transport planning
traffic engineering
modelling

Proposed Service Station

Lot 1 (1351) and Lot 132 (1369) Wanneroo Road, Wanneroo

Transport Impact Assessment

PREPARED FOR:
Leyton Property

September 2021

Document history and status

Author	Revision	Approved by	Date approved	Revision type
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Author: Mohammad Rasouli

Project manager: Mohammad Rasouli

Client: Leyton Property

Project: Lot 1 (1351) and Lot 132 (1369) Wanneroo Road, Wanneroo

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Project number: t21.142

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1 Introduction

This TIA has been prepared by Transcore on behalf of Leyton Property with regards to the proposed service station at Lot 1 (1351) and Lot 132 (1369) Wanneroo Road, Wanneroo.

Transcore was the traffic engineer for the previous BP service station project at this location (which has not been proceed based on our understanding). Accordingly, the proposed access/ egress and layout of the development has been developed in accordance with the City's requirements (as per our previous discussions with the City officers for the previous project) for this site. Further the same traffic modelling methodology and assumptions from the previous project, which has been accepted by approval authorities, has been adopted but updated for this project.

The subject site is currently vacant and is located at the south-west corner of the four-way signalised intersection of Wanneroo Road/ Clackson Avenue/ Mowatt Close as shown in **Figure 1**. This intersection serves the endorsed Detailed Development Plan (DAP) for Drovers Place Central Precinct to the west of Wanneroo Road, which Lot 1 (1351) and Lot 132 (1369) Wanneroo Road is part of this precinct. A copy of the endorsed DAP is provided in **Appendix A**.

Figure 1 illustrates the location of the Central Precinct and the subject site. Access and egress to/from the proposed development would be indirectly from Wanneroo Road via the existing signalised intersection of Wanneroo Road/ Clackson venue/Mowatt Close.

Figure 1: Location of the subject site

The key issues that will be addressed in this report include the traffic generation of the proposed development, capacity analysis of the proposed 4-way intersection on Mowatt Close (in line with the approved DAP) and the recently constructed 4-way signalised intersection of Wanneroo Road/Clarkson Avenue/ Mowatt Close.

For the assessment of the existing signalised intersection in 2031, the estimated traffic from the entire Central Precinct area, including the approved and constructed development at Lots 1 & 132 Wanneroo Road situated at the north side of Mowatt Close, will be considered. It should be noted that Transcore was the traffic engineers for the recently approved development and constructed service station on the northern side of Mowatt Close and the approved development and recently constructed McDonald's restaurant on the south east corner of the signalised intersection.

The location of the subject site within the *Metropolitan Region Scheme* context is illustrated in **Figure 2**. The subject site is zoned as *"Urban"* in the *MRS*. The MRS map also classified Wanneroo Road as a *"Primary Regional Road"*.

