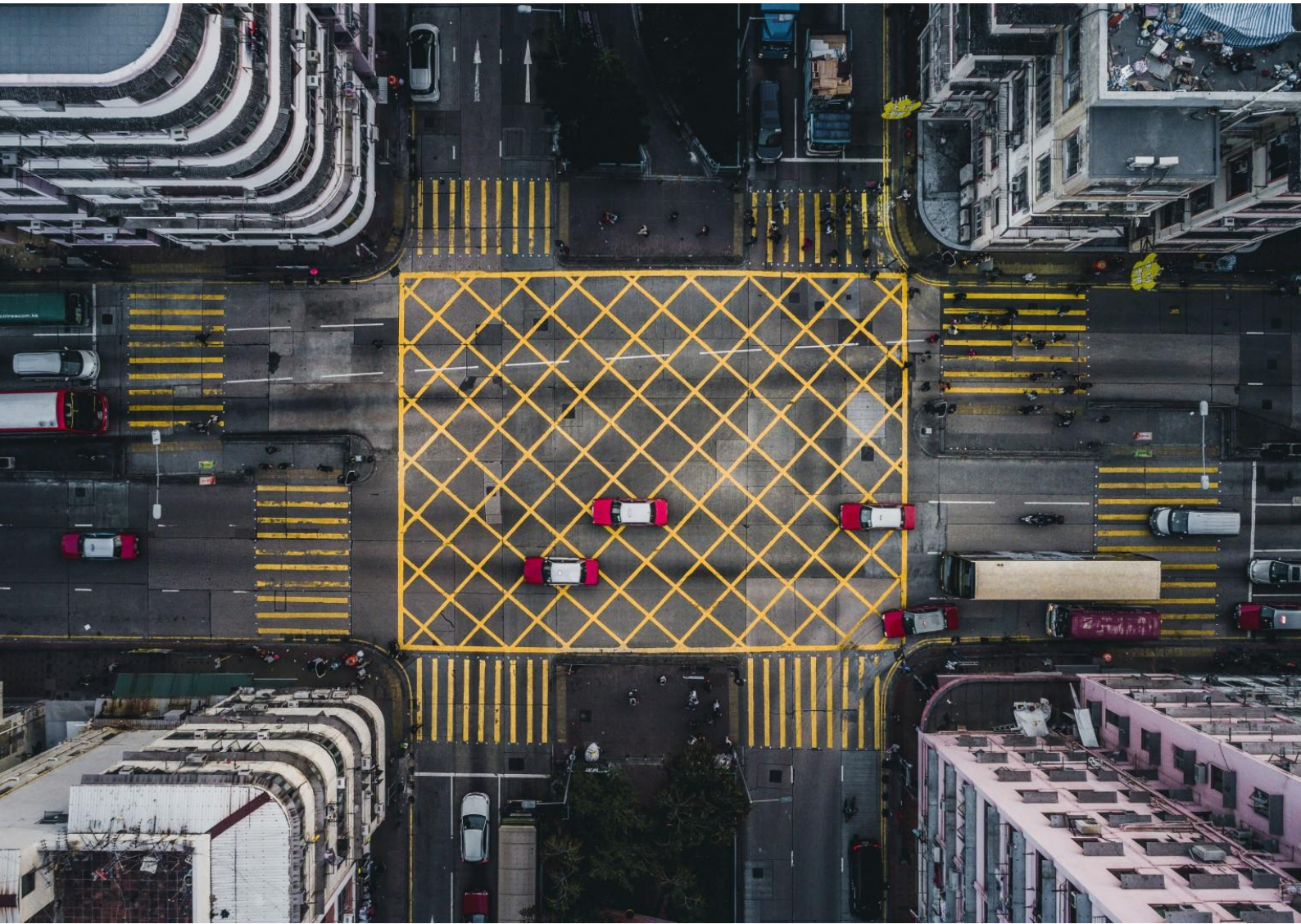
Maroochydore CBD – Lot 600

Traffic Report

GHD PTY LTD

11 September 2024

→ **The Power of Commitment**



Project name		Lot 600 Maroochydore Traffic Advice					
Document title		Maroochydore CBD – Lot 600 | Traffic Report					
Project number		12643366					
File name		12643366_REP_0-Lot 600 Design Review Report.docx					
Status Code	Revision	Author	Reviewer		Approved for issue		
			Name	Signature	Name	Signature	Date
S2	A	S. Bate	V. Chan				
S3	B	S. Bate	V. Chan	DRAFT	D. Gallagher	DRAFT	22/08/24
S4	0	S. Bate	D. Gallagher	ON FILE	D. Gallagher	ON FILE	11/08/24

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1. Introduction

A development application (DA) is to be lodged with Economic Development Queensland (EDQ) for a proposed mixed-use development to be located at Lot 600 in the Maroochydore CBD area, specifically within their nominated precinct 3. GHD was commissioned by Walker Corporation to undertake a layout review of the car parking and servicing areas of the site, as well as a review of the likely traffic impacts to the surrounding intersections as a result of the development traffic.

1.1 Purpose of this report

This report sets out an assessment of the geometric design elements, active transport accessibility, and compliance with the requirements set out in the Maroochydore City Centre (MCC) Priority Development Area (PDA) Development Scheme, including consideration of the following:

– Suitability of the proposed parking supply
– Suitability of the proposed vehicle access points
– Pedestrian and cyclist accessibility
– Suitability of the proposed servicing arrangements for the site
– Impacts to the surrounding intersections.

1.2 Scope and limitations

This report: has been prepared by GHD for GHD PTY LTD and may only be used and relied on by GHD PTY LTD for the purpose agreed between GHD and GHD PTY LTD as set out in section 1.1 of this report.

GHD otherwise disclaims responsibility to any person other than GHD PTY LTD arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (refer section(s) 1.3 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

Accessibility of documents

If this report is required to be accessible in any other format, this can be provided by GHD upon request and at an additional cost if necessary.

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1.3 Assumptions & references

In preparing this report, reference has been made to the following:

– An inspection of the site and its surrounds undertaken on 16 May 2024
– MCC PDA Development Scheme (March 2024)
– Sunshine Coast Planning Scheme (2014)
– Australian/New Zealand Standard, Parking Facilities, Part 1: Off-Street Car Parking 2890.1:2004 (AS/NZS 2890.1:2004)
– Australian Standard, Parking Facilities, Part 2: Off-Street Commercial Vehicle Facilities 2890.2-2018 (AS 2890.2-2018)

- Australian/New Zealand Standard, Parking Facilities, Part 6: Off-Street Parking for People with Disabilities 2890.6:2022 (AS/NZS 2890.6:2022)
- Maroochydore City Centre Priority Development Area Development Scheme Traffic Report (GHD,2022).
- Plans for the proposed development prepared by Plus Architecture:
  - Floor Plan – Ground Level: DA100, Issue O, dated 24.09.05
  - Floor Plan – Level 01 – Podium: DA101, Issue K, dated 24.09.03
  - Floor Plan – Level 02 – Podium: DA102, Issue K, dated 24.09.03
  - Floor Plan – Level 03 – Podium: DA103, Issue K, dated 24.09.03
  - Elevation North & South – Overall: DA200, Issue A, dated 24.09.03
- Preliminary Development Summary, (70850_240905_Development Summary)

2. Car parking

2.1 Proposed car parking supply

The proposed development includes 382 car parking spaces comprising of:

– 44 retail car parking spaces (single spaces)
– 2 PWD spaces and associated shared space provided within the retail car parking area
– 336 total residential car parking spaces consisting of:
  - 286 residential car parking spaces provided in single spaces
  - 41 residential car parking spaces provided in 21 tandem parking modules
  - 9 accessible car parking spaces.

2.2 Statutory car parking requirement

The Maroochydore City Centre (MCC) Priority Development Area (PDA) Development Scheme (March 2024), specifically *Table 2 – On-site car parking rates* outlines the acceptable car parking rates for each land use. For the proposed residential and retail use of the proposed development, the applicable on-site car parking rates are indicated in Table 1.

Table 1 MCC PDA on-site car parking rates

Land Use		
Residential		Maximum 1 space per dwelling, or maximum 2 spaces per dwelling where the dwelling contains 3 or more bedrooms.
Non-residential in Precinct 3	GFA approved[1]	
	20,001m^2 to 50,000m^2	Maximum 1 space per 100m^2 GFA

2.2.1 Residential car parking requirement

Based on the proposed development's dwelling unit yield, and the application of the MCC PDA, a maximum residential car parking of 336 car parking spaces is required/allowed, details of the calculations are provided further in Table 2.

Table 2 Residential car parking requirement

Unit type	**On-site car parking rate**	**Unit yield**	**Maximum car parking spaces allowed**	**Car parking spaces proposed**
One bedroom dwelling	Maximum 1 space per dwelling	55	55	55
Two-bedroom dwelling	Maximum 1 space per dwelling	111	111	111
Three-bedroom dwelling	Maximum 2 space per dwelling	75	150	150
Penthouse[2]	Maximum 2 space per dwelling	10	20	20
Total			336	336

[1] It is understood that Precinct 3 has exceeded 20,000 m^2 of approved GFA
[2] It is assumed that the penthouse units feature at least 3 bedrooms

The nominated provision of 336 residential car parking spaces complies with the MCC PDA requirement of a maximum 336 residential car parking spaces.

2.2.2 Retail car parking requirement

For non-residential uses within Precinct 3, a maximum of 1 car parking space per 100m^2 GFA is indicated under the MCC PDA. The development proposes to provide 46 car parking spaces for the retail uses, as opposed to the maximum 22 car parking spaces allowed under the MCC PDA, as shown in Table 3.

Table 3 Retail car parking requirement

Land use	On-site car parking rate	Land use yield	Maximum car parking spaces allowed	Car parking spaces proposed
Non-residential	Maximum 1 space per 100m^2 GFA	2,130 m^2	22	46

A performance solution is proposed for the retail car parking provision, noting that section 2.6.5.6 of the MCC PDA states that the development *"may propose car parking provision that varies from the requirements of Table 2 – On-site car parking rates where it can be demonstrated that the particular use, or combination of uses, requires a different rate of car parking provision to support development outcomes in accordance with the Vision."*.

The additional car parking spaces is proposed for the following reasons:

– Under Sunshine Coast Council's Planning Scheme for a shop use, based on the required rate of 1 space per 20m^2, this would represent a requirement of 107 car parking spaces, over double what is proposed to be provided. The proposed location of the development is not expected to reduce this car parking demand, which is typically expected to be high, even under Council's Planning Scheme.

– The smaller footprint of the retail spaces typically requires a larger proportion of car parking spaces than that of larger areas. Table 5.2 of the *Guide to Traffic Generating Developments (RTA, 2002)* shows the minimum recommended off-street car parking rates based on gross leasable floor area, which decreases as the area increases, and also would recommend 98 car parking spaces (which is also greater than the proposed provision).

Table 5.2
Off Street Parking

Gross leasable floor area (GLFA) m^2	Car Parking Spaces per 100m^2 of GLFA
0-10,000	6.1
10,000-20,000	5.6
20,000-30,000	4.3
Over 30,000	4.1

Figure 1 Off street car parking rates for shop use

– Taking into account the various uses within the site, and noting that speciality shops (i.e., small footprint stores) are noted to have the highest peak car parking demand rates for shop uses based on the *Guide to Traffic Generating Developments (RTA, 2002)*. The indicative peak parking model would suggest a provision of 53 car parking spaces is needed service this array of non-residential uses.

Peak Parking Demand = 24 A(S) + 40 A(F) + 42 A(SM) + 45 A(SS) + 9 A(OM) (per 1,000m^2).

where:

A(S): Slow Trade GLFA, includes major Department stores such as David Jones and Grace Brothers, furniture, electrical and utility goods stores.

A(F): Faster Trade GLFA, includes discount department stores such as K-Mart and Target, together with larger specialist stores such as Fosseys.

A(SM): Supermarket GLFA, includes stores such as Franklins and large fruit markets.

A(SS): Speciality Shops and Secondary retail GLFA, includes speciality shops and take-away stores such as McDonalds. These stores are grouped since they tend not be primary attractors to the centre.

A(OM): Offices, medical GLFA.

Figure 2 Car parking rates based on retail use

– A comparison of the parking provision is illustrated in Table 4, which indicates the proposed car parking provision of the development is still well below the typical rates suggested by Council and the RTA.

Table 4 Parking provision by reference

Reference	Total car parking provision	Car parking rate
Sunshine Coast Planning Scheme	107	5 per 100m^2 GFA
RTA – Generic Shopping Centre	98	8.1 per 100m^2 GFA
RTA – Peak Parking Demand Model	53	2.5 per 100m^2 GFA
Proposed car parking rate	**46**	**2.2 per 100m^2 GFA**

– As further detailed in section 5, the shops are expected to be predominantly serviced by VAN size vehicles due to their small footprint, with an intent for some of these bays to be used by VANs. While it is understood that it is possible to dedicate spaces to VANs (or service vehicles only), it is believed that this proposed layout results in a more efficient use of the site to allow a combined use for both visitors and small service vehicles.
– As the retail stores are expected to be boutique in nature, drop-in and linked trips are not expected to occur at a large rate, rather, visitors will travel to the development specifically to access the shop, increasing parking demand.
– Walker Corporation's experience with retail developments and tenancies, especially with small form factor and boutique retail spaces has indicated a typical need for a higher proportion of car parking than what is indicated from this maximum rate.
– The increase in car parking supply is not expected to materially impact the operation or safety of the development's internal layout, or the external road and path network.

Furthermore, an investigation of the impacts of the increased car parking provision has been conducted through a traffic impact assessment, which has found that the proposed car parking provision is unlikely to have any material impact on the surrounding road network. Further details can be found in section 7.

2.3 Car parking layout review

The car parking layout has been reviewed against the requirements of the MCC PDA and Council's planning scheme policy for the transport and parking code, which refers to Australian Standards (AS2890.1 – Part 1: Off Street Car Parking and AS2890.2 – Off Street Parking Part 2: Commercial Vehicles).

Table 5 Ground floor car parking layout review

Design aspect	Design element	Statutory requirement	Proposed design	Compliance
Car parking bay	Regular bay			
	Bay width	2.6m	2.4-2.6m	*Performance Solution*
	Bay length	5.4m	5.4m	Achieved
	PWD bay			
	Bay width	2.4m	2.6m	Achieved
	Bay length	5.4m	5.4m	Achieved
Aisle width	Parking aisle	5.8m (two-way)	6.7m (one-way	Achieved
Adjacent structures	Walls	0.3m	N/A	N/A
	Columns	Outside of design envelope	Outside of design envelope	Achieved
Ramp Gradients	Summit grade change	1:8	1:8	Achieved
	Sag grade change	1:6.7	1:8	Achieved
	Circulation ramp grade	1:5	1:5	Achieved
Height clearances	PWD Parking bay	2.5m	4.5m	Achieved
Aisle extensions	Aisle extension	1.0m	N/A	N/A

Table 6 Podium level 1 car parking layout review

Design aspect	Design element	Statutory requirement	Proposed design	Compliance
Car parking bay	Regular bay			
	Bay width	2.4m	2.4m	Achieved
	Bay length	5.4m	5.4m	Achieved
	Parallel bay			
	Bay width	2.1m	2.1m	Achieved
	Bay length	6.6m	6.6m	Achieved
Aisle width	Parking aisle	5.8m	6.1m – 6.7m	Achieved
Adjacent structures	Walls	0.3m	0.3m	Achieved
	Columns	Outside of design envelope	Outside of design envelope	Achieved
Ramp Gradients	Summit grade change	1:8	1:8	Achieved
	Sag grade change	1:6.7	1:8	Achieved
	Circulation ramp grade	1:5	1:5	Achieved
Height clearances	Parking bay	2.2m	3.1m	Achieved
Aisle extensions	Aisle extension	1.0m	2.1m	Achieved

Table 7 Podium level 2 car parking layout review

Design aspect	Design element	Statutory requirement	Proposed design	Compliance
Car parking bay	*Regular bay*			
	Bay width	2.4m	2.4m	Achieved
	Bay length	5.4m	5.4m	Achieved
	Small car bay			
	Bay width	2.3m	2.4m	Achieved
	Bay length	5.0m	5.0m	Achieved
Aisle width	Parking aisle	5.8m	6.0m – 6.7m	Achieved
Adjacent structures	Walls	0.3m	0.3m	Achieved
	Columns	Outside of design envelope	Outside of design envelope	Achieved
Ramp Gradients	Summit grade change	1:8	1:8	Achieved
	Sag grade change	1:6.7	1:8	Achieved
	Circulation ramp grade	1:5	1:5	Achieved
Height clearances	Parking bay	2.2m	3.1m	Achieved
Aisle extensions	Aisle extension	1.0m	1.3m	Achieved

Table 8 Podium level 3 car parking layout review

Design aspect	Design element	Statutory requirement	Proposed design	Compliance
Car parking bay	*Regular bay*			
	Bay width	2.4m	2.4m	Achieved
	Bay length	5.4m	5.4m	Achieved
	Small car bay			
	Bay width	2.3m	2.4m	Achieved
	Bay length	5.0m	5.0m	Achieved
Aisle width	Parking aisle	5.8m	6.0m – 6.7m	Achieved
Adjacent structures	Walls	0.3m	0.3m	Achieved
	Columns	Outside of design envelope	Outside of design envelope	Achieved
Ramp Gradients	Summit grade change	1:8	1:8	Achieved
	Sag grade change	1:6.7	1:8	Achieved
	Circulation ramp grade	1:5	1:5	Achieved
Height clearances	Parking bay	2.2m	3.1m	Achieved
Aisle extensions	Aisle extension	1.0m	1.3m	Achieved

The car parking layout review has found that all design elements are in compliance with the Australian Standards, with the exception of the parking bay width for the majority of bays located on the ground floor. As a result, a performance solution is proposed for the parking bay widths.

Performance solution – public car parking bay widths

The public car parking area proposes to have a width of 2.56m for the majority of bays, with the exception of bays P1, P5-P7, P33, P36, P37, P40, P44-46 which all achieve the required 2.6m. It is noted that bay P38 has a nominated with of 2.4m, however as there is no space adjacent to this bay, the effective entry and exit width of the bay is much wider, resulting in no likely impacts to the manoeuvrability to and from the parking space.

The affected car parking spaces are visualised through Figure 3, with the red highlighted bays containing a width less than 2.6m.

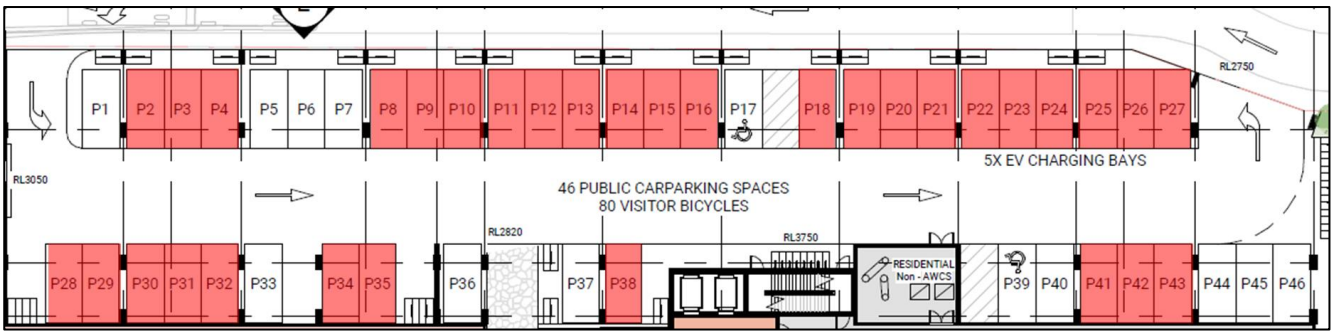


Figure 3 Impacted parking bays

This width is viewed acceptable for the following reasons:

– The parking aisle width provided exceeds the required 5.8m through a provision of a 6.7m wide aisle, which is also provided as a one-way arrangement. Critically, this wide aisle is expected to allow vehicles to easily manoeuvre into the car parking bays, reducing the need for wide bays.

– Due to the width of the one-way aisle, the need for any 3-point turns either within the car park bay or within the parking aisle is highly unlikely.

– The proposed width of 2.56m is balanced across three bays, rather than as two 2.6m wide bays and a 2.48m wide bay. This balanced width across the car parking module provides a less confusing layout configuration that is more visually comprehensible, particular for visitors who are not familiar with the car park.

– The car park services the retail uses of the development only and will not impact the adjacent service lane traffic, service vehicles, or proposed residential uses. As a result, no delay/operational impact is expected on any other users.

3. Vehicle access design review

3.1 Vehicle access requirements

Under the MCC PDA, the vehicle access of a development must:

– Ensure vehicle access arrangements are safe and convenient for residents, workers, visitors, and service providers
– Located vehicle access points with consideration for street typologies
– Ensure the vehicle access connects to and takes into consideration impacts to existing networks, ensuring acceptable levels of amenity and minimising negative impacts on through traffic.

3.2 Proposed vehicle access arrangements

Vehicle access to the development is proposed at three locations, all along Gaba Lane.

1. Vehicle access on the northern-most end of the site, providing vehicle access to the residential car park on the podium levels
2. A one-way entry access near the centre of the site (adjacent to the proposed loading dock facilities)
3. A one-way exit access on the southern end of the site.

The locations of the proposed vehicle accesses are shown in Figure 4.

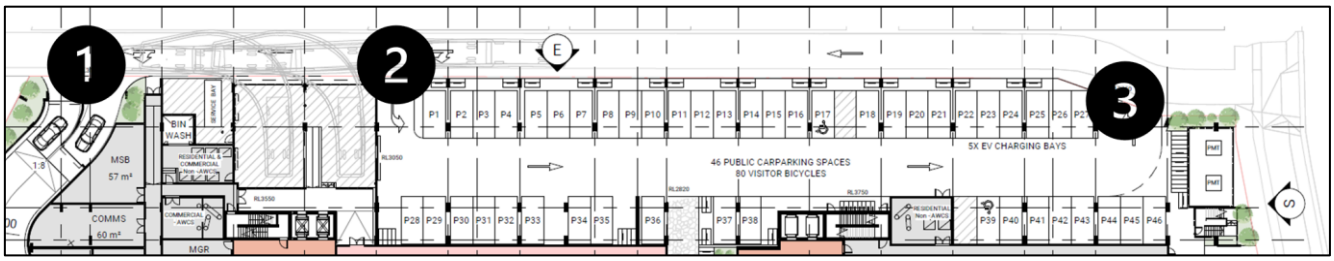


Figure 4 Vehicle access locations

3.3 Residential vehicle access

The residential car park is proposed to be serviced by a vehicle access on the northern end of the site, allowing access for up to a B99 design vehicle, shown in Figure 5. To ensure a secure environment for the residential car parking levels, a roller door control point is proposed at the vehicle access. The roller door setup is currently configured to allow exiting vehicles sight distance of oncoming vehicles along Gaba lane, as well as storage for at least one vehicle entering the car park, to queue off the laneway.

