.4	115	20.4	0.092	10.0	LOS A	0.4	3.0	0.39	0.91	0.39	41.9
North: Kent St															
3	L2	All MCs	28	2.1	28	2.1	0.023	7.1	LOS A	0.1	0.6	0.25	0.55	0.25	47.8
4	T1	All MCs	459	2.1	459	2.1	0.119	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
Approach			487	2.1	487	2.1	0.119	0.4	LOS A	0.1	0.6	0.01	0.03	0.01	68.8
West: Median Storage															
5	T1	All MCs	146	1.6	146	1.6	0.148	1.8	LOS A	0.6	3.9	0.45	0.37	0.45	33.5
Approach			146	1.6	146	1.6	0.148	1.8	LOS A	0.6	3.9	0.45	0.37	0.45	33.5
All Vehicles			748	4.8	748	4.8	0.148	2.2	NA	0.6	3.9	0.16	0.23	0.16	60.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: S2 [Kent St / Univeristy Bvd (Site Folder: 2029 +DEV_SAT)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [SAT_Kent St / University Bvd (Network Folder: 2029+DEV)]

Type A Two-Stage T-Intersection Crossing
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kent St															
2	T1	All MCs	496	1.6	496	1.6	0.128	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
3	R2	All MCs	146	1.6	146	1.6	0.080	6.4	LOS A	0.0	0.0	0.00	0.66	0.00	56.4
Approach			642	1.6	642	1.6	0.128	1.5	NA	0.0	0.0	0.00	0.15	0.00	67.5
East: Median Storage															
1	R2	All MCs	22	20.4	22	20.4	0.034	4.8	LOS A	0.1	1.0	0.51	0.51	0.51	39.0
Approach			22	20.4	22	20.4	0.034	4.8	LOS A	0.1	1.0	0.51	0.51	0.51	39.0
All Vehicles			664	2.3	664	2.3	0.128	1.6	NA	0.1	1.0	0.02	0.16	0.02	66.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

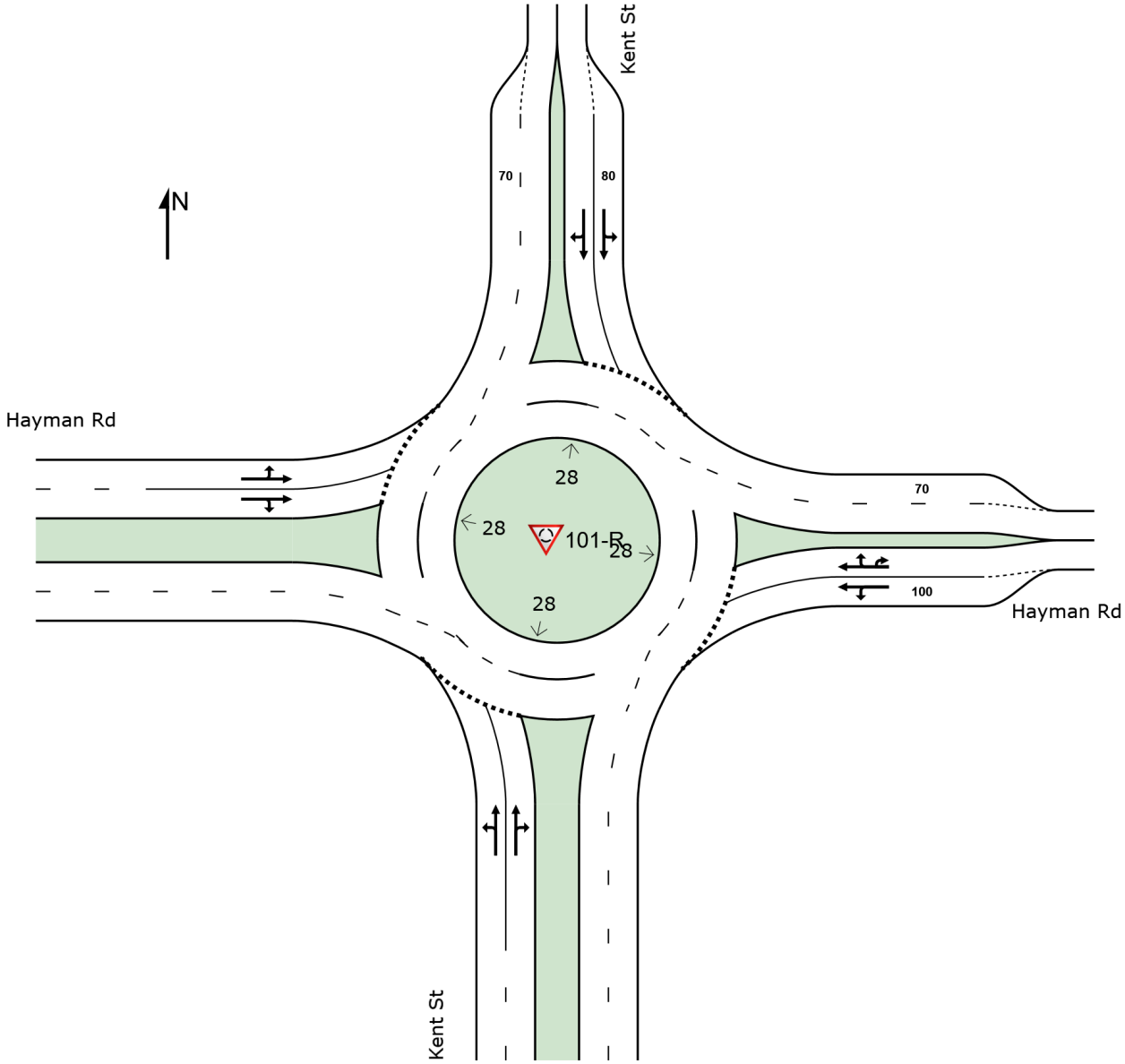
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: 101-R [Hayman Rd / Kent St (Site Folder: 2039 +DEV_AM)]

