

Transport Impact Assessment

Prospect Logistics Estate (SSD – 10399)
Foundation Place and Clunies Ross Street, Pemulwuy

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Table of Contents

1	INTRODUCTION	1
1.1	OVERVIEW & OBJECTIVE	1
1.2	STUDY PURPOSE	1
1.3	SEAR REQUIREMENTS	1
1.4	KEY REFERENCES	2
2	OVERVIEW OF PROPOSAL	4
2.1	PROPOSED SSD YIELD	4
2.2	VEHICULAR ACCESS	4
2.3	PEDESTRIAN / CYCLIST ACCESS	6
3	EXISTING CONDITIONS	7
3.1	SITE DETAILS	7
3.2	ROAD NETWORK	9
3.3	PUBLIC TRANSPORT	14
3.4	ACTIVE TRANSPORT	16
4	FUTURE UPGRADES (WITHOUT PROPOSAL)	17
4.1	PROSPECT HIGHWAY KEY FEATURES	17
4.2	INTERSECTION LAYOUTS (PROSPECT HIGHWAY PROJECT)	18
4.3	MODELLING SCENARIOS	19
4.4	FUTURE TRAFFIC PROFILE	21
4.5	BASELINE MODELLING RESULTS	22
5	PARKING PROVISIONS	25
5.1	CAR PARKING	25
5.2	BICYCLE PARKING	27
6	DESIGN COMMENTARY	28
6.1	RELEVANT DESIGN STANDARDS	28
6.2	PROPOSED DESIGN	28
7	OPERATIONAL TRAFFIC ASSESSMENT	29
7.1	TRAFFIC GENERATION	29
7.2	TRAFFIC DISTRIBUTION	30
7.3	TRAFFIC IMPACTS	32
8	SUMMARY AND CONCLUSIONS	39
8.1	KEY FINDINGS	39
8.2	RECOMMENDATIONS & CONCLUSIONS	40

Appendices

Appendix A: Swept Path Analysis & Design Commentary

Appendix B: SIDRA Output Summary

1 Introduction

1.1 Overview & Objective

Ason Group has been engaged by ISPT Pty Ltd to prepare a Transport Impact Assessment (TIA) to support the proposed warehouse and industrial development at various Lots fronting Foundation Place and Clunies Ross Street (the Site). The Site is located within Blacktown and Cumberland Local Government Areas (LGA). However, as a State Significant Development (SSD-10399), the application shall be subject to Department of Planning, Industry & Environment (DPIE) assessment and approval.

1.2 Study Purpose

The purpose of this TIA is to address the “traffic and transport” related comments outlined in the Secretary’s Environmental Assessment Requirements (SEAR) provided by the Department of Planning Industry and Environment (DPIE) dated 16 December 2019. A copy of the relevant comments is included below.

1.3 SEAR Requirements

In response to the SSD – 10399 the DPIE has provided number of traffic and transport related comments which are outlined in below table:

SEAR Requirements and Ason Group Response

No.	SEAR Comments	Ason Group Response	Reference
the EIS must include a Traffic and Transport – Including:			
1	a Traffic Impact Assessment detailing all daily and peak traffic and transport movements likely to be generated (vehicle, public transport, pedestrian and cycle trips) during construction and operation of the development, including a description of vehicle access routes and the impacts on nearby intersections	A detailed assessment of operational traffic movements has been undertaken. Construction traffic will be predominantly vehicular based and thus not generate large number active and public transport trips. Nevertheless, traffic during construction (both peak and daily) shall remain less than the operational volumes outlined above. Heavy Vehicle access routes to be adopted by construction vehicles are also presented in	Section 7 Section 8
2	details of access to the site from the road network including intersection location, design and sight distance	Reference should be made to the architectural plans prepared by SBA Architects in relation to site access arrangements.	Section 6

No.	SEAR Comments	Ason Group Response	Reference
		The site access location and design (including sight distance) has also been assessed.	
3	an assessment of predicted impacts on road safety and the capacity of the road network to accommodate the development	Assessment of high level network impacts has been conducted as referenced.	Section 7.3
4	detailed plans of the proposed site access and parking provision on site in accordance with the relevant Australian Standards	A set of detailed plans accompany this submission. An assessment of the plans in general accordance with Australian Standards has been undertaken.	Section 6.1
5	identification of any dangerous goods likely to be transported on arterial and local roads to/ from the site and, if necessary, the preparation of an incident management strategy	The transport of Dangerous Goods is not specifically proposed. Should individual tenants seek to facilitate transportation of DGs, then operators shall seek necessary permits and associated incident management plans.	n/a
6	details of impact mitigation, management and monitoring measures.	Impact mitigation, management and monitoring measures for traffic generation are included in a separate 'Green Travel Plan'	n/a

1.4 Key References

In preparing this TIA, Ason Group has referenced key planning documents, these include:

- Blacktown City Council Development Control Plan 2015 (BCC DCP 2015)
- Holroyd Development Control Plan 2013 (HDGP 2013)

This TIA also references general access, traffic and parking guidelines and other relevant previous holistic traffic and transport studies including:

- parking; traffic; civil design; communication (ptc.), *Planning Proposal for Prospect South Lands, traffic and parking assessment for Office of Strategic Lands*, 15/03/2018.
- Urbis, *Planning Proposal for Prospect South I Future Industrial Area, SA 6939 Post Gateway prepared for NSW Office of Strategic Lands, revision 1*, 30/10/2018.
- Roads and Maritime Services (RMS), *Prospect Highway Upgrade, Project update*, June 2019.
- Roads and Maritime Services (RMS), *Guide to Traffic Generating Developments* (RMS Guide)
- Australian Standard 2890.1: Parking Facilities – Off Street Car Parking (AS 2890.1)

- Australian Standard 2890.2: Parking Facilities – Off Street Commercial Vehicle Facilities (AS 2890.2)

2 Overview of Proposal

Details of the proposed SSD (the Proposal) are shown in the site plan prepared by SBA Architects. A reduced copy presented in Figure 1 with shown access arrangements for ease of reference.

2.1 Proposed SSD Yield

In summary, the application relates to construction of large format industrial, warehouse and distribution estate with associated (ancillary) office and car parking facilities. The Proposal will be delivered in 7 Lots with key details summarised below.

Table 1: Proposed SSD Yield

Lot No.	Warehouse m ² GFA	Office m ² GFA	Café m ² GFA	Car Parking Provided	LGA
1	18,224	1,396		125	Blacktown
2	24,071	1,787		127	Cumberland
3	12,088	1,318		95	Cumberland
4	5,349	476		101	Cumberland
5	10,401	1,109			Cumberland
6	8,441	1,013		51	Cumberland
7	8,927	893		50	Blacktown
Café Area			146	15	Blacktown
Total	87,501	7,992	146	564	
Total Building GFA		95,639			

2.2 Vehicular Access

As can be seen in **Figure 1**, the Proposal will be accessed via number of access crossovers to both public roads (Foundation Place and Clunies Road Street) and the new internal road.

It is understood that the internal road will be constructed to the relevant Councils' standards. Fire truck access is provided via all roads; however the primary fire truck routes will be through the proposed roads to access the sprinkler tanks located on road section 2 below.

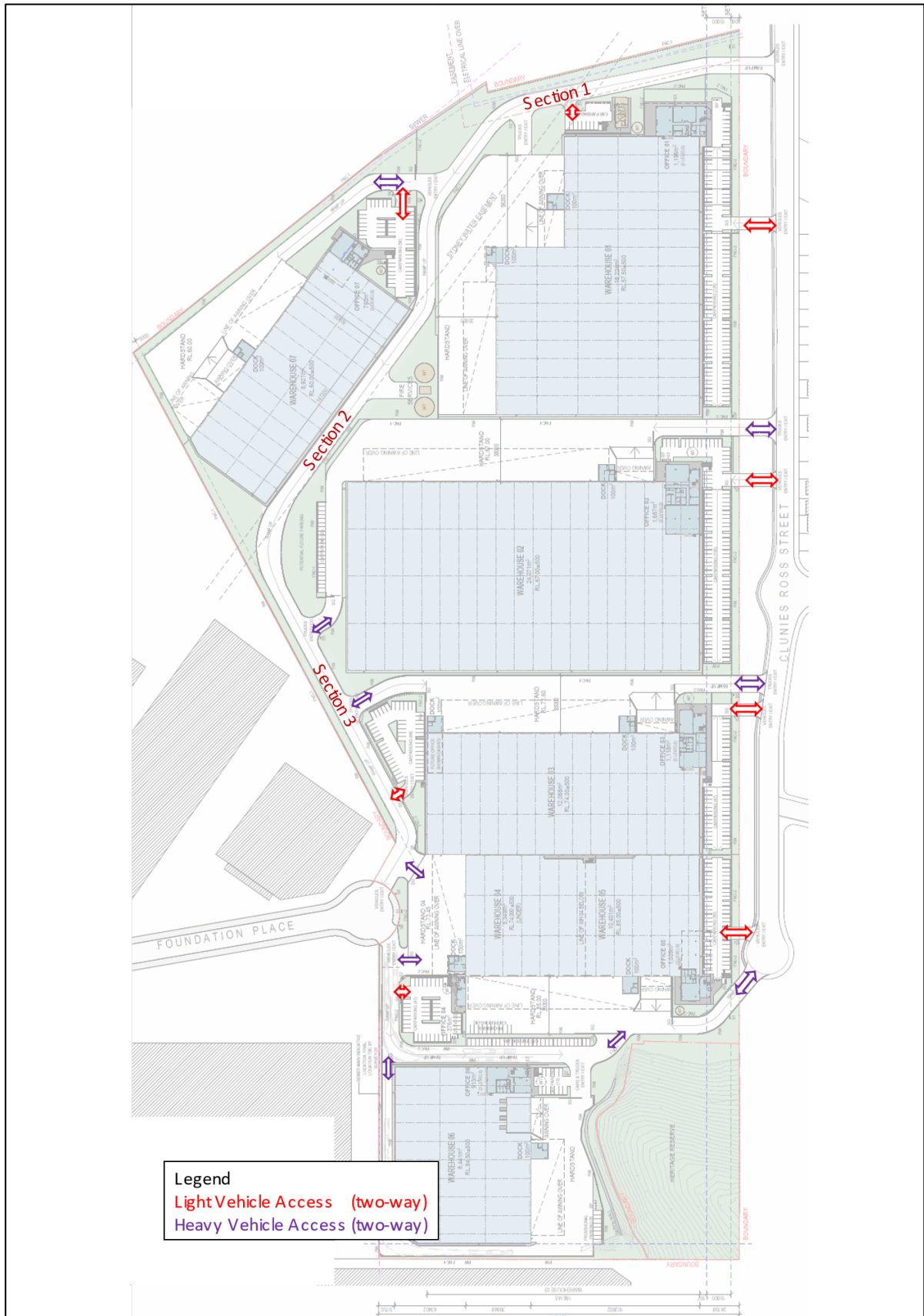


Figure 1: Proposed Vehicular Access Arrangement

2.3 Pedestrian / Cyclist Access

Pedestrian and cycle routes within the Estate are not shown on the current site plan

It is expected that pedestrian footpaths (in the form of concrete footpath) will be provided to connect to the existing pedestrian network on Clunies Ross Street and Foundation Place.

3 Existing Conditions

3.1 Site Details

3.1.1 Site Location

As discussed before, the Site lies within Blacktown and Cumberland City Council as shown in **Figure 2**. The Site includes the following properties:

- Lot 10 DP 1022044,
- Lot 107 DP 102808,
- Lot 63 DP 752051,
- Lot 216 DP1030744, and
- Lot 1047403.



Figure 2: Site Location

3.1.2 Existing Land Use

The Site is currently zoned IN1 and consists of warehouse / industrial and office developments comprising:

- 11,141 m² of 'general industry', including
 - 1,200 m² of office on 44 Clunies Ross Street, and
- 10,474 m² 'office' premises on Lot 107/DP 1028208.

3.1.3 Existing Site Access

Currently, the Site is directly accessed via Foundation Place and in several locations along Clunies Ross Street.

3.1.4 Existing Vehicular Traffic Generation

The likely traffic generation of the Site has been estimated having regard for the traffic generation rates specified in Section 1.1. Accordingly, the following vehicular traffic generation is estimated for the Site:

Table 2: Existing Vehicular Traffic Generation

Lot	Warehouse	Office	AM Peak (veh/hr)	PM Peak (veh/hr)	Daily (veh/day)
44 Clunies Ross Street	11,141	1200	29	29	211
Lot 107/DP 1028208	0	10,474	168	126	1,152
Total	11,141	11,674	197	155	1,363

Notes) 1) 0.265 veh/100 m² GFA/hr for AM and PM peak hour and 1.892 veh/100 m² GFA/ day
 2) 1.6, 1.2 and 11 vehicular trips per AM, PM and Daily per 100 m² GFA.

Accordingly, the existing land-uses on this site can potentially generate in the order of 155-200 veh/hr during the peak periods. It is noteworthy that the Lot 107 is currently closed and does not generate any traffic.

3.2 Road Network

3.2.1 Road Hierarchy

The key roads in the vicinity of the site are summarised below.

Road Name	Road Classification	AADT ² (vpd) ¹	Speed Limit ³
Foundation Place	Local	~ 1,000	50 km/h
Clunies Ross Street	Local	~ 3,000	60 km/h
Prospect Highway	State Road	~ 10,000	60 km/h

Notes: 1) If no data available, value based on typical environmental thresholds

2) AADT volumes have been estimated based on traffic surveys conducted during peak hours in December 2019.

3) Sign posted speed limit. Actual speeds may vary.