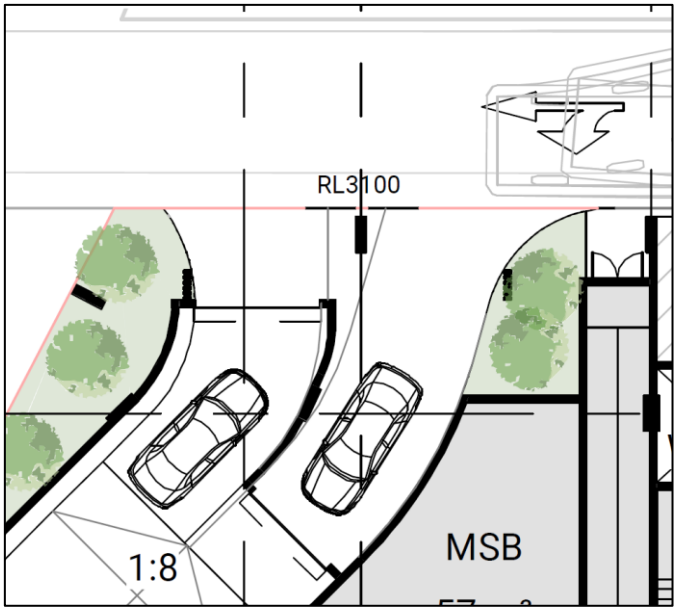


Figure 5 *Residential car park vehicle access*

A swept path check using a B99 vehicle found that a vehicle can safely and efficiently travel down the ramp, and out of the vehicle access on to Gaba Lane, as illustrated in Figure 6.

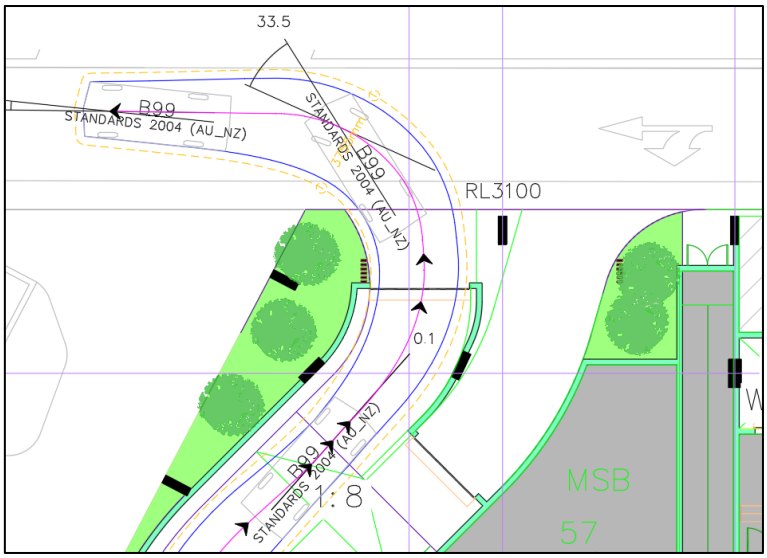


Figure 6 *Residential vehicle access – B99 Movement OUT*

A swept path check using a B99 vehicle found that a vehicle can safely and efficiently travel down Gaba Lane, queue out of the traffic lane of Gaba Lane, while waiting for the roller door to open, and travel up the ramp to the residential car park, as illustrated in Figure 7.

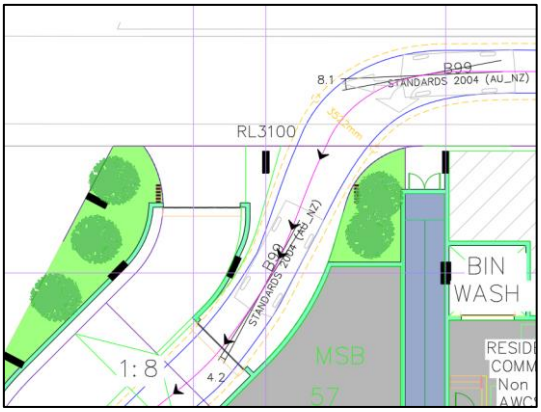


Figure 7 Residential vehicle access – B99 Movement IN

As the residential vehicle access is safe and convenient for residents, located as per typical for laneway type streets, and avoids creating impacts on South Sea Islander Way (i.e., the main thoroughfare of the adjacent road network), the residential access is found to adhere to the intent of vehicle accesses under the MCC PDA.

An assessment of the ramp operations was also conducted which found that concurrent two-way movements with two B99 design vehicles is achievable, as illustrated in Figure 8.

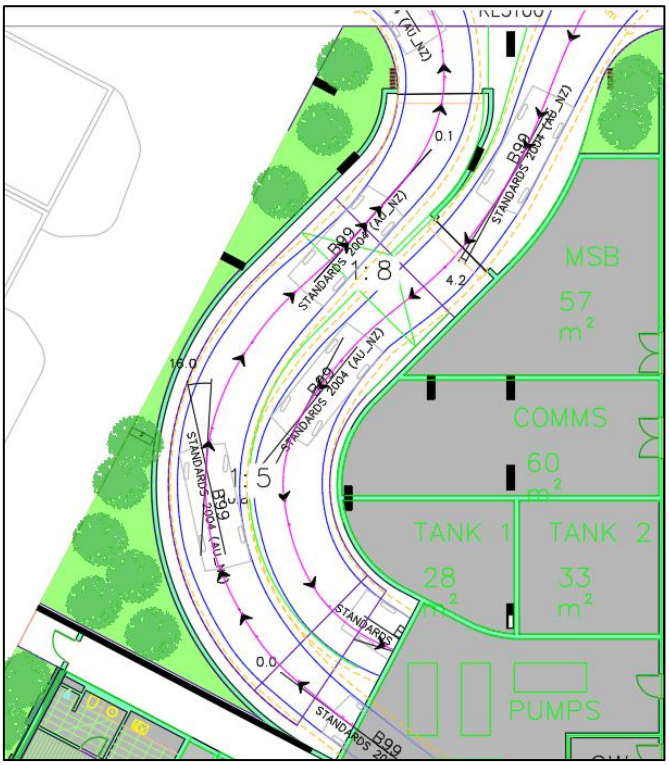


Figure 8 Two-way ramp movements

3.4 Retail car park vehicle access

3.4.1 Entry vehicle access

The retail car park is proposed near the centre of the site, allowing access for up to a B99 design vehicle, with the proposed access form outlined in Figure 9.

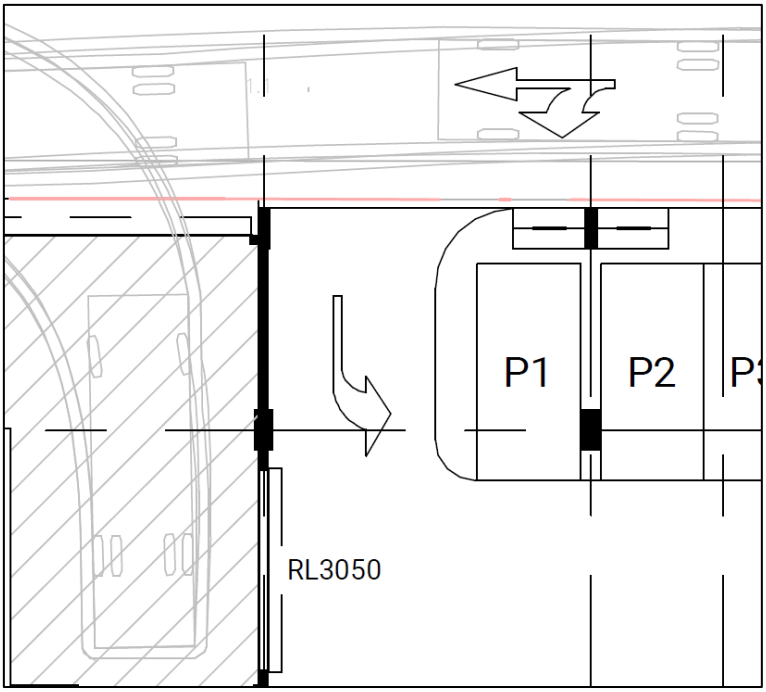


Figure 9 Retail car park vehicle access – entry

The swept path conducted using a B99 design vehicle has found that can safely and adequately enter the retail car park using the entry only vehicle access, as indicated in Figure 10. As the retail entry vehicle access is safe and convenient for customers, located as per typical for laneway type streets, and avoids creating impacts on South Sea Islander Way, the proposed entry access is found to adhere to the intent of vehicle accesses under the MCC PDA.

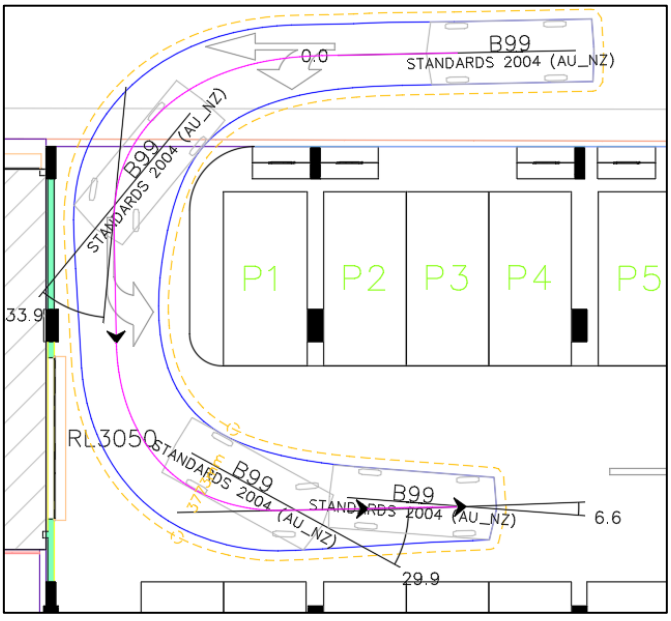


Figure 10 Retail car park access – B99 Movement IN

3.4.2 Exit vehicle access

The retail car park is southern end of the site, allowing access for up to a B99 design vehicle, with the proposed access form outlined in Figure 11.

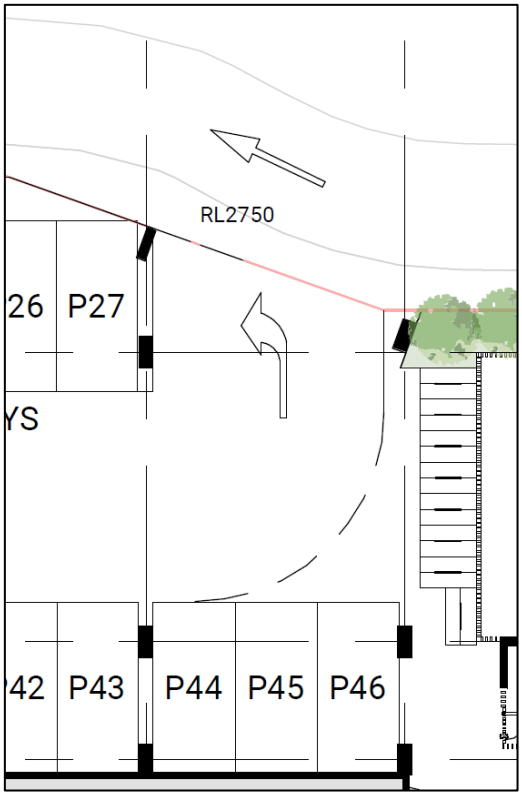


Figure 11 Retail car park vehicle access – exit

The swept path conducted using a B99 design vehicle has found that can safely and adequately enter the retail car park using the entry only vehicle access, as indicated in Figure 12. As the retail exit vehicle access is safe and convenient for customers, located as per typical for laneway type streets, and avoids creating impacts on South Sea Islander Way, the proposed entry access is found to adhere to the intent of vehicle accesses under the MCC PDA.

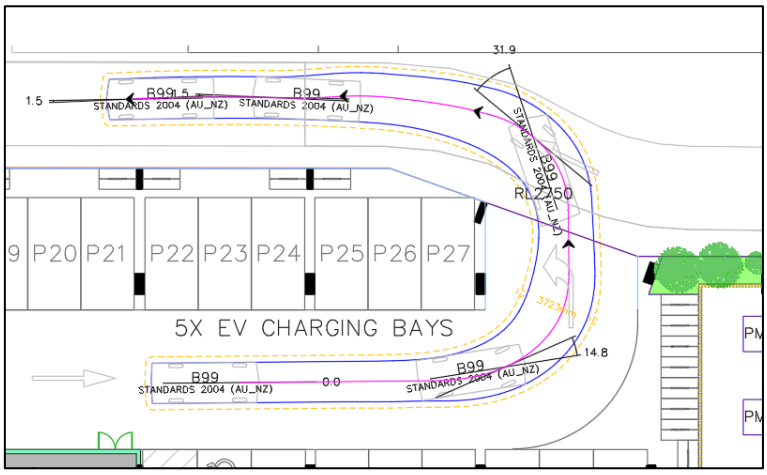


Figure 12 Retail car park access – B99 Movement OUT

3.5 Emergency vehicle access

To account for the potential closure of Gaba Lane, an emergency vehicle access is proposed to be provided at the South Sea Islander Way frontage, as indicated in Figure 13.

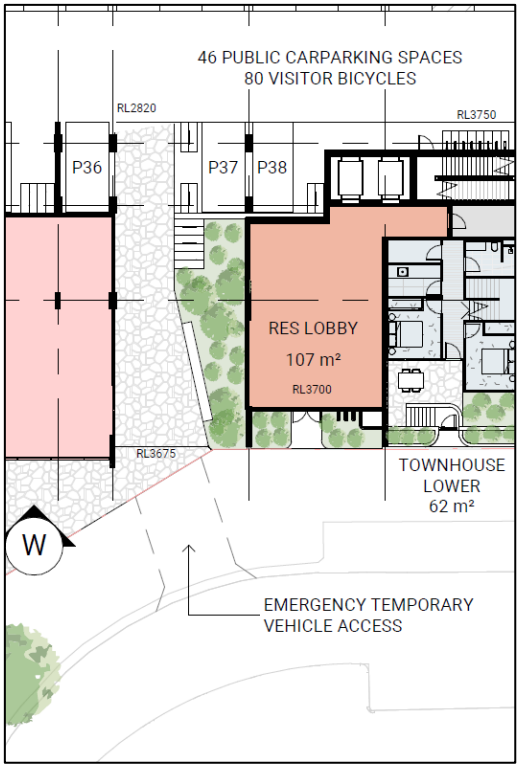


Figure 13 Emergency vehicle access on South Sea Islander Way

This emergency vehicle access and accessway to the retail car park features a minimum width of 3.5m to allow access for typical passenger vehicles such as a B85 and B99, as well as typical QAS vehicles that may be required to attend on site. The satisfactory movements of the ambulance into the site are illustrated in Figure 14 and Figure 15. It is understood that this vehicle access would only be used for temporary purposes under the guidance of a traffic management scheme and traffic controllers. As a result, the one-way nature of the accessway is found to be appropriate noting the active management schemes in place.

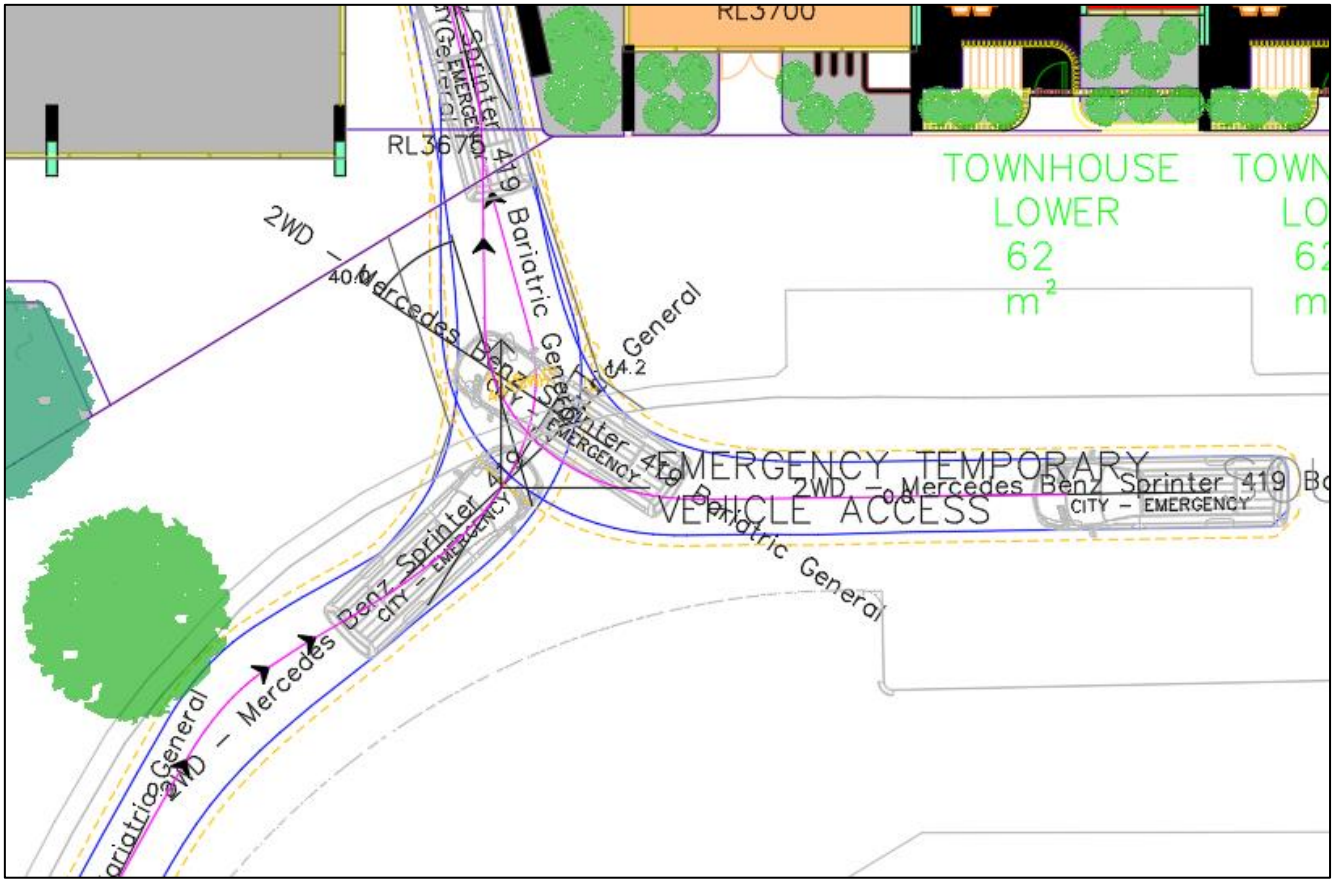


Figure 14 *Emergency Vehicle Access – Ambulance IN*

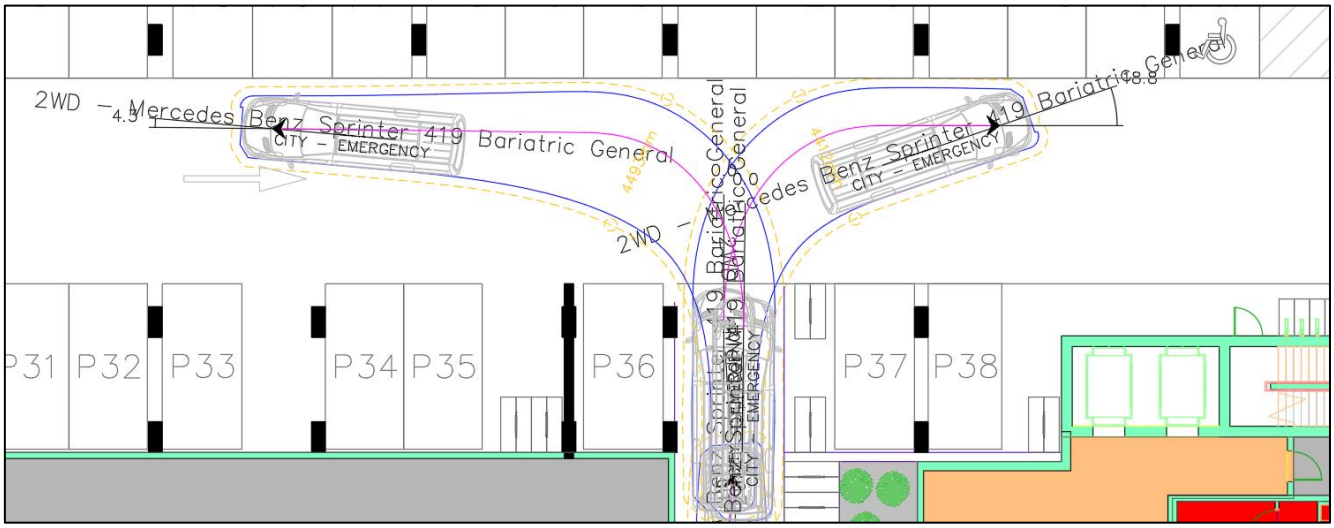


Figure 15 *Emergency Vehicle Access – Ambulance into car park*

3.6 Use of Gaba Lane for vehicle access

3.6.1 MCC PDA Requirements

The use of Gaba Lane for direct vehicle access to the proposed site has been assessed against the requirements set out in section 2.6.5.5 – Vehicle access of the MCC PDA. A review of the requirements set out in this section has indicated that:

– The assessment of the proposed vehicle accesses along Gaba Lane indicates that they can safely manoeuvre into the proposed vehicle access and egress points along Gaba Lane, adhere with the first

requirement of "*vehicle access arrangements are safe and convenient for residents, workers, visitors and services providers"*.

– The vehicle access arrangements are not located on any primary and priority frontages and adhere to the road hierarchy typology, observing the second requirement of locating *"vehicle access points with consideration for street typologies as identified on Map 8 – Road hierarchy plan and Primary and Priority frontages as identified on Map 5 – Frontages and interfaces map"*.
– The provision of vehicle accesses along Gaba Lane also aims to reduce impacts on the surrounding road network (and adjacent through traffic) and promote amenity on the main pedestrian accessed areas on the frontage of South Sea Islander Way. As a result, the proposed vehicle accesses fulfill the third requirement of having the vehicle access *"connects to and takes into consideration impacts to existing networks, ensuring acceptable levels of amenity and minimising negative impacts on through traffic"*.

As the proposed vehicle accesses adhere to the criteria set out in the MCC PDA, the use of Gaba Lane for vehicle access is viewed as acceptable.

Furthermore:

– The Gaba Lane vehicle entry points are located approximately 95m away from Future Way, resulting in a very low chance of impacts to the through movements along Future Way.
– The residential vehicle egress point achieves a sight distance of at least 35m, adhering to the minimum sight distances for a 40km/h speed frontage road.
– The non-residential vehicle egress points achieve sight distances of at approximately 22m, noting that as per Council's Planning Scheme Policy (as referred to in the MCC PDA), the design speed of a lane way is 20km/h. Due to this low speed, combined with the slow speed left turn vehicles will need to make to enter Gaba Lane, all vehicle exit accesses proposed by the development should achieve a long enough distance to react to any oncoming vehicles, pedestrians, and cyclists along Gaba Lane.
– The relocation of vehicle accesses from South Sea Islander Way to Gaba Lane will allow for better activation of the frontage for pedestrians, promoting the safety, amenity and use by pedestrians.
– There is also precedent of laneways providing direct vehicle access to a development within the precinct, such as:
    - Foundation Place at 8 Market Lane, which has access to their carpark along both Lightning Lane and Market Lane
    - The Holiday Inn at 42 First Avenue, which has access to their carpark along Lightning Lane
    - It is also understood that a 294-space public car park will be constructed along Lightning Lane as well.

3.6.2 Potential pavement impact

While it is noted that the residential and non-residential car park accesses of the proposed site utilise Gaba Lane resulting in increased overall use, the pavement impacts in terms of the pavement's design life are more directly related to heavy vehicle movements.