NA
Site Category: (None)
Roundabout

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



MOVEMENT SUMMARY

Site: 101-R [Hayman Rd / Kent St (Site Folder: 2039 +DEV_AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kent St															
1	L2	All MCs	523	4.4	523	4.4	0.529	7.8	LOS A	3.5	26.9	0.71	0.77	0.80	55.5
2	T1	All MCs	353	4.4	353	4.4	0.538	8.8	LOS A	3.5	26.7	0.72	0.80	0.85	51.0
3	R2	All MCs	99	4.4	99	4.4	0.538	14.4	LOS B	3.5	26.7	0.72	0.80	0.85	47.3
Approach			975	4.4	975	4.4	0.538	8.9	LOS A	3.5	26.9	0.72	0.78	0.82	53.1
East: Hayman Rd															
4	L2	All MCs	63	3.8	63	3.8	0.385	7.3	LOS A	2.3	17.2	0.77	0.74	0.81	48.7
5	T1	All MCs	409	3.9	409	3.9	0.385	7.7	LOS A	2.3	17.2	0.77	0.77	0.81	51.4
6	R2	All MCs	67	3.9	67	3.9	0.385	13.8	LOS B	2.1	16.1	0.76	0.83	0.83	46.1
6u	U	All MCs	15	3.8	15	3.8	0.385	16.1	LOS B	2.1	16.1	0.76	0.83	0.83	41.5
Approach			555	3.9	555	3.9	0.385	8.6	LOS A	2.3	17.2	0.77	0.78	0.82	50.2
North: Kent St															
7	L2	All MCs	76	2.9	76	2.9	0.599	13.8	LOS B	5.1	38.8	0.96	0.95	1.24	45.8
8	T1	All MCs	403	2.9	403	2.9	0.599	12.8	LOS B	5.1	38.8	0.95	0.96	1.23	48.4
9	R2	All MCs	179	2.9	179	2.9	0.599	19.6	LOS B	4.6	34.5	0.93	0.99	1.23	47.3
Approach			658	2.9	658	2.9	0.599	14.7	LOS B	5.1	38.8	0.95	0.97	1.23	47.8
West: Hayman Rd															
10	L2	All MCs	192	1.8	192	1.8	0.485	10.2	LOS B	3.4	25.2	0.75	0.74	0.83	53.9
11	T1	All MCs	609	1.8	609	1.8	0.883	16.0	LOS B	17.2	129.1	0.93	1.02	1.47	46.0
12	R2	All MCs	445	1.8	445	1.8	0.883	23.5	LOS C	17.2	129.1	1.00	1.13	1.72	46.3
Approach			1246	1.8	1246	1.8	0.883	17.8	LOS B	17.2	129.1	0.93	1.02	1.46	47.4
All Vehicles			3434	3.1	3434	3.1	0.883	13.2	LOS B	17.2	129.1	0.84	0.90	1.13	49.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101-R [Hayman Rd / Kent St (Site Folder: 2039 +DEV_PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kent St															
1	L2	All MCs	512	2.6	512	2.6	0.596	8.9	LOS A	4.3	32.6	0.82	0.87	0.99	55.2
2	T1	All MCs	337	2.6	337	2.6	0.575	10.1	LOS B	3.8	28.6	0.81	0.88	0.99	51.2
3	R2	All MCs	62	2.6	62	2.6	0.575	15.7	LOS B	3.8	28.6	0.81	0.88	0.99	47.2
Approach			911	2.6	911	2.6	0.596	9.8	LOS A	4.3	32.6	0.81	0.88	0.99	53.2
East: Hayman Rd															
4	L2	All MCs	103	2.9	103	2.9	0.653	11.2	LOS B	5.4	40.8	0.89	0.97	1.23	46.2
5	T1	All MCs	619	2.9	619	2.9	0.653	11.8	LOS B	5.4	40.8	0.89	0.99	1.23	48.4
6	R2	All MCs	28	2.9	28	2.9	0.653	18.4	LOS B	4.8	36.6	0.88	1.02	1.24	42.8
6u	U	All MCs	117	2.9	117	2.9	0.653	20.7	LOS C	4.8	36.6	0.88	1.02	1.24	37.4
Approach			867	2.9	867	2.9	0.653	13.2	LOS B	5.4	40.8	0.89	0.99	1.23	46.7
North: Kent St															
7	L2	All MCs	65	1.8	65	1.8	0.583	11.9	LOS B	4.9	36.8	0.91	0.91	1.16	47.0
8	T1	All MCs	545	1.8	545	1.8	0.583	11.4	LOS B	4.9	36.8	0.91	0.93	1.16	49.7
9	R2	All MCs	139	1.8	139	1.8	0.583	17.8	LOS B	4.4	33.2	0.90	0.95	1.17	49.2
Approach			749	1.8	749	1.8	0.583	12.6	LOS B	4.9	36.8	0.91	0.93	1.16	49.4
West: Hayman Rd															
10	L2	All MCs	169	1.0	169	1.0	0.408	9.2	LOS A	2.5	18.6	0.71	0.70	0.72	54.6
11	T1	All MCs	381	1.0	381	1.0	0.744	11.1	LOS B	9.4	69.5	0.84	0.82	1.04	49.7
12	R2	All MCs	500	1.0	500	1.0	0.744	17.5	LOS B	9.4	69.5	0.91	0.89	1.22	50.0
Approach			1051	1.0	1051	1.0	0.744	13.8	LOS B	9.4	69.5	0.85	0.83	1.07	50.7
All Vehicles			3578	2.0	3578	2.0	0.744	12.4	LOS B	9.4	69.5	0.86	0.90	1.11	50.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101-R [Hayman Rd / Kent St (Site Folder: 2039 +DEV_SAT)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kent St															
1	L2	All MCs	289	2.1	289	2.1	0.236	5.8	LOS A	1.1	8.2	0.42	0.57	0.42	57.7
2	T1	All MCs	244	2.1	244	2.1	0.250	6.2	LOS A	1.2	8.7	0.43	0.56	0.43	53.6
3	R2	All MCs	35	2.1	35	2.1	0.250	11.7	LOS B	1.2	8.7	0.43	0.56	0.43	50.2
Approach			568	2.1	568	2.1	0.250	6.3	LOS A	1.2	8.7	0.42	0.56	0.42	55.5
East: Hayman Rd															
4	L2	All MCs	34	3.0	34	3.0	0.123	5.3	LOS A	0.5	4.0	0.49	0.54	0.49	50.9
5	T1	All MCs	183	3.0	183	3.0	0.123	5.4	LOS A	0.5	4.0	0.50	0.57	0.50	53.4
6	R2	All MCs	3	3.0	3	3.0	0.123	11.1	LOS B	0.5	3.9	0.51	0.62	0.51	47.9
6u	U	All MCs	27	3.0	27	3.0	0.123	13.4	LOS B	0.5	3.9	0.51	0.62	0.51	43.7
Approach			247	3.0	247	3.0	0.123	6.4	LOS A	0.5	4.0	0.50	0.57	0.50	52.1
North: Kent St															
7	L2	All MCs	15	2.0	15	2.0	0.183	5.6	LOS A	0.9	6.6	0.49	0.51	0.49	50.6
8	T1	All MCs	261	2.0	261	2.0	0.183	5.2	LOS A	0.9	6.6	0.49	0.55	0.49	53.6
9	R2	All MCs	114	2.0	114	2.0	0.183	10.9	LOS B	0.9	6.4	0.50	0.65	0.50	52.7
Approach			389	2.0	389	2.0	0.183	6.9	LOS A	0.9	6.6	0.50	0.57	0.50	53.2
West: Hayman Rd															
10	L2	All MCs	97	1.1	97	1.1	0.161	6.7	LOS A	0.8	5.7	0.45	0.56	0.45	56.0
11	T1	All MCs	186	1.1	186	1.1	0.293	6.4	LOS A	1.6	12.2	0.46	0.61	0.46	53.2
12	R2	All MCs	226	1.1	226	1.1	0.293	11.8	LOS B	1.6	12.2	0.47	0.63	0.47	54.1
Approach			509	1.1	509	1.1	0.293	8.8	LOS A	1.6	12.2	0.46	0.61	0.46	54.2
All Vehicles			1715	1.9	1715	1.9	0.293	7.2	LOS A	1.6	12.2	0.46	0.58	0.46	54.1

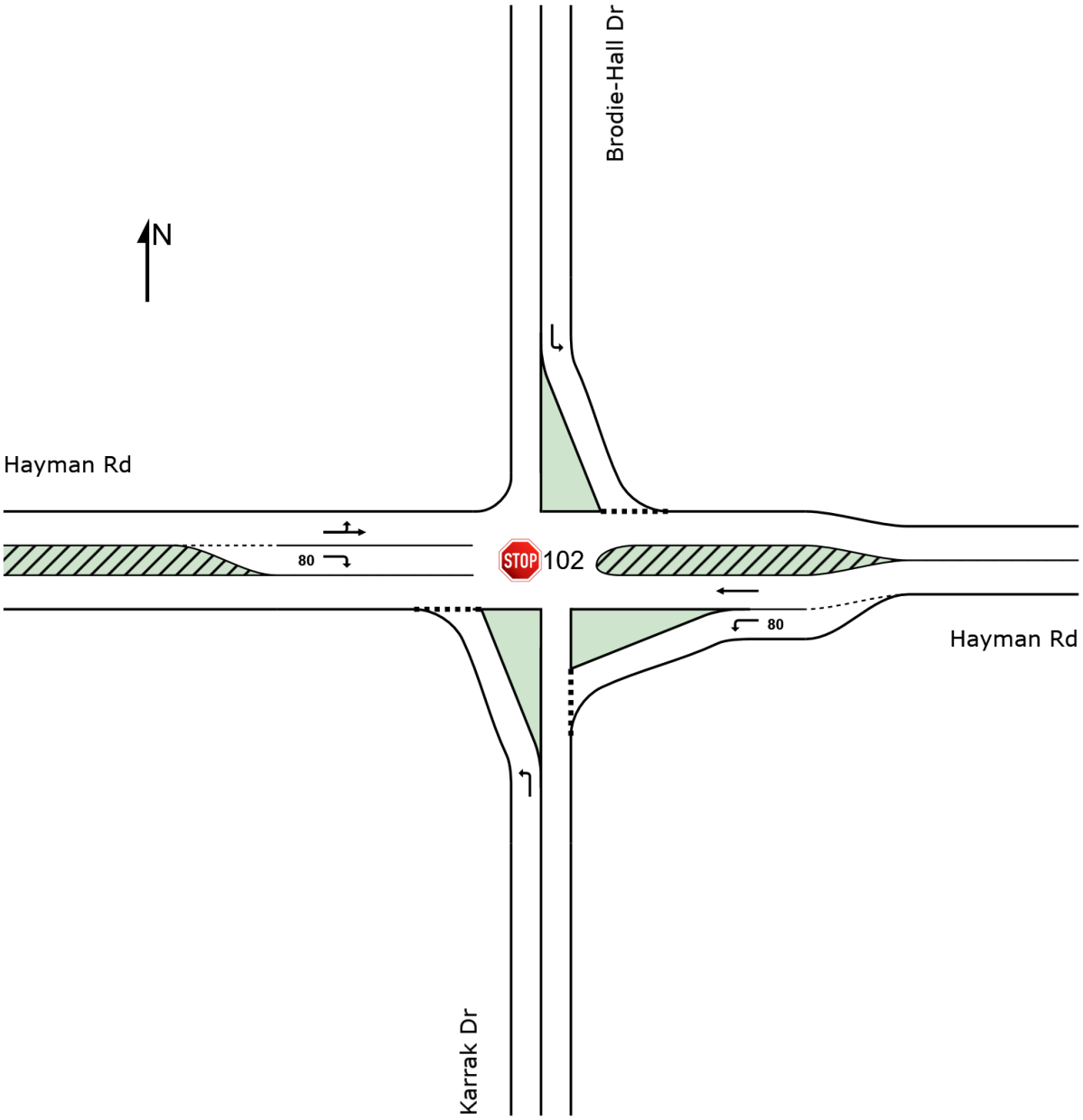
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: 102 [Hayman Rd / Karrak Dr / Brodie-Hall Dr (Site Folder: 2039+DEV_AM)]

