Ballina Byron Gateway Airport

Ground Transport Management Plan

Ballina Shire Council

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EXECUTIVE SUMMARY

Background

The Ballina Byron Gateway Airport (BBGA) caters for around 620,000 passengers a year. As the largest Council owned commercial airport in Australia, it provides a strong foundation for Ballina's economy. The airport has recently experienced strong growth which is expected to continue, with the emergence of Ballina and surrounding the north coast region as a domestic tourism destination and attractive lifestyle destination for residents.

The investigations for the GTMP focus on improving the safety and efficiency of existing airport infrastructure and to provide a future focused Master Plan that align with Council's goals.

Objectives

The purpose of the GTMP is to provide the framework needed for cost-effective and staged development of the airports ground transport infrastructure, and should meet Council's objectives as listed below:

- Describe the anticipated short and long-term development plans to meet future aviation demand
- Provide an effective graphic presentation of the anticipated short-, medium-, and long-term development of the airports ground transport infrastructure
- Establish a realistic schedule for the stage implementation of the development proposed in the plan, particularly a short-term concept suitable for progression into design development, and
- Adopt a flexible approach to the expanding ground transport infrastructure ensuring its ongoing safe, secure, reliable and efficient operation.

Existing and Future Facilities Assessment

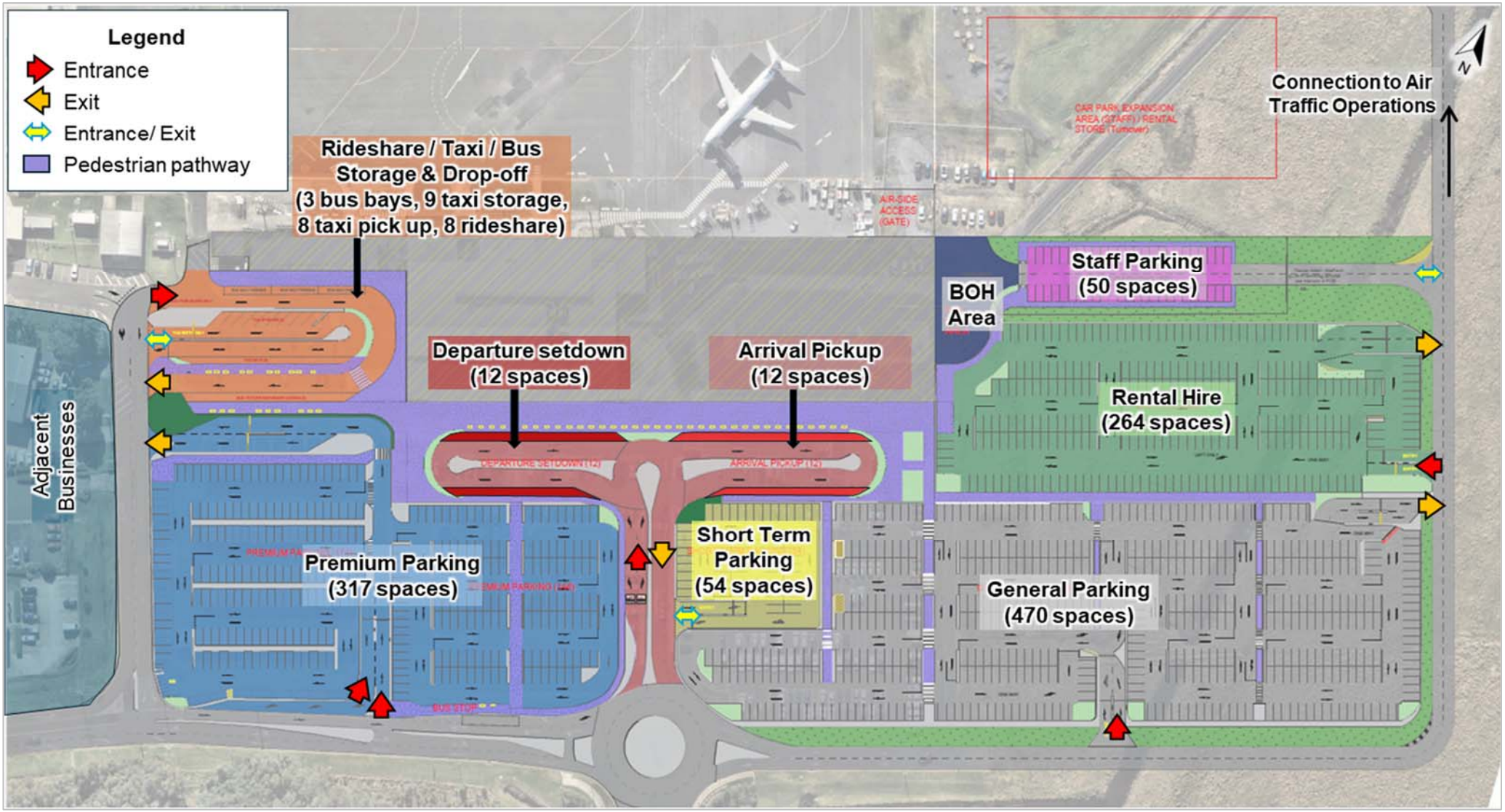
Existing and future planning strategies and related policies were reviewed to understand the issues and opportunities surrounding the site. Surveys were undertaken, and data collected was used to forecast airport growth, including patronage, parking and traffic demand. The existing study identified Premium and Taxi/Rideshare parking areas were underutilised and presented opportunities for improvement, to be aligned with Council's planned upgrades. To support assessed upgrades, the survey data was analysed in SIDRA modelling and applied a seasonal growth factor of 33% each year.

Preferred Ground Transport Master Plan

Ground transport layout options were workshopped through discussions with Council and refined over multiple iterations. Two options were recommended as part of the GTMP options analysis, which took consideration from similar sized regional airports such as Cairns, Hobart and Canberra. Each option was assessed against nine categories of the Master Plan objectives.

The preferred option is shown below and includes:

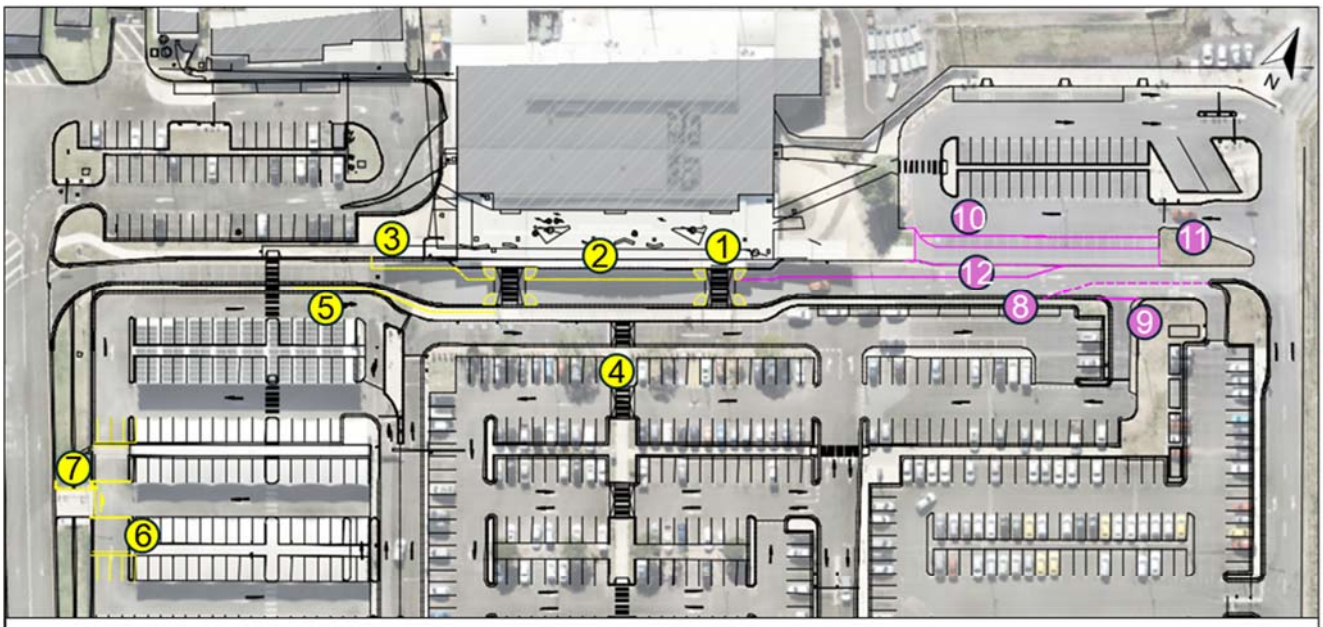
- Combined vehicle entry onto site through roundabout T-head intersection
- Separated departure and arrivals set-down and pick-up area
- Operational access is located on the west side
- Taxi and Bus storage moved away from front of house – centre bay to be used for taxi storage
- Separated taxi and Bus entry and exit
- Premium carparking allocation provides scalability
- No pedestrian conflicts with drop off and pick up area
- Separated entry and exit for Rental
- Relocation of the staff parking outlined within the future expansion area and into the new General carpark precinct
- Desire for only one point of entry / exit for each precinct
- Further operation access on the east side of general parking.



Ballina Airport Ground Transport Master Plan

Short Term Recommendations

To assist in the delivery of the proposed GTMP, short term interim options were also recommended to provide “quick-fix” solutions whilst further investigations and planning can progress. The short-term interim options are shown below.



Item 1A

1. Remove drop off zone line marking and provide as one zone
2. Provide kerb extensions at both Pedestrian Crossings
3. Provide standard PWD space drop off zone west of western crossing
4. PWD gradients from standard parking to terminal
5. Provide Fencing to reshape pedestrian desire line from premium
6. Block off parking aisle and provide 90-degree parking bays on both sides
7. Move boom gate and camera to align with vehicle exiting from centre aisle

Item 1B

Including Item 1A

8. Shorten Right turn pocket into rental
9. Remove Right turn entry facility into general
10. Convert 90-degree South facing bays in taxi area to parallel
11. Extend pedestrian pathway zone to landscaping
12. Install pickup zone to end of new rental right turn pocket

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1. INTRODUCTION

1.1 Context

Ballina Shire Council (Council) is located in Northern NSW, less than 200 kilometres south of Brisbane. The shire is serviced by the Ballina Byron Gateway Airport (BBGA), which caters for approximately 620,000 commercial passengers a year.

Bitzios has been engaged by Council to develop a Ground Transport Master Plan (GTMP) for the BBGA. The airport is a certified security-controlled and screen airport and, as the largest Council owned commercial airport in Australia, provides a strong foundation to Ballina's economy. The airport has recently experienced strong growth which is expected to continue, with the emergence of Ballina and surrounding the north coast region as a domestic tourism destination and attractive lifestyle destination for residents. The airport's location with respect to the Ballina CBD is provided in Figure 1.1.

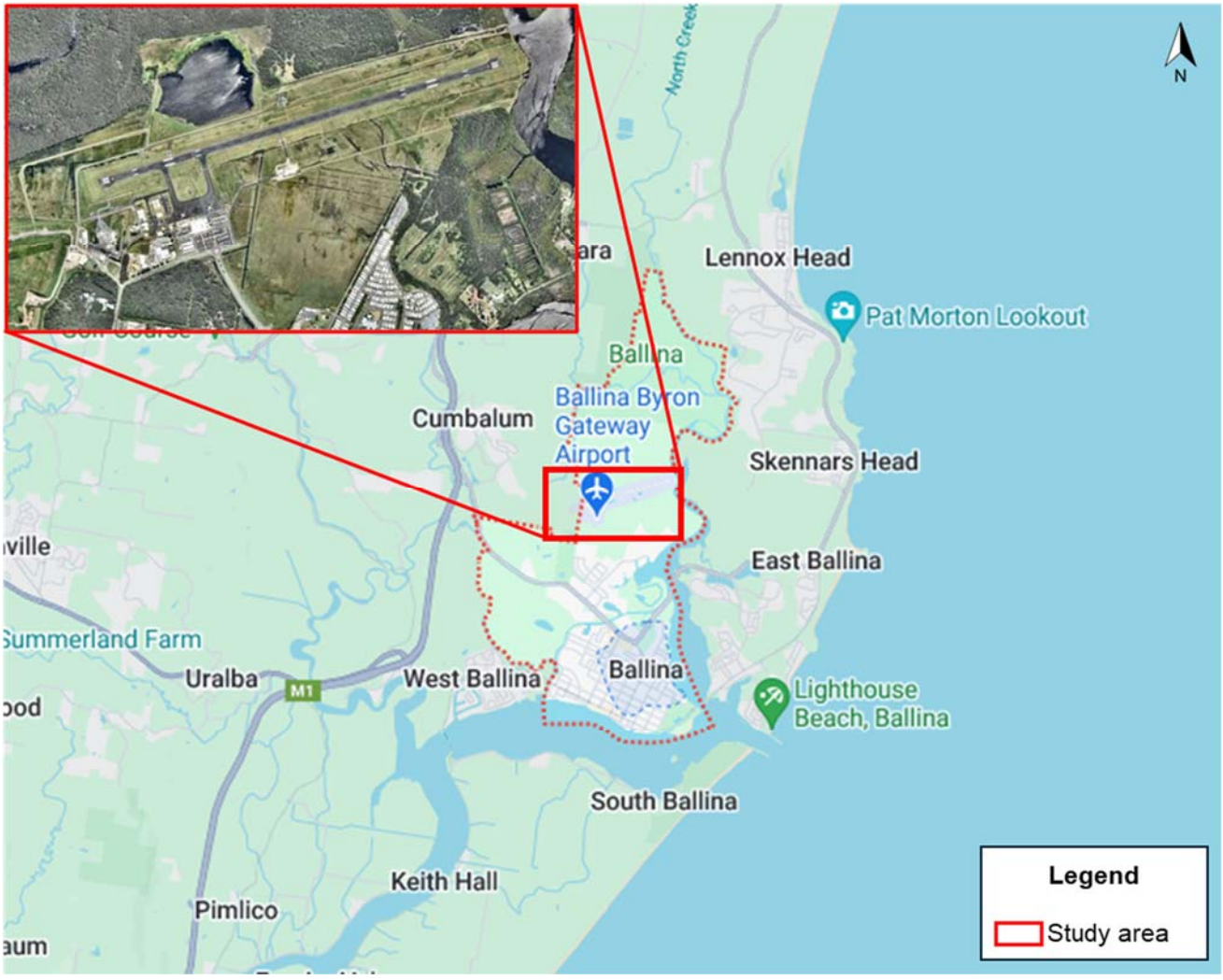


Figure 1.1: Study Area

1.2 Airport Master Plan

The airport is anticipated to grow to 1.29 million travellers by 2040, with the increase trips typically linked to tourism, and the growing popularity of hybrid remote employment which sees a work force who require access to a major airport to travel to traditional major hubs within capital cities. Terminal expansion is planned to account for the resultant increase in air traffic which will have a flow-on impact on the demand for ground transport facilities. A GTMP is required to optimise existing operations, and provide resilient infrastructure to cater for a 50% uplift in passengers over the next 20 years.

1.3 Purpose of this GTMP

The GTMP is to provide the framework needed for cost-effective and staged development of the airports ground transport infrastructure, and should meet Council's objectives as listed below:

- Describe anticipated short, and long-term development plans to meet future aviation demand,
- Provide an effective graphic presentation of the anticipated short- and long-term development of the airports ground transport infrastructure
- Establish a realistic schedule for the stage implementation of the development proposed in the plan, particularly a short-term concept suitable for progression into design development, and
- Adopt a flexible approach to the expanding ground transport infrastructure ensuring its ongoing safe, secure, reliable and efficient operation.

1.4 Contents of this GTMP

This GTMP is comprised of the following key elements:

- **Chapter 2** – Review of existing operations and relevant state / council strategic planning
- **Chapter 3** – Review of existing ground transport infrastructure including the findings of consultation with ground staff and car rental operators
- **Chapter 4** – Review and forecast of current and future year parking demand and trip generation. Car parking demand is disaggregated by parking type.
- **Chapter 5** – Overview of the design process and staging of the proposed Master Plan, including assessment against future year parking demand and intersection modelling of key intersections.
- **Chapter 6** – Summary and conclusions.

2. BACKGROUND

2.1 Existing Airport Operations

The BBGA is easily accessed by people from a number of different suburbs and states. Key features of Ballina Byron Gateway Airport are illustrated in Figure 2.1.

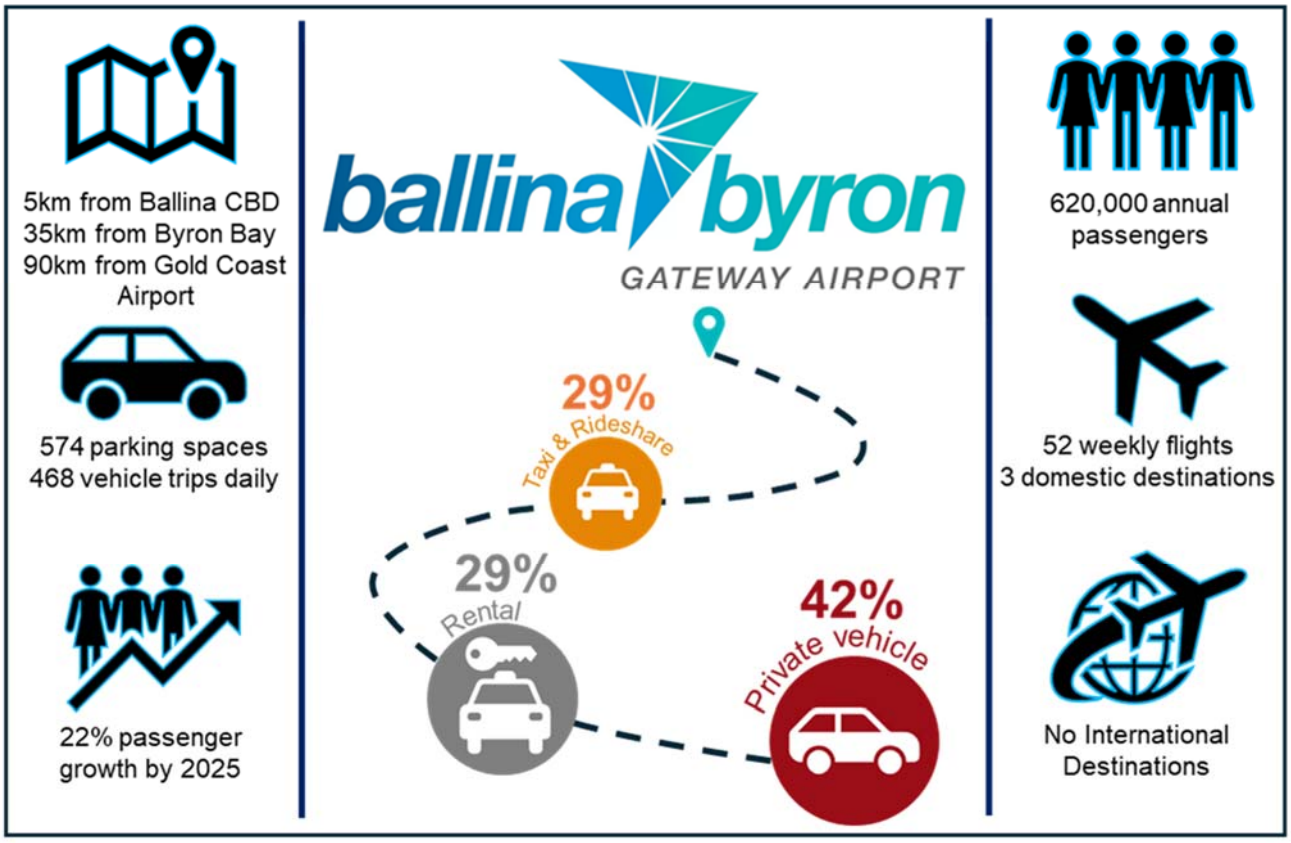
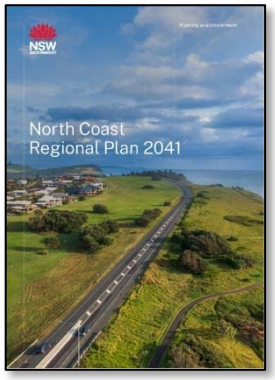


Figure 2.1: Key Features of Ballina Airport

The BBGA services flights to Sydney, Melbourne, and Newcastle; however, its highest number of flights are to Sydney. The current partnership airlines are Qantas, Jetstar, Virgin Australian. Fly Pelican previously operated flights into and out of BBGA, however, ceased operations to the airport in October 2024. On a typical day, the BBGA caters for 16 flights between 8am – 6pm, most commonly to / from Sydney.

2.2 Existing Plans and Strategies

2.2.1 North Coast Regional Plan 2041

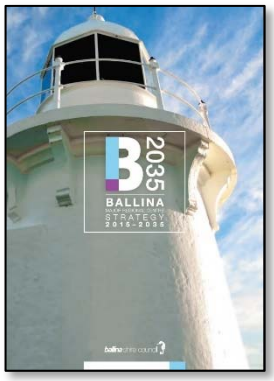


The North Coast Regional Plan (NCRP) sets a 20-year strategic land use planning framework for the region, with aims to protect and enhance the region's assets and plan for a sustainable future. Ballina Shire is recognised as a key strategic centre of the North Coast, with a strong and diverse economy forecast to continue to grow. The plan recognises the BBGA as a major support for cultural tourism in the region, and supports the plan's regional priorities for Smart, Connected and Accessible Infrastructure. In respect of transport connections, the NCRP has outlined objectives with the goal to provide a Productive and Connected region:

- Improve state and regional connectivity
- Increase active and public transport usage
- Utilise new transport technology.

No specific plans outline improvement connections for the BBGA via state-controlled roads, however, the plan recognises the need for promotion of intrastate aviation between North Coast Holiday airport destinations that include Ballina-Byron, Coffs Harbour and Port-Macquarie. This document is considered where relevant within the GTMP.

2.2.2 Ballina Major Regional Centre Strategy 2015 – 2035



The Ballina Major Regional Centre Strategy (MRCS) is a long-term regional planning strategy designed to advance and consolidate Ballina as a regional centre. It focuses on community expectations and feedback on outlining key issues, drivers of change, aspirations and ideas within the community for improvement to achieving the local vision of a '*Vibrant and Prosperous Regional Centre'*.

The Strategy promotes six key themes against four key principles:

Key Themes

- Open Space and Healthy Living
- Economic Development
- Character, Culture and Amenity
- Community Facilities and Infrastructure
- Environment
- Housing

Key Principles

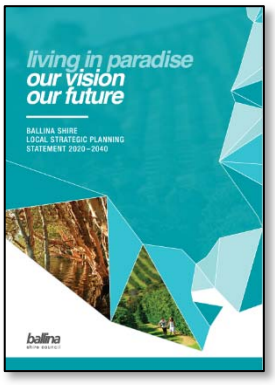
- Inclusive
- Resilient
- Sustainable
- Vibrant

Overall, three key drivers were identified with strategic responses that focus on future population growth and related BBGA infrastructure connections:

- Population Growth Potential – Prepare for the population growth that is anticipated to occur with the development of major urban growth areas. This also includes actions that enhance lifestyle opportunities and access to services and facilities for existing and future residents
- The BBGA - harness opportunities that invest in the airports infrastructure and encourage future opportunities
- Industrial Land Supply – Harness opportunities associated with the strategic location of Councils Industrial land supplies, adjacent to the BBGA and key future road infrastructure upgrades.

The MRCS provides the context required for long term planning and meeting the expectations of the community in Ballina Shire. This document will be considered where relevant in providing the GTMP.

2.2.3 Ballina Local Strategic Planning Statement 2020 - 2040



The Local Strategic Planning Statement (LSPS) is the strategic document that plans for Ballina's economic, social and environmental priorities and aligns with the North Coast Regional Plan 2036 to implement directions and actions at a local level.

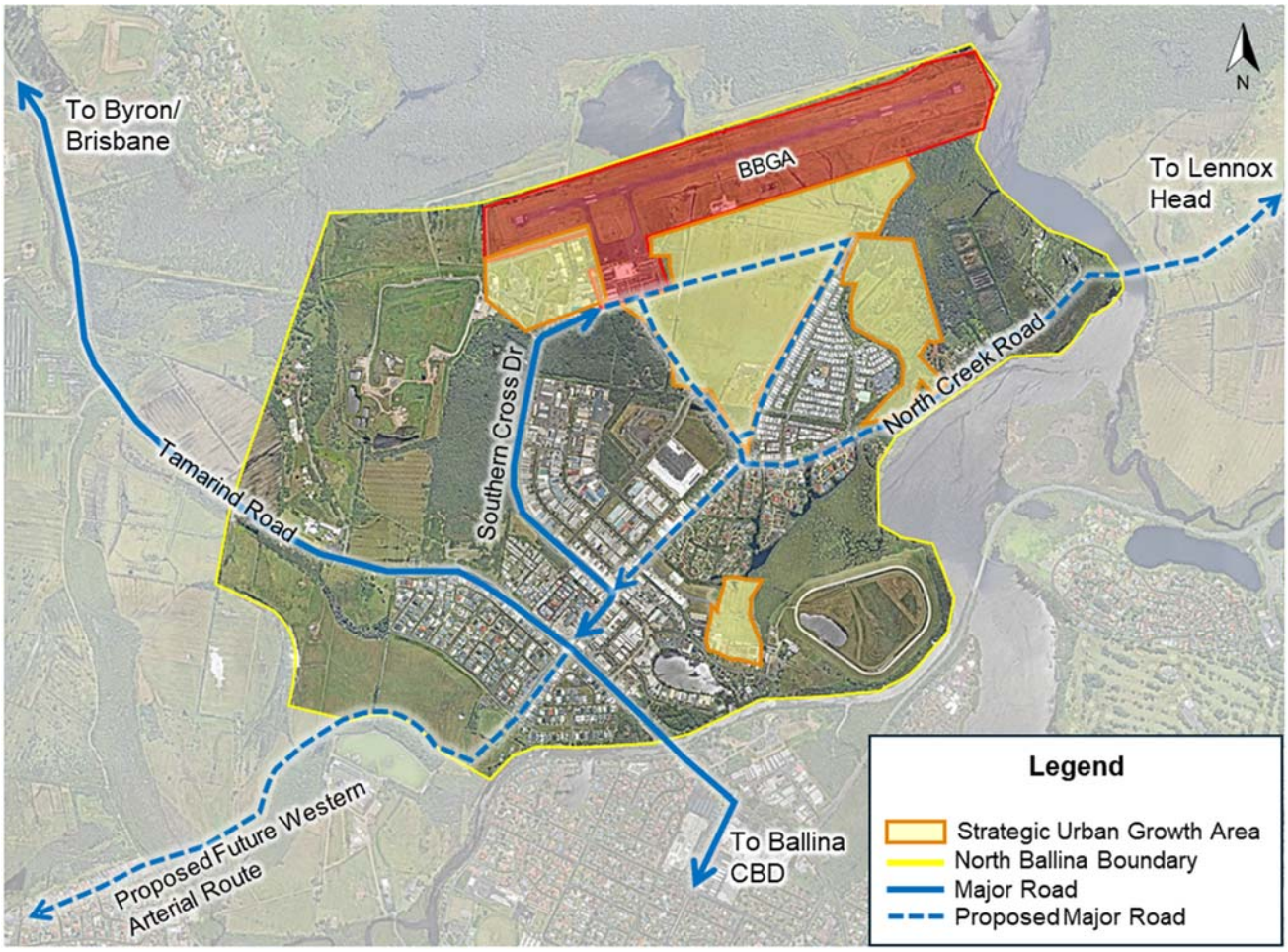
The LSPS builds on plans and goals of the:

- Ballina Shire Local Growth Management Strategy (*Superseded*)
- Ballina Shire Local Environment Plan 2012 (LEP)
- Ballina Shire Development Control Plan 2012 (DCP)
- Ballina Shire Community Strategic Plan
- Ballina Shire Delivery Operation Plan 2019.

Within the document, 14 Planned Priorities and 56 Actions include the desire for future urban development enhancement that contribute to the Shire's growth in all aspects. Within this strategy, the BBGA is identified as one of the Shire's key pieces of transport infrastructure, offering significant access and transportation opportunities for industrial, commercial and leisure activities in the area. It recognises the importance of maintaining and supporting the airport infrastructure and integrating key infrastructure surrounding it for future use.

Under the LGMS (now superseded), strategic actions to investigate a future road connection between North Ballina and Lennox Head via North Creek Road were identified as a future benefit in terms of better connectivity from North Ballina to the BBGA and Southern Cross Industrial Estate. As the Southern Cross Industrial Estate is located adjacent to the BBGA serves as primary industrial area for the region, and plans for improved air, rail and public transport infrastructure connectivity to both the Industrial Estate and the BBGA are outlined as a planned priority in this strategy also.

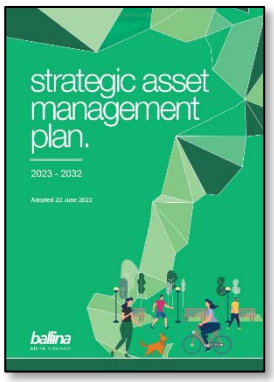
A map showing the proposed road connection is shown in Figure 2.2.



Source: Ballina Shire Local Growth Management Strategy 2016 (Re-made by Bitzios)

Figure 2.2: North Ballina Strategic Action Strategy Map

2.2.4 Ballina Shire Asset Management Plan 2024 – 2028



The Asset Management Plan (AMP) ensures efficient and sustainable management of a Ballina's assets including demands for assets and service levels and performance requirements to meet those service levels. Under the AMP, the Ballina Byron Gateway Airport is managed by Council assets as an important infrastructure for catering to the Shire's growth.

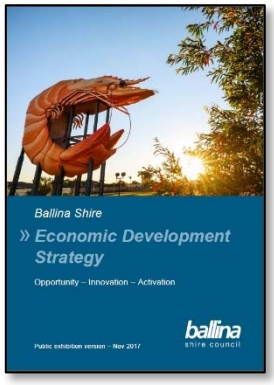
As population grows, a number of transport upgrades within the Shire are planned to maintain level of service. The AMP outlines the demographic change in population and population characteristics, particularly the service age groups and the related forecasts of demand. It is noted that no specific proposed improvements to the airport infrastructure, roads and connecting network have been identified under this strategy. Rather the strategy lists the objectives of Council's Strategic Plan and developed asset management objective related for delivering the operations. As such the Airport is only listed as an asset for preventative maintenance of both the runway and terminal.

2.2.5 Ballina Shire Delivery Program and Operational plan

The Delivery Program and Operation Plan form part of the NSW Office of Local Government's *Integrated Planning and Reporting* (IPR) Framework. A number of key elements of the framework focus on planning and reporting, of which the BBGA Master Plan is included in its 10-year focus.

Planned upgrades for improving connectivity and transport to the BBGA, aligns with the desired outcome of the Community Strategic Plan for a Prosperous Economy. Under the Delivery Program and Operational Plan, the BBGA is outlined as an operational plan activity which targets the goal "Enhance transport and other business networks". This plan provides context to planned works in Ballina with regards to the BBGA and will be considered where relevant to providing the GTMP.

2.2.6 Ballina Economic Development Strategy

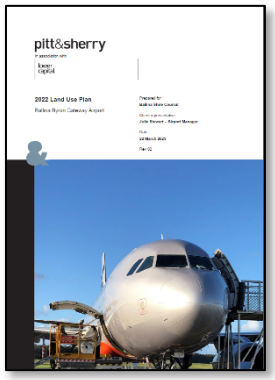


The Ballina Economic Development Strategy's purpose is to identify the key drivers of opportunity for economic development in Ballina Shire and far North Coast Region. It also identifies actions that Council can pursue to support these opportunities.

The Strategy recognises that the Shire's growth and tourism lifestyle is largely underpinned by the improvement of road connections from South-East Queensland through the Pacific Highway, as well as increasing passenger air services through the BBGA. As such, it highlights expansions to the BBGA as a driver for improved local road infrastructure, specifically for improved connections to the Southern Cross industrial Estate.

Although no specific improvements to the road infrastructure supporting the BBGA are outlined in this strategy, investigations towards the BBGA's expansion provides supporting evidence that improved parking and layout operations are needed to cater to the growth of Ballina in the future. This will be considered where relevant when providing the GTMP.

2.2.7 Ballina Byron Gateway Airport Land Use Plan 2022



The BBGA Land Use Plan (LUP) was formulated to assess the needs for the airport and understand reasonable actions to cater for the growth over the next 20 years; this included airport operations as a whole, including terminal space and passenger movement in and out of the terminal.