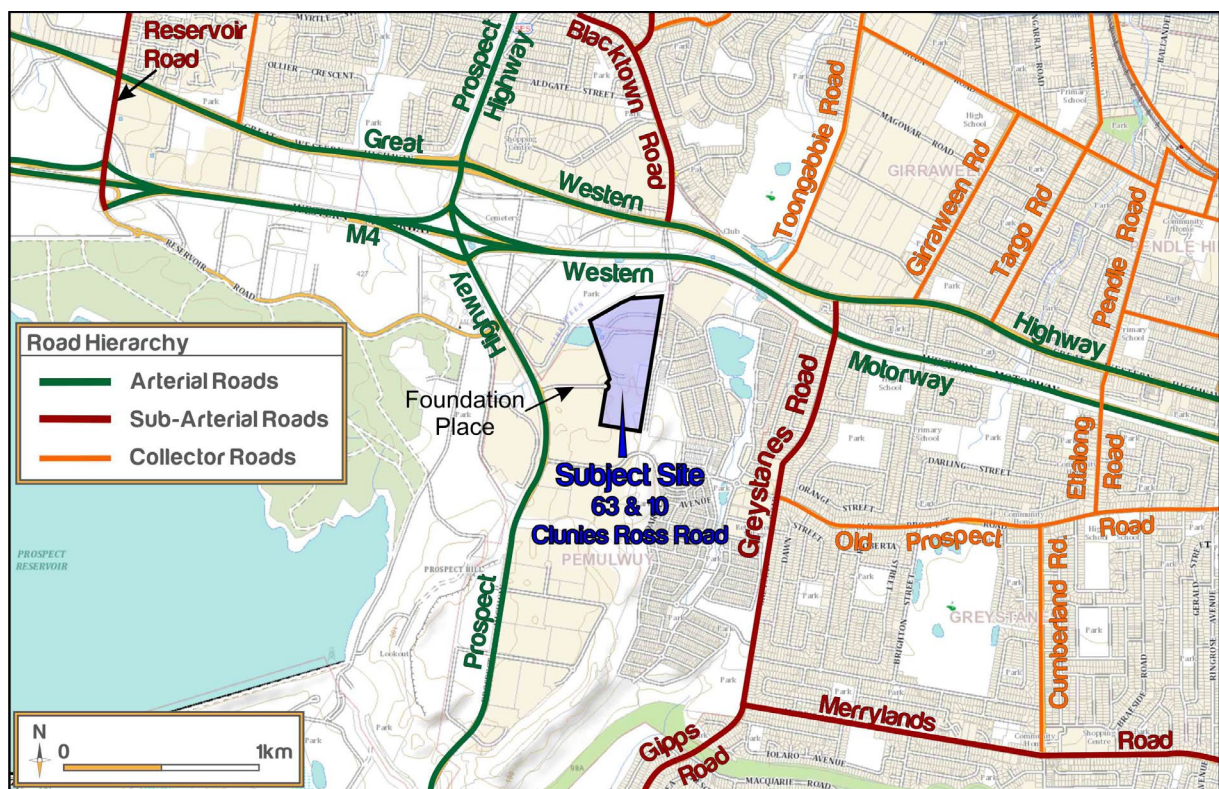


Figure 3: Site and Road Hierarchy

3.2.2 Existing Intersection Performance

The key intersections in the vicinity of the site are discussed below:

- Great Western Hwy / Clunies Ross St / Blacktown Rd operates as an existing signalised intersection observed with notable queueing on the northern approach. It should be noted that the left turn from Blacktown Road has undergone a recent upgrade to facilitate pedestrian priority.
- Clunies Ross St / Wombat St exists as a roundabout providing access to the low-density residential area east of the intersection. Currently, the southern approach of the Site forms a cul-de-sac.
- M4 Western Mwy / Prospect Hwy (North & South) is a two part interchange providing access and egress to the Western Motorway via separated on-and-off ramps. The northern junction is a two-lane roundabout with a signalised pedestrian crossing the western motorway off-ramp, while the southern junction is signalised.
- Prospect Hwy / Reservoir Rd forms a roundabout, with Reservoir Road forming the east-west junction. Each leg is characterized by a single travel line in each direction.
- Prospect Hwy / Foundation PI is a three-way junction with the minor leg (Foundation PI) forming a cul-de-sac at its eastern end.

Traffic surveys were undertaken in December 2019 (outside of school holiday periods) to establish existing movements for the 2019 baseline scenario, and to develop a foundation for modelling future years. The results of the traffic survey are presented in **Figure 4**.

In addition to conducted traffic surveys, on-site assessment was conducted. It was observed during AM and PM Peak site assessments that the road network inclusive of the abovementioned intersections generally perform with a moderate degree of congestion, accounting for high vehicle movements northbound and southbound through the Prospect Highway industrial corridor.

It should be noted that the Clunies Ross Street / Wombat Street roundabout generally performed satisfactorily, accounting for the primary usage from the low-density residential zone to the Site's east.

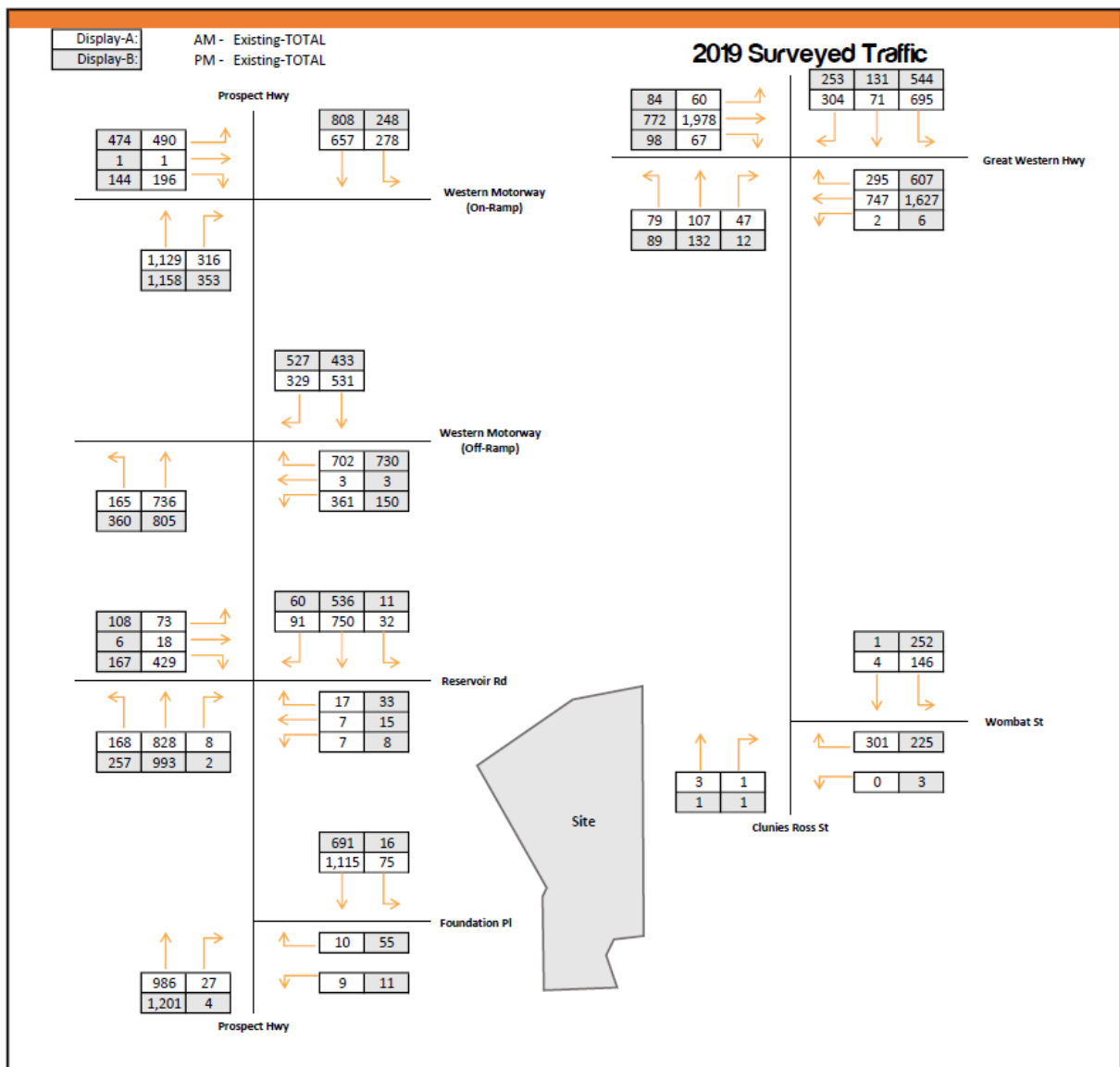


Figure 4: 2019 Existing Baseline Movements

The performance of the key intersections has been analysed using the SIDRA Intersection computer program. SIDRA modelling outputs a range of performance measures, in particular:

- *Average Vehicle Delay (AVD)* – The AVD (or average delay per vehicle in seconds) for intersections also provides a measure of the operational performance of an intersection and is used to determine an intersection's Level of Service (see below). For signalised intersections, the AVD reported relates to the average of all vehicle movements through the intersection. For priority (Give Way, Stop & Roundabout controlled) intersections, the AVD reported is that for the movement with the highest AVD.
- *Level of Service (LOS)* – This is a comparative measure that provides an indication of the operating performance, based on AVD.

The following table provides a recommended baseline for assessment as per the RMS Guide:

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way and Stop Signs
A	less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays. Roundabouts require other control mode	At capacity, requires other control mode
F	More than 70	Unsatisfactory and requires additional capacity.	Unsatisfactory and requires other control mode or major treatment.

The local network performance is provided in **Table 3** which presents the SIDRA intersection modelling results of the key intersections under the existing “baseline” scenario.

Table 3: Intersection Performance – Existing Base Case

Intersection	Control Type	Period	Intersection Delay	Level of Service
Western Motorway / Prospect Highway (North)	Priority	AM	122.7	F
		PM	156.8	F
Western Motorway / Prospect Highway (South)	Signals	AM	36.5	C
		PM	46.3	C
Prospect Highway / Reservoir Road	Priority	AM	465	F
		PM	99.4	F
Prospect Highway / Foundation Place	Priority	AM	19.3	B
		PM	12.3	A
Great Western Highway / Blacktown Road / Clunies Ross Street	Signals	AM	42	C
		PM	41.7	C
Clunies Ross Street / Wombat Street	Priority	AM	9.8	A
		PM	9.4	A

The results generally indicate that, overall, there is substantial congestion noted in the area, with the M4 / Prospect Hwy and Prospect Hwy / Reservoir Rd intersections performing at LoS F. However, it should be noted that planned upgrades for intersections have been confirmed and detailed in Section 4, warranting the need for a future “Baseline” network case for assessment.

3.3 Public Transport

The Site is has limited connectivity to the public transport network. Key rail and bus services local to the Site are summarised below.

3.3.1 Railway Services

Having regard for the general guidelines listed in the Integrated Public Transport Service Planning Guidelines, Sydney Metropolitan Area (TfNSW, December 2013), rail services within 800 metres (approximately 10-minute walk) influence modal travel to the Site. Considering this, there are no immediate train stations within proximity of the wider industrial park, with the closest being Pendle Hill Station situated 4.5km to the east.

3.3.2 Bus Services

The *Integrated Public Transport Service Planning Guidelines* provides similar guidance to the above with regard for bus services within 400m (approximately 5-minute walk) of the Site. In this proximity, a single bus stop pair is ideally situated on Clunies Ross Street, with another two bus stop pairs situated within 800m – on Njiong Drive to the east and Prospect Highway to the west. Service accessibility is broken down below.

Table 4: Bus Services

Route Number	Location	Service Route	Frequency
800	~ 400m (Clunies Ross St)	Blacktown to Fairfield via Wetherill Park	8-10 services during AM Peak 8-10 services during PM Peak
810/810X	~ 800m (Nijong Dr)	Merrylands to Parramatta via Great Western Hwy	2-3 services during AM Peak 7-8 services during PM Peak
812	~ 800m (Prospect Hwy)	Blacktown to Fairfield	4-5 services during AM Peak 6-7 services during PM Peak

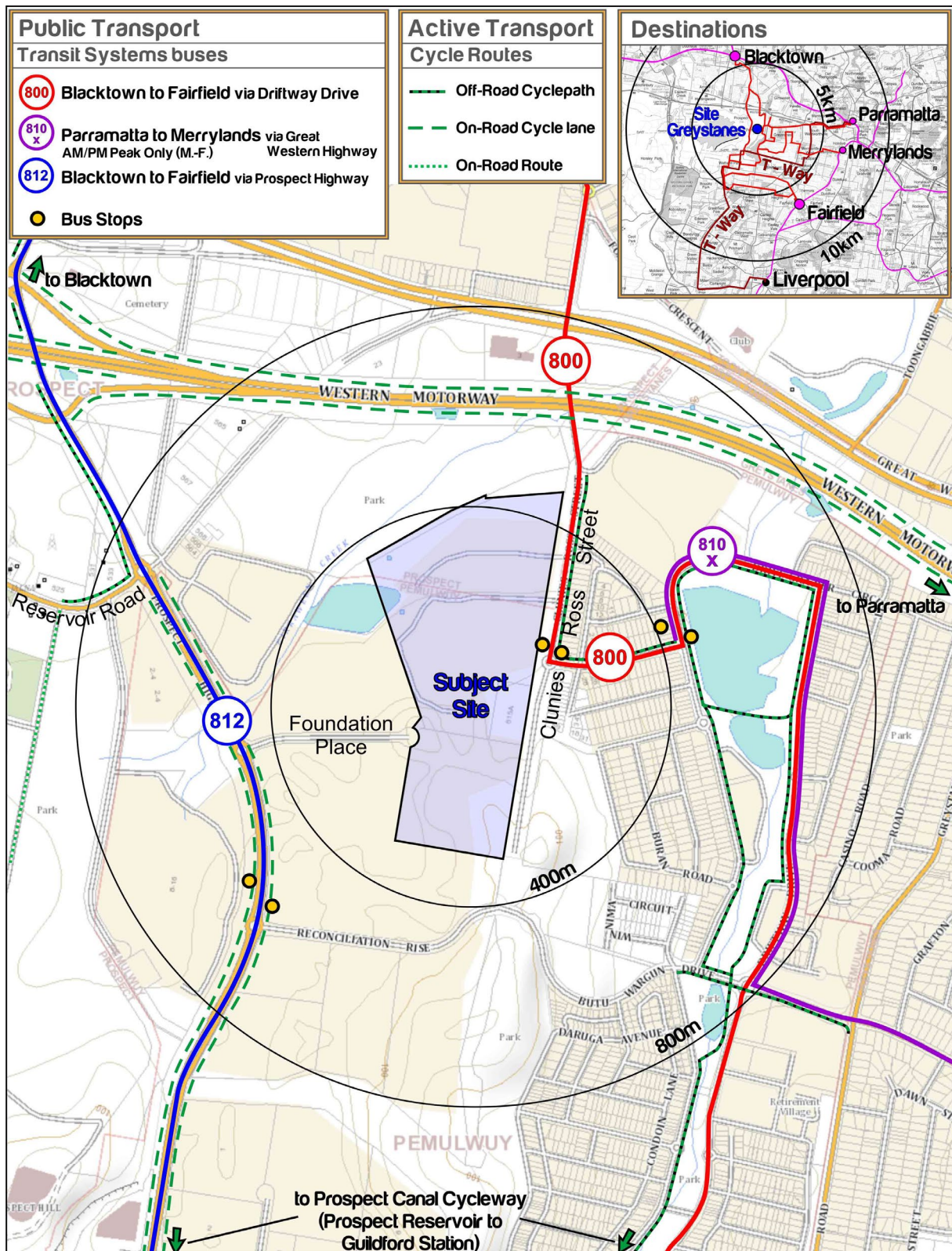


Figure 5: Public Transport Network

3.4 Active Transport

3.4.1 Existing Pedestrian Accessibility

The Site is generally serviced well by pedestrian footpaths. Both Clunies Ross Street and Foundation Place provide accessible pathways connecting to the wider pedestrian network.

