The STAR

MOD14 | Construction Pedestrian and Traffic Management Plan

2 March 2017

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Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
A	13/1/17	MVS			Memo
B	16/1/17	MVS	DP	VS	Draft Report
C	25/1/17	MVS	MH	VS	Draft Report
D	27/1/17	MVS	MH	VS	Draft Report (TfNSW)
E	7/2/17	MVS	MH	VS	Draft Report
F	14/2/17	MVS	MH	VS	Final Draft
G	2/3/17	NJ	MH	MVS	Final

Document reference: 358488 | 2 | G

Information class: Standard

Contents

Executive summary 1

1 Introduction 3
1.1 Context 3
1.2 Background 3

2 Modification 14 Scope 4

3 Construction 6
3.1 Construction Program 6
3.2 Hours of Work 6
3.3 Methodology 6

4 Construction Impacts 8
4.1 Construction Workforce Impacts 8
4.2 Haulage Routes 10
4.3 Construction Deliveries 11
4.4 Construction Traffic Impacts 12
4.5 Construction Zone (Pirrama Road) 13
4.6 Construction Zone (Port Cochere) 15
4.7 Construction Zone (Pyrmont Street) 15
4.8 Impacts on Bus Services 17
4.9 Impacts on Cyclists 17
4.10 Impacts of Other Developments 17
4.10.1 Harbourside 18
4.10.2 IMAX & The Ribbon 18
4.10.3 Cockle Bay Wharf 19
4.10.4 Darling Square 19
4.11 Conclusion 20

Appendices 21

A. SIDRA Analysis 22

Executive summary

Introduction

This Construction Pedestrian & Traffic Management Plan (CPTMP) has been prepared to support the Section 75W (S75W) modification application (Modification 14) and to provide guidance to Star Entertainment Group Limited (SEGL) and its contractors during the construction phase of the upgrade to The Star Casino Complex. It provides additional clarification relating to construction management aspects of the proposal, as requested by City of Sydney and Transport for NSW in their responses to the proposal. It was initially used as the basis for discussions with CBD Coordination Office (CCO) and City of Sydney (CoS) in January 2017, and following revisions, now forms part of the final 'Response to Stakeholder Comments on Transport Issues' document.

SEGL is embarking on a five-year redevelopment journey to improve the landmark, exemplar integrated resort.

Construction

The Modification 14 works are scheduled to commence in October 2017, subject to relevant approvals, and take two-years to complete (October 2019).

Current construction works associated with D2015/1515 will be completed before the commencement of Modification 14. However, many of the construction practices that have worked successfully during D2015/1515 will be utilised for Modification 14, these include:

- Use of loading bays 5 and 6, in the Jones Bay Road loading dock, for some construction deliveries.
- Use of the existing crane mounted on the roof at the north-western end of the site
- Use of the existing Loading Zone along the eastern kerb of Pyrmont Street (Between Jones Bay Road and Edward Street)

In addition, the contractors will be seeking to establish a new tower crane position and off-road delivery site (refer Figure 7 in Section 4 of this plan) on the Pirrama Road forecourt (where the taxi drop-off and pick-up area is currently located). This crane, with 65 metre reach, will service the Sovereign, vertical transport drum and Heart of House construction areas (refer items 3, 8, 9, 11, 12 and 13 in Section 2 of this plan). The crane will be installed on a structural steel grillage founded on new piles and free stand on tower sections to a height such that it sits above the existing Pirrama Road ribbon structure at the main entry.

Construction Impacts

The construction workforce will generate up to 80 private vehicle trips per day. The main haulage route will be Pyrmont Bridge Road, Murray Street, Pirrama Road and return via Jones Bay Road, Pyrmont Street and Pyrmont Bridge Road. The construction works are expected to generate up to 24 deliveries per day at its peak.

The combined construction traffic impacts represent a 16% increase in existing AM peak trips to/from the site and 9% increase in existing PM peak trips to/from the site.

SIDRA analysis indicates that the surrounding network will operate at existing or acceptable performance levels, despite the additional traffic (workers and deliveries) associated with Modification 14 construction activity (refer Appendix A).

SEGL will allocate up to 100 on-site spaces for construction staff in its on-site car park during business hours. The Star has more than sufficient excess capacity, during business hours, to accommodate the increased parking demand. However, to discourage car travel to the site, these spaces will be controlled using a booking system and parking above this threshold will be actively discouraged through on-site parking fees. Additionally, SEGL will continue to encourage construction workers to take advantage of the excellent public transport access in accordance with the strategies outlined in The Star Travel Plan.

Cumulative Impacts

The CCO has identified the following developments that are planned or under construction near SEGL site:

- Harbourside Redevelopment (2018 to TBC)
- IMAX (now to 2019)
- The Ribbon (2017 to 2020)
- Cockle Bay Wharf (2018/19 to 2023)
- ICC Hotel (now to Q2 2017)
- Darling Square (now to 2019)
- Hay Street Redevelopment (2017 to 2019/20)
- Sydney Light Rail Zones 9-13 (Q3 2017 to 2019)

The Harbourside and Darling Square developments are the only planned developments likely to share the Pyrmont Bridge Road haulage route with The Star during construction. This will only impact on inbound movements passing through the intersection of Murray Street, Union Street and Pyrmont Bridge Road. On the return journey, Star construction traffic bypasses this critical intersection.

All other projects planned or under construction are well removed from The Star project or will be completed when Modification 14 construction commences.

Conclusion

The proposed Modification 14 pedestrian and traffic planning during construction have been reviewed in the context of the wider CCO advised approved or proposed construction activities in the Pyrmont precinct. No adverse pedestrian or traffic impacts are anticipated during construction of Modification 14.

1 Introduction

1.1 Context

This Construction Pedestrian & Traffic Management Plan (CPTMP) has been prepared to support the Section 75W (S75W) modification application (Modification 14) and to provide guidance to Star Entertainment Group Limited (SEGL) and its contractors during the construction phase of the upgrade to The Star Casino Complex. It provides additional clarification relating to construction management aspects of the proposal, as requested by City of Sydney and Transport for NSW in their responses to the proposal. It was initially used as the basis for discussions with CBD Coordination Office (CCO) and City of Sydney (CoS) in January 2017, and following revisions, now forms part of the final 'Response to Stakeholder Comments on Transport Issues' document.

1.2 Background

SEGL is a leading operator of integrated resorts catering to both local and international visitors and is the operator of The Star Casino Complex.

The Star is one of the most important tourist destinations in Australia attracting over 10 million visitors to the property every year. After an $870 million redevelopment in 2011, The Star has been transformed into Sydney's multi-award winning entertainment destination. The Star offers award winning chefs and restaurant's, five-star accommodation across three hotel towers including the luxuriously boutique hotel, The Darling Hotel, indulgent experiences at The Darling Spa, a luxury retail collection, and a world class casino.

SEGL is embarking on a five-year redevelopment journey to create a landmark, exemplar integrated resort within the City of Sydney.

2 Modification 14 Scope

Modification 14 includes the following proposed works:

1. Level B4 Infrastructure Upgrades - Upgrades to existing generators, existing harbour heat rejection system, natural gas system, existing domestic cold water system and an additional sewer connection
2. Level 00 – Porte Cochere and Astral Lobby Upgrade - Realignment of Porte Cochere to accommodate expanded and upgraded Astral Lobby, upgraded Astral Lobby Bar and retail expansion and upgrades of the Main Casino Entry, including valet improvements to the Porte Cochere
3. Level 00 Back of House Upgrades - Internal upgrades and improvements to multiple aspects of the back of house space at Level 00
4. Level 00 Astral Luxury Retail Zone - New luxury retail zone connecting from Astral Hotel Lobby out to Jones Bay Road. Change of use from office / back of house to retail
5. Level 00 - SELS Fit-out - Refurbish existing SELS Level 00 toilets at southern end of building to allow for adjacent lift lobby circulation areas. Upgrades and tenancy improvements to existing retail tenant at northern end of SELS building along Jones Bay Road. No external changes to SELS are proposed, with internal alterations only
6. Level 00 SELS Lighting - External lighting of the SELS building along Pyrmont Street to celebrate the heritage elements of the building
7. Level 00 Darling Café – New Café within the existing Darling Hotel Lobby at Level 00
8. Level 00 to 01 - G-Star Raw Escalators - Replace existing G-Star Raw retail shop at Level 00 with new escalators providing access from Level 00 to Main Gaming Floor at Level 01. Includes new arrival bar adjacent to escalators at Level 01
9. Level 01 - Main Gaming Floor Slab Infill - Slab expansion off the Main gaming Floor at Level 01 over the existing main entry foyer facing Pirrama Road. No facade works are proposed
10. Level 02 – Oasis Gaming Area – Minor external alterations to the Oasis unenclosed gaming area at Level 02
11. Level 03 - Sovereign Expansion – Expansion to the existing Sovereign Room at Level 03. This includes refurbishment of existing food, beverage and gaming locations, expansion of food and beverage opportunities an VIP gaming and unenclosed gaming areas
12. Level 03 - Event Centre Pre-function Space - New pre-function space adjacent to the MUEF at Level 03, to allow for circulation changes from the level 03 expansion
13. Vertical Transportation Drum - New escalators as part of a vertical transport arrival strategy from Level 00 to Level 05
14. Level 04 – Star Administrative Offices. Fit-out of existing administrative offices within Astral Residences tower. Internal improvements only

15. Level 05 – VIP Lobby and Check-in conversion of existing pool plant space and enclosed pool deck at Level 05 to a lobby for the VIP hotel guest lounge
16. Level 05 – Astral Residences Reception – conversion of meeting room to reception and check-in lobby. Includes minor expansion to existing enclosed space
17. Northern Porte Cochere Canopy - Removal of a section of the current glazing (retaining the canopy structure) of the current porte cochere canopy and include a new ceiling at a lower height over a section of the new slab (NW Gaming slab infill)
18. Level 05 – Refurbishment of Astral Towers

3 Construction

3.1 Construction Program

The Modification 14 works are scheduled to commence in October 2017 and take two-years to complete (October 2019).

Work on the Sovereign upgrades (refer items 11 and 12 in Section 2) are expected to be on the critical path for completion of all site works and define the 2-year construction period. Most of the other Modification 14 works will run in parallel and staged earlier and later in the program to manage work-site conflicts. Up to three contractors may be working on the site at any time.

3.2 Hours of Work

The assumed hours of construction, based on existing consent conditions (MP08_0098), will be:

- 0700 to 1730 Monday to Friday (inclusive)
- 0800 to 1500 Saturday
- No work on Sundays or Public Holidays

Additionally, approval is being sought to undertake internal, non-noise generating works, on a 24/7 basis.

3.3 Methodology

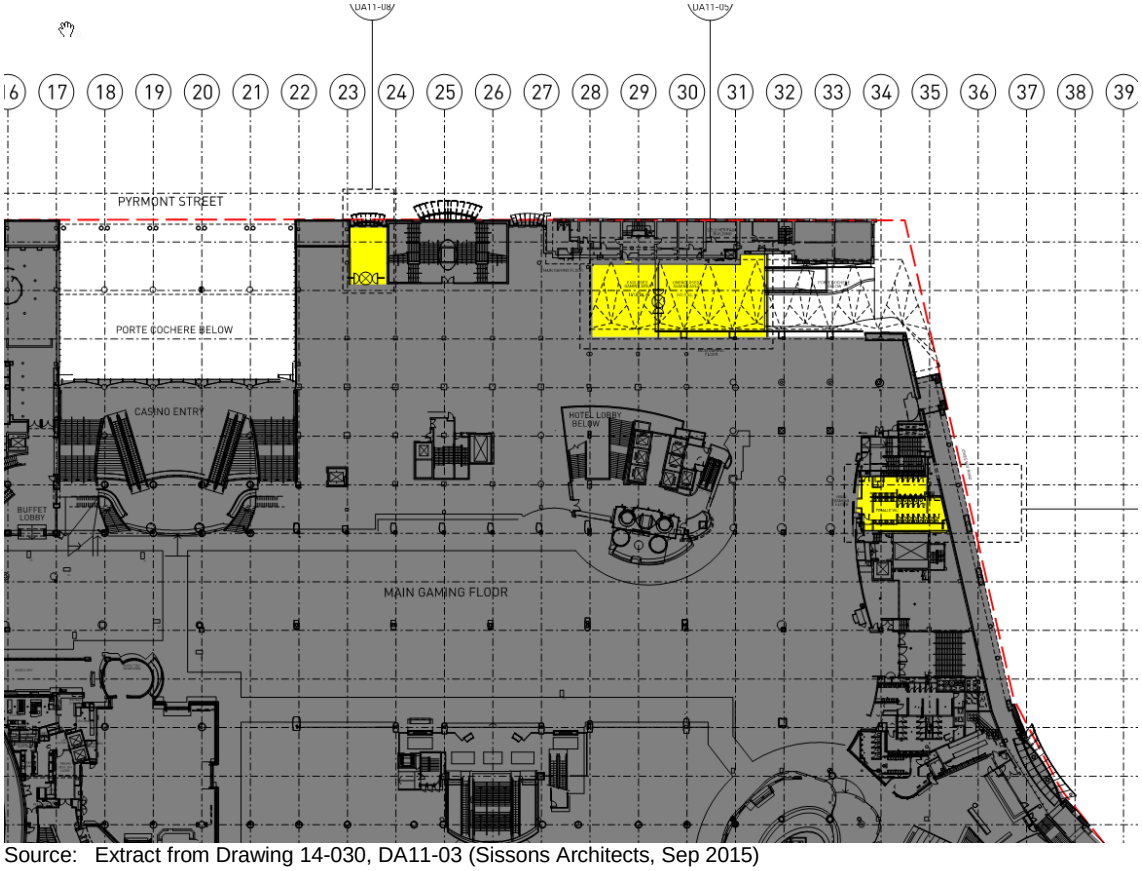
Current construction works associated with D2015/1515 will be completed before the commencement of Modification 14. The works currently being undertaken as part of that consent include:

- Alterations and additions to Level 01 including extension of gaming areas over the porte cochere adjacent to Jones Bay Road,
- Alterations to a section of the Pyrmont Street façade,
- Refurbishment of the adjacent gaming area, and
- Conversion of an existing plant room to toilet facilities.

Many of the construction practices that have worked successfully during D2015/1515 will be utilised for Modification 14, these include:

- Use of loading bays 5 and 6, in the Jones Bay Road loading dock, for some construction deliveries. A review of delivery data from March 2016 revealed that construction accounted for up to the 8% of the average weekday delivery movements through the dock and 20% of the average weekend delivery movements. The use of bays 5 and 6 has not impacted normal loading operations. On a typical weekday, the loading dock processes up to 20-25 pallets per hour (80% of estimated capacity) during the AM peak hour (0700-0800). Over the rest of the day deliveries drop significantly to less than 10 pallets per hour.
- Use of the existing crane mounted on the roof at the north-western end of the site
- Use of the existing Loading Zone along the eastern kerb of Pyrmont Street (Between Jones Bay Road and Edward Street)

Figure 1: Works Close to Completion as Part of D2015/1515



Source: Extract from Drawing 14-030, DA11-03 (Sissons Architects, Sep 2015)

In addition, the contractors will be seeking to establish a new tower crane position and off-road delivery site on the Pirrama Road promenade (where the taxi drop-off and pick-up area is currently located).

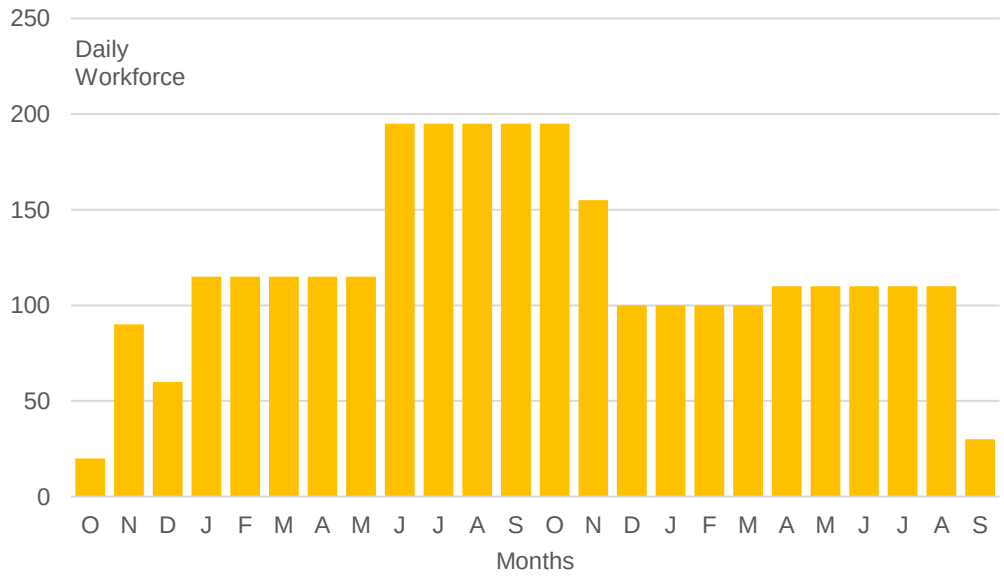
This crane, with 65 metre reach, will service the Sovereign, vertical transport drum and Heart of House construction areas (refer to items 3, 8, 9, 11, 12 and 13 in Section 2). The crane will be installed on a structural steel grillage founded on new piles and free stand on tower sections to a height such that it sits above the existing Pirrama Road ribbon structure at the main entry.

4 Construction Impacts

4.1 Construction Workforce Impacts

Although the works are expected to generate 915 construction jobs over the 2-year period of construction, the maximum number of workers on site on any day is expected to peak at 195. A profile of the average daily work-force on-site during the construction period is presented in Figure 2.

Figure 2: Average Daily Workforce

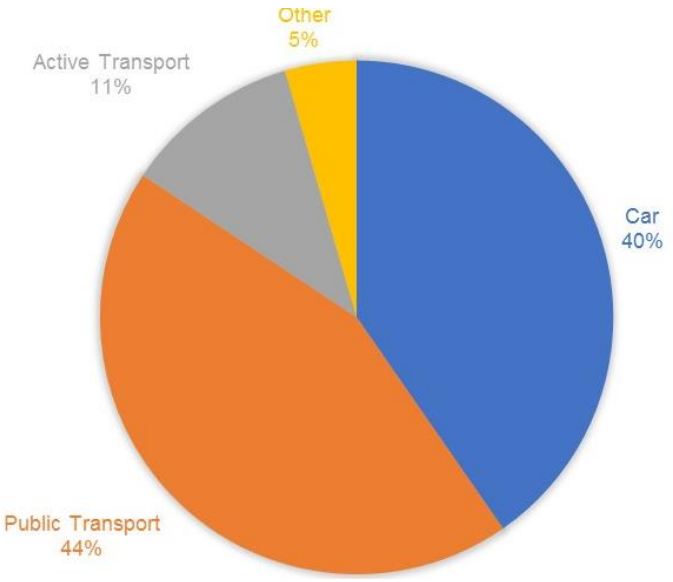


A review of 2011 Journey to Work Travel data[1] specific to labourers, technicians and trade workers travelling to the Pyrmont area[2], revealed that 36% travelled by car as driver. Up to 40% travelled by car as a driver or passenger (refer Figure 3). If the trends in this sample of 1,487 workers prevails, the construction workforce may generate up to 80 private vehicle trips. This represents a 16% increase in existing AM peak vehicle trips to/from the site and 9% increase in existing PM peak vehicle trips to/from the site.