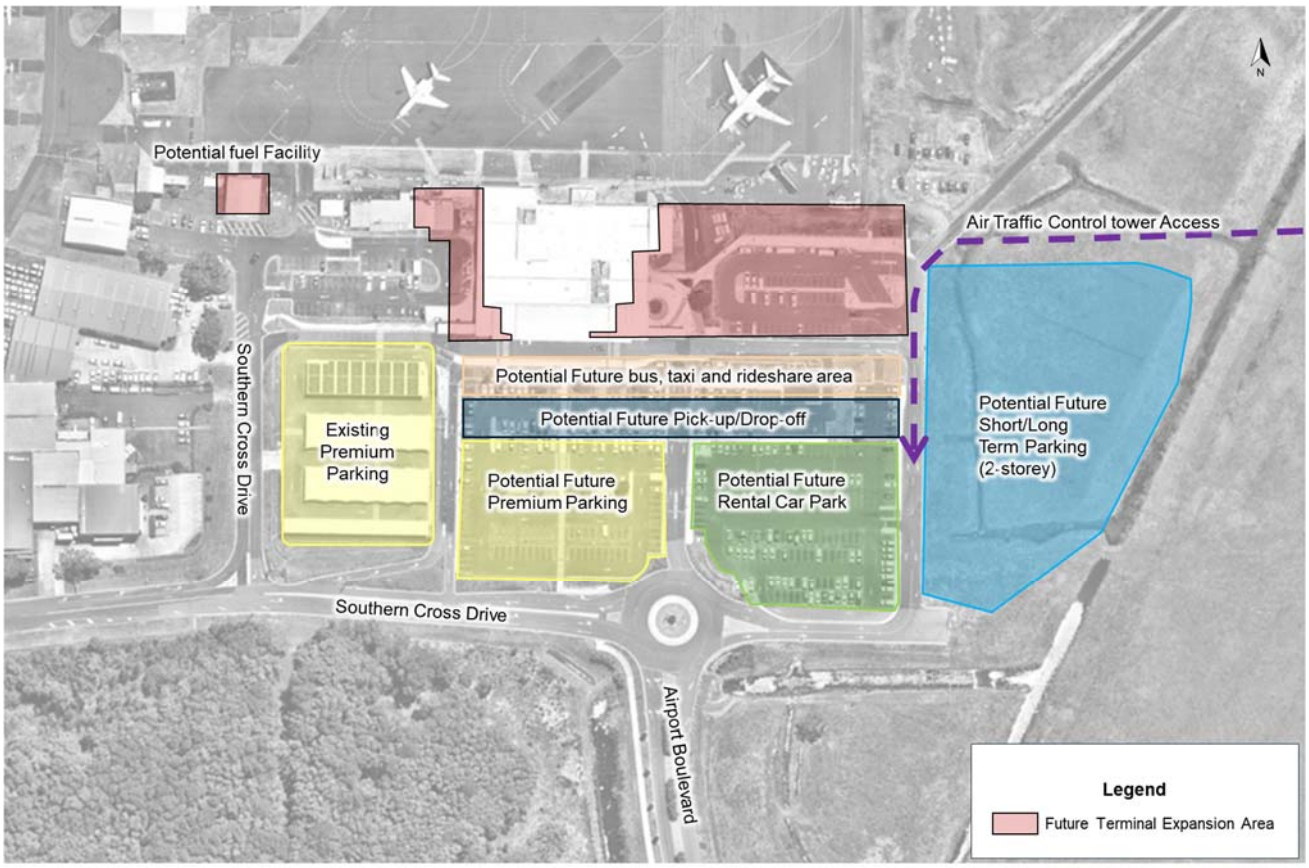
As the airport is owned and operated by Council, BBGA is not subject to statutory planning framework that requires an Airport Master Plan as per the Airports Act. However, the LUP and other planning frameworks provide support for the BBGA to better respond to the local growth in the area. General works undertaken included stakeholder consultation and engagement, assessment of existing facilities and infrastructure, constraints, trends and future growth forecasts for the entire airport as a whole. Conceptual designs and schematics were provided to highlight areas for realignment and growth.

In terms of future expansions and ground transport facilities, the following recommendations/ estimates were concluded in the LUP:

- estimated parking shortfalls for 2027 based on 5, 10 and 20 years, however no parking counts or occupancy counts were undertaken
- Rental car parking to be relocated off site
- Short Term and Long-Term parking to be segregated, realignment of parking
- Bus stop capacity to be reassessed
- Public bus integrated with Shuttle bus/taxi and ride share area, moved closer to the airport frontage
- Active transport only mentions a provision for a bicycle parking area for staff, however future pedestrian connections are not considered

- Existing taxi/ ride share area will be taken over for future terminal expansion
- Potential future short term/long term parking area expansion towards the eastern side is recommended
- Potential airport traffic control access road located directly north of future parking expansion.

Figure 2.3 shows the Ground Transport Concept Plan outlined in the LUP. Specific transport recommendations were made in the LUP which will be considered where relevant and provide the basis for providing the GTMP.



Source: BBGA Land Use Plan 2022 (remade by Bitzios)

Figure 2.3: LUP Ground Transport Concept Plan

3. EXISTING GROUND TRANSPORT INFRASTRUCTURE

3.1 Road Network

3.1.1 External Road Network

The major highway connections and surrounding external roads linking to the BBGA are shown in Figure 3.1 and Figure 3.2.

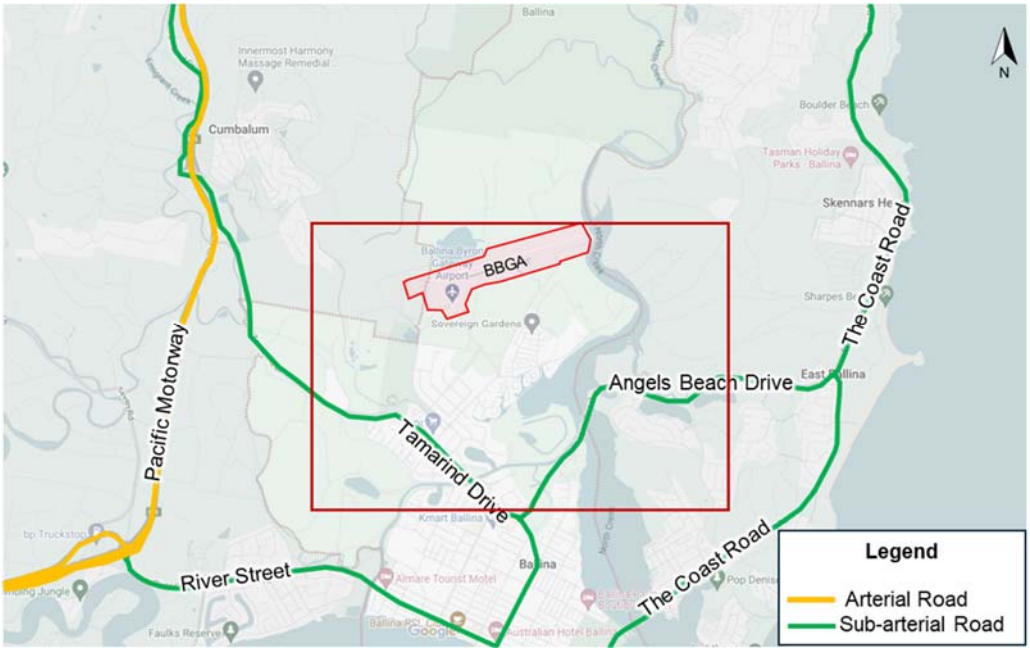


Figure 3.1: Greater External Road Network

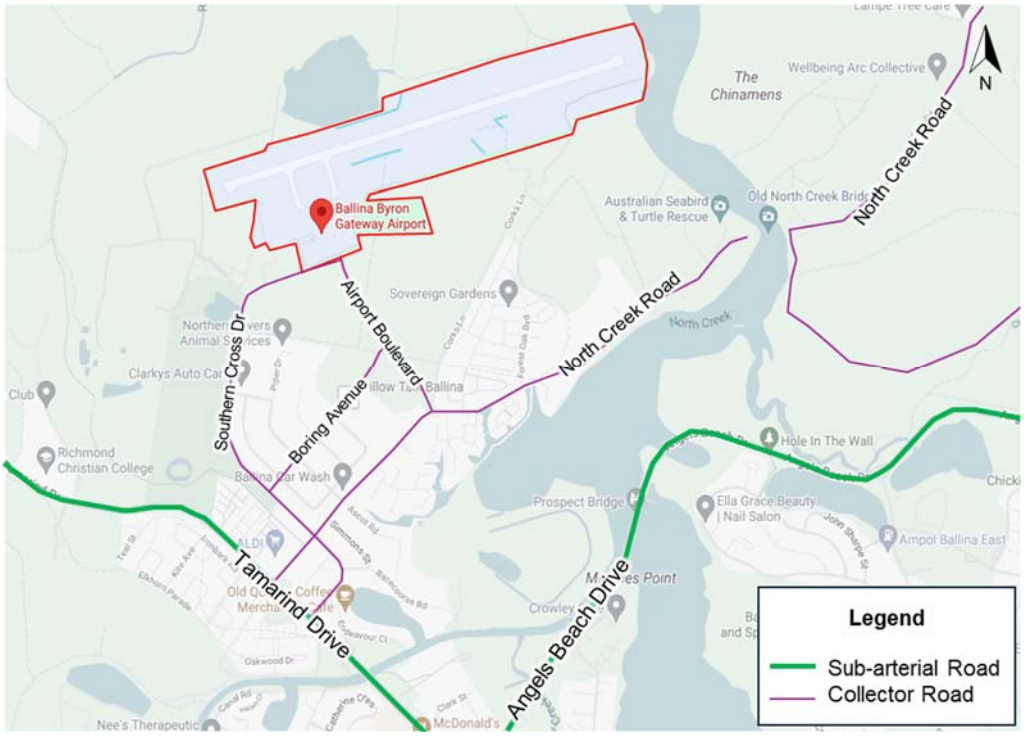


Figure 3.2: Surrounding External Road Network

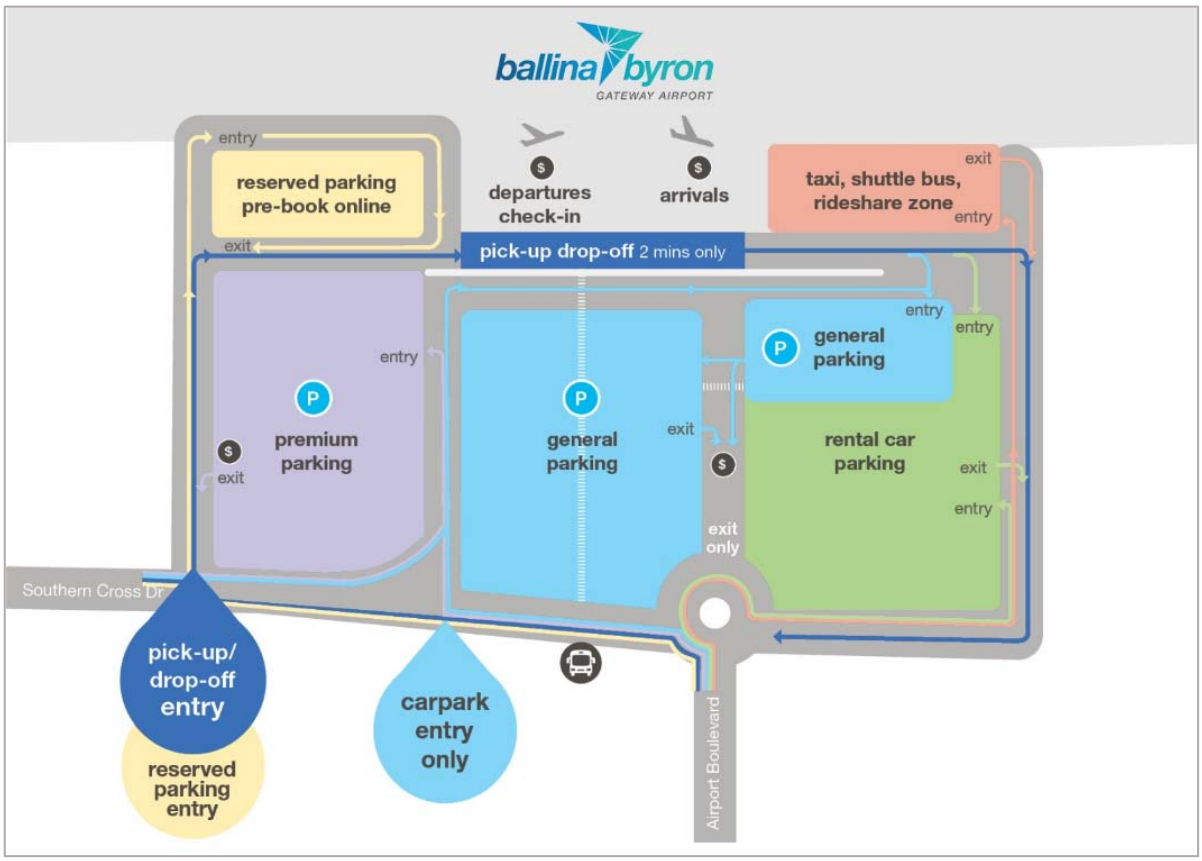
The BBGA is accessed by the local road Southern Cross Road and Airport Boulevard, further connecting to North Creek Road and Tamarind Drive. The majority of connections from the north are assumed to be accessed from Tamarind Drive off the Pacific Motorway, with other trips from Lennox Head connecting via The Coast Road and Angels Beach Drive. The details of the external road network are detailed in Table 3.1.

Table 3.1: External Road Network

Road Name	Jurisdiction	No. of lanes	Hierarchy	Posted Speed
Southern Cross Drive	Council	2	Distributor	60km/h
Airport Boulevard	Council	2	Distributor	-
Tamarind Drive	Council	2	Distributor	60km/h
River Street	Council	4	Distributor	60km/h
The Coast Road	Council	2	Arterial	80km/h
Angels Beach Drive	Council	2	Arterial	80km/h
Pacific Motorway	State	4	Arterial	100km/h

3.1.2 Ground transport layout

The current transport facilities of the BBGA are outlined in Figure 3.3.



Source: Ballina Shire Council Website

Figure 3.3: BBGA Current Facilities Layout

3.2 Public Transport

3.2.1 Bus Services

There is currently one bus stop fronting the BBGA parking area along Southern Cross Drive. Only one bus service (640) operates this stop. The bus boards at Ballina Airport and ends at Mullumbimby utilising the Old Coast Road through Ballina CBD and Byron Bay. Bus stop details are shown in Table 3.2.

Table 3.2: Bus Stop Service Details

Service	Route	Time	Frequency
640	To Ballina, Lennox Head, Byron Bay Bus Interchange and Mullumbimby	Weekday	1 hr peak
		Weekend	Every 2hrs

3.3 Active Transport

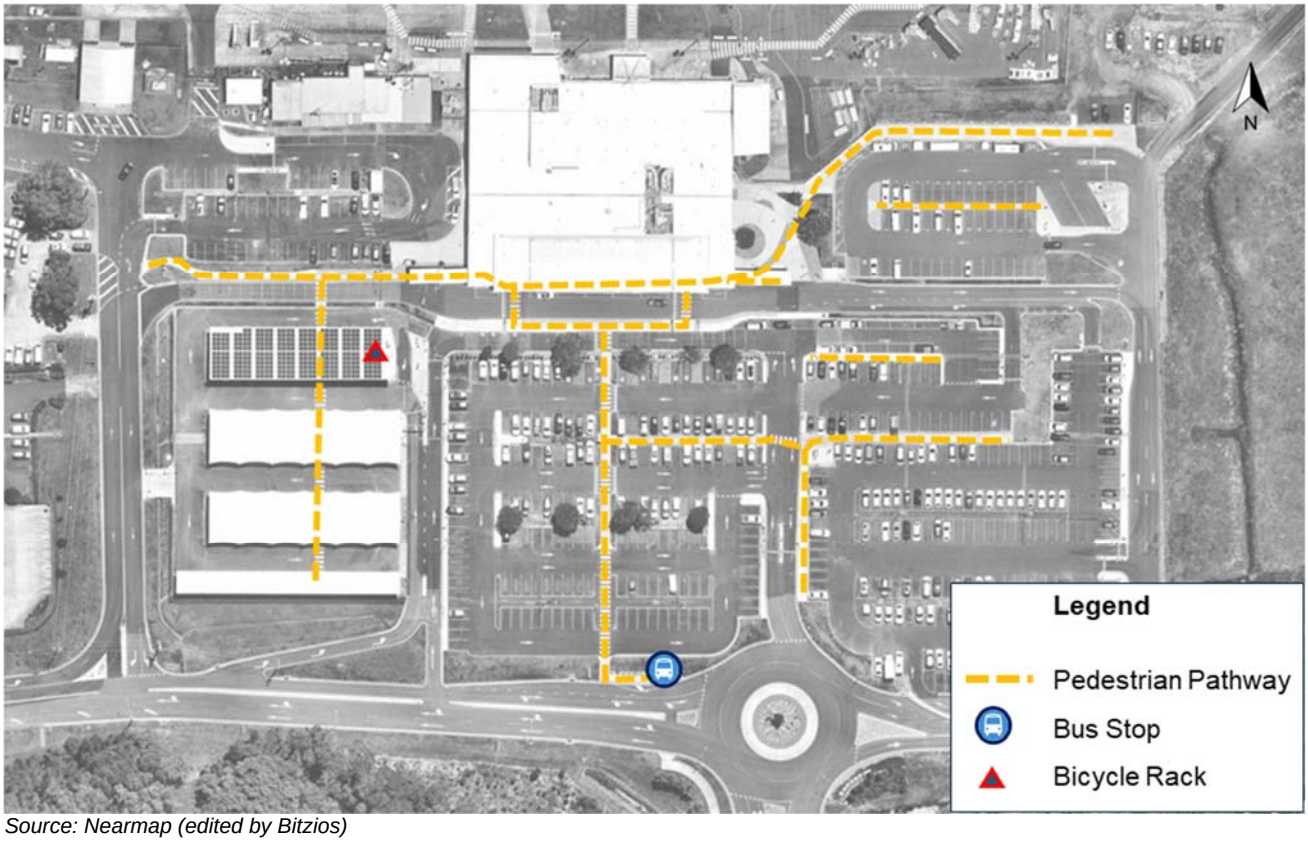
3.3.1 Bicycle access

There are limited cycle paths surrounding the BBGA and the majority of the cycle paths are on unsealed roads external to the BBGA. The site provides minimal bicycle parking, with only one parking rack located within the premium long stay car parking area.

3.3.2 Pedestrian

There is currently only one existing external footpath that connects to the BBGA frontage, of which connects directly through the carpark to the pick-up and drop-off area. Other pedestrian footpaths have been provided internally, connecting the car parking area also.

The existing pedestrian footpaths, bicycle rack and bus stop are shown in Figure 3.4.



Source: Nearmap (edited by Bitzios)

Figure 3.4: Active and Public Transport on Site

3.4 Ground Transport Facilities

3.4.1 Parking – Car Parking Supply

Parking is provided on site with the use of automated boom gates and pay station machines on site. The parking system uses plate recognition scanning for all gates within the parking area.

Car parking is provided within the following categories:

- **Premium Parking**: Used by customers with a long length of stay (i.e. more than four hours) who require parking close to the terminal.113 parking bays are provided in covered parking area and is located less than a one-minute walk from the terminal. Premium parking is offered at a flat daily rate of $30/day.

- **Short-Stay/ General parking:** Generally used by customers parking for less than four hours (64%). Parking is designed for those walking passengers into / out of the terminal, and passengers. The car park is less than a one-minute walk from the terminal, it has outdoor parking and costs $4/hour and then $2/hour for every hour after that. A daily fee of $20 is applied for all parking over 8 hours (long stay).
- **Reserved Parking:** Used by customers who want to secure a parking spot before they arrive. The parking provides a minimum of 24hrs for a flat rate of $25. The parking is located on the eastern corner of the Departure gate. Parking bookings are made online via the BBGA website.
- **Rental Parking:** Car rental is provided on-site, with rental car offices located within the airport terminal at the Arrival gate. The site includes 186 on-site car parks for rental ready vehicles which are stored separate to general parking bays,
- **Staff Parking:** Staff parking is not explicitly allocated on site, however most of staff parking is currently located at the back of the site, behind the allocated Taxi zone.

The number of car spaces supplied within each parking zone as of 2024 is outlined in Table 3.3.

Table 3.3: Car Parking Supply (2024)

Parking Area	Existing car spaces
Premium Parking	113 (including 2 PWD Bays)
Short Stay/General Parking	225 (Including 7 PWD Bays + 8 Motorbike Bays)
Reserved Parking (Online Bookings)	39
Rental Parking	186
Taxi and Rideshare	52
Staff Parking	54
Total Parking	**669**

3.4.2 Drop off/ Pick up

The passenger drop-off and pick up zone is located along the frontage of the departure and arrival gate entrance, and spans approximately 67m in length and can hold seven (7) vehicles at one time.

3.4.3 Taxi's/ Ride Share and Shuttle

A dedicated parking area is provided towards the western corner of the subject site for all taxi's, shuttle buses and ride share vehicles. Entry into the taxi area is controlled by boom gates with number plate recognition. Taxis and ride share vehicles who frequent the airport have had their number plate entered into the boom gate system by ground staff.

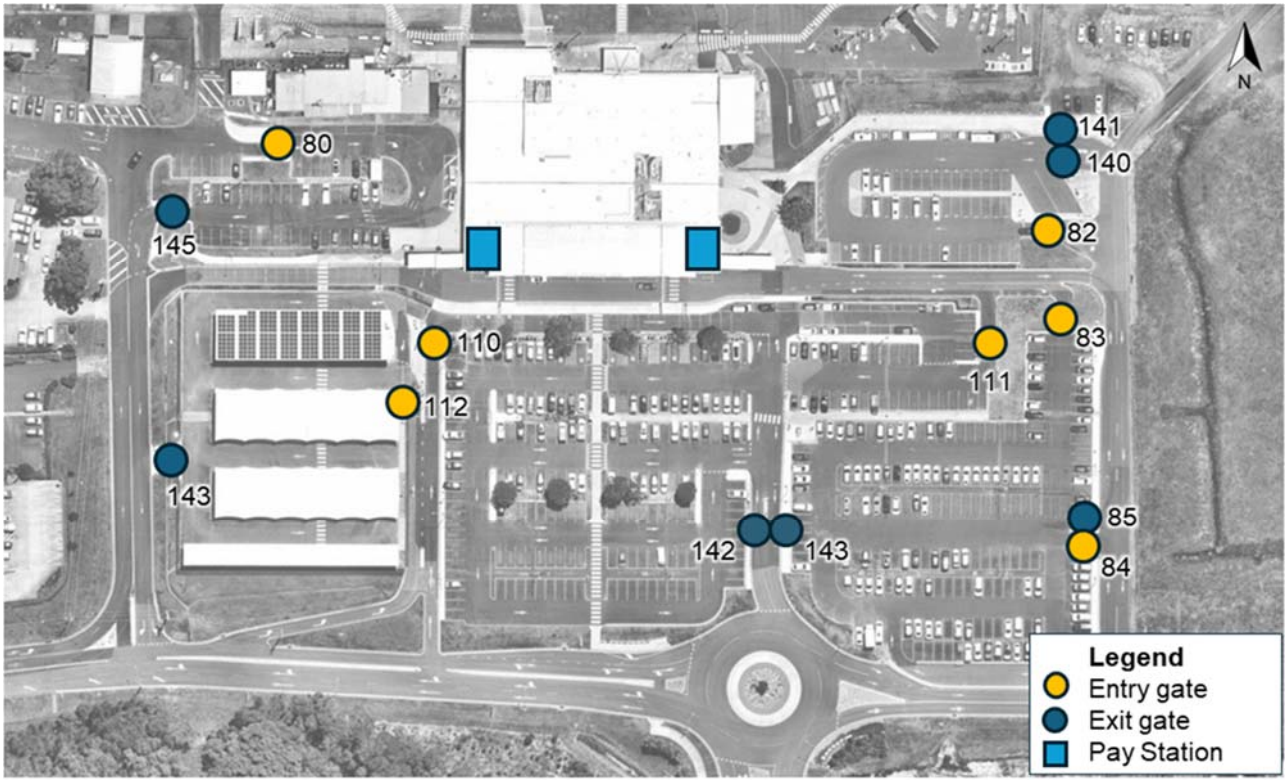
3.4.4 Freight/ Loading

A large loading zone is provided on the eastern corner of the departure gate which is accessed through the dedicated online reserved parking area.

3.4.5 Entry and Exit Operations

Existing entry and exit points into the airport are via eight (8) different boom gate access points, with number plate recognition technology. All vehicles parked on site are required to pay at the allocated pay stations inside the terminal, or by credit card at the exit gates. A review of the Contract between Council and the boom gate operator (CDS Worldwide) was also undertaken separate to this report.

The existing entry and exit gates on site are outlined in Figure 3.5.



Source: Nearmap (edited by Bitzios)

Figure 3.5: Existing Entry and Exit gates

3.5 Issues and Opportunities

3.6 Consultation

Meetings were held at the airport with relevant stakeholders to discuss the current and past issues related to ground transport and operations.

3.6.1 Ground Airport Staff

During an initial meeting, Ground Operations staff identified a number of existing issues on site. A site visit was then undertaken with ground staff to review the existing facilities and operations. A summary of issues and opportunities are outlined below and mapped in Section 3.7.

Pedestrian and driver wayfinding in and around site was identified as poor, as evidenced during the site visit. Staff identified that although there are few wayfinding signs present, additional directional signage and information signage would be beneficial for all, particularly for directing vehicles to avoid queues and safely direct pedestrians to and from the carpark.

The existing boom gates and number plate recognition technology was often confusing customers. Customer complaints with boom gate and ticket issues were generally related to operation issues on the current system, particularly at the exit where number plates were not properly recognised and staff were then required to manually operate the access.

A further issue was identified where the number plate scanner displayed the vehicle's fee on-screen prior to a driver inserting a ticket. When the screen remains static following ticket insertion, drivers become concerned that the display is relevant to the previous vehicle.

The 2-minute drop-off and pick-up zone was outlined as a major issue for the airport, as traffic was often queued out to the public road (Southern Cross Drive) at peak times. Unsafe driver behaviour at the drop-off zone was also noted, where drivers had left vehicles unattended and often parked for more than 2 minutes.

Sight lines for vehicles behind the queue were also blocked by vehicles directly in-front of them, as they could not see the open drop-off space ahead. Vehicles parked in the set-down zone obscured pedestrians entering the roadway at pedestrian crossings.

3.6.2 Ground Transport Operators

An internal survey was provided to existing ground transport operators of the BBGA. This included Uber, Taxi, Bus/ Shuttle and private limousine drivers who currently have been operating for up to 10 years at BBGA. Operators were asked a series of questions considering BBGA's strengths, weaknesses and expectations for the future. A total of 23 responses were collected, and a summary of the most common responses are listed in Table 3.4.

Table 3.4: Identified GT Operator Issues

Strengths	Weaknesses	Future Needs
▪ Location to Byron Bay ▪ Proximity to prime locations (Gold Coast, Byron etc.)	▪ Lack of shelter between rideshare/ taxi car park and terminal ▪ Rideshare/ taxi drop-off is far away from terminal entrance ▪ No dedicated taxi storage/ waiting area unless paid entry ▪ Drop off area is too small ▪ VIP drop-off distance to terminal ▪ Lack of parking ▪ Boom gate is often faulty ▪ Carpark design is poor ▪ Lack of pay stations ▪ Operator fee to drop off passenger	▪ Proper shelter for all pedestrian areas ▪ Larger terminals for drop off/pick up area ▪ Clear wayfinding signage for passengers and drivers ▪ Speed bumps to limit speeding in carpark ▪ Closer drop off area for taxi's/rideshare and private transfers

3.6.3 Car Rental (Avis)

Avis staff were consulted to provide their perspective of current issues at the BBGA. Overall, staff identified that the current operations of the car parking could be improved and help rental car pick up and return operations. The issues are listed in Table 3.5.

Table 3.5: Identified Rental Issues

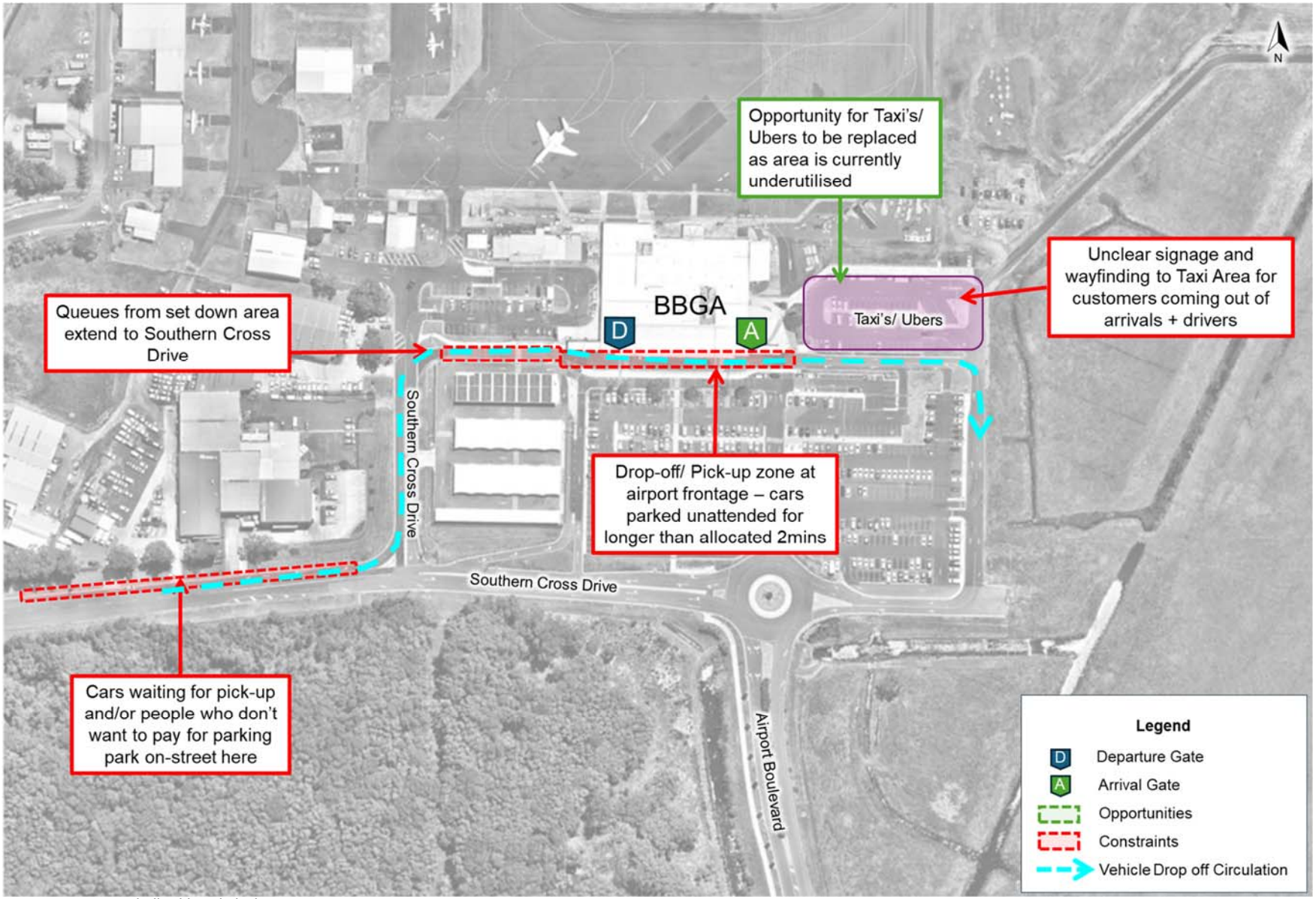
Issue	Description
Wayfinding	Customers returning vehicles often get lost – no clear direct wayfinding to rental car park area No clear separation of rental and public parking area
Limited Space	lack of space for vehicle storage – rental vehicles are often parked on-street
Staff Parking	Limited staff parking, staff are currently parking at the back of the airport
Peak Time Queues	Vehicles queueing can often block the exit
Boom Gate Entrance	Existing boom gate entrance storage space does not wholly fit one vehicle License plate recognition upon entrance often fails and Ground staff have disconnected the boom gate

3.7 Issues and Opportunities Mapping

The existing issues and opportunities have been mapped to help outline the key areas of improvement needed on site. The issues found particularly focus on:

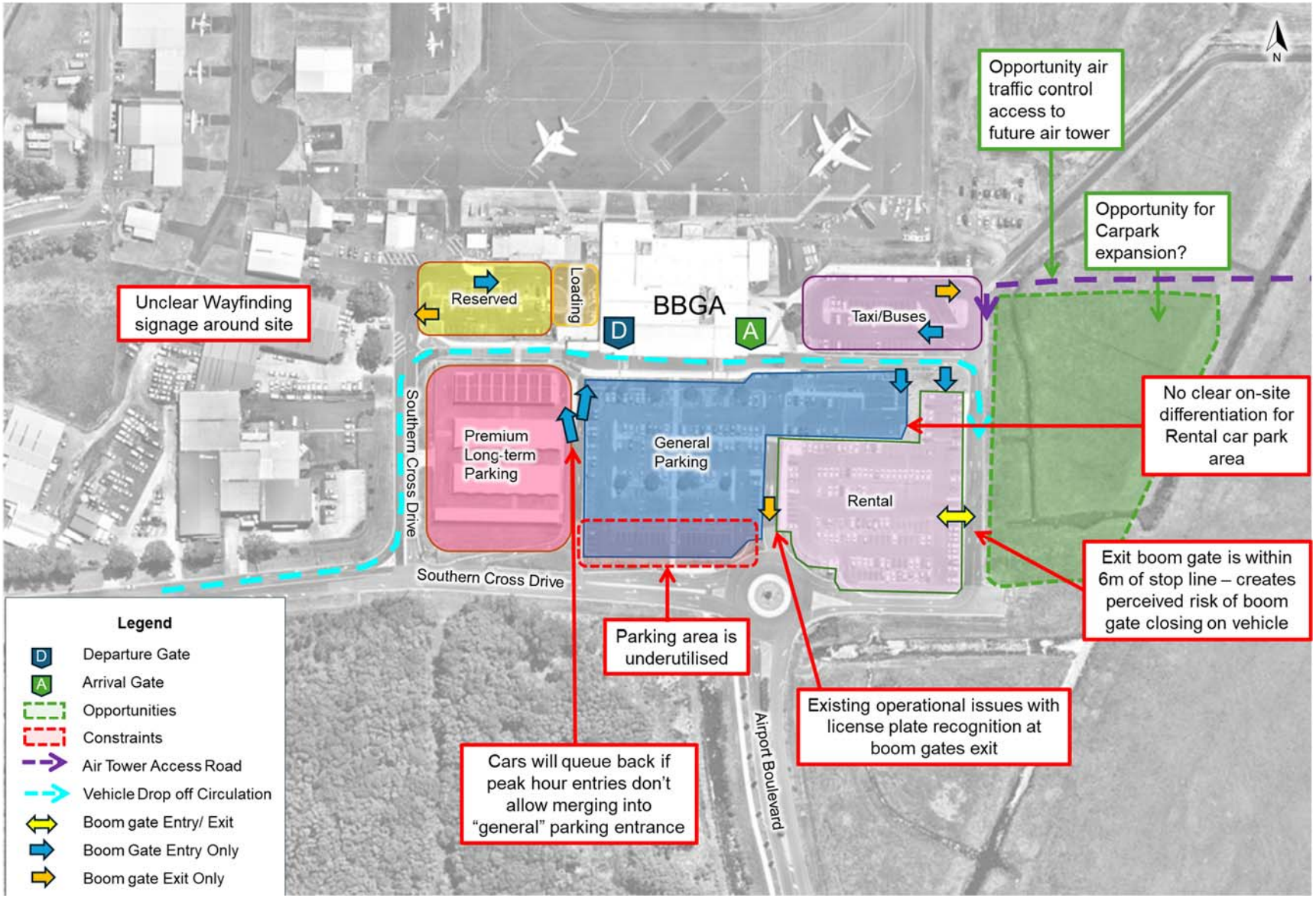
- Pick up/ Drop-off Operations (Including Taxi's, Ubers and Shuttle Buses)
- Parking Operations (Including Rental Parking and Staff Parking)
- Pedestrian Wayfinding and Pathways
- Public Transport

The issues and opportunities for the existing Drop-off/ Pick-up operations are outlined in Figure 3.6, Figure 3.7, Figure 3.8 and Figure 3.9.