There are no formal pedestrian crossings at the Prospect Highway / Foundation Place roundabout. However, the Great Western Highway / Blacktown Road intersection has signalised pedestrian protection, with the anticipated Reservoir Street signalisation upgrade receiving similar amenity.

3.4.2 Existing Cycle Routes

There is currently moderate cycling network connectivity to the Site, with the primary connection to the wider network via the M4 motorway and on-road via Prospect Highway. Similar amenity exists for Clunies Ross Street. It should be noted that Blacktown City Council have proposed several new bicycle routes along Reservoir Street.

4 Future Upgrades (Without Proposal)

TfNSW has planned upgrades to 3.6 kilometres of Prospect Highway between Reservoir Road in Prospect and St Martin Crescent in Blacktown. In June 2019, it was announced that the NSW Government has committed funding for this upgrade with the start date of construction set for 2020.

4.1 Prospect Highway Key Features

According to TfNSW (former RMS), key features of this upgrade can be summarised as follows:

- Upgrading Prospect Highway into a four-lane divided road (from an undivided two-lane road),
- Duplicating the bridges over the M4 Motorway and Great Western Highway,
- A new two-way link road between Great Western Highway and Prospect Highway, with traffic lights at each end of the new road
- New traffic lights at:
 - Stoddart Road
 - M4 Motorway eastbound entry and exit ramps
 - Reservoir Road
- Changing access arrangements at:
 - Tudor Avenue
 - Roger Place
 - Vesuvius Street
 - Ponds Road
- Upgrading the existing shared path on the western side of Prospect Highway between M4 Motorway and Blacktown Road,
- Installing a kerbside bus lane in each direction between Lancelot Street and north of St Martins Crescent.
- Providing a kiss-and-ride facility for Shelly Public School within the school grounds.
- Modifying the intersection at Hadrian Avenue and Keyworth Drive to provide a roundabout.
- Changing the posted speed limit on Prospect Highway between Reservoir Road and Blacktown Road, from 60km/h to 70km/h.

A reduced copy of this upgrade is provided in **Figure 6**.

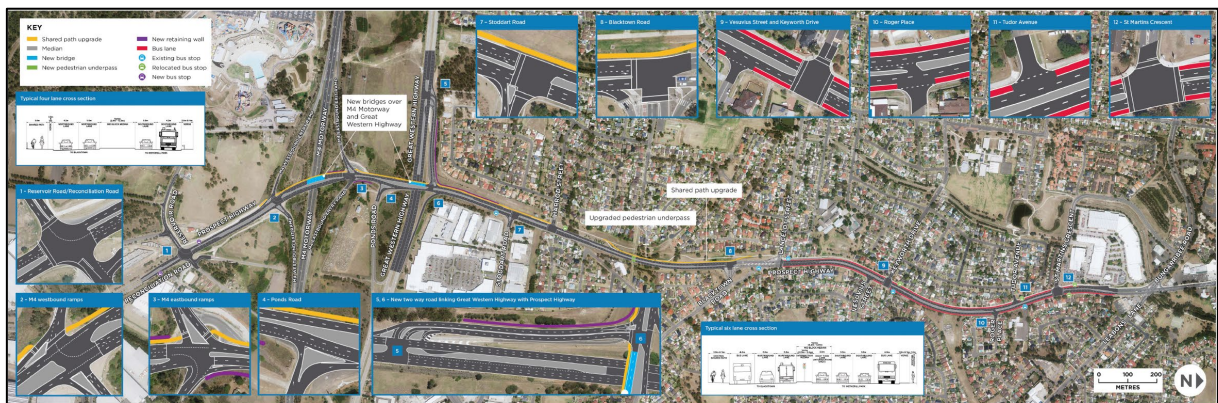


Figure 6: Prospect Highway Upgrade Plan

4.2 Intersection Layouts (Prospect Highway Project)

In relation to the intersections with planned upgrades associated with the site network, three updated layouts have been adopted for the modelling tasks having regard for 100% Completion plans prepared by SMEC. A comparison of these intersections and the 2019 existing configurations are provided below.

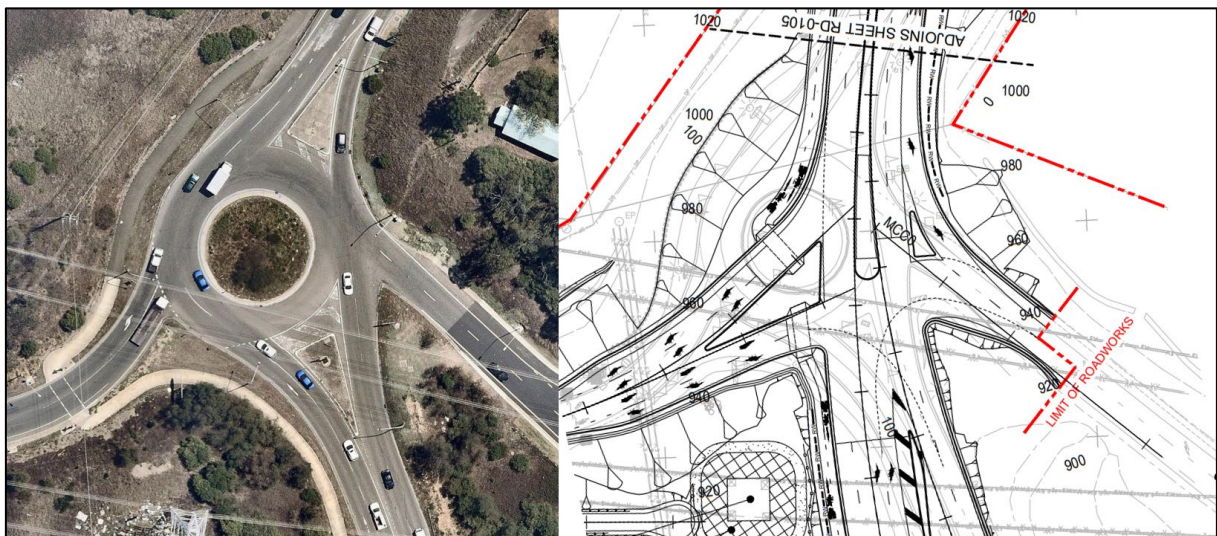


Figure 7: M4 Eastbound Ramp (North) – Existing and SMEC Plans

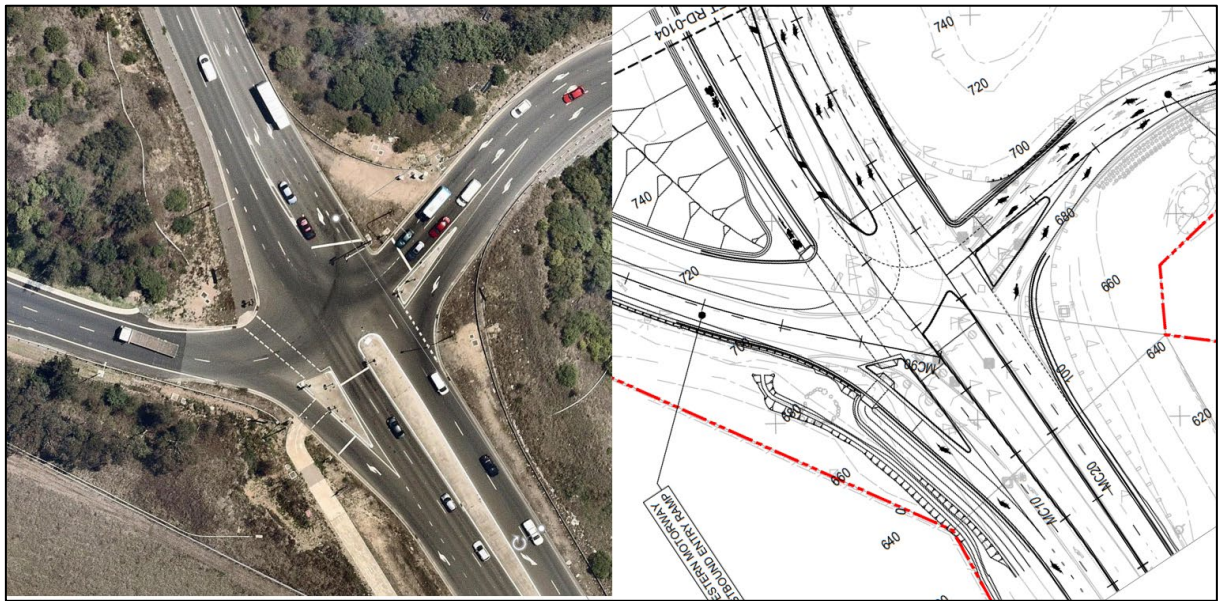


Figure 8: M4 Westbound Ramp (South) – Existing and SMEC Plans

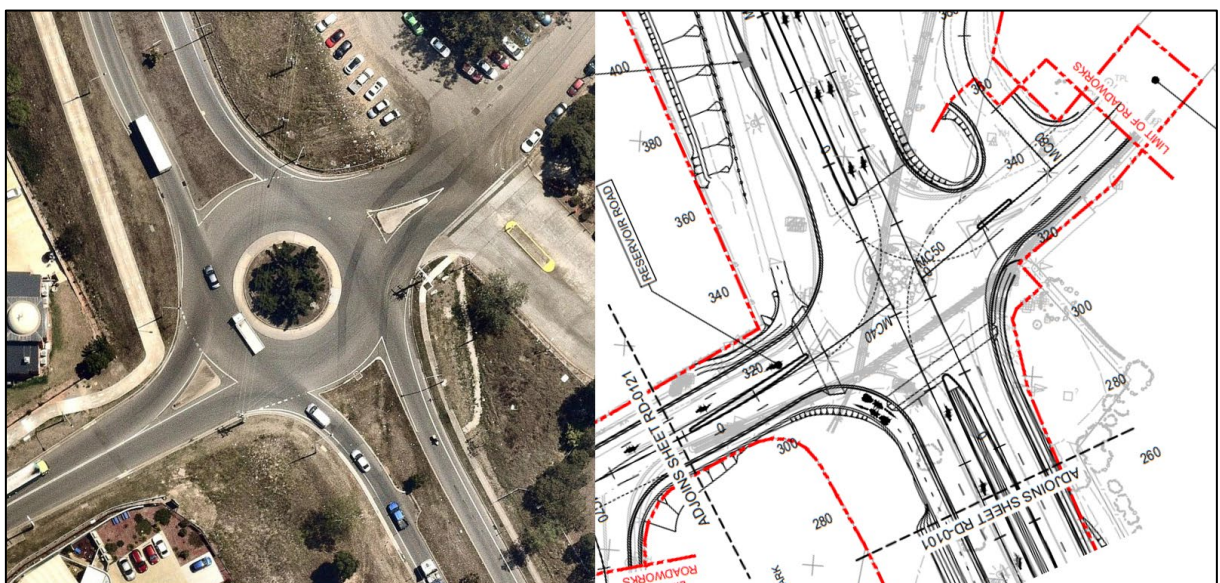


Figure 9: Prospect Highway / Reservoir Road – Existing and SMEC Plans

It should be noted that the remaining intersections with no planned future upgrades have been modelled in their existing configurations.

4.3 Modelling Scenarios

Noting that the Prospect Highway upgrade works are underway and due for commencement in 2020, this TIA assumes a baseline of 2021 for the purpose of the base scenario, as agreed to in discussion with TfNSW. In this regard, the modelling pre-emptively assumes operational capacity of the planned upgrades by 2021.

Accordingly, the SIDRA network layouts assumed for 2019 (surveyed date) and 2021 (base year) are shown in the following figure for comparison.