As Gaba Lane is intended to service the adjacent lots to the road link for loading, unloading, and refuse collection (i.e., large number of heavy vehicles), the current proposal is not expected to affect the design life of the pavement beyond what was originally expected.

3.6.3 Traffic Management Plans

As part of the use of Gaba Lane, it is understood that on rare occasions, Council and utility companies may be required to close portions of Gaba Lane to the public to conduct servicing activities. While it is understood that the parties conducting these activities (that would close the road down) will devise the traffic management plan, a review of the likely flow management schemes to be implemented was reviewed to understand the potential impacts to the development. These found that generally all scenarios should be able to be managed satisfactorily with accesses typically maintained. The following sections outline the specific movements likely required for each closure scenario.

3.6.3.1 Gaba Lane entry closed

For the situation in which the Gaba Lane entry is blocked off, the emergency vehicle access can be utilised as a temporary vehicle access, as pictured in Figure 16. Vehicles can then exit as usual using the Gaba Lane exit to the north of the site. If service vehicles are required to enter the site, it is expected that they would utilise the Gaba Lane exit conducting a contraflow movement under active traffic management (i.e., traffic controllers).

Figure 16 Traffic Management Plan – Gaba Lane blocked

3.6.3.2 Retail vehicle exit closed

For the situation in which the Gaba Lane entry and retail vehicle exit is blocked off, the emergency vehicle access can be utilised as a temporary vehicle access, as pictured in Figure 17. Vehicles can then exit as usual using the Gaba Lane exit to the north of the site. If service vehicles are required to enter the site, it is expected that they would utilise the Gaba Lane exit conducting a contraflow movement under active traffic management (i.e., traffic controllers).

While the retail car park aisle is wide at 6.7m, the two-way movement along this aisle is not expected to cause any safety issues, noting that the traffic management plan will likely guide vehicles to open car parking spaces.

Figure 17 Traffic Management Plan – retail exit closed

3.6.3.3 Retail vehicle accesses closed

For the situation in which the Gaba Lane entry and retail vehicle exit is blocked off, the emergency vehicle access can be utilised as a temporary vehicle access, as pictured in Figure 18. If residential and service vehicles are required to enter the site, it is expected that they would utilise the Gaba Lane exit conducting a contraflow movement under active traffic management (i.e., traffic controllers).

With the retail car park aisle being a width of 6.7m, this width is noted to be compliant with the minimum widths stated in AS2890.1 for two-way movements, as a result, this aisle is not expected to cause any safety issues. The traffic management plan will also likely guide vehicles to open car parking spaces, to further reduce friction and improve safety.

Figure 18 Traffic Management Plan – retail vehicle accesses closed

3.6.3.4 All Gaba Lane vehicle accesses closed

For the situation in which all vehicle accesses on Gaba Lane are blocked off, the emergency vehicle access can be utilised as a temporary vehicle access, as pictured in Figure 19.

With the retail car park aisle being a width of 6.7m, this width is noted to be compliant with the minimum widths stated in AS2890.1 for two-way movements, as a result, this aisle is not expected to cause any safety issues. The traffic management plan will also likely guide vehicles to open car parking spaces, to further reduce friction and improve safety. When vehicles are queued to exit, it is expected that the traffic controllers will manage the emergency vehicle accessway to allow for safe one-way movement.

It is unlikely that regular residential and service vehicle access can be maintained in this situation and would require advanced notification to all residents and servicing contractors on the expected interruptions. However this situation would be no different to any other residential driveway on any other road, and is not viewed as an atypical situation. This can be further mitigated through temporary opening of the residential and service vehicle access in peak periods (and closures on non-peak).

Figure 19 Traffic Management Plan – all vehicle accesses closed

3.6.4 Recommended modifications

The current formation of the Gaba Lane / Future Way intersection shown in Figure 20, is found to appear as a driveway intersection, with green pavement surface treatment for the cycle track and no zebra crossing line marking. As a result, the existing form of the intersection is understood to be confusing in communicating active travel user priority which may be exasperated with the introduction of the development traffic.

Figure 20 Gaba Lane / Future Way intersection

It is also noted for this intersection that cyclists traveling eastbound are also likely to be at higher risk for conflicts to left turning vehicles, specifically in the situation where the westbound cyclists and the westbound movements from Future Way (western leg) at the intersection of South Sea Islander Way / Future Way both share a green

light, this is due to reduced visibility between vehicles and cyclists as they travel side by side. This specific situation is illustrated in Figure 21.

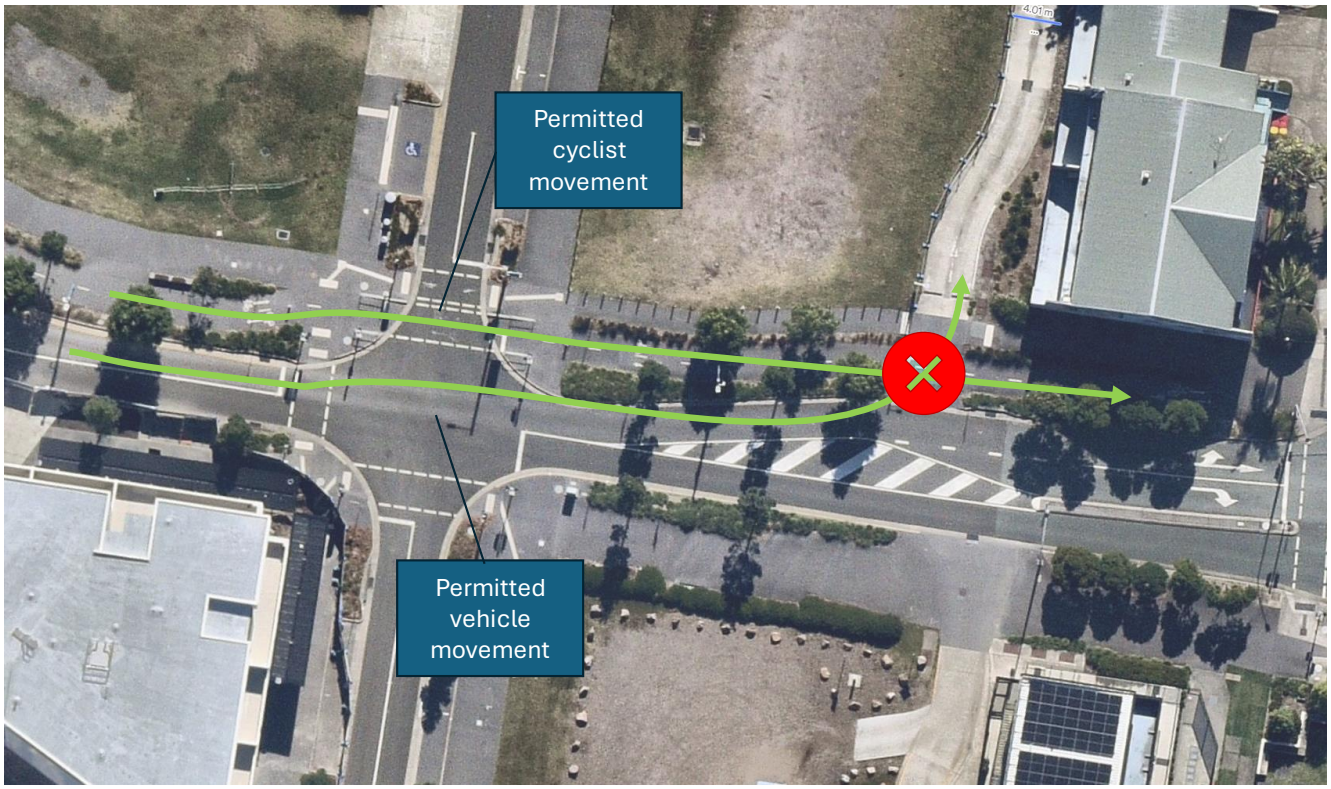


Figure 21 Concurrent vehicle and cyclist movement

The impact of this situation is reduced as no development traffic is expected to utilise the western leg approach of Future Way to enter the site, due to the current right turn ban at First Avenue / Future Way intersection. As a result, any northbound traffic is likely to utilise the South Sea Islander Way southern leg to turn right into Future Way and then turn left into Gaba Lane. In this situation, the right turn phase into Future Way will occur while the

cyclists would be on a red light, reducing the potential conflict frequency for this eastbound cyclist movement, as illustrated in Figure 22.

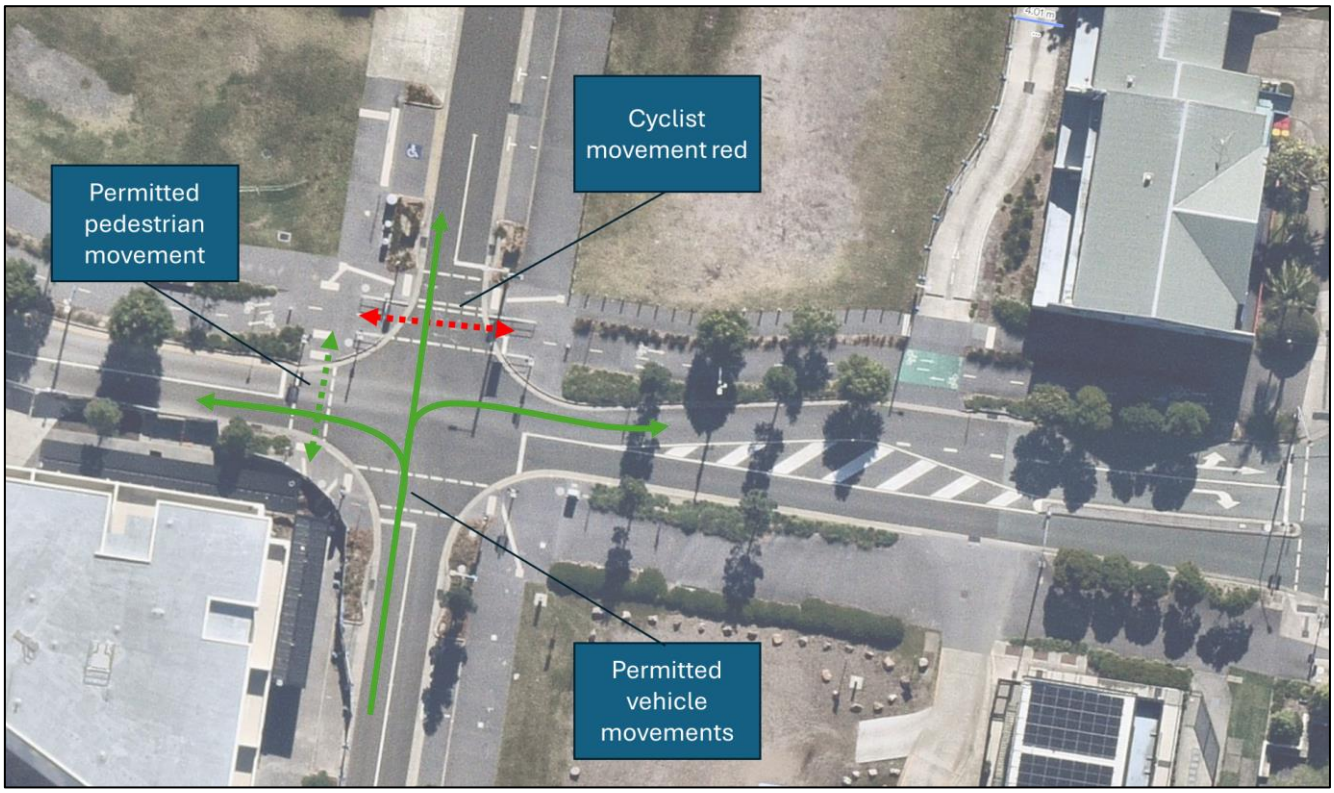


Figure 22 Cyclist red light controlled movement

Finally, no right turns into Gaba Lane from Future Way are expected, resulting in further reduction in conflict points at the intersection.

Based on the above findings, it is recommended that the intersection be modified to the 'Retrofit Concrete Priority Crossing At Side Roads – Figure B2.02' from TMR's 'Selection and design of cycle tracks' guideline, shown in Figure 23 and Figure 24. While the below details are for a two-way road, the retrofitting is deemed to still to be applicable, with the egress line marking and signage not required. The modification to this intersection form will

reduce vehicle speeds resulting in lower severity incidents and promote communication of active travel user priority.

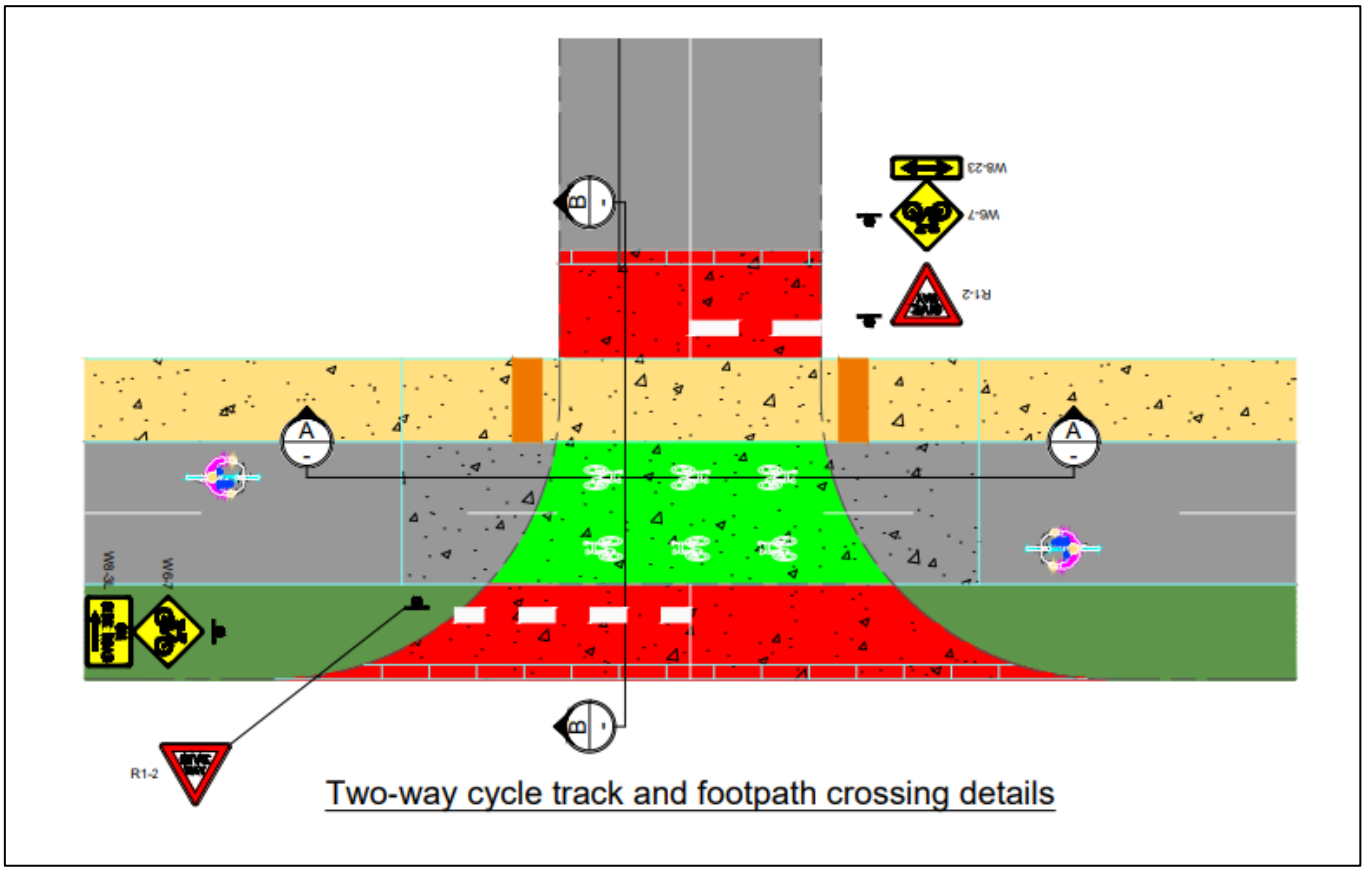


Figure 23 Two-way cycle track and footpath crossing details

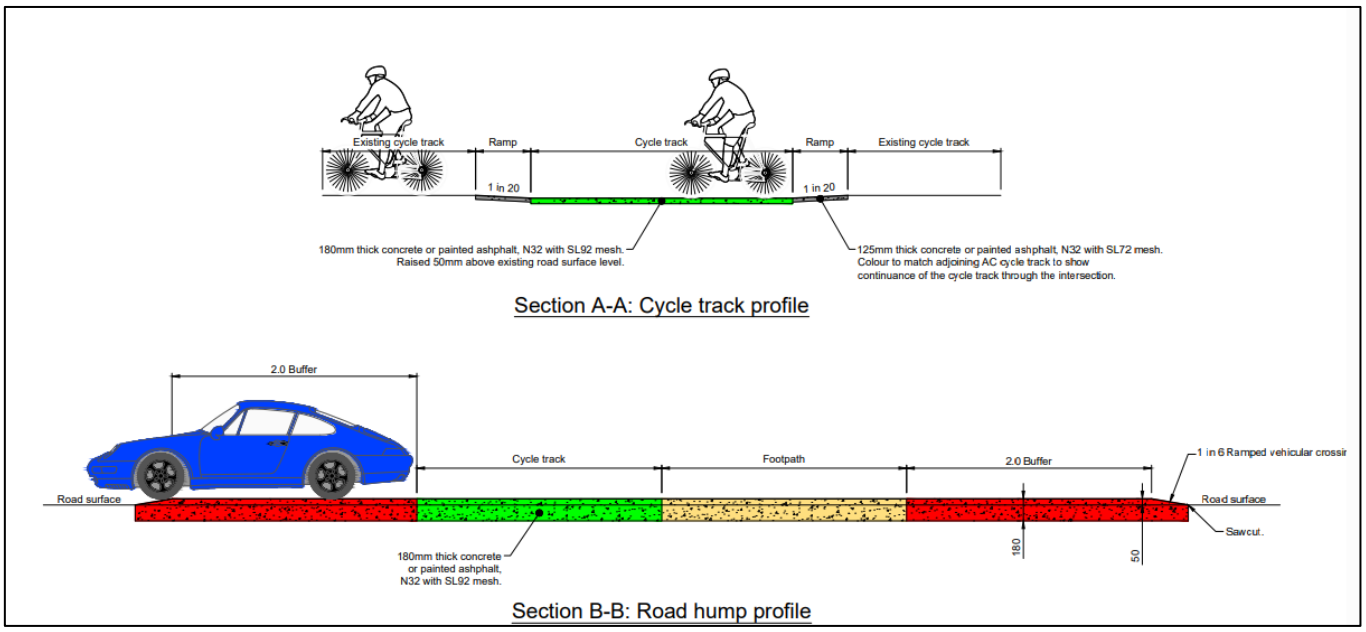


Figure 24 Two-way cycle track profiles

This modification will involve the following changes to the intersection:

– Provide red surface treatment at the start and end of the platform with accompanying give way line marking. This will communicate to drivers of the potential conflict with cyclists and pedestrians.

– Provide both the give-way signage and advanced warning signage at the entry of the intersection as per the crossing details. This will further communicate the need for drivers to give way, as well as provide advanced warning of the potential conflict.
– Modify the concrete platform to ensure that a 1 in 6 ramp is provided to slow vehicles down further when entering the intersection.

To further improve intersection sight lines, it is also recommended that the tree identified in Figure 25 be removed/relocated from the intersection as it currently blocks sight lines of approaching cyclists from the west.

Figure 25 Tree blocking sight lines

4. Pedestrian and cyclist provision

4.1 Pedestrian accessibility

The proposed development integrates with the existing pedestrian network with multiple access points along South Sea Islander Way, as illustrated in Figure 26.

Figure 26 Pedestrian accessibility

These access points allow safe and direct links throughout the development, while allowing convenient pedestrian links to the north of the CBD, as well as the south of the CBD, maximising permeability and connectivity to precinct 3. As a result, the pedestrian provisions of the development are understood to adhere to the requirements set out in the MCC PDA.

4.2 Cyclist accessibility

As per the MCC PDA, the CBD area has been developed to promote the use of cycling, with the provision of separated two-way cycle tracks throughout the area. To help promote the use of cycling, the proposed development connects to the cycle-track on the southern end of the site (i.e., cycle track on Future Way) to provide safe and efficient movements from the surrounding cycling network to the site.

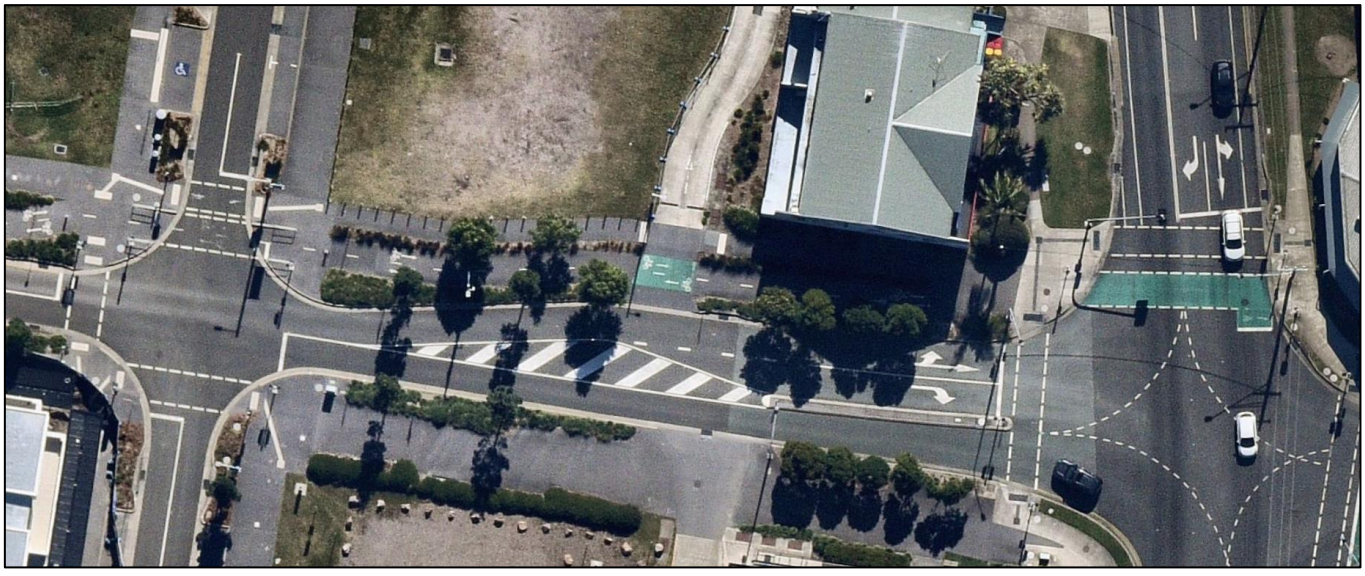


Figure 27 Future Way cycle track

4.3 Bicycle parking

Based on the proposed development's yield, and the application of the Council's planning scheme, 251 bicycle spaces are required for residents, 63 spaces are required for the residential visitors. For the retail component of

the development, 21 spaces are required for the employee and retail visitors respectively, according to Council's planning scheme.

Details of the bicycle parking calculations are provided further in Table 9.