NA
Site Category: (None)
Stop (Two-Way)

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



MOVEMENT SUMMARY

Site: 102 [Hayman Rd / Karrak Dr / Brodie-Hall Dr (Site Folder: 2039+DEV_AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Karrak Dr															
1	L2	All MCs	28	5.3	28	5.3	0.031	6.8	LOS A	0.1	0.8	0.49	0.63	0.49	44.2
Approach			28	5.3	28	5.3	0.031	6.8	LOS A	0.1	0.8	0.49	0.63	0.49	44.2
East: Hayman Rd															
4	L2	All MCs	29	4.4	29	4.4	0.019	5.7	LOS A	0.1	0.5	0.10	0.52	0.10	47.4
5	T1	All MCs	526	4.4	526	4.4	0.268	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			556	4.4	556	4.4	0.268	0.4	LOS A	0.1	0.5	0.01	0.03	0.01	58.6
North: Brodie-Hall Dr															
7	L2	All MCs	14	5.3	14	5.3	0.020	8.1	LOS A	0.1	0.5	0.56	0.68	0.56	45.1
Approach			14	5.3	14	5.3	0.020	8.1	LOS A	0.1	0.5	0.56	0.68	0.56	45.1
West: Hayman Rd															
10	L2	All MCs	68	3.9	68	3.9	0.390	5.6	LOS A	0.0	0.0	0.00	0.05	0.00	55.6
11	T1	All MCs	698	3.9	698	3.9	0.390	0.1	LOS A	0.0	0.0	0.00	0.05	0.00	58.9
12	R2	All MCs	32	3.9	32	3.9	0.032	7.8	LOS A	0.1	0.9	0.52	0.67	0.52	44.0
Approach			798	3.9	798	3.9	0.390	0.8	NA	0.1	0.9	0.02	0.08	0.02	57.5
All Vehicles			1396	4.1	1396	4.1	0.390	0.8	NA	0.1	0.9	0.03	0.07	0.03	57.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 102 [Hayman Rd / Karrak Dr / Brodie-Hall Dr (Site Folder: 2039+DEV_PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Karrak Dr															
1	L2	All MCs	248	2.7	248	2.7	0.303	8.3	LOS A	1.4	9.8	0.60	0.81	0.69	43.3
Approach			248	2.7	248	2.7	0.303	8.3	LOS A	1.4	9.8	0.60	0.81	0.69	43.3
East: Hayman Rd															
4	L2	All MCs	122	3.3	122	3.3	0.084	6.0	LOS A	0.3	2.5	0.22	0.53	0.22	47.0
5	T1	All MCs	618	3.3	618	3.3	0.312	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach			740	3.3	740	3.3	0.312	1.0	LOS A	0.3	2.5	0.04	0.09	0.04	56.3
North: Brodie-Hall Dr															
7	L2	All MCs	208	2.7	208	2.7	0.217	6.9	LOS A	0.9	6.3	0.53	0.70	0.53	46.0
Approach			208	2.7	208	2.7	0.217	6.9	LOS A	0.9	6.3	0.53	0.70	0.53	46.0
West: Hayman Rd															
10	L2	All MCs	1	2.9	1	2.9	0.254	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	56.3
11	T1	All MCs	502	2.9	502	2.9	0.254	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
12	R2	All MCs	122	2.9	122	2.9	0.138	8.6	LOS A	0.6	4.1	0.58	0.78	0.58	43.4
Approach			625	2.9	625	2.9	0.254	1.7	NA	0.6	4.1	0.11	0.15	0.11	54.9
All Vehicles			1822	3.0	1822	3.0	0.312	2.9	NA	1.4	9.8	0.20	0.28	0.21	51.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 102 [Hayman Rd / Karrak Dr / Brodie-Hall Dr (Site Folder: 2039+DEV_SAT)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Karrak Dr															
1	L2	All MCs	55	1.3	55	1.3	0.040	5.1	LOS A	0.2	1.1	0.28	0.50	0.28	45.3
Approach			55	1.3	55	1.3	0.040	5.1	LOS A	0.2	1.1	0.28	0.50	0.28	45.3
East: Hayman Rd															
4	L2	All MCs	27	3.0	27	3.0	0.017	5.7	LOS A	0.1	0.5	0.09	0.52	0.09	47.4
5	T1	All MCs	193	3.0	193	3.0	0.097	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			220	3.0	220	3.0	0.097	0.7	LOS A	0.1	0.5	0.01	0.06	0.01	57.3
North: Brodie-Hall Dr															
7	L2	All MCs	27	1.3	27	1.3	0.021	5.2	LOS A	0.1	0.6	0.31	0.50	0.31	46.8
Approach			27	1.3	27	1.3	0.021	5.2	LOS A	0.1	0.6	0.31	0.50	0.31	46.8
West: Hayman Rd															
10	L2	All MCs	7	3.0	7	3.0	0.119	5.6	LOS A	0.0	0.0	0.00	0.02	0.00	56.1
11	T1	All MCs	228	3.0	228	3.0	0.119	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.6
12	R2	All MCs	27	3.0	27	3.0	0.018	6.1	LOS A	0.1	0.6	0.30	0.55	0.30	44.9
Approach			263	3.0	263	3.0	0.119	0.8	NA	0.1	0.6	0.03	0.07	0.03	57.1
All Vehicles			565	2.8	565	2.8	0.119	1.4	NA	0.2	1.1	0.06	0.13	0.06	54.7