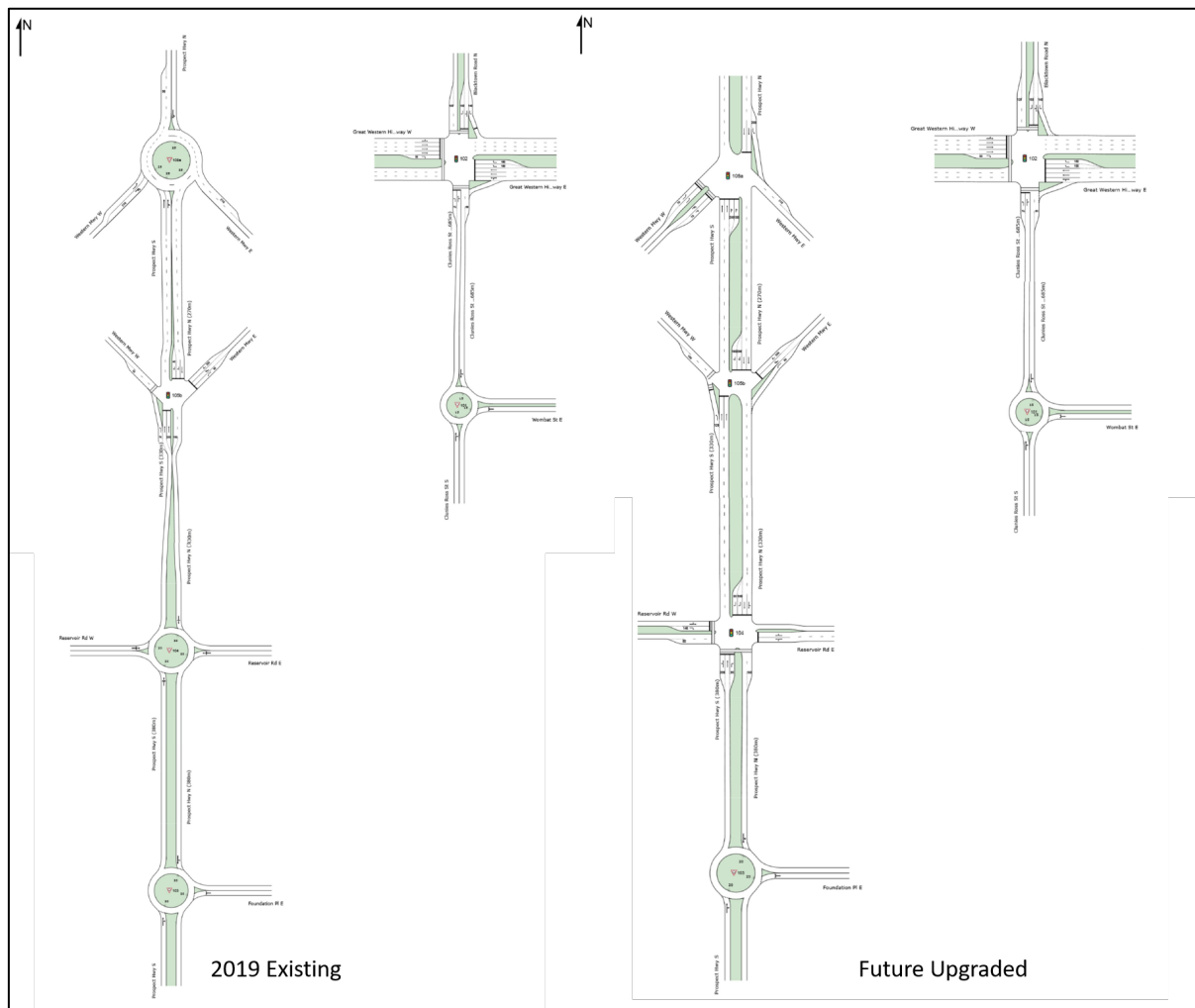


Figure 10: 2019 (surveyed year) vs. 2021 Future Base Year - SIDRA Network

The longer-term future scenario (10-year post completion) of Prospect Highway has been assumed to be 2031 for the purpose of our modelling. The SIDRA network configuration remains the same as that of 2021.

Accordingly, the following modelling scenarios have been modelled for assessment of 'base case' scenarios:

- 2019 – Surveyed year.
- 2021 – Baseline case
- 2031 – 10-year post development

4.4 Future Traffic Profile

The traffic volumes for different modelling scenarios have been established as follows:

- 2021 – The application of average annual growth rates in line with TfNSW's Strategic Traffic Forecast Model (STFM) for 2036.
- 2031 – The application of average annual growth rates in line with TfNSW's STFM for 2036.

Accordingly, the following traffic profiles have been adopted for the broader network.

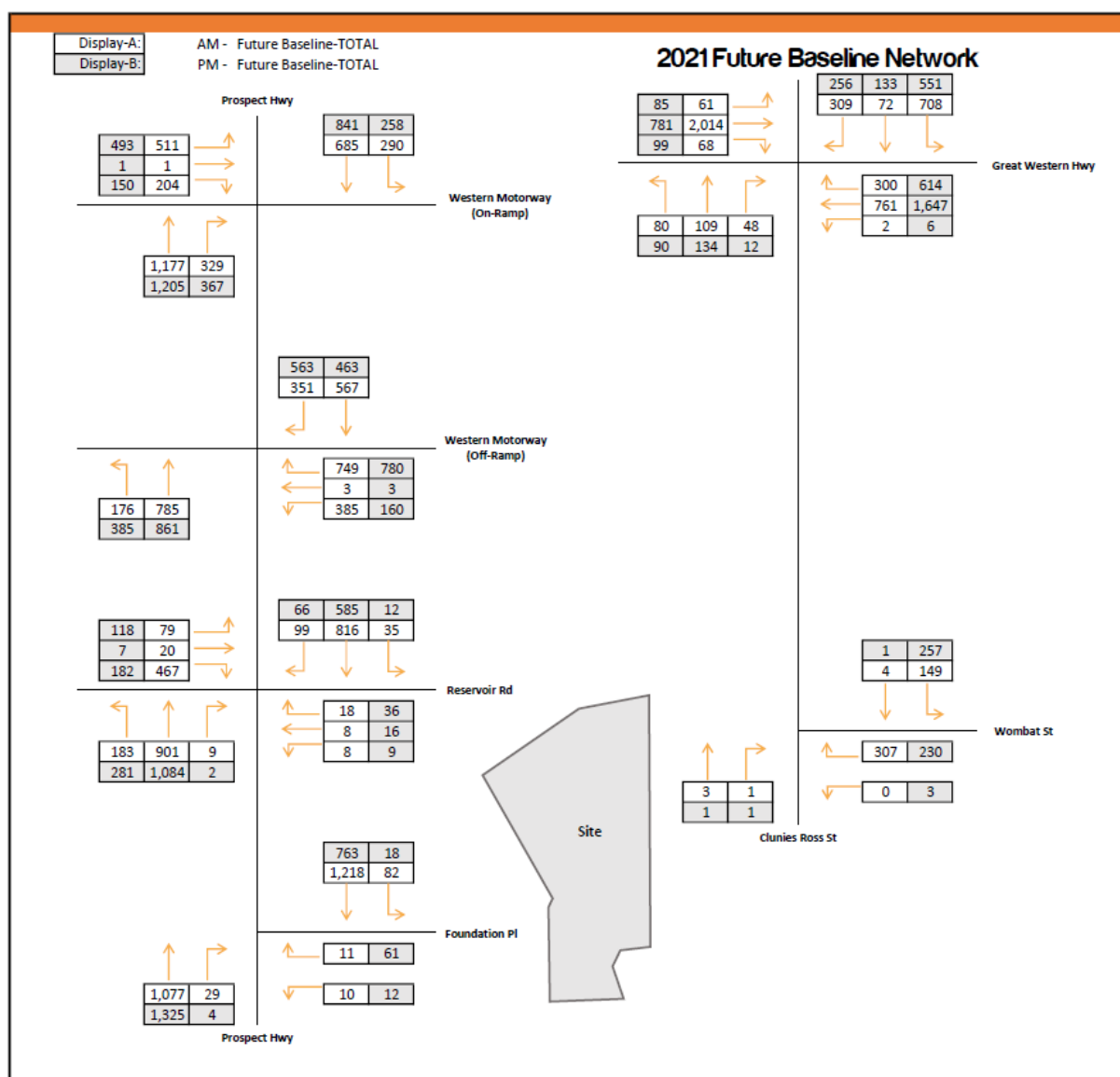


Figure 11: 2021 Baseline Movements

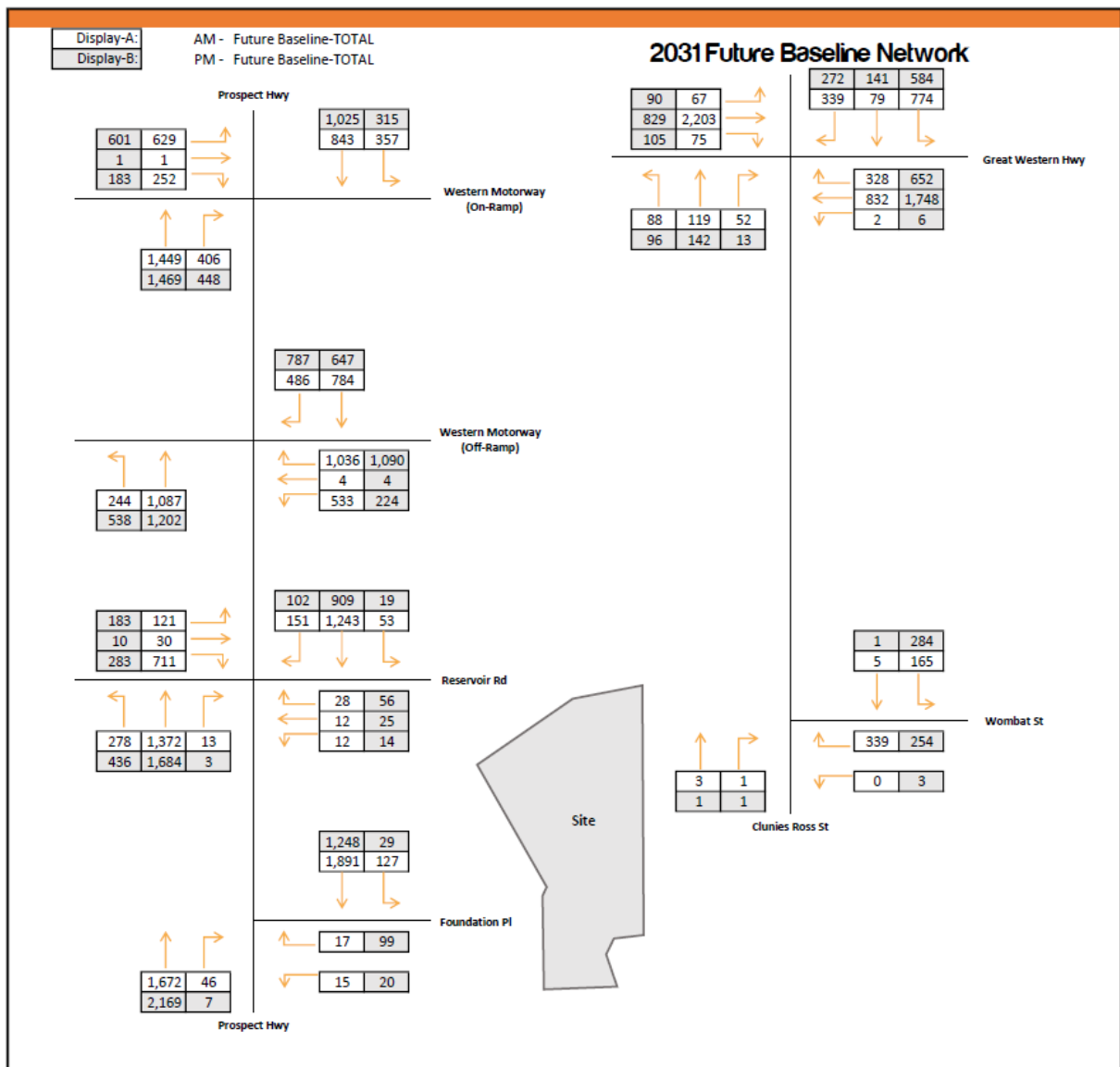


Figure 12: 2031 Baseline Movements

4.5 Baseline Modelling Results

The following baseline scenarios have been modelled in SIDRA based on the future network displayed in **Figure 10**, and adopt the future traffic profiles in **Figure 11** and **Figure 12**:

- 2021 Future Base; and
- 2031 Future Base (10-year post-development).

The SIDRA results of the base case scenarios are summarised below.

Table 5: Future Base Modelling Scenarios

Intersection	Control Type	Period	2021 Future Base		2031 Future Base	
			Intersection Delay	Level of Service	Intersection Delay	Level of Service
Western Motorway / Prospect Highway (North)	Signals	AM	25.5	B	30.1	C
		PM	24.8	B	27.6	B
Western Motorway / Prospect Highway (South)	Signals	AM	32.1	C	129.7	F
		PM	45.1	D	129.2	F
Prospect Highway / Reservoir Road	Signals	AM	48	D	232.8	F
		PM	21.4	B	29.5	C
Prospect Highway / Foundation Place	Priority	AM	32.4	C	1252.9	F
		PM	14.9	B	593.2	F
Great Western Highway / Blacktown Road / Clunies Ross Street	Signals	AM	45.3	D	52	D
		PM	41.7	C	45.3	D
Clunies Ross Street / Wombat Street	Priority	AM	8.1	A	8.3	A
		PM	7.4	A	7.5	A

The results of the future base modelling demonstrate that generally, the network performs satisfactorily in 2021, with the worst performing intersection (Great Western Highway / Blacktown Road / Clunies Ross Street) performing at LoS D and C during the AM and PM Peaks.

However, the 2031 future base case indicates reduced network performance as a result of 10-year background growth forecast in the TfNSW STFM model. Increased growth primarily along Prospect Highway has impacted the performance of the existing and upgraded intersections, notably Foundation Place (performing at LoS F during the AM and PM Peaks) as well as Reservoir Street and the Southern M4 Junction.

This indicates that to accommodate future growth, further upgrades to Prospect Highway may be required in the future. This may involve reducing pressure on the single-lane bottleneck of Prospect Highway (Reconciliation Road) between Reservoir Street and Bellevue Circuit to the south.

In any event, the impact of the Project Case traffic on these intersections is discussed in Section 7.

5 Parking Provisions

Car parking provisions proposed under this SSD have been reviewed against the following controls:

- BCC DCP 2015 → applicable to Lots 1, 7 and the café,
- HDCP 2013, and applicable to Lots 2-6 (incl.)
- RMS Guides. provide a general indicator for parking provision in line with SEARs.

5.1 Car Parking

5.1.1 Car Parking Rates

Applicable parking rates to the proposal are as outlined in **Table 6**.