Table 9 Council bicycle parking requirement

Unit type	On-site car parking rate	Unit yield	Bicycle parking rate	Bicycle parking required
Residential	Residential	251 dwellings	1 resident space per dwelling	251
Residential	Visitors	251 dwellings	1 visitor space per 4 dwellings	63
Shop	Employee	2,130 m^2 GFA	1 employee space per 100m^2 GFA	22
Penthouse	Visitors	2,130 m^2 GFA	1 customer space per 100m^2 GFA	22

The nominated provision of 252 residential bicycle parking spaces complies with the planning scheme, however the proposed provision of 80 visitor spaces on the ground floor is a departure from the planning scheme. As a result, a performance solution for the employee and visitor/customer bicycle parking spaces is proposed.

Performance solution – visitor bicycle parking quantum

Reference has been made to Austroad's *Guide to Traffic Management Part 11: Parking Management Techniques*, which presents guidelines for determining the demand for and supply of parking. The bicycle parking rates outlined in this document are detailed in Table 10.

Table 10 Austroads bicycle parking requirement

Unit type	On-site car parking rate	Unit yield	Bicycle parking rate	Bicycle parking required
Residential	Visitors	251 dwellings	1 visitor space per 12 flats	21
Shop	Employee	2,130 m^2 GFA	1 employee space per 300m^2 GFA	8
Penthouse	Visitors	2,130 m^2 GFA	1 shopper space per 300m^2 GFA	8

Based on the Austroad's bicycle parking rates, the following bicycle parking is required:

– 21 residential visitor bicycle spaces
– 8 employee bicycle spaces
– 8 shopper bicycle spaces.

The development provides well above this requirement, with visitor bicycle spaces proposed in locations that ensure maximum public visibility, enabling retail employees to utilise the visitor bicycle spaces.

5. Servicing requirements and provision review

5.1 Proposed servicing arrangements

A dedicated waste/commercial loading bay, along with a dedicated residential bay is currently proposed, with access provided from Gaba Lane. Waste collection is expected to be conducted through the use of an MRV size vehicle, typical for collection within the precinct. The residential service bay will also provide for vehicles up to a MRV size.

The form of the servicing bays is indicated in Figure 28.

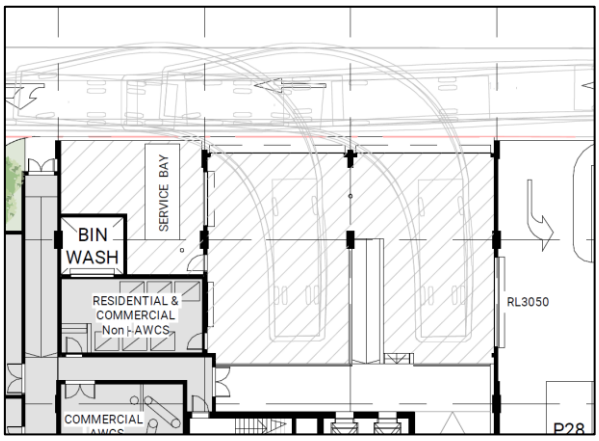


Figure 28 Proposed servicing bays

5.2 Statutory requirements

Council's Planning Scheme states that:

– For a multiple dwelling, a service space is provided for an MRV + VAN + waste collection vehicle (WCV).
– For a shop, with a total cumulative GFA of 2,130 m^2, 2 bays for a VAN, SRV, and MRV respectively are provided, with 1 bay for an WCV provided.

5.3 Proposed servicing bay area design

The proposed service bay area intents to provide the following quantum of service bays:

– 1 x MRV bay (11.5m x 4.5m) [western bay]
– 1 x MRV bay (11.5m x 4.5m) [eastern bay]
– VAN type vehicles are to utilise the service bay west of the MRV bays

Both MRV bays are proposed to be accessed through a reverse in and forward out arrangement. The vehicle movement checks are provided in Figure 29 and Figure 30, which showcase the movements are undertaken with adequate clearances to adjacent structures.

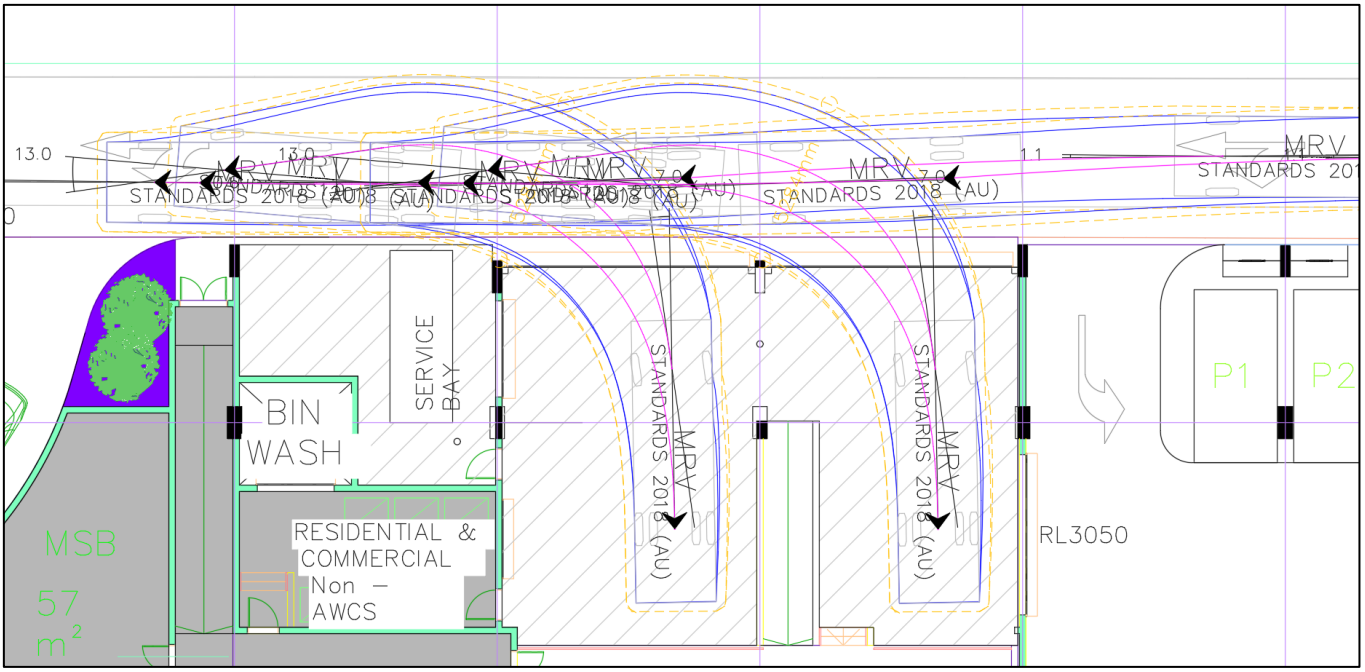


Figure 29 *MRV Movement – One continuous movement (reverse in, forward out)*

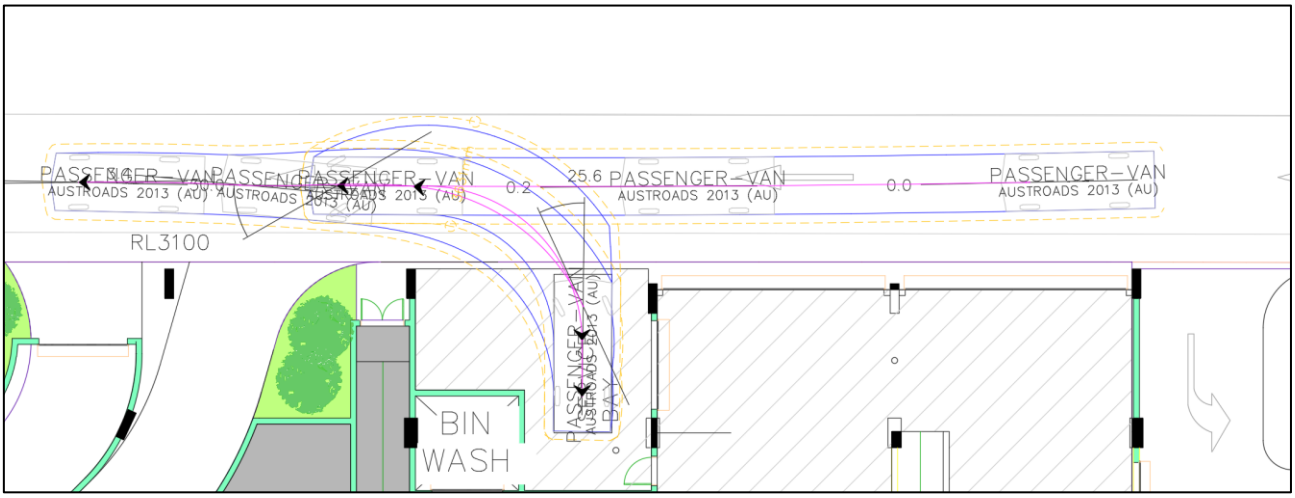


Figure 30 *VAN Movement - One continuous movement (reverse in, forward out)*

The proposed servicing bay area is considered adequate for the proposed development on the following basis:

– The retail servicing is expected to utilise smaller size vehicles due to the smaller individual footprints of each tenancy, as a result, servicing is expected to be predominantly through the use of VANS, which would utilise the western service bay or public car park bays.
  - There is also an understanding that the retail tenancies would understand the servicing arrangements of the site, and only agree to move in if these bay numbers and sizes were adequate.
– The provided bays are in excess of the required service bay dimensions outlined in the Australian Standards, further promoting safety in and around the servicing area.
– The reversing movement for the MRV is expected to be adequate due to the function of the service laneway, limited traffic volumes along the laneway during typical servicing times, and adequate sight lines throughout.
– Due to the CBD environment of the development, a loading management plan to avoid double up of large service vehicles is expected to be implemented.
– The servicing arrangements avoids placing truck parking areas on the main thoroughfare of South Sea Islander Way, thereby not reducing the visual and noise amenity of the street frontage, and also not creating any additional friction on the road network.

6. Development traffic

6.1 Trip generation

6.1.1 Residential use trip generation

The expected traffic generation of the development has been based on a combination of the *Guide to Traffic Generating Developments Updated traffic surveys (RMS, 2013)* and the *Guide to Traffic Generating Developments (RTA, 2002)*.

For the residential component of the site, the traffic generation based on various rates is indicated in Table 11 below. These have been based on a high-density, residential flat dwelling as the site is located close to public transport, greater than six storeys, and almost exclusively residential in nature.

Table 11 Residential trip generation rates

Rate	Yield	AM peak hour rate	PM peak hour rate
Per unit	251	0.19	0.15
Per car space	336	0.15	0.12
Per bedroom	532	0.09	0.07

The resulting potential residential trip generation yields based on each rate are indicated in Table 12.The highest trip generation was found to occur when using a rate based on car space. As a result, this rate has been utilised for the purposes of the traffic impact assessment.

Table 12 Residential trip generation yield

Rate	Yield	AM peak hour trip generation	PM peak hour rate trip generation
Per unit	251	48	38
Per car space	336	**50**	**40**
Per bedroom	532	48	37

The resulting residential trip generation is expected to be 50 vehicles in the AM peak hour, and 40 vehicles in the PM peak hour.

6.1.2 Non-residential use trip generation

To determine the appropriate non-residential use trip generation, a rate based on car park spaces has been devised from the rates provided in the *Guide to Traffic Generating Developments (RTA, 2002)*. This has been calculated based on the peak trip generation rate from RTA, against the peak car parking rate also from the RTA, resulting in a trip generation of 2.1 vehicles per car park space. The working of this rate is indicated in Table 13 below.

Table 13 Non-residential trip generation

	Office / commercial	Supermarket vehicle	Retail / Food & Beverage vehicle rate	Total
GFLA	489	458	651	1598m^2
Peak trip generation rate (vehicles per 1000m2)	22	155	46	
Trip generation	11	71	30	112 veh / hour

	Office / commercial	Supermarket vehicle	Retail / Food & Beverage vehicle rate	Total
Peak car parking demand rate (spaces (per 1000m2)	9	42	45	
Car parking demand	4	19	29	53 car parking spaces
Trips per car park space	2.4	3.7	1.0	2.1 veh / hour / car park space

Based on the provision of 46 car parking spaces, a non-residential trip rate of 97 vehicles in the peak hour has been assumed.

The strategic modelling for the precinct also indicated specific vehicle trip generation rates per use. These rates, illustrated in Table 14 below were found to be much lower than the RTA rates. For the purposes of a conservative estimate, the higher RTA rates were used noting that trip generation may in fact be lower than what is estimated.

Table 14 Strategic modelling trip generation rates

Land Use	Unit	AM Peak Hour	PM Peak Hour
Residential	dwelling	0.45	0.43
Commercial	100sqm	1.88	1.86
Retail	100sqm	3.36	4.41

6.1.3 Trip distribution

The distribution of the traffic generated by the site onto the external road network has been based on acknowledgement of the proposed access locations and geometric limitations caused by the future light rail.

The following turn distributions have been assumed for the 'IN' movements into the site, 25% for both First Avenue, and South Sea Islander Way (north), with 50% for South Sea Islander Way (south). This is visualised in Figure 31 below. No movements have been assumed to originate from Future Way due to the right turn ban along First Avenue limiting the accessibility of this movement.

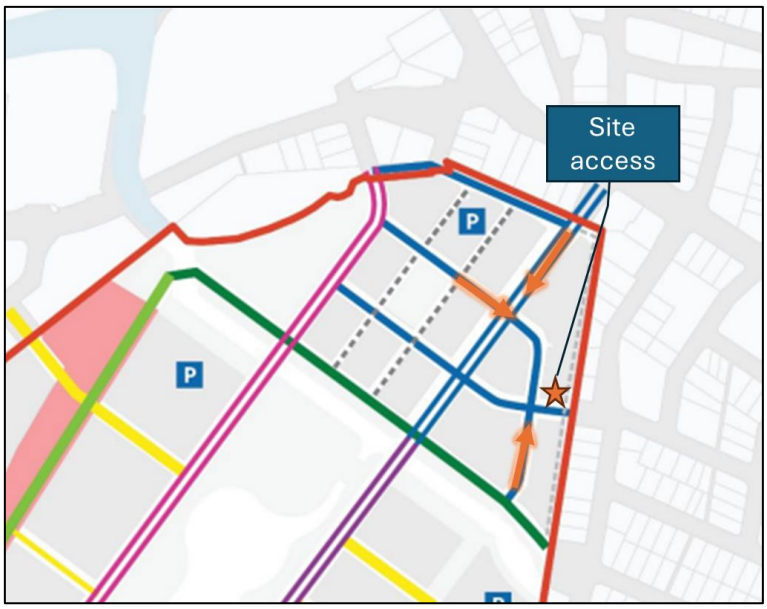


Figure 31 Turn distributions – IN movements

For the 'OUT' movements, it has been assumed that 50% of traffic will utilise First Avenue, with 25% exiting using South Sea Islander Way, and the other 25% using Future Way. The exit/out routes are indicated in Figure 32.

Figure 32 Turn distributions – OUT movements

In addition, the following peak hour period in / out splits have been adopted:

– AM Peak Hour:
  - Residential: 20% IN / 80% OUT
  - Non-residential: 50% IN / 50% OUT
– PM Peak Hour:
  - Residential: 80% IN / 20% OUT
  - Non-residential: 50% IN / 50% OUT

Based on the above, Figure 33 and Figure 34 illustrate the expected turning movements at the intersections nearby the site development. 'IN' movements are highlighted orange, 'OUT' movements are highlighted purple, and movements that contain both 'IN' and 'OUT' movements are highlighted green.

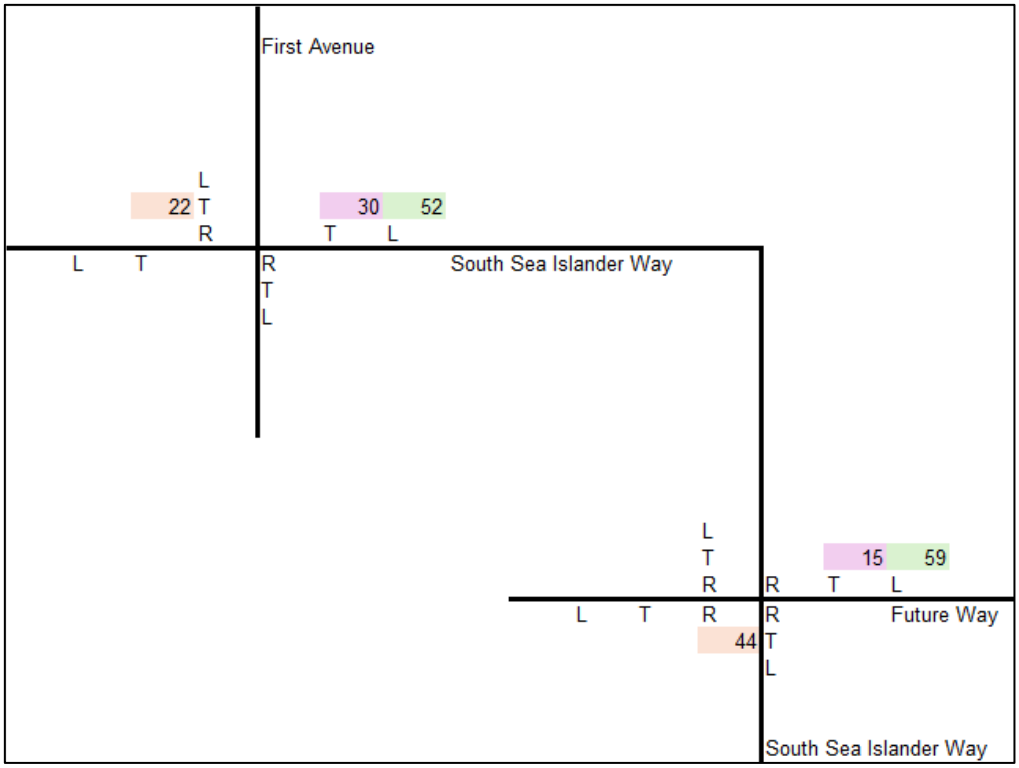


Figure 33 Development traffic – AM Peak

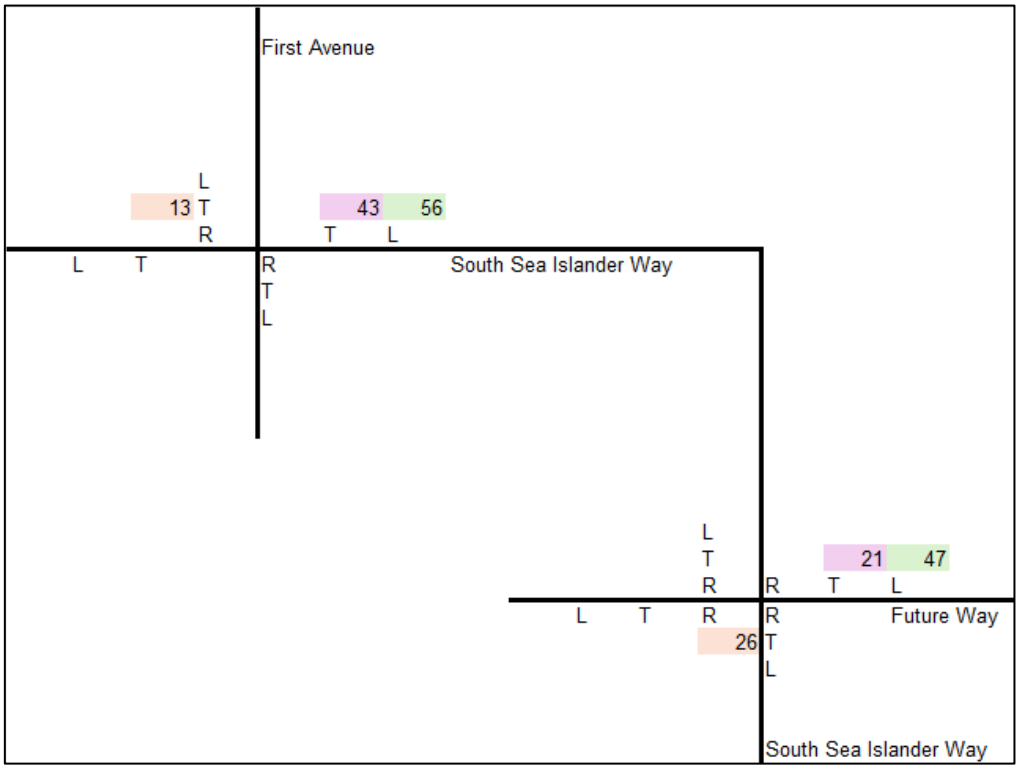


Figure 34 Development traffic – PM Peak

7. Traffic Impact Assessment

7.1 Assessment scenarios

Prior planning of the precinct has assumed that vehicle accesses are to be provided along South Sea Islander Way, as indicated in Figure 35. With the proposed relocation of the vehicle access to Gaba Lane only, a traffic impact assessment on this relocation was undertaken to identify if any material impacts would occur as a result of this rearrangement.

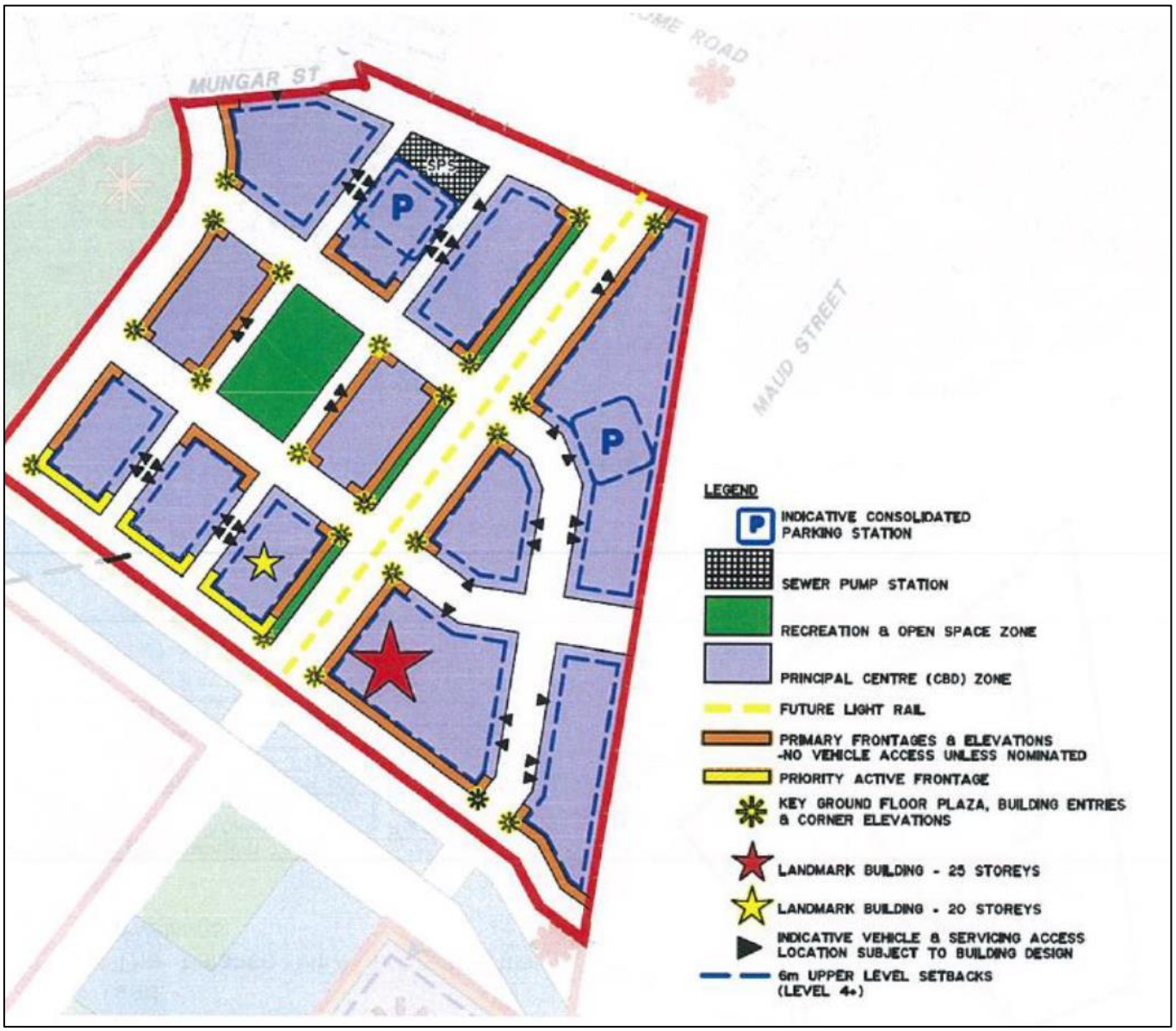


Figure 35 Previous precinct built form interfaces plan

For the purposes of the traffic impact assessment, the development has been analysed under the design year of 2041 for the nearby intersections of First Avenue / South Sea Islander Way, and Future Way / South Sea Islander Way. The 2041 base case volumes at these intersections are based on strategic modelling outputs for the precinct and account for the proposed light rail along First Avenue, and the turning movement restrictions along the road as a result. Further detail on the workings of these volumes and models can be found in the *Maroochydore City Centre Priority Development Area Development Scheme Traffic Report (GHD,2022)*.