[1] 2011JTW_Table05_V1.3

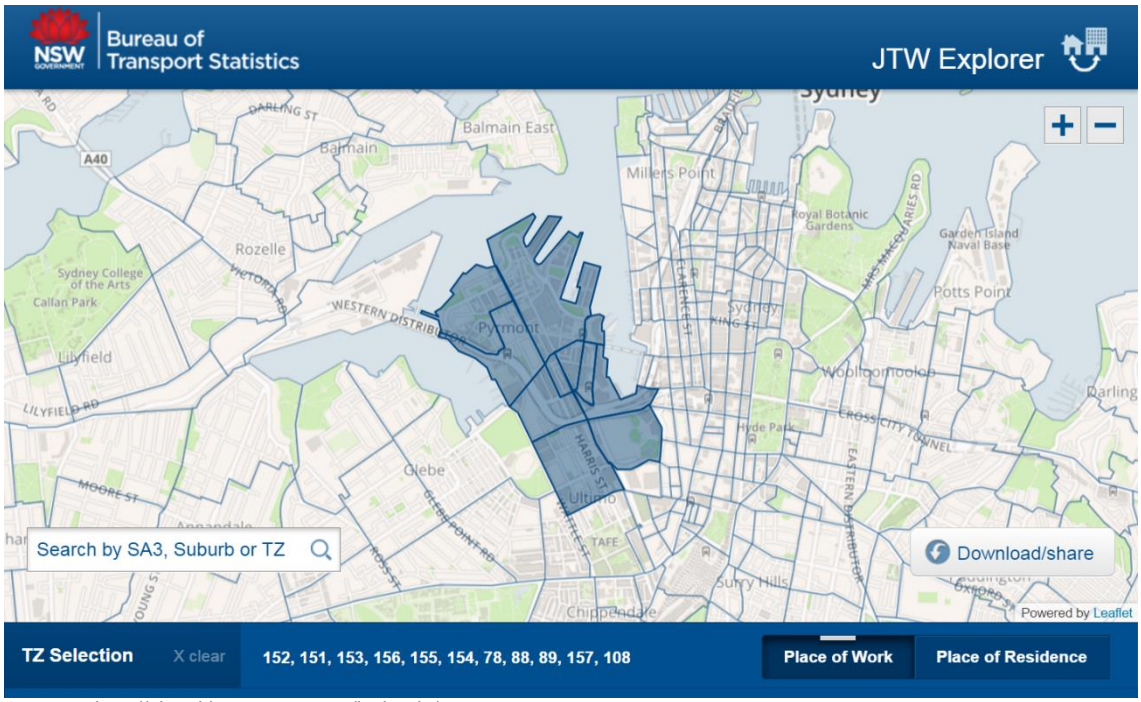
[2] Data for BTS Travel Zones 78, 88, 89, 108, 152-157 (refer Figure 4)

Figure 3: Travel Mode of Labourers, Technicians and Trade Workers Travelling to the Pyrmont Area



Source: 2011JTW_Table05_V1.3

Figure 4: Journey To Work Sample Area



Source: http://visual.bts.nsw.gov.au/jtwbasic/

4.2 Haulage Routes

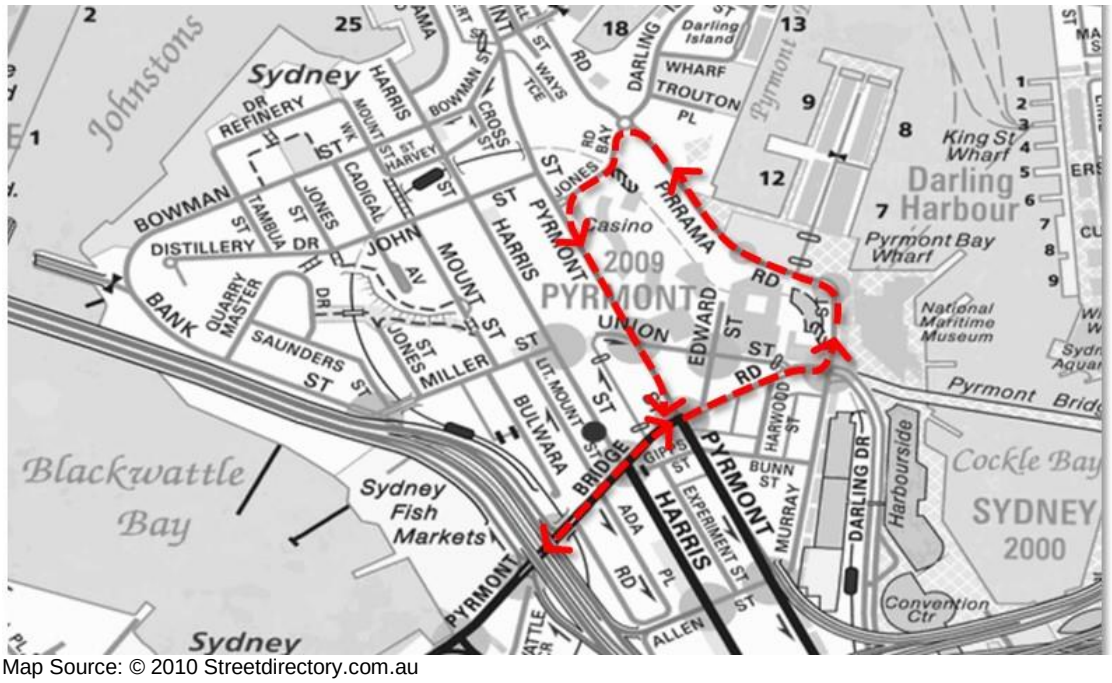
Construction deliveries to the site will be via the following routes outlined in Figure 5.

This route will provide access to the main delivery locations around the site:

- Pirrama Road (Forecourt)
- Jones Bay Road Loading Dock
- Pyrmont Street Loading Zone

This route will accommodate up to a 19m semi-trailer.

Figure 5: Proposed Haulage Routes



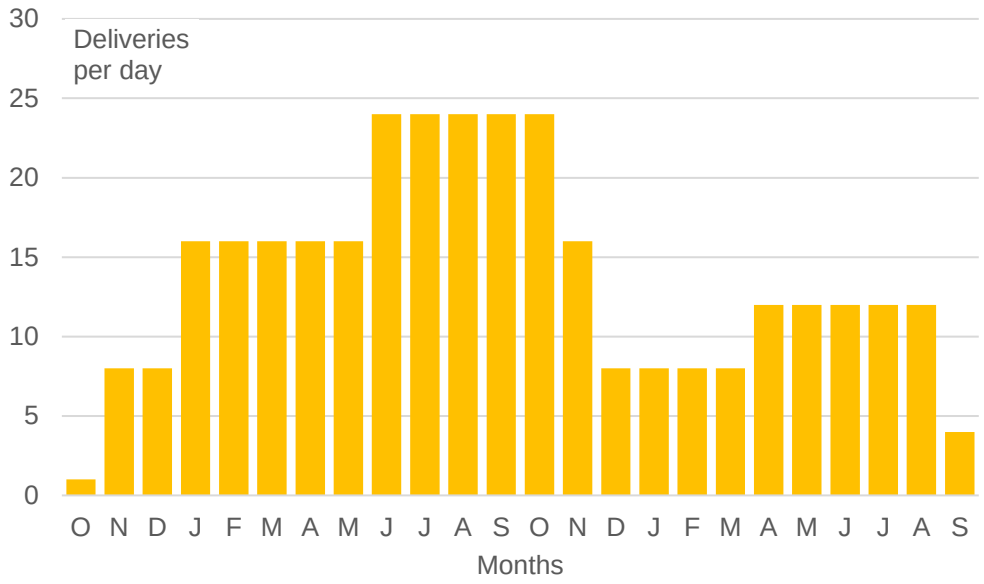
Map Source: © 2010 Streetdirectory.com.au

4.3 Construction Deliveries

The average of number of construction deliveries per day is expected to peak at 24 deliveries per day.

This is expected to be sustained for some 5 months during structural works and concrete pours associated with Sovereign upgrades. A profile of the average daily deliveries over the 2-year construction period is presented in Figure 6.

Figure 6: Average Number of Deliveries per day



4.4 Construction Traffic Impacts

The cumulative traffic impacts (workers and deliveries) on the critical intersections around the site is summarised in Table 1.

Table 1: Estimated traffic increase at adjacent intersections due to SEGL construction

Intersection	AM	PM
Pyrmont Street / Jones Bay Road	0%	0%
Pyrmont Street / Union Street	2%	2%
Pyrmont Street / Pyrmont Bridge Road	4%	4%
Pyrmont Bridge Road / Union Street	5%	4%
Pirrama Road / Star Car Park Entrance	7%	5%
Jones Bay Road / Pirrama Road	1%	1%
Union Street / Edward Street	13%	7%
Pyrmont Bridge Road / Murray Street	4%	3%

The performance of the surrounding road network, under the additional construction traffic (workers and deliveries), was assessed using SIDRA 6.1. The Level of Service (LOS) results of the SIDRA analysis are summarised in Table 2

Table 2: Estimated Road Network Performance During Construction (level of service)

Intersection	AM	PM
Pyrmont Street / Jones Bay Road	A	A
Pyrmont Street / Union Street	B	B
Pyrmont Street / Pyrmont Bridge Road	B	B
Pyrmont Bridge Road / Union Street	A	C
Pirrama Road / Star Car Park Entrance	A	A
Jones Bay Road / Pirrama Road	A	A
Union Street / Edward Street	B	C
Pyrmont Bridge Road / Murray Street	C	D

The SIDRA analysis indicates that the surrounding network will operate at existing or acceptable performance levels, despite the additional traffic associated with Modification 14 construction activity (refer Appendix A).

SEGL will allocate up to 100 on-site spaces for construction staff in its on-site car park. During business hours, The Star car-park is significantly underutilised and has sufficient capacity to accommodate this parking provision. However, to discourage car travel to the site, these spaces will be controlled using a booking system and parking above this threshold will be actively discouraged through on-site parking fees. Additionally, SEGL will continue to encourage construction workers to take advantage of the excellent public transport access in accordance with the strategies outlined in The Star Travel Plan.

4.5 Construction Zone (Pirrama Road)

An indicative arrangement for the proposed Pirrama Road forecourt crane and delivery site is presented in Figure 7.

The main impacts on pedestrian and vehicle access arrangements will include:

- Restriction of pedestrian access along the front of Pirrama Road construction zone. All pedestrians would be diverted west against the building to maintain access to existing escalators, lifts, light rail and relocated taxi zone. North-south access along Pirrama Road would be maintained always via this detour. Minimum walkway widths 3-4m will be maintained. Wayfinding will support the proposed pedestrian and taxi diversions
- Relocation of Taxis into service road during construction. This will provide significantly more off-road storage for taxis servicing the site (up to 12 additional spaces). Taxis will exit the service road at Pirrama Road, north of the Jones Bay Road roundabout. This will require suspension/changes to the existing boom-gate controlled access arrangements for the service road
- Relocation of Star Express buses further north along the service road
- An upgrade of pedestrian access arrangements along the service road from the light rail station up to its connection to Pirrama Road. Light rail users use this informal pedestrian route to access Pyrmont North (particularly during inclement weather). This upgrade is required due to increased traffic in the service road.
- Some SEGL tenants in the Pirrama Road forecourt may have to suspend al-fresco dining operations due to the proposed closures and pedestrian diversions. Hoardings will be provided to minimise impacts on these venues.
- Construction vehicle access in/out of the construction site will use the existing kerb crossings. Sliding gates would be provided on the entry and exit. All trucks will enter and exit the site in a forward direction
- No stopping restrictions along the front of the Pirrama Road construction site. All loading/unloading is within the site.
- The construction site will be protected with Class A hoardings, where adjacent to traffic, and Class B hoarding over the pedestrian access corridors
- Major special events such as the ‘Aria’ Awards may have to be suspended/ reorganised during the two-year construction period due to the constraints imposed by the proposed construction arrangements

Figure 7: Pirrama Road Forecourt Construction Zone

4.6 Construction Zone (Port Cochere)

The main construction activities that could impact on Port Cochere operations include:

- Realignment of Porte Cochere façade to accommodate expanded and upgraded Astral Lobby, upgraded Astral Lobby Bar and retail expansion and upgrades of the Main Casino Entry, including valet improvements to the Porte Cochere
- New luxury retail zone connecting from Astral Hotel Lobby out to Jones Bay Road.

SEGL will work with its Contractors to develop construction staging plans for the Port Cochere that maintain:

- Pedestrian access between the Port Cochere and the Astral lobby and Casino, always
- Valet parking services in the Port Cochere
- Taxi pick-up and set-down operations. The feeder ranks on Jones Bay Road will continue to operate during construction
- Class A hoarding protection for pedestrians/vehicles moving around all work-sites. The new facades and retail areas are set-back from the existing kerbs so erection of hoardings will not impact on adjacent parking/storage lanes (e.g. for valet and hire car parking). The existing hoarding protecting the new escalators installed as part of D2015/1515 illustrate how this will work.
- Taxi operations clear of hoardings to allow for safe passenger side entry/exit to taxis.
- Temporary construction loading zones in off-peak demand periods

SEGL will adopt the same construction traffic management strategies that were successfully implemented during construction of the recent D2015/1515 modifications to the Port Cochere. These strategies included:

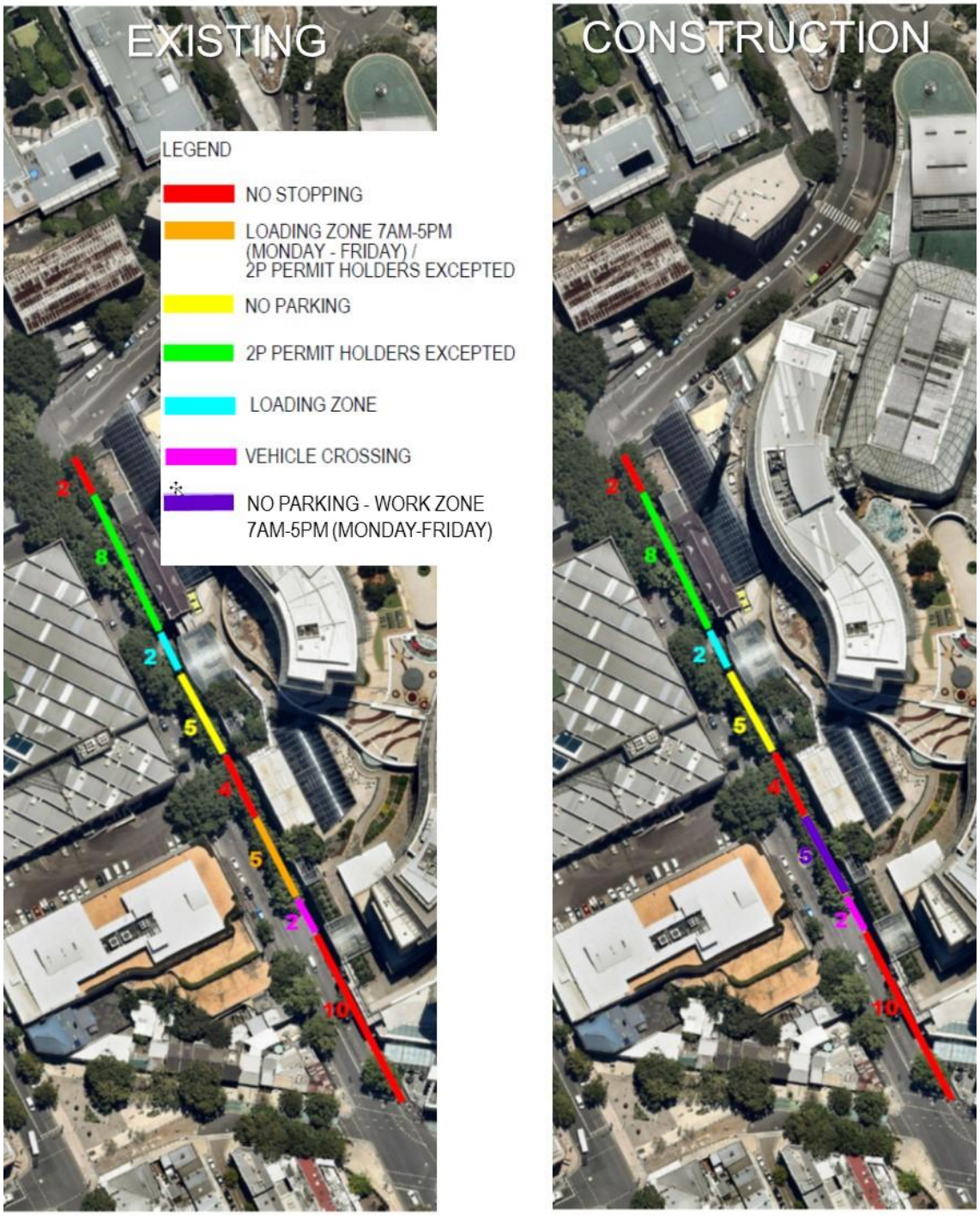
- Additional site supervision/security to enforce agreed traffic management practices (e.g. relating to Hire Car dwell times and drivers staying with their vehicles)
- Additional resourcing of valet services to speed up processing of valet parking to eliminate risk of vehicle stacking or queuing in the Port Cochere
- Additional site supervision to manage taxi operations (e.g. to reduce taxi dwell times in the Port Cochere.

4.7 Construction Zone (Pyrmont Street)

During construction of Modification 14, the following parking changes are proposed in Pyrmont Street:

- Convert the existing loading zone (5 spaces) at the south end of Pyrmont Street, close to the new relocated outdoor Sovereign Room, to a work zone. This will facilitate the removal of demolition material as well as assist the construction and fitout works. Hoardings and jersey kerbs will be installed to delineate between the road and the construction zone (refer Figure 8).

Figure 8: Construction Zone Parking (Pyrmont Street)



4.8 Impacts on Bus Services

The proposed Modification 14 construction activities are not expected to impact on bus services for the following reasons:

- The traffic analysis has demonstrated that the increased traffic due to construction (workers and deliveries) will not have any significant impact on the performance of the network used by existing bus services
- The proposed construction traffic arrangements do not impact on any bus zones
- The proposed relocation of taxis into the service road is expected to increase on-site taxi storage significantly and help reduce taxi queuing issues on Pirrama Road that have impacted on bus services

4.9 Impacts on Cyclists

The proposed construction activities are not expected to impact on cyclist for the following reasons:

- The proposed construction traffic arrangements do not impact on any cycle parking or cycle paths. Staff cycle parking facilities will be maintained on Level B2 throughout construction
- The proposed construction traffic arrangements maintain existing active transport access along the Pirrama Road entry to The Star
- The visitor cycle parking upgrades proposed in Modification 14, will be undertaken as early works, to improve visitor cycle parking opportunities during construction

4.10 Impacts of Other Developments

The CCO has identified the following developments that are planned or under construction near SEGL site:

- Harbourside Redevelopment (2018 to TBC)
- IMAX (now to 2019)
- The Ribbon (2017 to 2020)
- Cockle Bay Wharf (2018/19 to 2023)
- ICC Hotel (now to Q2 2017)
- Darling Square (now to 2019)
- Hay Street Redevelopment (2017 to 2019/20)
- Sydney Light Rail Zones 9-13 (Q3 2017 to 2019)

The Harbourside and Darling Square developments are the only planned developments likely to share the Pyrmont Bridge Road haulage route with The Star during construction. This will only impact on inbound movements passing through the intersection of Murray Street, Union Street and Pyrmont Bridge Road. On the return journey, The Star construction traffic bypasses this critical intersection.

All other projects planned or under construction are well removed from the proposed Modification 14 works, or will be completed when Modification 14 construction commences.

4.10.1 Harbourside

As of January 2017, this proposal is open for public exhibition with anticipated approval in December 2017.

The Site is located within Darling Harbour. It is bound by Pyrmont Bridge to the north, the Sydney International Convention, Exhibition and Entertainment Precinct (SICEEP) to the south, Darling Drive and the alignment of the Light Rail to the west and Cockle Bay to the east . The proposed redevelopment will include the following quantum of gross floor area (GFA):

- Residential 35,000 sqm
- Retail 52,000 sqm

During the period of construction, the access routes for this development will be via: Pyrmont Street, Pyrmont Bridge Road, Harris Street, Darling Drive and Harbour Street.

The main conflict area between haulage routes proposed under this development and the works proposed under Modification 14 for SEGL, will be at the intersection of Pyrmont Bridge Road and Murray Street (to the north) and Darling Drive (to the south). The Harbourside truck movements have been anticipated to be spread evenly throughout the construction programme, where it is estimated 3-4 trucks will enter and exit the site every hour over the duration of the development.

The Harbourside traffic impact assessment also identified that construction works would result in increased demand for adjacent parking facilities, such as the ICC and to a lesser extent SEGL, due to the displacement of some Harbourside customer parking during construction.

Figure 9: Other Development In Precinct

Source: CCO, January 2017

4.10.2 IMAX & The Ribbon

As of June 2014, this proposal has been approved by the DPE for construction. Demolition of the IMAX cinema site is underway now.

The subject site is in a prominent position within Darling Harbour along the western fringe of Sydney CBD. Occupying land between the two Western Distributor elevated roadways, the site of approximately 2,330sqm has a frontage primarily north facing to the pedestrian environment of Darling Harbour. The site is under the care and control of SHFA and is occupied by the IMAX Cinema, function centre and associated restaurants/ cafes. The proposed redevelopment will include:

- 403 luxury seat IMAX cinema
- Residential 17,280sqm
- Retail 5,470sqm

- 588 room six-star W Hotel 32,130sqm

During the period of construction, the access routes for this development will be via: Wheat Street, and Harbour Street. Construction traffic associated with this development is not expected to conflict with Modification 14 construction traffic.

4.10.3 Cockle Bay Wharf

As of January 2017, this proposal is open for public exhibition.

The proposed redevelopment will include the following quantum of gross floor area (GFA):

- Commercial 85,000sqm
- Retail 25,000sqm
- Public Domain 12,000sqm

Cockle Bay Wharf is located on the eastern side of Darling Harbour. The proposed redevelopment will not affect the works proposed under Modification 14 for SEGL. During the period of construction, the access routes for this development will be via: Harbour Street, Wheat Road; and Western Distributor (where northbound traffic will be diverted via King Street).

Access to the site is available from Harbour Street via Wheat Road. Wheat Road passes through the site in a northerly direction and Harbour Street is located adjacent to the eastern boundary of the site.

The proposed redevelopment will include an extension of the development over the northbound and southbound carriageways of the Western Distributor and the diversion of Wheat Road through the site.