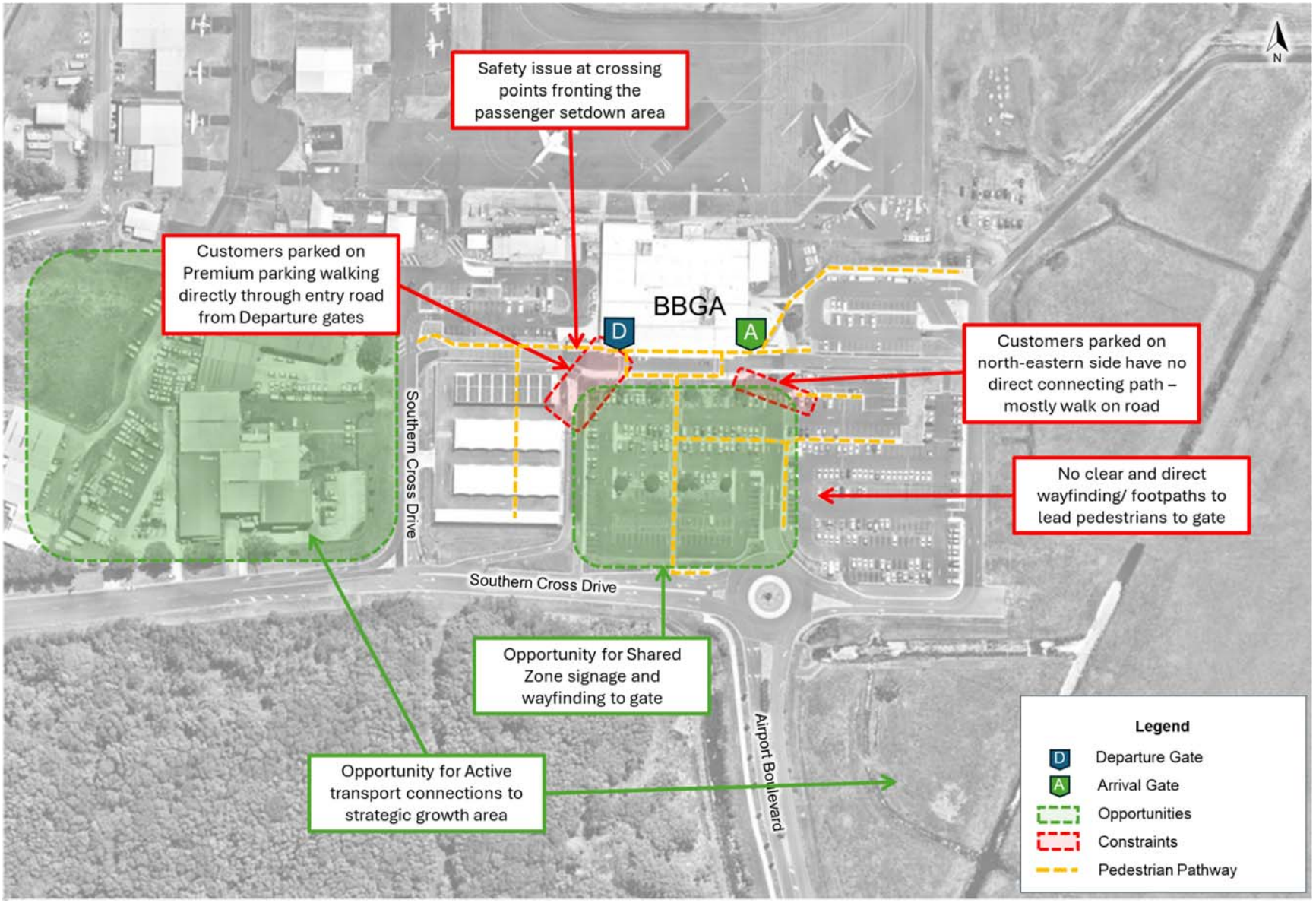
Source: Nearmap (edited by Bitzios)

Figure 3.6: Existing Drop-off/ Pick-up Issues and Opportunities



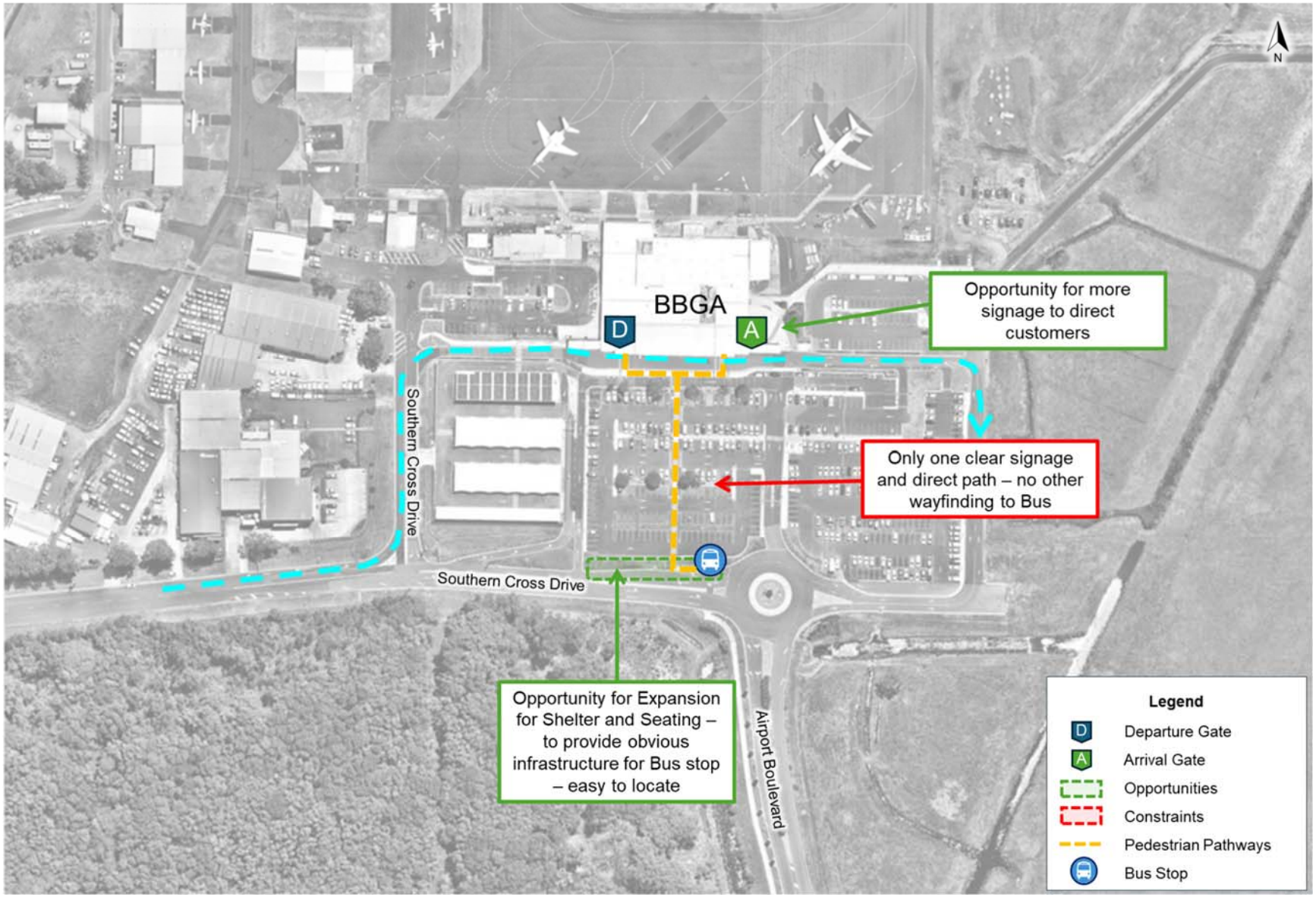
Source: Nearmap (edited by Bitzios)

Figure 3.7: Existing Issues and Opportunities for BBGA Parking Operations



Source: Nearmap (edited by Bitzios)

Figure 3.8: Issues and Opportunities for the Existing Pedestrian Facilities



Source: Nearmap (edited by Bitzios)

Figure 3.9: Issues and Opportunities for the Existing Public Transport Facilities

4. GROUND TRANSPORT DEMANDS

4.1 Existing Parking Demands

Survey parking data, undertaken on Friday 3rd May 2024, helped to identify the maximum occupancy of vehicles parked in each area. This also allowed identification of current parking demands areas underutilised. Boom-gate data was sourced from Council to determine the peak day within the BBGA's typical busiest period from December – March. Prior to the GTMP, airport staff indicated that car parking at the BBGA had regularly exceeded capacity, and therefore further boom gate data from the month of November was also included in the analysis. As a result, the 29th November 2024 was identified as the day with the highest parking turnover. This boom-gate entry / exit data was compared with entry / exit data from Friday 3rd May 2024 to yield a seasonality factor of 57% which represents the BBGA's busiest day. This seasonality factor was applied to the parking occupancy data, with results provided in Table 4.1.

Table 4.1: Parking Occupancy Per Parking Area

Parking Area	Supply	6am		9am		12pm		3pm		6pm	
		Occ	%	Occ	%	Occ	%	Occ	%	Occ	%
Premium	**113**	61	54%	71	63%	77	68%	71	63%	66	58%
General	**225**	157	70%	202	90%	226	100%	227	101%	229	102%
Online/ reserved	**39**	17	44%	25	64%	41	105%	41	105%	39	100%
Rental	**186**	186	100%	168	90%	186	100%	186	100%	168	90%
Taxi/Rideshare	**52**	16	31%	19	37%	20	38%	35	67%	6	12%
TOTAL Occupancy	**615***	**437**	**71%**	**485**	**79%**	**550**	**89%**	**560**	**91%**	**508**	**83%**

Note: Occ – Occupancy, % - Total Occupancy Percentage
**Total supply of car parking does not include Staff Parking (54 spaces). Overall total Parking is 669 spaces.*

A breakdown of maximum occupancy per parking area during the surveyed time period is shown in Figure 4.1 to Figure 4.5.

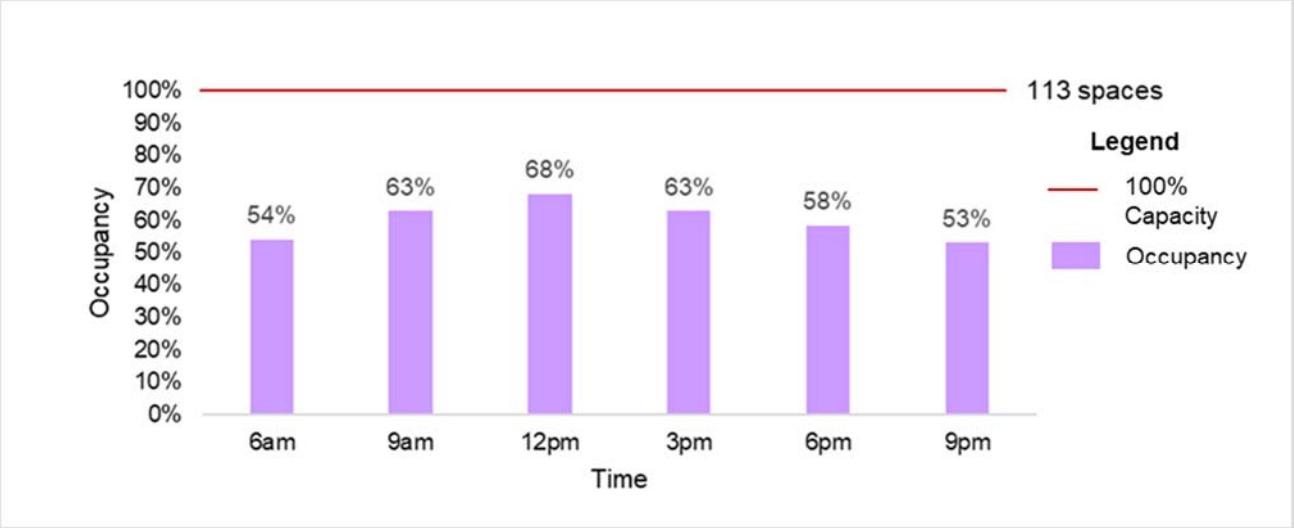


Figure 4.1: Premium Parking Occupancy

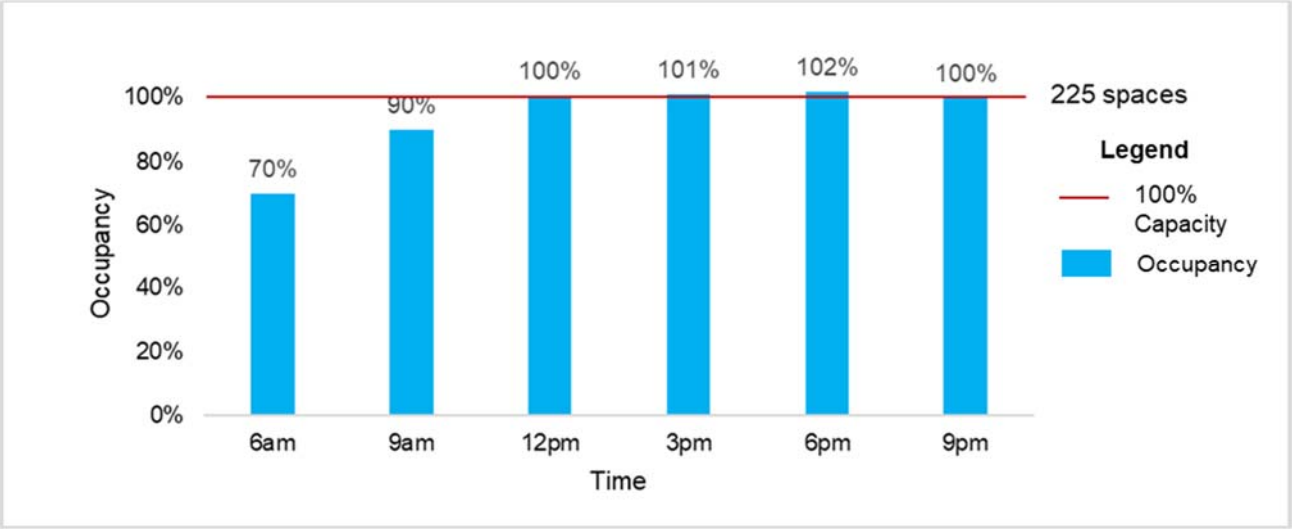


Figure 4.2: General Parking Occupancy

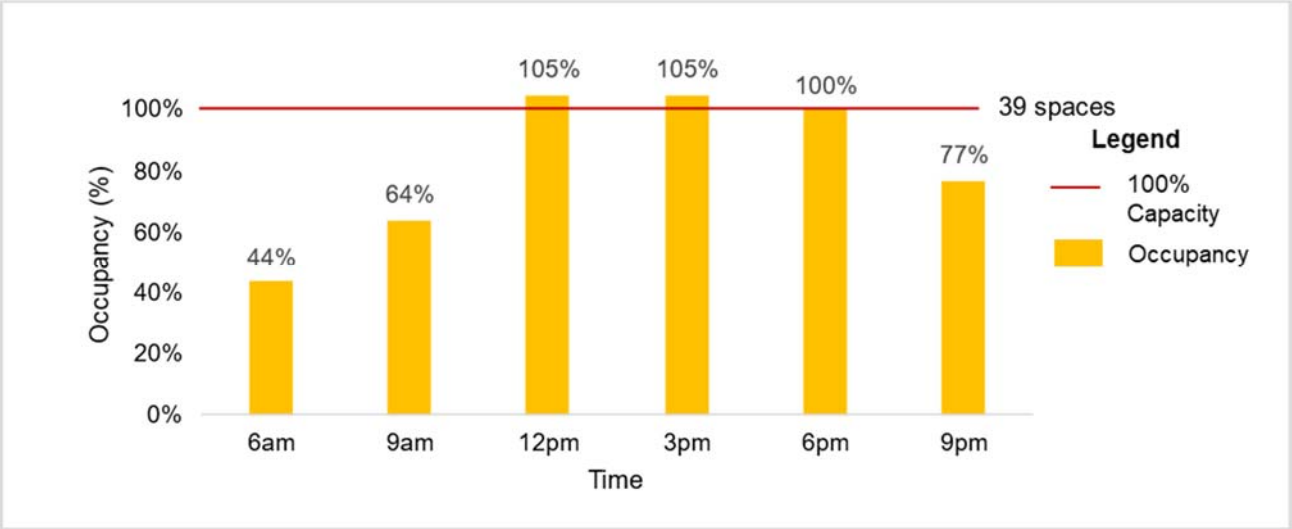


Figure 4.3: Reserved Parking Occupancy

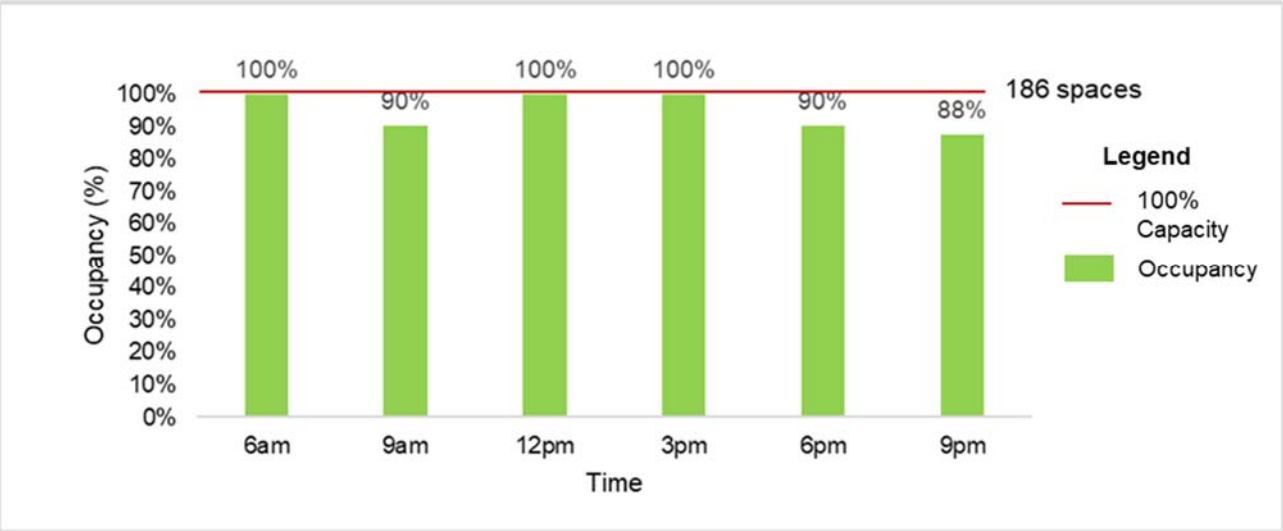


Figure 4.4: Rental Parking Occupancy

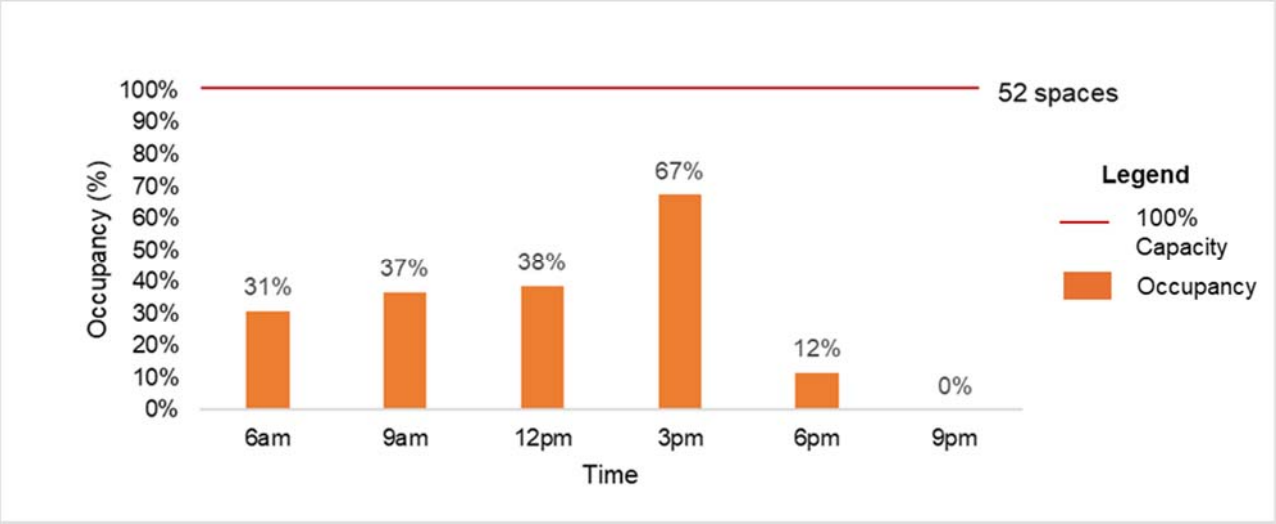


Figure 4.5: Taxi and Rideshare Parking Occupancy

Consistent with most regional airports, car rental operators have the majority of their fleet (100%) on-site from 6am – 9am. This occupancy reduces after the first arrival of the day at 8:40am.

Premium parking (32%), and Taxi and Rideshare parking (33%) was found to be underutilised.

As a whole, the survey data showed that out of the total 615 car parking spaces (excluding staff parking), a maximum of 91% (560 car parks) is occupied from 12pm to 3pm. This leaves a total of 55 car parking spaces under-utilised on site during the peak hour period. From 6am to 12pm, only a maximum of 79% (485 car parks) are utilised, leaving 130 car parks under-utilised for half a day.

4.2 Survey Volumes

Survey counts were undertaken by Traffic Data and Control (TDC) on Friday 3rd May 2024 on site, and at five (5) key intersections listed as follows:

- Intersection 1 - Airport Boulevard / Southern Cross Drive
- Intersection 2 – Southern Cross Drive / Carpark Access
- Intersection 3 – Southern Cross Drive / East Access
- Intersection 4 – Southern Cross Drive / Drop-off Entry
- Intersection 5 – Southern Cross Drive / Eastern Entry Exit Intersection

Figure 4.6 shows the surveyed intersections.

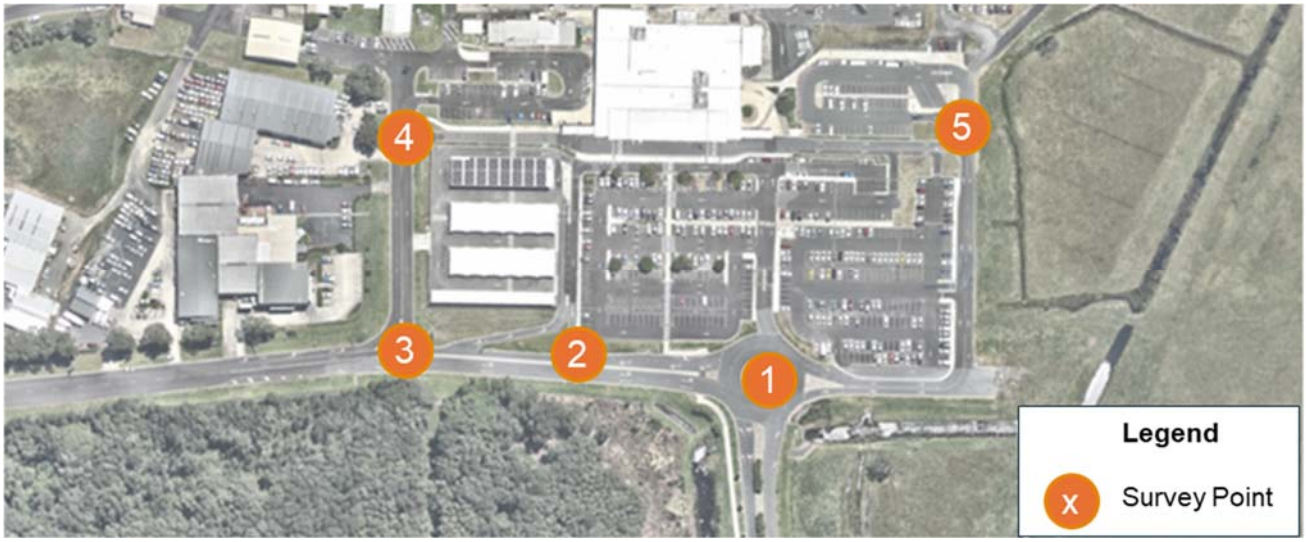


Figure 4.6: Survey Locations

Details of the survey collection are provided in Table 4.2.

Table 4.2: Survey Collection Details

Survey	Duration	Details
Video Based movement counts	6am – 9pm (15 minute intervals)	▪ Modes: light vehicles, heavy vehicles, buses, cyclists, pedestrians
Parking Occupancy survey	6am – 9pm (3 hour snapshots)	▪ By Parking Area
Passenger Survey	6am – 9pm (Every vehicle)	▪ Collecting vehicle type (car, taxi, uber, mini-bus, coach, public bus) ▪ # pax entering vehicle and parking duration ▪ # pax exiting vehicle and parking duration
Boom gate Data	6am – 9pm (every vehicle)	▪ Every vehicle timestamped on survey day ▪ Plus two-week Number pate data matching at each boom gate for duration of stay profile analysis

Pax – passengers
 # - total number of passengers

4.3 Future Year Parking Demands

Future ground transport demand is assumed to be directly correlated to anticipated air transport demand. As such, the accuracy of future year trip generation and parking demand is dependent on the accuracy of future year passenger forecasts. Forecasting future year traffic growth and car parking demand is also dependent on several assumptions including mode share, trip origin / trip destination constraints and influence of competing trip generators. Key assumptions specific to the BBGA include:

- Growth in ground transport demand will be proportional to growth in passengers
- Mode share will remain consistent in future year scenarios
  - Road network conditions / parking supply are not anticipated to reduce car mode share
- Planned growth of the nearby Coffs Harbour Airport and Gold Coast Airport are not anticipated to change the origin of passengers using Ballina Airport.

4.3.1 Growth Rates

The anticipated growth in annual passengers is provided in Table 4.3. It is noted that the growth rate is relevant for each 5-year period (i.e. year 2034 growth rate obtained from comparison of 2029 to 2034 passenger forecast).

Table 4.3: Anticipated Growth Rates

Year	Annual Passenger Forecast	Compounding Growth Rate per Annum
2024	620,000	-
2029	957,684	9%
2034	1,057,361	2%
2039	1,167,411	2%
2044	1,288,917	2%

The BBGA is anticipated to experience strong growth over the next 5 years, before slowing in the 15-year period from 2029 – 2044.

4.3.2 Future Year Parking Demand

This growth rate has been applied to demand including rental car, taxis, long-stay parking and trip generation. The resultant peak period (by use) parking demand is provided in Table 4.4.

Table 4.4: Peak Period Parking Demand

Year	Premium Parking (12pm)	General Parking (6pm)	Online Reserved (12pm)	Rental (6am)	Taxi / Rideshare (3pm)	Total Demand
2024	77	229	41	186	35	**568**
2029	119	353	64	287	54	**877**
2034	132	390	71	317	60	**970**
2039	146	431	79	350	67	**1073**
2044	162	476	88	387	74	**1187**

4.3.3 Future Year Traffic Demand

The airport is anticipated to generate 681 AM peak hour trips and 1,825 PM peak hour trips in the design year 2044.

4.4 Future Year Trip Generation

Consistent with the methodology described in Section 4.3.1, a seasonality factor of 57% was applied to the survey data.

The growth rate was also applied to trip generation. The impact on BBGA trip generation in the identified peak hours of 7:30am-8:30am and 3:30pm-4:30pm is provided in Table 4.5.

Table 4.5: Peak Period Traffic Generation

Year	AM IN	AM OUT	PM IN	PM OUT
2024	176	168	566	359
2029	270	260	871	552
2034	294	287	962	610
2039	330	318	1,063	674
2044	365	351	1,175	775

4.5 Queuing and Intersection Modelling

The existing setdown facility in 2024 shows extensive queuing extending over 200m back from the first bay. Whilst this is partially a function of vehicles idling within the setdown area, this queuing fundamentally derived from a shortage of setdown spaces (seven currently provided). Queuing is exacerbated during periods where there are multiple flights arriving / departing within an hour. The planned growth of the airport will likely see additional flights depart / arrive during these peak hours.

Exacerbation of this queuing will likely result in the use of the verge as an alternative location for pick-up / set-down on Southern Cross Drive or Airport Boulevard. Increased pedestrian movements to these areas, combined with vehicles decelerating / stopping within the travel lane will increase the risk of crashes.

The intersection modelling demonstrates that all external intersections are anticipated to operate well within acceptable performance parameters in the 20 year design horizon (2044). Queuing does note extend between intersections and all movements perform with a Level of Service A. A summary of intersection modelling results, and detailed outputs from the SIDRA Intersection modelling software is provided in **Appendix C**.

5. GROUND TRANSPORT MASTER PLAN

5.1 Preliminary (Short Term) Improvements

The GTMP is designed to cater for transport demands out to a design year of 2044 (20-year design horizon). The full extent of the recommended Master Plan layout is not necessarily required to address short-term transport concerns. As such, a suite of cost-effective, short-term improvements were devised to ameliorate identified ground transport issues. These short-term improvements have been recommended to increase the current user safety and maximise traffic efficiency on site without large scale and expensive changes. The recommended improvements are as follows:

- Removal of the existing drop-off zone individual parking bay line marking, to be provided as one connected drop-off zone, with an extended concrete walkway
- Provision of kerb extensions on both sides of pedestrian crossings along drop-off zone
- Provision of a dedicated PWD drop-off zone west of the western pedestrian crossing
- Investigation of gradient change for PWD parking bays fronting the drop-off zone
- Provision of fencing on eastern corner of premium parking area to reshape pedestrian desire line
- Shortened right turn pocket into the rental
- Removal of the right turn entry access into the general parking area
- Conversion of existing parking bays at the taxi area from 90-degrees South facing bays to parallel bays for a taxi drop off/ pick up zone.