Table 6: Council Parking Rates

Land Use	BCC DCP 2015	HDCP 2013	RMS Guides
Warehouse / Industrial	1 space per 75 m ²	1 space per 300 m ²	1 space per 300 m ²
Office	1 space per 40 m ²	1 space per 40 m ²	1 space per 40 m ²
Café	1 space per 10sq.m of dining area, plus 1 space per 2 employees	1 space per 8 m ²	15 space per 100 m ² , or 1 space per 3 seats.

Notes: 1) Food and drink premises (including Restaurants, Take away food and drink premises and Pubs) in all zones other than B1, B2, B4, B6 and R4)

5.1.2 Car Parking Requirements & Provision

Accordingly, the corresponding parking requirements are provided in **Table 7**.

Table 7: Car Parking Demand vs. Supply

Lot No.	Warehouse GFA	Office / Café GFA	BCC DCP 2015	Holroyd DCP 2013	RMS Guide	On-site Supply
1	18,224	1,396	278	-	96	125
2	24,071	1,787	-	125	125	127
3	12,088	1,318	-	73	73	95
4	5,349	476	-	30	30	101
5	10,401	1,109	-	62	62	

Lot No.	Warehouse GFA	Office / Café GFA	BCC DCP 2015	Holroyd DCP 2013	RMS Guide	On-site Supply
6	8,441	1,013	-	53	53	51
7	8,927	893	141	-	52	50
Café		146	15	-	22	15
Total	87,501	8,138	434	344	513	564

The above table demonstrates that on-site parking provisions generally satisfy the parking demands of the Site, with relatively minor departures specifically for Lot 6 and 7. It should be considered that a deficit of 2 spaces for the abovementioned Lots would generally have minimal impact in an operational perspective.

In this regard consideration should be given to the other, external approvals within the broader Western Sydney Employment Area (WSEA). This is briefly discussed as follows.

5.1.3 Standard Use Demands Derived from Other Similar Developments

Ason Group has previously undertaken surveys of 8 comparable industrial developments in order to establish the effective parking rate of operational developments. These surveys have adopted the same methodology as that used in establishing the RMS Guide rates. Surveys included industrial developments (generally warehouse) in several locations including:

- Erskine Park,
- Oakdale Central; and
- M7 Business Hub.

The results of these surveys are summarised in **Table 8**.

Table 8: Effective Parking Rates for Surveyed Developments

Site Address	Total GFA (m ²)	Car Parking Provided	Maximum Parking Demand	Effective Parking Rate (1 space per X m ²)
Bunning's – 8 Interchange Dr	55,550	140	68	817
Toll – Lot 11 Wonderland Dr	27,440	137	47	584
Ingram Micro – 23 Wonderland Dr	36,610	300	183	200

DHL – Milner Ave	20,170	115	109	185
Kimberly Clarke – 35 Sarah Andrews Cl	45,210	100	78	580
Linfox – 25 Sarah Andrews Cl	51,200	217	116	441
Ubeeco – 28 Sarah Andrews Cl	10,865	150	71	153
Woolworths – 29 Sarah Andrews Cl	52,705	280	197	268
Total Average Rate				404

The surveys demonstrated a range of between 1 space per 153 m² and 1 space per 817 m² with a mean value of 1 space per 404 m². Accordingly, the “middle range” car parking rate based on the surveys is in the order of **1 space per 350 m²**.

Overall, these rates are consistent with those established by the RMS Guide and indeed suggest that a reduction in overall car parking could be justified in comparison to the parking rates provided in BCC DCP 2015.

In summary, the proposed parking provisions are in accordance with RMS Guide rates and are therefore sufficient to accommodate all reasonable demands on-site.

5.1.4 Accessible Parking

Holroyd DCP does not explicitly state rates for accessible parking in industrial zones however facilitates consideration for accessible parking needs. In response, a total of 8 accessible parking spaces have been provided distributed throughout parking areas of the development. It is noted that addition of these bays and their associated shared areas may result in reduction of overall parking spaces currently allowed for in Master Plan.

5.2 Bicycle Parking

Both BCC DCP 2015 and the Holroyd DCP 2013 do not specify parking requirements for the provision of on-site bicycle provision. However, both make reference to a general need for the provision of on-site parking opportunity and associated cycling amenities to be facilitated.

In this regard, it can be considered that a rate for bicycle parking can be a condition of consent at Council's discretion which can be delivered at Construction Certificate (CC) of the project.

6 Design Commentary

6.1 Relevant Design Standards

The site access, car park and loading areas have generally been designed to comply with the following relevant Australian Standards:

- AS2890.1 for car parking areas,
- AS2890.2 for commercial vehicle loading areas; and
- AS2890.6 for accessible (disabled) parking.

It is expected that any detailed construction drawings in relation to any modified areas of the car park or site access would comply with these Standards. Furthermore, compliance with the above Standards would be expected to form a standard condition of consent to any development approval.

6.2 Proposed Design

The commercial (heavy) vehicle facilities of the development have been designed having regard for the requirements of AS2890.2.

Reference should also be made to the swept path analysis provided in Appendix A, demonstrating the suitability of the design.

7 Operational Traffic Assessment

7.1 Traffic Generation

7.1.1 Adopted Generation Rates

The traffic impacts of the proposed development have been assessed having regard for the:

- RMS Guide to Traffic Generation Developments (2002), and
- RMS Technical Direction (2013/04a).

The following rates have been adopted based on surveyed sites within the RMS TDT 2013/04a for 'Business Parks and Industrial Estates':

- 0.265 vehicle trips per 100 m² per peak hour period; and
- 1.892 vehicle trips per 100 m² per day.

7.1.2 Development Traffic Generation

Application of these rates to the development is summarised below.

Table 9: Precinct Traffic Generation

Warehouse	AM Traffic Generation	PM Traffic Generation	Daily Traffic Generation
Warehouse 01	52	52	371
Warehouse 02	69	69	489
Warehouse 03	36	36	254
Warehouse 04	15	15	110
Warehouse 05	31	31	218
Warehouse 06	25	25	179
Warehouse 07	26	26	186
Precinct Totals	253	253	1,807

The above is not a net increase and consideration of the traffic associated with existing traffic associated with the site.

Table 10: Traffic Generation Comparison - Existing vs. Proposed

Scenario	Warehouse	Office	AM Peak (veh/hr)	PM Peak (veh/hr)	Daily (veh/day)
Existing	11,141	11,674	197	155	1,363
Proposed	87,501	7,992	253	253	1,807
Total	+76,360	-3,682	+56	+98	+444

It is evident from the above that the Proposal will result in a moderate increase in traffic, both daily and during network peak periods.

7.1.3 Light and Heavy Vehicle Distribution

Further analysis based of the RMS TDT 2013/04a of the surveyed 'Business Parks and Industrial Estates' Sites has demonstrated an indicative percentage split between light and heavy vehicles for the AM and PM hourly peaks, as well as daily totals. The vehicle splits are quantified as follows:

- 28% of total vehicle movements during the AM Peak,
- 16% of total vehicle movements during the PM Peak; and
- 29% of total vehicle movements throughout the day.

7.2 Traffic Distribution

An assessment of the Journey-To-Work 2016 census data set has been undertaken to inform traffic distribution of the abovementioned generation. The figure below demonstrates concentration of movements between home (origin) and the Prospect Industrial Area destination zone (destination).

Based on the above, the following directional proportions have been adopted:

- It should be noted that the above distributions have been compared and validated against the 2019 conducted survey volumes and the 2031 STFM 'select link analysis' to indicate that the adopted distributions are generally within acceptable range.

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3/06/2020

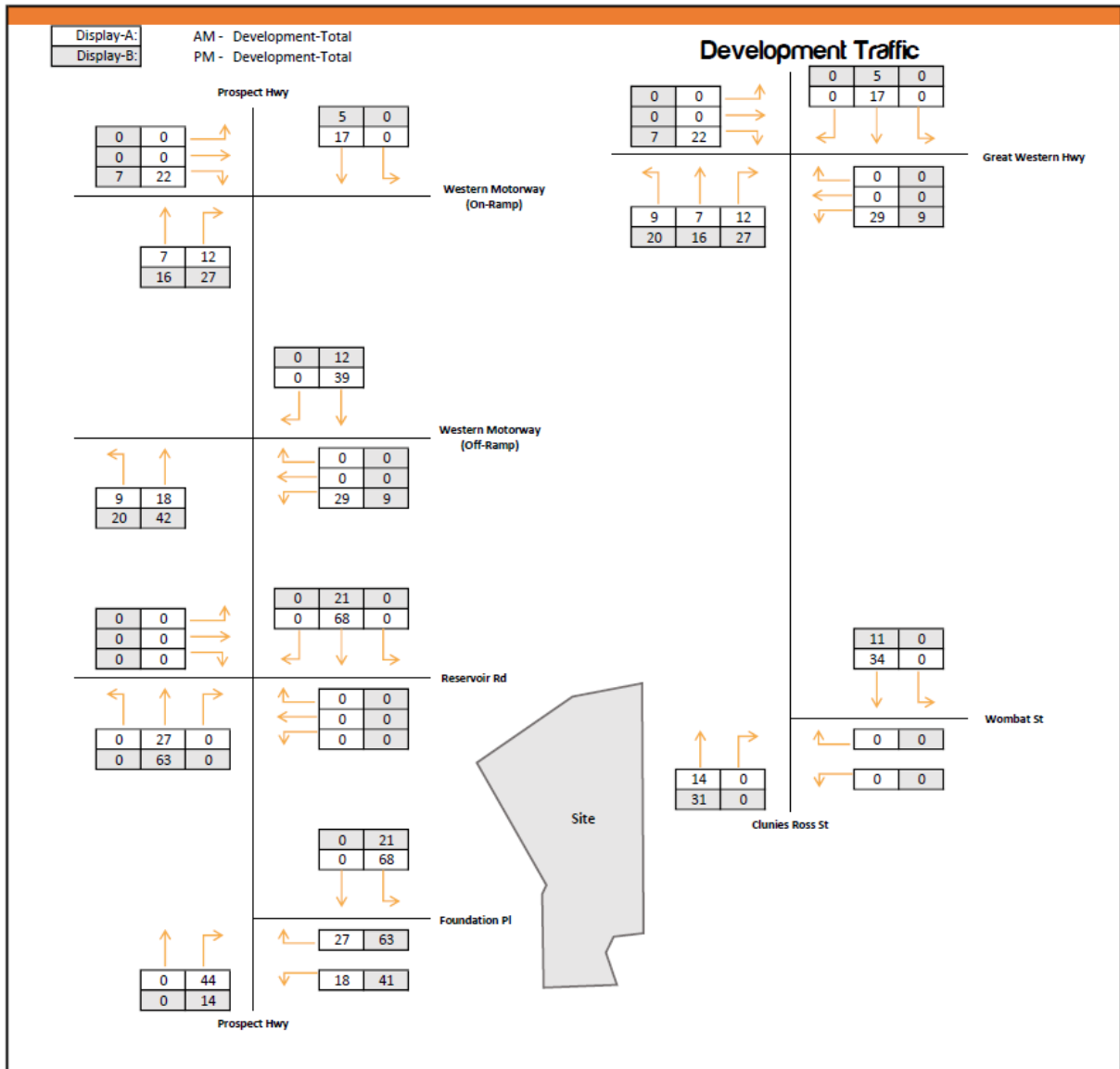


Figure 14: Development Traffic

7.3 Traffic Impacts

Development traffic has been assessed based over two periods, including the 2021 Baseline scenario as well as the 2031 Future scenario. Accordingly, the results of both assessments are discussed in detail below.

7.3.1 2021 Scenario Modelling

With regard for the future Prospect Highway Upgrades referenced in Section 4, a comparison between the 2021 Baseline and Project cases has been undertaken to quantify the impact of development on the road network. The results of this comparison are provided below, with detailed modelling results provided in the Appendix.

Table 11: Intersection Performance Comparison – Base Case vs. Project Case

Intersection	Config	Period	2021 Baseline		2021 Project	
			Delay	Level of Service	Intersection Delay	Level of Service
Western Motorway / Prospect Highway (North)	Signals	AM	25.5	B	26.3	B
		PM	24.8	B	25	B
Western Motorway / Prospect Highway (South)	Signals	AM	32.1	C	31.4	C
		PM	45.1	D	45.3	D
Prospect Highway / Reservoir Road	Signals	AM	48	D	101.7	F
		PM	21.4	B	21.6	B
Prospect Highway / Foundation Place	Priority ¹	AM	32.4	C	40.2	C
		PM	14.9	B	90.7	F
Great Western Highway / Blacktown Road / Clunies Ross Street	Signals	AM	45.3	D	48	D
		PM	41.7	C	43.2	D
Clunies Ross Street / Wombat Street	Priority ¹	AM	8.1	A	7.4	A
		PM	7.4	A	7.1	A

Notes: 1 Results for priority intersections are based on worst approach.

The comparison between the two scenarios above demonstrate that - with the exception of two intersections - the increased traffic associated with the development generally pertains to minimal impact on network performance. The two intersections demonstrated to be markedly impacted are examined below.

The Prospect Highway / Reservoir Road intersection demonstrates an increase of 53.7 seconds to average intersection delay, reducing Level of Service from D to LoS F. Investigation has been undertaken to determine that this has been caused by the worsening impact on the Prospect Highway / Foundation Place roundabout, which forms a bottle neck for traffic volumes moving both north and south. This is demonstrated by similarly poor performance of the Foundation Place roundabout as a result of the increased turning traffic from the east approach associated with the development, evident through the roundabouts' PM performance, noting increased delays to the southern approach of 75.8 seconds and worsening of Level of Service from C to LoS F. As a result of this, sensitivity testing and options testing has been undertaken.

7.3.2 Options Testing

It should be considered that the extent of works of the Prospect Highway Upgrade has produced a bottleneck between the Reservoir Street and Foundation Place intersections as a result of the traffic lanes transitioning from 4 to 2 lanes. This has resulted in an option test to extend the 4-lane roadway from Reservoir Street past the Foundation Place roundabout. The modelled intersections, as well as updated network performance results are provided below.