It should be noted that the base case volumes within the strategic modelling would have contained an approximate traffic volume likely to be generated by this development. However, for a conservative approach, the calculated development traffic has been added on top of these future 2041 volumes.

Accordingly, the following assessment scenarios have been considered:

– 2041 base case
– 2041 with development

7.2 Operational Impacts

7.2.1 First Avenue / South Sea Islander Way

The operation of the First Avenue / South Sea Islander Way intersection has been assessed using SIDRA. The modelled intersection form is indicated in Figure 36.

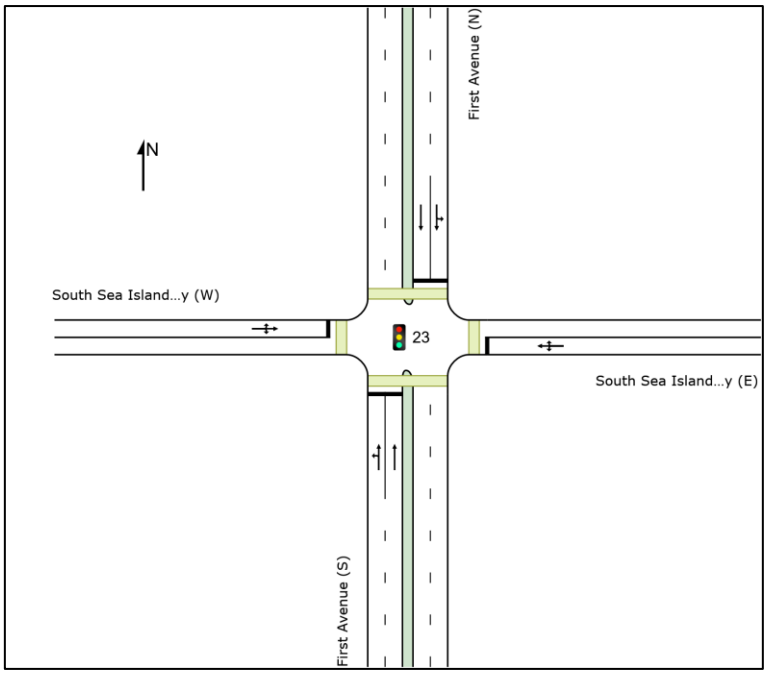


Figure 36 Modelled First Avenue / South Sea Islander Way intersection form

The phasing arrangement of the signalised intersection is indicated in Figure 37, and includes a 6 second late start for any left turn movements that will conflict with a pedestrian movement. SIDRA has also been allowed to determine the cycle time for each scenario.

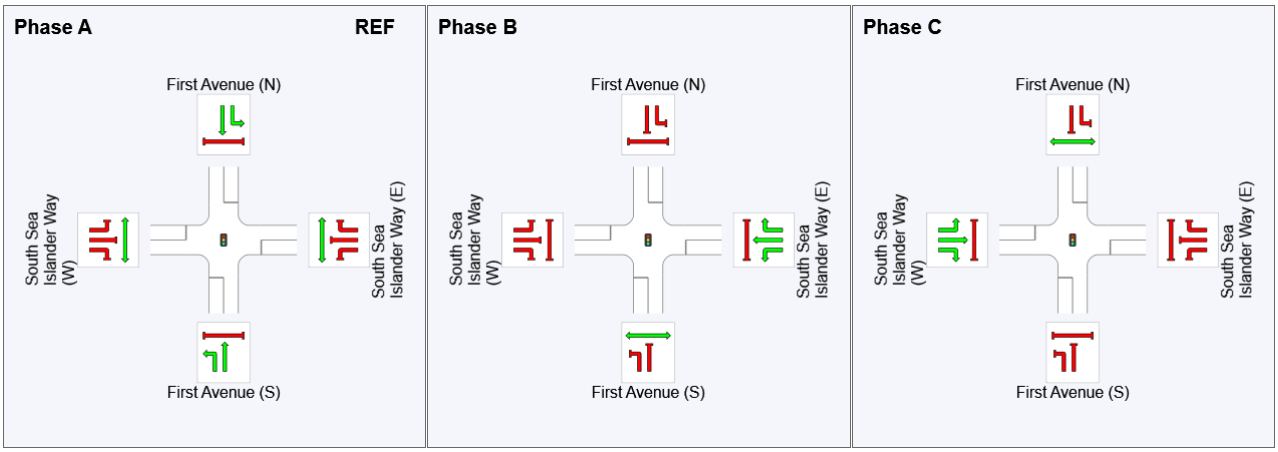


Figure 37 First Avenue / South Sea Islander Way Signal Plan

The results of the traffic impact assessment for the 2041 design year are detailed in Appendix A and summarised in Table 15 and Table 16.

Table 15 First Avenue / South Sea Islander Way – AM Peak movement summary

Approach	Base Case				With Development			
	DOS	Average Delay (sec)	LOS	Average queue (m)	DOS	Average Delay (sec)	LOS	Average queue (m)
First Avenue (South)	0.20	26	B	16	0.18	27	B	17
South Sea Islander Way (East)	0.75	31	C	94	0.80	36	C	122
First Avenue (North)	0.80	35	C	53	0.81	38	C	68
South Sea Islander Way (West)	0.79	35	C	95	0.82	40	C	117
Intersection	0.80	33	C	95	0.82	37	C	122

Table 16 First Avenue / South Sea Islander Way – PM Peak movement summary

Approach	Base Case				With Development			
	DOS	Average Delay (sec)	LOS	Average queue (m)	DOS	Average Delay (sec)	LOS	Average queue (m)
First Avenue (South)	0.56	44	D	54	0.48	45	D	57
South Sea Islander Way (East)	0.82	38	C	193	0.86	45	D	223
First Avenue (North)	0.77	52	D	80	0.84	58	E	112
South Sea Islander Way (West)	0.83	46	D	166	0.86	51	D	192
Intersection	0.83	44	D	193	0.86	49	D	223

7.2.2 Future Way / South Sea Islander Way

The operation of the Future Way / South Sea Islander Way intersection has been assessed using SIDRA. The modelled intersection form is indicated in Figure 38.

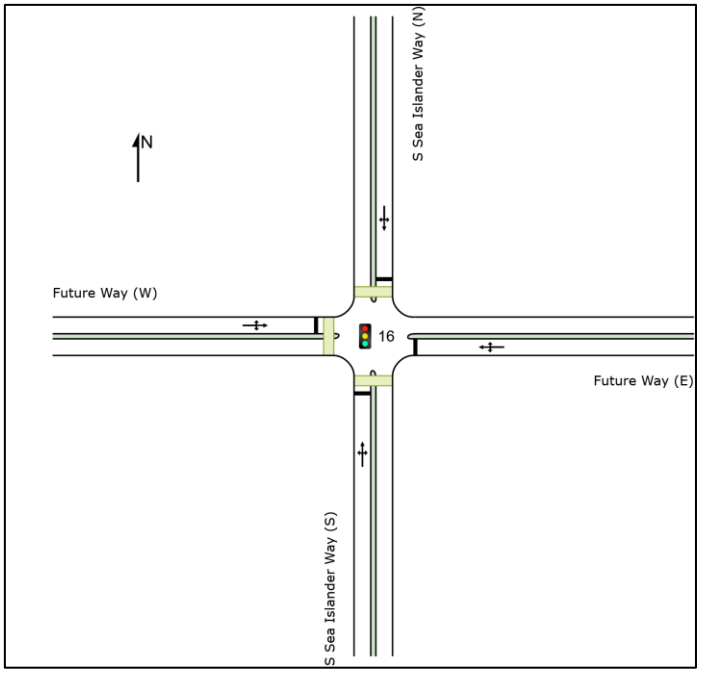


Figure 38 Modelled Future Way / South Sea Islander Way intersection form

The phasing arrangement of the signalised intersection is indicated in Figure 39, and includes a 6 second late start for any left turn movements that will conflict with a pedestrian movement. SIDRA has also been allowed to determine the cycle time for each scenario.

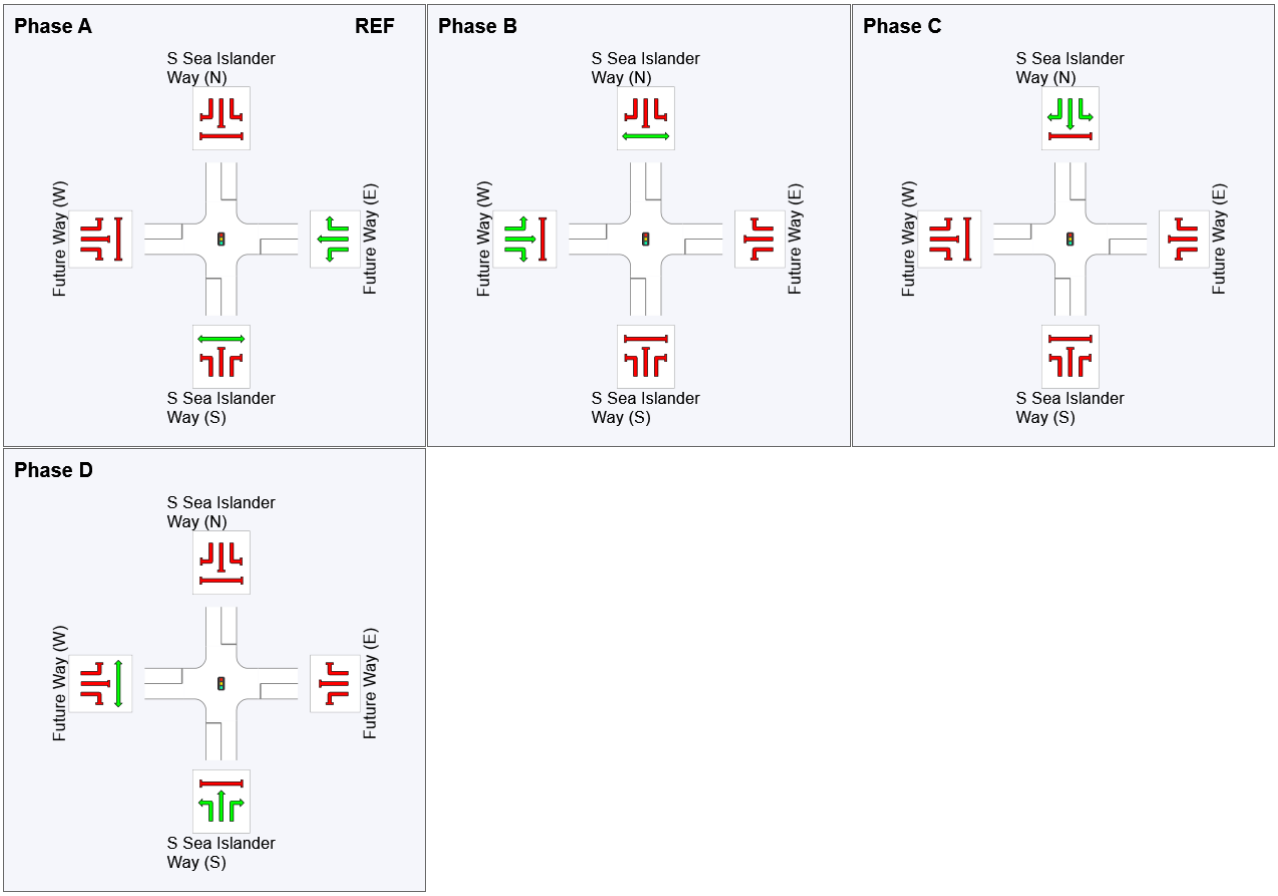


Figure 39 Future Way / South Sea Islander Way Signal Plan

Table 17 Future Way / South Sea Islander Way – AM Peak movement summary

Approach	Base Case				With Development			
	DOS	Average Delay (sec)	LOS	Average queue (m)	DOS	Average Delay (sec)	LOS	Average queue (m)
South Sea Islander Way (South)	0.16	33	C	9	0.34	35	C	20
Future Way (East)	0.53	27	B	58	0.67	32	C	65
South Sea Islander Way (North)	0.59	40	C	24	0.65	37	C	43
Future Way (West)	0.19	33	C	10	0.19	33	C	10
Intersection	0.59	31	C	58	0.67	34	C	65

Table 18 Future Way / South Sea Islander Way – PM Peak movement summary

Approach	Base Case				With Development			
	DOS	Average Delay (sec)	LOS	Average queue (m)	DOS	Average Delay (sec)	LOS	Average queue (m)
South Sea Islander Way (South)	0.27	34	C	16	0.44	41	C	26
Future Way (East)	0.65	30	C	70	0.61	31	C	76
South Sea Islander Way (North)	0.66	42	C	32	0.65	41	C	54
Future Way (West)	0.28	32	C	15	0.38	38	C	18
Intersection	0.66	33	C	70	0.65	36	C	76

7.3 Traffic Impact Summary

With an expected total traffic generation of 147 vehicles and 137 in the AM and PM peak respectively, no material impact on the adjacent road network and intersections is expected. The SIDRA intersection modelling detailed in section 7.2 found that the introduction of the development traffic resulting in minimal increases in DOS, delay, and queue lengths. The LOS of both signalised intersections are not expected to be decreased, being maintained at a high LOS of C or D.

Importantly, it is important to note that this traffic impact assessment has been conducted for a design year of 2041. This accounts for the precinct being fully developed, and results in the most conservative assessment scenario, noting due to the greenfield nature of the area, an assessment of the opening year (or even 10-year) is unlikely to indicate any reliable future performance of the intersections.

8. Conclusion

Based on the assessment and discussions presented in this traffic report, the following conclusions are made:

- The development proposes to provide 336 residential car parking spaces which meets the requirements of the MCC PDA.
- The development proposes 46 car parking spaces for the non-residential uses within the site, which is viewed as acceptable due to minimal traffic generation impacts as well as high typical car parking usage for this type of uses.
- The proposed parking layout is generally consistent with the dimensional requirements as set out in Council's Planning Scheme and the Australian Standards.
- The site is proposed to be accessed along Gaba Lane in the form of residential and non-residential vehicle accesses, swept path checks have found that the typical design vehicle is able to satisfactorily manoeuvre through these vehicle accesses.
- Access off Gaba Lane is viewed as satisfactory due to:
    - observing the PDA requirements for vehicle accesses
    - acceptable manoeuvrability into and out of Gaba Lane from the site
    - adequate sight distances as a result of the low-speed environment along the laneway
    - precedent set out within the precinct for direct vehicle accesses from laneways
    - no change in the design life of the pavement expected
- Several high-level Traffic Management Plans have been devised based on various scenarios showcasing that adequate access can be maintained
- It is recommended as part of the development that the intersection of Gaba Lane / Future Way be modified to a Retrofit Concrete Priority Crossing to promote active travel user safety and accessibility
- The development proposes to provide 252 residential bicycle parking spaces, which meets the requirements of the MCC PDA.
- The development proposes a visitor and employee provision of 80 spaces compared that to the required 101 spaces. As a result, a performance solution based on bicycle parking rates set out in the Austroads Guidelines is utilised, which suggest a supply of 35 spaces can adequately cater for the non-residential bicycle parking demand.
- On-site servicing by an MRV is achieved in a satisfactory manner through the loading bay areas.
- The site is expected to generate up to 147 trips in the AM peak hour and 137 trips in the PM peak hour.
- An assessment of the nearby intersections for the 2041 design year indicates that the intersections of First Avenue / South Sea Islander Way, and Future Way / South Sea Islander Way are expected to maintain acceptable levels of performance even with the introduction of the development traffic.

Appendices

Appendix A

SIDRA Movement Summaries

USER REPORT FOR SITE

Project: Lot 600 - Traffic Gen Check

Output produced by SIDRA INTERSECTION Version: 9.1.1.200 **Template: Default Site User Report**

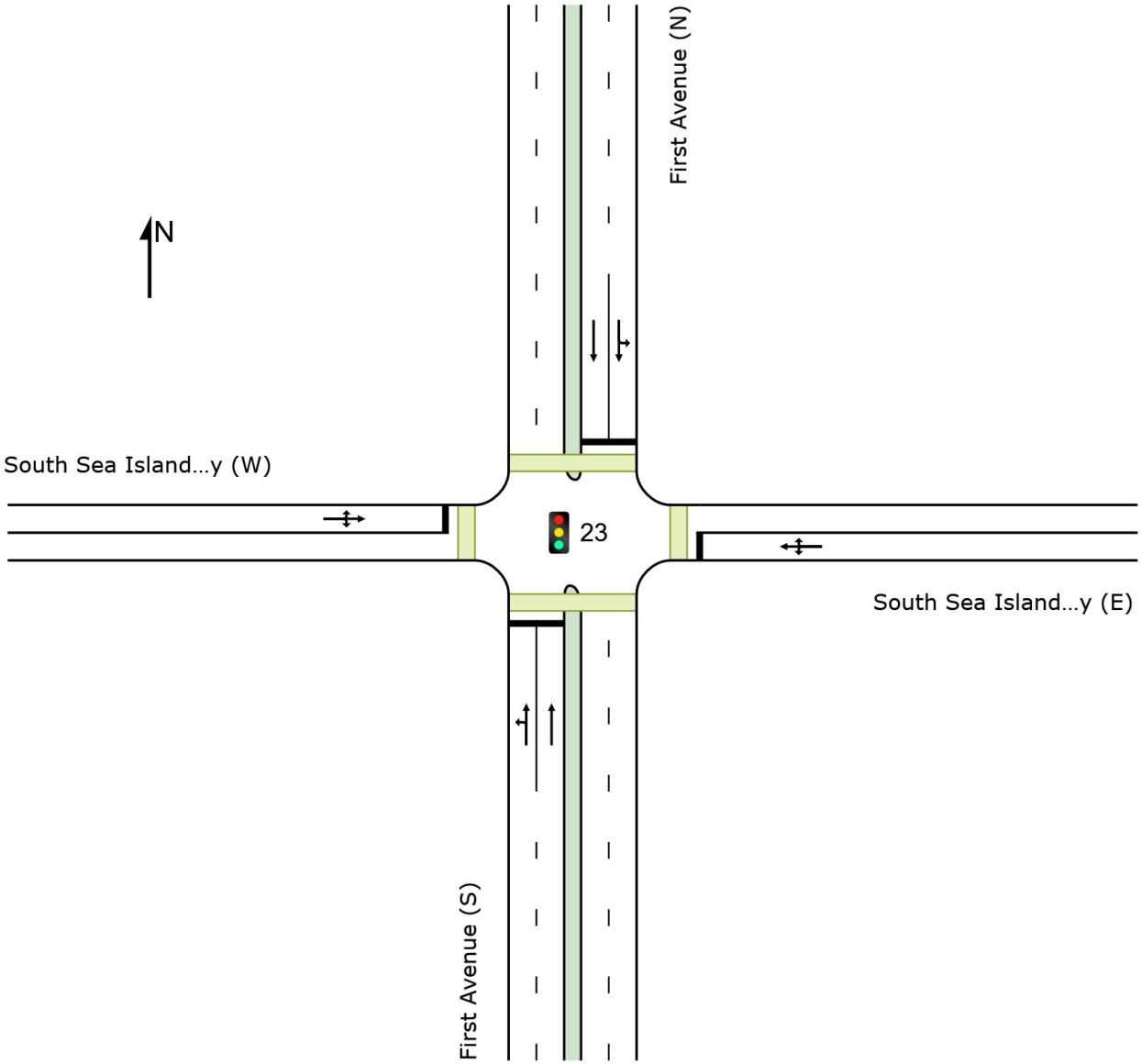
Site: 23 [First Ave / South Sea Islander Way - AM Peak - Base Case (Site Folder: Lot 600)]

First Avenue / South Sea Islander Way with LR
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 70 seconds (Site Practical Cycle Time)

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

Site Layout

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


N
First Avenue (N)
South Sea Island…y (W)
23
South Sea Island…y (E)
First Avenue (S)

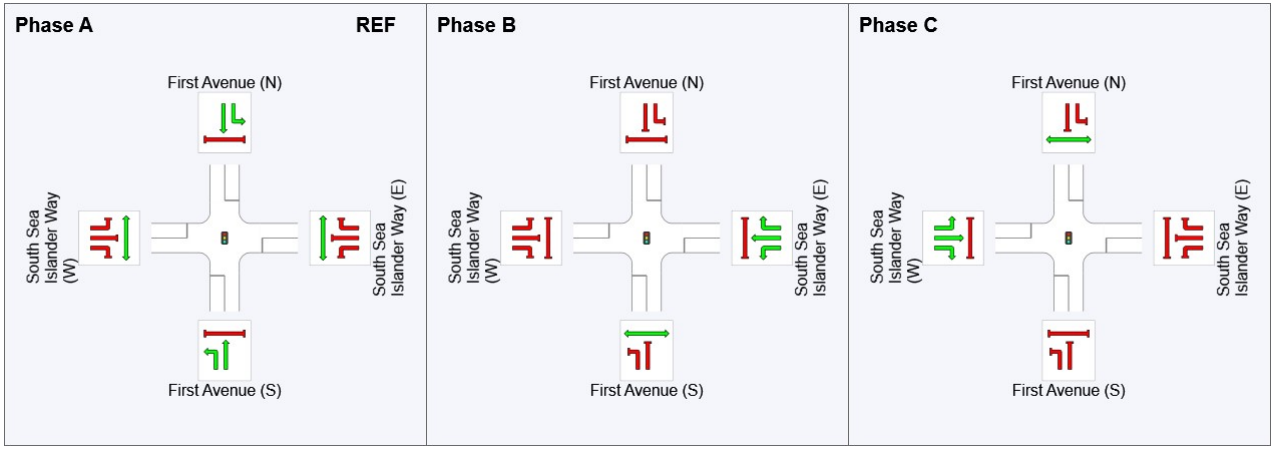
Vehicle Movement Performance

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: First Avenue (S)															
1	L2	All MCs	1	5.0	1	5.0	0.198	36.1	LOS C	2.2	15.8	0.87	0.67	0.87	19.1
2	T1	All MCs	147	5.0	147	5.0	0.198	25.8	LOS B	2.2	16.0	0.87	0.67	0.87	22.0
Approach			148	5.0	148	5.0	0.198	25.9	LOS B	2.2	16.0	0.87	0.67	0.87	22.0
East: South Sea Islander Way (E)															
4	L2	All MCs	5	5.0	5	5.0	0.746	38.9	LOS C	12.9	94.4	0.97	0.89	1.06	14.7
5	T1	All MCs	126	5.0	126	5.0	* 0.746	27.0	LOS B	12.9	94.4	0.97	0.89	1.06	20.5
6	R2	All MCs	254	5.0	254	5.0	0.746	32.6	LOS C	12.9	94.4	0.97	0.89	1.06	20.4
Approach			385	5.0	385	5.0	0.746	30.8	LOS C	12.9	94.4	0.97	0.89	1.06	20.3
North: First Avenue (N)															
7	L2	All MCs	163	5.0	163	5.0	* 0.796	43.7	LOS D	6.2	45.3	1.00	0.94	1.30	16.4
8	T1	All MCs	226	5.0	226	5.0	0.599	28.5	LOS C	7.3	53.4	0.96	0.79	0.96	20.7
Approach			389	5.0	389	5.0	0.796	34.9	LOS C	7.3	53.4	0.98	0.86	1.10	18.5
West: South Sea Islander Way (W)															
10	L2	All MCs	1	5.0	1	5.0	0.786	42.4	LOS C	13.0	94.7	0.99	0.93	1.15	21.1
11	T1	All MCs	74	5.0	74	5.0	* 0.786	30.2	LOS C	13.0	94.7	0.99	0.93	1.15	18.9
12	R2	All MCs	291	5.0	291	5.0	0.786	35.8	LOS C	13.0	94.7	0.99	0.93	1.15	16.2
Approach			365	5.0	365	5.0	0.786	34.7	LOS C	13.0	94.7	0.99	0.93	1.15	16.8
All Vehicles			1288	5.0	1288	5.0	0.796	32.6	LOS C	13.0	94.7	0.97	0.87	1.08	18.9