A concept of the proposed short term interim solutions are provided in **Attachment B.**

5.2 Master Plan Design Process

Layout options for BBGA were developed with consideration to similarly sized regional airports including Cairns, Hobart and Canberra. In particular, Canberra Airport's separation of pedestrian and vehicular movements, and Cairns Airport's pick-up / drop-off facility and the primacy of Hobart Airport's car rental parking area were identified as key elements to be incorporated into the design of the BBGA Master Plan.

The options developed for the airport were designed and assessed based on the following components and associated objectives outlined in Table 5.1.

Table 5.1: Master Plan Concept Evaluation Components and Objectives

Component	Objective
Safety	▪ Reduce the risk of vehicle conflict through considered design ▪ Minimise conflict points between traffic and pedestrians
Circulation and Efficiency	▪ Provide a network that is intuitive and supports the separation of trip types, accompanied by sufficient wayfinding ▪ Develop a resilient network that can accommodate disruption
Parking	▪ Maximise parking provision to accommodate the future-year needs of the BBGA, minimizing external impacts ▪ Ensure scalability and flexibility of parking ▪ Provide staff parking in an area that is accessed by a safe and continuous pathway ▪ Providing a parking system that supports the efficient regulation of short-term and long-term visitors to the airport
Security	▪ Separation between FoH, BoH and ancillary uses ▪ Provide physical separation between the terminal and vehicles
Operational	▪ Provide ground-side servicing areas for goods drop-off and refuse collection that are separated from the passenger experience
Pick-up/Drop-off	▪ Maximise pick-up/drop-off queuing space ▪ Separation of departures and arrivals ▪ Provide adequate circulation to reduce likelihood of vehicles waiting in set-down bays
Rental	▪ Provide rental car spaces close to the terminal to allow operators to efficiently process customers ▪ Provide a rental car turnover space to allow operators to service vehicles
Buses	▪ Provide a premium public and private bus stop facility, close to the terminal and supported by covered walkways to the terminal
Taxi / Rideshare	▪ Separation between operators and regular passenger vehicles ▪ Provision of a taxi / rideshare area that is clearly signed to allow passengers to quickly identify where to find operators.

5.3 Options Comparison

5.3.1 Overview

Two layout options were developed for the BBGA, with Council providing two additional sub-options which were taken into consideration to further refine these options. Following the outcomes of the evaluation, the identified preferred option was refined in consultation with Council over multiple iterations to achieve the previously mentioned criteria in Table 5.1.

Main features of each option are provided below and shown in Figure 5.1 and Figure 5.2 respectively.

5.3.2 Option 1: Separated Departure and Arrival Entry

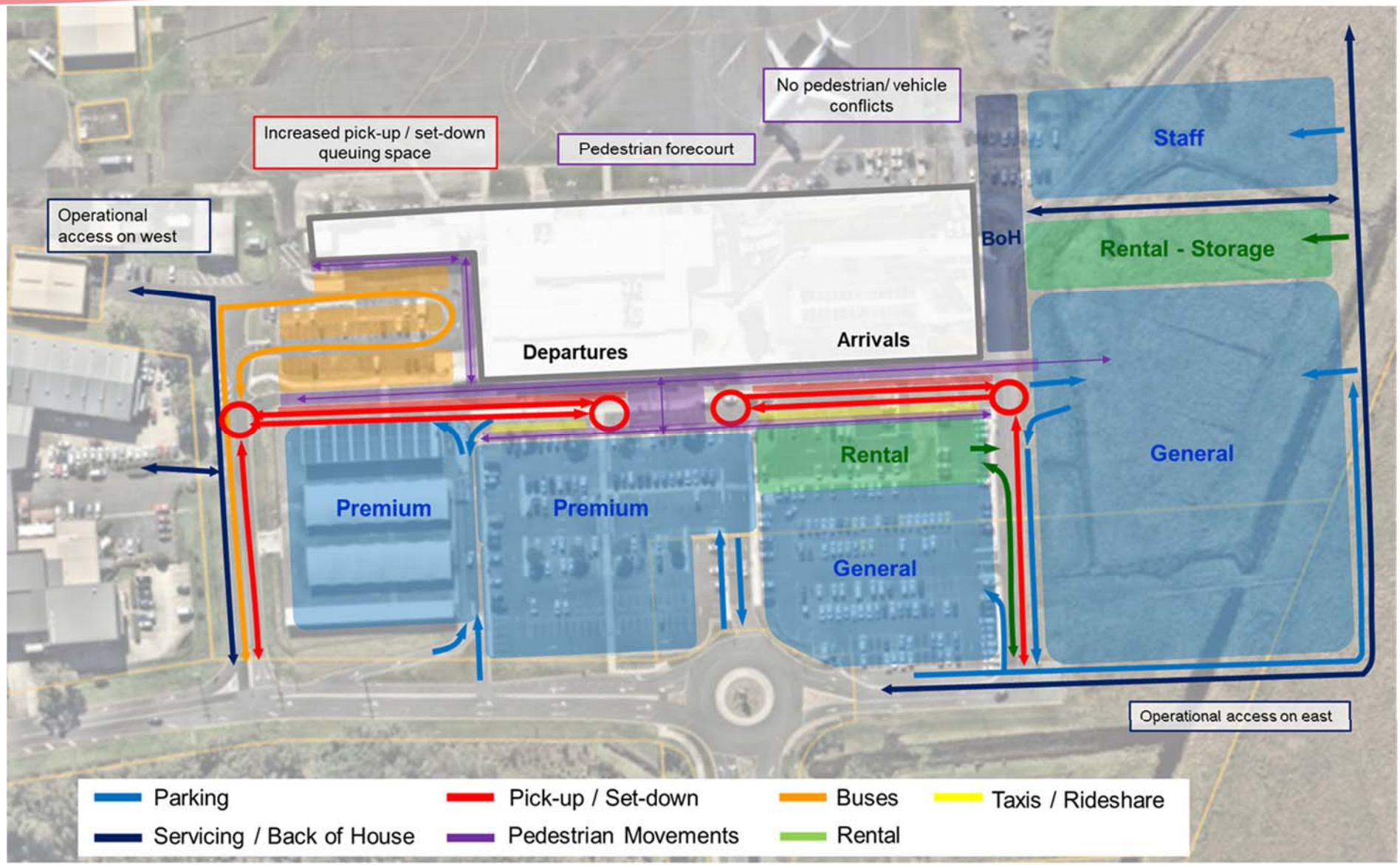
The main features of the proposed option are as follows:

- Separated pickup and set-down areas, with increased queuing space
- Two separate entrance/ exit points for departures and arrivals areas
- Operational access is located on the west side, away from front of house
- New general parking area located on proposed expansion
- Increased rental storage on the proposed expansion area
- One main pedestrian forecourt
- No pedestrian/ vehicle conflicts
- Further operational access on the east side of general parking.

5.3.3 Option 2: T-head Intersection

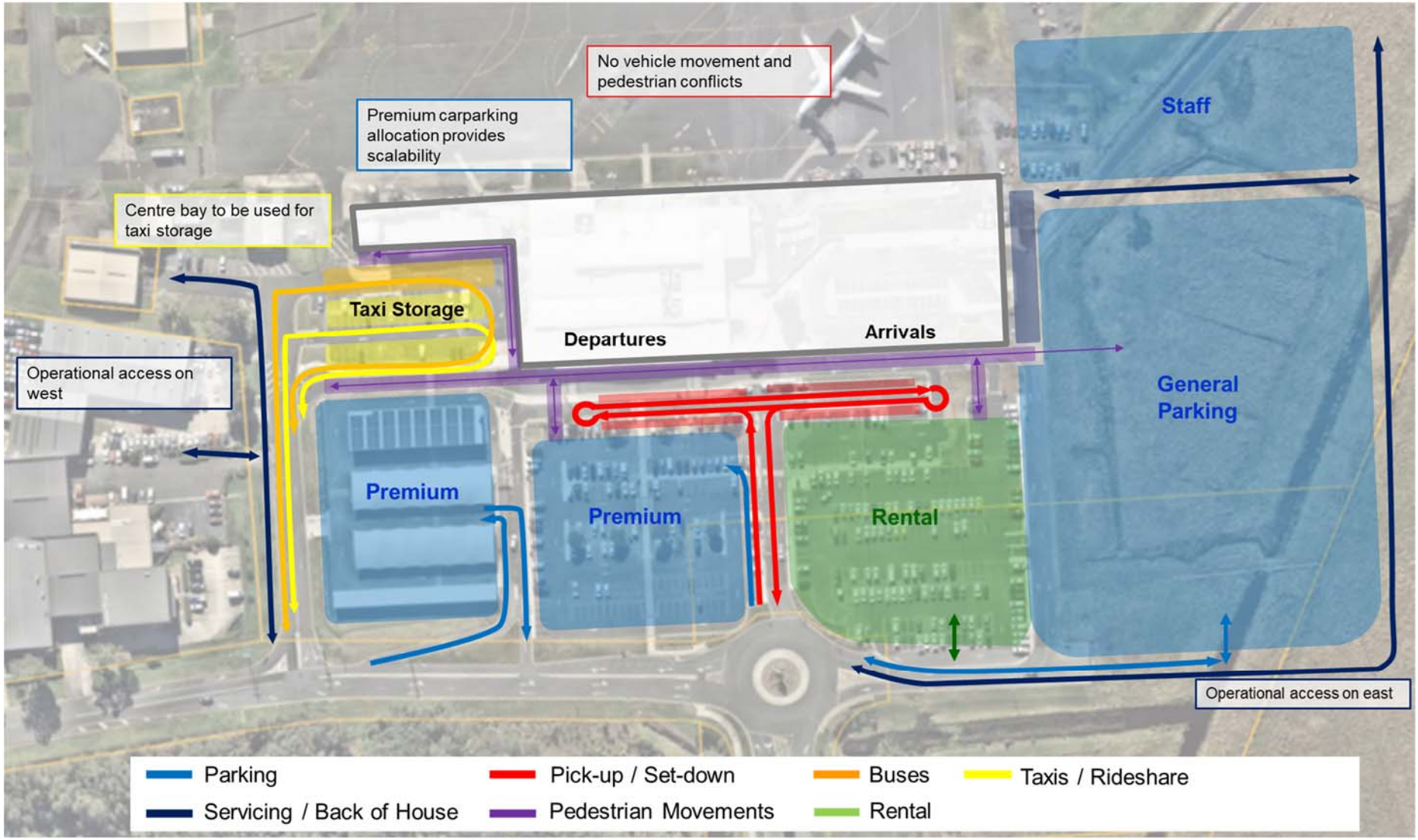
The main features of the proposed option is outlined as follows:

- Combined vehicle entry onto site through T-head intersection
- Separated departure and arrivals set-down and pick-up area
- Operational access is located on the west side
- Taxi and Bus storage moved away from front of house – centre bay to be used for taxi storage
- Separated taxi and Bus entry and exit
- Premium carparking allocation provides scalability
- No pedestrian conflicts with drop off and pick up area
- Separated entry and exit for Rental
- Further operation access on the east side of general parking.



Source: Nearmap (edited by Bitzios)

Figure 5.1: Option 1 – Separated Departure and Arrival Entry



Source: Nearmap (edited by Bitzios)

Figure 5.2: Option 2 – T-head Intersection

5.3.4 Options Assessment

Each option was assessed against the criteria provided in Table 5.1 and identified across four categories being Achieved, Partially Achieved, Could be Achieved or Not Achieved. The outcomes of this assessment are provided Table 5.2.

Table 5.2: Options Assessment

Objective	Option 1	Option 2
Safety		
Reduce risk of vehicle conflict	Partly achieved	Achieved
Minimise traffic / pedestrian conflict points	Partly achieved	Achieved
Circulation and Efficiency		
Intuitive network which separates trip types	Not achieved	Achieved
Resilient network which offers redundancies	Achieved	Partly achieved
Parking		
Maximise parking provision	Achieved	Achieved
Scalability and flexibility	Achieved	Achieved
Accessibility of staff parking	Achieved	Achieved
Regulation of short-term and long-term visitors	Could be achieved	Could be achieved
Security		
Separation of FoH, BoH and ancillary uses	Achieved	Achieved
Physical separation of terminal from public vehicles	Achieved	Achieved
Operational		
Separation of groundside servicing from public	Achieved	Achieved
Pick-up / Drop-off		
Maximise queuing space	Achieved	Partly achieved
Separation of departures / arrivals	Achieved	Could be achieved
Provide adequate circulation to reduce overstays	Achieved	Achieved
Rental		
Proximity to terminal	Achieved	Achieved
Provision of turnover space	Achieved	Could be achieved
Buses		
Premium public and private bus stop facility	Achieved	Achieved
Taxi / Rideshare		
Separation of operators from public vehicles	Not achieved	Achieved
Proximity to terminal supplemented by signage	Achieved	Achieved

Based on the above, and through consultation with Council, Option 2 was identified as the preferred option as it provided a more intuitive network and also greater opportunities to separate and manage the various transport components.

5.4 Preferred Option Refinement

Following evaluation by the broader project team, a number of refinements were made to Option 2 which included:

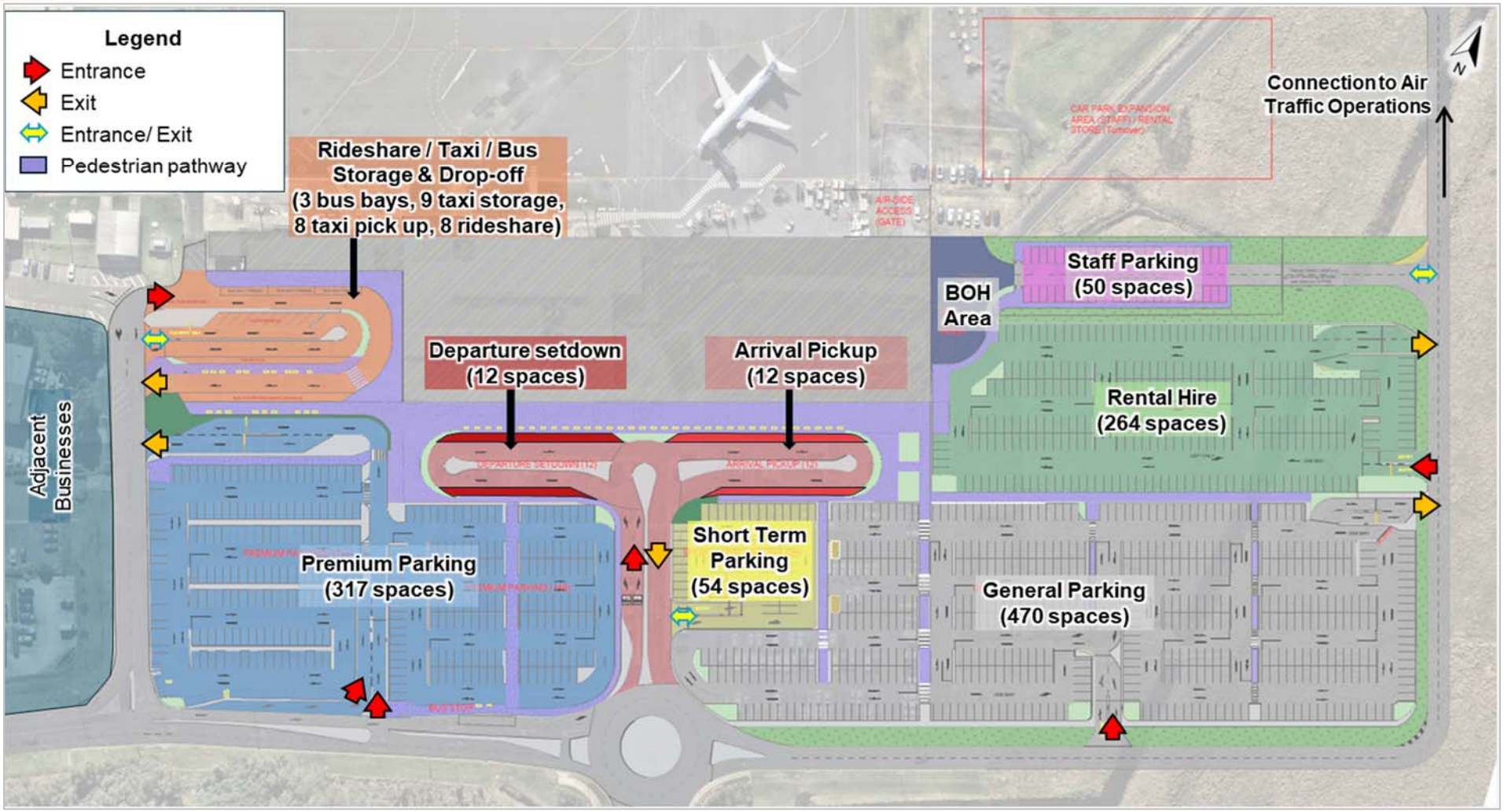
- Relocation of the staff parking outlined within the future expansion area and into the new General carpark precinct
- Desire for only a single (one) point of entry / exit for each precinct but providing sufficient operational capacity.
- Incorporating an internal roundabout at the T-head intersection servicing the departures and arrivals.

Final refinements were updated, which resulted in the final option layout, as shown in Figure 5.3 (see overleaf).

The resultant Master Plan is shown in **Appendix A**.

It is noted that the proposed Master Plan is designed to be modular, with medians separating the car rental and standard parking able to be moved as to reallocate car spaces to each parking type should future year demand deviate from what is forecast.

Additional aspects such as wayfinding, signage and airport plans to be provided in later stages as part of detailed design and construction plans.



Source: Nearmap Aerial with Bitzios Concept Design, 2024

Figure 5.3: Finalised Option 2 Layout Concept

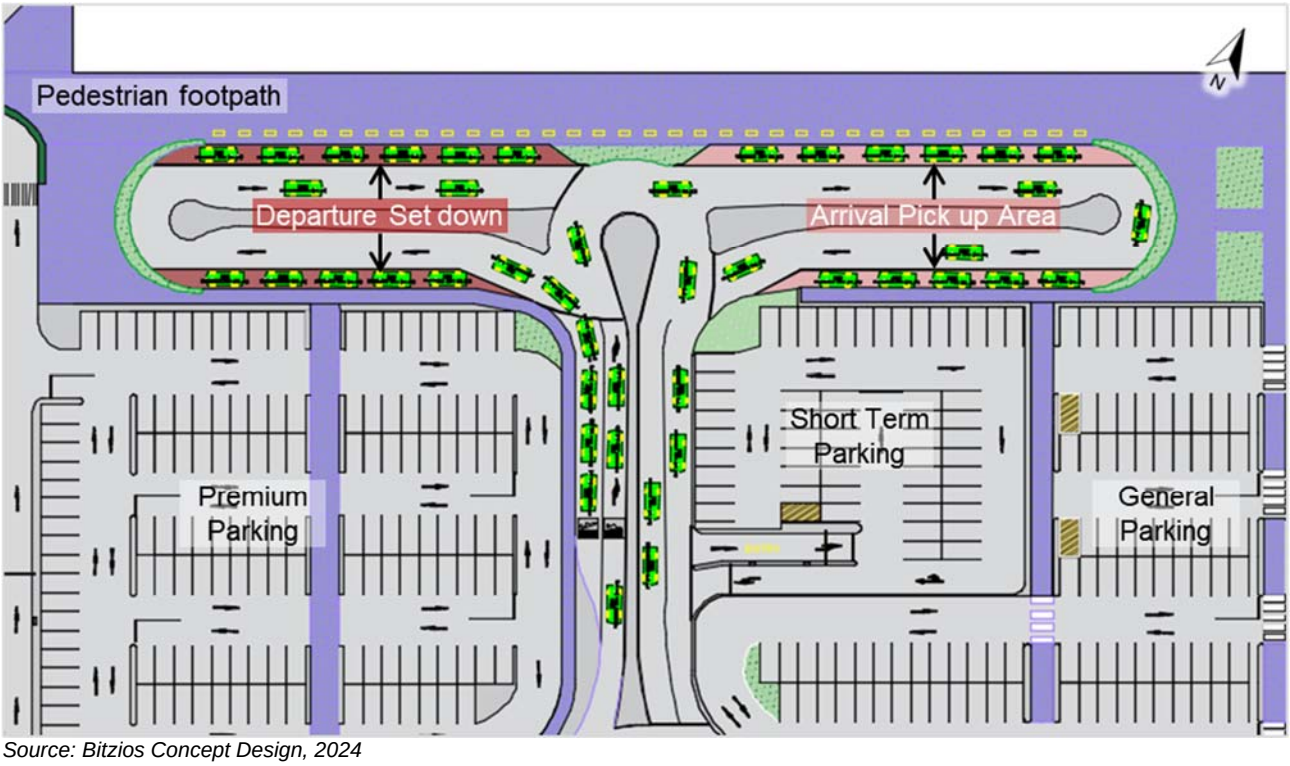
5.5 Preferred Master Plan Performance

5.5.1 Queuing Assessment

An origin – destination survey was undertaken to determine existing queuing constraints within setdown area. The queueing analysis showed that a typical kerbside pick-up vehicle would be parked within the setdown area for 2 minutes 45 seconds, with a maximum of 9 minutes 17 seconds. The maximum time spent waiting to enter the setdown area was 2 minutes 35 seconds.

Traffic survey data showed that, under typical operations, 120 vehicles enter the setdown area during the PM peak hour. Based on anticipated growth in passenger numbers, it is likely that 251 vehicles will enter the setdown area during the peak hour in the design year 2044.

The recommended Master Plan option shows a total of 24 setdown spaces. Pursuant to the AustRoads Guide to Traffic Management: Traffic Theory Concepts, queuing has been calculated based on the 24 spaces and a service rate of 2 minutes 45 seconds. This found that under the proposed Master Plan, the proposed setdown area would result in a 98th percentile queue of five vehicles (waiting to enter setdown spaces) during the peak period from 4:00pm – 5:00pm. This queue can be accommodated within the 54m space between the Southern Cross Drive / Airport Boulevard roundabout and the setdown area. Figure 5.4 shows a simulation of vehicle queuing within the T-head intersection when all 24 setdown spaces are utilized.



Source: Bitzios Concept Design, 2024

Figure 5.4: GTMP Concept Plan - Queuing Area at Drop-off area

The proposed setdown area can therefore cater for the anticipated demand in the design year 2044 with minimal queuing. Further traffic demand management strategies can further reduce this demand / queue including:

- Signposted time-restrictions within the setdown area
- Peak period marshalling to improve the efficiency of the setdown area
- A dedicated short-term parking module within the parking supply that offers free parking for vehicles picking up / dropping off visitors (i.e. 30 minutes free parking within long-term parking area).

5.5.2 External Intersection Performance

The intersection modelling of the relevant intersections both with and without the GTMP in the 20-year design horizon 2044 demonstrated that there is no anticipated change to intersection performance following the implementation of the Master Plan. All intersections remain well within acceptable performance parameters with a Level of Service A for all movements.

5.5.3 Parking Supply

A comparison of the GTMP's parking supply based on current and forecasted demand is shown in Table 5.3.

Table 5.3: Parking Supply

Parking Area	Current Supply	2024 Peak Period Demand	2044 Forecast Demand	2044 GTMP Supply
Premium Parking	113	77	162	317
Online Reserved	39	41	88	
General Parking	225	229	476	470
Short Term Parking	-			54
Rental Parking	186	186	280*	264
Taxi and Rideshare	52	35	50*	25
Drop-off/ Pick up Parking	-	-	-	24
Staff Parking	54	-	-	50
Total	**669**	**383**	**1,056**	**1,204**

**based on proportional increase to airport patrons. Likely to be conservative.*

6. CONCLUSIONS AND NEXT STEPS

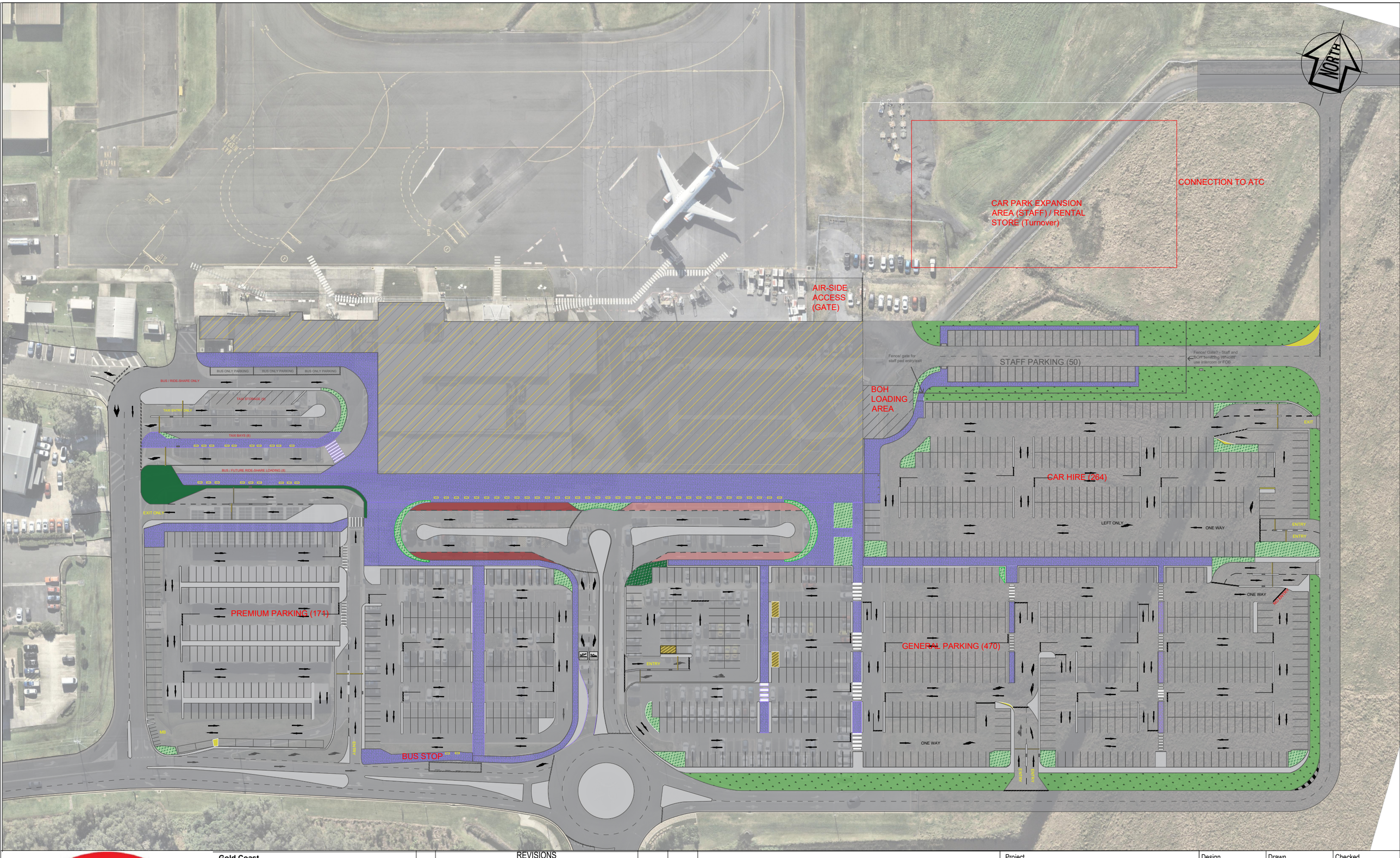
A review of the ground transport of Ballina Byron Gateway Airport demonstrated that there was a need for a comprehensive Ground Transport Master Plan to address existing issues across the groundside of the airport. These issues which include queuing from the setdown area, conflicts between vehicles and pedestrians, insufficient parking supply and read-rates / confusion at entering / exiting boom-gates are anticipated to significantly worse across the 20-year design horizon.

In devising the Master Plan, consultation was undertaken with ground staff, current transport operators and a representative car rental operator to determine the existing constraints and opportunities experience on a day-to-day basis. Year 2024 demand was determined through traffic and parking surveys. Future year traffic and parking was forecast through use of anticipated patronage numbers, and a seasonality factor taken from boom-gate entry data.

A number of regional airports were assessed to determine best practice in the design of the recommended car parking layout. Two options were developed and applied to an assessment matrix. Through this process, Option 2 was selected as the recommended layout, and then refined following feedback from Council. The recommended Master Plan layout is modular, provides adequate separation of users and increases the setdown area capacity by 17 spaces, and car parking capacity by 535 spaces.

Following the approval of the GTMP by Council, it is recommended that the BBGA look to implement the preliminary (short-term) improvements as soon as possible. It is noted that these improvements are designed to be cost-effective and can be built without disrupting the operations of the airport. Once funding is provided to implement the broader long-term Master Plan, the construction of the new car park over the current greenfield site east of the existing terminal as part of the first stage provides the redundancy to allow for the closure of the existing parking areas. It is noted that given the demand for parking at the airport exceeding the current supply, the early construction of the additional parking spaces also increases the revenue received from paid parking at the terminal.