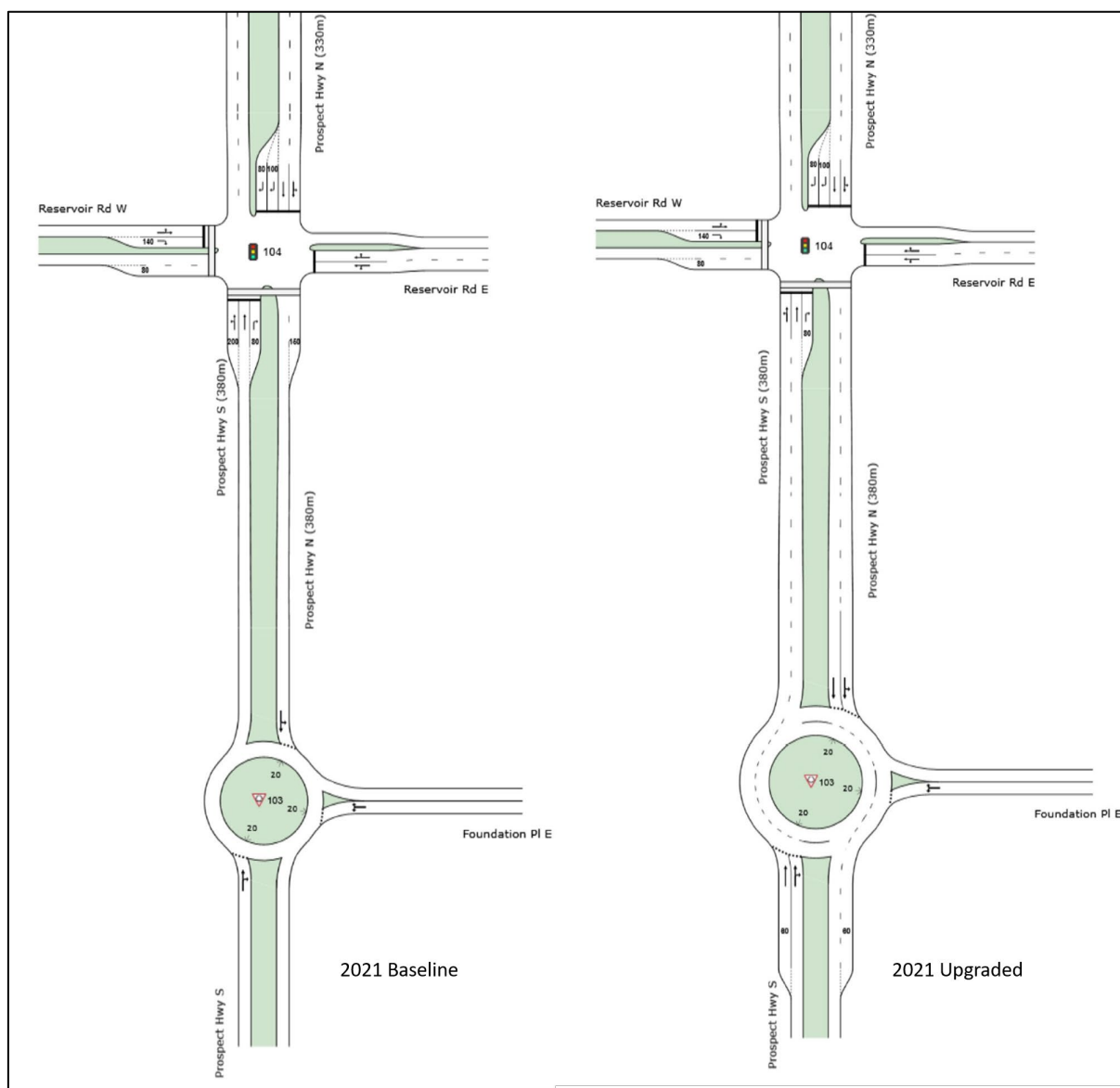


Figure 15: Options Test Upgrades

Table 12: 2021 Modelling Results

Intersection	Config	Period	2021 Baseline		2021 Project		2021 Project (Options Test)	
			Delay	Level of Service	Delay	Level of Service	Delay	Level of Service
Western Motorway / Prospect Highway (North)	Signals	AM	25.5	B	26.3	B	26.2	B
		PM	24.8	B	25	B	25	B

Intersection	Config	Period	2021 Baseline		2021 Project		2021 Project (Options Test)	
			Delay	Level of Service	Delay	Level of Service	Delay	Level of Service
Western Motorway / Prospect Highway (South)	Signals	AM	32.1	C	31.4	C	32.2	C
		PM	45.1	D	45.3	D	47.7	D
Prospect Highway / Reservoir Road	Signals	AM	48	D	101.7	F	51.2	D
		PM	21.4	B	21.6	B	21	B
Prospect Highway / Foundation Place	Priority ¹	AM	32.4	C	40.2	C	21.7	B
		PM	14.9	B	90.7	F	10.6	A
Great Western Highway / Blacktown Road / Clunies Ross Street	Signals	AM	45.3	D	48	D	48	D
		PM	41.7	C	43.2	D	43.2	D
Clunies Ross Street / Wombat Street	Priority ¹	AM	8.1	A	7.4	A	7.4	A
		PM	7.4	A	7.1	A	7.1	A

Notes: 1 Results for priority intersections are based on worst approach.

The results above quantify the traffic impacts of the bottleneck by demonstrating that the inclusion of development traffic would only warrant minor increases to intersection delay, as opposed to the previous results.

In summary, it is demonstrated that traffic generation of the proposed development generally has minimal impact on the proposed road network. However, it should be considered that the Foundation Place roundabout would require further capacity upgrades at a later stage to facilitate not only development traffic but also background growth.

7.3.3 2031 Scenario Modelling

As referenced above, a 10-year post development assessment has been undertaken to assess network performance for 2031. However, consideration should be given to the modelling results presented in **Section 4** that demonstrate poor network performance purely as a result of background growth as specified in TfNSW's STFM model.

The table below provides a results comparison between the 2031 Future Baseline case, a 2031 Upgraded Baseline case in accordance with previously recommended upgrades, and the 2031 Future Project case with upgrades.

Table 13: 2031 Modelling Results

Intersection	Config	Period	2031 Baseline		2031 Baseline (Upgraded)		2031 Project (Upgraded)	
			Delay	Level of Service	Delay	Level of Service	Delay	Level of Service
Western Motorway / Prospect Highway (North)	Signals	AM	30.1	C	30.3	C	30.3	C
		PM	27.6	B	27.6	B	28	B
Western Motorway / Prospect Highway (South)	Signals	AM	129.7	F	137.1	F	160.8	F
		PM	129.2	F	151.7	F	148.5	F
Prospect Highway / Reservoir Road	Signals	AM	232.8	F	274.1	F	262.7	F
		PM	29.5	C	45.9	D	38.9	C
Prospect Highway / Foundation Place	Priority ¹	AM	1252.9	F	259.2	F	354.7	F
		PM	593.2	F	95.6	F	386.1	F
Great Western Highway /	Signals	AM	52	D	52	D	53.2	D

Intersection	Config	Period	2031 Baseline		2031 Baseline (Upgraded)		2031 Project (Upgraded)	
			Delay	Level of Service	Delay	Level of Service	Delay	Level of Service
Blacktown Road / Clunies Ross Street		PM	45.3	D	45.3	D	45.2	D
Clunies Ross Street / Wombat Street	Priority ¹	AM	8.3	A	8.3	A	7.6	A
		PM	7.5	A	7.5	A	7.1	A

Notes: 1 Results for priority intersections are based on worst approach.

The results demonstrate that the 2031 future baseline scenario – even with the capacity upgrade to Foundation Place roundabout, exhibits poor network performance. Of note is the worsening of the Reservoir Road intersection and the southern Western Motorway junction, which demonstrate the likely downstream impacts of alleviating the Foundation Place bottleneck. This demonstrates overall capacity issues for the wider network that is outside the scope of this Transport assessment.

It should be noted that the intersections that have not demonstrated capacity exceedance, only experience minor increases to intersection delay with the inclusion of development-associated traffic. This reiterates that development traffic is only anticipated to have minimal impacts to intersection performance, representing approximately 9% of total net growth.

8 Summary and Conclusions

8.1 Key Findings

The key findings of this Traffic Impact Assessment are:

- The SSDA relates to a proposed warehouse and industrial precinct spanning 95,639 m² combined GFA, consisting of 7 warehouse facilities spanning both Blacktown City Council and Cumberland Council LGA's. The site is situated within the Western Sydney Employment Area (WSEA), within the Greystanes Northern Employment Lands precinct.
- Currently, the site benefits from moderate accessibility to public and active transport networks. Notwithstanding, the nature of the use lends itself to a reliance predominantly on the road network to facilitate commuting and business operations. The Site has good proximity of the classified road network, with proximity to the M4 Motorway and Great Western Highway.
- Having regard for the existing Site conditions, the network performs with moderate congestion, as observed on-site and demonstrated in modelling. However, the NSW Government has committed to funding the planned Prospect Highway Upgrade project, with works commencing in 2020.
- Future base modelling inclusive of the Prospect Highway upgrades has been conducted on the basis of background growth guided by TfNSW's STFM EMME model. On this basis, the 2021 Future base scenario is deemed to be operationally sound, however experiences reduced network performance during the 2031 Future Base scenario.
- Project modelling has been conducted over both the 2021 Baseline and the 2031 10-year post development scenarios, with the following outcomes:
 - 2021 Project modelling demonstrates only minimal increases in intersection delay across most intersections, with the exception of the Reservoir Street intersection, worsening in performance from a LoS D to F during the AM. Sensitivity testing has been conducted to demonstrate that the transition from 4-lane to 2-lane between the upgraded Reservoir Street intersection and Foundation Place roundabout is the cause.
 - Options testing has been performed for a hypothetical lane extension as part of the Prospect Highway Upgrade project from Reservoir Street southwards past Foundation Place. This improvement quantifies the presence of a bottle neck at the roundabout, attributed predominantly to background traffic, as well as development traffic, to a lesser extent.
 - The 2031 10—year post development assessment demonstrates that worsening network performance is purely a result of background traffic growth in the region. The upgraded Foundation Place intersection does little to alleviate performance. However, the assessment continues to demonstrate that development traffic contributes a proportionally small impact to network performance.

- In line with individual Council DCP's, the requirement for on-site parking provision falls in the range between 344 and 434 spaces. The RMS Guide suggest a parking provision of 513 spaces. In response, the precinct intends to supply in the order of 564 spaces across the 7 sites and café, broadly satisfying parking provisions requirements as above.
- To assess that this provision is generally sufficient, a parking survey of operational sites within the WSEA area has previously been conducted to establish a definitive range and median parking rate. The parking provision for individual tenancies of the SSDA have been deemed to fall within this established range.
- The access and basement design has generally been designed having regard for relevant Australian Standards (AS2890 series). A standard condition of consent requiring compliance with AS2890 would be considered sufficient to ensure that any minor changes to the plans required, if any, could be undertaken as part of detailed Construction Certificate documentation.

8.2 Recommendations & Conclusions

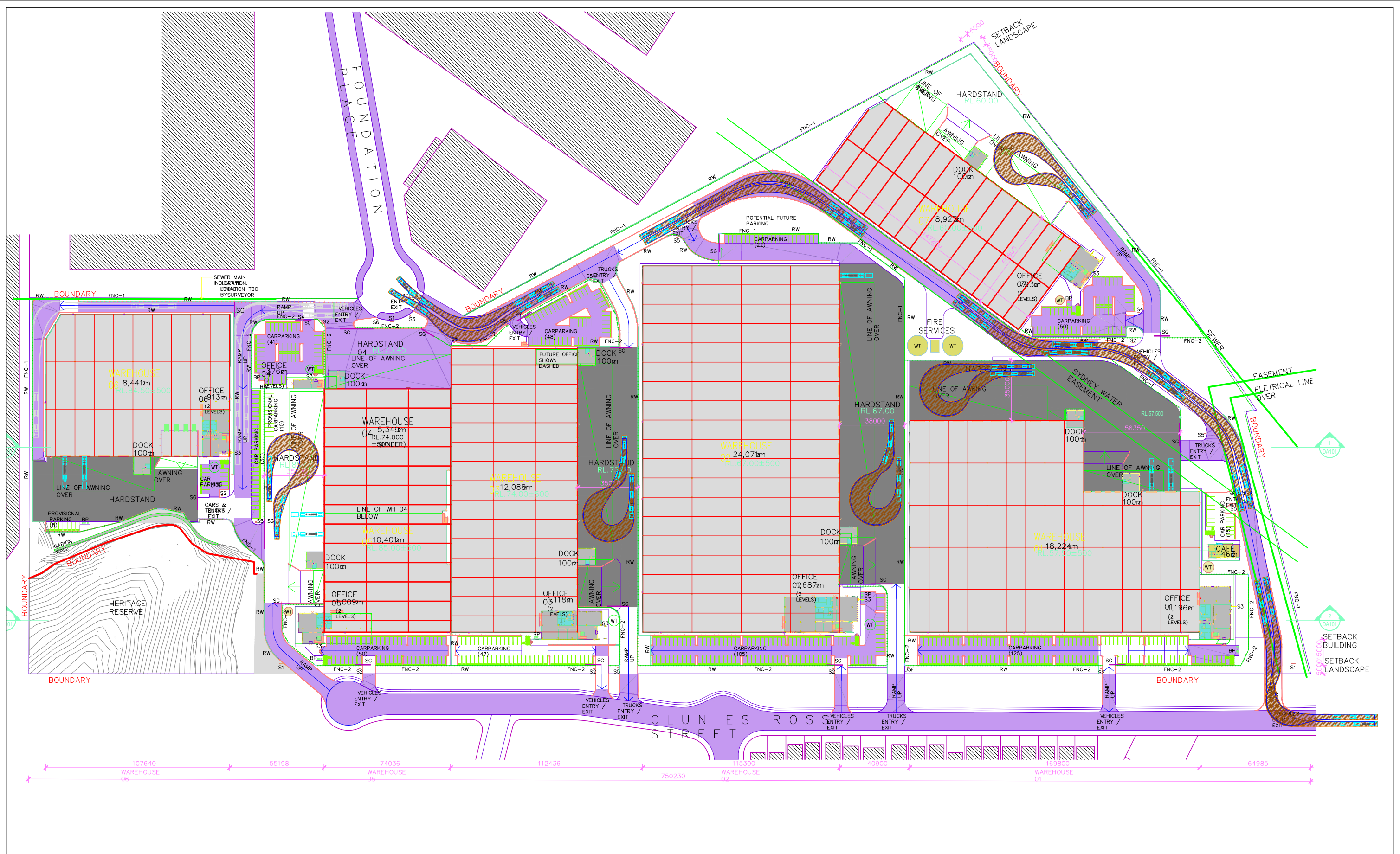
As mentioned previously, the impacts of traffic associated with the development are moderate and contribute to relatively minimal increases to intersection delays in the network.