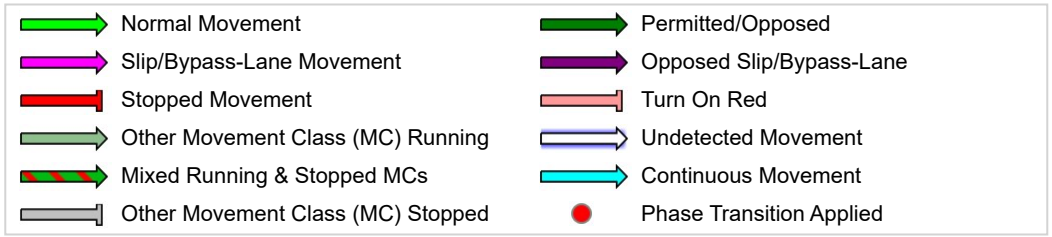
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: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

* Critical Movement (Signal Timing)

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	20	46
Green Time (sec)	14	20	18
Phase Time (sec)	20	26	24
Phase Split	29%	37%	34%
Phase Frequency (%)	100.0[4]	100.0[4]	100.0[4]

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

4 Phase Frequency specified by the user (phase times not specified).

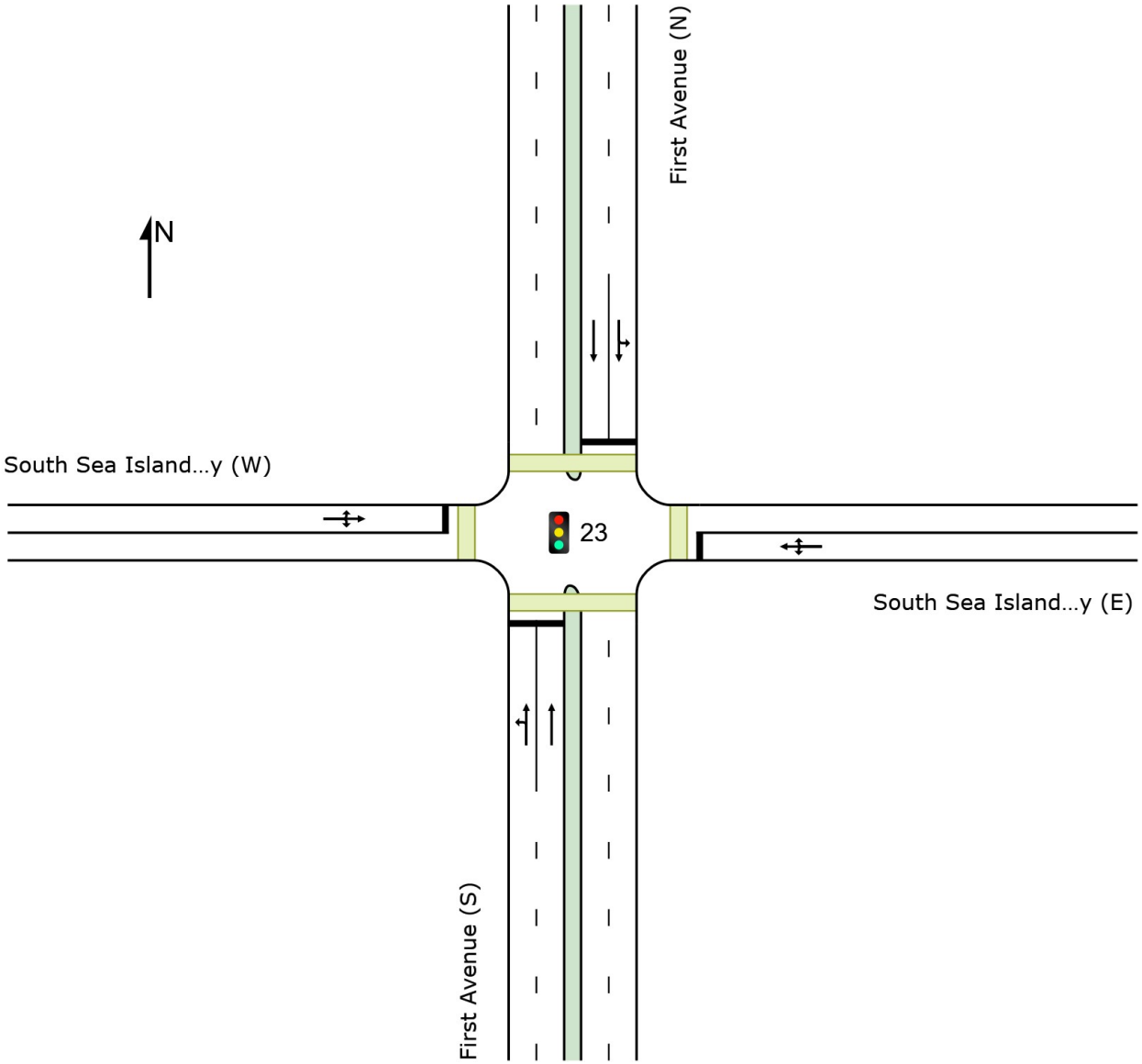
Site: 23 [First Ave / South Sea Islander Way - AM Peak - Dev Case (Site Folder: Lot 600)]

First Avenue / South Sea Islander Way with LR
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Practical Cycle Time)

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

Site Layout

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


N
First Avenue (N)
South Sea Island…y (W)
23
South Sea Island…y (E)
First Avenue (S)

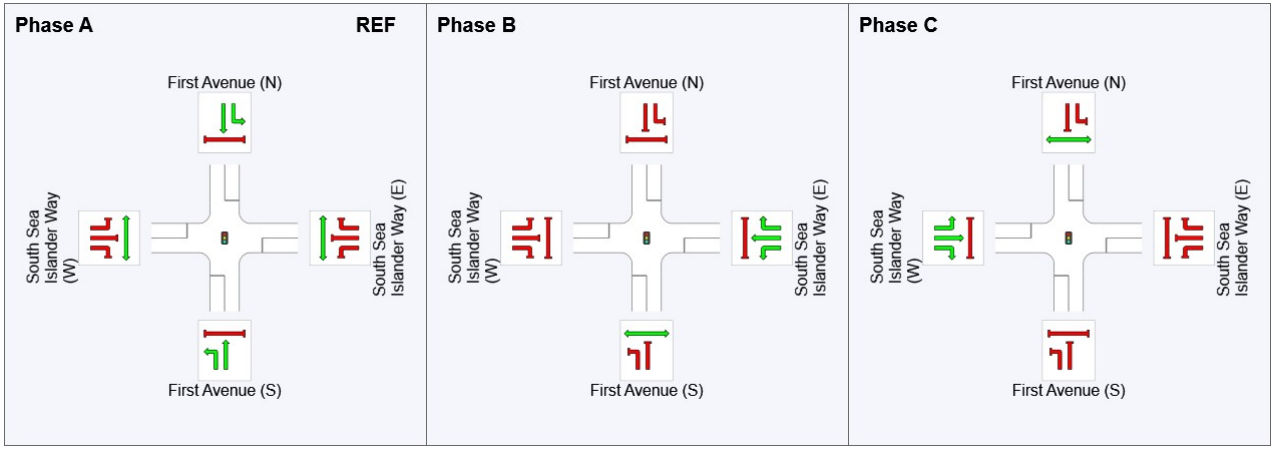
Vehicle Movement Performance

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: First Avenue (S)															
1	L2	All MCs	1	5.0	1	5.0	0.176	37.4	LOS C	2.4	17.3	0.84	0.66	0.84	18.4
2	T1	All MCs	147	5.0	147	5.0	0.176	27.3	LOS B	2.4	17.4	0.84	0.65	0.84	21.2
Approach			148	5.0	148	5.0	0.176	27.4	LOS B	2.4	17.4	0.84	0.65	0.84	21.2
East: South Sea Islander Way (E)															
4	L2	All MCs	5	5.0	5	5.0	* 0.798	44.7	LOS D	16.7	121.6	0.99	0.93	1.12	13.1
5	T1	All MCs	158	5.0	158	5.0	0.798	32.7	LOS C	16.7	121.6	0.99	0.93	1.12	18.4
6	R2	All MCs	254	5.0	254	5.0	0.798	38.2	LOS C	16.7	121.6	0.99	0.93	1.12	18.4
Approach			417	5.0	417	5.0	0.798	36.2	LOS C	16.7	121.6	0.99	0.93	1.12	18.4
North: First Avenue (N)															
7	L2	All MCs	218	5.0	218	5.0	* 0.810	47.0	LOS D	9.3	67.9	1.00	0.94	1.25	15.6
8	T1	All MCs	258	5.0	258	5.0	0.607	30.8	LOS C	9.3	67.8	0.95	0.79	0.95	19.7
Approach			476	5.0	476	5.0	0.810	38.2	LOS C	9.3	67.9	0.97	0.86	1.09	17.4
West: South Sea Islander Way (W)															
10	L2	All MCs	1	5.0	1	5.0	* 0.816	47.4	LOS D	16.0	117.0	1.00	0.95	1.17	19.5
11	T1	All MCs	97	5.0	97	5.0	0.816	35.3	LOS C	16.0	117.0	1.00	0.95	1.17	17.3
12	R2	All MCs	291	5.0	291	5.0	0.816	40.9	LOS C	16.0	117.0	1.00	0.95	1.17	14.8
Approach			388	5.0	388	5.0	0.816	39.5	LOS C	16.0	117.0	1.00	0.95	1.17	15.5
All Vehicles			1429	5.0	1429	5.0	0.816	36.9	LOS C	16.7	121.6	0.97	0.88	1.10	17.5

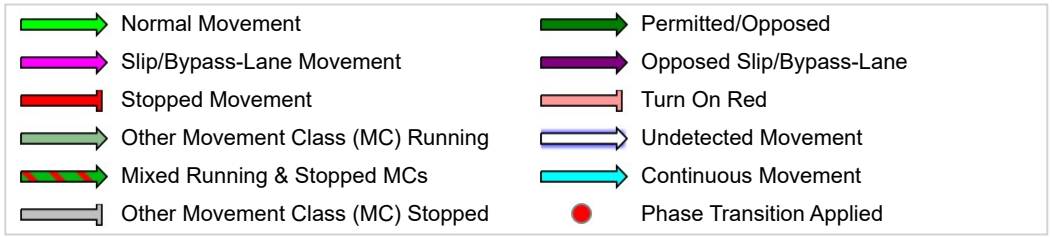
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: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

* Critical Movement (Signal Timing)

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	24	53
Green Time (sec)	18	23	21
Phase Time (sec)	24	29	27
Phase Split	30%	36%	34%
Phase Frequency (%)	100.0[4]	100.0[4]	100.0[4]

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

4 Phase Frequency specified by the user (phase times not specified).

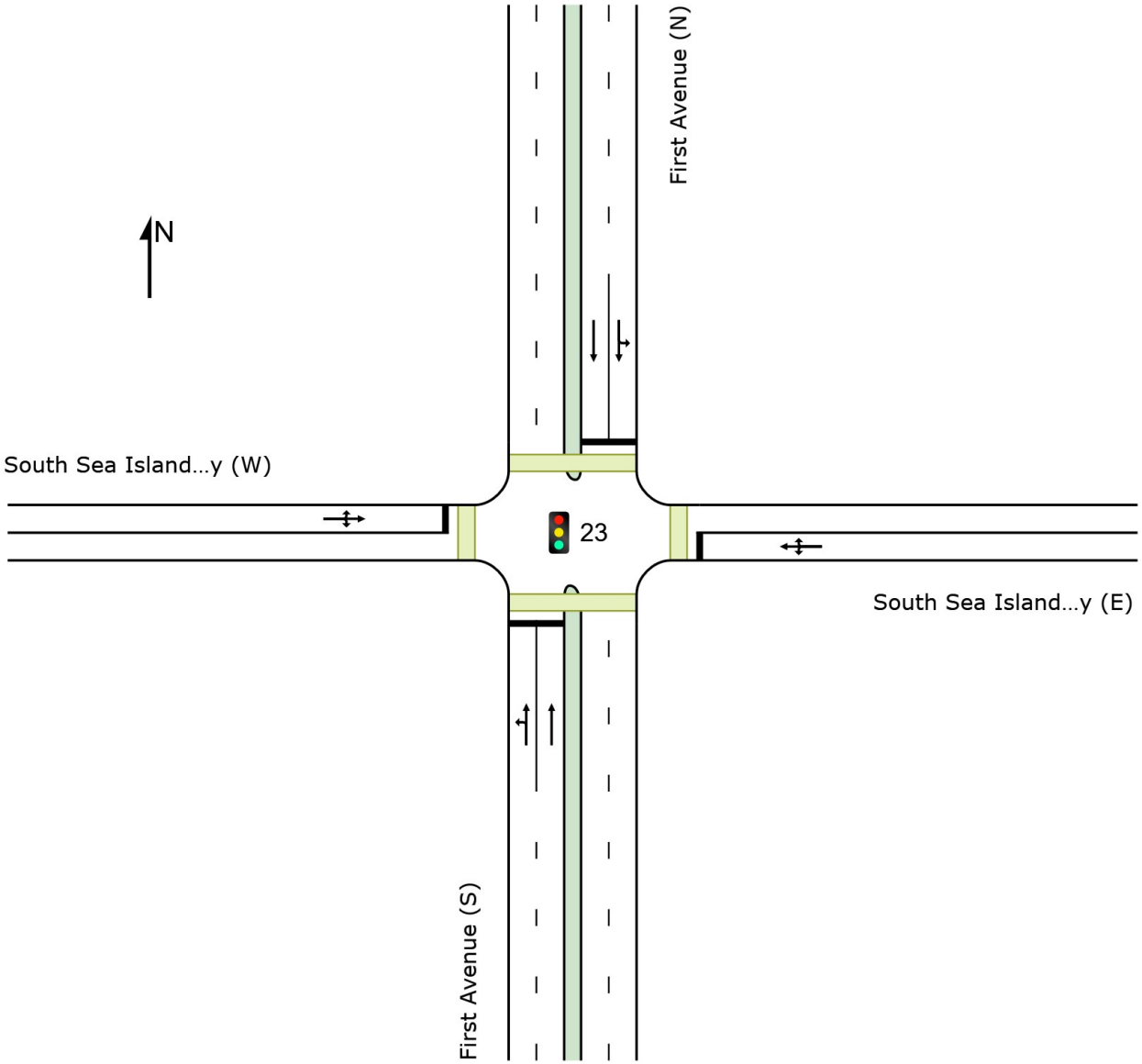
Site: 23 [First Ave / South Sea Islander Way - PM Peak - Base Case (Site Folder: Lot 600)]

First Avenue / South Sea Islander Way with LR
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 100 seconds (Site Practical Cycle Time)

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

Site Layout

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


N
First Avenue (N)
South Sea Island…y (W)
23
South Sea Island…y (E)
First Avenue (S)

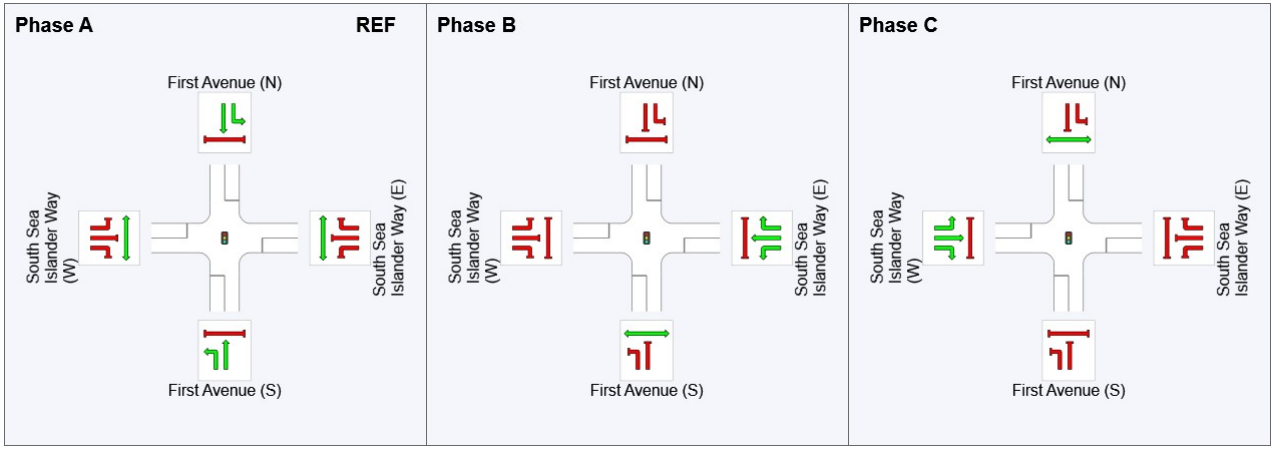
Vehicle Movement Performance

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: First Avenue (S)															
1	L2	All MCs	1	5.0	1	5.0	0.557	54.7	LOS D	7.3	53.5	0.98	0.79	0.98	13.4
2	T1	All MCs	314	5.0	314	5.0	0.557	43.8	LOS D	7.4	53.8	0.98	0.79	0.98	15.3
Approach			315	5.0	315	5.0	0.557	43.8	LOS D	7.4	53.8	0.98	0.79	0.98	15.3
East: South Sea Islander Way (E)															
4	L2	All MCs	19	5.0	19	5.0	* 0.819	46.4	LOS D	26.4	192.8	0.97	0.93	1.06	12.8
5	T1	All MCs	295	5.0	295	5.0	0.819	34.8	LOS C	26.4	192.8	0.97	0.93	1.06	17.9
6	R2	All MCs	239	5.0	239	5.0	0.819	40.3	LOS C	26.4	192.8	0.97	0.93	1.06	18.0
Approach			553	5.0	553	5.0	0.819	37.6	LOS C	26.4	192.8	0.97	0.93	1.06	17.8
North: First Avenue (N)															
7	L2	All MCs	106	5.0	106	5.0	* 0.766	59.5	LOS E	6.9	50.2	1.00	0.91	1.20	12.8
8	T1	All MCs	242	5.0	242	5.0	0.766	48.0	LOS D	11.0	80.1	1.00	0.91	1.14	14.1
Approach			348	5.0	348	5.0	0.766	51.5	LOS D	11.0	80.1	1.00	0.91	1.16	13.6
West: South Sea Islander Way (W)															
10	L2	All MCs	1	5.0	1	5.0	* 0.831	53.0	LOS D	22.7	165.7	1.00	0.94	1.13	17.7
11	T1	All MCs	74	5.0	74	5.0	0.831	41.0	LOS C	22.7	165.7	1.00	0.94	1.13	15.5
12	R2	All MCs	376	5.0	376	5.0	0.831	46.6	LOS D	22.7	165.7	1.00	0.94	1.13	13.4
Approach			451	5.0	451	5.0	0.831	45.7	LOS D	22.7	165.7	1.00	0.94	1.13	13.7
All Vehicles			1666	5.0	1666	5.0	0.831	43.9	LOS D	26.4	192.8	0.99	0.90	1.08	15.2

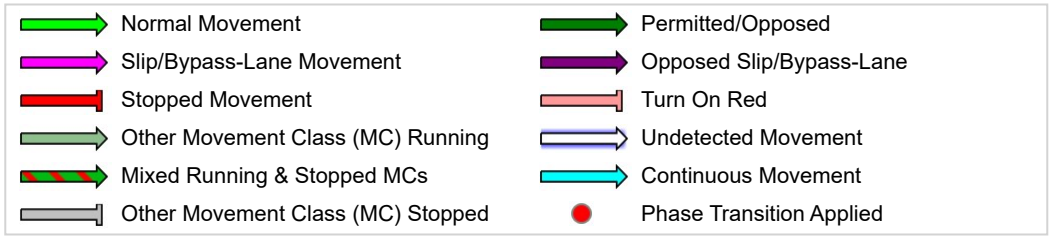
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: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

* Critical Movement (Signal Timing)

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	21	64
Green Time (sec)	15	37	30
Phase Time (sec)	21	43	36
Phase Split	21%	43%	36%
Phase Frequency (%)	100.0[4]	100.0[4]	100.0[4]