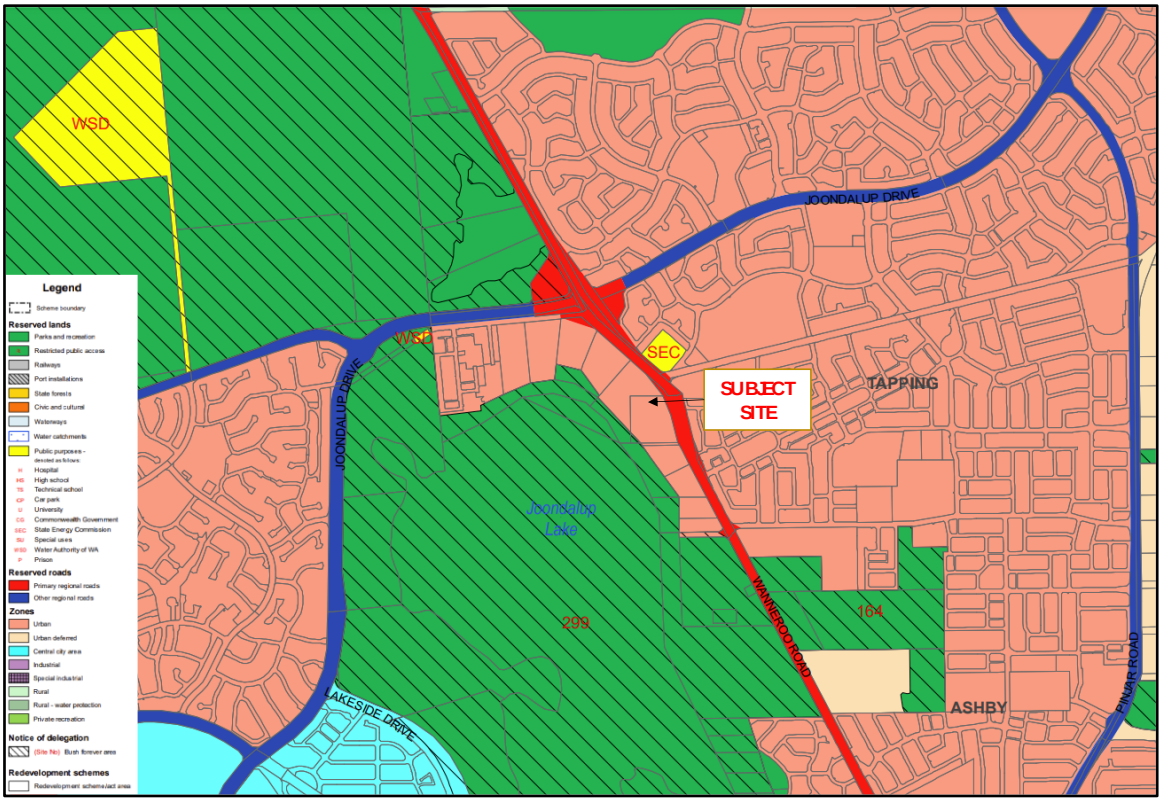


Figure 2. Site location within Metropolitan Region Scheme

2 Existing Situation

2.1 Existing Site Use, Access and Parking

Currently the site is vacant and does not generate any traffic. The land to the south of the site is also mainly vacant. There are existing retail and commercial land uses within the northern part of the Central Precinct.

The Central Precinct is accessed via the signalised intersection, the connection to the Northern Precinct and future connection to the Southern Precinct. The proposed service station will be accessed via the four-way intersection on Mowatt Close with its parking catered on-site.

2.2 Surrounding Road Network and Traffic Management on Frontage Roads

The existing road network and its classification in the Main Roads WA *Functional Road Hierarchy* is illustrated in **Figure 3**.