Notwithstanding, Foundation Place has been identified to form a bottle neck for network performance. It should be considered that capacity upgrades to the roundabout be facilitated by TfNSW at a later stage.

In summary, the Proposal is supportable on traffic planning grounds.

Appendix A

Swept Paths



Revision notes:

Rev:	Date:	Notes:

For information purposes only - not for construction

Drawn By:

M TANGONAN

Client:

Aliro

Project:

P1227
Prospect Logistics

Drawing Title:

Internal Road
36m A-Double

Date:

1-Jun-20

Scale @ A3:

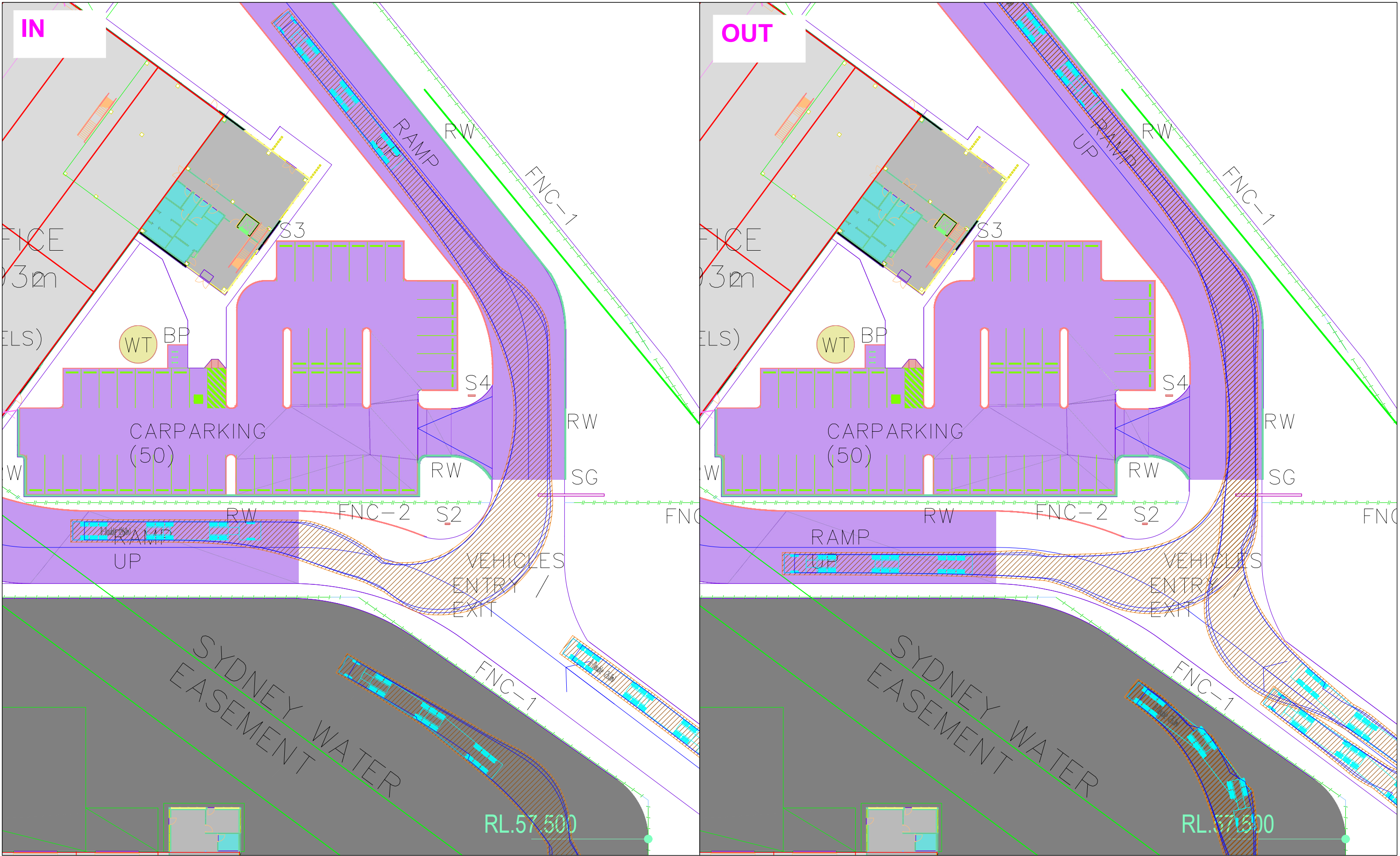
[scale]

Drawing Number:

AG01

asongroup

Suite 5.02, Level 5, 1 Castlereagh Street
Sydney NSW 2000
info@asongroup.com.au



Revision notes:		
Rev:	Date:	Notes:
For information purposes only - not for construction		

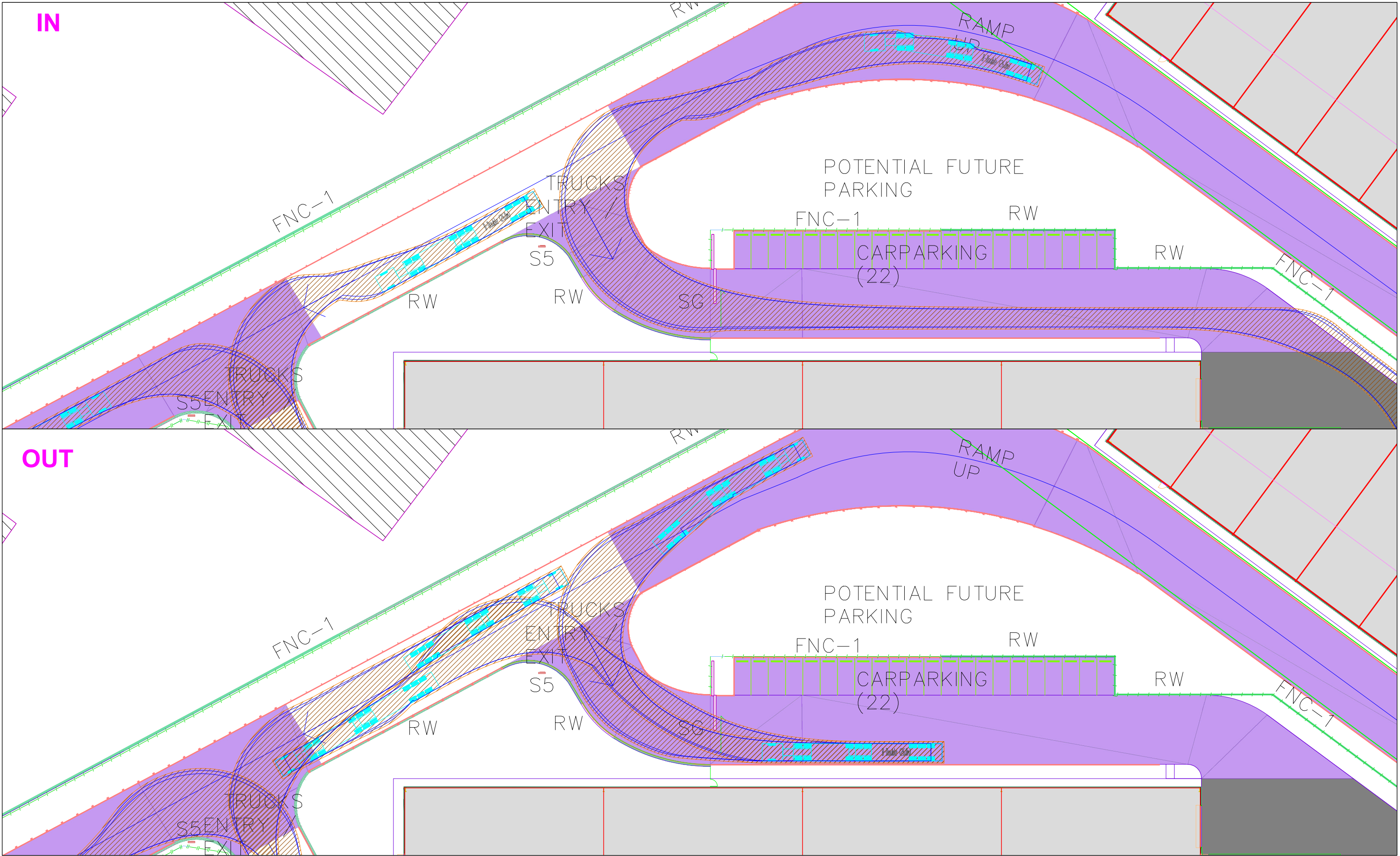
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Client: Aliro

Project: P1227 Prospect Logistics
Drawing Title: Warehouse 7 26m B-Double

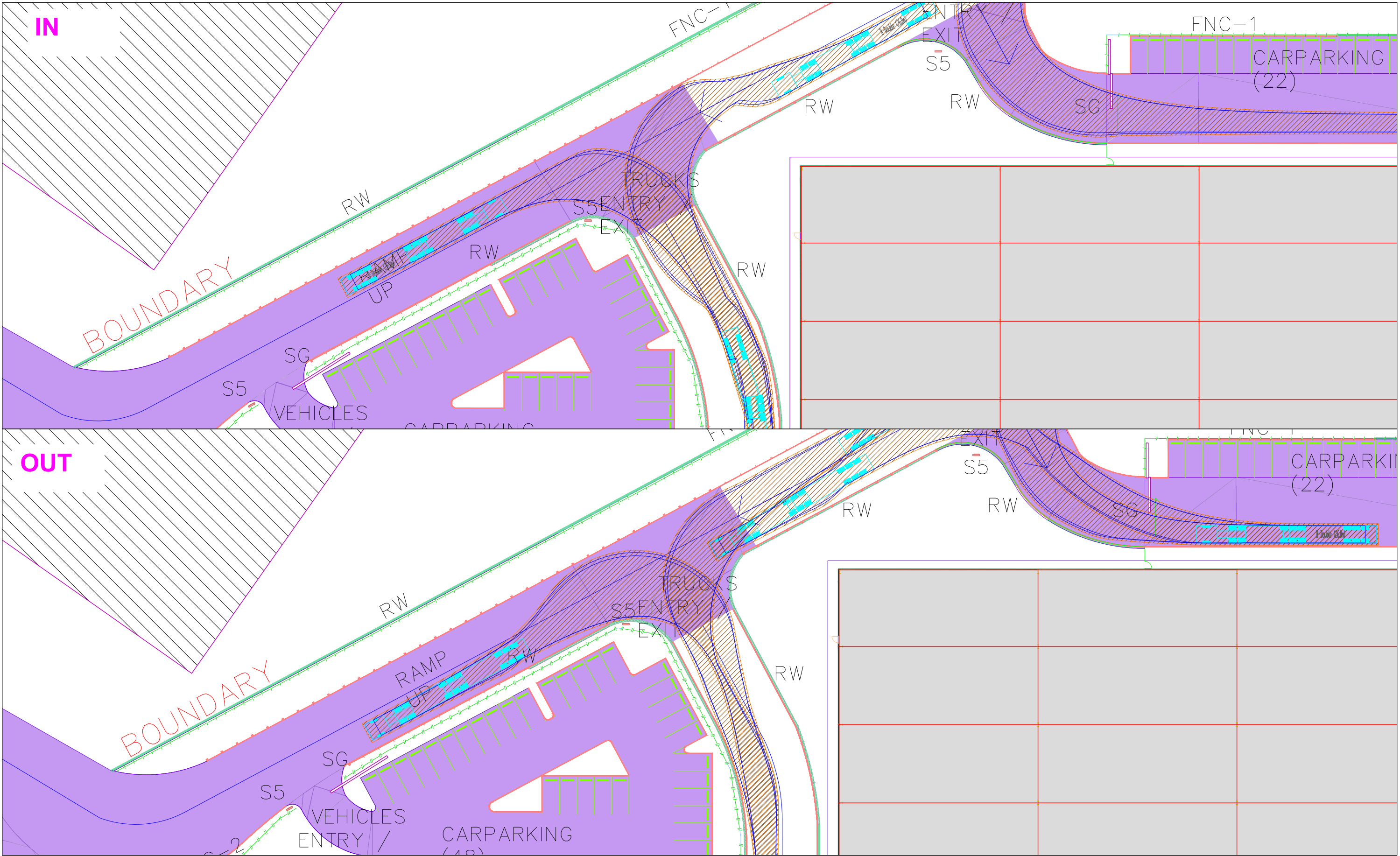
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Drawing Number: AG01.2