Appendix A: GTMP Master Plan



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REVISIONS

Issue	Revisions/Descriptions	Drawn	Date
001	Ballina Airport GTMP - Concept Plan	S.TA	28.08.2024
002	Ballina Airport GTMP - Concept Plan Updates	S.TA	09.09.2024
003	Ballina Airport GTMP - Finalised Concept Plan	S.TA	04.12.2024

Scale @ A4 0 10 20 30 40 50 60 1:1250

Project: Ballina Airport GTMP

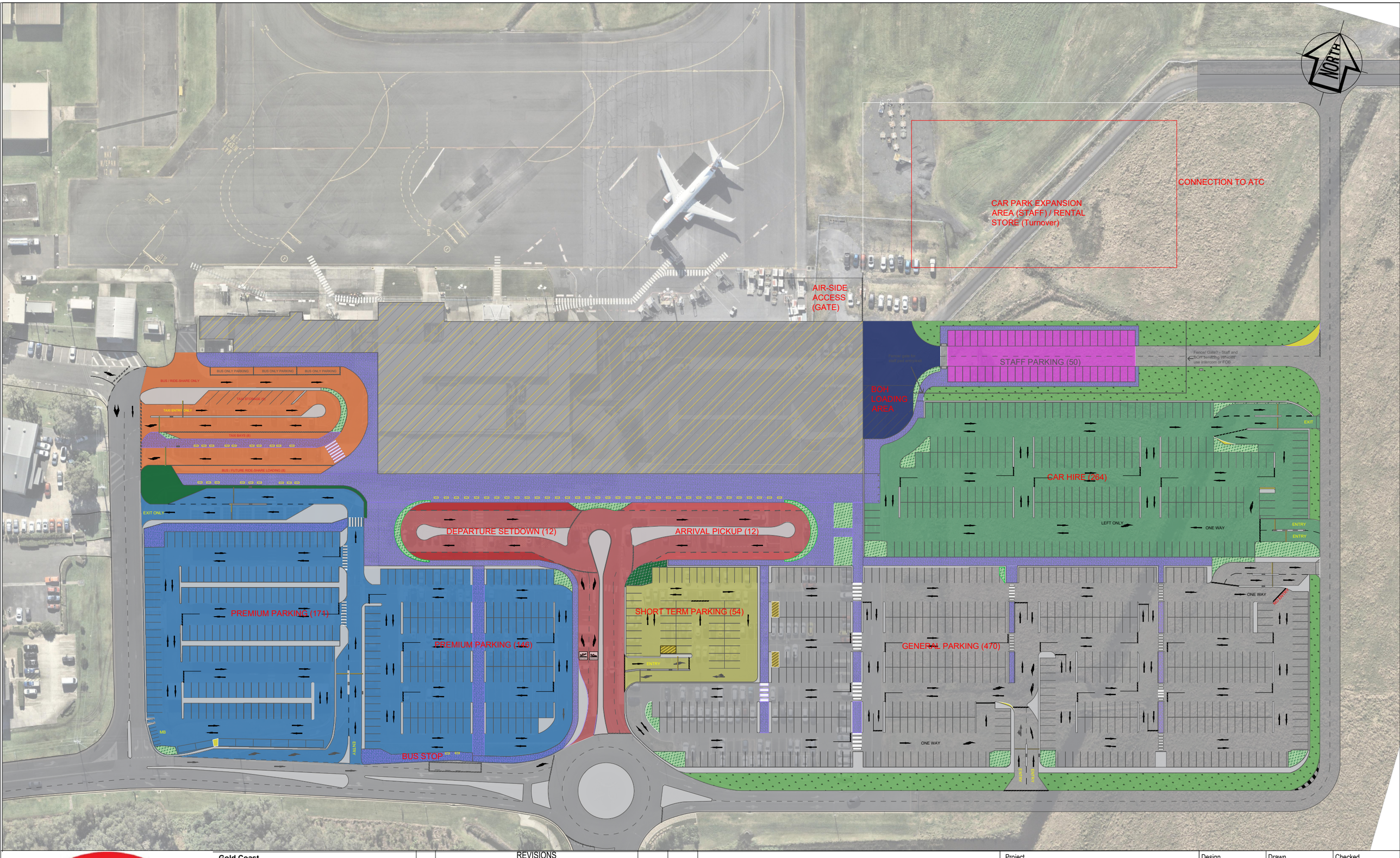
Title: GTMP Concept Plan

Design	Drawn	Checked
M.B	S.TA	A.E

CONCEPT ONLY

Date: 04.12.2024

Project Number	Sheet Number	Issue
P6438	1	002



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REVISIONS

Issue	Revisions/Descriptions	Drawn	Date
001	Ballina Airport GTMP - Concept Plan	S.TA	28.08.2024
002	Ballina Airport GTMP - Concept Plan Updates	S.TA	09.09.2024
003	Ballina Airport GTMP - Finalised Concept Plan	S.TA	04.12.2024

Scale @ A4 0 10 20 30 40 50 60 1:1250

Project: Ballina Airport GTMP

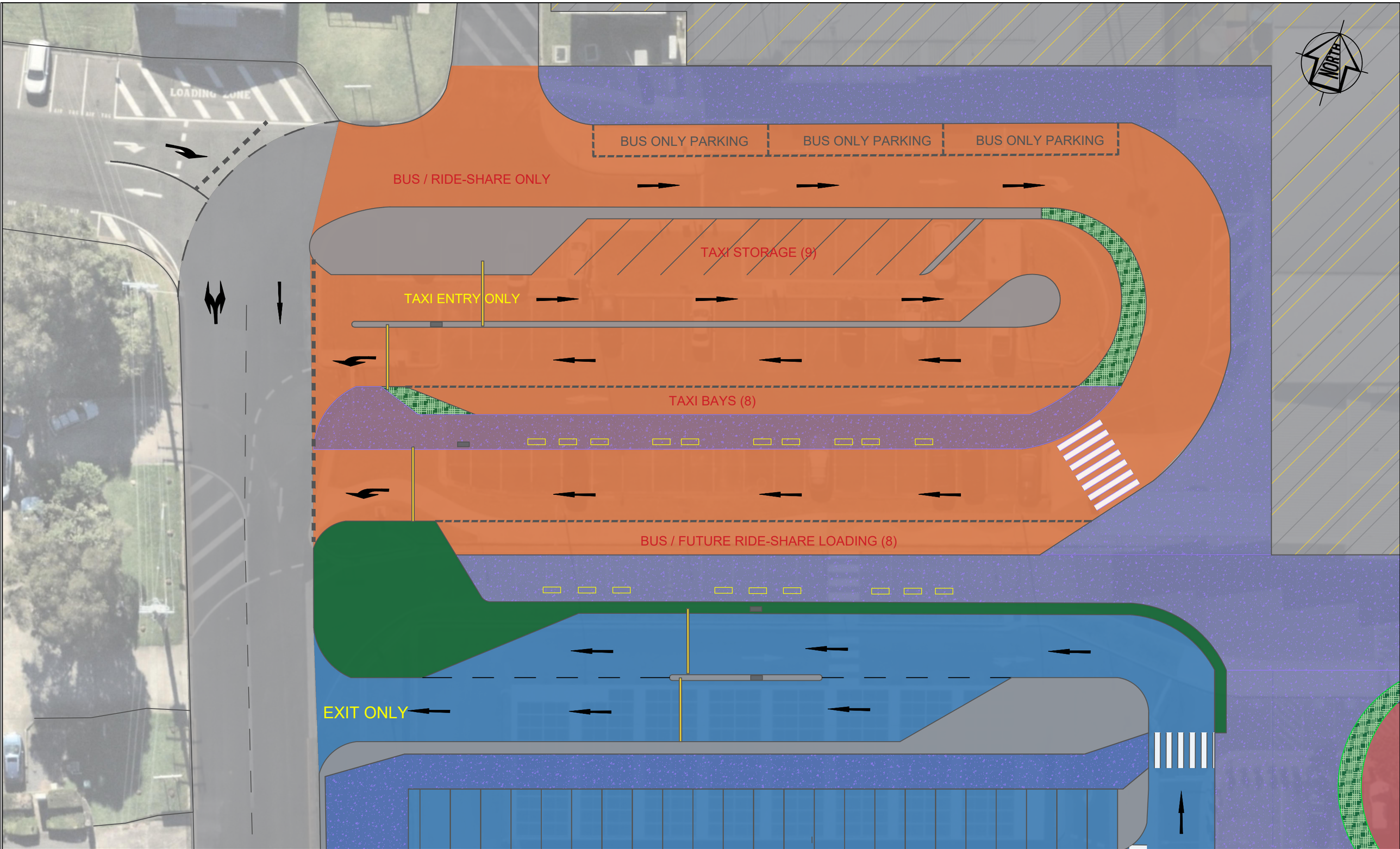
Title: GTMP Concept Zone Plan

Design	Drawn	Checked
M.B	S.TA	A.E

CONCEPT ONLY

Date: 04.12.2024

Project Number	Sheet Number	Issue
P6438	2	002



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REVISIONS

Issue	Revisions/Descriptions	Drawn	Date
001	Ballina Airport GTMP - Concept Plan	S.TA	28.08.2024
002	Ballina Airport GTMP - Concept Plan Updates	S.TA	09.09.2024
003	Ballina Airport GTMP - Finalised Concept Plan	S.TA	04.12.2024

Scale @ A4 0 2 4 6 8 10 12 14 1:300

Project: Ballina Airport GTMP

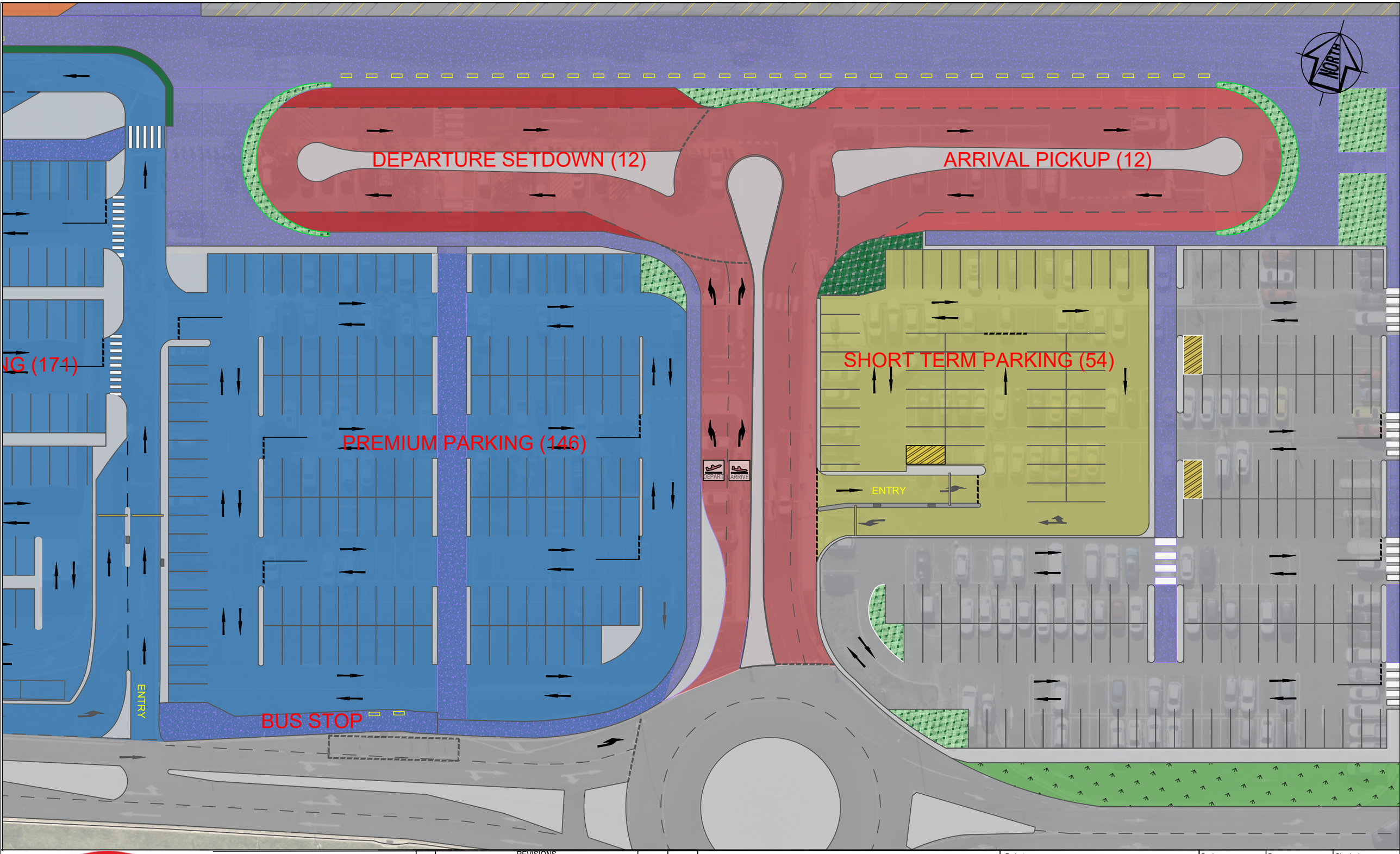
Title: GTMP Concept Plan
Taxi and Rideshare Zone

Design	Drawn	Checked
M.B	S.TA	A.E

CONCEPT ONLY

Date: 04.12.2024

Project Number	Sheet Number	Issue
P6438	3	002



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REVISIONS

Issue	Revisions/Descriptions	Drawn	Date
001	Ballina Airport GTMP - Concept Plan	S.TA	28.08.2024
002	Ballina Airport GTMP - Concept Plan Updates	S.TA	09.09.2024
003	Ballina Airport GTMP - Finalised Concept Plan	S.TA	04.12.2024

Scale @ A4 0 10 20 30 40 50 1:1000

Project: Ballina Airport GTMP

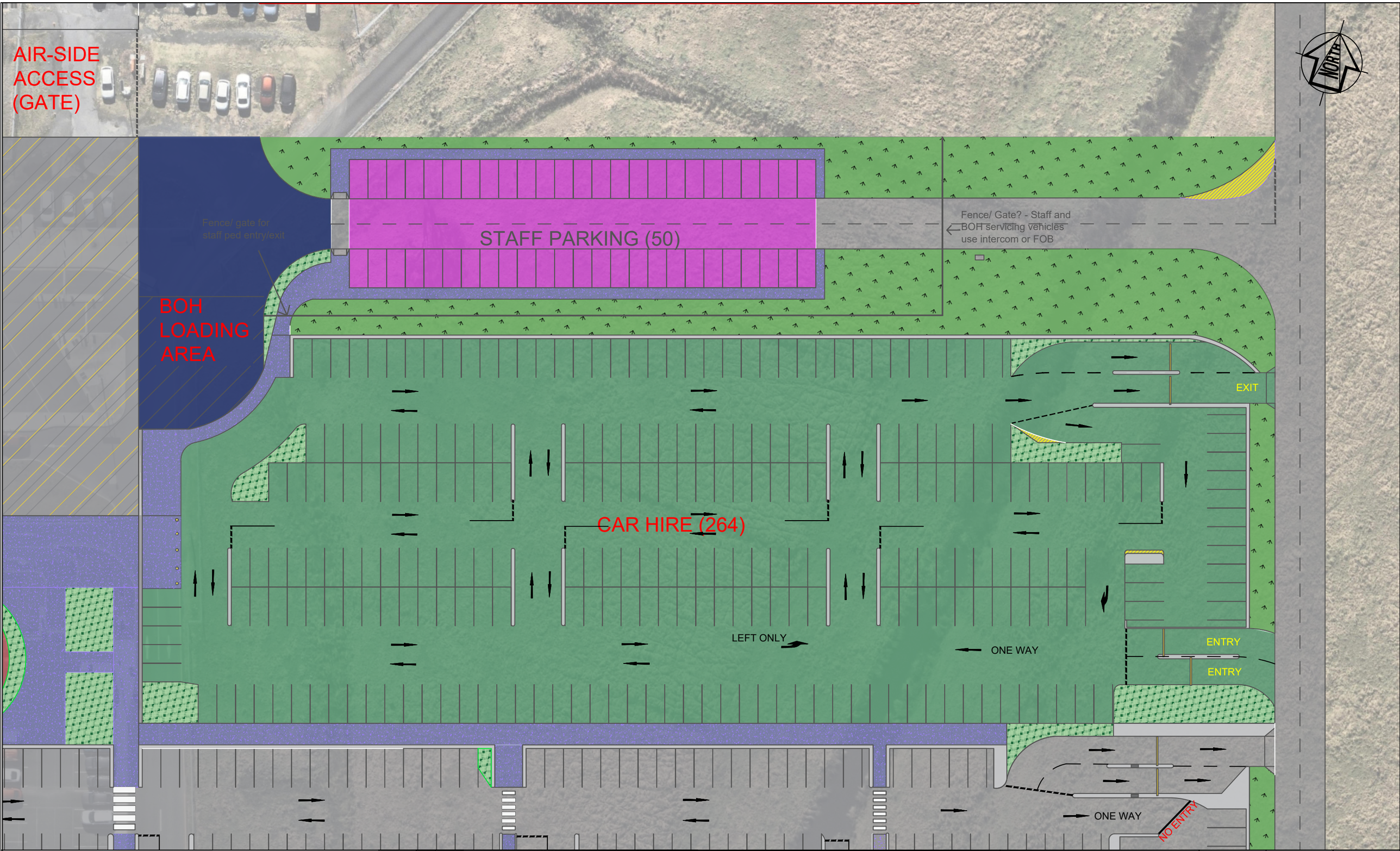
Title: GTMP Concept Plan
Premium Parking and Passenger
Set Down/ Pick up Zone

Design	Drawn	Checked
M.B	S.TA	A.E

CONCEPT ONLY

Date: 04.12.2024

Project Number	Sheet Number	Issue
P6438	4	002



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REVISIONS

Issue	Revisions/Descriptions	Drawn	Date
001	Ballina Airport GTMP - Concept Plan	S.TA	28.08.2024
002	Ballina Airport GTMP - Concept Plan Updates	S.TA	09.09.2024
003	Ballina Airport GTMP - Finalised Concept Plan	S.TA	04.12.2024

Scale @ A4 0 10 20 30 40 50 1:1000

Project: Ballina Airport GTMP

Title: GTMP Concept Plan BOH Area & Rental and Staff Parking

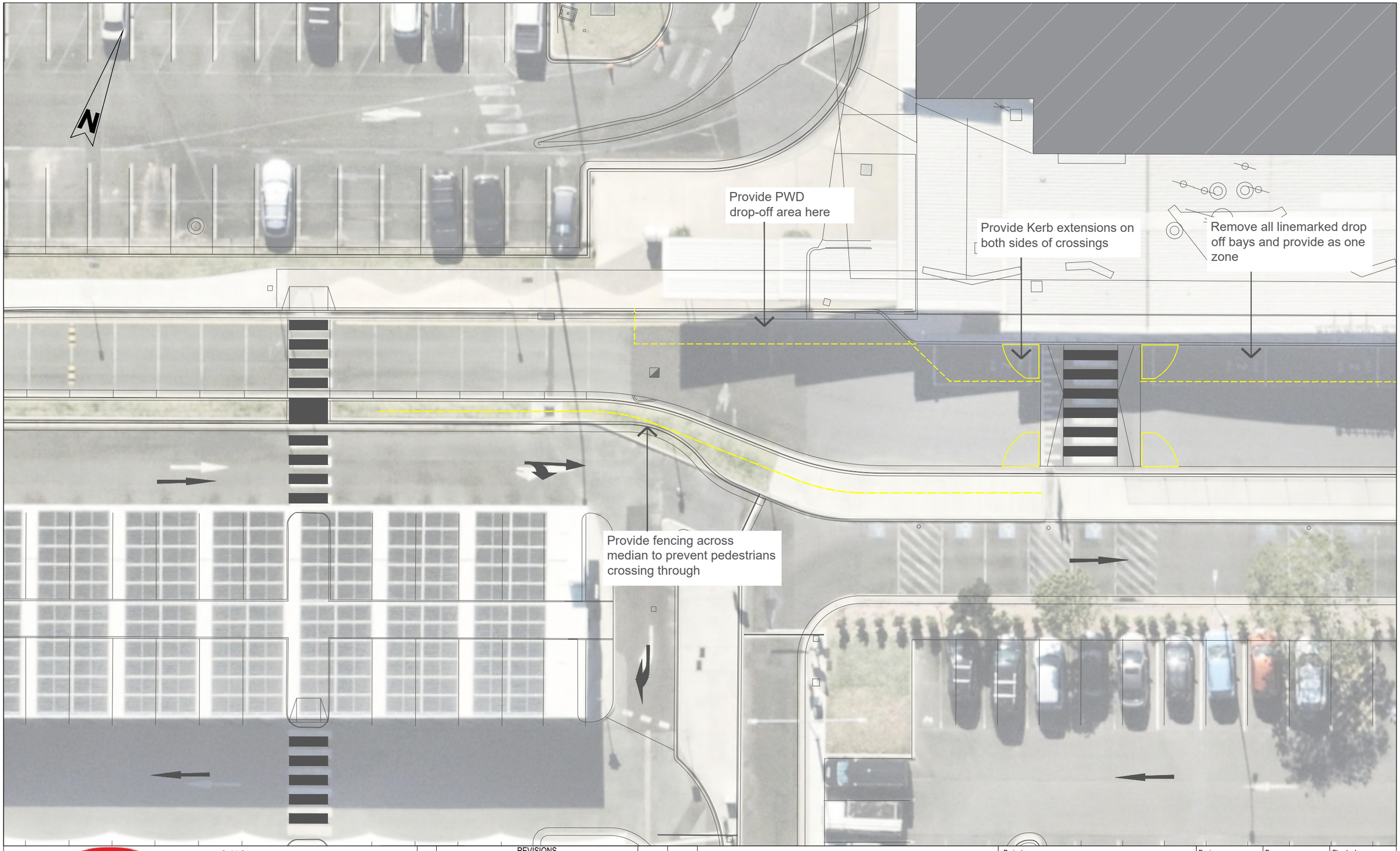
Design	Drawn	Checked
M.B	S.TA	A.E

CONCEPT ONLY

Date: 04.12.2024

Project Number	Sheet Number	Issue
P6438	5	002

Appendix B: Short Term Interim Options



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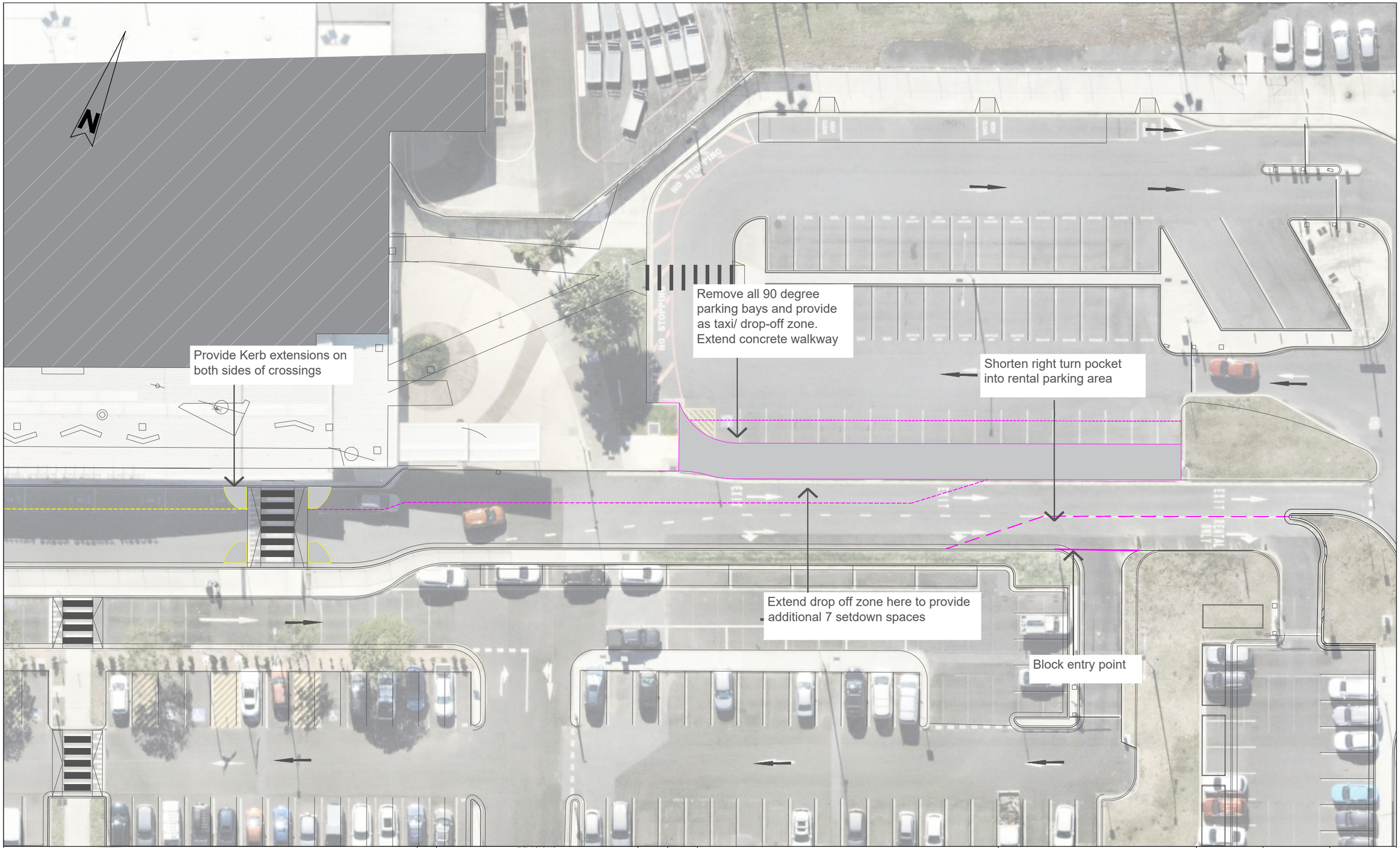
REVISIONS

Issue	Revisions/Descriptions	Drawn	Date
001	Interim Options Concept	S.TA	04/12/2024

Scale @ A3 0 1.0 2.0 3.0 4.0 5.0 1:100

Project: Ballina Byron GTMP	Design: S.TA	Drawn: S.TA	Checked: M.B
Title: Interim Options Concept	CONCEPT ONLY		Date: 31.01.2025
	Project Number: P6438	Sheet Number: 1	Issue: 001



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REVISIONS

Issue	Revisions/Descriptions	Drawn	Date
001	Interim Options Concept	S.TA	04/12/2024
002	Interim Options Concept - Updates	S.TA	31/01/2025

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Project: Ballina Byron GTMP

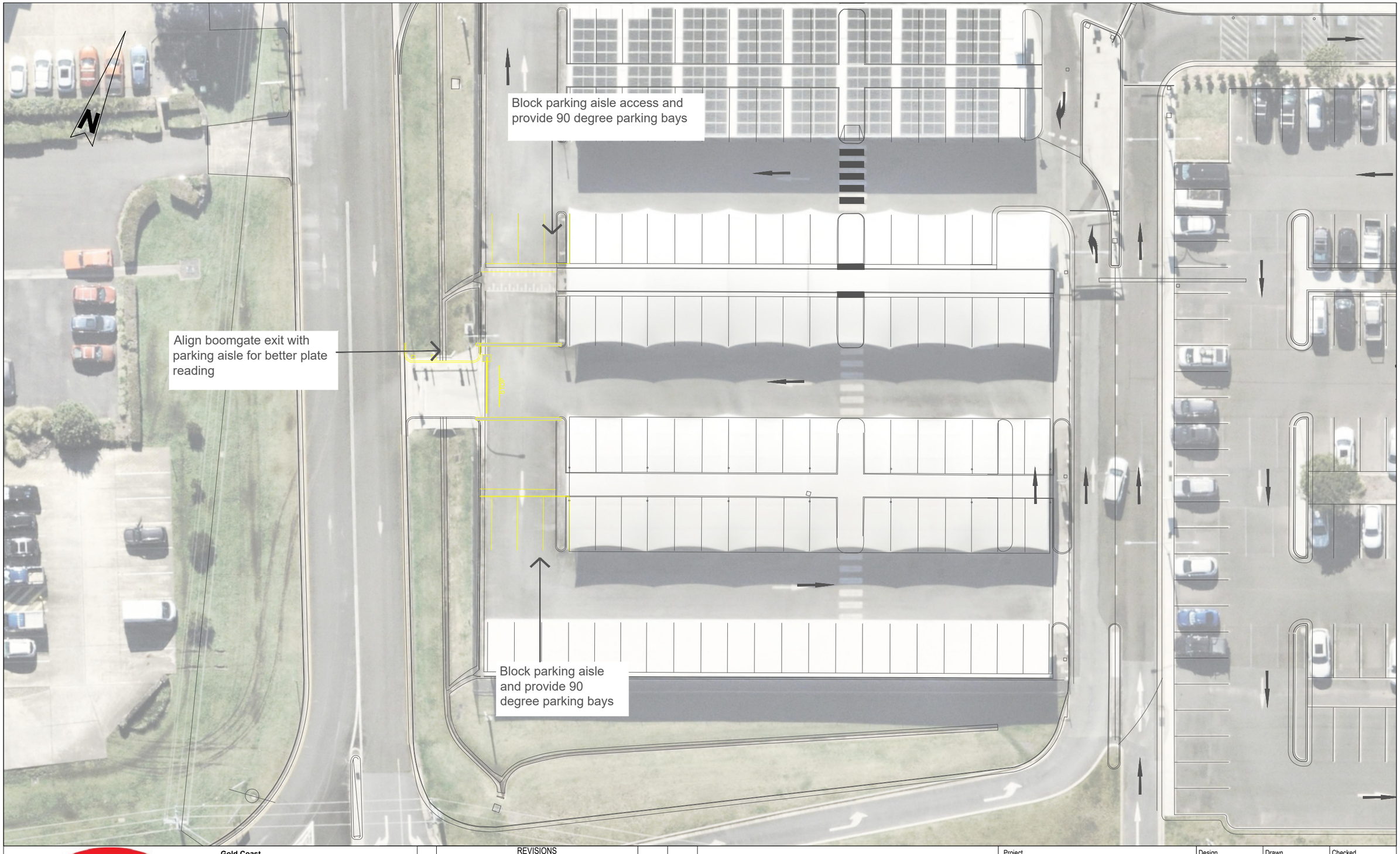
Title: Interim Options Concept

Design	Drawn	Checked
S.TA	S.TA	M.B

CONCEPT ONLY

Date: 31.01.2025

Project Number	Sheet Number	Issue
P6438	2	002



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REVISIONS

Issue	Revisions/Descriptions	Drawn	Date
001	Interim Options Concept	S.TA	04/12/2024

Scale @ A3 0 1.0 2.0 3.0 4.0 5.0 1:100

Project: Ballina Byron GTMP

Title: Interim Options Concept

Design	Drawn	Checked
S.TA	S.TA	M.B

CONCEPT ONLY

Date: 31.01.2025

Project Number	Sheet Number	Issue
P6438	3	001

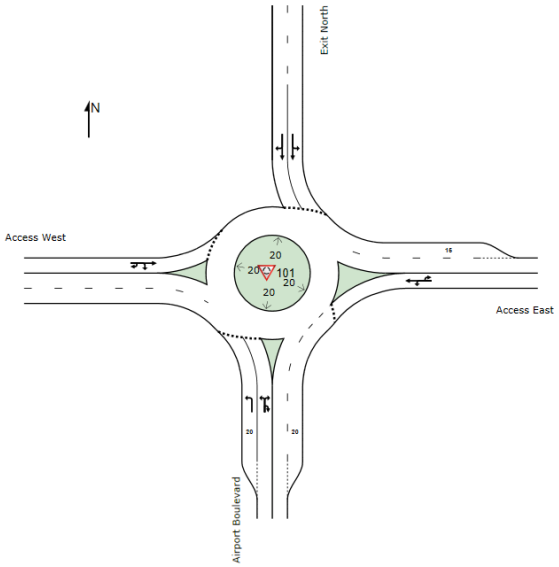
Appendix C: SIDRA Results

Base Modelling

Intersection 1: Airport Boulevard Airport / Southern Cross Drive Roundabout

The assessed SIDRA intersection layout and results summaries are shown below.

Table 1: Intersection 1 – Airport Boulevard / Southern Cross Drive Roundabout

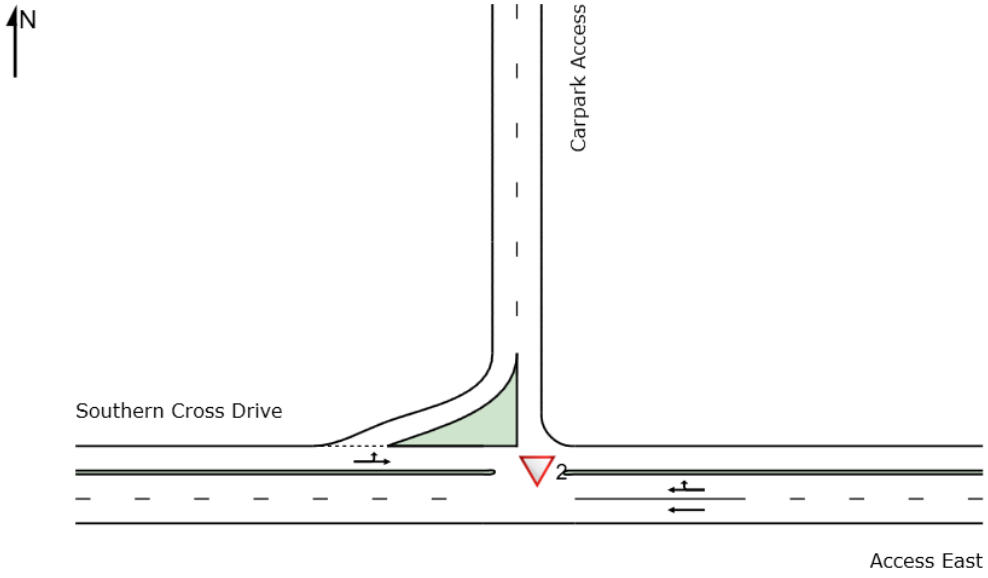


Design Year	AM Peak				PM Peak			
	DOS	Avg. Delay (s)	LOS	95% Queue	DOS	Avg. Delay (s)	LOS	95% Queue
2024 Background								
Airport Boulevard (S)	0.02	7	A	1	0.03	8	A	1
Access East (E)	0.14	0	A	5	0.30	1	A	13
Exit North (N)	0.01	2	A	0	0.05	2	A	2
Southern Cross Drive (W)	0.04	7	A	1	0.05	7	A	2
2029 Seasonal (5 Years)								
Airport Boulevard (S)	0.03	7	A	1	0.05	9	A	2
Access East (E)	0.21	1	A	8	0.50	1	A	25
Exit North (N)	0.02	2	A	1	0.08	2	A	3
Southern Cross Drive (W)	0.05	7	A	2	0.08	7	A	3
2034 Seasonal (10 Years)								
Airport Boulevard (S)	0.03	7	A	1	0.06	9	A	3
Access East (E)	0.24	1	A	10	0.54	2	A	30
Exit North (N)	0.03	2	A	1	0.08	2	A	3
Southern Cross Drive (W)	0.06	7	A	2	0.09	7	A	4
2044 Seasonal (20 Years)								
Airport Boulevard (S)	0.04	7	A	2	0.08	10	A	4
Access East (E)	0.30	1	A	13	0.68	3	A	50
Exit North (N)	0.03	2	A	1	0.11	3	A	4
Southern Cross Drive (W)	0.07	7	A	3	0.11	7	A	5

Intersection 2: Southern Cross Drive/ Carpark Access Intersection

The assessed SIDRA intersection layout and results summaries are shown in the table below.