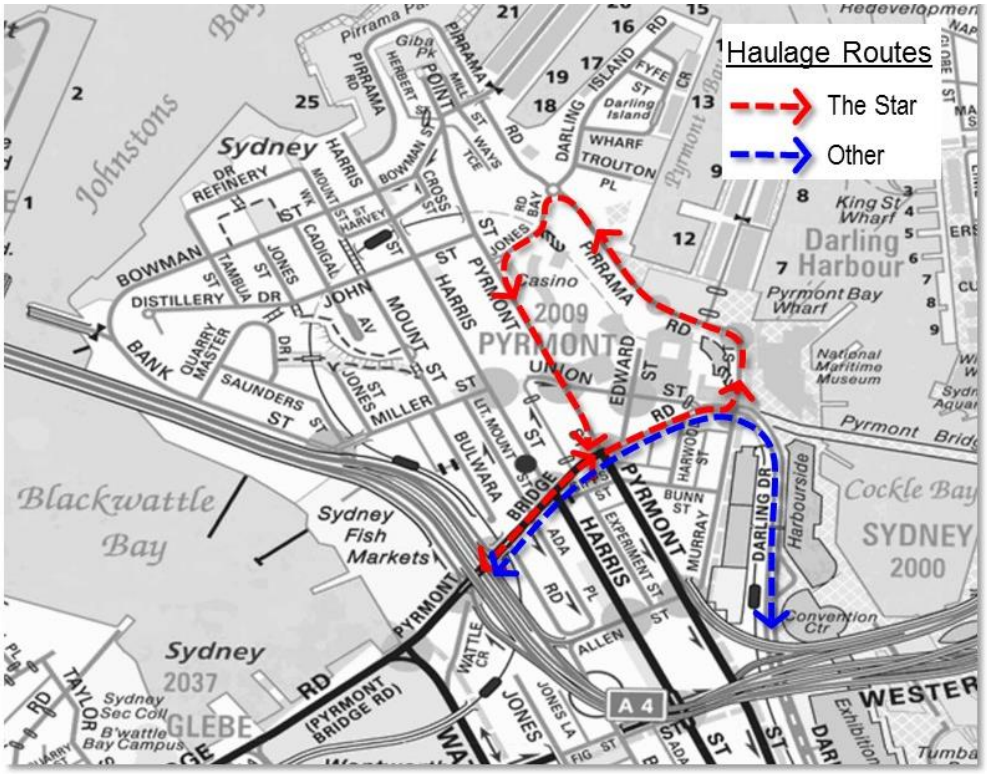
4.10.4 Darling Square

As of January 2017, this proponent is responding to submissions from the DPE planning approval assessment process.

The Darling Square Site is, located in the south of the SICEEP Site, within the northern portion of the suburb of Haymarket. Bounded by the Powerhouse Museum to the west, the Pier Street overpass and Little Pier Street to the north, Harbour Street to the east, and Hay Street to the south; and has is irregular in shape and occupies an area of approximately 37,700sqm. At completion, this development will add an additional 400 public car spaces.

Construction traffic associated with this development is 3-4 trucks per hour spread evenly throughout the construction programme. The main conflict points with the Modification 14 haulage routes will be trucks entering/exiting the darling square site via Darling Drive and Pyrmont Bridge Road. SEGL has mitigated its potential impacts on this intersection through the choice of haulage route which avoids the intersection on the outbound journey.

Figure 10: Summary of Pyrmont Haulage Routes



Map Source: © 2010 Streetdirectory.com.au

4.11 Conclusion

The proposed Modification 14 pedestrian and traffic planning during construction has been reviewed in the context of the wider CCO advised approved or proposed construction activities in the Pyrmont precinct. No adverse pedestrian or traffic impacts are anticipated during construction of Modification 14.

Appendices

A. SIDRA Analysis 22

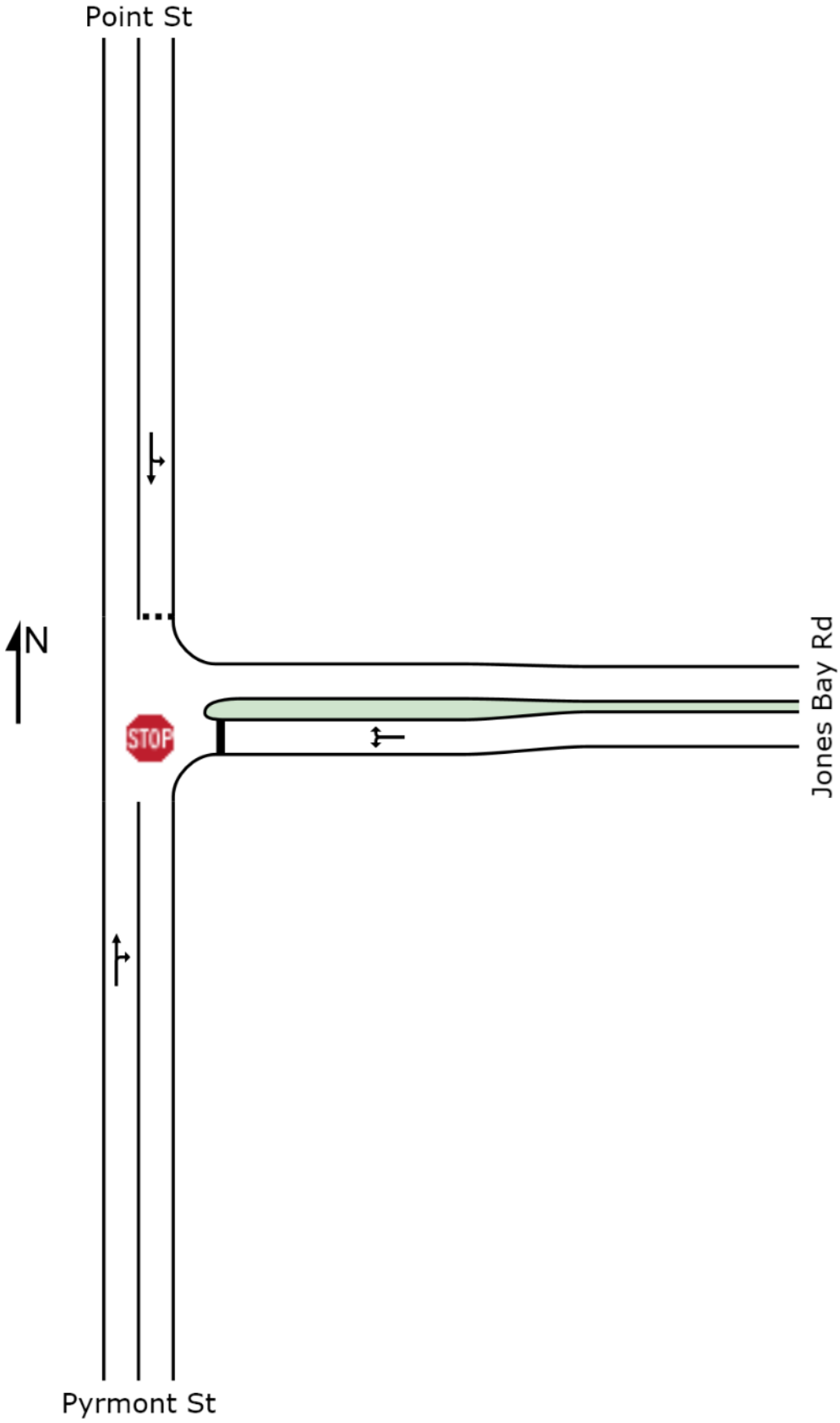
A. SIDRA Analysis

		AM Peak				PM Peak			
Ref.	Intersection	DoS	LOS	Avg. Delay (s)	95% Back of Queue (m)	DoS	LOS	Avg. Delay (s)	95% Back of Queue (m)
1	Pyrmont Street / Jones Bay Road	0.155	A	9.4	4.8	0.274	A	9.3	8.9
2	Pyrmont Street / Union Street	0.359	B	21.1	71.7	0.427	B	22.3	87.4
3	Pyrmont Street / Pyrmont Bridge Road	0.87	B	25.6	96.3	0.622	B	26.4	85.8
4	Pyrmont Bridge Road / Union Street	0.106	A	5.4	0.8	0.191	C	34	27.4
5	Pirrama Road / Star Car Park Entrance	0.178	A	5	7.8	0.439	A	13.1	36.9
6	Jones Bay Road / Pirrama Road	0.225	A	11.2	8.5	0.386	A	11.5	15.7
7	Union Street / Edward Street	0.239	B	27.7	41	0.268	C	31.2	44.4
8	Pyrmont Bridge Road / Murray Street	0.87	C	36	75.4	1.105	D	52.1	113.6

SITE LAYOUT

Site: AM Pyrmont St/Jones Bay Rd

No Project
Stop (Two-Way)



MOVEMENT SUMMARY

Site: AM Pyrmont St/Jones Bay Rd

Network: AM Star Casino Network

No Project
Stop (Two-Way)

Movement Performance - Vehicles

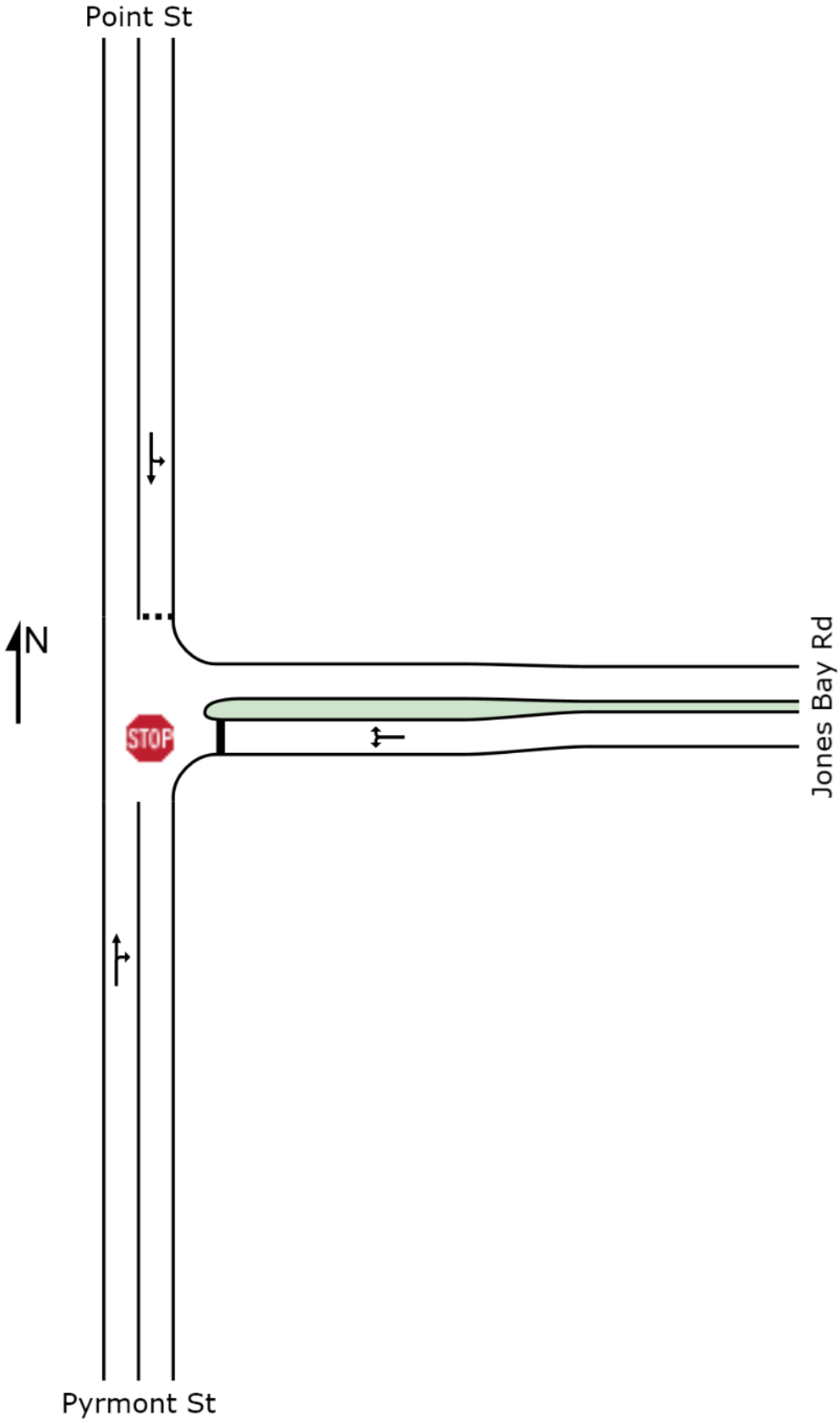
Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Pyrmont St													
2	T1	42	4.8	42	4.8	0.112	0.0	LOS A	0.0	0.0	0.00	0.45	42.0
3	R2	162	4.3	162	4.3	0.112	4.6	LOS A	0.0	0.0	0.00	0.45	40.7
Approach		204	4.4	204	4.4	0.112	3.7	NA	0.0	0.0	0.00	0.45	41.0
East: Jones Bay Rd													
4	L2	135	6.7	135	6.7	0.155	8.4	LOS A	0.6	4.7	0.29	0.90	29.5
6	R2	32	3.1	32	3.1	0.155	9.4	LOS A	0.6	4.7	0.29	0.90	25.6
Approach		167	6.0	167	6.0	0.155	8.6	LOS A	0.6	4.7	0.29	0.90	28.5
North: Point St													
7	L2	54	3.7	54	3.7	0.154	4.2	LOS A	0.7	4.8	0.28	0.49	26.8
8	T1	150	0.0	150	0.0	0.154	3.0	LOS A	0.7	4.8	0.28	0.49	26.8
Approach		204	1.0	204	1.0	0.154	3.3	LOS A	0.7	4.8	0.28	0.49	26.8
All Vehicles		575	3.7	575	3.7	0.155	5.0	NA	0.7	4.8	0.19	0.59	33.8

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

SITE LAYOUT

Site: PM Pyrmont St/Jones Bay Rd

No Project
Stop (Two-Way)



MOVEMENT SUMMARY

Site: PM Pyrmont St/Jones Bay Rd

Network: PM Star Casino Network

No Project
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Pyrmont St													
2	T1	107	0.9	107	0.9	0.122	0.0	LOS A	0.0	0.0	0.00	0.30	44.3
3	R2	123	0.8	123	0.8	0.122	4.6	LOS A	0.0	0.0	0.00	0.30	43.3
Approach		230	0.9	230	0.9	0.122	2.4	NA	0.0	0.0	0.00	0.30	43.8
East: Jones Bay Rd													
4	L2	244	1.2	241	1.2	0.274	8.0	LOS A	1.3	8.9	0.25	0.90	29.5
6	R2	72	0.0	71	0.0	0.274	9.3	LOS A	1.3	8.9	0.25	0.90	25.6
Approach		316	0.9	312[N1]	1.0	0.274	8.3	LOS A	1.3	8.9	0.25	0.90	28.3
North: Point St													
7	L2	40	0.0	40	0.0	0.103	4.0	LOS A	0.4	3.1	0.25	0.48	27.0
8	T1	99	1.0	99	1.0	0.103	2.9	LOS A	0.4	3.1	0.25	0.48	27.0
Approach		139	0.7	139	0.7	0.103	3.2	LOS A	0.4	3.1	0.25	0.48	27.0
All Vehicles		685	0.9	681[N1]	0.9	0.274	5.3	NA	1.3	8.9	0.17	0.61	34.0

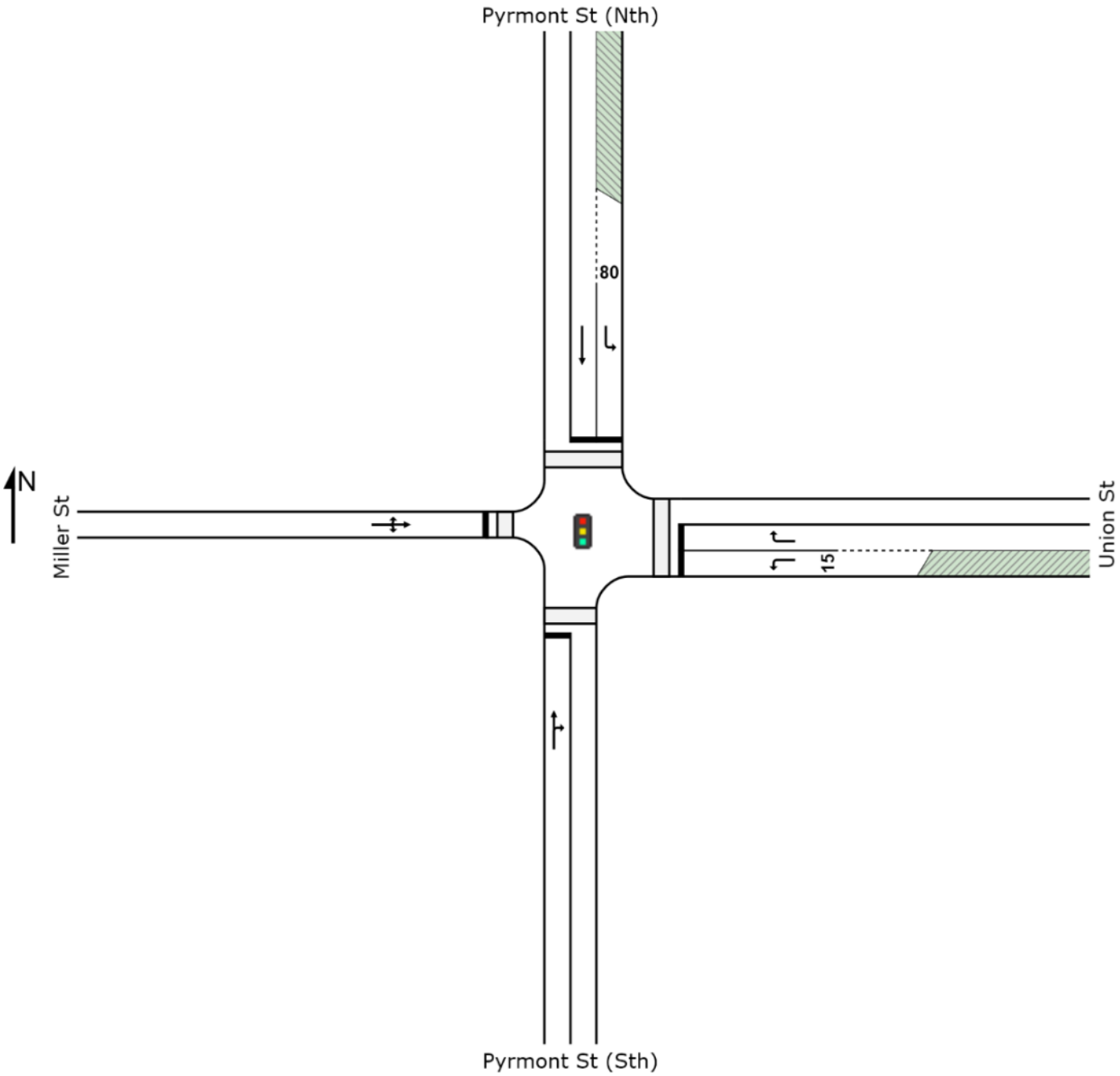
Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control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

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

SITE LAYOUT

Site: AM Pyrmont St/Union St

No Project
Signals - Fixed Time Isolated



MOVEMENT SUMMARY

Site: AM Pyrmont St/Union St

Network: AM Star Casino Network

No Project
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Pyrmont St (Sth)													
2	T1	197	5.1	197	5.1	0.307	15.2	LOS B	5.2	38.2	0.50	0.46	17.0
3	R2	30	10.0	30	10.0	0.307	19.9	LOS B	5.2	38.2	0.50	0.46	17.0
Approach		227	5.7	227	5.7	0.307	15.9	LOS B	5.2	38.2	0.50	0.46	17.0
East: Union St													
4	L2	41	4.9	41	4.9	0.190	53.6	LOS D	2.0	14.8	1.00	0.74	4.9
6	R2	11	9.1	11	9.1	0.042	50.2	LOS D	0.5	4.0	1.00	0.69	5.0
Approach		52	5.8	52	5.8	0.190	52.9	LOS D	2.0	14.8	1.00	0.73	4.9
North: Pyrmont St (Nth)													
7	L2	25	4.0	25	4.0	0.021	11.1	LOS A	0.4	3.0	0.37	0.61	29.8
8	T1	319	4.7	319	4.7	0.359	18.0	LOS B	9.8	71.7	0.68	0.59	23.6
Approach		344	4.7	344	4.7	0.359	17.5	LOS B	9.8	71.7	0.66	0.59	23.9
West: Miller St													
10	L2	4	0.0	4	0.0	0.124	39.8	LOS C	1.7	12.3	0.86	0.70	4.0
11	T1	14	0.0	14	0.0	0.124	36.6	LOS C	1.7	12.3	0.86	0.70	4.0
12	R2	24	4.2	24	4.2	0.124	40.0	LOS C	1.7	12.3	0.86	0.70	4.0
Approach		42	2.4	42	2.4	0.124	38.9	LOS C	1.7	12.3	0.86	0.70	4.0
All Vehicles		665	5.0	665	5.0	0.359	21.1	LOS B	9.8	71.7	0.64	0.56	17.9

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	98	44.4	LOS E	0.3	0.3	0.94	0.94
P2	East Full Crossing	61	21.2	LOS C	0.1	0.1	0.65	0.65
P3	North Full Crossing	921	43.1	LOS E	2.5	2.5	0.95	0.95
P4	West Full Crossing	62	16.3	LOS B	0.1	0.1	0.57	0.57
All Pedestrians		1142	40.5	LOS E			0.91	0.91