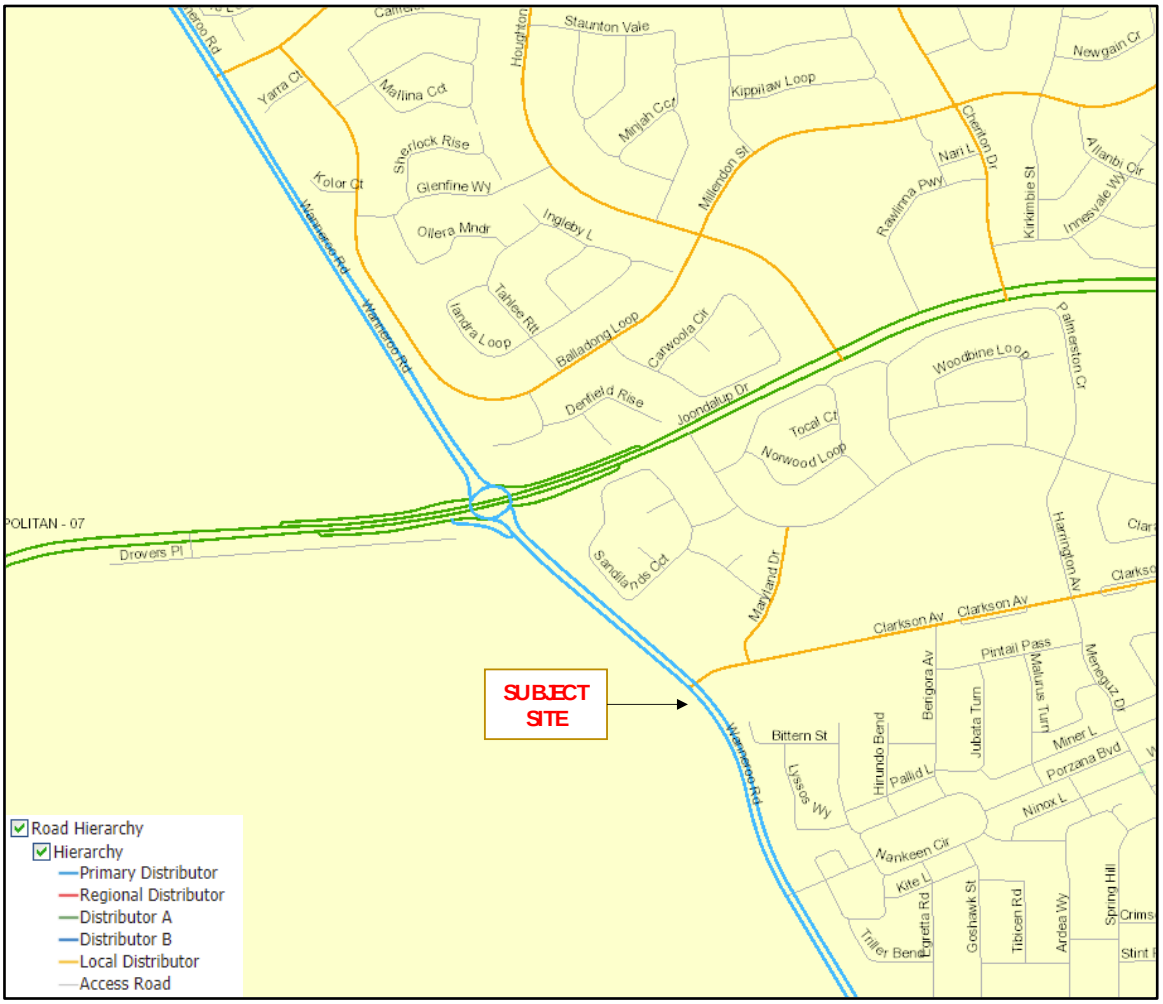


Figure 3. Existing Road Hierarchy

Wanneroo Road is a dual divided carriageway with a speed limit of 70km/h in the vicinity of the subject site. On street cycle lanes are provided on either side of the road. It is reserved as a Primary Regional Road in the Metropolitan Region Scheme and is classified as a Primary Distributor Road in the Main Roads WA Functional Road Hierarchy.

The intersection of Wanneroo Road/Clarkson Avenue/Mowatt Close has recently been constructed as a four-way signalised intersection with left turn and right turn pockets on all four legs of intersection. The intersection of Wanneroo Road and Joondalup Drive has recently been upgraded to a grade separated interchange.

There is an existing intersection on Wanneroo Road serving the existing retail/commercial complex located at lots 810 and 811. This intersection is located approximately 200m south of Wanneroo Road/Joondalup Drive interchange and operates as left-in/left-out/right-in, with a left-turn slip lane and right-turn pocket on Wanneroo Road.

Clarkson Avenue is a single undivided carriageway with pedestrian paths on both sides of the road. It is classified as a Local Distributor in Main Roads WA Functional Road Hierarchy and operates under the speed limit of 50km/h in the vicinity of the subject site.

Drovers Place provides access to properties along the northern frontage of the Drovers Place Precinct. It is constructed as a 6m-wide, kerbed single carriageway road. Drovers Place is subject to the 50 km/h speed limit.

Mowatt Close, in the vicinity of the subject site is recently constructed as a single divided carriageway road with pedestrian path on the northern side of the road.

2.3 Existing Traffic Volumes on Roads

According to the latest available traffic count data from Main Roads WA, Wanneroo Road (south of Joondalup Drive) carried an average weekday traffic volume of about 23,733vpd in 2020/21. The recorded heavy vehicle component of total traffic mix was approximately 8.2%.

According to the latest available traffic count data from Main Road WA, Clarkson Avenue (east of Wanneroo Road) carried an average weekday traffic volume of 3,384vpd in 2017/18. The recorded heavy vehicle component of total traffic mix was approximately 4.3%. Existing weekday AM and PM peak hour traffic flows from February 2021 SCATS data for the Wanneroo Road/Clarkson Avenue/Mowatt Close signalised intersection are shown in **Figure 4**.