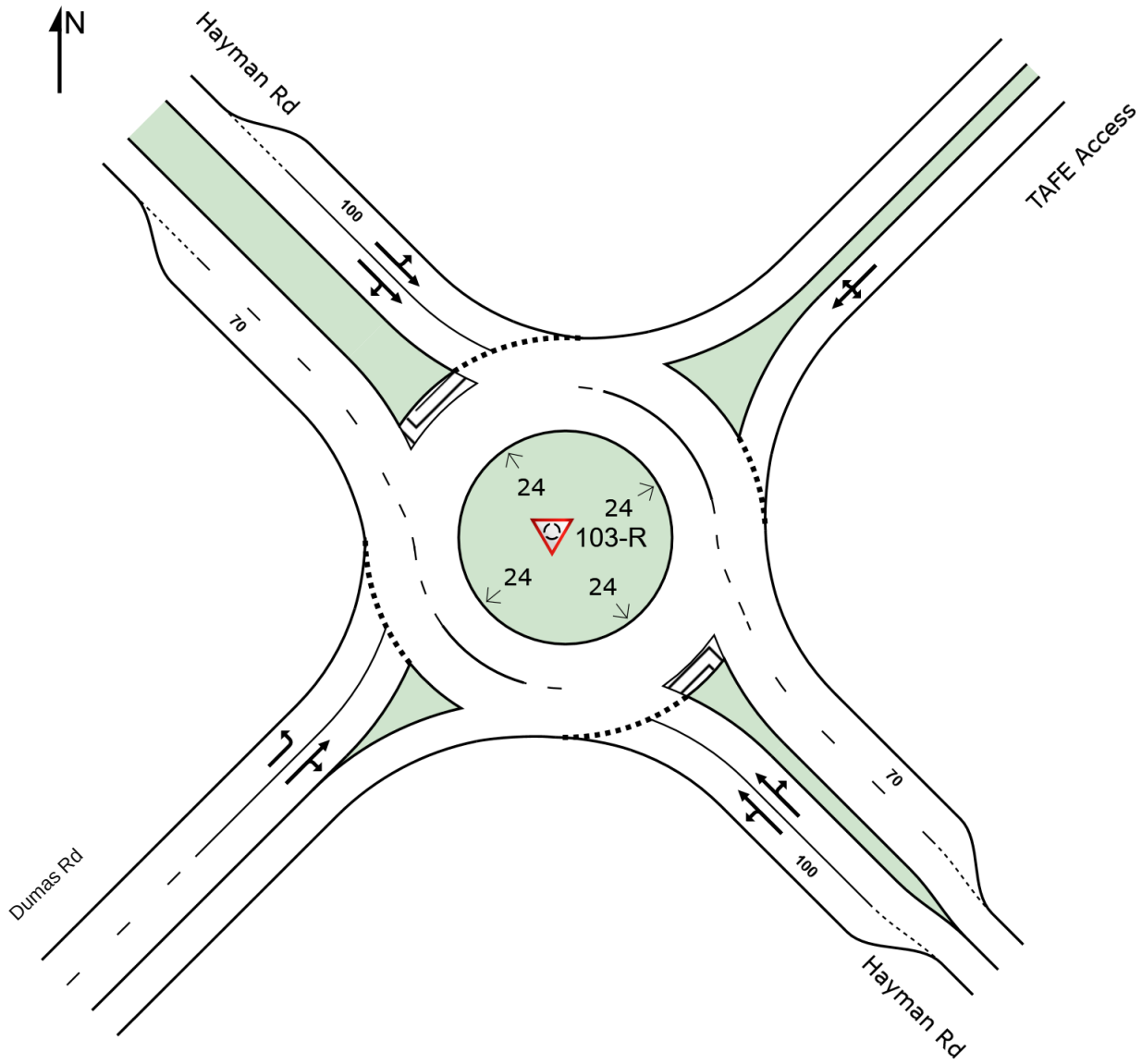
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: 103-R [Hayman Rd / Dumas Rd (Site Folder: 2039 +DEV_AM)]

NA
Site Category: (None)
Roundabout

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



MOVEMENT SUMMARY

Site: 103-R [Hayman Rd / Dumas Rd (Site Folder: 2039 +DEV_AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Hayman Rd															
4	L2	All MCs	2	3.0	2	3.0	0.187	4.2	LOS A	1.0	7.8	0.19	0.37	0.19	49.9
5	T1	All MCs	720	3.0	720	3.0	0.364	4.5	LOS A	2.5	18.9	0.19	0.41	0.19	52.6
6	R2	All MCs	123	3.0	123	3.0	0.364	9.1	LOS A	2.5	18.9	0.20	0.43	0.20	49.3
Approach			845	3.0	845	3.0	0.364	5.2	LOS A	2.5	18.9	0.19	0.41	0.19	52.0
NorthEast: TAFE Access															
7	L2	All MCs	21	0.0	21	0.0	0.046	5.5	LOS A	0.2	1.4	0.49	0.63	0.49	48.5
8	T1	All MCs	1	0.0	1	0.0	0.046	4.4	LOS A	0.2	1.4	0.49	0.63	0.49	44.1
9	R2	All MCs	18	0.0	18	0.0	0.046	9.4	LOS A	0.2	1.4	0.49	0.63	0.49	46.2
Approach			40	0.0	40	0.0	0.046	7.2	LOS A	0.2	1.4	0.49	0.63	0.49	47.4
NorthWest: Hayman Rd															
10	L2	All MCs	74	4.4	74	4.4	0.159	4.7	LOS A	0.8	6.5	0.32	0.45	0.32	48.1
11	T1	All MCs	544	4.4	544	4.4	0.310	4.7	LOS A	2.0	15.0	0.32	0.43	0.32	51.6
12	R2	All MCs	27	4.4	27	4.4	0.310	9.5	LOS A	2.0	15.0	0.32	0.42	0.32	45.8
Approach			645	4.4	645	4.4	0.310	4.9	LOS A	2.0	15.0	0.32	0.43	0.32	51.0
SouthWest: Duams Rd															
1	L2	All MCs	27	31.3	27	31.3	0.035	7.3	LOS A	0.1	1.3	0.55	0.62	0.55	39.7
2	T1	All MCs	1	31.3	1	31.3	0.005	7.8	LOS A	0.0	0.2	0.58	0.62	0.58	41.7
3	R2	All MCs	1	31.3	1	31.3	0.005	12.9	LOS B	0.0	0.2	0.58	0.62	0.58	37.7
Approach			29	31.3	29	31.3	0.035	7.5	LOS A	0.1	1.3	0.55	0.62	0.55	39.7
All Vehicles			1560	4.0	1560	4.0	0.364	5.2	LOS A	2.5	18.9	0.26	0.43	0.26	51.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 103-R [Hayman Rd / Dumas Rd (Site Folder: 2039 +DEV_PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Hayman Rd															
4	L2	All MCs	1	2.7	1	2.7	0.110	4.3	LOS A	0.6	4.4	0.21	0.38	0.21	49.8
5	T1	All MCs	477	2.7	477	2.7	0.214	4.4	LOS A	1.3	9.8	0.21	0.38	0.21	53.1
6	R2	All MCs	1	2.7	1	2.7	0.214	9.2	LOS A	1.3	9.8	0.21	0.37	0.21	49.8
Approach			479	2.7	479	2.7	0.214	4.4	LOS A	1.3	9.8	0.21	0.38	0.21	53.0
NorthEast: TAFE Access															
7	L2	All MCs	31	0.0	31	0.0	0.086	6.8	LOS A	0.3	2.5	0.54	0.70	0.54	47.8
8	T1	All MCs	1	0.0	1	0.0	0.086	5.2	LOS A	0.3	2.5	0.54	0.70	0.54	43.4
9	R2	All MCs	39	0.0	39	0.0	0.086	10.1	LOS B	0.3	2.5	0.54	0.70	0.54	45.5
Approach			71	0.0	71	0.0	0.086	8.6	LOS A	0.3	2.5	0.54	0.70	0.54	46.5
NorthWest: Hayman Rd															
10	L2	All MCs	1	3.3	1	3.3	0.165	4.0	LOS A	1.0	7.4	0.08	0.37	0.08	49.1
11	T1	All MCs	775	3.3	775	3.3	0.321	4.3	LOS A	2.3	17.6	0.09	0.37	0.09	53.2
12	R2	All MCs	22	3.3	22	3.3	0.321	9.0	LOS A	2.3	17.6	0.09	0.38	0.09	47.5
Approach			798	3.3	798	3.3	0.321	4.4	LOS A	2.3	17.6	0.09	0.37	0.09	53.1
SouthWest: Duams Rd															
1	L2	All MCs	89	11.7	89	11.7	0.086	5.4	LOS A	0.3	2.8	0.45	0.54	0.45	44.3
2	T1	All MCs	1	11.7	1	11.7	0.015	5.4	LOS A	0.1	0.4	0.49	0.65	0.49	42.2
3	R2	All MCs	8	11.7	8	11.7	0.015	10.4	LOS B	0.1	0.4	0.49	0.65	0.49	42.2
Approach			99	11.7	99	11.7	0.086	5.8	LOS A	0.3	2.8	0.45	0.55	0.45	44.1
All Vehicles			1446	3.5	1446	3.5	0.321	4.7	LOS A	2.3	17.6	0.17	0.40	0.17	52.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 103-R [Hayman Rd / Dumas Rd (Site Folder: 2039 +DEV_SAT)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Hayman Rd															
4	L2	All MCs	1	2.8	1	2.8	0.044	4.0	LOS A	0.2	1.7	0.04	0.37	0.04	50.8
5	T1	All MCs	213	2.8	213	2.8	0.086	3.9	LOS A	0.4	3.4	0.04	0.37	0.04	54.0
6	R2	All MCs	1	2.8	1	2.8	0.086	8.9	LOS A	0.4	3.4	0.04	0.37	0.04	50.5
Approach			215	2.8	215	2.8	0.086	4.0	LOS A	0.4	3.4	0.04	0.37	0.04	54.0
NorthEast: TAFE Access															
7	L2	All MCs	1	0.0	1	0.0	0.004	3.7	LOS A	0.0	0.1	0.30	0.49	0.30	48.9
8	T1	All MCs	1	0.0	1	0.0	0.004	3.2	LOS A	0.0	0.1	0.30	0.49	0.30	44.6
9	R2	All MCs	2	0.0	2	0.0	0.004	8.2	LOS A	0.0	0.1	0.30	0.49	0.30	46.6
Approach			4	0.0	4	0.0	0.004	5.8	LOS A	0.0	0.1	0.30	0.49	0.30	46.8
NorthWest: Hayman Rd															
10	L2	All MCs	3	3.0	3	3.0	0.051	4.0	LOS A	0.3	1.9	0.03	0.38	0.03	49.4
11	T1	All MCs	246	3.0	246	3.0	0.100	4.0	LOS A	0.5	4.0	0.03	0.37	0.03	53.7
12	R2	All MCs	1	3.0	1	3.0	0.100	8.9	LOS A	0.5	4.0	0.03	0.37	0.03	48.1
Approach			251	3.0	251	3.0	0.100	4.0	LOS A	0.5	4.0	0.03	0.37	0.03	53.6
SouthWest: Duams Rd															
1	L2	All MCs	5	16.7	5	16.7	0.004	3.9	LOS A	0.0	0.1	0.28	0.40	0.28	44.0
2	T1	All MCs	1	16.7	1	16.7	0.002	3.6	LOS A	0.0	0.1	0.31	0.46	0.31	44.3
3	R2	All MCs	1	16.7	1	16.7	0.002	8.6	LOS A	0.0	0.1	0.31	0.46	0.31	43.1
Approach			7	16.7	7	16.7	0.004	4.5	LOS A	0.0	0.1	0.29	0.42	0.29	43.9
All Vehicles			477	3.1	477	3.1	0.100	4.0	LOS A	0.5	4.0	0.04	0.38	0.04	53.6