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

PHASING SUMMARY

Site: AM Pyrmont St/Union St

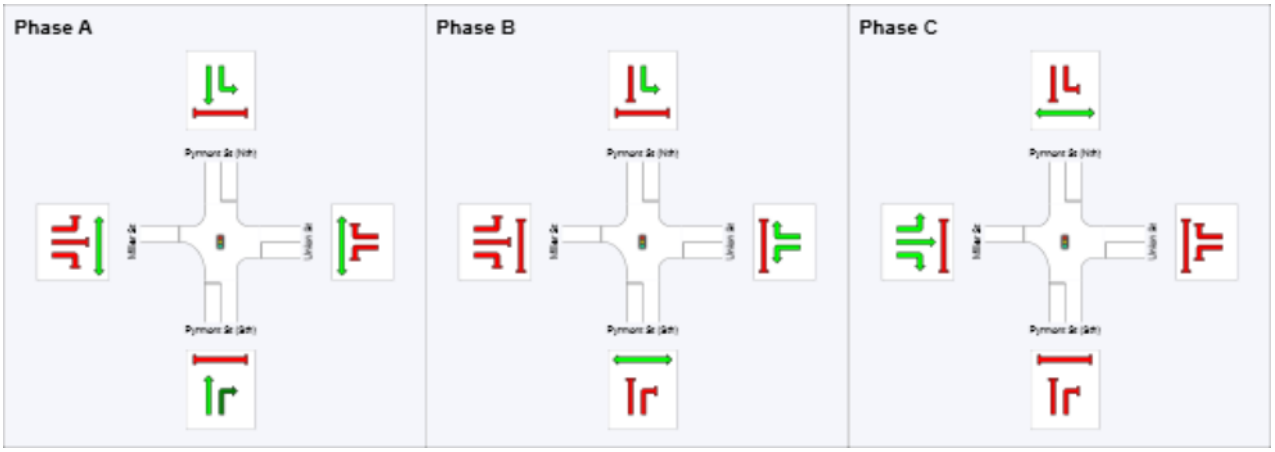
Network: AM Star Casino Network

No Project
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network Cycle Time)

Phase times specified by the user
Sequence: Existing Phasing - AM
Movement Class: All Movement Classes
Input Sequence: A, B, C
Output Sequence: A, B, C

Phase Timing Results

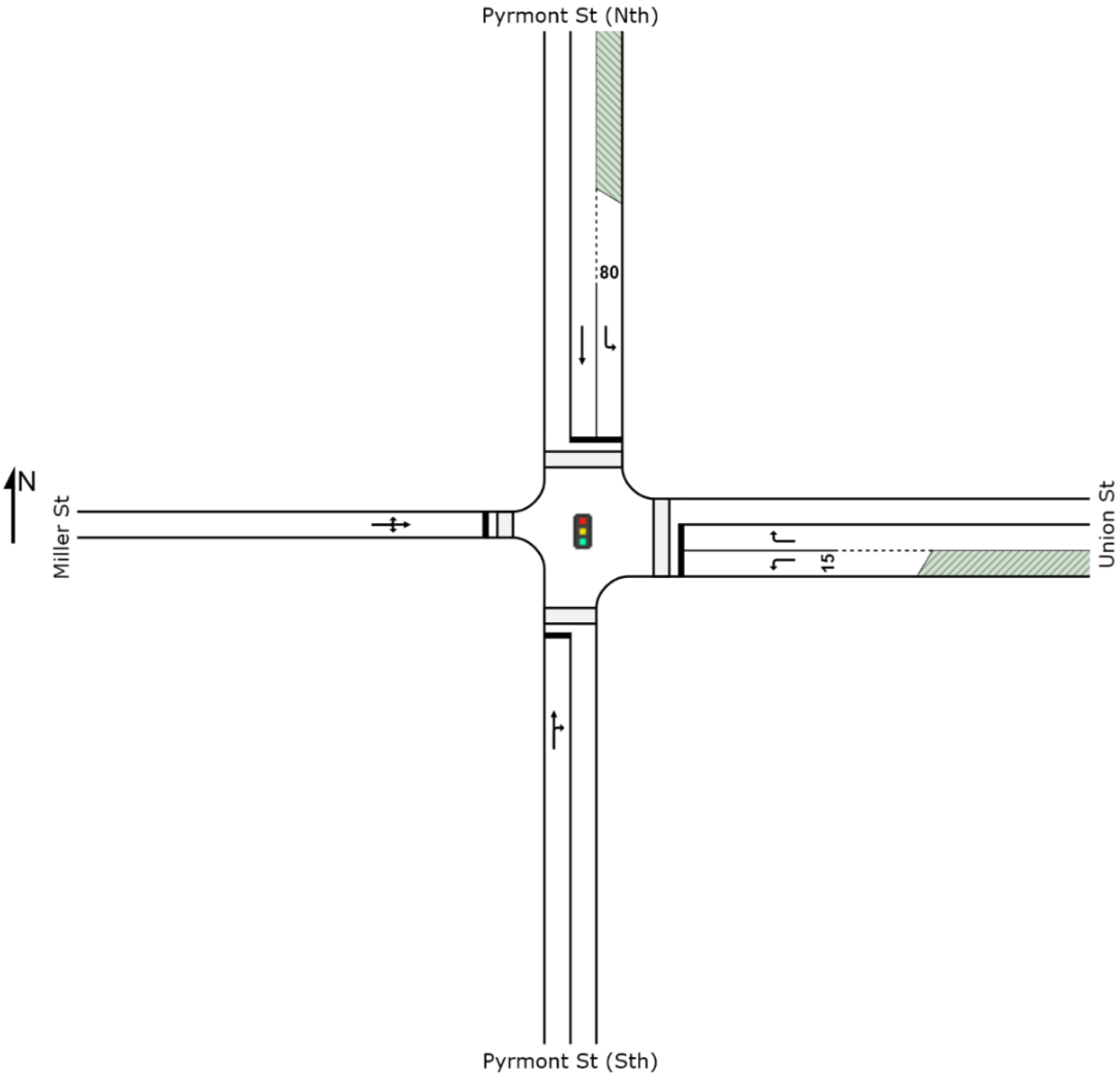
Phase	A	B	C
Reference Phase	Yes	No	No
Phase Change Time (sec)	0	53	74
Green Time (sec)	47	15	20
Yellow Time (sec)	4	4	4
All-Red Time (sec)	2	2	2
Phase Time (sec)	53	21	26
Phase Split	53 %	21 %	26 %



SITE LAYOUT

Site: PM Pyrmont St/Union St

No Project
Signals - Fixed Time Isolated



MOVEMENT SUMMARY

Site: PM Pyrmont St/Union St

Network: PM Star Casino Network

No Project
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Pyrmont St (Sth)													
2	T1	189	1.6	189	1.6	0.390	8.2	LOS A	3.6	25.5	0.32	0.36	23.5
3	R2	53	0.0	53	0.0	0.390	12.8	LOS A	3.6	25.5	0.32	0.36	23.5
Approach		242	1.2	242	1.2	0.390	9.2	LOS A	3.6	25.5	0.32	0.36	23.5
East: Union St													
4	L2	98	0.0	98	0.0	0.406	53.9	LOS D	4.9	34.1	1.00	0.78	4.9
6	R2	37	0.0	37	0.0	0.105	48.5	LOS D	1.8	12.5	1.00	0.74	5.2
Approach		135	0.0	135	0.0	0.406	52.5	LOS D	4.9	34.1	1.00	0.77	4.9
North: Pyrmont St (Nth)													
7	L2	59	0.0	59	0.0	0.046	10.1	LOS A	0.9	6.4	0.35	0.62	30.8
8	T1	383	1.0	380	1.0	0.427	19.4	LOS B	12.4	87.4	0.72	0.63	22.7
Approach		442	0.9	439[N1]	0.9	0.427	18.1	LOS B	12.4	87.4	0.67	0.62	23.5
West: Miller St													
10	L2	6	0.0	6	0.0	0.152	42.8	LOS D	1.9	13.5	0.90	0.73	3.6
11	T1	5	0.0	5	0.0	0.152	39.6	LOS C	1.9	13.5	0.90	0.73	3.6
12	R2	34	0.0	34	0.0	0.152	43.0	LOS D	1.9	13.5	0.90	0.73	3.6
Approach		45	0.0	45	0.0	0.152	42.6	LOS D	1.9	13.5	0.90	0.73	3.6
All Vehicles		864	0.8	861[N1]	0.8	0.427	22.3	LOS B	12.4	87.4	0.64	0.58	17.1

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	96	41.6	LOS E	0.2	0.2	0.91	0.91
P2	East Full Crossing	61	21.8	LOS C	0.1	0.1	0.66	0.66
P3	North Full Crossing	674	45.5	LOS E	1.9	1.9	0.97	0.97
P4	West Full Crossing	48	16.9	LOS B	0.1	0.1	0.58	0.58
All Pedestrians		879	41.8	LOS E			0.92	0.92

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

PHASING SUMMARY

Site: PM Pyrmont St/Union St

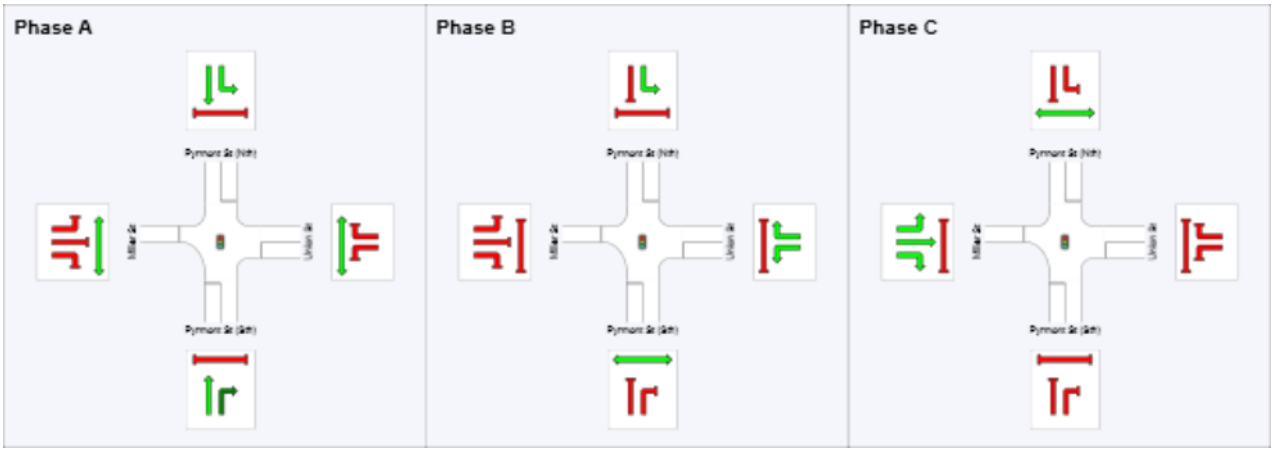
Network: PM Star Casino Network

No Project
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network Cycle Time)

Phase times specified by the user
Sequence: Existing Phasing - AM
Movement Class: All Movement Classes
Input Sequence: A, B, C
Output Sequence: A, B, C

Phase Timing Results

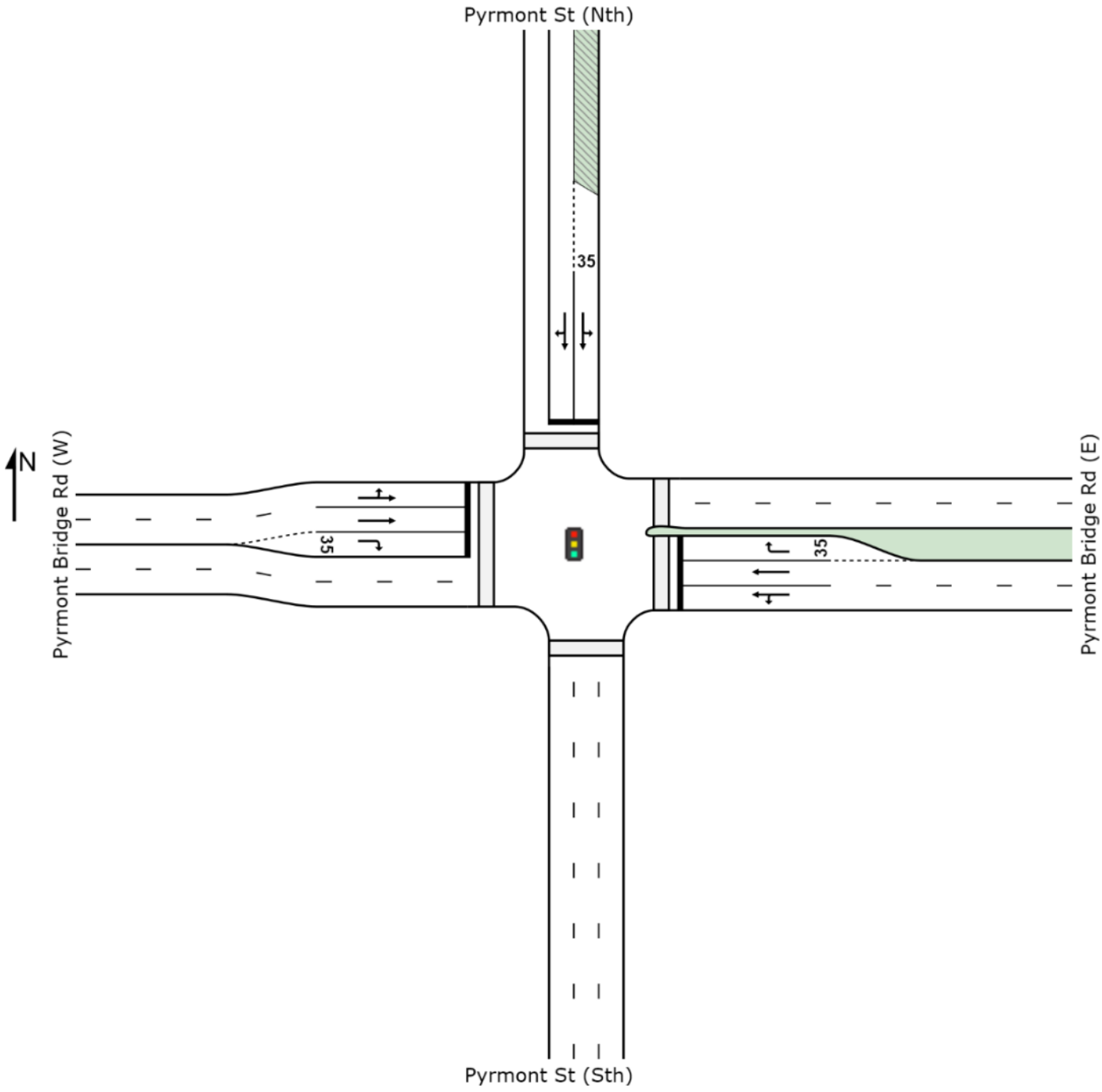
Phase	A	B	C
Reference Phase	Yes	No	No
Phase Change Time (sec)	0	52	77
Green Time (sec)	46	19	17
Yellow Time (sec)	4	4	4
All-Red Time (sec)	2	2	2
Phase Time (sec)	52	25	23
Phase Split	52 %	25 %	23 %



SITE LAYOUT

Site: AM Pyrmont St/Pyrmont Bridge Rd

No Project
Signals - Fixed Time Coordinated



Organisation: MOTT MACDONALD | Created: 25 January 2017 13:58:01
Project: P:\Sydney\Projects\35xxxx\358488\04 Working\06 Traffic\MOD 14\SIDRA\170125 2017 With Construction Traffic.sip6

MOVEMENT SUMMARY

Site: AM Pyrmont St/Pyrmont Bridge Rd

Network: AM Star Casino Network

No Project
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Pyrmont Bridge Rd (E)													
4	L2	26	19.2	26	19.2	0.337	45.1	LOS D	4.2	32.7	0.88	0.71	10.7
5	T1	196	11.7	196	11.7	0.337	38.7	LOS C	4.9	37.7	0.86	0.69	13.6
6	R2	38	5.3	38	5.3	0.160	41.3	LOS C	1.5	10.7	0.80	0.71	9.3
Approach		260	11.5	260	11.5	0.337	39.7	LOS C	4.9	37.7	0.85	0.70	12.7
North: Pyrmont St (Nth)													
7	L2	2	0.0	2	0.0	0.870	59.1	LOS E	11.7	84.9	1.00	0.93	6.8
8	T1	255	3.9	255	3.9	0.870	54.6	LOS D	11.7	84.9	1.00	0.94	8.4
9	R2	130	6.9	130	6.9	0.870	60.2	LOS E	9.0	66.6	1.00	0.96	8.9
Approach		387	4.9	387	4.9	0.870	56.5	LOS E	11.7	84.9	1.00	0.95	8.6
West: Pyrmont Bridge Rd (W)													
10	L2	195	4.6	195	4.6	0.316	9.7	LOS A	4.1	30.3	0.30	0.48	22.5
11	T1	562	6.8	562	6.8	0.316	1.9	LOS A	4.1	30.3	0.12	0.16	35.6
12	R2	472	2.3	472	2.3	0.852	27.2	LOS B	13.5	96.3	0.86	0.89	11.6
Approach		1229	4.7	1229	4.7	0.852	12.9	LOS A	13.5	96.3	0.44	0.49	17.5
All Vehicles		1876	5.7	1876	5.7	0.870	25.6	LOS B	13.5	96.3	0.61	0.61	12.9

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	189	44.5	LOS E	0.5	0.5	0.95	0.95
P2	East Full Crossing	66	44.3	LOS E	0.2	0.2	0.94	0.94
P3	North Full Crossing	415	41.2	LOS E	1.1	1.1	0.92	0.92
P4	West Full Crossing	105	44.4	LOS E	0.3	0.3	0.94	0.94
All Pedestrians		776	42.7	LOS E			0.93	0.93

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

PHASING SUMMARY

Site: AM Pyrmont St/Pyrmont Bridge Rd

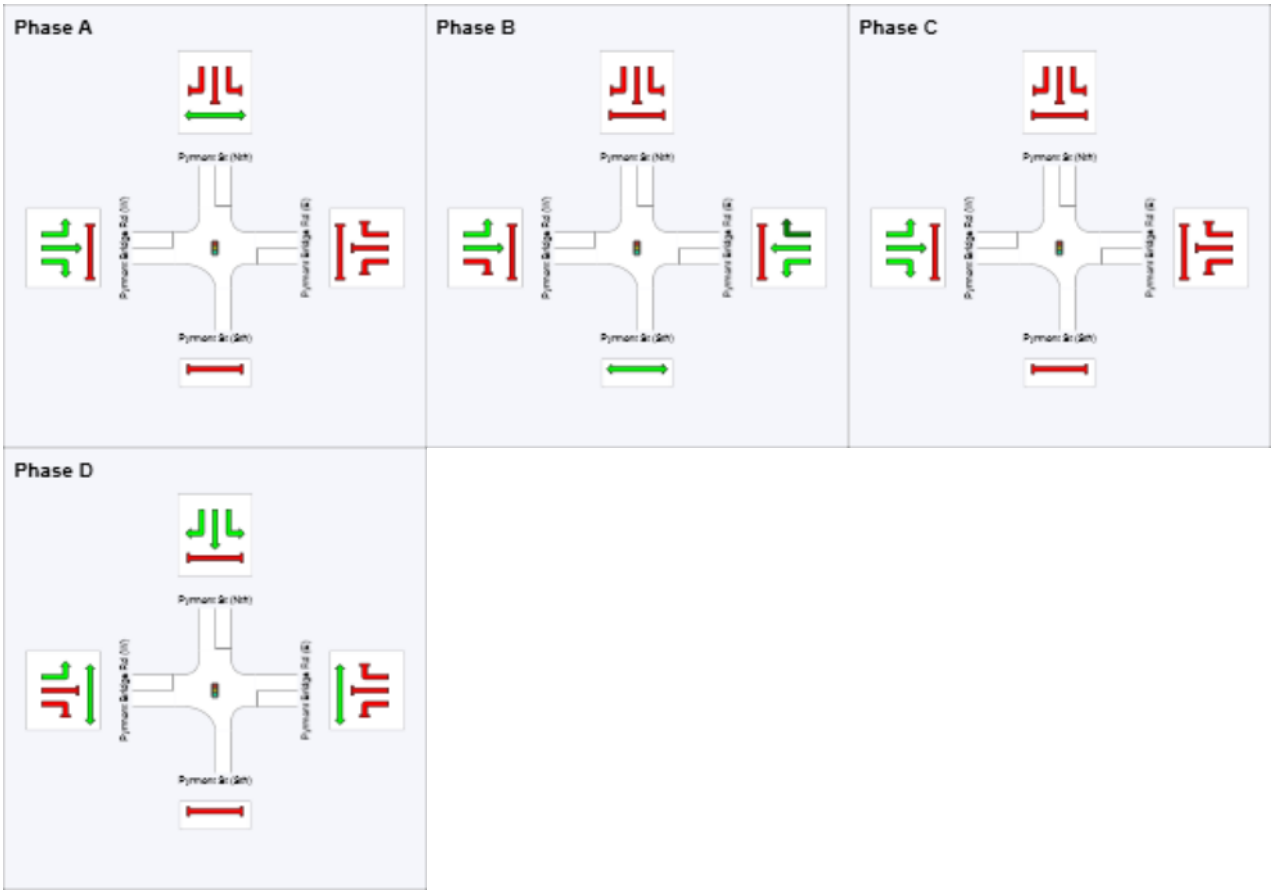
Network: AM Star Casino Network

No Project
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network Cycle Time)

Phase times specified by the user
Sequence: Existing Phasing - AM
Movement Class: All Movement Classes
Input Sequence: A, B, C, D
Output Sequence: A, B, C, D

Phase Timing Results

Phase	A	B	C	D
Reference Phase	Yes	No	No	No
Phase Change Time (sec)	0	25	51	78
Green Time (sec)	19	20	21	16
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	25	26	27	22
Phase Split	25 %	26 %	27 %	22 %