Table 2: Intersection 2: Southern Cross Drive / Carpark Access Intersection

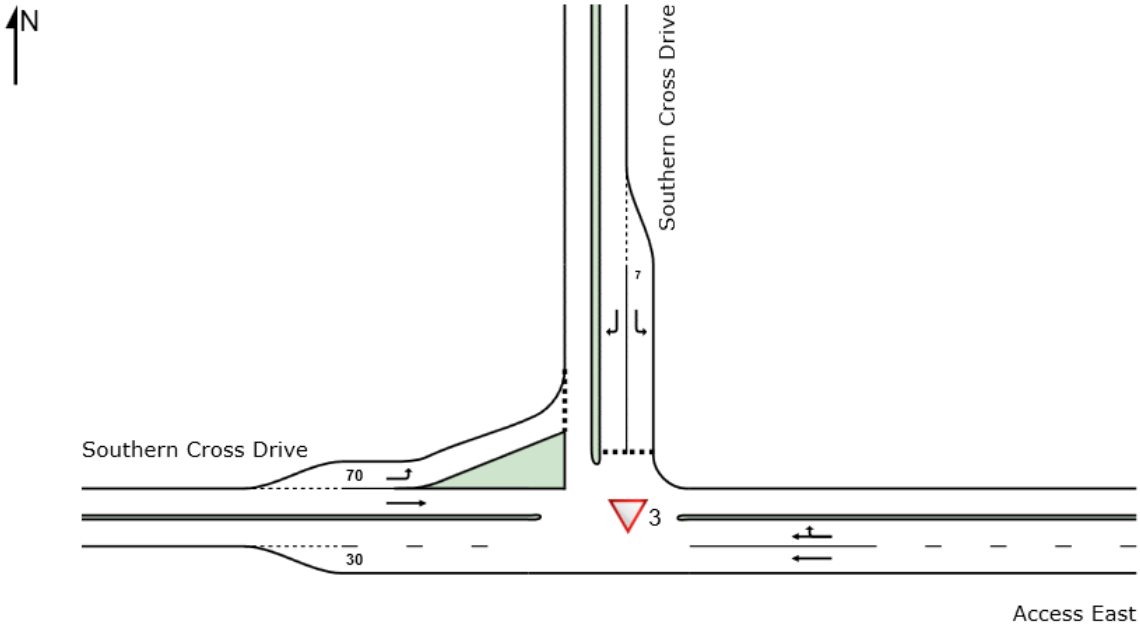


Design Year	AM Peak				PM Peak			
	DOS	Avg. Delay (s)	LOS	95% Queue	DOS	Avg. Delay (s)	LOS	95% Queue
2024 Background								
Southern Cross Drive (W)	0.05	0	NA	0	0.10	0	NA	0
Southern Cross Drive (E)	0.04	2	NA	0	0.06	2	NA	0
2029 Seasonal (5 Years)								
Southern Cross Drive (W)	0.07	0	NA	1	0.15	0	NA	1
Southern Cross Drive (E)	0.07	2	NA	0	0.10	2	NA	0
2034 Seasonal (10 Years)								
Southern Cross Drive (W)	0.08	0	NA	1	0.17	0.1	NA	1
Southern Cross Drive (E)	0.07	2	NA	0	0.11	2	NA	0
2044 Seasonal (20 Years)								
Southern Cross Drive (W)	0.10	0	NA	1	0.21	0	NA	1
Southern Cross Drive (E)	0.09	2	NA	0	0.13	2	NA	0

Intersection 3: Southern Cross Drive / East Access

The assessed SIDRA intersection layout and results summaries are shown in the table below.

Table 3: Southern Cross Drive / East Access Intersection layout

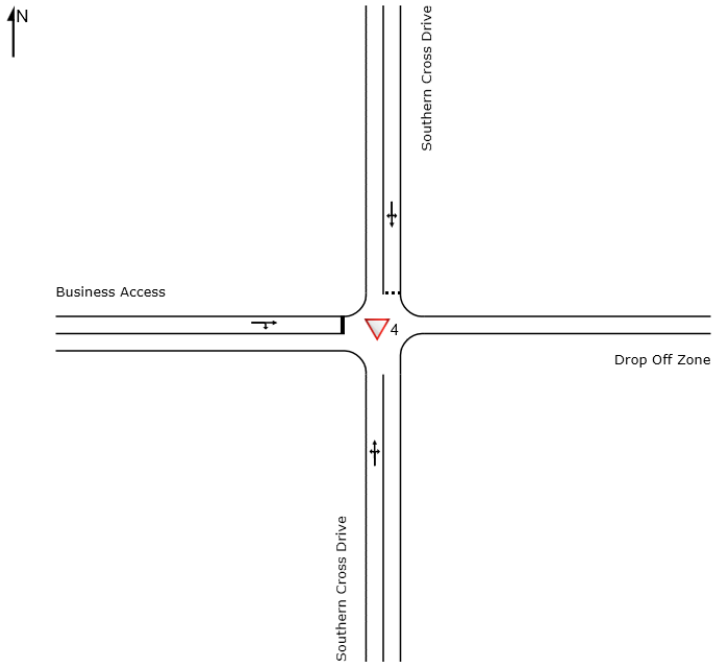


Design Year	AM Peak				PM Peak			
	DOS	Avg. Delay (s)	LOS	95% Queue	DOS	Avg. Delay (s)	LOS	95% Queue
2024 Background								
Southern Cross Drive (E)	0.08	1	NA	1	0.16	2	NA	4
Airport Access (N)	0.01	4	A	0	0.07	6	A	2
Southern Cross Drive (W)	0.09	4	A	3	0.16	4	A	5
2029 Seasonal (5 Years)								
Southern Cross Drive (E)	0.12	1	NA	2	0.26	2	NA	7
Airport Access (N)	0.03	5	A	1	0.18	11	B	4
Southern Cross Drive (W)	0.13	4	A	4	0.26	4	A	9
2034 Seasonal (10 Years)								
Southern Cross Drive (E)	0.12	1	NA	2	0.30	2	NA	8
Airport Access (N)	0.03	5	A	1	0.23	13	B	6
Southern Cross Drive (W)	0.15	4	A	5	0.29	4	B	10
2044 Seasonal (20 Years)								
Southern Cross Drive (E)	0.16	1	NA	3	0.35	2	NA	11
Airport Access (N)	0.05	7	A	1	0.42	24	C	11
Southern Cross Drive (W)	0.18	4	A	6	0.36	4	A	13

Intersection 4: Southern Cross Drive Drop-off Entry Intersection

The assessed SIDRA intersection layout and results summaries are shown in the table below.

Table 4: Southern Cross Drive Drop-off Entry Intersection

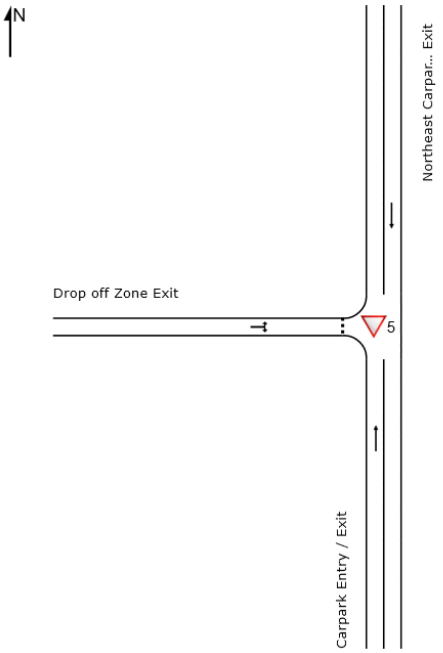


Design Year	AM Peak				PM Peak			
	DOS	Avg. Delay (s)	LOS	95% Queue	DOS	Avg. Delay (s)	LOS	95% Queue
2024 Background								
Airport Access (S)	0.09	2	NA	0	0.18	3	NA	0
Premium Car Park Access (N)	0.01	2	A	0	0.02	2	A	1
Vehicular Crossover (W)	0.01	8	A	0	0.01	7	A	0
2029 Seasonal (5 Years)								
Airport Access (S)	0.14	2	NA	0	0.27	3	A	0
Premium Car Park Access (N)	0.02	2	A	1	0.04	3	A	1
Vehicular Crossover (W)	0.02	8	A	1	0.01	9	A	0
2034 Seasonal (10 Years)								
Airport Access (S)	0.15	2	NA	0	0.30	3	NA	0
Premium Car Park Access (N)	0.02	2	A	0	0.04	3	A	1
Vehicular Crossover (W)	0.02	9	A	0	0.02	9	A	0
2044 Seasonal (20 Years)								
Airport Access (S)	0.19	2	NA	0	0.37	3	NA	0
Premium Car Park Access (N)	0.03	3	A	1	0.06	4	A	1
Vehicular Crossover (W)	0.03	10	A	1	0.02	11	B	1

Intersection 5: Eastern Entry Exit Intersection

The assessed SIDRA intersection layout and results summaries are shown in the table below.

Table 5: Intersection 5 – Eastern Entry Exit Intersection



Design Year	AM Peak				PM Peak			
	DOS	Avg. Delay (s)	LOS	95% Queue	DOS	Avg. Delay (s)	LOS	95% Queue
2024 Background								
Eastern Roadway (S)	0.01	0	NA	0	0.02	0	NA	0
Northeast Carpark Entry / Exit (N)	0.01	0	NA	0	0.03	0	NA	0
Drop-off Zone Exit (W)	0.10	3	A	3	0.26	3	A	7
2029 Seasonal (5 Years)								
Eastern Roadway (S)	0.02	0	NA	0	0.03	0	NA	0
Northeast Carpark Entry / Exit (N)	0.01	0	NA	0	0.04	0	NA	0
Drop-off Zone Exit (W)	0.17	3	A	0	0.41	4	A	14
2034 Seasonal (10 Years)								
Eastern Roadway (S)	0.02	0	NA	0	0.04	0	NA	0
Northeast Carpark Entry / Exit (N)	0.02	0	NA	0	0.04	0	NA	0
Drop-off Zone Exit (W)	0.18	3	A	5	0.46	4	A	16
2044 Seasonal (20 Years)								
Eastern Roadway (S)	0.03	0	NA	0	0.04	0	NA	0
Northeast Carpark Entry / Exit (N)	0.03	0	NA	0	0.05	0	NA	0
Drop-off Zone Exit (W)	0.23	3	A	6	0.60	5	A	33

With Master Plan Modelling

SIDRA Intersection 9.1 was used to develop models to assess the impact of the forecasted traffic on the key intersections to ensure that the recommended Master Plan does not result in unacceptable traffic impacts.

The below tables summarise the impact of the recommended Master Plan at the assessed intersections intersection in the AM and PM peak period.

Table 6: Airport Boulevard / Southern Cross Drive – GTMP SIDRA Output Summary

Design Year	AM Peak				PM Peak			
	DOS	Avg. Delay (s)	LOS	95% Queue	DOS	Avg. Delay (s)	LOS	95% Queue
2044 Base								
Airport Boulevard (S)	0.04	7	A	2	0.08	10	A	4
Access East (E)	0.30	1	A	13	0.68	3	A	50
Exit North (N)	0.03	2	A	1	0.11	3	A	4
Southern Cross Drive (W)	0.07	7	A	3	0.11	7	A	5
2044 GTMP								
Airport Boulevard (S)	0.04	8	A	2	0.08	10	A	3
Access East (E)	0.17	2	A	7	0.50	6	A	25
Setdown Area (N)	0.10	3	A	4	0.25	4	A	11
Southern Cross Drive (W)	0.17	5	A	7	0.30	5	A	15

Table 7: Southern Cross Drive / Car Park Access – GTMP SIDRA Output Summary

Design Year	AM Peak				PM Peak			
	DOS	Avg. Delay (s)	LOS	95% Queue	DOS	Avg. Delay (s)	LOS	95% Queue
2044 Base								
Southern Cross Drive (W)	0.10	0	NA	1	0.21	0	NA	1
Southern Cross Drive (E)	0.09	2	NA	0	0.13	2	NA	0
2044 GTMP								
Southern Cross Drive (W)	0.08	0	NA	0	0.16	0	NA	0
Southern Cross Drive (E)	0.21	0	NA	0	0.35	0	NA	0

Table 8: Western Airport Access – GTMP SIDRA Output Summary

Design Year	AM Peak				PM Peak			
	DOS	Avg. Delay (s)	LOS	95% Queue	DOS	Avg. Delay (s)	LOS	95% Queue
2044 Base								
Southern Cross Drive (E)	0.16	1	NA	3	0.35	2	NA	11
Airport Access (N)	0.05	7	A	1	0.42	24	C	11
Southern Cross Drive (W)	0.18	4	A	6	0.36	4	A	13
2044 GTMP								
Southern Cross Drive (E)	0.12	1	NA	2	0.26	2	NA	7
Airport Access (N)	0.03	5	A	1	0.18	11	B	4
Southern Cross Drive (W)	0.14	4	A	4	0.26	4	A	9

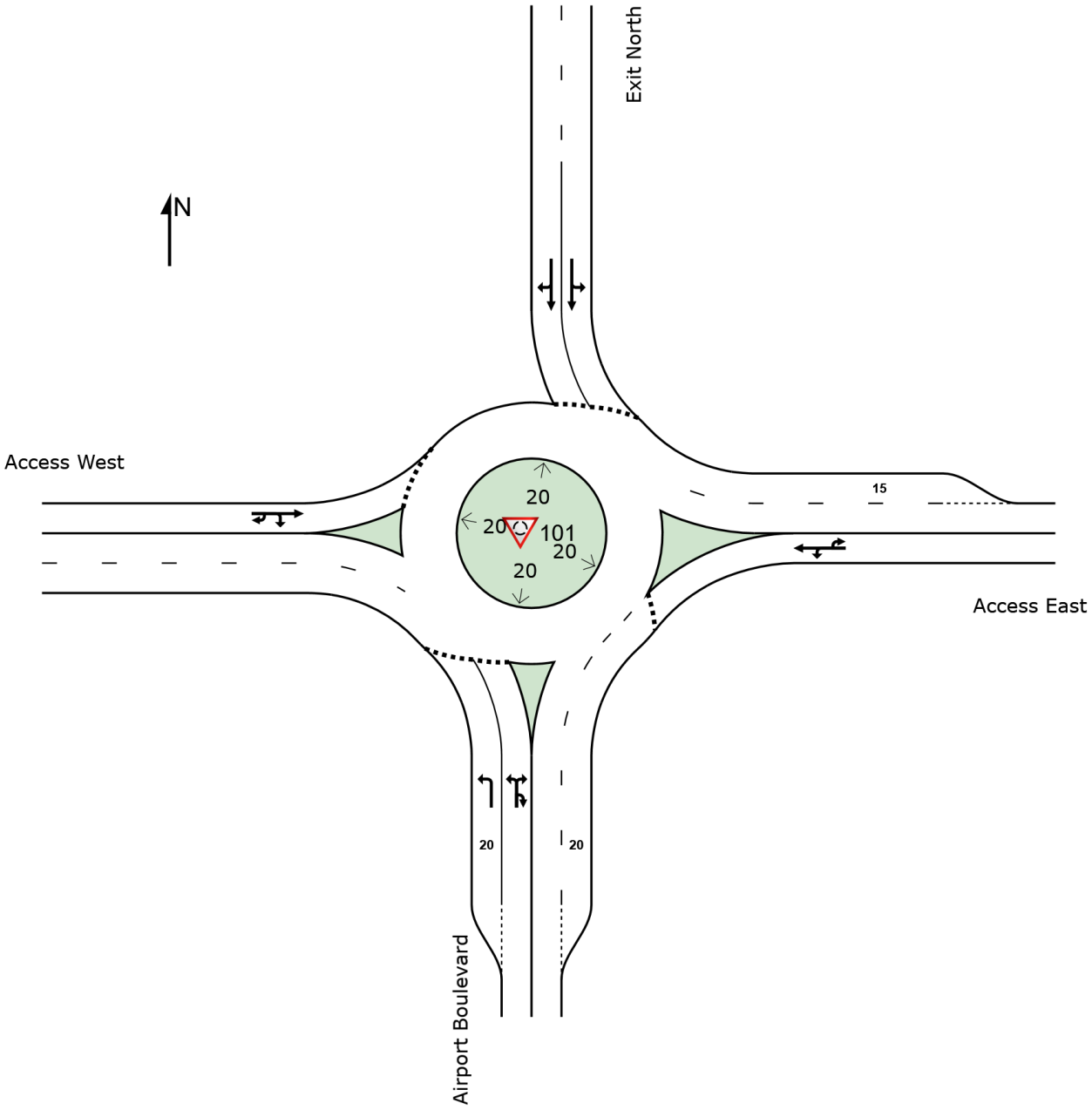
SIDRA Movement Summaries

SITE LAYOUT

Site: 101 [2024 AM Seasonal (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

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



MOVEMENT SUMMARY

Site: 101 [2024 AM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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: Airport Boulevard															
1	L2	All MCs	25	16.7	25	16.7	0.015	4.9	LOS A	0.1	0.6	0.29	0.50	0.29	52.6
3	R2	All MCs	13	8.3	13	8.3	0.015	9.4	LOS A	0.1	0.5	0.30	0.57	0.30	36.9
3u	U	All MCs	1	0.0	1	0.0	0.015	11.3	LOS B	0.1	0.5	0.30	0.57	0.30	50.8
Approach			39	13.5	39	13.5	0.015	6.5	LOS A	0.1	0.6	0.29	0.53	0.29	46.1
East: Access East															
4	L2	All MCs	59	0.0	59	0.0	0.135	0.5	LOS A	0.7	4.9	0.16	0.06	0.16	38.6
5	T1	All MCs	131	2.4	131	2.4	0.135	0.2	LOS A	0.7	4.9	0.16	0.06	0.16	38.6
6u	U	All MCs	1	0.0	1	0.0	0.135	4.0	LOS A	0.7	4.9	0.16	0.06	0.16	29.7
Approach			191	1.7	191	1.7	0.135	0.3	LOS A	0.7	4.9	0.16	0.06	0.16	38.5
North: Exit North															
7	L2	All MCs	1	0.0	1	0.0	0.004	0.9	LOS A	0.0	0.1	0.20	0.09	0.20	29.7
8	T1	All MCs	8	0.0	8	0.0	0.014	0.3	LOS A	0.1	0.4	0.18	0.24	0.18	37.9
9	R2	All MCs	16	0.0	16	0.0	0.014	3.2	LOS A	0.1	0.4	0.17	0.31	0.17	37.3
Approach			25	0.0	25	0.0	0.014	2.1	LOS A	0.1	0.4	0.17	0.28	0.17	37.1
West: Access West															
11	T1	All MCs	28	0.0	28	0.0	0.035	4.9	LOS A	0.2	1.3	0.08	0.54	0.08	37.7
12	R2	All MCs	13	25.0	13	25.0	0.035	9.0	LOS A	0.2	1.3	0.08	0.54	0.08	51.3
12u	U	All MCs	7	0.0	7	0.0	0.035	10.8	LOS B	0.2	1.3	0.08	0.54	0.08	52.2
Approach			48	6.5	48	6.5	0.035	6.8	LOS A	0.2	1.3	0.08	0.54	0.08	42.4
All Vehicles			303	3.8	303	3.8	0.135	2.3	LOS A	0.7	4.9	0.17	0.21	0.17	39.8

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 [2024 PM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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: Airport Boulevard															
1	L2	All MCs	35	0.0	35	0.0	0.026	5.3	LOS A	0.1	1.0	0.45	0.53	0.45	52.9
3	R2	All MCs	22	0.0	22	0.0	0.026	10.2	LOS B	0.1	0.9	0.46	0.63	0.46	36.4
3u	U	All MCs	4	0.0	4	0.0	0.026	12.2	LOS B	0.1	0.9	0.46	0.63	0.46	49.7
Approach			61	0.0	61	0.0	0.026	7.6	LOS A	0.1	1.0	0.45	0.58	0.45	45.1
East: Access East															
4	L2	All MCs	95	0.0	95	0.0	0.293	0.9	LOS A	1.8	12.5	0.32	0.13	0.32	38.2
5	T1	All MCs	292	0.4	292	0.4	0.293	0.6	LOS A	1.8	12.5	0.32	0.13	0.32	38.3
6u	U	All MCs	1	0.0	1	0.0	0.293	4.5	LOS A	1.8	12.5	0.32	0.13	0.32	29.5
Approach			387	0.3	387	0.3	0.293	0.7	LOS A	1.8	12.5	0.32	0.13	0.32	38.2
North: Exit North															
7	L2	All MCs	3	0.0	3	0.0	0.012	1.2	LOS A	0.1	0.4	0.26	0.12	0.26	29.6
8	T1	All MCs	33	0.0	33	0.0	0.046	0.4	LOS A	0.2	1.6	0.23	0.25	0.23	37.9
9	R2	All MCs	46	0.0	46	0.0	0.046	3.3	LOS A	0.2	1.6	0.22	0.31	0.22	37.3
Approach			82	0.0	82	0.0	0.046	2.1	LOS A	0.2	1.6	0.23	0.28	0.23	37.2
West: Access West															
11	T1	All MCs	37	0.0	37	0.0	0.050	4.9	LOS A	0.3	1.9	0.13	0.55	0.13	37.5
12	R2	All MCs	22	0.0	22	0.0	0.050	8.8	LOS A	0.3	1.9	0.13	0.55	0.13	51.8
12u	U	All MCs	12	0.0	12	0.0	0.050	10.9	LOS B	0.3	1.9	0.13	0.55	0.13	51.8
Approach			71	0.0	71	0.0	0.050	7.1	LOS A	0.3	1.9	0.13	0.55	0.13	43.2
All Vehicles			601	0.2	601	0.2	0.293	2.4	LOS A	1.8	12.5	0.30	0.25	0.30	39.2

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: 101 [2029 AM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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: Airport Boulevard															
1	L2	All MCs	39	18.9	39	18.9	0.026	5.3	LOS A	0.1	1.0	0.37	0.53	0.37	52.3
3	R2	All MCs	20	15.8	20	15.8	0.026	10.0	LOS A	0.1	1.0	0.38	0.60	0.38	36.8
3u	U	All MCs	1	0.0	1	0.0	0.026	11.7	LOS B	0.1	1.0	0.38	0.60	0.38	50.6
Approach			60	17.5	60	17.5	0.026	7.0	LOS A	0.1	1.0	0.38	0.55	0.38	45.7
East: Access East															
4	L2	All MCs	91	0.0	91	0.0	0.213	0.6	LOS A	1.2	8.4	0.23	0.09	0.23	38.4
5	T1	All MCs	202	2.6	202	2.6	0.213	0.4	LOS A	1.2	8.4	0.23	0.09	0.23	38.5
6u	U	All MCs	1	0.0	1	0.0	0.213	4.2	LOS A	1.2	8.4	0.23	0.09	0.23	29.6
Approach			294	1.8	294	1.8	0.213	0.5	LOS A	1.2	8.4	0.23	0.09	0.23	38.4
North: Exit North															
7	L2	All MCs	3	0.0	3	0.0	0.006	1.2	LOS A	0.0	0.2	0.26	0.14	0.26	29.6
8	T1	All MCs	14	0.0	14	0.0	0.023	0.4	LOS A	0.1	0.8	0.23	0.27	0.23	37.8
9	R2	All MCs	24	0.0	24	0.0	0.023	3.3	LOS A	0.1	0.8	0.22	0.31	0.22	37.3
Approach			41	0.0	41	0.0	0.023	2.2	LOS A	0.1	0.8	0.22	0.28	0.22	36.8
West: Access West															
11	T1	All MCs	43	0.0	43	0.0	0.054	4.9	LOS A	0.3	2.1	0.11	0.54	0.11	37.6
12	R2	All MCs	20	26.3	20	26.3	0.054	9.1	LOS A	0.3	2.1	0.11	0.54	0.11	51.1
12u	U	All MCs	12	0.0	12	0.0	0.054	10.8	LOS B	0.3	2.1	0.11	0.54	0.11	52.1
Approach			75	7.0	75	7.0	0.054	6.9	LOS A	0.3	2.1	0.11	0.54	0.11	42.5
All Vehicles			469	4.5	469	4.5	0.213	2.5	LOS A	1.2	8.4	0.23	0.24	0.23	39.7

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 [2029 PM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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: Airport Boulevard															
1	L2	All MCs	55	0.0	55	0.0	0.049	6.3	LOS A	0.3	2.0	0.59	0.60	0.59	52.6
3	R2	All MCs	35	0.0	35	0.0	0.049	11.3	LOS B	0.3	1.9	0.60	0.69	0.60	36.1
3u	U	All MCs	7	0.0	7	0.0	0.049	13.4	LOS B	0.3	1.9	0.60	0.69	0.60	49.2
Approach			97	0.0	97	0.0	0.049	8.6	LOS A	0.3	2.0	0.60	0.64	0.60	44.8
East: Access East															
4	L2	All MCs	148	0.0	148	0.0	0.481	1.6	LOS A	3.6	25.1	0.49	0.25	0.49	37.9
5	T1	All MCs	451	0.7	451	0.7	0.481	1.3	LOS A	3.6	25.1	0.49	0.25	0.49	37.9
6u	U	All MCs	1	0.0	1	0.0	0.481	5.1	LOS A	3.6	25.1	0.49	0.25	0.49	29.3
Approach			600	0.5	600	0.5	0.481	1.4	LOS A	3.6	25.1	0.49	0.25	0.49	37.9
North: Exit North															
7	L2	All MCs	5	0.0	5	0.0	0.020	1.5	LOS A	0.1	0.6	0.33	0.18	0.33	29.6
8	T1	All MCs	51	0.0	51	0.0	0.075	0.7	LOS A	0.4	2.6	0.30	0.29	0.30	37.7
9	R2	All MCs	72	0.0	72	0.0	0.075	3.5	LOS A	0.4	2.6	0.29	0.33	0.29	37.2
Approach			127	0.0	127	0.0	0.075	2.3	LOS A	0.4	2.6	0.30	0.31	0.30	37.0
West: Access West															
11	T1	All MCs	58	0.0	58	0.0	0.080	5.0	LOS A	0.5	3.2	0.17	0.54	0.17	37.4
12	R2	All MCs	35	0.0	35	0.0	0.080	8.9	LOS A	0.5	3.2	0.17	0.54	0.17	51.6
12u	U	All MCs	18	0.0	18	0.0	0.080	10.9	LOS B	0.5	3.2	0.17	0.54	0.17	51.6
Approach			111	0.0	111	0.0	0.080	7.2	LOS A	0.5	3.2	0.17	0.54	0.17	43.1
All Vehicles			935	0.3	935	0.3	0.481	2.9	LOS A	3.6	25.1	0.44	0.33	0.44	39.0

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 [2034 AM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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: Airport Boulevard															
1	L2	All MCs	43	19.5	43	19.5	0.029	5.4	LOS A	0.1	1.2	0.39	0.54	0.39	52.2
3	R2	All MCs	22	14.3	22	14.3	0.029	10.1	LOS B	0.1	1.1	0.40	0.60	0.40	36.7
3u	U	All MCs	1	0.0	1	0.0	0.029	11.8	LOS B	0.1	1.1	0.40	0.60	0.40	50.5
Approach			66	17.5	66	17.5	0.029	7.1	LOS A	0.1	1.2	0.40	0.56	0.40	45.7
East: Access East															
4	L2	All MCs	101	0.0	101	0.0	0.237	0.7	LOS A	1.3	9.6	0.25	0.10	0.25	38.4
5	T1	All MCs	222	2.4	222	2.4	0.237	0.4	LOS A	1.3	9.6	0.25	0.10	0.25	38.4
6u	U	All MCs	1	0.0	1	0.0	0.237	4.2	LOS A	1.3	9.6	0.25	0.10	0.25	29.6
Approach			324	1.6	324	1.6	0.237	0.5	LOS A	1.3	9.6	0.25	0.10	0.25	38.4
North: Exit North															
7	L2	All MCs	3	0.0	3	0.0	0.007	1.3	LOS A	0.0	0.2	0.27	0.15	0.27	29.6
8	T1	All MCs	16	0.0	16	0.0	0.026	0.4	LOS A	0.1	0.8	0.24	0.27	0.24	37.8
9	R2	All MCs	26	0.0	26	0.0	0.026	3.3	LOS A	0.1	0.8	0.23	0.31	0.23	37.3
Approach			45	0.0	45	0.0	0.026	2.2	LOS A	0.1	0.8	0.24	0.29	0.24	36.8
West: Access West															
11	T1	All MCs	49	0.0	49	0.0	0.061	4.9	LOS A	0.3	2.3	0.12	0.53	0.12	37.6
12	R2	All MCs	22	23.8	22	23.8	0.061	9.1	LOS A	0.3	2.3	0.12	0.53	0.12	51.2
12u	U	All MCs	13	0.0	13	0.0	0.061	10.8	LOS B	0.3	2.3	0.12	0.53	0.12	52.1
Approach			84	6.3	84	6.3	0.061	6.9	LOS A	0.3	2.3	0.12	0.53	0.12	42.3
All Vehicles			520	4.3	520	4.3	0.237	2.5	LOS A	1.3	9.6	0.24	0.24	0.24	39.6

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 [2034 PM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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: Airport Boulevard															
1	L2	All MCs	60	0.0	60	0.0	0.057	6.6	LOS A	0.4	2.5	0.64	0.63	0.64	52.5
3	R2	All MCs	39	0.0	39	0.0	0.057	11.7	LOS B	0.3	2.3	0.65	0.71	0.65	36.0
3u	U	All MCs	8	0.0	8	0.0	0.057	13.8	LOS B	0.3	2.3	0.65	0.71	0.65	48.8
Approach			107	0.0	107	0.0	0.057	9.0	LOS A	0.4	2.5	0.64	0.66	0.64	44.6
East: Access East															
4	L2	All MCs	162	0.0	162	0.0	0.539	1.9	LOS A	4.3	30.0	0.55	0.30	0.55	37.8
5	T1	All MCs	497	0.6	497	0.6	0.539	1.6	LOS A	4.3	30.0	0.55	0.30	0.55	37.8
6u	U	All MCs	1	0.0	1	0.0	0.539	5.4	LOS A	4.3	30.0	0.55	0.30	0.55	29.3
Approach			660	0.5	660	0.5	0.539	1.6	LOS A	4.3	30.0	0.55	0.30	0.55	37.8
North: Exit North															
7	L2	All MCs	5	0.0	5	0.0	0.023	1.7	LOS A	0.1	0.7	0.35	0.19	0.35	29.5
8	T1	All MCs	56	0.0	56	0.0	0.084	0.8	LOS A	0.4	3.0	0.32	0.30	0.32	37.7
9	R2	All MCs	80	0.0	80	0.0	0.084	3.6	LOS A	0.4	3.0	0.31	0.34	0.31	37.2
Approach			141	0.0	141	0.0	0.084	2.4	LOS A	0.4	3.0	0.32	0.32	0.32	37.0
West: Access West															
11	T1	All MCs	63	0.0	63	0.0	0.089	5.1	LOS A	0.5	3.6	0.19	0.54	0.19	37.4
12	R2	All MCs	39	0.0	39	0.0	0.089	8.9	LOS A	0.5	3.6	0.19	0.54	0.19	51.6
12u	U	All MCs	20	0.0	20	0.0	0.089	10.9	LOS B	0.5	3.6	0.19	0.54	0.19	51.6
Approach			122	0.0	122	0.0	0.089	7.2	LOS A	0.5	3.6	0.19	0.54	0.19	43.1
All Vehicles			1031	0.3	1031	0.3	0.539	3.2	LOS A	4.3	30.0	0.48	0.37	0.48	38.9

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 [2044 AM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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: Airport Boulevard															
1	L2	All MCs	54	17.6	54	17.6	0.038	5.7	LOS A	0.2	1.5	0.44	0.56	0.44	52.1
3	R2	All MCs	26	16.0	26	16.0	0.038	10.5	LOS B	0.2	1.5	0.45	0.62	0.45	36.7
3u	U	All MCs	1	0.0	1	0.0	0.038	12.1	LOS B	0.2	1.5	0.45	0.62	0.45	50.5
Approach			81	16.9	81	16.9	0.038	7.3	LOS A	0.2	1.5	0.45	0.58	0.45	45.8
East: Access East															
4	L2	All MCs	123	0.0	123	0.0	0.294	0.8	LOS A	1.8	12.7	0.29	0.12	0.29	38.3
5	T1	All MCs	272	2.7	272	2.7	0.294	0.5	LOS A	1.8	12.7	0.29	0.12	0.29	38.3
6u	U	All MCs	1	0.0	1	0.0	0.294	4.3	LOS A	1.8	12.7	0.29	0.12	0.29	29.6
Approach			396	1.9	396	1.9	0.294	0.6	LOS A	1.8	12.7	0.29	0.12	0.29	38.3
North: Exit North															
7	L2	All MCs	4	0.0	4	0.0	0.008	1.4	LOS A	0.0	0.3	0.30	0.17	0.30	29.6
8	T1	All MCs	18	0.0	18	0.0	0.032	0.5	LOS A	0.2	1.1	0.27	0.29	0.27	37.7
9	R2	All MCs	33	0.0	33	0.0	0.032	3.4	LOS A	0.2	1.1	0.26	0.33	0.26	37.2
Approach			55	0.0	55	0.0	0.032	2.3	LOS A	0.2	1.1	0.26	0.30	0.26	36.7
West: Access West															
11	T1	All MCs	59	0.0	59	0.0	0.074	5.0	LOS A	0.4	2.9	0.14	0.53	0.14	37.6
12	R2	All MCs	26	28.0	26	28.0	0.074	9.2	LOS A	0.4	2.9	0.14	0.53	0.14	51.0
12u	U	All MCs	16	0.0	16	0.0	0.074	10.9	LOS B	0.4	2.9	0.14	0.53	0.14	52.0
Approach			101	7.3	101	7.3	0.074	7.0	LOS A	0.4	2.9	0.14	0.53	0.14	42.3
All Vehicles			633	4.5	633	4.5	0.294	2.7	LOS A	1.8	12.7	0.28	0.26	0.28	39.6