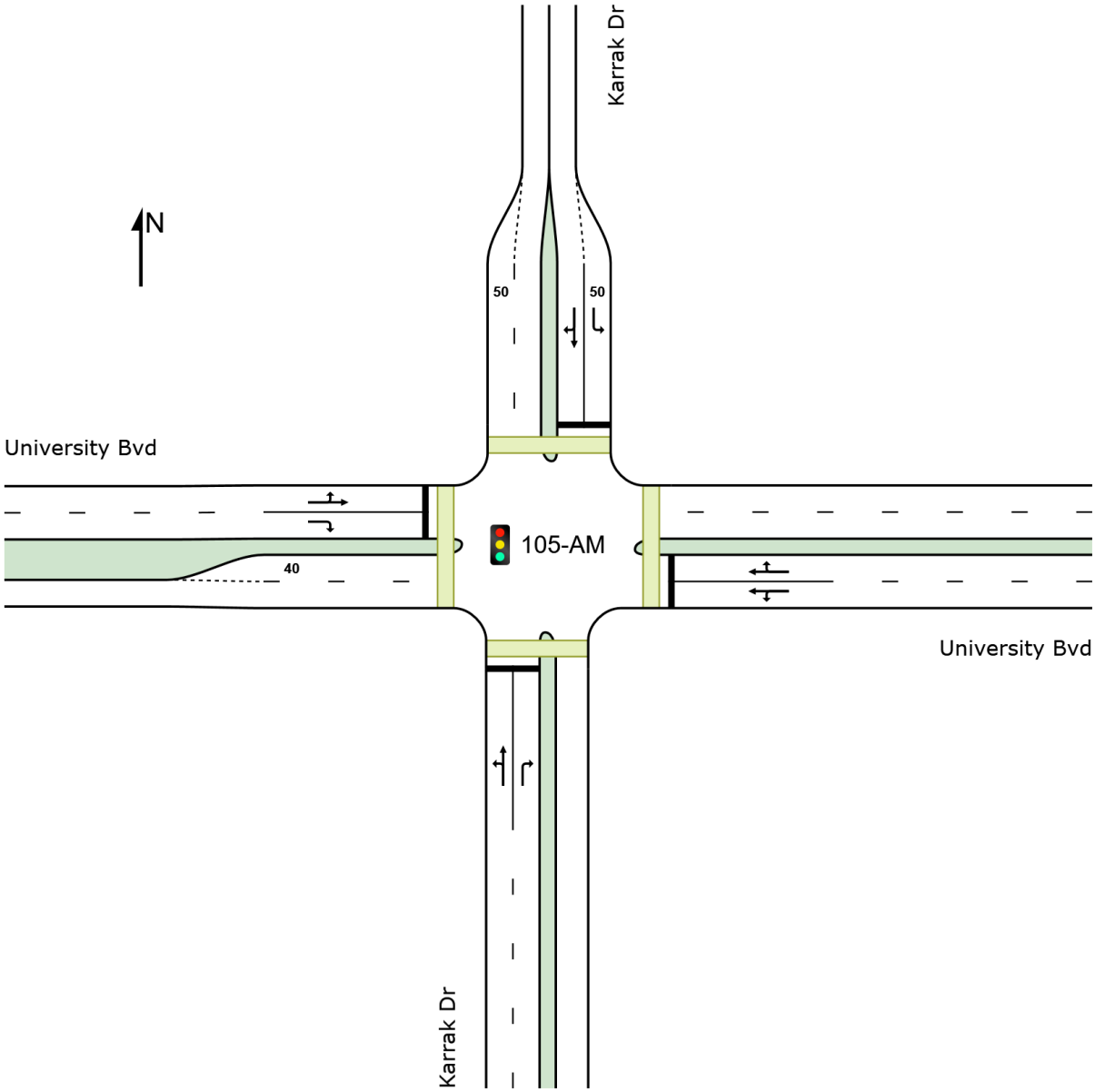
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: 105-AM [University Bvd / Karrak Dr (Site Folder: 2039 +DEV_AM)]

Four-way intersection with 2-lane approaches (Signals)
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



MOVEMENT SUMMARY

Site: 105-PM [University Bvd / Karrak Dr (Site Folder: 2039 +DEV_PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Four-way intersection with 2-lane approaches (Signals)
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 54 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Karrak Dr															
1	L2	All MCs	46	2.7	46	2.7	0.141	24.3	LOS C	1.2	8.5	0.85	0.71	0.85	32.5
2	T1	All MCs	6	2.7	6	2.7	*0.141	19.8	LOS B	1.2	8.5	0.85	0.71	0.85	37.8
3	R2	All MCs	24	100.0	24	100.0	0.110	25.6	LOS C	0.6	7.2	0.84	0.70	0.84	33.2
Approach			77	33.3	77	33.3	0.141	24.3	LOS C	1.2	8.5	0.85	0.71	0.85	33.3
East: University Bvd															
4	L2	All MCs	53	9.9	53	9.9	0.430	9.0	LOS A	5.7	43.3	0.79	0.69	0.79	38.8
5	T1	All MCs	240	9.9	240	9.9	*0.430	16.2	LOS B	5.7	43.3	0.79	0.69	0.79	34.5
6	R2	All MCs	39	9.9	39	9.9	0.126	20.9	LOS C	1.0	7.7	0.76	0.68	0.76	36.9
Approach			332	9.9	332	9.9	0.430	15.6	LOS B	5.7	43.3	0.79	0.69	0.79	35.8
North: Karrak Dr															
7	L2	All MCs	69	2.7	69	2.7	0.187	24.6	LOS C	1.6	11.3	0.86	0.73	0.86	34.5
8	T1	All MCs	5	2.7	5	2.7	*0.459	21.4	LOS C	4.2	29.8	0.92	0.78	0.92	37.0
9	R2	All MCs	165	2.7	165	2.7	0.459	26.6	LOS C	4.2	29.8	0.92	0.78	0.92	31.7
Approach			240	2.7	240	2.7	0.459	25.9	LOS C	4.2	29.8	0.91	0.77	0.91	32.7
West: University Bvd															
10	L2	All MCs	36	10.9	36	10.9	0.315	18.8	LOS B	3.9	30.2	0.77	0.66	0.77	36.9
11	T1	All MCs	164	10.9	164	10.9	0.315	14.1	LOS B	3.9	30.2	0.77	0.66	0.77	34.7
12	R2	All MCs	31	10.9	31	10.9	0.099	22.6	LOS C	0.7	5.0	0.81	0.70	0.81	33.2
Approach			231	10.9	231	10.9	0.315	15.9	LOS B	3.9	30.2	0.78	0.66	0.78	34.8
All Vehicles			879	10.3	879	10.3	0.459	19.3	LOS B	5.7	43.3	0.82	0.71	0.82	34.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Karrak Dr												
P1	Full	50	53	18.8	LOS B	0.1	0.1	0.84	0.84	172.6	200.0	1.16
East: University Bvd												