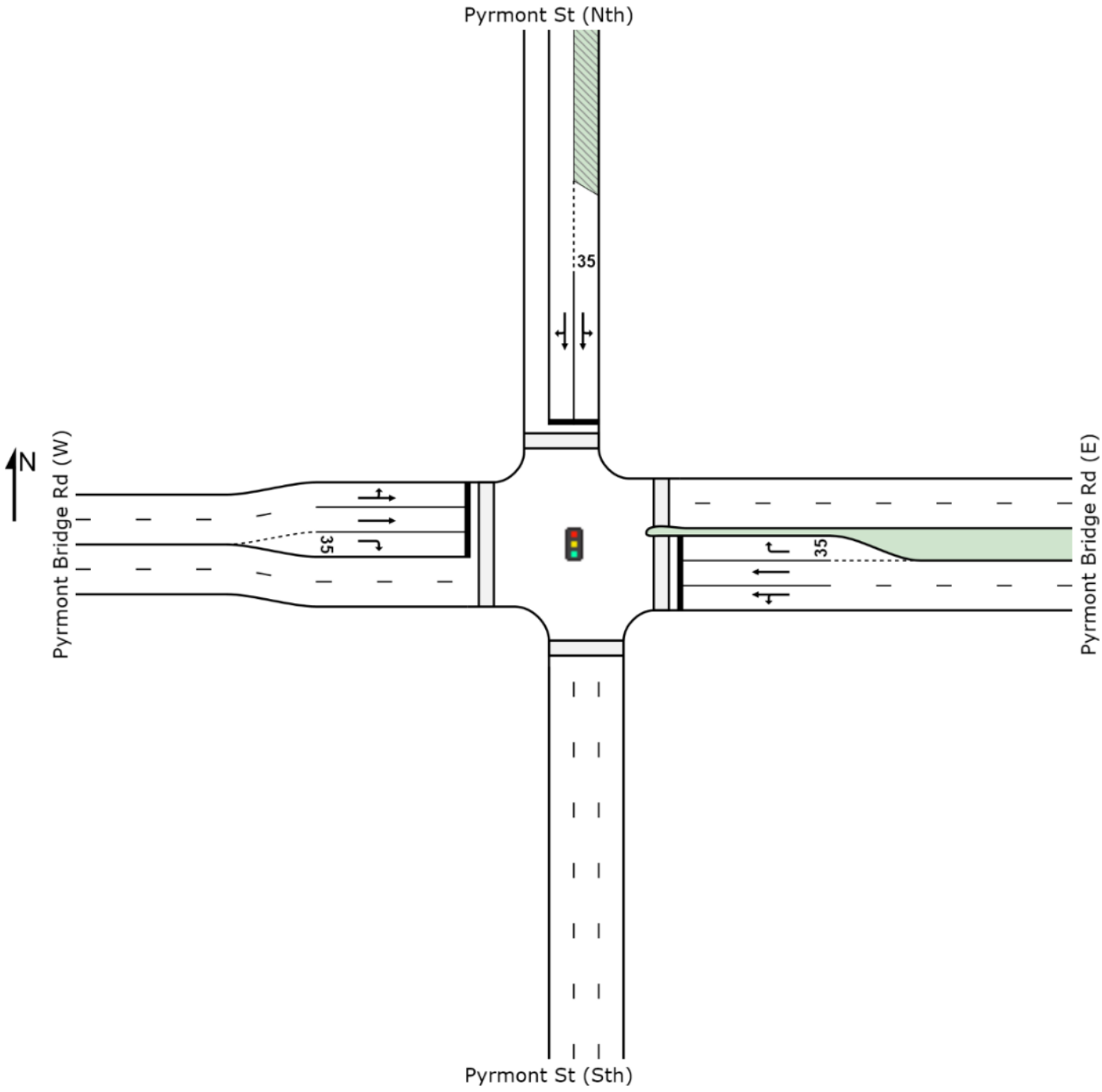


Normal Movement
Permitted/Opposed
Slip/Bypass-Lane Movement
Opposed Slip/Bypass-Lane
Stopped Movement
Turn On Red
Other Movement Class Running
Other Movement Class Stopped
Mixed Running & Stopped Movement Classes
Undetected Movement
Phase Transition Applied

SITE LAYOUT

Site: PM Pyrmont St/Pyrmont Bridge Rd

No Project
Signals - Fixed Time Coordinated



MOVEMENT SUMMARY

Site: PM Pyrmont St/Pyrmont Bridge Rd

Network: PM Star Casino Network

No Project
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Pyrmont Bridge Rd (E)													
4	L2	43	0.0	43	0.0	0.574	46.8	LOS D	8.3	58.6	0.94	0.77	10.4
5	T1	359	1.4	359	1.4	0.574	40.6	LOS C	9.2	65.5	0.92	0.76	13.2
6	R2	84	2.4	84	2.4	0.346	43.8	LOS D	3.5	24.9	0.86	0.76	8.8
Approach		486	1.4	486	1.4	0.574	41.7	LOS C	9.2	65.5	0.91	0.76	12.2
North: Pyrmont St (Nth)													
7	L2	6	0.0	6	0.0	0.622	35.2	LOS C	12.2	85.8	0.91	0.77	10.9
8	T1	306	0.7	304	0.7	0.622	31.0	LOS C	12.2	85.8	0.91	0.77	13.1
9	R2	211	0.5	210	0.5	0.622	40.8	LOS C	10.3	72.5	0.96	0.82	11.8
Approach		523	0.6	520 N1	0.6	0.622	35.0	LOS C	12.2	85.8	0.93	0.79	12.5
West: Pyrmont Bridge Rd (W)													
10	L2	171	0.6	171	0.6	0.376	17.5	LOS B	7.2	50.8	0.53	0.58	14.7
11	T1	560	1.1	560	1.1	0.376	9.3	LOS A	7.2	50.8	0.41	0.39	19.5
12	R2	257	0.0	257	0.0	0.554	23.4	LOS B	6.5	45.2	0.92	0.81	12.9
Approach		988	0.7	988	0.7	0.554	14.4	LOS A	7.2	50.8	0.56	0.53	16.0
All Vehicles		1997	0.9	1994 N1	0.9	0.622	26.4	LOS B	12.2	85.8	0.74	0.65	13.4

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	160	44.5	LOS E	0.4	0.4	0.95	0.95
P2	East Full Crossing	134	33.8	LOS D	0.3	0.3	0.82	0.82
P3	North Full Crossing	278	42.8	LOS E	0.7	0.7	0.93	0.93
P4	West Full Crossing	72	32.1	LOS D	0.2	0.2	0.80	0.80
All Pedestrians		643	40.2	LOS E			0.90	0.90

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

PHASING SUMMARY

Site: PM Pyrmont St/Pyrmont Bridge Rd

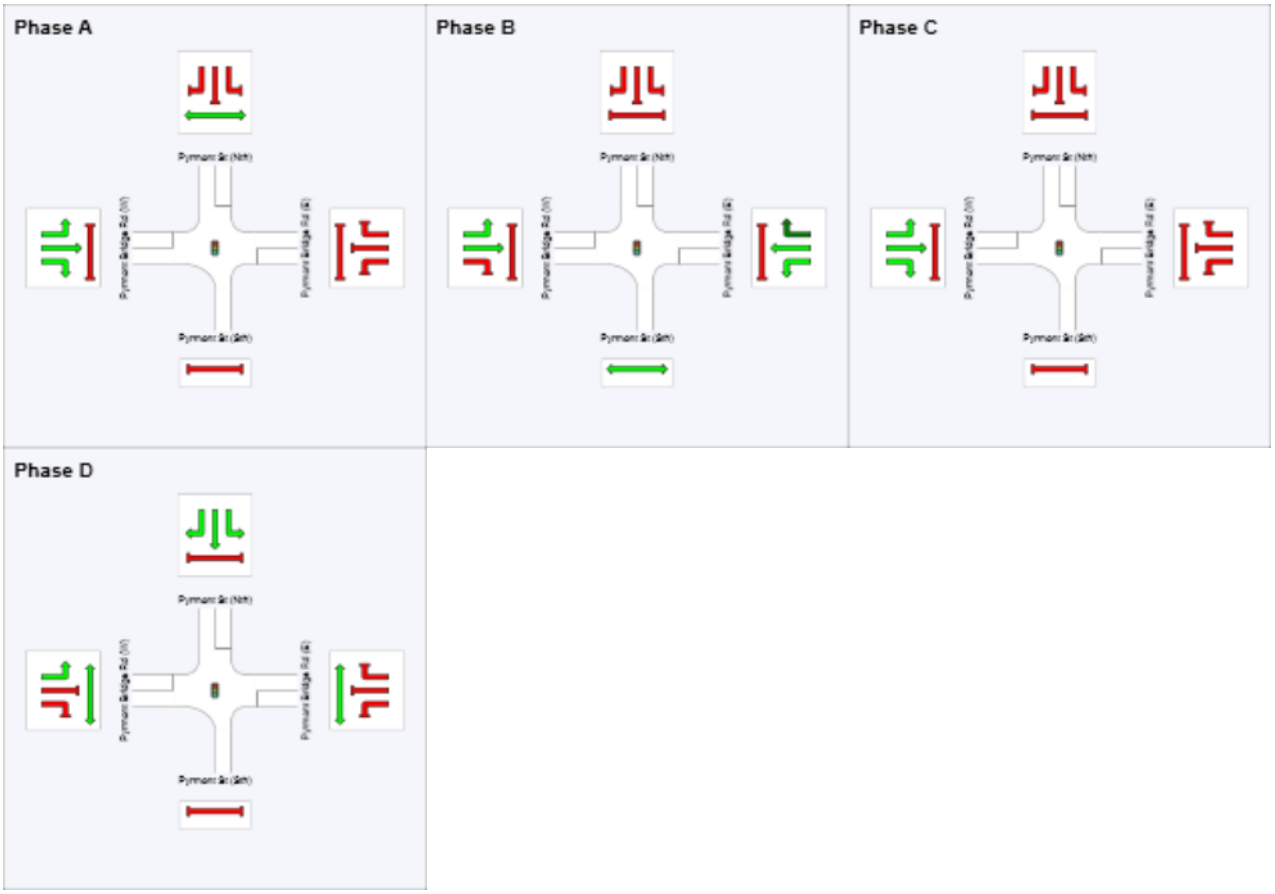
Network: PM Star Casino Network

No Project
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network Cycle Time)

Phase times specified by the user
Sequence: Existing Phasing - PM
Movement Class: All Movement Classes
Input Sequence: A, B, C, D
Output Sequence: A, B, C, D

Phase Timing Results

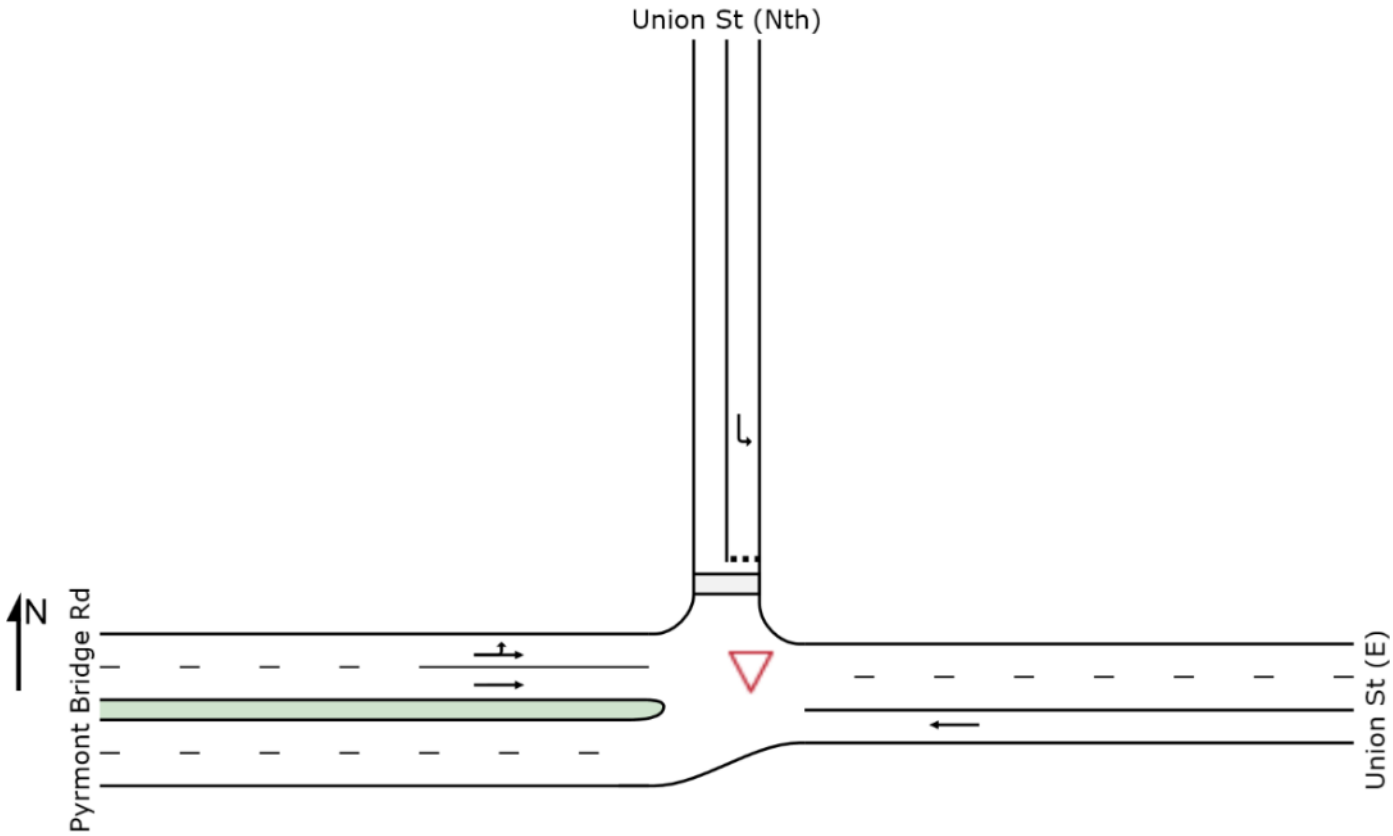
Phase	A	B	C	D
Reference Phase	Yes	No	No	No
Phase Change Time (sec)	0	23	49	63
Green Time (sec)	17	20	8	31
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	23	26	14	37
Phase Split	23 %	26 %	14 %	37 %



SITE LAYOUT

Site: AM Pyrmont Bridge Rd/Union St

No Project
Giveway / Yield (Two-Way)



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MOVEMENT SUMMARY

Site: AM Pyrmont Bridge Rd/Union St

Network: AM Star Casino Network

No Project
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

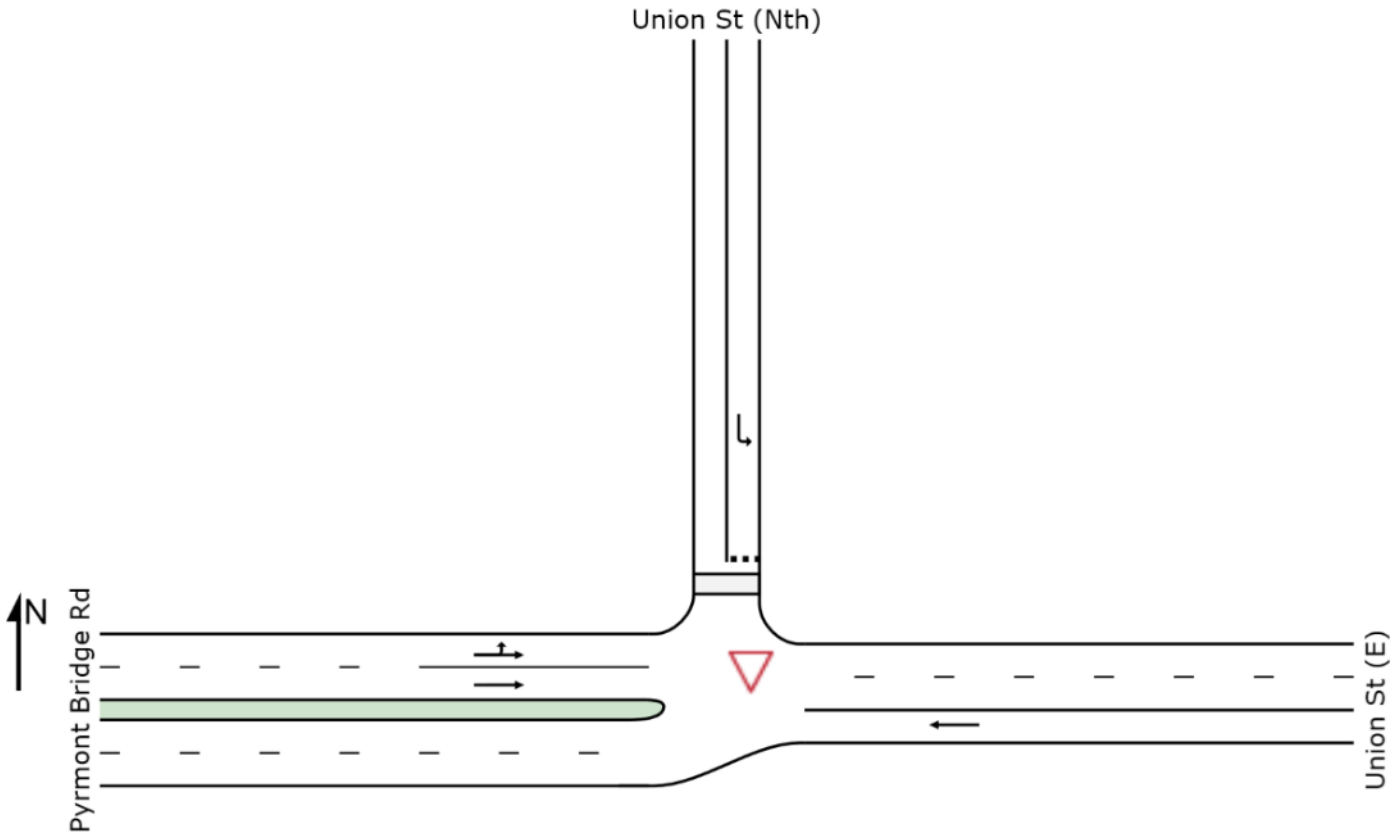
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Union St (E)													
5	T1	191	13.1	191	13.1	0.106	0.0	LOS A	0.0	0.0	0.00	0.00	50.0
Approach		191	13.1	191	13.1	0.106	0.0	NA	0.0	0.0	0.00	0.00	50.0
North: Union St (Nth)													
7	L2	37	5.4	37	5.4	0.028	5.4	LOS A	0.1	0.8	0.24	0.52	27.0
Approach		37	5.4	37	5.4	0.028	5.4	LOS A	0.1	0.8	0.24	0.52	27.0
West: Pyrmont Bridge Rd													
10	L2	20	0.0	20	0.0	0.100	4.7	LOS A	0.0	0.0	0.00	0.08	47.5
11	T1	332	10.2	332	10.2	0.100	0.1	LOS A	0.0	0.0	0.00	0.04	48.7
Approach		352	9.7	352	9.7	0.100	0.3	NA	0.0	0.0	0.00	0.04	48.7
All Vehicles		580	10.5	580	10.5	0.106	0.5	NA	0.1	0.8	0.02	0.06	46.6

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

SITE LAYOUT

Site: PM Pyrmont Bridge Rd/Union St

No Project
Giveway / Yield (Two-Way)