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 [2044 PM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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: Airport Boulevard															
1	L2	All MCs	73	0.0	73	0.0	0.082	7.5	LOS A	0.6	3.9	0.75	0.67	0.75	51.9
3	R2	All MCs	47	0.0	47	0.0	0.082	12.9	LOS B	0.5	3.6	0.75	0.74	0.75	35.6
3u	U	All MCs	9	0.0	9	0.0	0.082	15.0	LOS B	0.5	3.6	0.75	0.74	0.75	48.1
Approach			129	0.0	129	0.0	0.082	10.0	LOS B	0.6	3.9	0.75	0.70	0.75	44.1
East: Access East															
4	L2	All MCs	199	0.0	199	0.0	0.681	3.3	LOS A	7.1	50.3	0.71	0.50	0.75	37.5
5	T1	All MCs	606	0.7	606	0.7	0.681	2.9	LOS A	7.1	50.3	0.71	0.50	0.75	37.5
6u	U	All MCs	1	0.0	1	0.0	0.681	6.7	LOS A	7.1	50.3	0.71	0.50	0.75	29.1
Approach			806	0.5	806	0.5	0.681	3.0	LOS A	7.1	50.3	0.71	0.50	0.75	37.5
North: Exit North															
7	L2	All MCs	7	0.0	7	0.0	0.028	1.9	LOS A	0.1	0.9	0.38	0.23	0.38	29.5
8	T1	All MCs	67	0.0	67	0.0	0.105	0.9	LOS A	0.6	3.9	0.36	0.32	0.36	37.6
9	R2	All MCs	97	0.0	97	0.0	0.105	3.7	LOS A	0.6	3.9	0.35	0.36	0.35	37.1
Approach			172	0.0	172	0.0	0.105	2.5	LOS A	0.6	3.9	0.36	0.34	0.36	36.9
West: Access West															
11	T1	All MCs	77	0.0	77	0.0	0.109	5.1	LOS A	0.7	4.6	0.22	0.54	0.22	37.4
12	R2	All MCs	47	0.0	47	0.0	0.109	8.9	LOS A	0.7	4.6	0.22	0.54	0.22	51.5
12u	U	All MCs	24	0.0	24	0.0	0.109	11.0	LOS B	0.7	4.6	0.22	0.54	0.22	51.5
Approach			148	0.0	148	0.0	0.109	7.3	LOS A	0.7	4.6	0.22	0.54	0.22	43.0
All Vehicles			1256	0.3	1256	0.3	0.681	4.2	LOS A	7.1	50.3	0.61	0.51	0.64	38.6

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 [2044 AM Seasonal Masterplan (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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: Airport Boulevard															
1	L2	All MCs	9	0.0	9	0.0	0.037	5.3	LOS A	0.2	1.6	0.44	0.50	0.44	52.9
2	T1	All MCs	33	29.0	33	29.0	0.037	5.7	LOS A	0.2	1.6	0.44	0.50	0.44	52.7
3	R2	All MCs	38	11.1	38	11.1	0.037	10.3	LOS B	0.2	1.4	0.45	0.64	0.45	36.4
3u	U	All MCs	1	0.0	1	0.0	0.037	12.1	LOS B	0.2	1.4	0.45	0.64	0.45	49.7
Approach			81	16.9	81	16.9	0.037	7.9	LOS A	0.2	1.6	0.44	0.57	0.44	43.4
East: Access East															
4	L2	All MCs	58	0.0	58	0.0	0.172	1.9	LOS A	1.0	6.8	0.49	0.32	0.49	38.0
5	T1	All MCs	121	2.6	121	2.6	0.172	1.7	LOS A	1.0	6.8	0.49	0.32	0.49	38.0
6	R2	All MCs	1	0.0	1	0.0	0.172	10.3	LOS B	1.0	6.8	0.49	0.32	0.49	37.7
6u	U	All MCs	1	0.0	1	0.0	0.172	5.5	LOS A	1.0	6.8	0.49	0.32	0.49	29.4
Approach			181	1.7	181	1.7	0.172	1.8	LOS A	1.0	6.8	0.49	0.32	0.49	37.9
North: Exit North															
7	L2	All MCs	1	0.0	1	0.0	0.102	1.2	LOS A	0.5	3.8	0.34	0.27	0.34	29.3
8	T1	All MCs	83	0.0	83	0.0	0.102	0.7	LOS A	0.5	3.8	0.34	0.27	0.34	37.8
9	R2	All MCs	183	2.3	183	2.3	0.102	3.8	LOS A	0.5	3.8	0.35	0.39	0.35	36.9
Approach			267	1.6	267	1.6	0.102	2.8	LOS A	0.5	3.8	0.35	0.35	0.35	37.1
West: Access West															
10	L2	All MCs	256	0.0	256	0.0	0.164	4.4	LOS A	1.0	6.8	0.24	0.47	0.24	53.8
11	T1	All MCs	106	0.0	106	0.0	0.119	5.2	LOS A	0.7	4.8	0.25	0.51	0.25	37.6
12	R2	All MCs	26	28.0	26	28.0	0.119	9.5	LOS A	0.7	4.8	0.25	0.51	0.25	51.0
12u	U	All MCs	16	0.0	16	0.0	0.119	11.1	LOS B	0.7	4.8	0.25	0.51	0.25	52.0
Approach			404	1.8	404	1.8	0.164	5.2	LOS A	1.0	6.8	0.24	0.49	0.24	48.0
All Vehicles			934	3.0	934	3.0	0.172	4.1	LOS A	1.0	6.8	0.34	0.42	0.34	41.9

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 [2044 PM Seasonal Masterplan (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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: Airport Boulevard															
1	L2	All MCs	20	0.0	20	0.0	0.075	8.4	LOS A	0.4	3.0	0.69	0.67	0.69	51.5
2	T1	All MCs	44	0.0	44	0.0	0.075	8.2	LOS A	0.5	3.3	0.69	0.67	0.69	51.6
3	R2	All MCs	57	0.0	57	0.0	0.075	12.1	LOS B	0.5	3.3	0.69	0.70	0.69	35.9
3u	U	All MCs	9	0.0	9	0.0	0.075	14.1	LOS B	0.5	3.3	0.69	0.70	0.69	48.8
Approach			131	0.0	131	0.0	0.075	10.3	LOS B	0.5	3.3	0.69	0.69	0.69	43.1
East: Access East															
4	L2	All MCs	113	0.0	113	0.0	0.458	6.3	LOS A	3.5	24.6	0.83	0.72	0.91	36.6
5	T1	All MCs	234	1.8	234	1.8	0.458	6.1	LOS A	3.5	24.6	0.83	0.72	0.91	36.6
6	R2	All MCs	1	0.0	1	0.0	0.458	14.7	LOS B	3.5	24.6	0.83	0.72	0.91	36.4
6u	U	All MCs	1	0.0	1	0.0	0.458	9.8	LOS A	3.5	24.6	0.83	0.72	0.91	28.5
Approach			348	1.2	348	1.2	0.458	6.2	LOS A	3.5	24.6	0.83	0.72	0.91	36.6
North: Exit North															
7	L2	All MCs	1	0.0	1	0.0	0.253	1.8	LOS A	1.5	10.8	0.47	0.38	0.47	29.1
8	T1	All MCs	154	0.0	154	0.0	0.253	1.3	LOS A	1.5	10.8	0.47	0.38	0.47	37.4
9	R2	All MCs	469	0.0	469	0.0	0.253	4.4	LOS A	1.5	10.8	0.48	0.46	0.48	36.7
Approach			624	0.0	624	0.0	0.253	3.6	LOS A	1.5	10.8	0.47	0.44	0.47	36.9
West: Access West															
10	L2	All MCs	453	0.0	453	0.0	0.298	4.6	LOS A	2.1	14.9	0.34	0.48	0.34	53.4
11	T1	All MCs	144	0.0	144	0.0	0.181	5.4	LOS A	1.1	7.7	0.33	0.53	0.33	37.3
12	R2	All MCs	47	0.0	47	0.0	0.181	9.3	LOS A	1.1	7.7	0.33	0.53	0.33	51.5
12u	U	All MCs	24	0.0	24	0.0	0.181	11.4	LOS B	1.1	7.7	0.33	0.53	0.33	51.5
Approach			668	0.0	668	0.0	0.298	5.4	LOS A	2.1	14.9	0.34	0.50	0.34	48.6
All Vehicles			1772	0.2	1772	0.2	0.458	5.3	LOS A	3.5	24.6	0.51	0.53	0.52	41.0

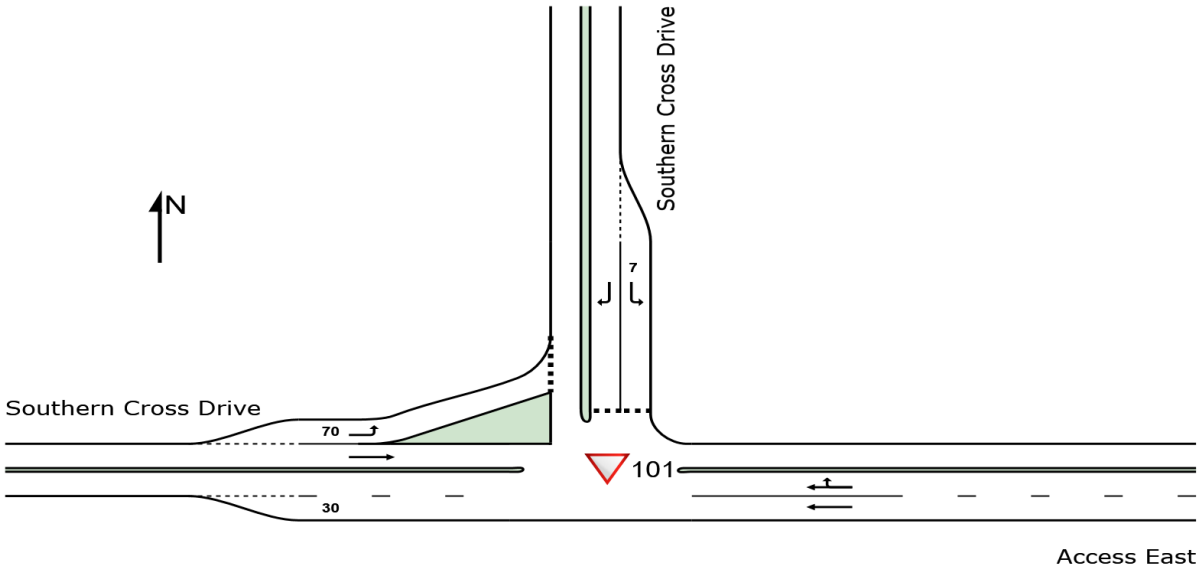
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay 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: 101 [2024 AM Seasonal (Site Folder: General)]

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

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



MOVEMENT SUMMARY

Site: 101 [2024 AM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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
East: Access East															
5	T1	All MCs	147	5.0	147	5.0	0.076	0.1	LOS A	0.2	1.1	0.06	0.10	0.06	58.9
6	R2	All MCs	26	0.0	26	0.0	0.076	5.8	LOS A	0.2	1.1	0.07	0.13	0.07	39.4
Approach			174	4.2	174	4.2	0.076	1.0	NA	0.2	1.1	0.06	0.10	0.06	54.8
North: Southern Cross Drive															
7	L2	All MCs	4	0.0	4	0.0	0.003	2.2	LOS A	0.0	0.1	0.16	0.32	0.16	37.6
9	R2	All MCs	9	11.1	9	11.1	0.012	4.1	LOS A	0.0	0.3	0.42	0.46	0.42	36.8
Approach			14	7.7	14	7.7	0.012	3.5	LOS A	0.0	0.3	0.34	0.41	0.34	37.1
West: Southern Cross Drive															
10	L2	All MCs	135	3.1	135	3.1	0.085	5.7	LOS A	0.4	2.6	0.09	0.52	0.09	37.8
11	T1	All MCs	76	4.2	76	4.2	0.040	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			211	3.5	211	3.5	0.085	3.7	LOS A	0.4	2.6	0.06	0.33	0.06	43.5
All Vehicles			398	4.0	398	4.0	0.085	2.5	NA	0.4	2.6	0.07	0.23	0.07	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: 101 [2024 PM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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
East: Access East															
5	T1	All MCs	281	0.4	281	0.4	0.164	0.2	LOS A	0.6	4.1	0.11	0.16	0.11	58.3
6	R2	All MCs	94	0.0	94	0.0	0.164	5.9	LOS A	0.6	4.1	0.15	0.22	0.15	39.0
Approach			375	0.3	375	0.3	0.164	1.7	NA	0.6	4.1	0.12	0.17	0.12	51.9
North: Southern Cross Drive															
7	L2	All MCs	7	0.0	7	0.0	0.005	2.3	LOS A	0.0	0.1	0.20	0.33	0.20	37.6
9	R2	All MCs	37	2.9	37	2.9	0.067	6.7	LOS A	0.2	1.7	0.56	0.66	0.56	36.0
Approach			44	2.4	44	2.4	0.067	6.0	LOS A	0.2	1.7	0.50	0.61	0.50	36.3
West: Southern Cross Drive															
10	L2	All MCs	237	0.4	237	0.4	0.157	5.9	LOS A	0.7	4.9	0.20	0.53	0.20	37.6
11	T1	All MCs	112	0.9	112	0.9	0.058	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			348	0.6	348	0.6	0.157	4.0	LOS A	0.7	4.9	0.14	0.36	0.14	42.6
All Vehicles			767	0.5	767	0.5	0.164	3.0	NA	0.7	4.9	0.15	0.28	0.15	46.2

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.
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: 101 [2029 AM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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
East: Access East															
5	T1	All MCs	228	5.1	228	5.1	0.119	0.2	LOS A	0.3	2.0	0.08	0.11	0.08	58.8
6	R2	All MCs	42	0.0	42	0.0	0.119	5.9	LOS A	0.3	2.0	0.10	0.14	0.10	39.3
Approach			271	4.3	271	4.3	0.119	1.1	NA	0.3	2.0	0.08	0.11	0.08	54.6
North: Southern Cross Drive															
7	L2	All MCs	7	0.0	7	0.0	0.005	2.3	LOS A	0.0	0.1	0.21	0.33	0.21	37.6
9	R2	All MCs	16	20.0	16	20.0	0.029	6.4	LOS A	0.1	0.8	0.53	0.58	0.53	35.8
Approach			23	13.6	23	13.6	0.029	5.1	LOS A	0.1	0.8	0.43	0.50	0.43	36.4
West: Southern Cross Drive															
10	L2	All MCs	208	3.5	208	3.5	0.134	5.8	LOS A	0.6	4.3	0.12	0.52	0.12	37.7
11	T1	All MCs	118	4.5	118	4.5	0.062	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			326	3.9	326	3.9	0.134	3.7	LOS A	0.6	4.3	0.08	0.33	0.08	43.5
All Vehicles			620	4.4	620	4.4	0.134	2.6	NA	0.6	4.3	0.09	0.24	0.09	47.3

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: 101 [2029 PM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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
East: Access East															
5	T1	All MCs	436	0.7	436	0.7	0.259	0.4	LOS A	1.0	7.2	0.16	0.18	0.16	58.1
6	R2	All MCs	145	0.0	145	0.0	0.259	6.2	LOS A	1.0	7.2	0.22	0.25	0.22	38.9
Approach			581	0.5	581	0.5	0.259	1.9	NA	1.0	7.2	0.17	0.20	0.17	51.7
North: Southern Cross Drive															
7	L2	All MCs	12	0.0	12	0.0	0.008	2.4	LOS A	0.0	0.2	0.26	0.35	0.26	37.5
9	R2	All MCs	58	1.8	58	1.8	0.176	12.3	LOS B	0.6	4.3	0.76	0.84	0.76	34.2
Approach			69	1.5	69	1.5	0.176	10.7	LOS B	0.6	4.3	0.67	0.76	0.67	34.7
West: Southern Cross Drive															
10	L2	All MCs	366	0.9	366	0.9	0.255	6.2	LOS A	1.2	8.6	0.28	0.54	0.28	37.4
11	T1	All MCs	174	0.6	174	0.6	0.089	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			540	0.8	540	0.8	0.255	4.2	LOS A	1.2	8.6	0.19	0.37	0.19	42.5
All Vehicles			1191	0.7	1191	0.7	0.259	3.4	NA	1.2	8.6	0.21	0.31	0.21	45.9

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: 101 [2034 AM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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
East: Access East															
5	T1	All MCs	252	5.0	252	5.0	0.131	0.2	LOS A	0.3	2.2	0.08	0.11	0.08	58.8
6	R2	All MCs	46	0.0	46	0.0	0.131	6.0	LOS A	0.3	2.2	0.11	0.15	0.11	39.3
Approach			298	4.2	298	4.2	0.131	1.1	NA	0.3	2.2	0.09	0.12	0.09	54.6
North: Southern Cross Drive															
7	L2	All MCs	8	0.0	8	0.0	0.006	2.3	LOS A	0.0	0.2	0.22	0.33	0.22	37.6
9	R2	All MCs	17	18.8	17	18.8	0.033	7.0	LOS A	0.1	0.9	0.55	0.61	0.55	35.7
Approach			25	12.5	25	12.5	0.033	5.4	LOS A	0.1	0.9	0.44	0.52	0.44	36.3
West: Southern Cross Drive															
10	L2	All MCs	229	3.7	229	3.7	0.148	5.8	LOS A	0.7	4.8	0.13	0.52	0.13	37.7
11	T1	All MCs	131	4.0	131	4.0	0.069	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			360	3.8	360	3.8	0.148	3.7	LOS A	0.7	4.8	0.09	0.33	0.09	43.5
All Vehicles			683	4.3	683	4.3	0.148	2.6	NA	0.7	4.8	0.10	0.24	0.10	47.3

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: 101 [2034 PM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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
East: Access East															
5	T1	All MCs	480	0.7	480	0.7	0.287	0.5	LOS A	1.2	8.3	0.17	0.19	0.17	58.1
6	R2	All MCs	161	0.0	161	0.0	0.287	6.3	LOS A	1.2	8.3	0.23	0.26	0.23	38.8
Approach			641	0.5	641	0.5	0.287	2.0	NA	1.2	8.3	0.19	0.21	0.19	51.6
North: Southern Cross Drive															
7	L2	All MCs	13	0.0	13	0.0	0.009	2.5	LOS A	0.0	0.2	0.27	0.36	0.27	37.5
9	R2	All MCs	63	1.7	63	1.7	0.226	15.4	LOS C	0.8	5.7	0.80	0.90	0.87	33.2
Approach			76	1.4	76	1.4	0.226	13.3	LOS B	0.8	5.7	0.72	0.81	0.77	33.8
West: Southern Cross Drive															
10	L2	All MCs	404	0.8	404	0.8	0.285	6.3	LOS A	1.4	9.9	0.31	0.55	0.31	37.4
11	T1	All MCs	192	0.5	192	0.5	0.099	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			596	0.7	596	0.7	0.285	4.3	LOS A	1.4	9.9	0.21	0.37	0.21	42.5
All Vehicles			1313	0.6	1313	0.6	0.287	3.7	NA	1.4	9.9	0.23	0.32	0.23	45.8

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: 101 [2044 AM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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
East: Access East															
5	T1	All MCs	306	5.2	306	5.2	0.160	0.2	LOS A	0.4	2.8	0.10	0.12	0.10	58.8
6	R2	All MCs	56	0.0	56	0.0	0.160	6.1	LOS A	0.4	2.8	0.12	0.15	0.12	39.3
Approach			362	4.4	362	4.4	0.160	1.1	NA	0.4	2.8	0.10	0.12	0.10	54.6
North: Southern Cross Drive															
7	L2	All MCs	9	0.0	9	0.0	0.007	2.4	LOS A	0.0	0.2	0.24	0.34	0.24	37.5
9	R2	All MCs	21	20.0	21	20.0	0.051	9.0	LOS A	0.2	1.4	0.61	0.70	0.61	34.9
Approach			31	13.8	31	13.8	0.051	7.0	LOS A	0.2	1.4	0.50	0.59	0.50	35.7
West: Southern Cross Drive															
10	L2	All MCs	280	3.4	280	3.4	0.182	5.8	LOS A	0.8	6.0	0.15	0.52	0.15	37.6
11	T1	All MCs	158	4.7	158	4.7	0.083	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			438	3.8	438	3.8	0.182	3.7	LOS A	0.8	6.0	0.10	0.33	0.10	43.4
All Vehicles			831	4.4	831	4.4	0.182	2.7	NA	0.8	6.0	0.11	0.25	0.11	47.3

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: 101 [2044 PM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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
East: Access East															
5	T1	All MCs	585	0.7	585	0.7	0.354	0.7	LOS A	1.6	10.9	0.20	0.21	0.20	58.0
6	R2	All MCs	196	0.0	196	0.0	0.354	6.6	LOS A	1.6	10.9	0.28	0.30	0.28	38.7
Approach			781	0.5	781	0.5	0.354	2.2	NA	1.6	10.9	0.22	0.23	0.22	51.5
North: Southern Cross Drive															
7	L2	All MCs	16	0.0	16	0.0	0.012	2.6	LOS A	0.0	0.3	0.30	0.38	0.30	37.4
9	R2	All MCs	77	1.4	77	1.4	0.421	27.8	LOS D	1.6	11.0	0.90	1.05	1.16	29.8
Approach			93	1.1	93	1.1	0.421	23.6	LOS C	1.6	11.0	0.80	0.93	1.02	30.9
West: Southern Cross Drive															
10	L2	All MCs	493	0.9	493	0.9	0.359	6.5	LOS A	1.9	13.2	0.37	0.57	0.37	37.3
11	T1	All MCs	234	0.5	234	0.5	0.120	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			726	0.7	726	0.7	0.359	4.4	LOS A	1.9	13.2	0.25	0.39	0.25	42.4
All Vehicles			1600	0.7	1600	0.7	0.421	4.4	NA	1.9	13.2	0.27	0.34	0.28	45.3

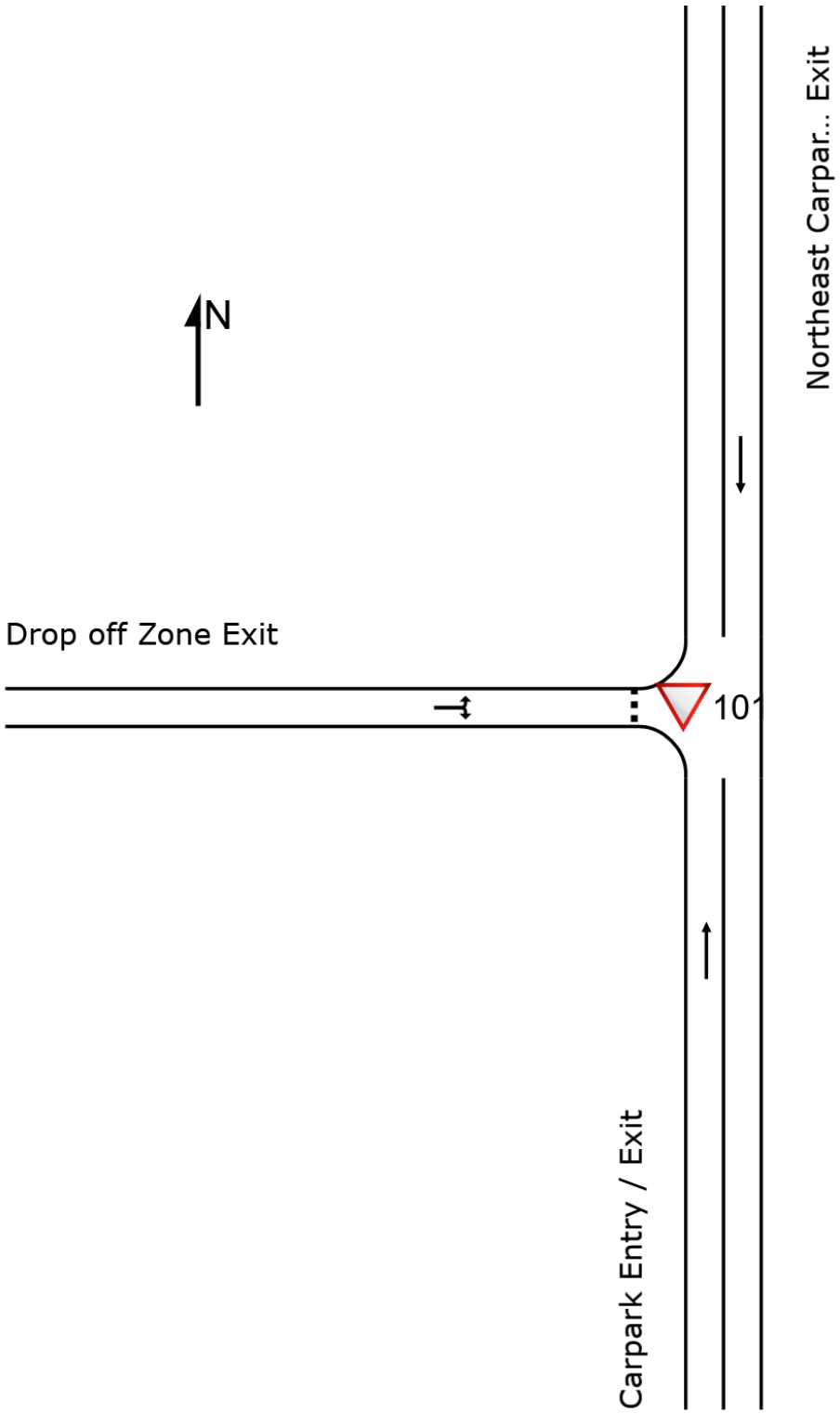
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of 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.

SITE LAYOUT

Site: 101 [2024 AM Seasonal (Site Folder: General)]

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

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



MOVEMENT SUMMARY

Site: 101 [2024 AM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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: Carpark Entry / Exit															
2	T1	All MCs	24	4.3	24	4.3	0.013	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	30.0
Approach			24	4.3	24	4.3	0.013	0.0	NA	0.0	0.0	0.00	0.00	0.00	30.0
North: Northeast Carpark Entry / Exit															
8	T1	All MCs	21	5.0	21	5.0	0.011	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	30.0
Approach			21	5.0	21	5.0	0.011	0.0	NA	0.0	0.0	0.00	0.00	0.00	30.0
West: Drop off Zone Exit															
10	L2	All MCs	1	0.0	1	0.0	0.104	5.6	LOS A	0.4	2.5	0.12	0.44	0.12	37.6
12	R2	All MCs	127	0.8	127	0.8	0.104	2.8	LOS A	0.4	2.5	0.12	0.44	0.12	29.1
Approach			128	0.8	128	0.8	0.104	2.9	LOS A	0.4	2.5	0.12	0.44	0.12	29.2
All Vehicles			174	1.8	174	1.8	0.104	2.1	NA	0.4	2.5	0.09	0.32	0.09	29.4

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: 101 [2024 PM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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: Carpark Entry / Exit															
2	T1	All MCs	41	0.0	41	0.0	0.021	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	30.0
Approach			41	0.0	41	0.0	0.021	0.0	NA	0.0	0.0	0.00	0.00	0.00	30.0
North: Northeast Carpark Entry / Exit															
8	T1	All MCs	47	2.2	47	2.2	0.025	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	30.0
Approach			47	2.2	47	2.2	0.025	0.0	NA	0.0	0.0	0.00	0.00	0.00	30.0
West: Drop off Zone Exit															
10	L2	All MCs	8	0.0	8	0.0	0.256	5.7	LOS A	1.0	7.1	0.19	0.45	0.19	37.7
12	R2	All MCs	300	0.0	300	0.0	0.256	3.1	LOS A	1.0	7.1	0.19	0.45	0.19	29.2
Approach			308	0.0	308	0.0	0.256	3.1	LOS A	1.0	7.1	0.19	0.45	0.19	29.4
All Vehicles			397	0.3	397	0.3	0.256	2.4	NA	1.0	7.1	0.15	0.35	0.15	29.5

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: 101 [2029 AM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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: Carpark Entry / Exit															
2	T1	All MCs	38	8.3	38	8.3	0.020	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	30.0
Approach			38	8.3	38	8.3	0.020	0.0	NA	0.0	0.0	0.00	0.00	0.00	30.0
North: Northeast Carpark Entry / Exit															
8	T1	All MCs	34	9.4	34	9.4	0.018	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	30.0
Approach			34	9.4	34	9.4	0.018	0.0	NA	0.0	0.0	0.00	0.00	0.00	30.0
West: Drop off Zone Exit															
10	L2	All MCs	1	0.0	1	0.0	0.166	5.7	LOS A	0.6	4.2	0.16	0.45	0.16	37.5
12	R2	All MCs	198	1.6	198	1.6	0.166	3.0	LOS A	0.6	4.2	0.16	0.45	0.16	29.1
Approach			199	1.6	199	1.6	0.166	3.0	LOS A	0.6	4.2	0.16	0.45	0.16	29.1
All Vehicles			271	3.5	271	3.5	0.166	2.2	NA	0.6	4.2	0.12	0.33	0.12	29.3

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: 101 [2029 PM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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: Carpark Entry / Exit															
2	T1	All MCs	63	0.0	63	0.0	0.032	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	30.0
Approach			63	0.0	63	0.0	0.032	0.0	NA	0.0	0.0	0.00	0.00	0.00	30.0
North: Northeast Carpark Entry / Exit															
8	T1	All MCs	74	4.3	74	4.3	0.039	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	30.0
Approach			74	4.3	74	4.3	0.039	0.0	NA	0.0	0.0	0.00	0.00	0.00	30.0
West: Drop off Zone Exit															
10	L2	All MCs	14	0.0	14	0.0	0.413	5.8	LOS A	2.0	13.7	0.30	0.49	0.30	37.6
12	R2	All MCs	463	0.0	463	0.0	0.413	3.4	LOS A	2.0	13.7	0.30	0.49	0.30	29.1
Approach			477	0.0	477	0.0	0.413	3.5	LOS A	2.0	13.7	0.30	0.49	0.30	29.3
All Vehicles			614	0.5	614	0.5	0.413	2.7	NA	2.0	13.7	0.23	0.38	0.23	29.5

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: 101 [2034 AM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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: Carpark Entry / Exit															
2	T1	All MCs	41	7.7	41	7.7	0.022	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	30.0
Approach			41	7.7	41	7.7	0.022	0.0	NA	0.0	0.0	0.00	0.00	0.00	30.0
North: Northeast Carpark Entry / Exit															
8	T1	All MCs	37	8.6	37	8.6	0.020	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	30.0
Approach			37	8.6	37	8.6	0.020	0.0	NA	0.0	0.0	0.00	0.00	0.00	30.0
West: Drop off Zone Exit															
10	L2	All MCs	1	0.0	1	0.0	0.183	5.7	LOS A	0.7	4.8	0.17	0.45	0.17	37.5
12	R2	All MCs	218	1.4	218	1.4	0.183	3.0	LOS A	0.7	4.8	0.17	0.45	0.17	29.1
Approach			219	1.4	219	1.4	0.183	3.0	LOS A	0.7	4.8	0.17	0.45	0.17	29.1
All Vehicles			297	3.2	297	3.2	0.183	2.2	NA	0.7	4.8	0.13	0.33	0.13	29.3

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: 101 [2034 PM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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: Carpark Entry / Exit															
2	T1	All MCs	71	0.0	71	0.0	0.036	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	30.0
Approach			71	0.0	71	0.0	0.036	0.0	NA	0.0	0.0	0.00	0.00	0.00	30.0
North: Northeast Carpark Entry / Exit															
8	T1	All MCs	81	3.9	81	3.9	0.043	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	30.0
Approach			81	3.9	81	3.9	0.043	0.0	NA	0.0	0.0	0.00	0.00	0.00	30.0
West: Drop off Zone Exit															
10	L2	All MCs	16	0.0	16	0.0	0.462	5.9	LOS A	2.3	16.1	0.33	0.50	0.33	37.6
12	R2	All MCs	511	0.0	511	0.0	0.462	3.6	LOS A	2.3	16.1	0.33	0.50	0.33	29.1
Approach			526	0.0	526	0.0	0.462	3.6	LOS A	2.3	16.1	0.33	0.50	0.33	29.3
All Vehicles			678	0.5	678	0.5	0.462	2.8	NA	2.3	16.1	0.26	0.39	0.26	29.5

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: 101 [2044 AM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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: Carpark Entry / Exit															
2	T1	All MCs	51	8.3	51	8.3	0.027	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	30.0
Approach			51	8.3	51	8.3	0.027	0.0	NA	0.0	0.0	0.00	0.00	0.00	30.0
North: Northeast Carpark Entry / Exit															
8	T1	All MCs	45	9.3	45	9.3	0.025	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	30.0
Approach			45	9.3	45	9.3	0.025	0.0	NA	0.0	0.0	0.00	0.00	0.00	30.0
West: Drop off Zone Exit															
10	L2	All MCs	1	0.0	1	0.0	0.228	5.7	LOS A	0.9	6.2	0.21	0.46	0.21	37.5
12	R2	All MCs	266	1.6	266	1.6	0.228	3.1	LOS A	0.9	6.2	0.21	0.46	0.21	29.0
Approach			267	1.6	267	1.6	0.228	3.1	LOS A	0.9	6.2	0.21	0.46	0.21	29.1
All Vehicles			363	3.5	363	3.5	0.228	2.3	NA	0.9	6.2	0.15	0.34	0.15	29.3

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: 101 [2044 PM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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: Carpark Entry / Exit															
2	T1	All MCs	85	0.0	85	0.0	0.044	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	30.0
Approach			85	0.0	85	0.0	0.044	0.0	NA	0.0	0.0	0.00	0.00	0.00	30.0
North: Northeast Carpark Entry / Exit															
8	T1	All MCs	99	4.3	99	4.3	0.052	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	30.0
Approach			99	4.3	99	4.3	0.052	0.0	NA	0.0	0.0	0.00	0.00	0.00	30.0
West: Drop off Zone Exit															
10	L2	All MCs	18	0.0	18	0.0	0.580	6.7	LOS A	4.7	33.2	0.43	0.59	0.52	37.2
12	R2	All MCs	623	0.0	623	0.0	0.580	4.7	LOS A	4.7	33.2	0.43	0.59	0.52	28.9
Approach			641	0.0	641	0.0	0.580	4.7	LOS A	4.7	33.2	0.43	0.59	0.52	29.1
All Vehicles			825	0.5	825	0.5	0.580	3.7	NA	4.7	33.2	0.34	0.46	0.41	29.3

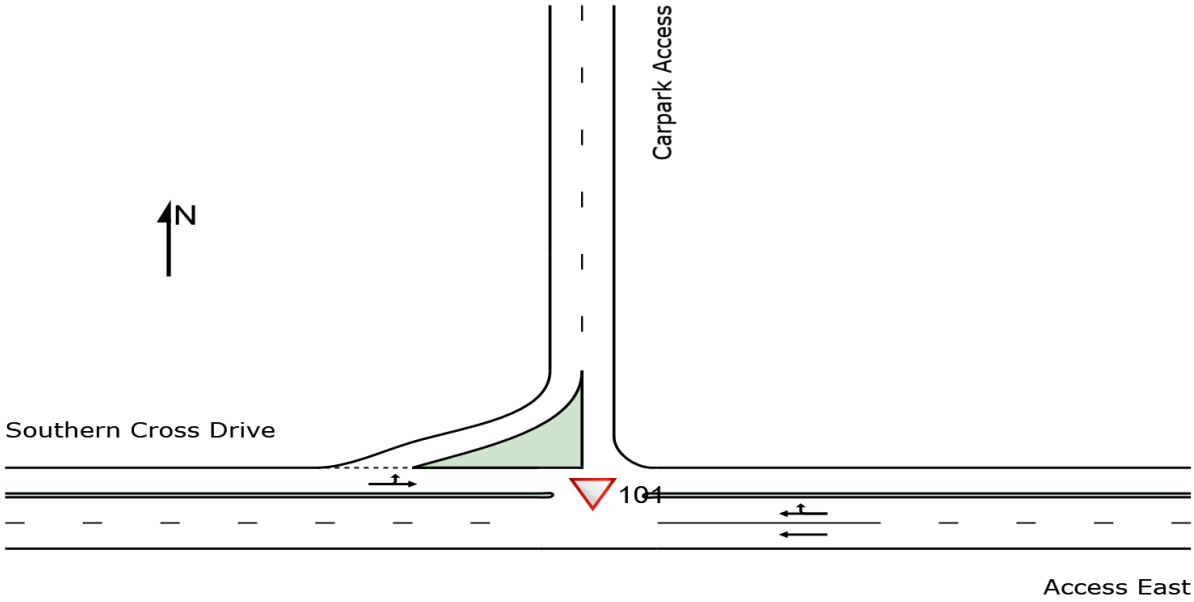
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of 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.