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Revision notes:			Drawn By: M TANGONAN	Project: P1227 Prospect Logistics	Date: 1-Jun-20	asongroup Suite 5.02, Level 5, 1 Castlereagh Street Sydney NSW 2000 info@asongroup.com.au
Rev:	Date:	Notes:				
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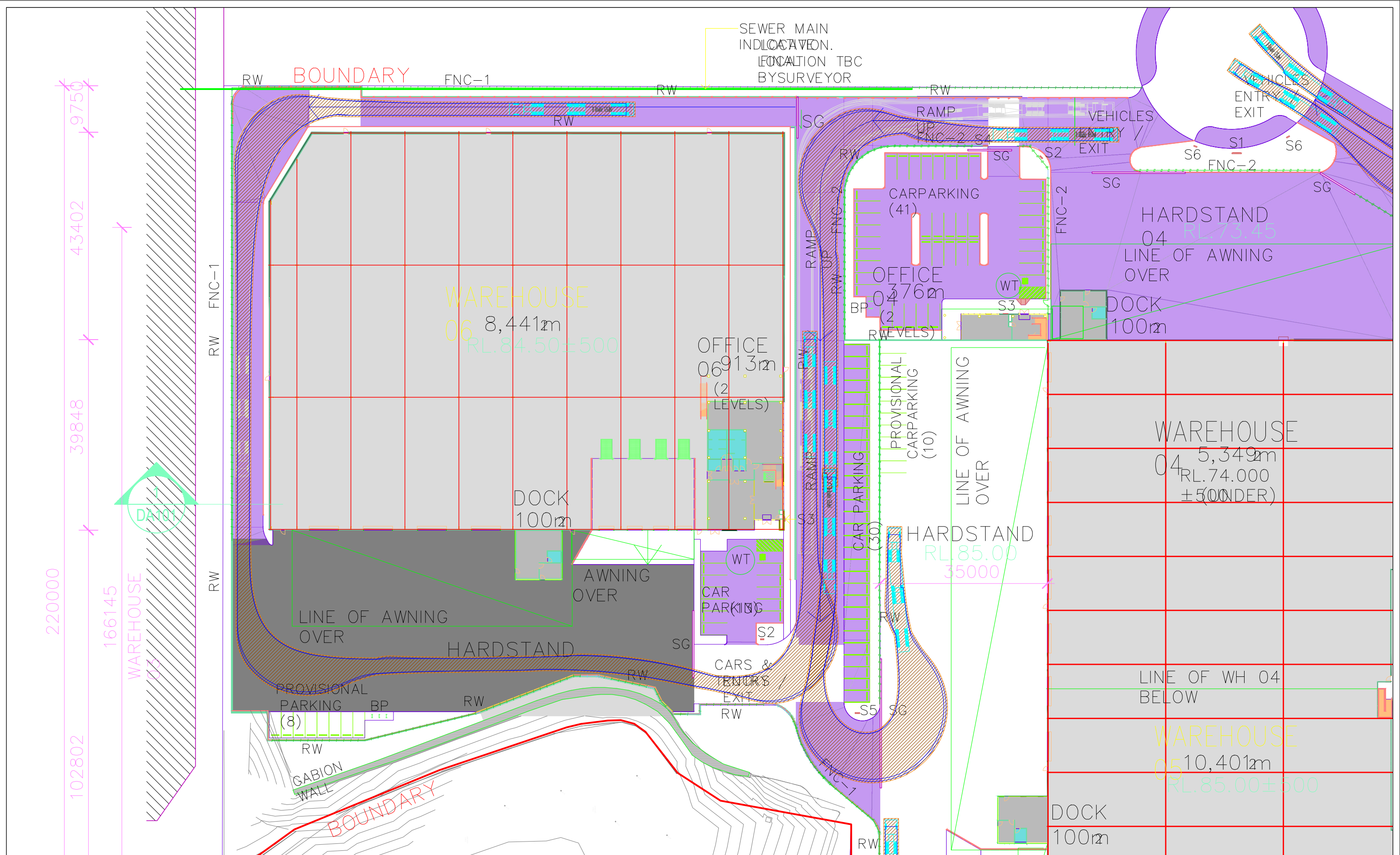


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For information purposes only - not for construction		

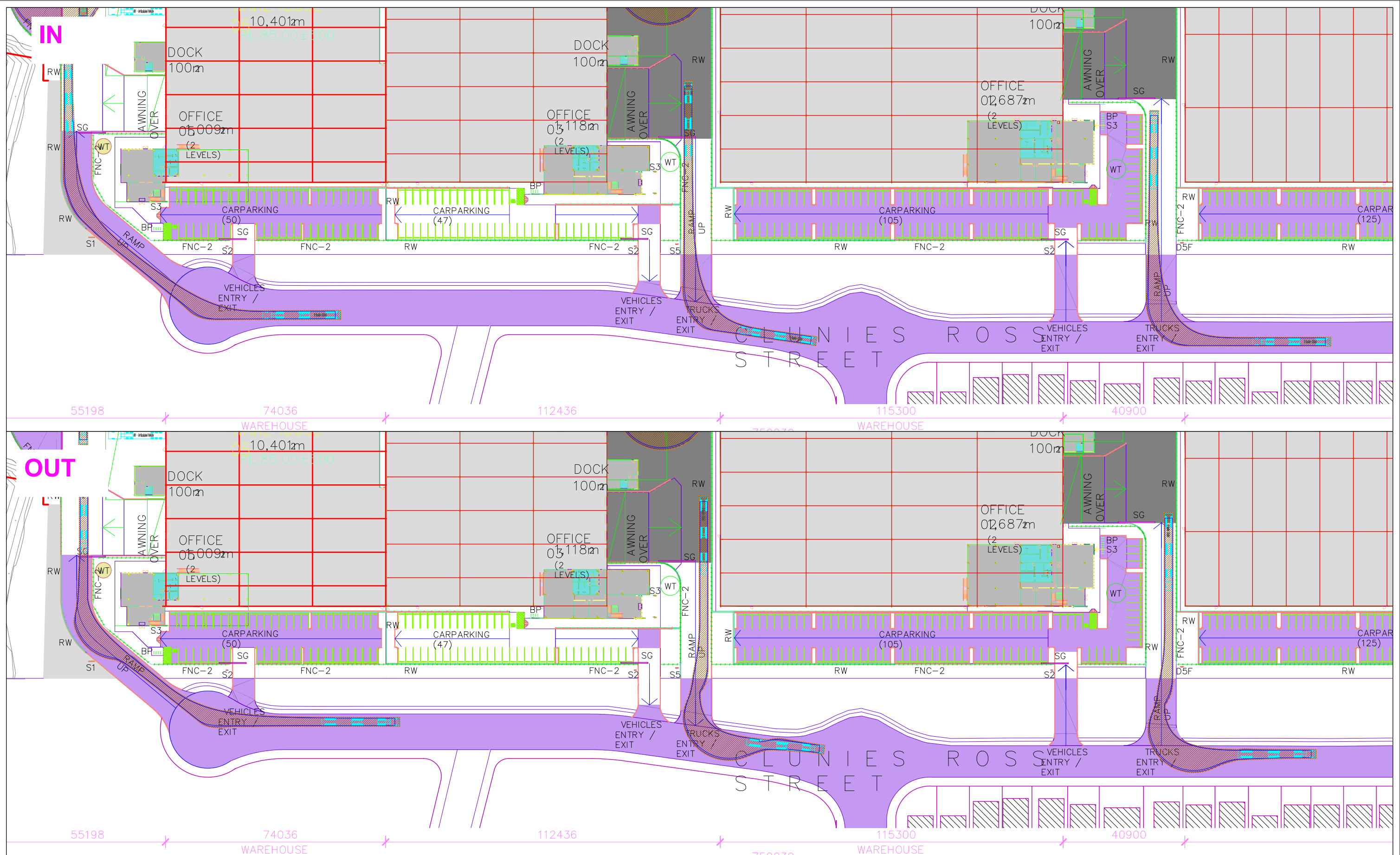
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Client: Aliro

Project: P1227 Prospect Logistics
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Date: 1-Jun-20
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Revision notes:			Drawn By:		Project:		Date:		asongroup Suite 5.02, Level 5, 1 Castlereagh Street Sydney NSW 2000 info@asongroup.com.au
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Rev:	Date:	Notes:	M TANGONAN		P1227 Prospect Logistics		1-Jun-20		
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Appendix B

SIDRA Modelling Results

				2019 Existing			2021 Future Base			2021 Future Project		
Intersection	Configuration	Period	Approach	Level of Service	Intersection Delay	Queue Distance	Level of Service	Average/Max Delay	Queue Distance	Level of Service	Average/Max Delay	Queue Distance
M4 Motorway / Prospect Highway Eastbound (north junction)	Signalised	AM	N	F	122.6	292.8	B	23.7	71.5	B	23.3	72.8
			S	A	5.4	0	B	19.3	79.1	B	20.7	76.9
			SW	C	30.9	42.8	C	41.3	54.3	C	41.4	54.3
		PM	N	F	156.7	377.3	B	22.5	79.6	B	21.9	79
			S	A	5.4	0	B	19.3	57.4	B	19.7	55.1
			SW	C	29.2	36.7	C	42	50.2	D	43	50.9
M4 Motorway / Prospect Highway Westbound (south junction)	Signalised	AM	N	B	20.5	67.6	B	24.4	63.4	B	23.3	61.7
			NE	D	46.8	96.9	C	31.8	91	C	31.3	91
			S	C	38.6	97.4	C	39.7	107.7	C	39.9	102.4
		PM	N	B	26.6	58.2	C	32.5	102.6	C	29.6	95
			NE	F	72.6	116	D	54.5	112.5	D	54.6	113.7
			S	C	40.9	106.3	D	48.2	106.7	D	51.5	109.6
Prospect Highway / Reservoir Street	Signalised	AM	N	B	23	79.1	C	34.9	113.9	F	83.5	221.2
			E	B	25.7	4.2	B	25.1	4.4	B	21.9	4
			S	A	7.8	60	D	54.6	187.9	F	104.9	253.2
		PM	W	F	464.3	396.9	E	58.6	155.2	F	132.9	249.9
			N	A	6.7	17	B	16.2	38.4	B	16.8	42.3
			E	A	13.5	2.2	C	42.5	8.1	C	41.5	7.9
Prospect Highway / Foundation Place	Priority (Roundabout)	AM	S	A	4.6	38	A	4.6	53.7	A	12.1	111.4
			N	A	4.4	15.2	A	4.4	20.7	A	4.5	23.7
			E	A	11.5	1.6	B	14.9	2.7	B	15.1	7.6
		PM	S	A	5.4	61.9	A	7	130.5	F	90.7	346.1
			N	D	54	178.6	C	38.4	153.3	C	39.7	154.8
			E	C	41.1	57	C	32	52.4	C	32.8	55.6
Great Western Highway / Blacktown Road / Clunies Ross Street	Signalised	AM	S	D	53.5	50.8	E	61.6	56.8	E	61.3	65.6
			W	C	35.2	135	D	53.6	173.1	E	58.2	181.9
			N	D	47.7	95.2	C	33.4	63.6	C	33.3	63.7
		PM	E	C	33.5	133.4	C	38.1	150.9	C	38	148.5
			S	E	57.6	51.8	D	52.1	48.7	D	50.1	60.3
			W	D	51.2	67.3	D	56	63.6	E	63	67.7
Clunies Ross Street / Wombat Place	Priority (Roundabout)	AM	N	A	4.2	1.4	A	4.2	1.5	A	4.3	1.9
			E	A	7.1	3.3	A	7.1	3.4	A	7.3	4
			S	A	8	0.1	A	8.1	0.1	A	7.4	0.5
		PM	N	A	4.2	2.3	A	4.2	2.3	A	4.2	2.5
			E	A	7.1	2.3	A	7.1	2.3	A	7.1	2.6
			S	A	7.4	0	A	7.4	0	A	5.9	0.5

Intersection	Configuration	Period	Approach	2031 Future Base			2031 Future Project		
				Level of Service	Intersection Delay	Queue Distance	Level of Service	Intersection Delay	Queue Distance
M4 Motorway / Prospect Highway Eastbound (north junction)	Signalised	AM	N	B	25.7	100.8	B	25.4	102.2
			S	B	25.1	95.1	B	24.9	93.6
			SW	D	44.7	76.2	D	45.7	77.2
		PM	N	B	22.5	105	B	23.2	107.7
			S	B	22.7	62.4	B	22.8	63.4
			SW	D	45	68	D	45.1	68
M4 Motorway / Prospect Highway Westbound (south junction)	Signalised	AM	N	D	53.1	136.5	E	67.2	177.6
			NE	F	218	533.7	F	273.9	635.5
			S	F	78.2	137.8	F	86.9	149.7
		PM	N	F	79	270	F	78.2	270
			NE	F	172.9	341.1	F	156.1	326
			S	F	141.8	195.3	F	163.9	208.3
Prospect Highway / Reservoir Street	Signalised	AM	N	F	267.3	330	F	483.1	330
			E	B	23	6.6	B	22.4	6.5
			S	F	141.6	317.7	F	121.6	278.1
		PM	W	F	304.2	620	F	780.8	962.5
			N	B	27.1	109.1	C	30.1	122.7
			E	C	38.2	12.7	C	36.5	12.4
Prospect Highway / Foundation Place	Priority (Roundabout)	AM	S	B	26.5	140.9	C	29	144.1
			W	C	41.4	77.9	C	41.2	79.4
			N	A	4.9	145.6	B	20.9	328.7
		PM	E	C	36.2	5.1	F	160.8	30
			S	F	1252.9	2628.3	F	1007.7	2378.2
			N	A	4.5	126.6	A	5	166.7
Great Western Highway / Blacktown Road / Clunies Ross Street	Signalised	AM	E	D	55.6	13.5	F	309.4	121.1
			S	F	593.2	1901.6	F	708.7	2060.7
			N	D	49.6	180.9	D	55	212.2
		PM	E	D	48.8	69.9	C	31.5	58.5
			S	E	63.2	65.8	E	67	76.1
			W	D	53.7	197.3	E	61.5	208.8
Clunies Ross Street / Wombat Place	Priority (Roundabout)	AM	N	B	28.4	59.4	C	35.4	71.2
			E	D	44.1	163.5	D	42.6	175.7
			S	E	57.6	55	D	55.4	69.8
		PM	W	E	61.7	72	E	57.8	68.9
			N	A	4.2	1.6	A	4.3	2
			E	A	7.1	3.9	A	7.4	4.6
			S	A	8.3	0.1	A	7.6	0.5
			N	A	4.2	2.7	A	4.2	2.8
			E	A	7.1	2.6	A	7.1	2.9
			S	A	7.5	0	A	6	0.5