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MOVEMENT SUMMARY

Site: PM Pyrmont Bridge Rd/Union St

Network: PM Star Casino Network

No Project
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

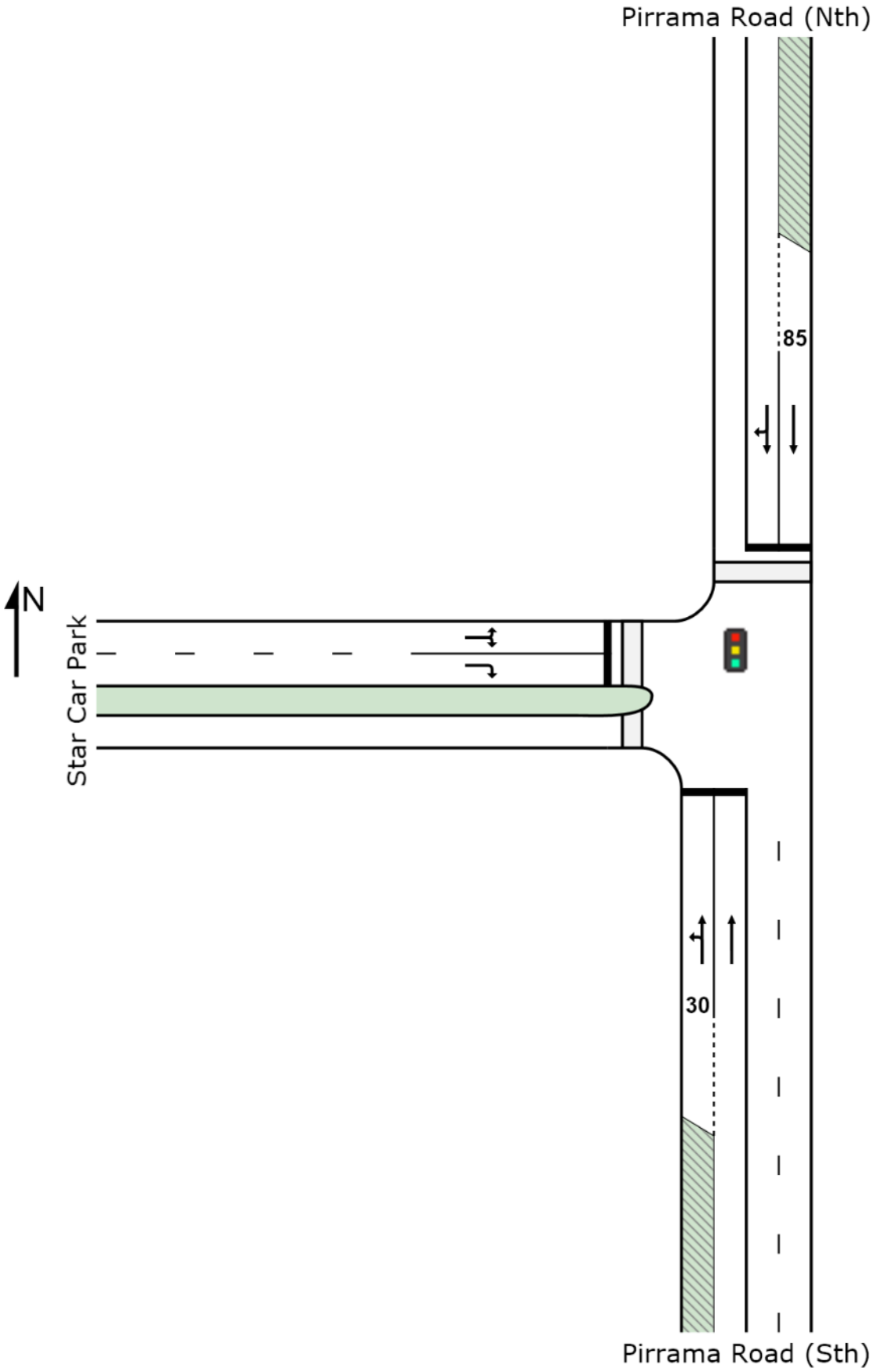
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Union St (E)													
5	T1	368	1.9	368	1.9	0.191	0.0	LOS A	0.0	0.0	0.00	0.00	50.0
Approach		368	1.9	368	1.9	0.191	0.0	NA	0.0	0.0	0.00	0.00	50.0
North: Union St (Nth)													
7	L2	49	0.0	49	0.0	0.071	34.0	LOS C	1.0	6.9	0.81	0.52	8.1
Approach		49	0.0	49	0.0	0.071	34.0	LOS C	1.0	6.9	0.81	0.52	8.1
West: Pyrmont Bridge Rd													
10	L2	27	0.0	27	0.0	0.142	4.8	LOS A	3.9	27.4	0.00	0.14	46.4
11	T1	367	1.1	367	1.1	0.142	0.1	LOS A	3.9	27.4	0.00	0.05	48.7
Approach		394	1.0	394	1.0	0.142	0.4	NA	3.9	27.4	0.00	0.05	48.5
All Vehicles		811	1.4	811	1.4	0.191	2.2	NA	3.9	27.4	0.05	0.06	37.1

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

SITE LAYOUT

Site: AM Pirrama Rd/Star Car Park Entrance

No Project
Signals - Fixed Time Coordinated



MOVEMENT SUMMARY

Site: AM Pirrama Rd/Star Car Park Entrance

Network: AM Star Casino Network

No Project
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Pirrama Road (Sth)													
1	L2	169	0.6	169	0.6	0.138	7.3	LOS A	1.1	7.8	0.15	0.58	24.9
2	T1	248	7.7	248	7.7	0.178	0.3	LOS A	0.3	2.1	0.03	0.02	48.0
Approach		417	4.8	417	4.8	0.178	3.2	LOS A	1.1	7.8	0.07	0.25	33.2
North: Pirrama Road (Nth)													
8	T1	103	15.5	103	15.5	0.059	4.0	LOS A	1.0	7.8	0.30	0.28	39.6
9	R2	24	8.3	24	8.3	0.059	10.7	LOS A	0.8	6.1	0.36	0.46	33.2
Approach		127	14.2	127	14.2	0.059	5.3	LOS A	1.0	7.8	0.31	0.31	38.0
West: Star Car Park													
10	L2	5	0.0	5	0.0	0.045	42.8	LOS D	0.4	2.8	0.91	0.62	3.7
12	R2	15	0.0	15	0.0	0.045	42.2	LOS C	0.5	3.3	0.90	0.62	3.7
Approach		20	0.0	20	0.0	0.045	42.3	LOS C	0.5	3.3	0.91	0.62	3.7
All Vehicles		564	6.7	564	6.7	0.178	5.0	LOS A	1.1	7.8	0.16	0.27	31.6

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P3	North Full Crossing	94	44.4	LOS E	0.3	0.3	0.94	0.94
P4	West Full Crossing	111	8.0	LOS A	0.1	0.1	0.40	0.40
All Pedestrians		204	24.7	LOS C			0.65	0.65

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

PHASING SUMMARY

Site: AM Pirrama Rd/Star Car Park Entrance

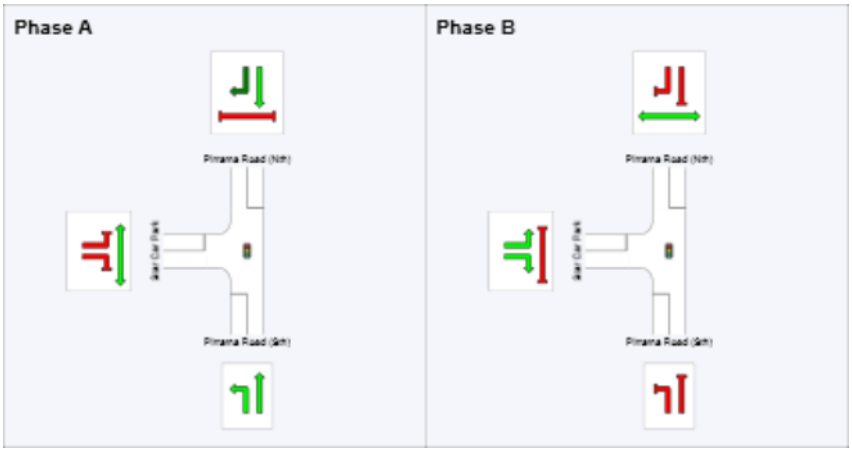
Network: AM Star Casino Network

No Project
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network Cycle Time)

Phase times specified by the user
Sequence: Existing Phasing - AM
Movement Class: All Movement Classes
Input Sequence: A, B
Output Sequence: A, B

Phase Timing Results

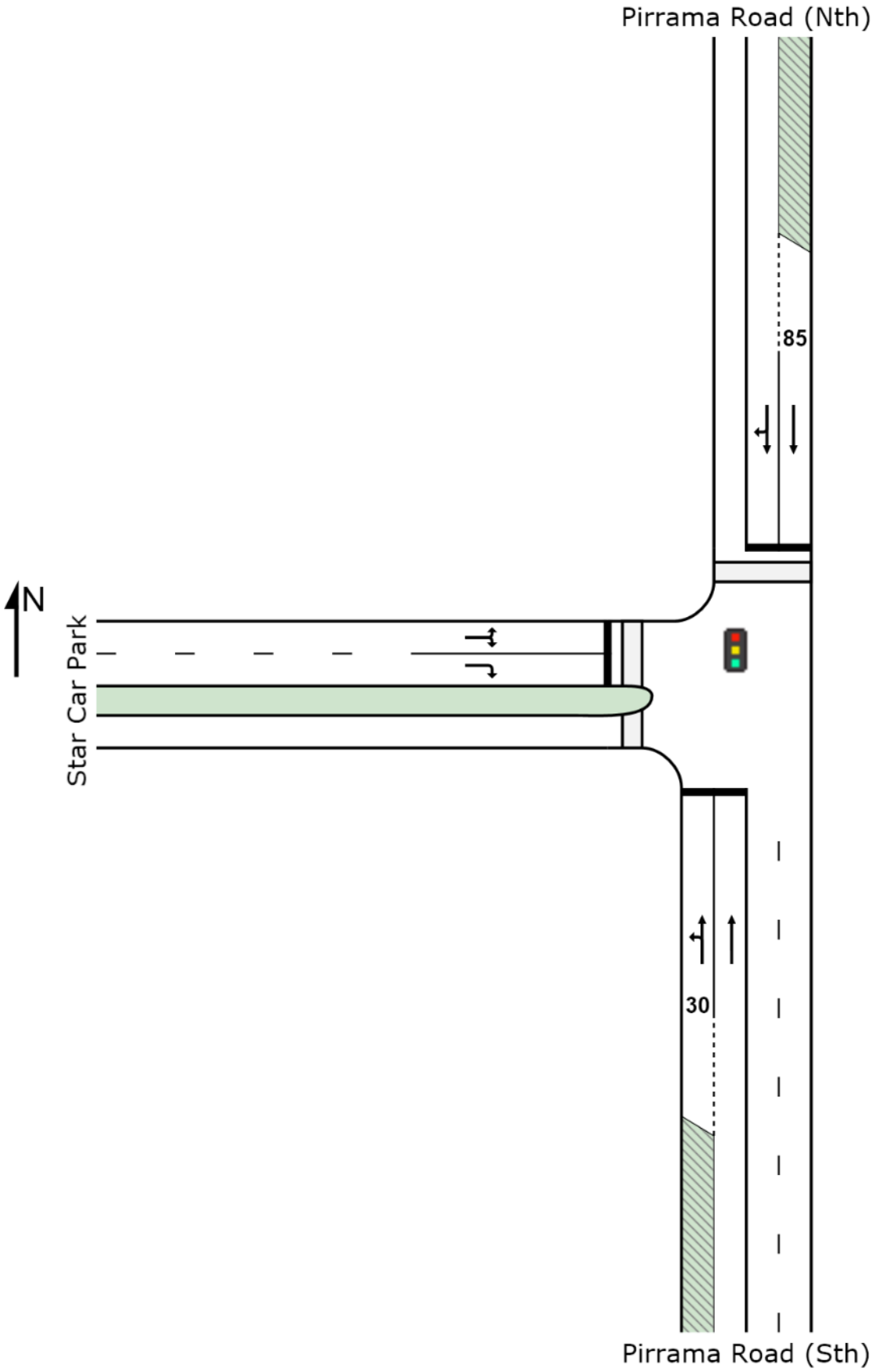
Phase	A	B
Reference Phase	Yes	No
Phase Change Time (sec)	0	81
Green Time (sec)	75	13
Yellow Time (sec)	4	4
All-Red Time (sec)	2	2
Phase Time (sec)	81	19
Phase Split	81 %	19 %



SITE LAYOUT

Site: PM Pirrama Rd/Star Car Park Entrance

No Project
Signals - Fixed Time Coordinated



MOVEMENT SUMMARY

Site: PM Pirrama Rd/Star Car Park Entrance

Network: PM Star Casino Network

No Project
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Pirrama Road (Sth)													
1	L2	178	0.6	172	0.6	0.143	6.6	LOS A	0.9	6.6	0.16	0.58	25.8
2	T1	361	3.0	350	3.1	0.247	0.4	LOS A	0.4	3.2	0.03	0.02	47.8
Approach		539	2.2	522[N1]	2.2	0.247	2.4	LOS A	0.9	6.6	0.07	0.21	35.6
North: Pirrama Road (Nth)													
8	T1	163	7.4	162	7.4	0.085	5.6	LOS A	1.6	11.5	0.34	0.31	37.2
9	R2	22	0.0	22	0.0	0.085	14.9	LOS B	1.4	10.6	0.48	0.48	29.8
Approach		185	6.5	184[N1]	6.5	0.085	6.7	LOS A	1.6	11.5	0.36	0.33	36.0
West: Star Car Park													
10	L2	39	0.0	39	0.0	0.439	45.8	LOS D	4.6	32.0	0.97	0.76	3.5
12	R2	172	0.0	172	0.0	0.439	44.8	LOS D	5.3	36.9	0.96	0.76	3.5
Approach		211	0.0	211	0.0	0.439	44.9	LOS D	5.3	36.9	0.97	0.76	3.5
All Vehicles		935	2.6	917[N1]	2.6	0.439	13.1	LOS A	5.3	36.9	0.34	0.36	19.7

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P3	North Full Crossing	187	44.5	LOS E	0.5	0.5	0.95	0.95
P4	West Full Crossing	346	8.5	LOS A	0.4	0.4	0.42	0.42
All Pedestrians		534	21.2	LOS C			0.60	0.60

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

PHASING SUMMARY

Site: PM Pirrama Rd/Star Car Park Entrance

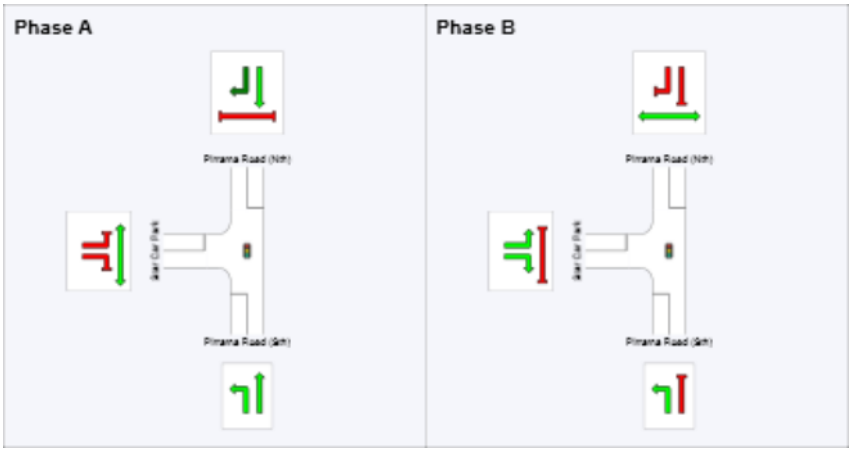
Network: PM Star Casino Network

No Project
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network Cycle Time)

Phase times specified by the user
Sequence: Existing Phasing - PM
Movement Class: All Movement Classes
Input Sequence: A, B
Output Sequence: A, B

Phase Timing Results

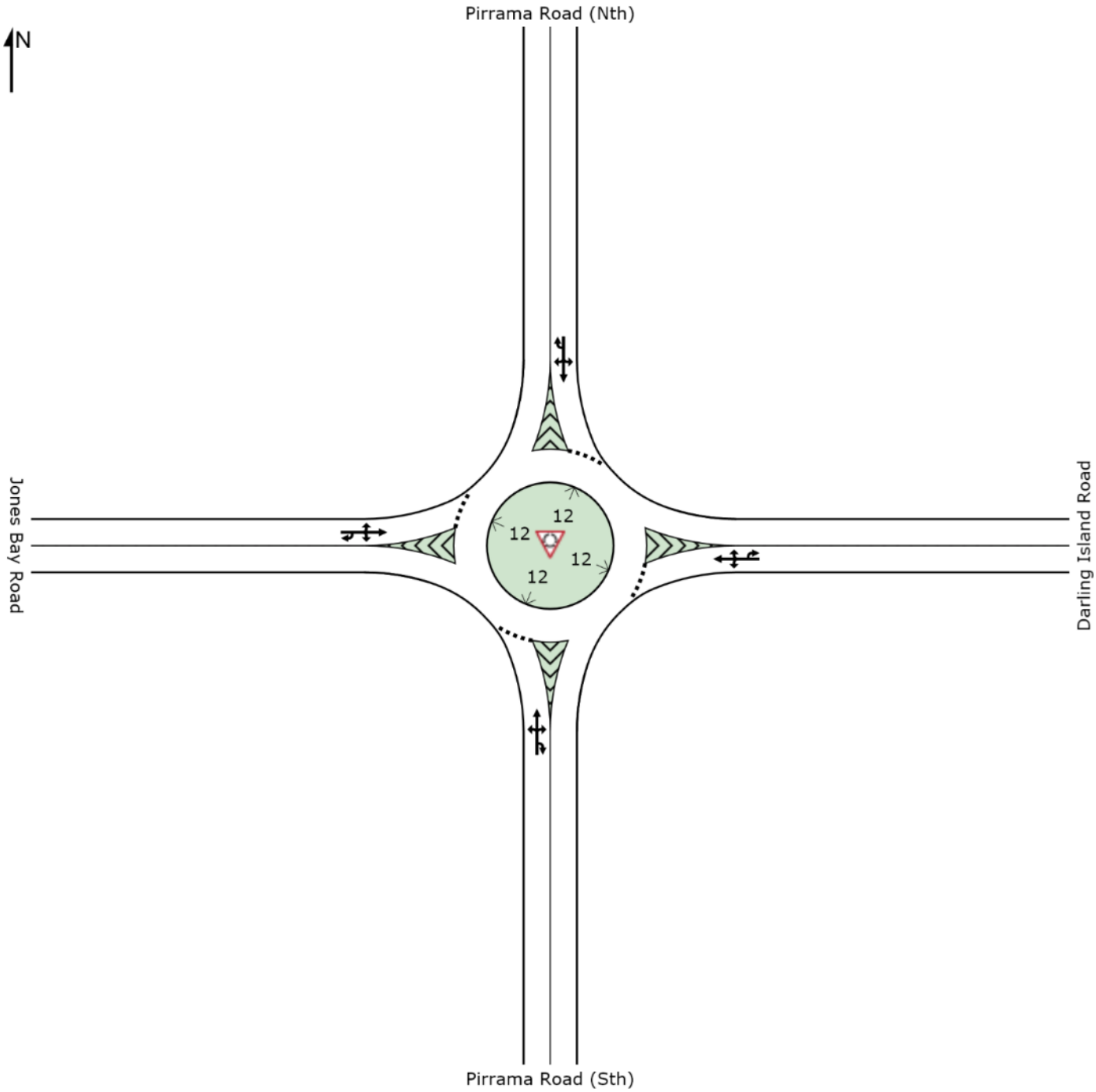
Phase	A	B
Reference Phase	Yes	No
Phase Change Time (sec)	0	80
Green Time (sec)	74	14
Yellow Time (sec)	4	4
All-Red Time (sec)	2	2
Phase Time (sec)	80	20
Phase Split	80 %	20 %



SITE LAYOUT

Site: AM Jones Bay Rd/Pirrama Rd

No Project
Roundabout



MOVEMENT SUMMARY

Site: AM Jones Bay Rd/Pirrama Rd

Network: AM Star Casino Network

No Project
Roundabout

Movement Performance - Vehicles

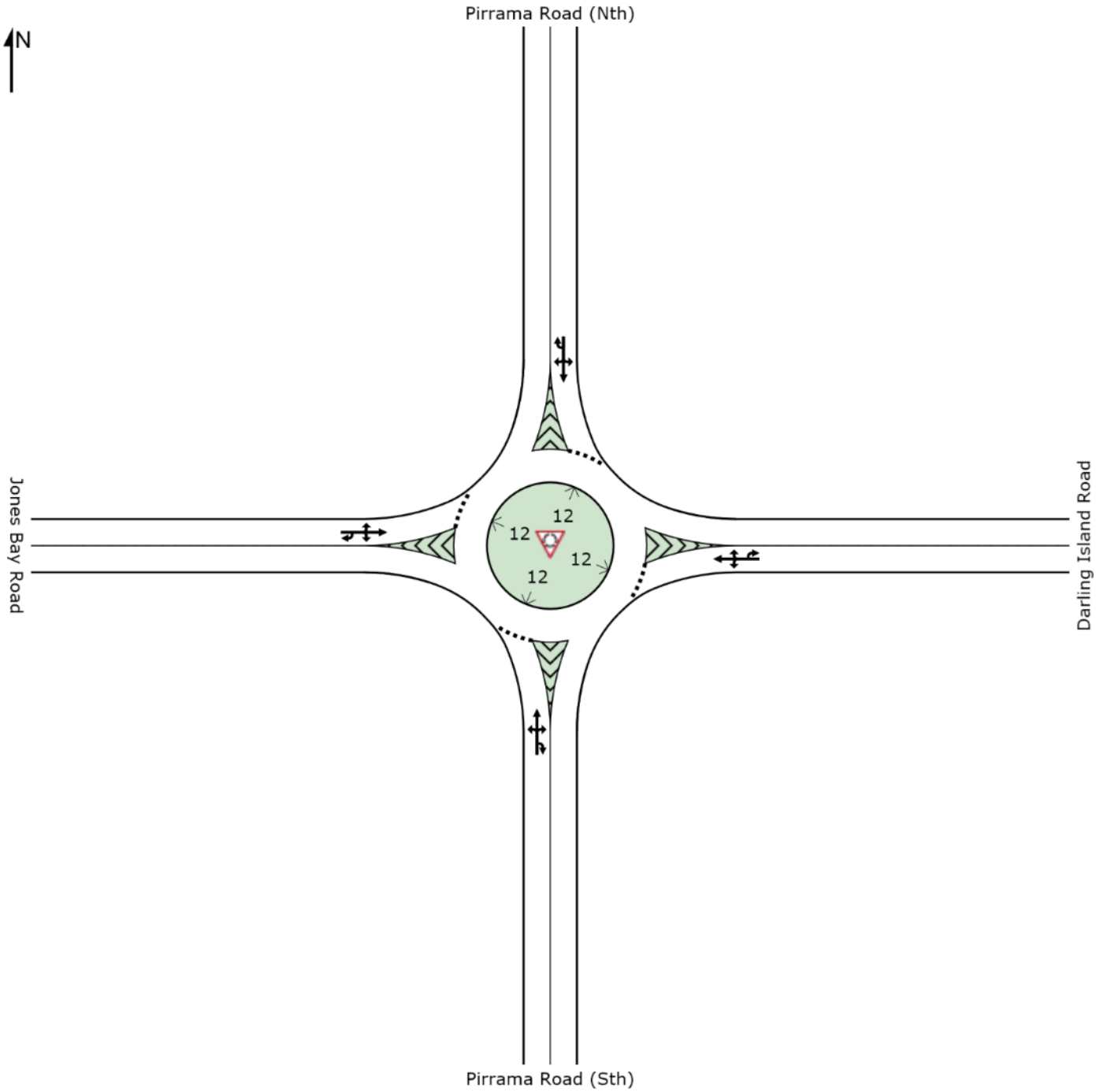
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Pirrama Road (Sth)													
1	L2	110	9.1	110	9.1	0.225	4.2	LOS A	1.1	8.3	0.25	0.53	38.1
2	T1	75	10.7	75	10.7	0.225	4.1	LOS A	1.1	8.3	0.25	0.53	45.6
3	R2	73	4.1	73	4.1	0.225	7.6	LOS A	1.1	8.3	0.25	0.53	35.0
3u	U	14	15.4	14	15.4	0.225	9.3	LOS A	1.1	8.3	0.25	0.53	38.1
Approach		272	8.5	272	8.5	0.225	5.3	LOS A	1.1	8.3	0.25	0.53	40.7
East: Darling Island Road													
4	L2	28	10.7	28	10.7	0.070	5.1	LOS A	0.3	2.6	0.32	0.52	31.1
5	T1	43	4.7	43	4.7	0.070	5.2	LOS A	0.3	2.6	0.32	0.52	31.1
6	R2	5	0.0	5	0.0	0.070	8.8	LOS A	0.3	2.6	0.32	0.52	50.5
6u	U	1	0.0	1	0.0	0.070	10.6	LOS A	0.3	2.6	0.32	0.52	24.8
Approach		77	6.5	77	6.5	0.070	5.5	LOS A	0.3	2.6	0.32	0.52	34.6
North: Pirrama Road (Nth)													
7	L2	15	6.7	15	6.7	0.096	5.9	LOS A	0.5	3.8	0.42	0.61	40.3
8	T1	36	27.8	36	27.8	0.096	6.5	LOS A	0.5	3.8	0.42	0.61	47.9
9	R2	36	0.0	36	0.0	0.096	9.4	LOS A	0.5	3.8	0.42	0.61	47.9
9u	U	1	0.0	1	0.0	0.096	11.2	LOS A	0.5	3.8	0.42	0.61	53.1
Approach		88	12.5	88	12.5	0.096	7.7	LOS A	0.5	3.8	0.42	0.61	46.3
West: Jones Bay Road													
10	L2	71	2.8	71	2.8	0.196	5.5	LOS A	1.2	8.5	0.39	0.57	49.0
11	T1	86	4.7	86	4.7	0.196	5.7	LOS A	1.2	8.5	0.39	0.57	29.7
12	R2	32	3.1	32	3.1	0.196	9.2	LOS A	1.2	8.5	0.39	0.57	34.6
12u	U	21	10.0	21	10.0	0.196	11.1	LOS A	1.2	8.5	0.39	0.57	34.6
Approach		210	4.3	210	4.3	0.196	6.7	LOS A	1.2	8.5	0.39	0.57	39.9
All Vehicles		647	7.5	647	7.5	0.225	6.1	LOS A	1.2	8.5	0.33	0.55	41.1