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

4 Phase Frequency specified by the user (phase times not specified).

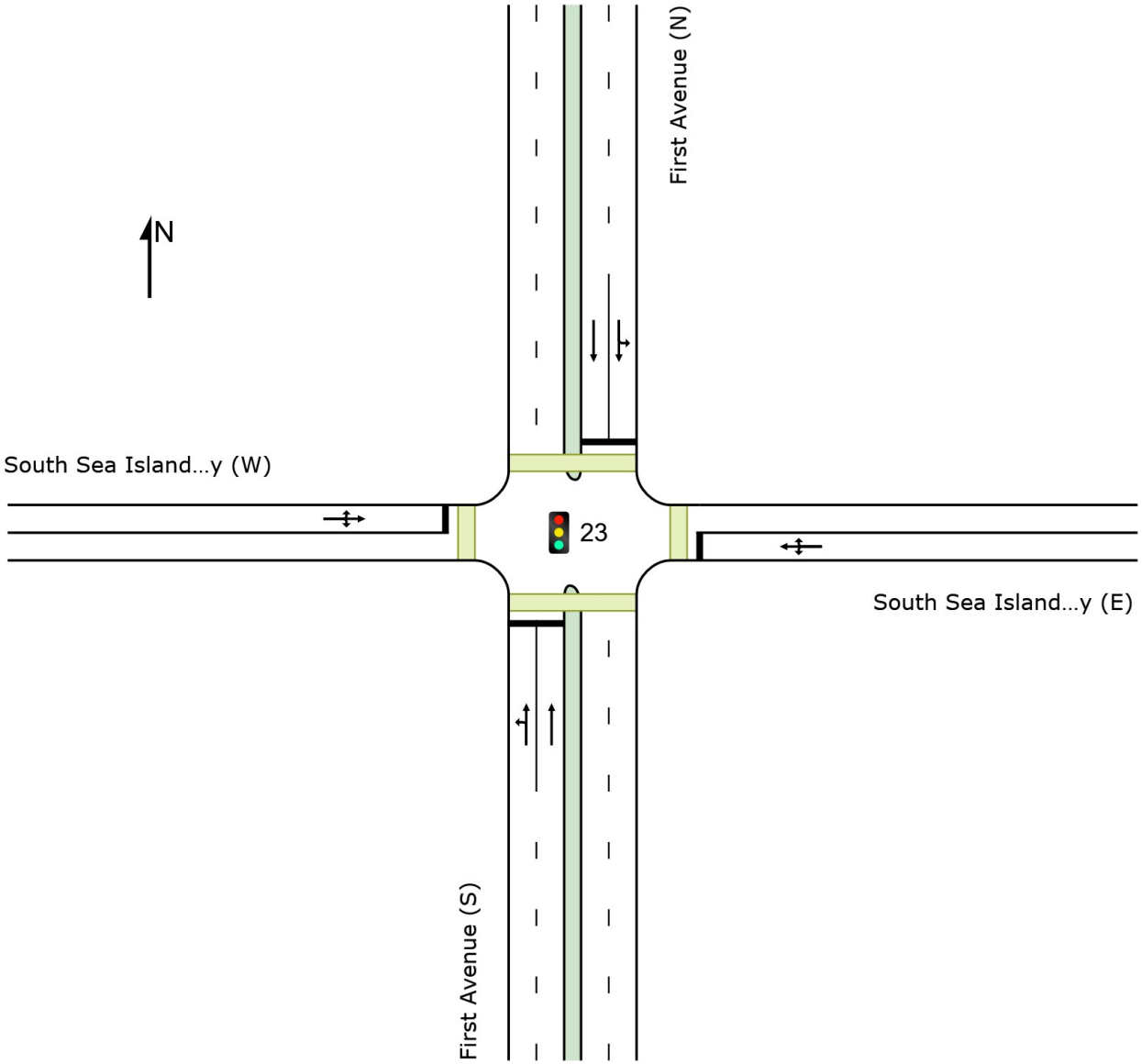
Site: 23 [First Ave / South Sea Islander Way - PM Peak - Dev Case (Site Folder: Lot 600)]

First Avenue / South Sea Islander Way with LR
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 110 seconds (Site Practical Cycle Time)

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

Site Layout

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


N
First Avenue (N)
South Sea Island…y (W)
23
South Sea Island…y (E)
First Avenue (S)

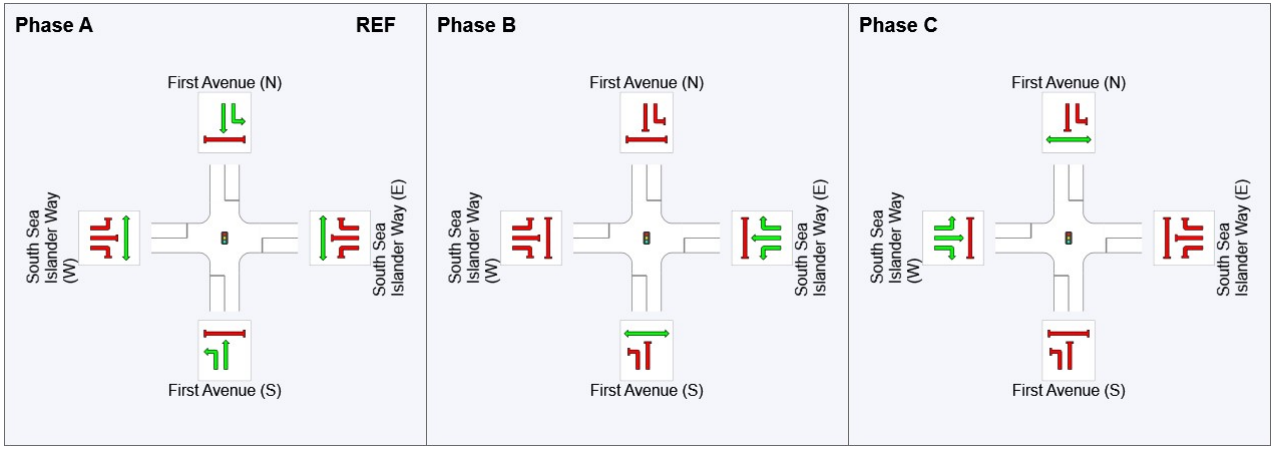
Vehicle Movement Performance

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: First Avenue (S)															
1	L2	All MCs	1	5.0	1	5.0	0.484	55.8	LOS D	7.8	56.7	0.95	0.77	0.95	13.1
2	T1	All MCs	314	5.0	314	5.0	0.484	45.1	LOS D	7.8	57.0	0.95	0.77	0.95	15.0
Approach			315	5.0	315	5.0	0.484	45.2	LOS D	7.8	57.0	0.95	0.77	0.95	15.0
East: South Sea Islander Way (E)															
4	L2	All MCs	19	5.0	19	5.0	* 0.855	53.9	LOS D	30.5	222.9	0.99	0.96	1.12	11.2
5	T1	All MCs	295	5.0	295	5.0	0.855	42.1	LOS C	30.5	222.9	0.99	0.96	1.12	15.8
6	R2	All MCs	239	5.0	239	5.0	0.855	47.7	LOS D	30.5	222.9	0.99	0.96	1.12	16.0
Approach			553	5.0	553	5.0	0.855	44.9	LOS D	30.5	222.9	0.99	0.96	1.12	15.7
North: First Avenue (N)															
7	L2	All MCs	165	5.0	165	5.0	* 0.835	64.6	LOS E	10.6	77.4	1.00	0.95	1.26	11.9
8	T1	All MCs	287	5.0	287	5.0	0.835	54.1	LOS D	15.6	114.2	1.00	0.98	1.20	12.9
Approach			453	5.0	453	5.0	0.835	57.9	LOS E	15.6	114.2	1.00	0.97	1.22	12.5
West: South Sea Islander Way (W)															
10	L2	All MCs	1	5.0	1	5.0	* 0.830	55.3	LOS D	25.3	184.4	1.00	0.93	1.11	17.1
11	T1	All MCs	87	5.0	87	5.0	0.830	43.5	LOS D	25.3	184.4	1.00	0.93	1.11	15.0
12	R2	All MCs	376	5.0	376	5.0	0.830	49.0	LOS D	25.3	184.4	1.00	0.93	1.11	12.9
Approach			464	5.0	464	5.0	0.830	48.0	LOS D	25.3	184.4	1.00	0.93	1.11	13.3
All Vehicles			1784	5.0	1784	5.0	0.855	49.1	LOS D	30.5	222.9	0.99	0.92	1.11	14.0

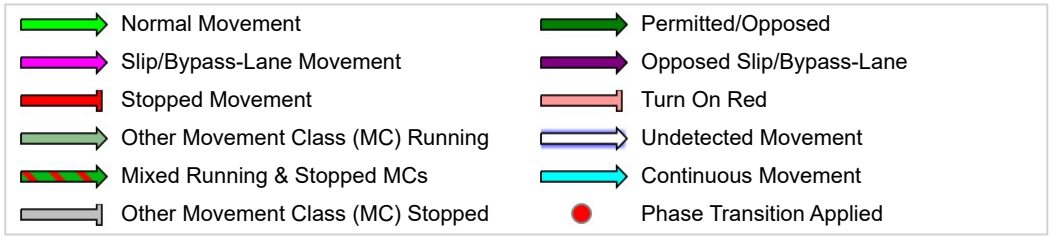
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: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

* Critical Movement (Signal Timing)

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	25	70
Green Time (sec)	19	39	34
Phase Time (sec)	25	45	40
Phase Split	23%	41%	36%
Phase Frequency (%)	100.0[4]	100.0[4]	100.0[4]

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

4 Phase Frequency specified by the user (phase times not specified).

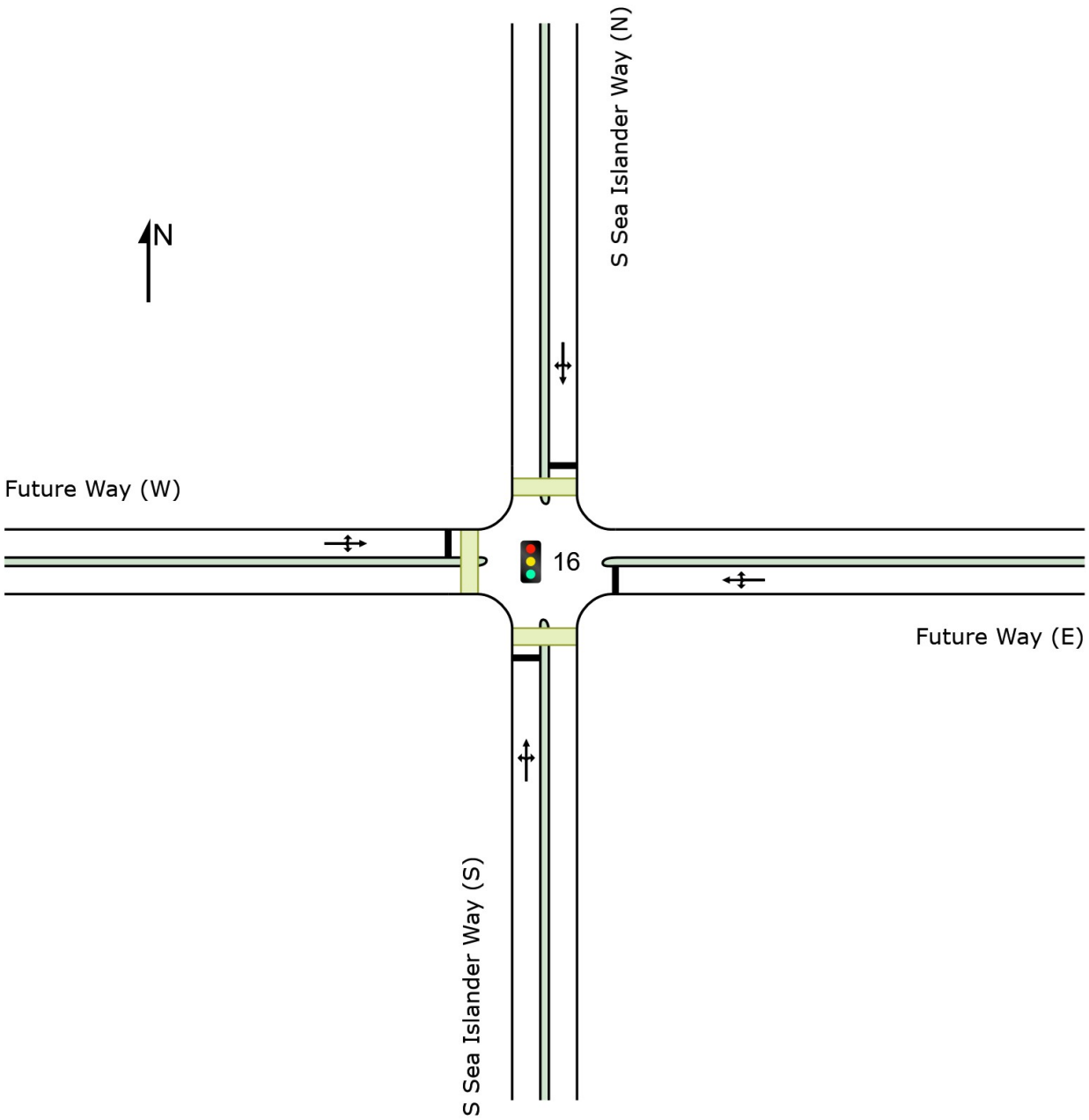
Site: 16 [Future Way / South Sea Islander Way - AM Peak - Base Case (Site Folder: Lot 600)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 70 seconds (Site Practical Cycle Time)

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

Site Layout

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


N
S Sea Islander Way (N)
Future Way (W)
16
Future Way (E)
S Sea Islander Way (S)

Vehicle Movement Performance

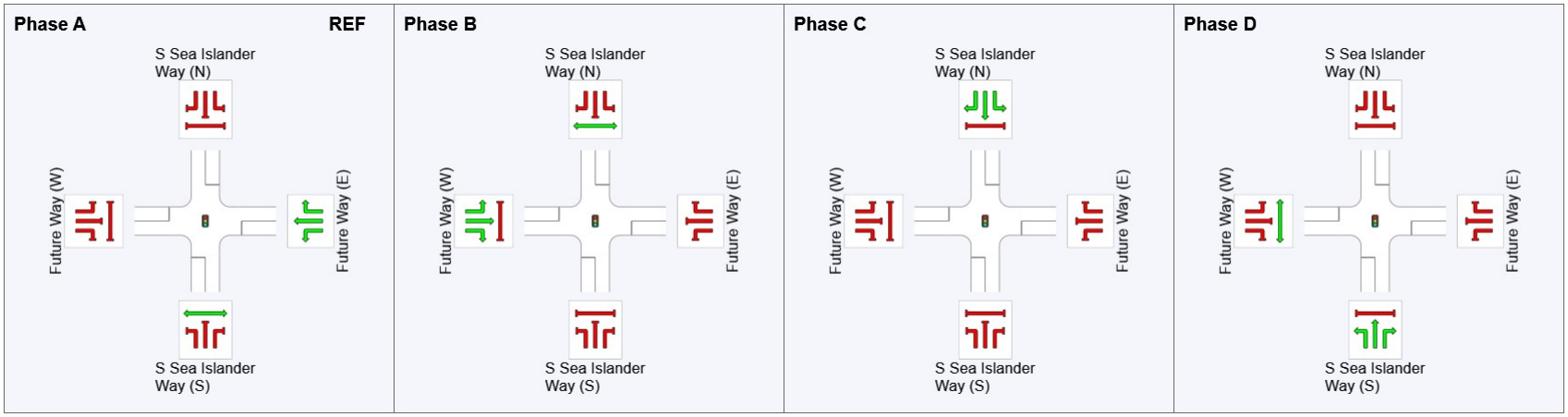
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: S Sea Islander Way (S)															
1	L2	All MCs	1	5.0	1	5.0	0.158	41.1	LOS C	1.3	9.1	0.91	0.71	0.91	12.2
2	T1	All MCs	15	5.0	15	5.0	* 0.158	29.4	LOS C	1.3	9.1	0.91	0.71	0.91	16.7
3	R2	All MCs	24	5.0	24	5.0	0.158	34.9	LOS C	1.3	9.1	0.91	0.71	0.91	13.7
Approach			40	5.0	40	5.0	0.158	33.0	LOS C	1.3	9.1	0.91	0.71	0.91	14.7
East: Future Way (E)															
4	L2	All MCs	6	5.0	6	5.0	* 0.531	33.6	LOS C	8.0	58.1	0.89	0.81	0.89	15.6
5	T1	All MCs	19	5.0	19	5.0	0.531	23.1	LOS B	8.0	58.1	0.89	0.81	0.89	14.2
6	R2	All MCs	244	5.0	244	5.0	0.531	27.6	LOS B	8.0	58.1	0.89	0.81	0.89	15.5
Approach			269	5.0	269	5.0	0.531	27.4	LOS B	8.0	58.1	0.89	0.81	0.89	15.4
North: S Sea Islander Way (N)															
7	L2	All MCs	49	5.0	49	5.0	0.585	41.9	LOS C	3.3	24.1	1.00	0.80	1.07	10.8
8	T1	All MCs	32	5.0	32	5.0	* 0.585	36.3	LOS C	3.3	24.1	1.00	0.80	1.07	14.6
9	R2	All MCs	11	5.0	11	5.0	0.585	41.8	LOS C	3.3	24.1	1.00	0.80	1.07	10.8
Approach			92	5.0	92	5.0	0.585	40.0	LOS C	3.3	24.1	1.00	0.80	1.07	12.0
West: Future Way (W)															
10	L2	All MCs	6	5.0	6	5.0	0.187	40.7	LOS C	1.3	9.6	0.93	0.71	0.93	12.7
11	T1	All MCs	23	5.0	23	5.0	* 0.187	29.9	LOS C	1.3	9.6	0.93	0.71	0.93	12.4
12	R2	All MCs	12	5.0	12	5.0	0.187	34.4	LOS C	1.3	9.6	0.93	0.71	0.93	13.7
Approach			41	5.0	41	5.0	0.187	32.8	LOS C	1.3	9.6	0.93	0.71	0.93	12.8
All Vehicles			442	5.0	442	5.0	0.585	31.0	LOS C	8.0	58.1	0.92	0.79	0.93	14.2

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

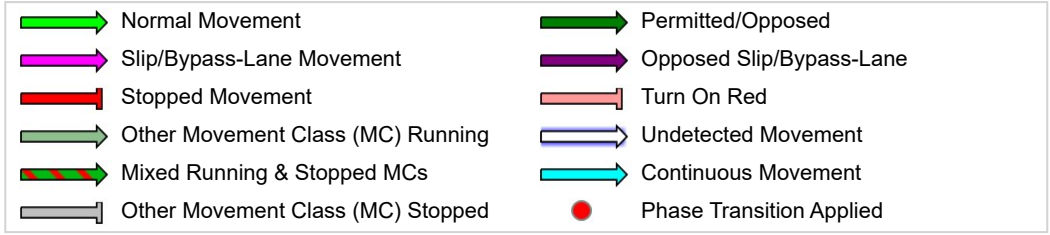
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	0	26	42	54
Green Time (sec)	20	10	6	10
Phase Time (sec)	26	16	12	16

Phase Split	37%	23%	17%	23%
Phase Frequency (%)	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

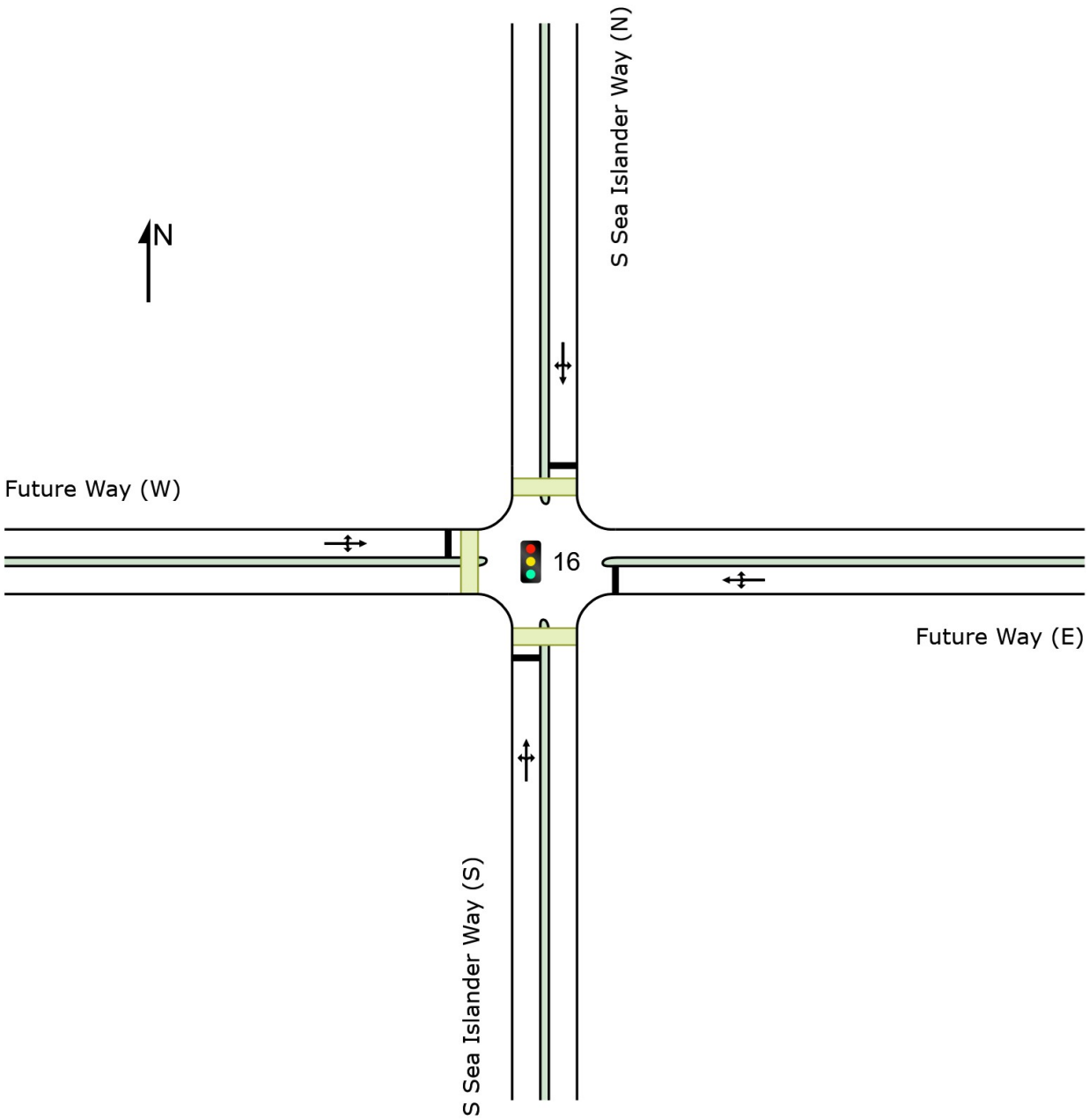
Site: 16 [Future Way / South Sea Islander Way - AM Peak - Dev Case (Site Folder: Lot 600)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 70 seconds (Site Practical Cycle Time)

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

Site Layout

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


N
S Sea Islander Way (N)
Future Way (W)
16
Future Way (E)
S Sea Islander Way (S)