SITE LAYOUT

Site: 101 [2024 AM Seasonal (Site Folder: General)]

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

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



MOVEMENT SUMMARY

Site: 101 [2024 AM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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
East: Access East															
5	T1	All MCs	171	4.3	171	4.3	0.047	0.0	LOS A	0.0	0.3	0.01	0.03	0.01	59.7
6	R2	All MCs	7	0.0	7	0.0	0.047	5.7	LOS A	0.0	0.3	0.03	0.05	0.03	39.6
Approach			178	4.1	178	4.1	0.047	0.2	NA	0.0	0.3	0.01	0.03	0.01	58.5
West: Southern Cross Drive															
10	L2	All MCs	33	0.0	33	0.0	0.043	5.6	LOS A	0.0	0.0	0.00	0.23	0.00	56.0
11	T1	All MCs	47	6.7	47	6.7	0.043	0.0	LOS A	0.0	0.0	0.00	0.23	0.00	57.7
Approach			80	3.9	80	3.9	0.043	2.3	NA	0.0	0.0	0.00	0.23	0.00	57.0
All Vehicles			258	4.1	258	4.1	0.047	0.9	NA	0.0	0.3	0.01	0.09	0.01	58.0

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.

MOVEMENT SUMMARY

Site: 101 [2024 PM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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
East: Access East															
5	T1	All MCs	378	0.3	378	0.3	0.099	0.0	LOS A	0.0	0.2	0.01	0.01	0.01	59.9
6	R2	All MCs	5	0.0	5	0.0	0.099	5.6	LOS A	0.0	0.2	0.01	0.02	0.01	39.7
Approach			383	0.3	383	0.3	0.099	0.1	NA	0.0	0.2	0.01	0.01	0.01	59.5
West: Southern Cross Drive															
10	L2	All MCs	46	0.0	46	0.0	0.062	5.6	LOS A	0.0	0.0	0.00	0.22	0.00	56.2
11	T1	All MCs	73	0.0	73	0.0	0.062	0.0	LOS A	0.0	0.0	0.00	0.22	0.00	57.9
Approach			119	0.0	119	0.0	0.062	2.2	NA	0.0	0.0	0.00	0.22	0.00	57.2
All Vehicles			502	0.2	502	0.2	0.099	0.6	NA	0.0	0.2	0.00	0.06	0.00	58.9

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: 101 [2029 AM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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
East: Access East															
5	T1	All MCs	264	4.4	264	4.4	0.073	0.0	LOS A	0.1	0.5	0.02	0.03	0.02	59.7
6	R2	All MCs	12	0.0	12	0.0	0.073	5.7	LOS A	0.1	0.5	0.03	0.06	0.03	39.5
Approach			276	4.2	276	4.2	0.073	0.3	NA	0.1	0.5	0.02	0.03	0.02	58.4
West: Southern Cross Drive															
10	L2	All MCs	51	0.0	51	0.0	0.067	5.6	LOS A	0.0	0.0	0.00	0.23	0.00	56.0
11	T1	All MCs	74	7.1	74	7.1	0.067	0.0	LOS A	0.0	0.0	0.00	0.23	0.00	57.7
Approach			124	4.2	124	4.2	0.067	2.3	NA	0.0	0.0	0.00	0.23	0.00	57.0
All Vehicles			400	4.2	400	4.2	0.073	0.9	NA	0.1	0.5	0.01	0.09	0.01	58.0

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.

MOVEMENT SUMMARY

Site: 101 [2029 PM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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
East: Access East															
5	T1	All MCs	585	0.5	585	0.5	0.154	0.0	LOS A	0.1	0.5	0.01	0.01	0.01	59.8
6	R2	All MCs	9	0.0	9	0.0	0.154	5.7	LOS A	0.1	0.5	0.02	0.02	0.02	39.7
Approach			595	0.5	595	0.5	0.154	0.1	NA	0.1	0.5	0.01	0.01	0.01	59.4
West: Southern Cross Drive															
10	L2	All MCs	72	0.0	72	0.0	0.097	5.6	LOS A	0.0	0.0	0.00	0.21	0.00	56.2
11	T1	All MCs	114	0.0	114	0.0	0.097	0.0	LOS A	0.0	0.0	0.00	0.21	0.00	57.9
Approach			185	0.0	185	0.0	0.097	2.2	NA	0.0	0.0	0.00	0.21	0.00	57.2
All Vehicles			780	0.4	780	0.4	0.154	0.6	NA	0.1	0.5	0.01	0.06	0.01	58.8

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: 101 [2034 AM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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
East: Access East															
5	T1	All MCs	293	4.3	293	4.3	0.081	0.0	LOS A	0.1	0.6	0.02	0.03	0.02	59.7
6	R2	All MCs	13	0.0	13	0.0	0.081	5.8	LOS A	0.1	0.6	0.04	0.06	0.04	39.5
Approach			305	4.1	305	4.1	0.081	0.3	NA	0.1	0.6	0.02	0.03	0.02	58.4
West: Southern Cross Drive															
10	L2	All MCs	56	0.0	56	0.0	0.073	5.6	LOS A	0.0	0.0	0.00	0.23	0.00	56.0
11	T1	All MCs	81	6.5	81	6.5	0.073	0.0	LOS A	0.0	0.0	0.00	0.23	0.00	57.7
Approach			137	3.8	137	3.8	0.073	2.3	NA	0.0	0.0	0.00	0.23	0.00	57.0
All Vehicles			442	4.0	442	4.0	0.081	0.9	NA	0.1	0.6	0.01	0.09	0.01	58.0

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.

MOVEMENT SUMMARY

Site: 101 [2034 PM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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
East: Access East															
5	T1	All MCs	645	0.5	645	0.5	0.169	0.0	LOS A	0.1	0.5	0.01	0.01	0.01	59.8
6	R2	All MCs	9	0.0	9	0.0	0.169	5.8	LOS A	0.1	0.5	0.02	0.02	0.02	39.7
Approach			655	0.5	655	0.5	0.169	0.1	NA	0.1	0.5	0.01	0.01	0.01	59.4
West: Southern Cross Drive															
10	L2	All MCs	80	0.0	80	0.0	0.107	5.6	LOS A	0.0	0.0	0.00	0.22	0.00	56.1
11	T1	All MCs	124	0.0	124	0.0	0.107	0.0	LOS A	0.0	0.0	0.00	0.22	0.00	57.9
Approach			204	0.0	204	0.0	0.107	2.2	NA	0.0	0.0	0.00	0.22	0.00	57.2
All Vehicles			859	0.4	859	0.4	0.169	0.6	NA	0.1	0.5	0.01	0.06	0.01	58.9

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: 101 [2044 AM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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
East: Access East															
5	T1	All MCs	356	4.4	356	4.4	0.099	0.0	LOS A	0.1	0.7	0.02	0.03	0.02	59.7
6	R2	All MCs	16	0.0	16	0.0	0.099	5.9	LOS A	0.1	0.7	0.04	0.06	0.04	39.5
Approach			372	4.2	372	4.2	0.099	0.3	NA	0.1	0.7	0.02	0.03	0.02	58.4
West: Southern Cross Drive															
10	L2	All MCs	67	0.0	67	0.0	0.089	5.6	LOS A	0.0	0.0	0.00	0.22	0.00	56.0
11	T1	All MCs	99	7.4	99	7.4	0.089	0.0	LOS A	0.0	0.0	0.00	0.22	0.00	57.7
Approach			166	4.4	166	4.4	0.089	2.3	NA	0.0	0.0	0.00	0.22	0.00	57.0
All Vehicles			538	4.3	538	4.3	0.099	0.9	NA	0.1	0.7	0.01	0.09	0.01	58.0

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.

MOVEMENT SUMMARY

Site: 101 [2044 PM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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
East: Access East															
5	T1	All MCs	786	0.5	786	0.5	0.206	0.0	LOS A	0.1	0.7	0.01	0.01	0.01	59.8
6	R2	All MCs	13	0.0	13	0.0	0.206	5.9	LOS A	0.1	0.7	0.02	0.02	0.02	39.7
Approach			799	0.5	799	0.5	0.206	0.1	NA	0.1	0.7	0.01	0.01	0.01	59.3
West: Southern Cross Drive															
10	L2	All MCs	97	0.0	97	0.0	0.130	5.6	LOS A	0.0	0.0	0.00	0.21	0.00	56.1
11	T1	All MCs	153	0.0	153	0.0	0.130	0.0	LOS A	0.0	0.0	0.00	0.21	0.00	57.9
Approach			249	0.0	249	0.0	0.130	2.2	NA	0.0	0.0	0.00	0.21	0.00	57.2
All Vehicles			1048	0.4	1048	0.4	0.206	0.6	NA	0.1	0.7	0.01	0.06	0.01	58.8

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: 101 [2044 AM Seasonal Masterplan (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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
East: Access East															
5	T1	All MCs	304	5.2	304	5.2	0.083	0.1	LOS A	0.0	0.3	0.02	0.02	0.02	59.8
6	R2	All MCs	4	0.0	4	0.0	0.083	7.7	LOS A	0.0	0.3	0.04	0.04	0.04	39.7
Approach			308	5.1	308	5.1	0.083	0.2	NA	0.0	0.3	0.02	0.02	0.02	59.4
West: Southern Cross Drive															
10	L2	All MCs	20	0.0	20	0.0	0.011	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	52.9
11	T1	All MCs	402	1.8	402	1.8	0.209	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			422	1.7	422	1.7	0.209	0.3	NA	0.0	0.0	0.00	0.03	0.00	59.5
All Vehicles			731	3.2	731	3.2	0.209	0.3	NA	0.0	0.3	0.01	0.03	0.01	59.5

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: 101 [2044 PM Seasonal Masterplan (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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
East: Access East															
5	T1	All MCs	606	0.7	606	0.7	0.160	0.1	LOS A	0.1	0.6	0.01	0.02	0.01	59.8
6	R2	All MCs	4	0.0	4	0.0	0.160	10.3	LOS B	0.1	0.6	0.03	0.04	0.03	39.7
Approach			611	0.7	611	0.7	0.160	0.2	NA	0.1	0.6	0.02	0.02	0.02	59.6
West: Southern Cross Drive															
10	L2	All MCs	29	0.0	29	0.0	0.016	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	52.9
11	T1	All MCs	673	0.0	673	0.0	0.345	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach			702	0.0	702	0.0	0.345	0.3	NA	0.0	0.0	0.00	0.02	0.00	59.5
All Vehicles			1313	0.3	1313	0.3	0.345	0.3	NA	0.1	0.6	0.01	0.02	0.01	59.5

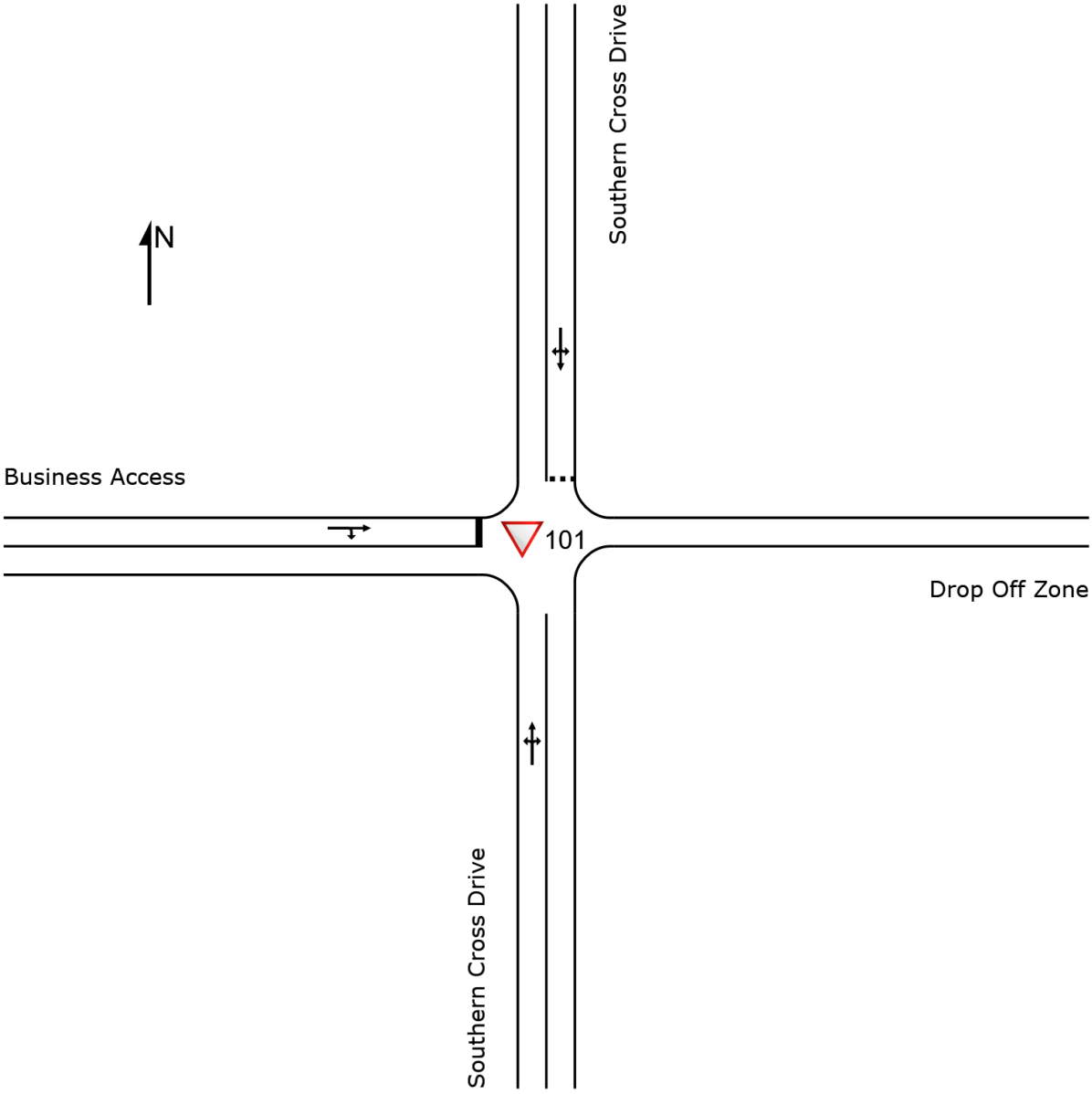
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of 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.

SITE LAYOUT

Site: 101 [2024 AM Seasonal (Site Folder: General)]

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

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



MOVEMENT SUMMARY

Site: 101 [2024 AM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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: Southern Cross Drive															
1	L2	All MCs	1	0.0	1	0.0	0.089	2.0	LOS A	0.0	0.0	0.00	0.39	0.00	29.3
2	T1	All MCs	17	0.0	17	0.0	0.089	0.0	LOS A	0.0	0.0	0.00	0.39	0.00	29.4
3	R2	All MCs	147	0.0	147	0.0	0.089	2.6	LOS A	0.0	0.0	0.00	0.39	0.00	29.2
Approach			165	0.0	165	0.0	0.089	2.4	NA	0.0	0.0	0.00	0.39	0.00	29.3
North: Southern Cross Drive															
7	L2	All MCs	1	0.0	1	0.0	0.010	2.4	LOS A	0.0	0.3	0.20	0.24	0.20	29.5
8	T1	All MCs	9	33.3	9	33.3	0.010	1.4	LOS A	0.0	0.3	0.20	0.24	0.20	29.5
9	R2	All MCs	1	0.0	1	0.0	0.010	2.4	LOS A	0.0	0.3	0.20	0.24	0.20	29.4
Approach			12	27.3	12	27.3	0.010	1.6	LOS A	0.0	0.3	0.20	0.24	0.20	29.5
West: Business Access															
11	T1	All MCs	4	0.0	4	0.0	0.010	6.2	LOS A	0.0	0.3	0.28	0.97	0.28	28.5
12	R2	All MCs	4	75.0	4	75.0	0.010	9.1	LOS A	0.0	0.3	0.28	0.97	0.28	28.4
Approach			8	37.5	8	37.5	0.010	7.7	LOS A	0.0	0.3	0.28	0.97	0.28	28.4
All Vehicles			185	3.4	185	3.4	0.089	2.6	NA	0.0	0.3	0.03	0.41	0.03	29.2

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.
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: 101 [2024 PM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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: Southern Cross Drive															
1	L2	All MCs	1	0.0	1	0.0	0.175	2.0	LOS A	0.0	0.0	0.00	0.41	0.00	29.3
2	T1	All MCs	21	0.0	21	0.0	0.175	0.1	LOS A	0.0	0.0	0.00	0.41	0.00	29.4
3	R2	All MCs	304	0.0	304	0.0	0.175	2.7	LOS A	0.0	0.0	0.00	0.41	0.00	29.2
Approach			326	0.0	326	0.0	0.175	2.5	NA	0.0	0.0	0.00	0.41	0.00	29.2
North: Southern Cross Drive															
7	L2	All MCs	13	0.0	13	0.0	0.019	2.9	LOS A	0.1	0.5	0.29	0.34	0.29	29.3
8	T1	All MCs	9	0.0	9	0.0	0.019	1.7	LOS A	0.1	0.5	0.29	0.34	0.29	29.3
9	R2	All MCs	1	0.0	1	0.0	0.019	2.4	LOS A	0.1	0.5	0.29	0.34	0.29	29.2
Approach			23	0.0	23	0.0	0.019	2.4	LOS A	0.1	0.5	0.29	0.34	0.29	29.3
West: Business Access															
11	T1	All MCs	1	0.0	1	0.0	0.006	7.0	LOS A	0.0	0.1	0.38	0.87	0.38	28.4
12	R2	All MCs	4	0.0	4	0.0	0.006	7.1	LOS A	0.0	0.1	0.38	0.87	0.38	28.4
Approach			5	0.0	5	0.0	0.006	7.1	LOS A	0.0	0.1	0.38	0.87	0.38	28.4
All Vehicles			355	0.0	355	0.0	0.175	2.6	NA	0.1	0.5	0.02	0.41	0.02	29.2

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.
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: 101 [2029 AM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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: Southern Cross Drive															
1	L2	All MCs	3	0.0	3	0.0	0.138	2.0	LOS A	0.0	0.0	0.00	0.39	0.00	29.3
2	T1	All MCs	26	0.0	26	0.0	0.138	0.1	LOS A	0.0	0.0	0.00	0.39	0.00	29.4
3	R2	All MCs	228	0.0	228	0.0	0.138	2.7	LOS A	0.0	0.0	0.00	0.39	0.00	29.2
Approach			258	0.0	258	0.0	0.138	2.4	NA	0.0	0.0	0.00	0.39	0.00	29.3
North: Southern Cross Drive															
7	L2	All MCs	3	0.0	3	0.0	0.021	2.7	LOS A	0.1	0.6	0.25	0.29	0.25	29.4
8	T1	All MCs	16	33.3	16	33.3	0.021	1.8	LOS A	0.1	0.6	0.25	0.29	0.25	29.4
9	R2	All MCs	3	0.0	3	0.0	0.021	2.4	LOS A	0.1	0.6	0.25	0.29	0.25	29.3
Approach			22	23.8	22	23.8	0.021	2.0	LOS A	0.1	0.6	0.25	0.29	0.25	29.4
West: Business Access															
11	T1	All MCs	7	0.0	7	0.0	0.021	6.7	LOS A	0.1	0.6	0.37	0.97	0.37	28.4
12	R2	All MCs	7	71.4	7	71.4	0.021	10.2	LOS B	0.1	0.6	0.37	0.97	0.37	28.2
Approach			15	35.7	15	35.7	0.021	8.4	LOS A	0.1	0.6	0.37	0.97	0.37	28.3
All Vehicles			295	3.6	295	3.6	0.138	2.7	NA	0.1	0.6	0.04	0.41	0.04	29.2

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.
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: 101 [2029 PM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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: Southern Cross Drive															
1	L2	All MCs	3	0.0	3	0.0	0.272	2.1	LOS A	0.0	0.0	0.00	0.41	0.00	29.3
2	T1	All MCs	34	0.0	34	0.0	0.272	0.1	LOS A	0.0	0.0	0.00	0.41	0.00	29.4
3	R2	All MCs	471	0.0	471	0.0	0.272	2.7	LOS A	0.0	0.0	0.00	0.41	0.00	29.2
Approach			507	0.0	507	0.0	0.272	2.5	NA	0.0	0.0	0.00	0.41	0.00	29.2
North: Southern Cross Drive															
7	L2	All MCs	20	0.0	20	0.0	0.037	3.7	LOS A	0.1	0.9	0.41	0.43	0.41	29.2
8	T1	All MCs	16	0.0	16	0.0	0.037	2.5	LOS A	0.1	0.9	0.41	0.43	0.41	29.2
9	R2	All MCs	1	0.0	1	0.0	0.037	2.4	LOS A	0.1	0.9	0.41	0.43	0.41	29.1
Approach			37	0.0	37	0.0	0.037	3.2	LOS A	0.1	0.9	0.41	0.43	0.41	29.2
West: Business Access															
11	T1	All MCs	1	0.0	1	0.0	0.014	8.1	LOS A	0.0	0.3	0.48	0.90	0.48	28.1
12	R2	All MCs	7	0.0	7	0.0	0.014	8.6	LOS A	0.0	0.3	0.48	0.90	0.48	28.1
Approach			8	0.0	8	0.0	0.014	8.6	LOS A	0.0	0.3	0.48	0.90	0.48	28.1
All Vehicles			553	0.0	553	0.0	0.272	2.7	NA	0.1	0.9	0.03	0.42	0.03	29.2

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.
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: 101 [2034 AM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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: Southern Cross Drive															
1	L2	All MCs	3	0.0	3	0.0	0.152	2.0	LOS A	0.0	0.0	0.00	0.39	0.00	29.3
2	T1	All MCs	29	0.0	29	0.0	0.152	0.1	LOS A	0.0	0.0	0.00	0.39	0.00	29.4
3	R2	All MCs	252	0.0	252	0.0	0.152	2.7	LOS A	0.0	0.0	0.00	0.39	0.00	29.2
Approach			284	0.0	284	0.0	0.152	2.4	NA	0.0	0.0	0.00	0.39	0.00	29.2
North: Southern Cross Drive															
7	L2	All MCs	3	0.0	3	0.0	0.022	2.8	LOS A	0.1	0.6	0.27	0.29	0.27	29.4
8	T1	All MCs	17	31.3	17	31.3	0.022	1.9	LOS A	0.1	0.6	0.27	0.29	0.27	29.4
9	R2	All MCs	3	0.0	3	0.0	0.022	2.5	LOS A	0.1	0.6	0.27	0.29	0.27	29.3
Approach			23	22.7	23	22.7	0.022	2.1	LOS A	0.1	0.6	0.27	0.29	0.27	29.4
West: Business Access															
11	T1	All MCs	8	0.0	8	0.0	0.024	6.8	LOS A	0.1	0.7	0.38	0.96	0.38	28.3
12	R2	All MCs	8	62.5	8	62.5	0.024	10.1	LOS B	0.1	0.7	0.38	0.96	0.38	28.2
Approach			17	31.3	17	31.3	0.024	8.5	LOS A	0.1	0.7	0.38	0.96	0.38	28.3
All Vehicles			324	3.2	324	3.2	0.152	2.7	NA	0.1	0.7	0.04	0.42	0.04	29.2

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.
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: 101 [2034 PM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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: Southern Cross Drive															
1	L2	All MCs	3	0.0	3	0.0	0.300	2.1	LOS A	0.0	0.0	0.00	0.41	0.00	29.3
2	T1	All MCs	37	0.0	37	0.0	0.300	0.1	LOS A	0.0	0.0	0.00	0.41	0.00	29.3
3	R2	All MCs	519	0.0	519	0.0	0.300	2.7	LOS A	0.0	0.0	0.00	0.41	0.00	29.2
Approach			559	0.0	559	0.0	0.300	2.6	NA	0.0	0.0	0.00	0.41	0.00	29.2
North: Southern Cross Drive															
7	L2	All MCs	22	0.0	22	0.0	0.042	4.0	LOS A	0.1	1.0	0.44	0.46	0.44	29.1
8	T1	All MCs	17	0.0	17	0.0	0.042	2.8	LOS A	0.1	1.0	0.44	0.46	0.44	29.2
9	R2	All MCs	1	0.0	1	0.0	0.042	2.5	LOS A	0.1	1.0	0.44	0.46	0.44	29.0
Approach			40	0.0	40	0.0	0.042	3.4	LOS A	0.1	1.0	0.44	0.46	0.44	29.1
West: Business Access															
11	T1	All MCs	1	0.0	1	0.0	0.016	8.5	LOS A	0.1	0.4	0.51	0.91	0.51	28.0
12	R2	All MCs	8	0.0	8	0.0	0.016	9.2	LOS A	0.1	0.4	0.51	0.91	0.51	28.0
Approach			9	0.0	9	0.0	0.016	9.1	LOS A	0.1	0.4	0.51	0.91	0.51	28.0
All Vehicles			608	0.0	608	0.0	0.300	2.7	NA	0.1	1.0	0.04	0.42	0.04	29.2

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.
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: 101 [2044 AM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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: Southern Cross Drive															
1	L2	All MCs	4	0.0	4	0.0	0.185	2.0	LOS A	0.0	0.0	0.00	0.39	0.00	29.3
2	T1	All MCs	35	0.0	35	0.0	0.185	0.1	LOS A	0.0	0.0	0.00	0.39	0.00	29.4
3	R2	All MCs	306	0.0	306	0.0	0.185	2.7	LOS A	0.0	0.0	0.00	0.39	0.00	29.2
Approach			345	0.0	345	0.0	0.185	2.4	NA	0.0	0.0	0.00	0.39	0.00	29.2
North: Southern Cross Drive															
7	L2	All MCs	4	0.0	4	0.0	0.030	3.0	LOS A	0.1	0.9	0.30	0.32	0.30	29.3
8	T1	All MCs	21	35.0	21	35.0	0.030	2.3	LOS A	0.1	0.9	0.30	0.32	0.30	29.4
9	R2	All MCs	4	0.0	4	0.0	0.030	2.5	LOS A	0.1	0.9	0.30	0.32	0.30	29.2
Approach			29	25.0	29	25.0	0.030	2.5	LOS A	0.1	0.9	0.30	0.32	0.30	29.3
West: Business Access															
11	T1	All MCs	9	0.0	9	0.0	0.031	7.1	LOS A	0.1	0.9	0.44	0.98	0.44	28.2
12	R2	All MCs	9	77.8	9	77.8	0.031	12.0	LOS B	0.1	0.9	0.44	0.98	0.44	28.0
Approach			19	38.9	19	38.9	0.031	9.6	LOS A	0.1	0.9	0.44	0.98	0.44	28.1
All Vehicles			394	3.7	394	3.7	0.185	2.8	NA	0.1	0.9	0.04	0.42	0.04	29.2

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.
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: 101 [2044 PM Seasonal (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
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: Southern Cross Drive															
1	L2	All MCs	4	0.0	4	0.0	0.366	2.1	LOS A	0.0	0.0	0.00	0.41	0.00	29.2
2	T1	All MCs	45	0.0	45	0.0	0.366	0.2	LOS A	0.0	0.0	0.00	0.41	0.00	29.3
3	R2	All MCs	633	0.0	633	0.0	0.366	2.8	LOS A	0.0	0.0	0.00	0.41	0.00	29.1
Approach			682	0.0	682	0.0	0.366	2.6	NA	0.0	0.0	0.00	0.41	0.00	29.2
North: Southern Cross Drive															
7	L2	All MCs	26	0.0	26	0.0	0.059	4.8	LOS A	0.2	1.4	0.51	0.54	0.51	28.9
8	T1	All MCs	21	0.0	21	0.0	0.059	3.5	LOS A	0.2	1.4	0.51	0.54	0.51	29.0
9	R2	All MCs	1	0.0	1	0.0	0.059	2.5	LOS A	0.2	1.4	0.51	0.54	0.51	28.9
Approach			48	0.0	48	0.0	0.059	4.2	LOS A	0.2	1.4	0.51	0.54	0.51	28.9
West: Business Access															
11	T1	All MCs	1	0.0	1	0.0	0.023	9.7	LOS A	0.1	0.5	0.60	0.95	0.60	27.7
12	R2	All MCs	9	0.0	9	0.0	0.023	10.8	LOS B	0.1	0.5	0.60	0.95	0.60	27.7
Approach			11	0.0	11	0.0	0.023	10.7	LOS B	0.1	0.5	0.60	0.95	0.60	27.7
All Vehicles			741	0.0	741	0.0	0.366	2.8	NA	0.2	1.4	0.04	0.42	0.04	29.1

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.
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.

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