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: PM Jones Bay Rd/Pirrama Rd

No Project
Roundabout



MOVEMENT SUMMARY

Site: PM Jones Bay Rd/Pirrama Rd

Network: PM Star Casino Network

No Project
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Pirrama Road (Sth)													
1	L2	197	0.5	192	0.5	0.386	5.0	LOS A	2.2	15.7	0.43	0.59	37.3
2	T1	148	8.8	144	8.9	0.386	5.2	LOS A	2.2	15.7	0.43	0.59	45.2
3	R2	44	0.0	43	0.0	0.386	8.5	LOS A	2.2	15.7	0.43	0.59	34.6
3u	U	41	5.1	40	5.2	0.386	10.2	LOS A	2.2	15.7	0.43	0.59	37.3
Approach		430	3.7	419[N1]	3.8	0.386	5.9	LOS A	2.2	15.7	0.43	0.59	41.4
East: Darling Island Road													
4	L2	31	0.0	31	0.0	0.121	6.0	LOS A	0.6	4.5	0.47	0.60	29.2
5	T1	74	0.0	74	0.0	0.121	6.1	LOS A	0.6	4.5	0.47	0.60	29.2
6	R2	15	0.0	15	0.0	0.121	9.8	LOS A	0.6	4.5	0.47	0.60	49.4
6u	U	1	0.0	1	0.0	0.121	11.5	LOS A	0.6	4.5	0.47	0.60	24.2
Approach		121	0.0	121	0.0	0.121	6.6	LOS A	0.6	4.5	0.47	0.60	35.5
North: Pirrama Road (Nth)													
7	L2	20	0.0	20	0.0	0.198	5.7	LOS A	1.1	8.1	0.43	0.62	40.3
8	T1	74	10.8	74	10.8	0.198	6.1	LOS A	1.1	8.1	0.43	0.62	47.6
9	R2	91	1.1	91	1.1	0.198	9.4	LOS A	1.1	8.1	0.43	0.62	47.6
9u	U	11	0.0	11	0.0	0.198	11.1	LOS A	1.1	8.1	0.43	0.62	52.9
Approach		196	4.6	196	4.6	0.198	7.9	LOS A	1.1	8.1	0.43	0.62	47.1
West: Jones Bay Road													
10	L2	27	0.0	27	0.0	0.145	5.9	LOS A	0.8	5.9	0.46	0.65	47.5
11	T1	28	0.0	28	0.0	0.145	6.1	LOS A	0.8	5.9	0.46	0.65	28.6
12	R2	49	0.0	49	0.0	0.145	9.6	LOS A	0.8	5.9	0.46	0.65	32.0
12u	U	41	2.6	41	2.6	0.145	11.4	LOS A	0.8	5.9	0.46	0.65	32.0
Approach		145	0.7	145	0.7	0.145	8.7	LOS A	0.8	5.9	0.46	0.65	36.5
All Vehicles		892	2.9	880[N1]	3.0	0.386	6.9	LOS A	2.2	15.7	0.44	0.61	41.9

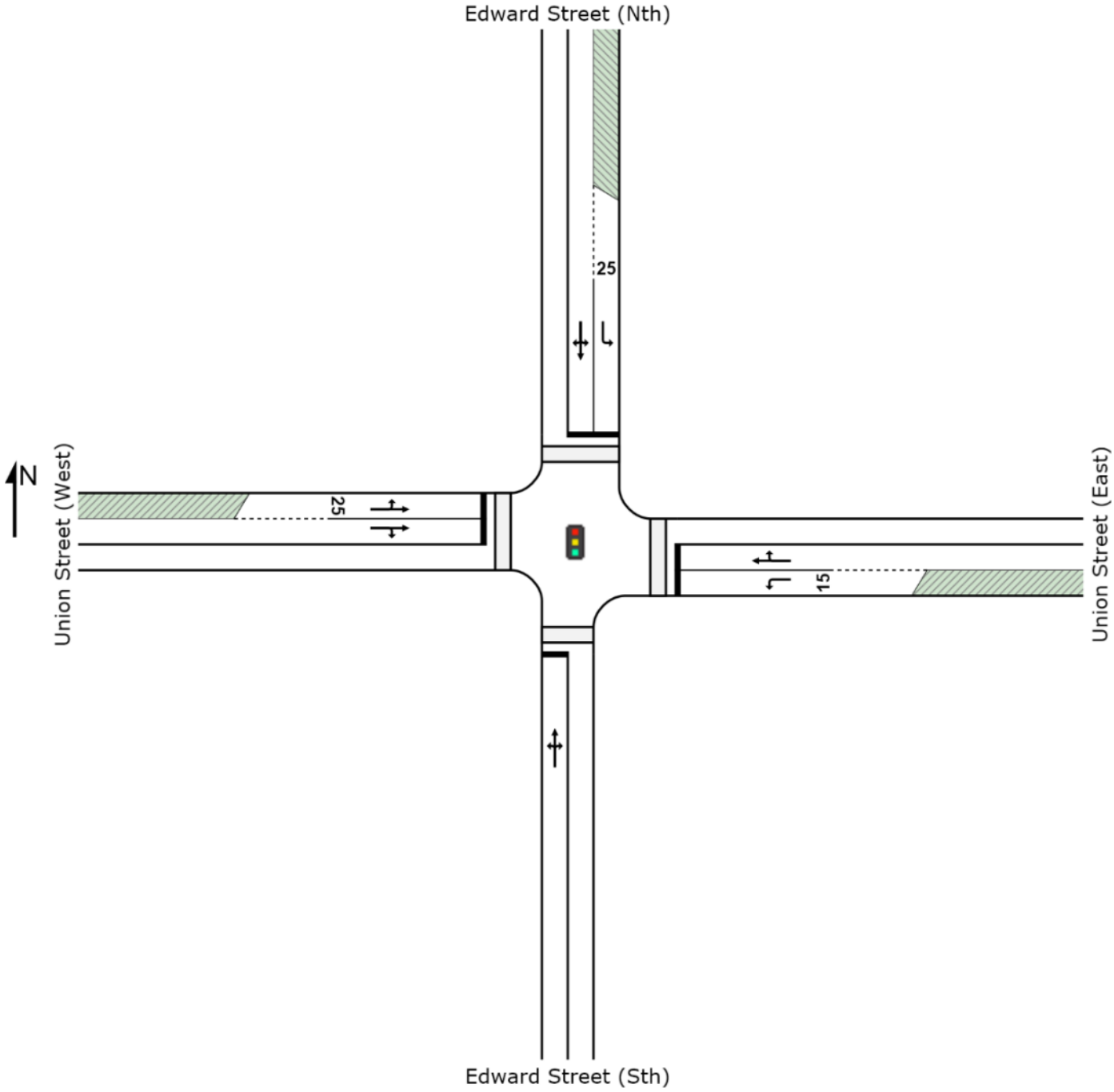
Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

SITE LAYOUT

Site: AM Union St/Edward St

No Project
Signals - Fixed Time Isolated



MOVEMENT SUMMARY

Site: AM Union St/Edward St

Network: AM Star Casino Network

No Project
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Edward Street (Sth)													
1	L2	10	10.0	10	10.0	0.239	25.9	LOS B	5.7	41.0	0.70	0.60	11.3
2	T1	161	2.5	161	2.5	0.239	21.3	LOS B	5.7	41.0	0.70	0.60	18.6
3	R2	7	0.0	7	0.0	0.239	25.9	LOS B	5.7	41.0	0.70	0.60	11.3
Approach		178	2.8	178	2.8	0.239	21.7	LOS B	5.7	41.0	0.70	0.60	18.0
East: Union Street (East)													
4	L2	9	0.0	9	0.0	0.012	22.3	LOS B	0.2	1.7	0.60	0.63	16.5
5	T1	7	0.0	7	0.0	0.083	42.2	LOS C	0.8	5.5	0.91	0.68	6.2
6	R2	11	0.0	11	0.0	0.083	46.8	LOS D	0.8	5.5	0.91	0.68	10.9
Approach		27	0.0	27	0.0	0.083	37.5	LOS C	0.8	5.5	0.81	0.66	11.0
North: Edward Street (Nth)													
7	L2	11	9.1	11	9.1	0.018	26.4	LOS B	0.3	2.6	0.67	0.64	11.2
8	T1	9	0.0	9	0.0	0.106	23.0	LOS B	1.6	11.6	0.70	0.68	16.2
9	R2	40	5.0	40	5.0	0.106	27.6	LOS B	1.6	11.6	0.70	0.68	10.9
Approach		60	5.0	60	5.0	0.106	26.7	LOS B	1.6	11.6	0.69	0.67	11.9
West: Union Street (West)													
10	L2	46	6.5	46	6.5	0.236	46.4	LOS D	2.0	14.7	0.89	0.72	10.3
11	T1	22	4.5	22	4.5	0.049	27.5	LOS B	1.0	7.1	0.81	0.61	8.3
12	R2	4	0.0	4	0.0	0.049	32.0	LOS C	1.0	7.1	0.81	0.61	13.5
Approach		72	5.6	72	5.6	0.236	39.8	LOS C	2.0	14.7	0.86	0.68	10.0
All Vehicles		337	3.6	337	3.6	0.239	27.7	LOS B	5.7	41.0	0.74	0.63	14.1

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	121	16.9	LOS B	0.2	0.2	0.58	0.58
P2	East Full Crossing	79	22.5	LOS C	0.2	0.2	0.67	0.67
P3	North Full Crossing	1153	18.3	LOS B	2.0	2.0	0.62	0.62
P4	West Full Crossing	64	23.2	LOS C	0.1	0.1	0.68	0.68
All Pedestrians		1417	18.6	LOS B			0.62	0.62

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

PHASING SUMMARY

Site: AM Union St/Edward St

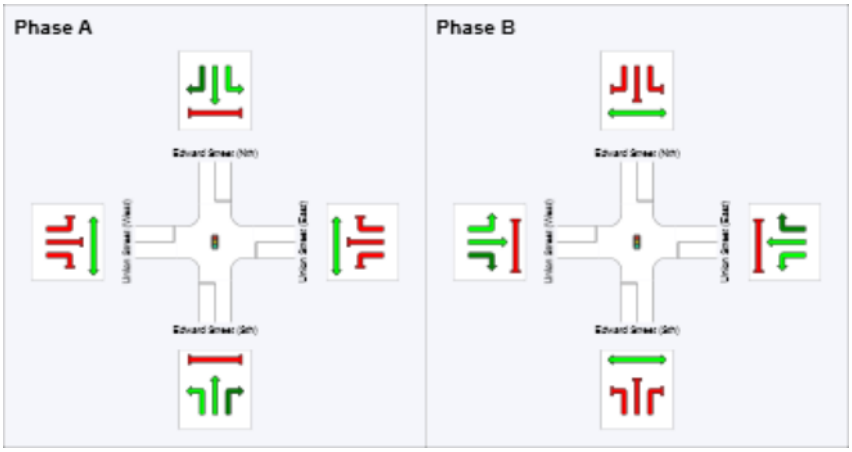
Network: AM Star Casino Network

No Project
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network Cycle Time)

Phase times specified by the user
Sequence: Existing Phasing - AM
Movement Class: All Movement Classes
Input Sequence: A, B
Output Sequence: A, B

Phase Timing Results

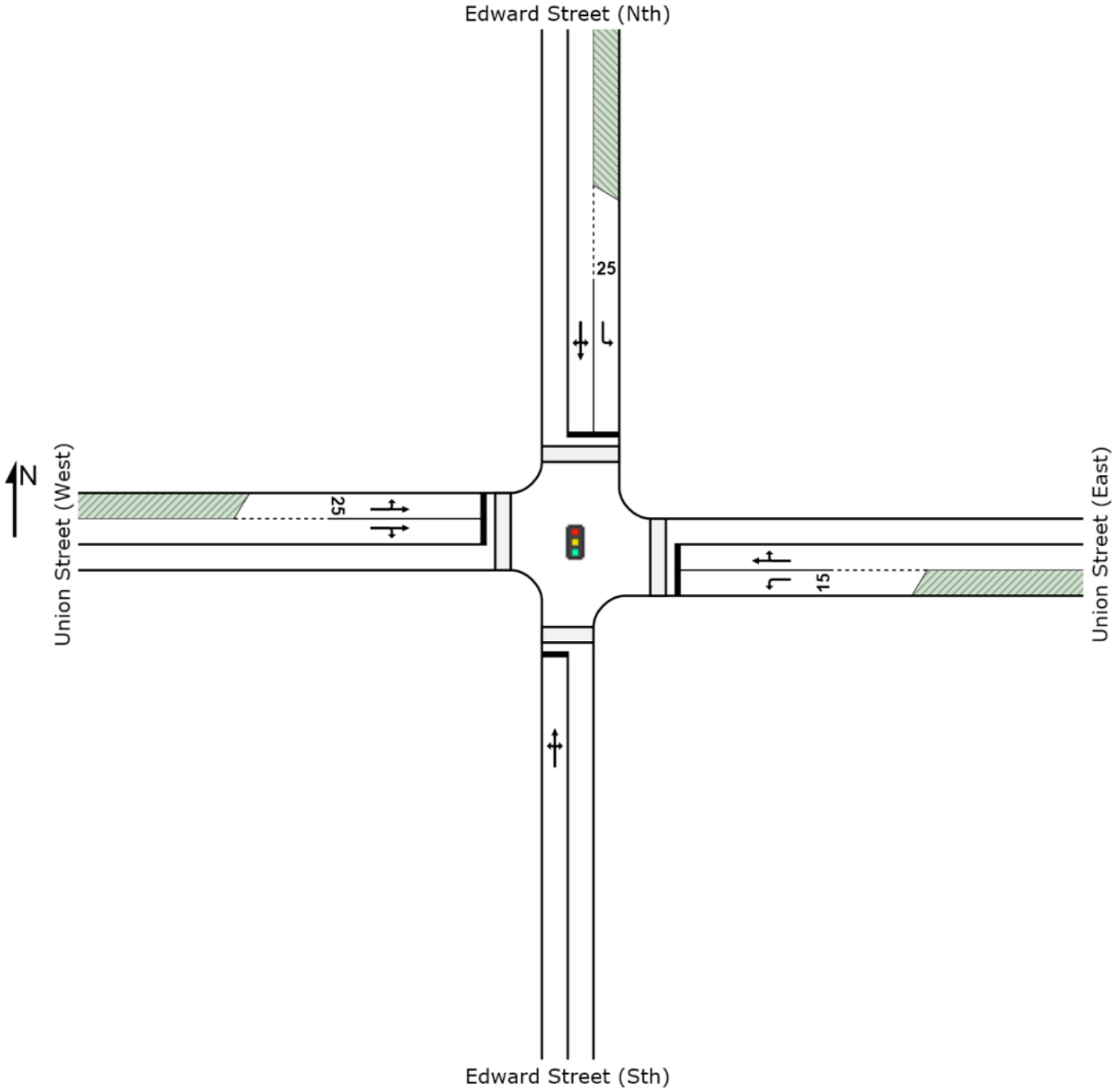
Phase	A	B
Reference Phase	Yes	No
Phase Change Time (sec)	0	46
Green Time (sec)	40	48
Yellow Time (sec)	4	4
All-Red Time (sec)	2	2
Phase Time (sec)	46	54
Phase Split	46 %	54 %



SITE LAYOUT

Site: PM Union St/Edward St

No Project
Signals - Fixed Time Isolated



MOVEMENT SUMMARY

Site: PM Union St/Edward St

Network: PM Star Casino Network

No Project
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Edward Street (Sth)													
1	L2	29	0.0	29	0.0	0.263	27.4	LOS B	6.3	44.4	0.73	0.64	10.6
2	T1	149	2.0	149	2.0	0.263	22.9	LOS B	6.3	44.4	0.73	0.64	17.5
3	R2	9	0.0	9	0.0	0.263	27.4	LOS B	6.3	44.4	0.73	0.64	10.6
Approach		187	1.6	187	1.6	0.263	23.8	LOS B	6.3	44.4	0.73	0.64	16.3
East: Union Street (East)													
4	L2	6	0.0	6	0.0	0.008	21.6	LOS B	0.2	1.1	0.59	0.62	16.9
5	T1	18	0.0	18	0.0	0.094	38.2	LOS C	1.2	8.2	0.88	0.67	6.9
6	R2	10	0.0	10	0.0	0.094	42.8	LOS D	1.2	8.2	0.88	0.67	11.9
Approach		34	0.0	34	0.0	0.094	36.6	LOS C	1.2	8.2	0.82	0.66	9.9
North: Edward Street (Nth)													
7	L2	21	0.0	21	0.0	0.033	27.9	LOS B	0.7	4.7	0.69	0.67	10.7
8	T1	36	0.0	36	0.0	0.260	25.2	LOS B	4.5	31.8	0.76	0.72	15.5
9	R2	93	0.0	93	0.0	0.260	29.8	LOS C	4.5	31.8	0.76	0.72	10.3
Approach		150	0.0	150	0.0	0.260	28.4	LOS B	4.5	31.8	0.75	0.71	11.8
West: Union Street (West)													
10	L2	65	0.0	65	0.0	0.268	52.5	LOS D	3.2	22.1	1.00	0.76	9.4
11	T1	42	0.0	42	0.0	0.104	34.9	LOS C	2.4	16.5	0.94	0.73	6.7
12	R2	12	0.0	12	0.0	0.104	39.4	LOS C	2.4	16.5	0.94	0.73	11.4
Approach		119	0.0	119	0.0	0.268	45.0	LOS D	3.2	22.1	0.97	0.75	8.9
All Vehicles		490	0.6	490	0.6	0.268	31.2	LOS C	6.3	44.4	0.80	0.69	12.2

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	91	16.9	LOS B	0.1	0.1	0.58	0.58
P2	East Full Crossing	123	22.6	LOS C	0.2	0.2	0.67	0.67
P3	North Full Crossing	958	18.1	LOS B	1.7	1.7	0.61	0.61
P4	West Full Crossing	125	23.2	LOS C	0.2	0.2	0.68	0.68
All Pedestrians		1297	19.0	LOS B			0.62	0.62