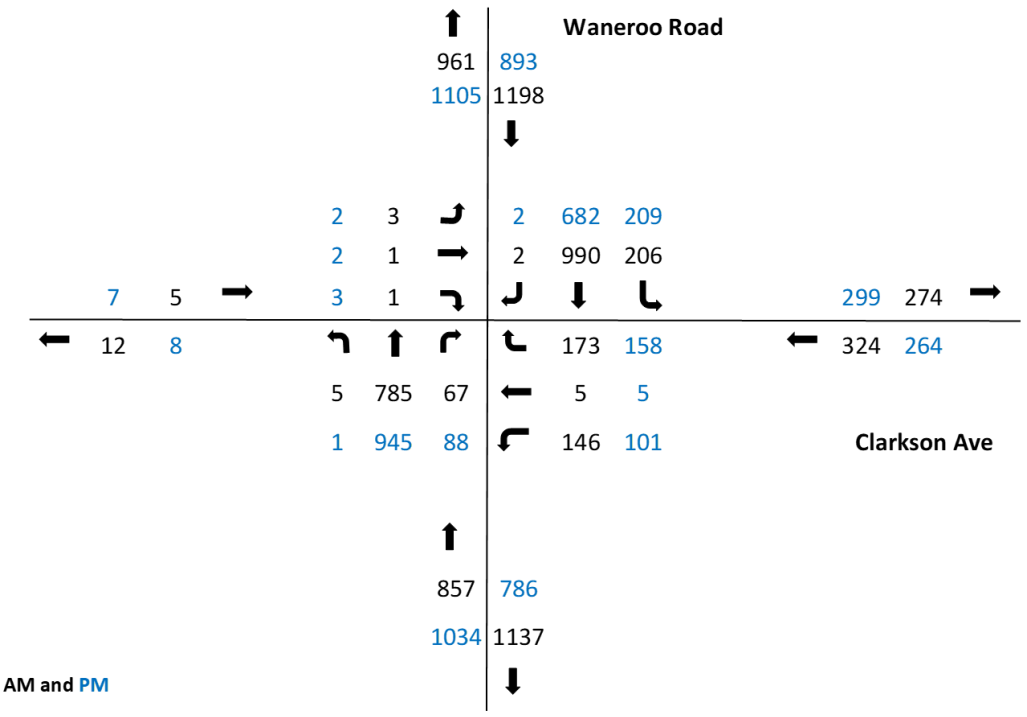


Figure 4: Existing traffic counts **AM** and **PM** hours

2.4 Heavy Vehicles

Restricted Access Vehicle (RAV) Network routes are designated for access by large heavy vehicle combinations, which is managed by Main Roads WA.

Wanneroo Road adjacent to the subject site forms part of RAV Tandem Drive Network 4 as shown in **Figure 5**. The RAV 4 Network classification permits a variety of prime mover and trailer combinations, up to a maximum length of 27.5m.