P2	Full	50	53	21.4	LOS C	0.1	0.1	0.89	0.89	175.2	200.0	1.14
North: Karrak Dr												
P3	Full	50	53	20.5	LOS C	0.1	0.1	0.87	0.87	174.3	200.0	1.15
West: University Bvd												
P4	Full	50	53	21.4	LOS C	0.1	0.1	0.89	0.89	175.2	200.0	1.14
All Pedestrians		200	211	20.5	LOS C	0.1	0.1	0.87	0.87	174.4	200.0	1.15

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: 105-SAT [University Bvd / Karrak Dr (Site Folder: 2039 +DEV_SAT)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Four-way intersection with 2-lane approaches (Signals)
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Karrak Dr															
1	L2	All MCs	15	1.3	15	1.3	0.086	37.9	LOS D	0.8	5.5	0.90	0.68	0.90	27.8
2	T1	All MCs	7	1.3	7	1.3	* 0.086	33.4	LOS C	0.8	5.5	0.90	0.68	0.90	33.4
3	R2	All MCs	9	100.0	9	100.0	0.064	39.5	LOS D	0.3	4.4	0.90	0.67	0.90	28.7
Approach			32	30.9	32	30.9	0.086	37.4	LOS D	0.8	5.5	0.90	0.68	0.90	29.6
East: University Bvd															
4	L2	All MCs	16	11.4	16	11.4	0.090	6.6	LOS A	1.6	12.0	0.45	0.41	0.45	42.7
5	T1	All MCs	80	11.4	80	11.4	0.090	8.2	LOS A	1.6	12.0	0.45	0.41	0.45	40.5
6	R2	All MCs	35	11.4	35	11.4	0.056	14.1	LOS B	0.6	5.0	0.50	0.64	0.50	39.3
Approach			131	11.4	131	11.4	0.090	9.6	LOS A	1.6	12.0	0.46	0.47	0.46	40.4
North: Karrak Dr															
7	L2	All MCs	11	1.3	11	1.3	0.046	38.6	LOS D	0.4	2.6	0.91	0.67	0.91	29.6
8	T1	All MCs	1	1.3	1	1.3	* 0.197	35.2	LOS D	1.7	11.7	0.93	0.73	0.93	32.4
9	R2	All MCs	44	1.3	44	1.3	0.197	39.9	LOS D	1.7	11.7	0.93	0.73	0.93	26.9
Approach			56	1.3	56	1.3	0.197	39.6	LOS D	1.7	11.7	0.93	0.72	0.93	27.5
West: University Bvd															
10	L2	All MCs	125	9.7	125	9.7	0.187	12.9	LOS B	3.5	26.5	0.49	0.59	0.49	39.2
11	T1	All MCs	69	9.7	69	9.7	* 0.187	8.2	LOS A	3.5	26.5	0.49	0.59	0.49	37.6
12	R2	All MCs	16	9.7	16	9.7	0.022	12.4	LOS B	0.3	2.0	0.45	0.61	0.45	38.6
Approach			211	9.7	211	9.7	0.187	11.3	LOS B	3.5	26.5	0.49	0.59	0.49	38.7
All Vehicles			428	10.7	428	10.7	0.197	16.4	LOS B	3.5	26.5	0.57	0.58	0.57	36.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Karrak Dr												
P1	Full	50	53	11.6	LOS B	0.1	0.1	0.54	0.54	165.4	200.0	1.21
East: University Bvd												

P2	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
North: Karrak Dr												
P3	Full	50	53	12.7	LOS B	0.1	0.1	0.56	0.56	166.5	200.0	1.20
West: University Bvd												
P4	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
All Pedestrians		200	211	23.2	LOS C	0.1	0.1	0.74	0.74	177.1	200.0	1.13

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: 105-AM [University Bvd / Karrak Dr (Site Folder: 2039 +DEV_AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Four-way intersection with 2-lane approaches (Signals)
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 79 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Karrak Dr															
1	L2	All MCs	37	5.3	37	5.3	0.248	38.6	LOS D	2.3	16.5	0.93	0.73	0.93	27.6
2	T1	All MCs	26	5.3	26	5.3	* 0.248	34.2	LOS C	2.3	16.5	0.93	0.73	0.93	33.3
3	R2	All MCs	34	100.0	34	100.0	0.223	40.3	LOS D	1.2	16.1	0.92	0.73	0.92	28.5
Approach			97	38.3	97	38.3	0.248	38.0	LOS D	2.3	16.5	0.93	0.73	0.93	29.6
East: University Bvd															
4	L2	All MCs	45	21.0	45	21.0	0.127	8.3	LOS A	2.1	17.6	0.50	0.51	0.50	40.9
5	T1	All MCs	72	21.0	72	21.0	0.127	12.3	LOS B	2.1	17.6	0.50	0.51	0.50	38.0
6	R2	All MCs	88	21.0	88	21.0	0.203	19.6	LOS B	2.1	17.6	0.65	0.71	0.65	36.6
Approach			205	21.0	205	21.0	0.203	14.5	LOS B	2.1	17.6	0.56	0.60	0.56	38.0
North: Karrak Dr															
7	L2	All MCs	15	5.3	15	5.3	* 0.050	35.1	LOS D	0.5	3.6	0.87	0.68	0.87	30.7
8	T1	All MCs	1	5.3	1	5.3	0.046	30.5	LOS C	0.5	3.3	0.87	0.67	0.87	34.0
9	R2	All MCs	13	5.3	13	5.3	0.046	35.2	LOS D	0.5	3.3	0.87	0.67	0.87	28.3
Approach			28	5.3	28	5.3	0.050	35.0	LOS C	0.5	3.6	0.87	0.67	0.87	29.8
West: University Bvd															
10	L2	All MCs	145	20.7	145	20.7	0.330	16.3	LOS B	6.4	52.8	0.61	0.63	0.61	37.5
11	T1	All MCs	147	20.7	147	20.7	* 0.330	11.3	LOS B	6.4	52.8	0.61	0.63	0.61	35.6
12	R2	All MCs	40	20.7	40	20.7	0.067	15.5	LOS B	0.8	6.5	0.53	0.65	0.53	36.7
Approach			333	20.7	333	20.7	0.330	14.0	LOS B	6.4	52.8	0.60	0.63	0.60	36.7
All Vehicles			663	22.7	663	22.7	0.330	18.6	LOS B	6.4	52.8	0.65	0.64	0.65	35.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Karrak Dr												
P1	Full	50	53	14.0	LOS B	0.1	0.1	0.60	0.60	167.9	200.0	1.19
East: University Bvd												

P2	Full	50	53	33.8	LOS D	0.1	0.1	0.93	0.93	187.6	200.0	1.07
North: Karrak Dr												
P3	Full	50	53	15.2	LOS B	0.1	0.1	0.62	0.62	169.1	200.0	1.18
West: University Bvd												
P4	Full	50	53	33.8	LOS D	0.1	0.1	0.93	0.93	187.6	200.0	1.07
All Pedestrians		200	211	24.2	LOS C	0.1	0.1	0.77	0.77	178.1	200.0	1.12

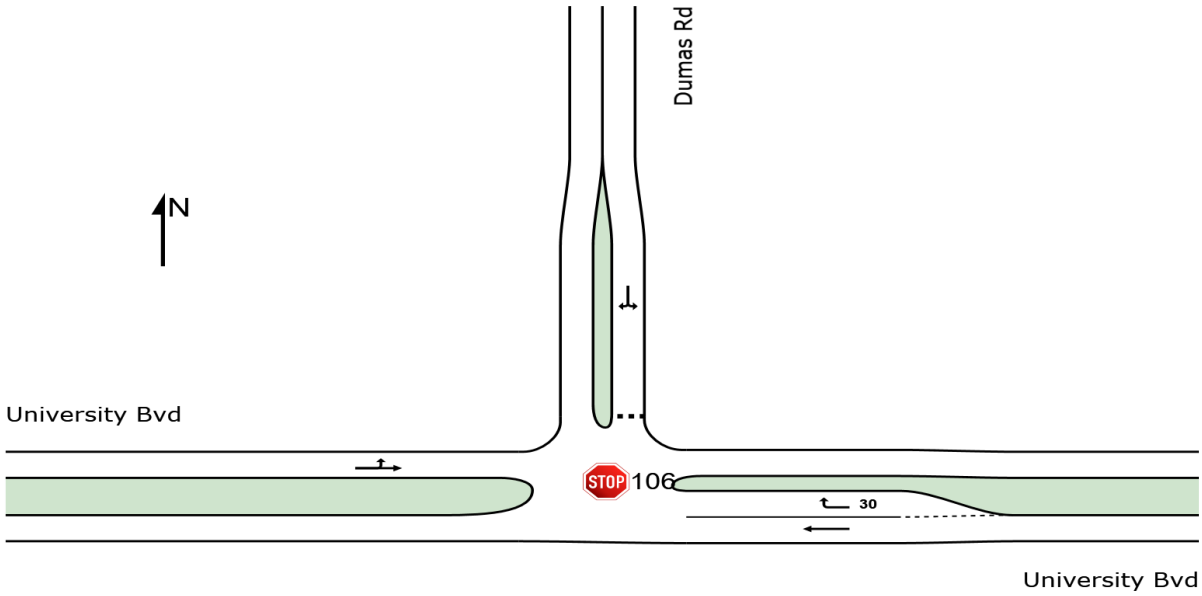
Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SITE LAYOUT