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

PHASING SUMMARY

Site: PM Union St/Edward St

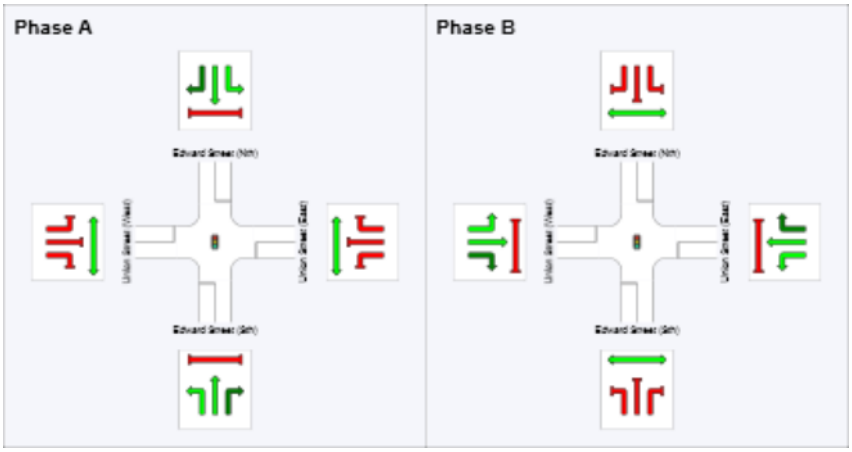
Network: PM Star Casino Network

No Project
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network Cycle Time)

Phase times specified by the user
Sequence: Existing Phasing - PM
Movement Class: All Movement Classes
Input Sequence: A, B
Output Sequence: A, B

Phase Timing Results

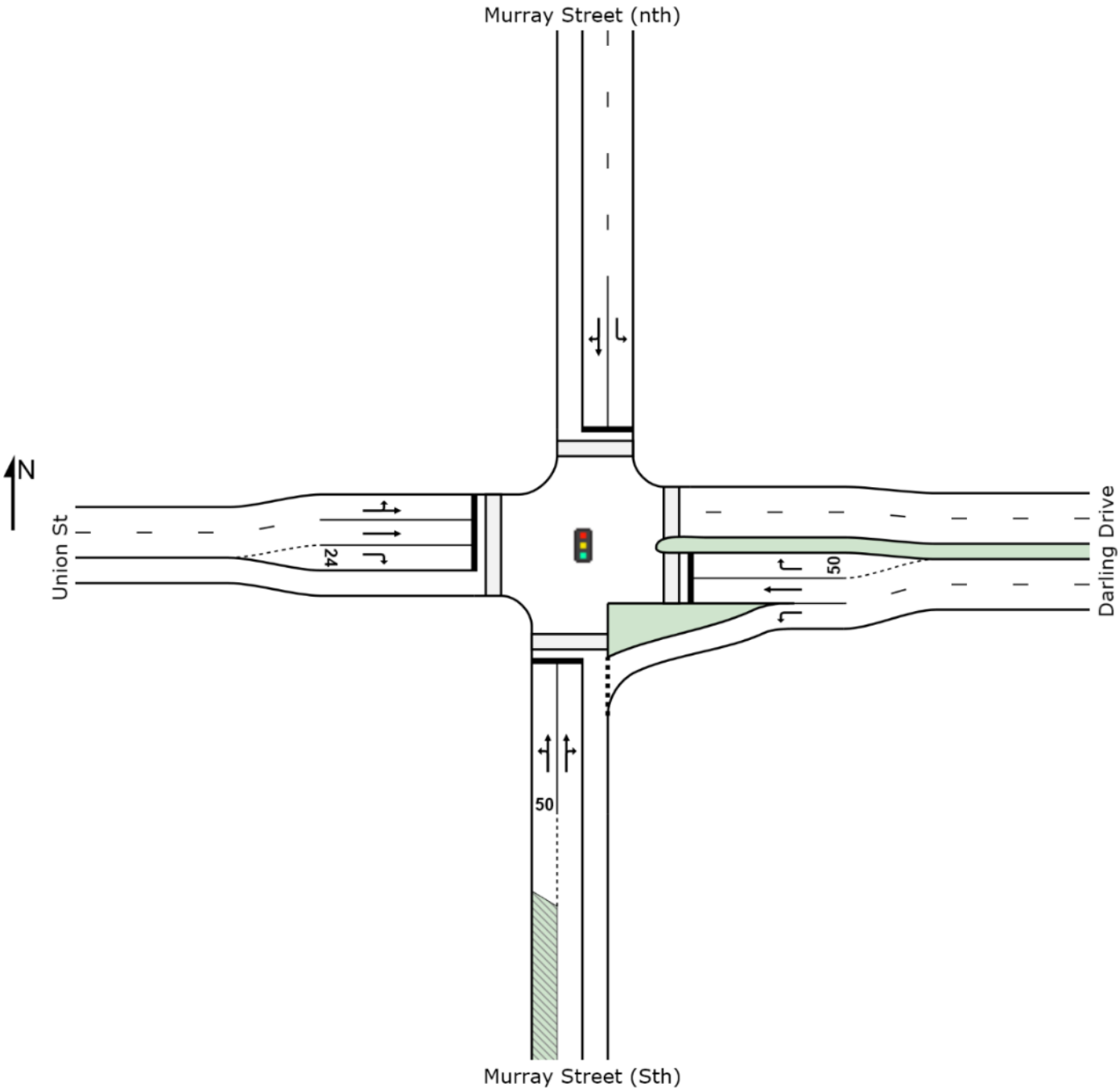
Phase	A	B
Reference Phase	Yes	No
Phase Change Time (sec)	0	46
Green Time (sec)	40	48
Yellow Time (sec)	4	4
All-Red Time (sec)	2	2
Phase Time (sec)	46	54
Phase Split	46 %	54 %



SITE LAYOUT

Site: AM Pyrmont Bridge Rd/Murray St

No Project
Signals - Fixed Time Coordinated



MOVEMENT SUMMARY

Site: AM Pyrmont Bridge Rd/Murray St

Network: AM Star Casino Network

No Project
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Murray Street (Sth)													
1	L2	31	9.7	31	9.7	0.077	19.7	LOS B	0.6	4.7	0.77	0.69	17.5
2	T1	119	4.2	119	4.2	0.386	39.6	LOS C	5.7	41.9	0.93	0.75	10.6
3	R2	11	27.3	11	27.3	0.386	44.6	LOS D	5.7	41.9	0.93	0.75	26.5
Approach		161	6.8	161	6.8	0.386	36.2	LOS C	5.7	41.9	0.90	0.73	13.4
East: Darling Drive													
4	L2	119	5.0	119	5.0	0.087	5.9	LOS A	0.9	6.4	0.23	0.57	44.3
5	T1	122	14.8	122	14.8	0.343	37.7	LOS C	5.2	41.1	0.90	0.72	24.7
6	R2	189	3.7	189	3.7	0.870	60.9	LOS E	10.4	75.4	1.00	0.97	18.9
Approach		430	7.2	430	7.2	0.870	39.1	LOS C	10.4	75.4	0.76	0.79	25.2
North: Murray Street (nth)													
7	L2	23	8.7	23	8.7	0.041	28.9	LOS C	0.6	4.9	0.61	0.65	30.3
8	T1	68	8.8	68	8.8	0.233	31.6	LOS C	3.8	28.8	0.75	0.65	18.3
9	R2	42	7.1	42	7.1	0.233	36.2	LOS C	3.8	28.8	0.75	0.65	11.5
Approach		133	8.3	133	8.3	0.233	32.6	LOS C	3.8	28.8	0.72	0.65	19.5
West: Union St													
10	L2	167	7.8	167	7.8	0.339	19.9	LOS B	3.5	26.4	0.75	0.73	7.8
11	T1	101	18.8	101	18.8	0.291	37.3	LOS C	4.0	32.5	0.83	0.66	25.7
12	R2	104	0.0	104	0.0	0.467	52.3	LOS D	5.1	35.8	1.00	0.79	9.7
Approach		372	8.6	372	8.6	0.467	33.7	LOS C	5.1	35.8	0.84	0.73	16.0
All Vehicles		1096	7.8	1096	7.8	0.870	36.0	LOS C	10.4	75.4	0.80	0.74	20.7

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	249	38.2	LOS D	0.6	0.6	0.88	0.88
P2	East Full Crossing	571	36.1	LOS D	1.4	1.4	0.86	0.86
P3	North Full Crossing	1420	40.2	LOS E	3.7	3.7	0.92	0.92
P4	West Full Crossing	223	44.6	LOS E	0.6	0.6	0.95	0.95
All Pedestrians		2463	39.5	LOS D			0.91	0.91

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

PHASING SUMMARY

Site: AM Pyrmont Bridge Rd/Murray St

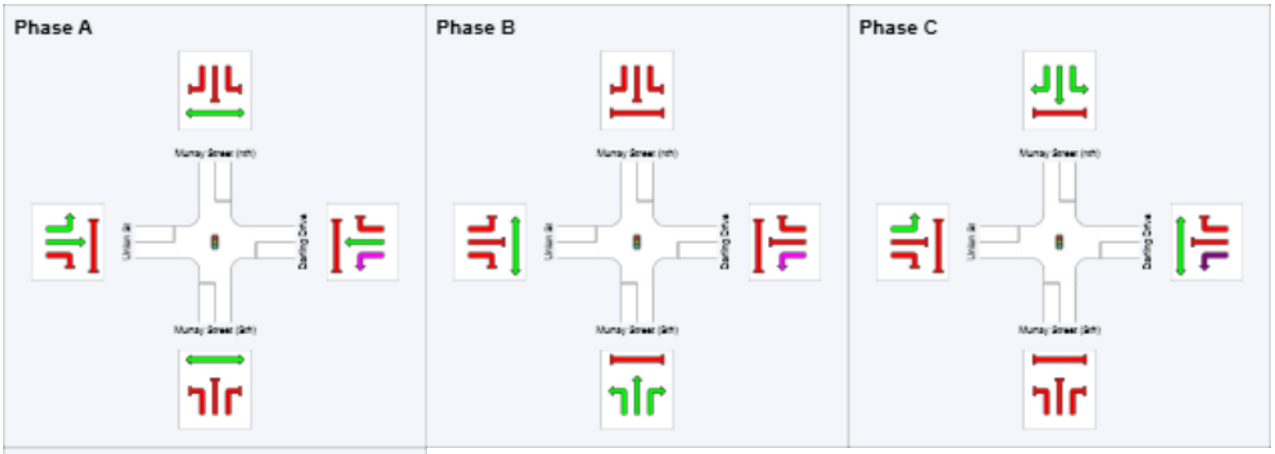
Network: AM Star Casino Network

No Project
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network Cycle Time)

Phase times specified by the user
Sequence: Existing Phasing - AM
Movement Class: All Movement Classes
Input Sequence: A, B, C, D, D1
Output Sequence: A, B, C, D1

Phase Timing Results

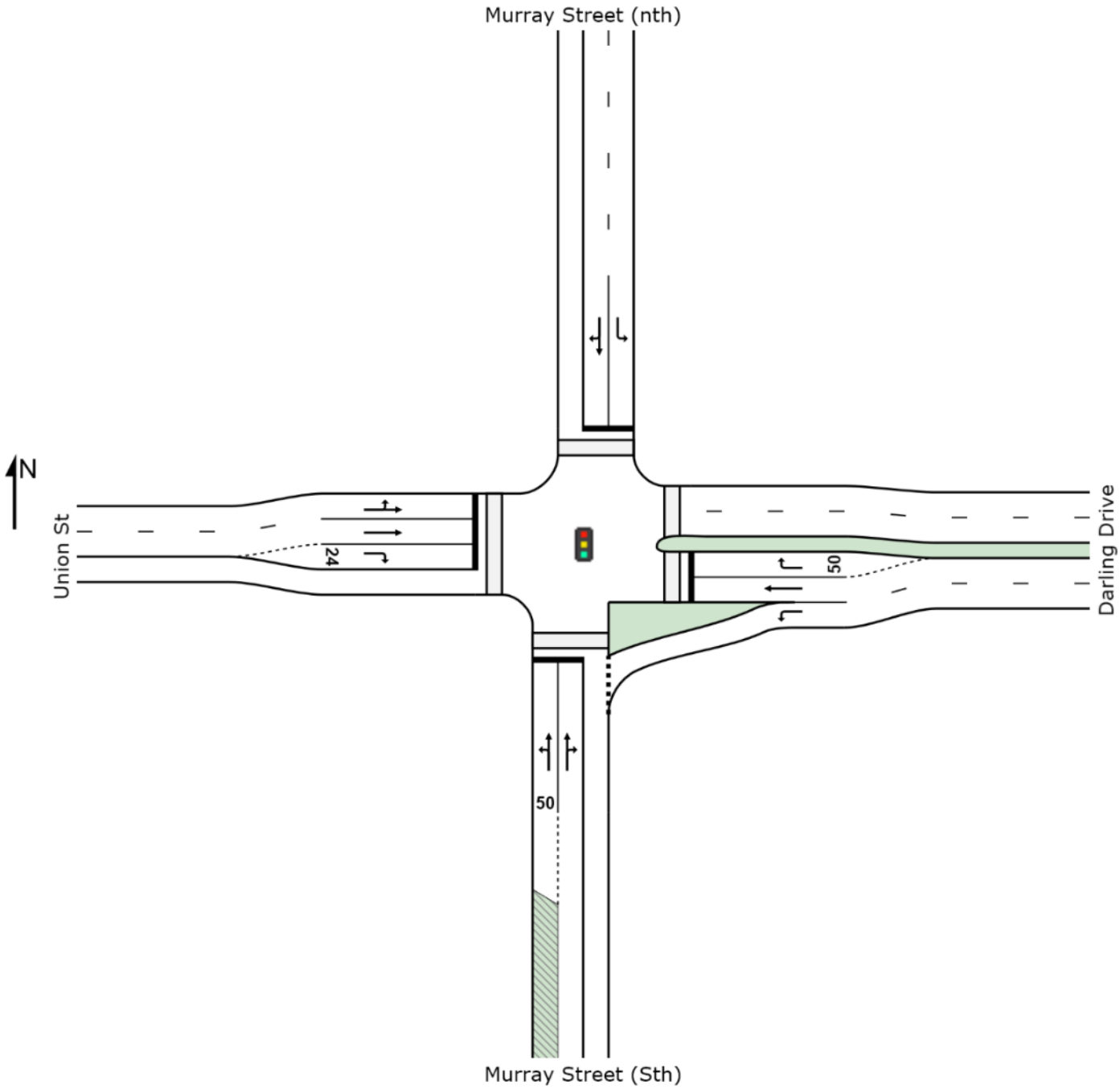
Phase	A	B	C	D1
Reference Phase	Yes	No	No	No
Phase Change Time (sec)	0	26	50	82
Green Time (sec)	20	18	26	12
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	26	24	32	18
Phase Split	26 %	24 %	32 %	18 %



SITE LAYOUT

Site: PM Pyrmont Bridge Rd/Murray St

No Project
Signals - Fixed Time Coordinated



MOVEMENT SUMMARY

Site: PM Pyrmont Bridge Rd/Murray St

Network: PM Star Casino Network

No Project
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Murray Street (Sth)													
1	L2	82	1.2	82	1.2	0.495	30.9	LOS C	2.4	16.7	0.99	0.76	12.7
2	T1	162	2.5	162	2.5	0.537	41.0	LOS C	8.3	59.8	0.96	0.79	10.3
3	R2	22	4.5	22	4.5	0.537	45.6	LOS D	8.3	59.8	0.96	0.79	26.2
Approach		266	2.3	266	2.3	0.537	38.3	LOS C	8.3	59.8	0.97	0.78	13.1
East: Darling Drive													
4	L2	101	2.0	101	2.0	0.074	6.6	LOS A	1.0	6.8	0.27	0.58	43.8
5	T1	139	2.2	139	2.2	0.258	30.2	LOS C	5.3	37.6	0.82	0.66	27.5
6	R2	203	1.5	203	1.5	1.105	118.9	LOS F	16.0	113.6	1.00	1.23	11.9
Approach		443	1.8	443	1.8	1.105	65.4	LOS E	16.0	113.6	0.78	0.90	18.8
North: Murray Street (nth)													
7	L2	84	7.1	84	7.1	0.263	43.4	LOS D	3.4	25.2	0.85	0.74	25.4
8	T1	142	0.7	142	0.7	0.766	43.5	LOS D	13.7	97.2	0.98	0.88	14.8
9	R2	147	2.0	147	2.0	0.766	48.1	LOS D	13.7	97.2	0.98	0.88	8.9
Approach		373	2.7	372[N1]	2.7	0.766	45.3	LOS D	13.7	97.2	0.95	0.85	16.1
West: Union St													
10	L2	245	0.8	245	0.8	0.948	57.3	LOS E	8.1	57.1	1.00	1.08	3.0
11	T1	59	0.0	59	0.0	0.108	28.7	LOS C	1.9	13.1	0.68	0.53	29.0
12	R2	104	1.0	104	1.0	0.564	56.1	LOS D	5.3	37.4	1.00	0.78	9.2
Approach		408	0.7	408	0.7	0.948	52.9	LOS D	8.1	57.1	0.95	0.92	8.7
All Vehicles		1490	1.8	1489[N1]	1.8	1.105	52.1	LOS D	16.0	113.6	0.90	0.87	15.1

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	235	31.5	LOS D	0.5	0.5	0.80	0.80
P2	East Full Crossing	624	41.6	LOS E	1.6	1.6	0.92	0.92
P3	North Full Crossing	1154	32.8	LOS D	2.7	2.7	0.83	0.83
P4	West Full Crossing	301	44.7	LOS E	0.8	0.8	0.95	0.95
All Pedestrians		2314	36.6	LOS D			0.87	0.87

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

PHASING SUMMARY

Site: PM Pyrmont Bridge Rd/Murray St

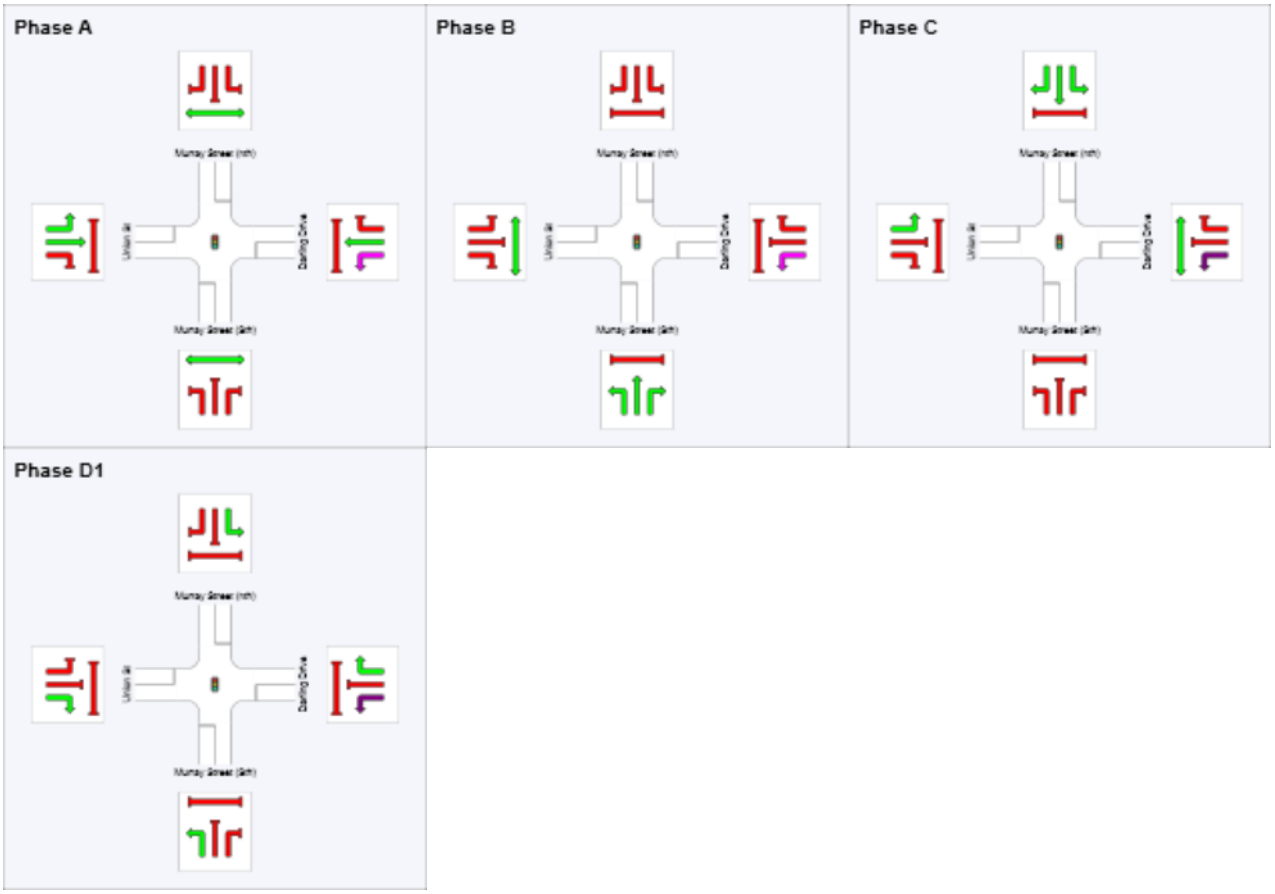
Network: PM Star Casino Network

No Project
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network Cycle Time)

Phase times specified by the user
Sequence: Existing Phasing - PM
Movement Class: All Movement Classes
Input Sequence: A, B, C, D, D1
Output Sequence: A, B, C, D1

Phase Timing Results

Phase	A	B	C	D1
Reference Phase	Yes	No	No	No
Phase Change Time (sec)	0	34	58	84
Green Time (sec)	28	18	20	10
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	34	24	26	16
Phase Split	34 %	24 %	26 %	16 %



Normal Movement
Permitted/Opposed
Slip/Bypass-Lane Movement
Opposed Slip/Bypass-Lane
Stopped Movement
Turn On Red
Other Movement Class Running
Other Movement Class Stopped
Mixed Running & Stopped Movement Classes
Undetected Movement
Phase Transition Applied