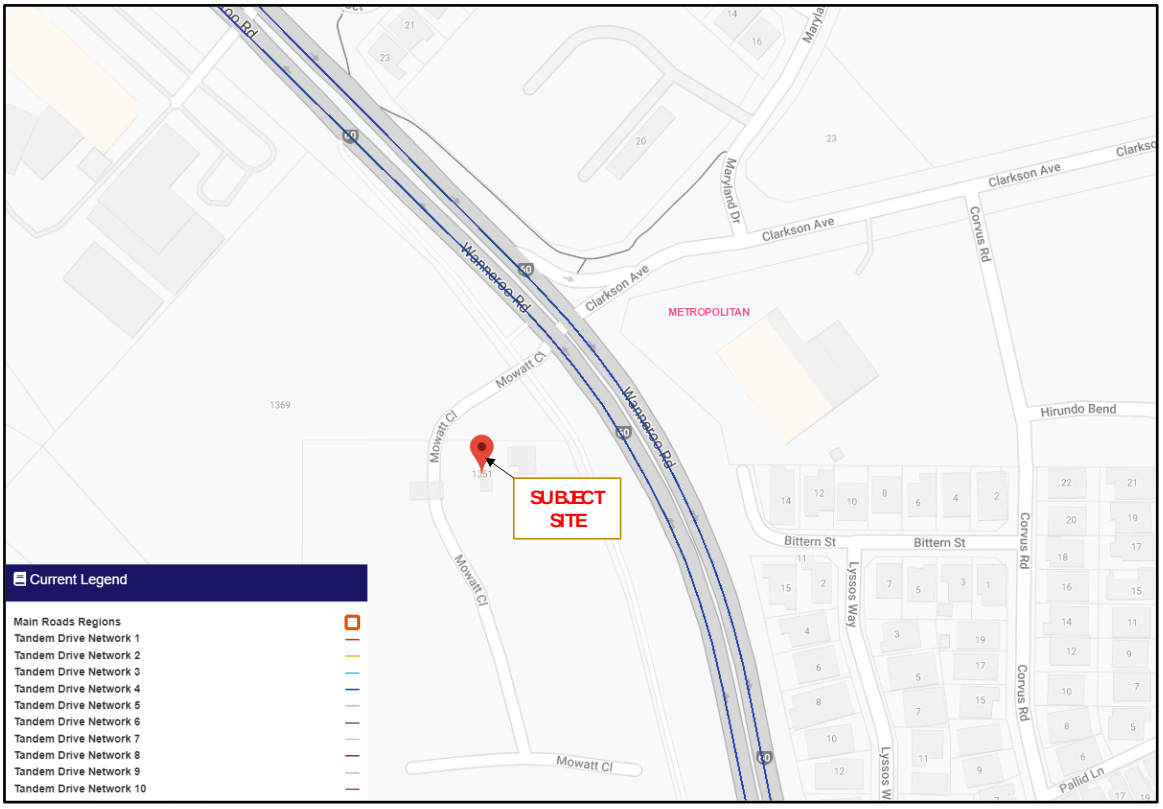


Figure 5. Existing heavy vehicle road network classification (RAV)

2.5 Public Transport Access

Nearby public transport services are illustrated in **Figure 6**. The closest existing bus route to the development area is Bus Route No. 468 which traverses along Wanneroo Road. This bus route provides service between Whitfords Station and Joondalup Station via Wanneroo Central Shopping Centre.

Other bus route in the vicinity of the subject site is Bus Route No. 390 which runs along Wanneroo Road but gets diverted to/from Clarkson Avenue.