Vehicle Movement Performance

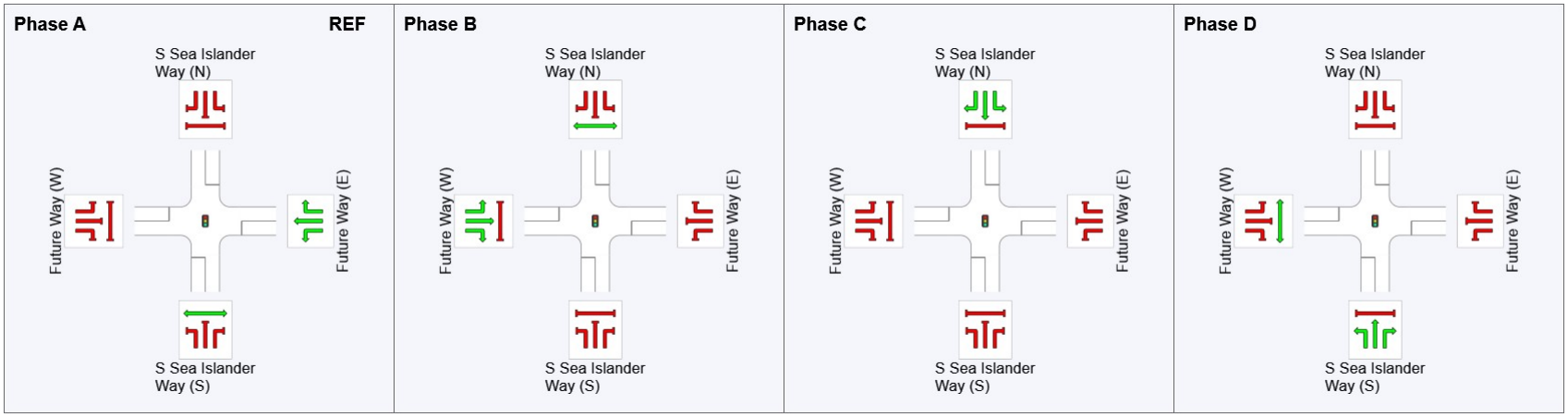
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: S Sea Islander Way (S)															
1	L2	All MCs	1	5.0	1	5.0	0.339	42.5	LOS D	2.8	20.4	0.94	0.76	0.94	11.7
2	T1	All MCs	15	5.0	15	5.0	*0.339	30.5	LOS C	2.8	20.4	0.94	0.76	0.94	15.9
3	R2	All MCs	71	5.0	71	5.0	0.339	36.0	LOS C	2.8	20.4	0.94	0.76	0.94	13.1
Approach			86	5.0	86	5.0	0.339	35.2	LOS C	2.8	20.4	0.94	0.76	0.94	13.5
East: Future Way (E)															
4	L2	All MCs	6	5.0	6	5.0	*0.667	38.9	LOS C	8.9	64.7	0.96	0.85	1.01	13.9
5	T1	All MCs	19	5.0	19	5.0	0.667	28.0	LOS B	8.9	64.7	0.96	0.85	1.01	12.5
6	R2	All MCs	244	5.0	244	5.0	0.667	32.4	LOS C	8.9	64.7	0.96	0.85	1.01	13.9
Approach			269	5.0	269	5.0	0.667	32.3	LOS C	8.9	64.7	0.96	0.85	1.01	13.8
North: S Sea Islander Way (N)															
7	L2	All MCs	112	5.0	112	5.0	0.652	38.6	LOS C	5.9	43.1	0.99	0.84	1.07	11.4
8	T1	All MCs	47	5.0	47	5.0	*0.652	33.0	LOS C	5.9	43.1	0.99	0.84	1.07	15.5
9	R2	All MCs	11	5.0	11	5.0	0.652	38.5	LOS C	5.9	43.1	0.99	0.84	1.07	11.4
Approach			169	5.0	169	5.0	0.652	37.0	LOS C	5.9	43.1	0.99	0.84	1.07	12.5
West: Future Way (W)															
10	L2	All MCs	6	5.0	6	5.0	0.187	40.7	LOS C	1.3	9.6	0.93	0.71	0.93	12.7
11	T1	All MCs	23	5.0	23	5.0	*0.187	29.9	LOS C	1.3	9.6	0.93	0.71	0.93	12.4
12	R2	All MCs	12	5.0	12	5.0	0.187	34.4	LOS C	1.3	9.6	0.93	0.71	0.93	13.7
Approach			41	5.0	41	5.0	0.187	32.8	LOS C	1.3	9.6	0.93	0.71	0.93	12.8
All Vehicles			566	5.0	566	5.0	0.667	34.2	LOS C	8.9	64.7	0.97	0.82	1.01	13.2

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

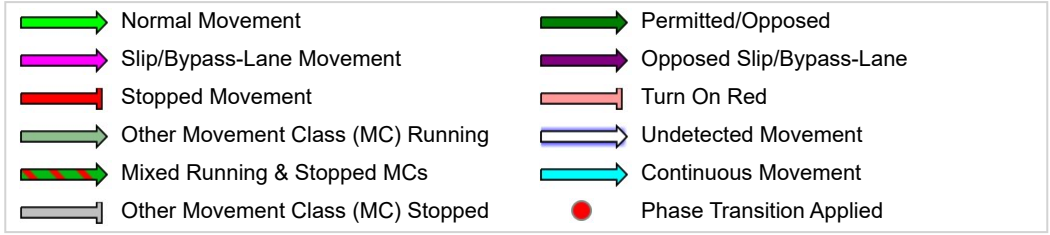
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	0	22	38	54
Green Time (sec)	16	10	10	10
Phase Time (sec)	22	16	16	16

Phase Split	31%	23%	23%	23%
Phase Frequency (%)	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

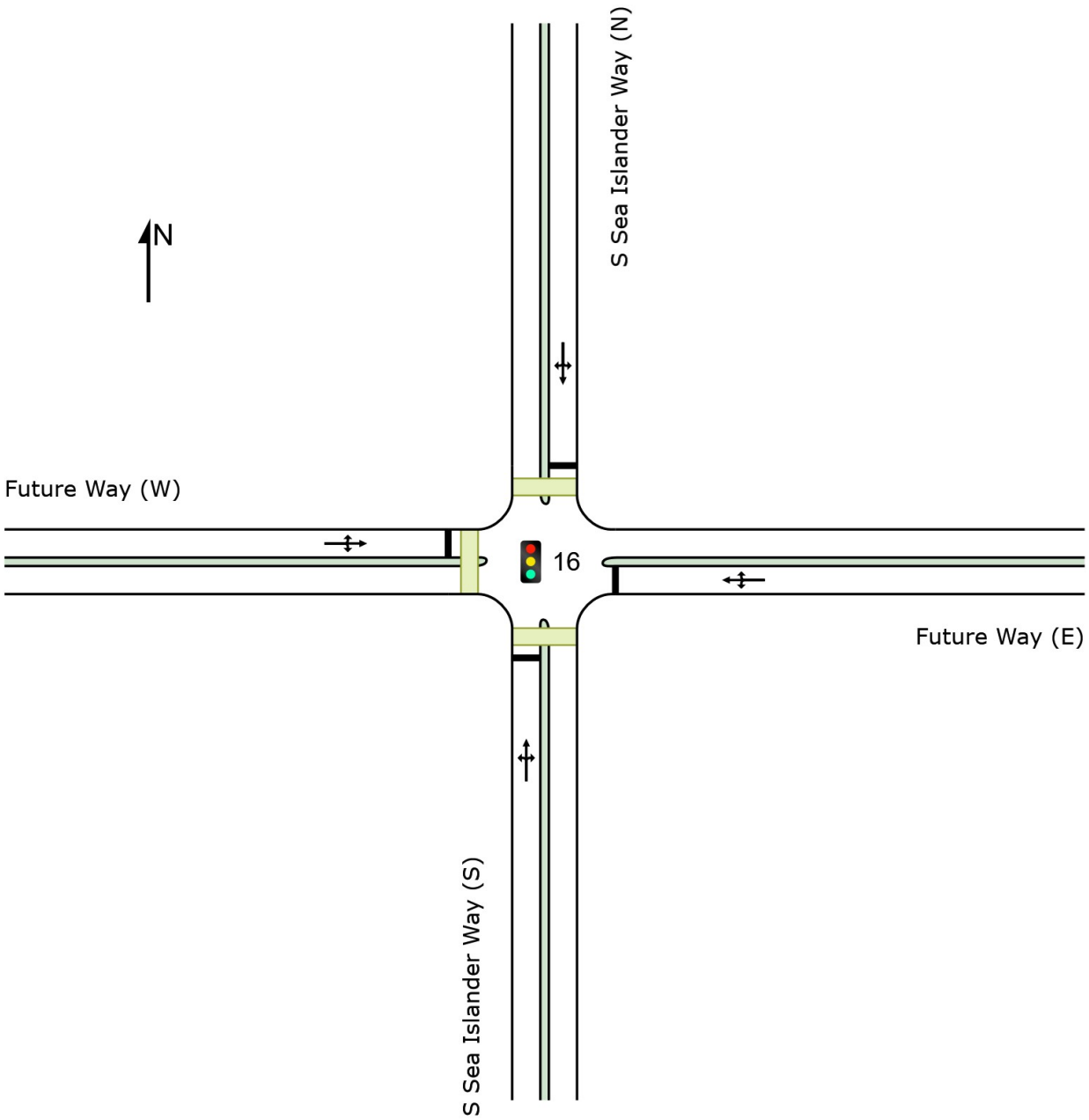
Site: 16 [Future Way / South Sea Islander Way - PM Peak - Base Case (Site Folder: Lot 600)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 70 seconds (Site Practical Cycle Time)

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

Site Layout

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


N
S Sea Islander Way (N)
Future Way (W)
16
Future Way (E)
S Sea Islander Way (S)

Vehicle Movement Performance

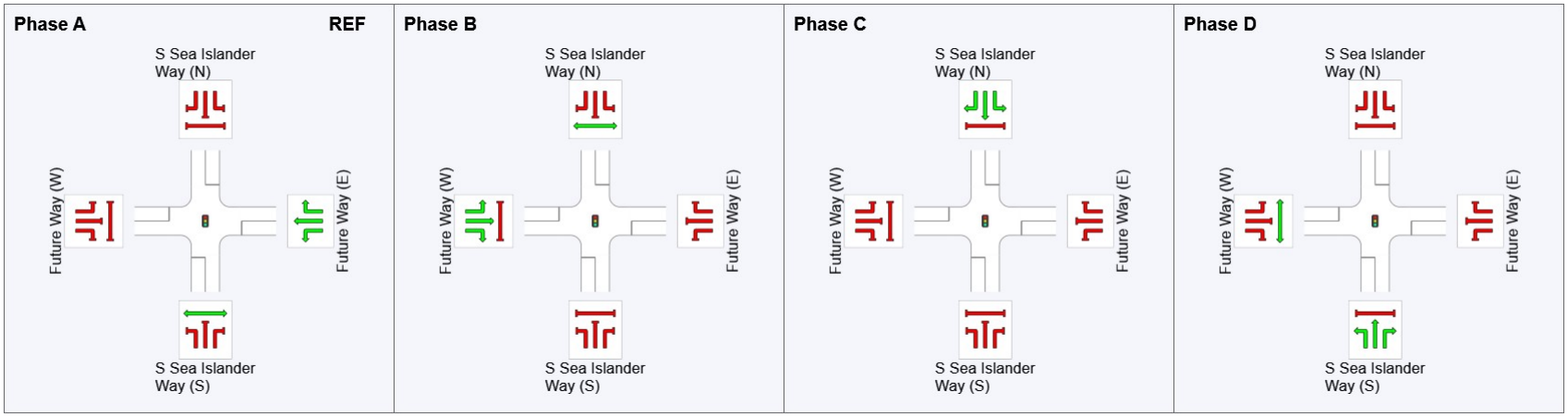
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: S Sea Islander Way (S)															
1	L2	All MCs	4	5.0	4	5.0	0.273	41.8	LOS C	2.1	15.5	0.93	0.74	0.93	12.0
2	T1	All MCs	27	5.0	27	5.0	* 0.273	29.9	LOS C	2.1	15.5	0.93	0.74	0.93	16.5
3	R2	All MCs	35	5.0	35	5.0	0.273	35.4	LOS C	2.1	15.5	0.93	0.74	0.93	13.5
Approach			66	5.0	66	5.0	0.273	33.6	LOS C	2.1	15.5	0.93	0.74	0.93	14.6
East: Future Way (E)															
4	L2	All MCs	25	5.0	25	5.0	* 0.653	35.6	LOS C	9.6	69.9	0.94	0.84	0.96	14.8
5	T1	All MCs	23	5.0	23	5.0	0.653	25.0	LOS B	9.6	69.9	0.94	0.84	0.96	13.4
6	R2	All MCs	255	5.0	255	5.0	0.653	29.4	LOS C	9.6	69.9	0.94	0.84	0.96	14.7
Approach			303	5.0	303	5.0	0.653	29.6	LOS C	9.6	69.9	0.94	0.84	0.96	14.7
North: S Sea Islander Way (N)															
7	L2	All MCs	106	5.0	106	5.0	0.663	41.7	LOS C	4.3	31.5	1.00	0.84	1.13	10.6
8	T1	All MCs	2	5.0	2	5.0	* 0.663	36.1	LOS C	4.3	31.5	1.00	0.84	1.13	14.2
9	R2	All MCs	11	5.0	11	5.0	0.663	41.6	LOS C	4.3	31.5	1.00	0.84	1.13	10.6
Approach			119	5.0	119	5.0	0.663	41.6	LOS C	4.3	31.5	1.00	0.84	1.13	10.7
West: Future Way (W)															
10	L2	All MCs	9	5.0	9	5.0	0.282	41.3	LOS C	2.1	15.1	0.94	0.72	0.94	12.9
11	T1	All MCs	53	5.0	53	5.0	* 0.282	30.4	LOS C	2.1	15.1	0.94	0.72	0.94	12.5
12	R2	All MCs	1	5.0	1	5.0	0.282	34.9	LOS C	2.1	15.1	0.94	0.72	0.94	13.9
Approach			63	5.0	63	5.0	0.282	32.1	LOS C	2.1	15.1	0.94	0.72	0.94	12.6
All Vehicles			552	5.0	552	5.0	0.663	32.9	LOS C	9.6	69.9	0.95	0.81	0.99	13.3

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

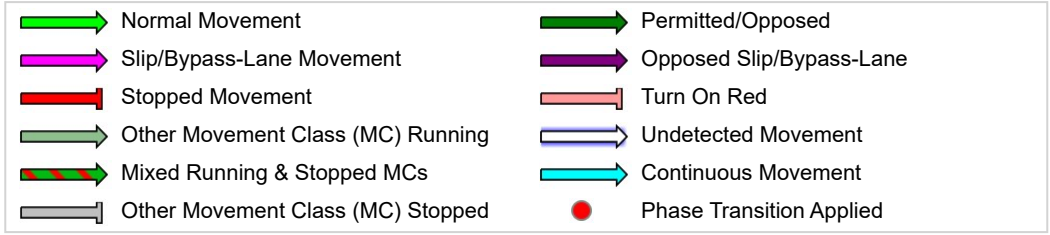
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	0	25	41	54
Green Time (sec)	19	10	7	10
Phase Time (sec)	25	16	13	16

Phase Split	36%	23%	19%	23%
Phase Frequency (%)	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

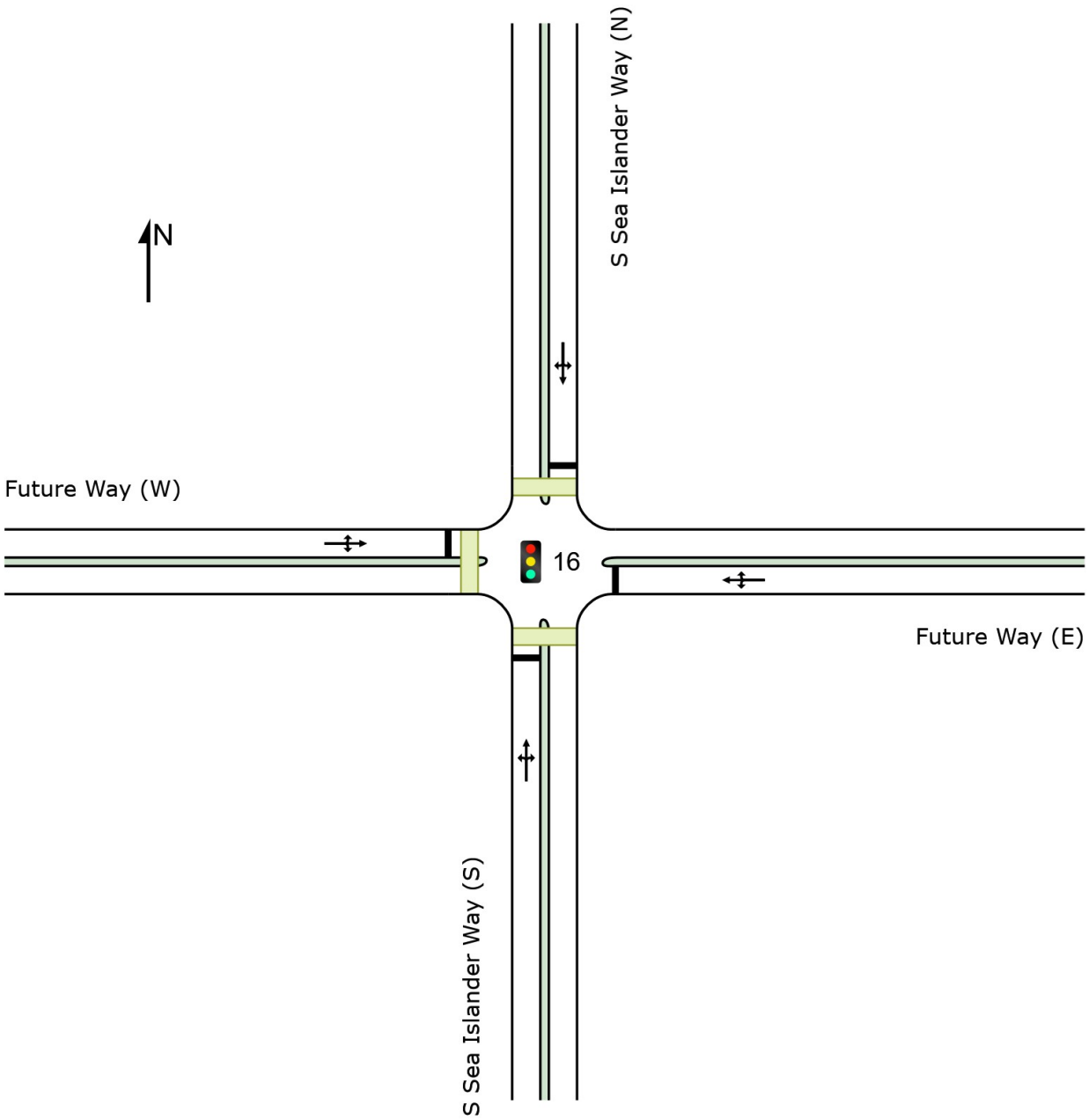
Site: 16 [Future Way / South Sea Islander Way - PM Peak - Dev Case (Site Folder: Lot 600)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Practical Cycle Time)

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

Site Layout

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


N
S Sea Islander Way (N)
Future Way (W)
16
Future Way (E)
S Sea Islander Way (S)

Vehicle Movement Performance

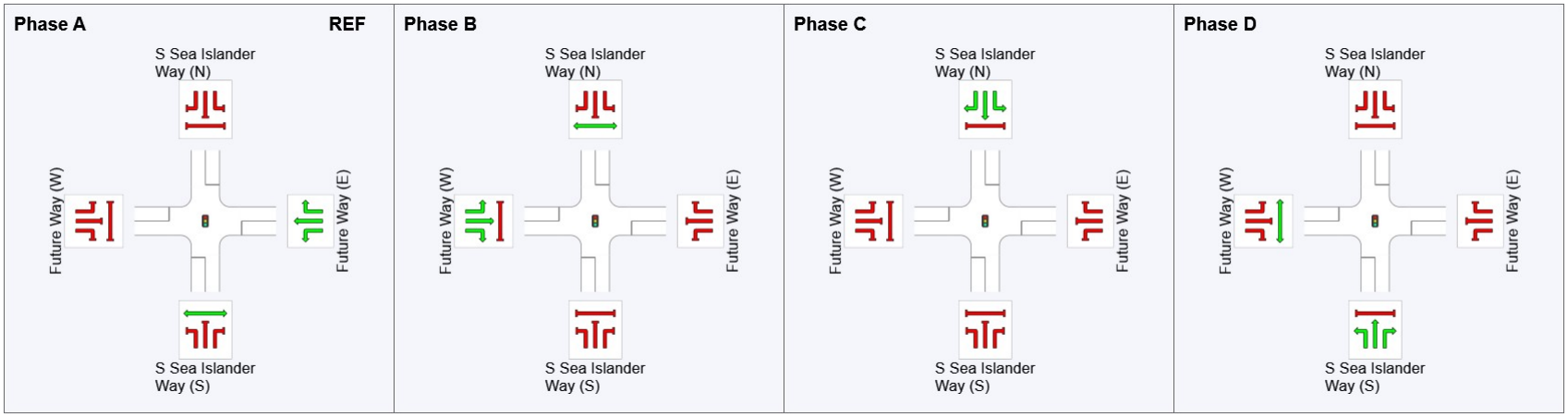
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: S Sea Islander Way (S)															
1	L2	All MCs	4	5.0	4	5.0	0.435	48.6	LOS D	3.6	26.1	0.97	0.77	0.97	10.6
2	T1	All MCs	27	5.0	27	5.0	* 0.435	36.5	LOS C	3.6	26.1	0.97	0.77	0.97	14.3
3	R2	All MCs	62	5.0	62	5.0	0.435	42.0	LOS C	3.6	26.1	0.97	0.77	0.97	11.7
Approach			94	5.0	94	5.0	0.435	40.7	LOS C	3.6	26.1	0.97	0.77	0.97	12.4
East: Future Way (E)															
4	L2	All MCs	25	5.0	25	5.0	* 0.611	37.1	LOS C	10.5	76.4	0.92	0.82	0.92	14.3
5	T1	All MCs	23	5.0	23	5.0	0.611	26.6	LOS B	10.5	76.4	0.92	0.82	0.92	12.9
6	R2	All MCs	255	5.0	255	5.0	0.611	31.1	LOS C	10.5	76.4	0.92	0.82	0.92	14.2
Approach			303	5.0	303	5.0	0.611	31.3	LOS C	10.5	76.4	0.92	0.82	0.92	14.1
North: S Sea Islander Way (N)															
7	L2	All MCs	156	5.0	156	5.0	0.650	41.4	LOS C	7.4	53.9	0.99	0.84	1.04	10.8
8	T1	All MCs	24	5.0	24	5.0	* 0.650	35.8	LOS C	7.4	53.9	0.99	0.84	1.04	14.4
9	R2	All MCs	11	5.0	11	5.0	0.650	41.3	LOS C	7.4	53.9	0.99	0.84	1.04	10.7
Approach			191	5.0	191	5.0	0.650	40.7	LOS C	7.4	53.9	0.99	0.84	1.04	11.2
West: Future Way (W)															
10	L2	All MCs	9	5.0	9	5.0	0.323	47.2	LOS D	2.4	17.5	0.96	0.73	0.96	11.5
11	T1	All MCs	53	5.0	53	5.0	* 0.323	36.2	LOS C	2.4	17.5	0.96	0.73	0.96	11.0
12	R2	All MCs	1	5.0	1	5.0	0.323	40.7	LOS C	2.4	17.5	0.96	0.73	0.96	12.3
Approach			63	5.0	63	5.0	0.323	37.9	LOS C	2.4	17.5	0.96	0.73	0.96	11.1
All Vehicles			651	5.0	651	5.0	0.650	36.0	LOS C	10.5	76.4	0.95	0.81	0.96	12.6

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

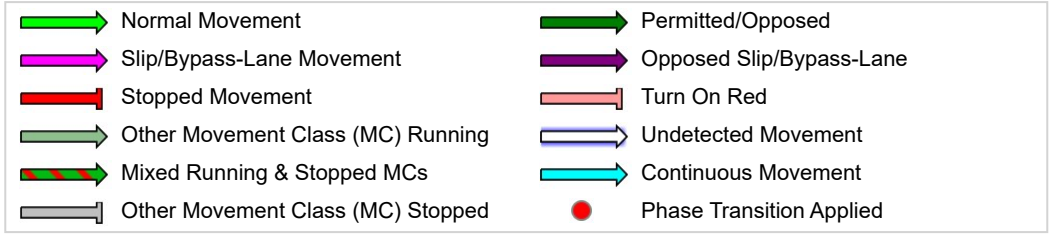
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	0	29	45	64
Green Time (sec)	23	10	13	10
Phase Time (sec)	29	16	19	16

Phase Split	36%	20%	24%	20%
Phase Frequency (%)	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

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