Site: 106 [University Bvd / Dumas Rd (Site Folder: 2039 +DEV_AM)]

NA
Site Category: (None)
Stop (Two-Way)

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



MOVEMENT SUMMARY

Site: 106 [University Bvd / Dumas Rd (Site Folder: 2039 +DEV_AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: University Bvd															
2	T1	All MCs	228	21.1	228	21.1	0.132	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
3	R2	All MCs	73	21.1	73	21.1	0.053	5.4	LOS A	0.2	2.0	0.30	0.52	0.30	43.3
Approach			301	21.1	301	21.1	0.132	1.3	NA	0.2	2.0	0.07	0.13	0.07	48.3
North: Dumas Rd															
4	L2	All MCs	5	10.6	5	10.6	0.075	5.0	LOS A	0.3	2.1	0.48	0.63	0.48	45.7
6	R2	All MCs	44	10.6	44	10.6	0.075	8.3	LOS A	0.3	2.1	0.48	0.63	0.48	42.1
Approach			49	10.6	49	10.6	0.075	7.9	LOS A	0.3	2.1	0.48	0.63	0.48	42.5
West: University Bvd															
7	L2	All MCs	68	24.4	68	24.4	0.093	4.8	LOS A	0.0	0.0	0.00	0.24	0.00	44.8
8	T1	All MCs	85	24.4	85	24.4	0.093	0.0	LOS A	0.0	0.0	0.00	0.24	0.00	48.3
Approach			154	24.4	154	24.4	0.093	2.1	NA	0.0	0.0	0.00	0.24	0.00	47.0
All Vehicles			504	21.1	504	21.1	0.132	2.2	NA	0.3	2.1	0.09	0.21	0.09	47.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 106 [University Bvd / Dumas Rd (Site Folder: 2039 +DEV_PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: University Bvd															
2	T1	All MCs	299	10.0	299	10.0	0.162	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
3	R2	All MCs	46	10.0	46	10.0	0.033	5.4	LOS A	0.1	1.1	0.32	0.53	0.32	43.5
Approach			345	10.0	345	10.0	0.162	0.8	NA	0.1	1.1	0.04	0.07	0.04	49.0
North: Dumas Rd															
4	L2	All MCs	28	9.4	28	9.4	0.097	5.2	LOS A	0.4	2.8	0.46	0.60	0.46	45.9
6	R2	All MCs	42	9.4	42	9.4	0.097	9.4	LOS A	0.4	2.8	0.46	0.60	0.46	42.3
Approach			71	9.4	71	9.4	0.097	7.7	LOS A	0.4	2.8	0.46	0.60	0.46	44.0
West: University Bvd															
7	L2	All MCs	54	12.4	54	12.4	0.113	4.7	LOS A	0.0	0.0	0.00	0.14	0.00	46.0
8	T1	All MCs	149	12.4	149	12.4	0.113	0.0	LOS A	0.0	0.0	0.00	0.14	0.00	48.9
Approach			203	12.4	203	12.4	0.113	1.3	NA	0.0	0.0	0.00	0.14	0.00	48.4
All Vehicles			619	10.7	619	10.7	0.162	1.7	NA	0.4	2.8	0.08	0.15	0.08	48.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 106 [University Bvd / Dumas Rd (Site Folder: 2039 +DEV_SAT)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: University Bvd															
2	T1	All MCs	99	10.9	99	10.9	0.054	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
3	R2	All MCs	8	10.9	8	10.9	0.005	4.8	LOS A	0.0	0.2	0.14	0.49	0.14	44.0
Approach			107	10.9	107	10.9	0.054	0.4	NA	0.0	0.2	0.01	0.04	0.01	49.5
North: Dumas Rd															
4	L2	All MCs	3	8.6	3	8.6	0.018	4.8	LOS A	0.1	0.5	0.23	0.50	0.23	47.7
6	R2	All MCs	15	8.6	15	8.6	0.018	5.5	LOS A	0.1	0.5	0.23	0.50	0.23	44.4
Approach			18	8.6	18	8.6	0.018	5.4	LOS A	0.1	0.5	0.23	0.50	0.23	45.1
West: University Bvd															
7	L2	All MCs	9	11.6	9	11.6	0.028	4.7	LOS A	0.0	0.0	0.00	0.10	0.00	46.4
8	T1	All MCs	41	11.6	41	11.6	0.028	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	49.3
Approach			51	11.6	51	11.6	0.028	0.9	NA	0.0	0.0	0.00	0.10	0.00	48.9
All Vehicles			176	10.9	176	10.9	0.054	1.0	NA	0.1	0.5	0.03	0.10	0.03	48.9

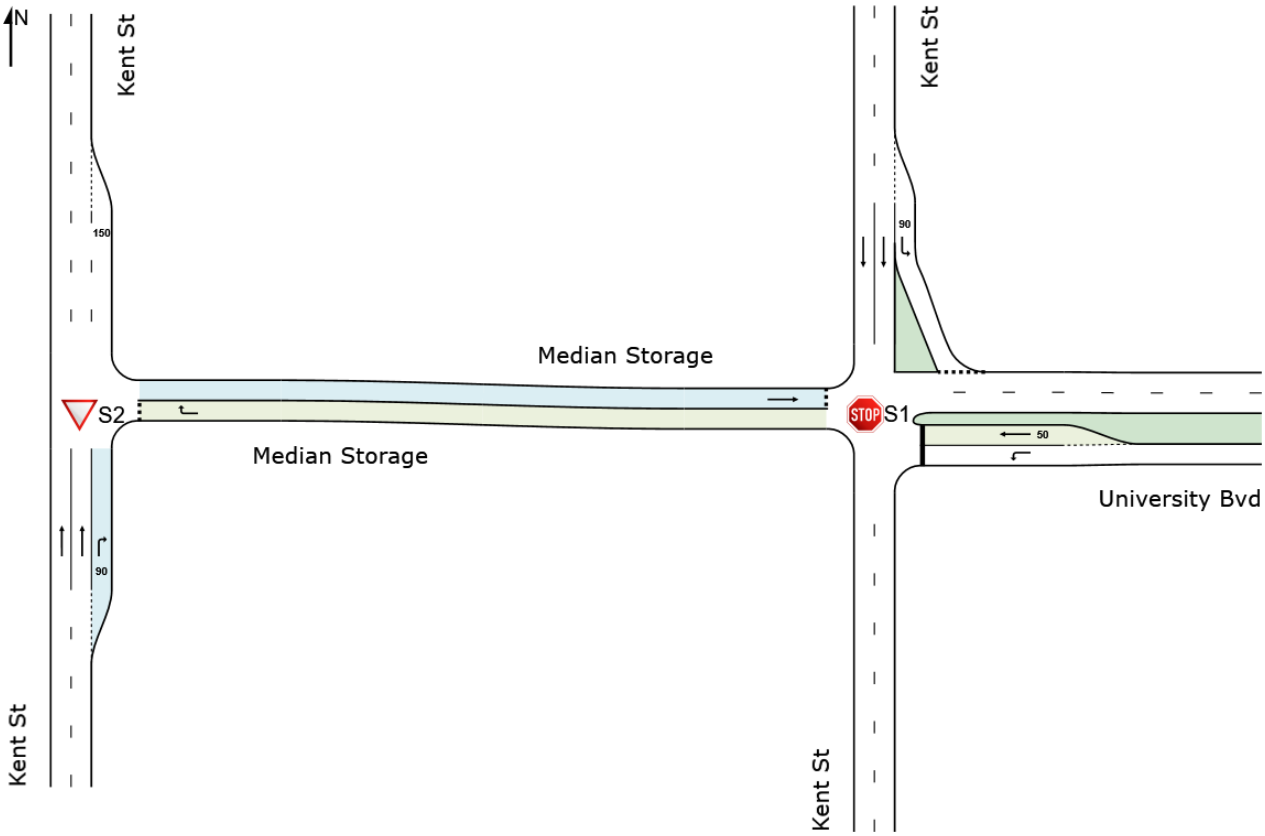
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