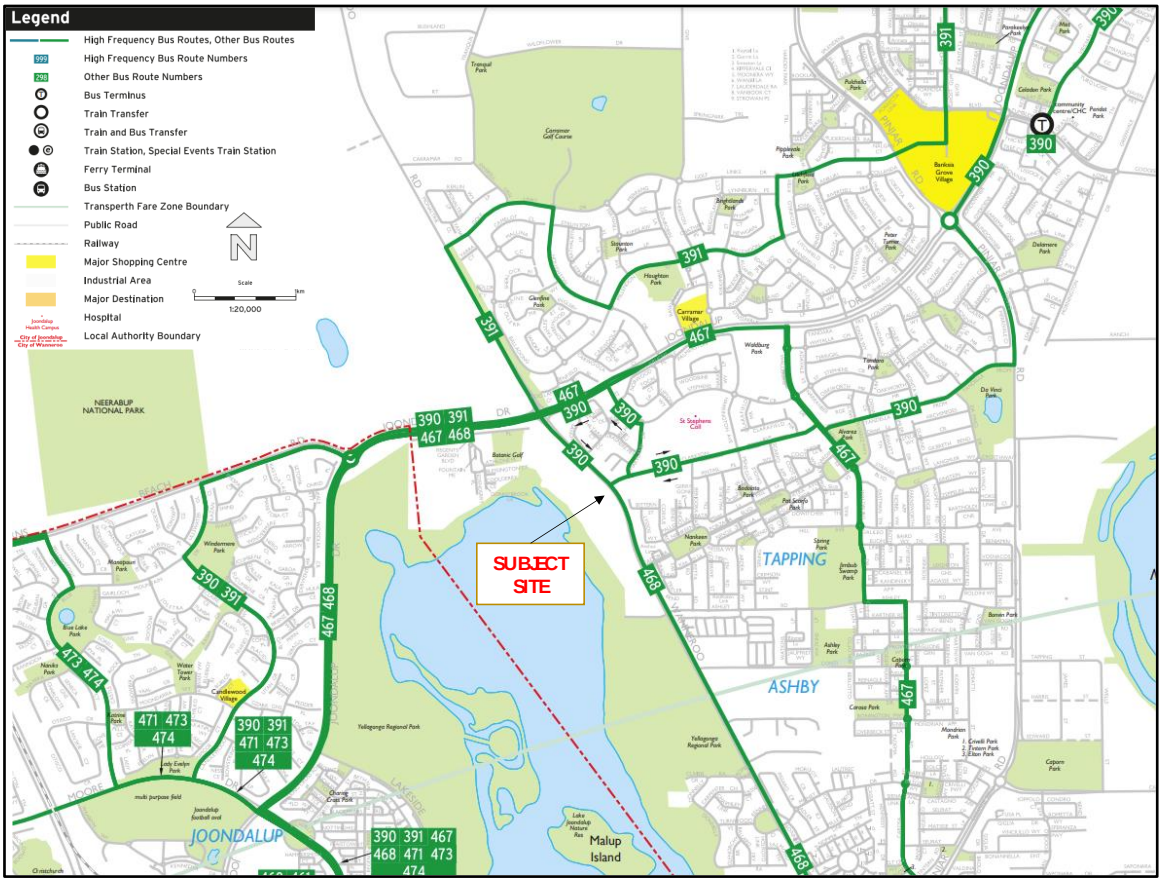


Figure 6: Existing bus routes (source: Transperth)

2.6 Pedestrian and Cyclist Facilities

Currently a concrete shared path exists along Wanneroo Road fronting the subject site. This shared path continues north and connects with Drovers Place. A shared path is also in place along the northern side of Mowatt Close. Pedestrian crossing facilities are provided at the signalised intersection on Wanneroo Road/ Clarkson Avenue/ Mowatt Close to facilitate the safe pedestrian/cyclist crossing at the intersection.

The Department of Transport's Perth Bike Map series (refer **Figure 7**) shows that Wanneroo Road also has a shared path on the eastern side which connects to the existing shared path on Clarkson Avenue and on the western side which connects to Dovers Place.