NETWORK LAYOUT

Network: N101 [AM_Kent St / University Bvd (Network Folder: 2039+DEV)]

New Network
Network Category: (None)

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



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
S1	NA	Kent St / University Bvd
S2	NA	Kent St / Univeristy Bvd

MOVEMENT SUMMARY

Site: S1 [Kent St / University Bvd (Site Folder: 2039 +DEV_AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [AM_Kent St / University Bvd (Network Folder: 2039+DEV)]

Type A Two-Stage T-Intersection Crossing
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: University Bvd															
1	L2	All MCs	72	22.8	72	22.8	0.089	10.8	LOS B	0.3	2.8	0.47	0.92	0.47	42.0
2	T1	All MCs	47	22.8	47	22.8	0.159	18.7	LOS C	0.5	3.8	0.74	1.02	0.74	21.0
Approach			119	22.8	119	22.8	0.159	13.9	LOS B	0.5	3.8	0.58	0.96	0.58	36.9
North: Kent St															
3	L2	All MCs	157	4.3	157	4.3	0.132	7.4	LOS A	0.6	4.0	0.30	0.59	0.30	47.3
4	T1	All MCs	756	4.3	756	4.3	0.199	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
Approach			913	4.3	913	4.3	0.199	1.3	LOS A	0.6	4.0	0.05	0.10	0.05	66.4
West: Median Storage															
5	T1	All MCs	169	3.0	169	3.0	0.244	4.2	LOS A	0.9	6.7	0.59	0.63	0.64	29.5
Approach			169	3.0	169	3.0	0.244	4.2	LOS A	0.9	6.7	0.59	0.63	0.64	29.5
All Vehicles			1201	5.9	1201	5.9	0.244	3.0	NA	0.9	6.7	0.18	0.26	0.19	60.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: S2 [Kent St / Univeristy Bvd (Site Folder: 2039 +DEV_AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [AM_Kent St / University Bvd (Network Folder: 2039+DEV)]

Type A Two-Stage T-Intersection Crossing
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kent St															
2	T1	All MCs	962	3.0	962	3.0	0.252	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	69.8
3	R2	All MCs	169	3.0	169	3.0	0.097	6.4	LOS A	0.0	0.0	0.00	0.66	0.00	56.4
Approach			1132	3.0	1132	3.0	0.252	1.0	NA	0.0	0.0	0.00	0.10	0.00	68.3
East: Median Storage															
1	R2	All MCs	47	22.8	47	22.8	0.173	14.8	LOS B	0.5	4.5	0.78	0.84	0.79	30.2
Approach			47	22.8	47	22.8	0.173	14.8	LOS B	0.5	4.5	0.78	0.84	0.79	30.2
All Vehicles			1179	3.8	1179	3.8	0.252	1.6	NA	0.5	4.5	0.03	0.13	0.03	66.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: S1 [Kent St / University Bvd (Site Folder: 2039 +DEV_PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [PM_Kent St / University Bvd (Network Folder: 2039+DEV)]

Type A Two-Stage T-Intersection Crossing
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: University Bvd															
1	L2	All MCs	303	15.9	303	15.9	0.462	14.4	LOS B	2.7	21.4	0.67	1.11	0.97	41.0
2	T1	All MCs	136	15.9	136	15.9	0.786	37.4	LOS E	2.8	22.0	0.95	1.29	1.91	12.6
Approach			439	15.9	439	15.9	0.786	21.5	LOS C	2.8	22.0	0.75	1.17	1.26	33.6
North: Kent St															
3	L2	All MCs	138	2.7	138	2.7	0.104	6.9	LOS A	0.4	3.1	0.18	0.55	0.18	48.2
4	T1	All MCs	1091	2.7	1091	2.7	0.285	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	69.8
Approach			1228	2.7	1228	2.7	0.285	0.8	LOS A	0.4	3.1	0.02	0.06	0.02	67.7
West: Median Storage															
5	T1	All MCs	75	1.6	75	1.6	0.163	6.9	LOS A	0.5	3.8	0.73	0.73	0.73	26.2
Approach			75	1.6	75	1.6	0.163	6.9	LOS A	0.5	3.8	0.73	0.73	0.73	26.2
All Vehicles			1742	6.0	1742	6.0	0.786	6.3	NA	2.8	22.0	0.24	0.37	0.36	56.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: S2 [Kent St / Univeristy Bvd (Site Folder: 2039 +DEV_PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [PM_Kent St / University Bvd (Network Folder: 2039+DEV)]

Type A Two-Stage T-Intersection Crossing
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kent St															
2	T1	All MCs	782	1.6	782	1.6	0.203	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
3	R2	All MCs	75	1.6	75	1.6	0.041	6.4	LOS A	0.0	0.0	0.00	0.66	0.00	56.4
Approach			857	1.6	857	1.6	0.203	0.6	NA	0.0	0.0	0.00	0.06	0.00	69.0
East: Median Storage															
1	R2	All MCs	136	15.9	136	15.9	0.320	10.8	LOS B	1.3	10.6	0.72	0.91	0.89	34.3
Approach			136	15.9	136	15.9	0.320	10.8	LOS B	1.3	10.6	0.72	0.91	0.89	34.3
All Vehicles			993	3.5	993	3.5	0.320	2.0	NA	1.3	10.6	0.10	0.17	0.12	64.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: S1 [Kent St / University Bvd (Site Folder: 2039 +DEV_SAT)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [SAT_Kent St / University Bvd (Network Folder: 2039+DEV)]

Type A Two-Stage T-Intersection Crossing
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: University Bvd															
1	L2	All MCs	101	20.4	101	20.4	0.104	9.6	LOS A	0.4	3.4	0.38	0.90	0.38	43.2
2	T1	All MCs	24	20.4	24	20.4	0.047	12.7	LOS B	0.1	1.2	0.54	0.99	0.54	26.1
Approach			125	20.4	125	20.4	0.104	10.2	LOS B	0.4	3.4	0.41	0.92	0.41	41.7
North: Kent St															
3	L2	All MCs	32	2.1	32	2.1	0.026	7.2	LOS A	0.1	0.7	0.27	0.56	0.27	47.8
4	T1	All MCs	504	2.1	504	2.1	0.131	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
Approach			536	2.1	536	2.1	0.131	0.4	LOS A	0.1	0.7	0.02	0.03	0.02	68.8
West: Median Storage															
5	T1	All MCs	161	1.6	161	1.6	0.171	2.1	LOS A	0.6	4.6	0.48	0.41	0.48	33.0
Approach			161	1.6	161	1.6	0.171	2.1	LOS A	0.6	4.6	0.48	0.41	0.48	33.0
All Vehicles			822	4.8	822	4.8	0.171	2.3	NA	0.6	4.6	0.17	0.24	0.17	60.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: S2 [Kent St / Univeristy Bvd (Site Folder: 2039 +DEV_SAT)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [SAT_Kent St / University Bvd (Network Folder: 2039+DEV)]

Type A Two-Stage T-Intersection Crossing
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kent St															
2	T1	All MCs	545	1.6	545	1.6	0.141	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
3	R2	All MCs	161	1.6	161	1.6	0.088	6.4	LOS A	0.0	0.0	0.00	0.66	0.00	56.4
Approach			706	1.6	706	1.6	0.141	1.5	NA	0.0	0.0	0.00	0.15	0.00	67.5
East: Median Storage															
1	R2	All MCs	24	20.4	24	20.4	0.041	5.4	LOS A	0.1	1.2	0.54	0.55	0.54	38.4
Approach			24	20.4	24	20.4	0.041	5.4	LOS A	0.1	1.2	0.54	0.55	0.54	38.4
All Vehicles			731	2.3	731	2.3	0.141	1.6	NA	0.1	1.2	0.02	0.16	0.02	66.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Stantec

Stantec is a global leader in sustainable architecture, engineering, and environmental consulting. The diverse perspectives of our partners and interested parties drive us to think beyond what's previously been done on critical issues like climate change, digital transformation, and future-proofing our cities and infrastructure. We innovate at the intersection of community, creativity, and client relationships to advance communities everywhere, so that together we can redefine what's possible.