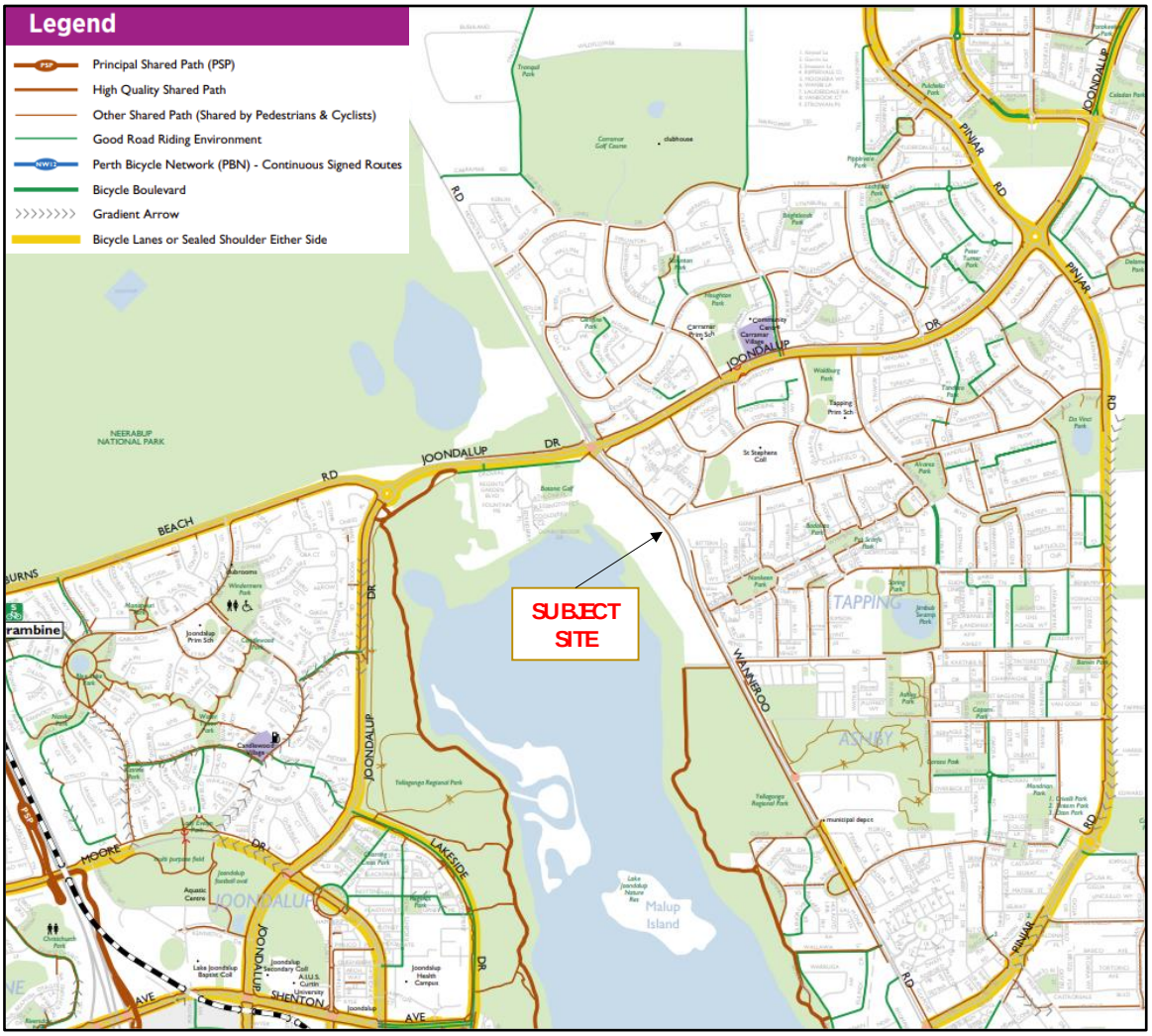


Figure 7: Existing bus routes (source: Transperth)

2.7 Public Transport Network Planning

The Department of Transport plan, Public Transport for ultimate network for city of 3.5 million population, envisages a combination of a future light rail and bus rapid transit route from Perth to Joondalup providing a cross-suburban link between these two areas. However, this is a long-term plan beyond 2031 (refer **Figure 8**).

Figure 8: Transperth Service Development Plan Map

2.8 Crash Data

Information available on Main Roads WA website provides crash statistics for Wanneroo Road/Clarkson Avenue intersection during the five-year period ending in December 2020 (mainly before signalisation of this intersection).

The crash records indicate that Wanneroo Road and Clarkson Avenue intersection recorded a total of 6 crashes with one casualty and no fatalities during the five-year period. Majority of crashes recorded were rear end types. More details on the crash records are provided in **Table 1.**

It should be noted that recent signalisation of the intersection of Wanneroo Road/Clarkson Avenue would improve safety and traffic operation of the intersection.

Table 1. Crash history for the Wanneroo Road/Clarkson Avenue intersection

Intersection				Total Crashes	Casualty
Wanneroo Road/Clarkson Avenue				6	1
Right Angle	Rear End	Rt Turn Thru	Pedestrian	Wet	Dry
1	2	0	0	1	5

3 Development Proposal

3.1 Proposed Site Use

The proposed development is for a service station with convenience store comprising:

- Light vehicle canopy with 16 fuelling positions (8 bowsers) for light vehicles;
- 8 car parking bays including 1 ACROD bay;
- One delivery bay; and,
- One air & water bay.

The layout of the proposed development is included in **Appendix C.** The proposed access/ egress and layout of the development has been developed in accordance with the City's requirements for the previous BP service station project at this location. The fuel tanker and service vehicle movements for the proposed development are the same as the previously approved BP service station at this location.

The proposed development provides 16 fuelling positions (8 bowsers) for light vehicles. It should be noted that the provision of 8 bowsers is in line with the business plan of the proposed operator that provides additional bowsers to ensure increased customer amenity and reduce wait times and reduce the risk of any internal congestion. Accordingly, this operator does not provide additional bowsers to increase patronage in proportion to the number of bowsers.

3.2 Proposed Access for all Modes

Access and egress to/from the proposed development is in line with the City's requirements as discussed and agreed for the previous BP service station project at this site. **Figure 9** illustrates the proposed development crossovers on continuation of Mowatt Close and the future access/ egress to the proposed developments to the south of the site. Crossover 1 is entry only and crossover 2 is entry and exit.

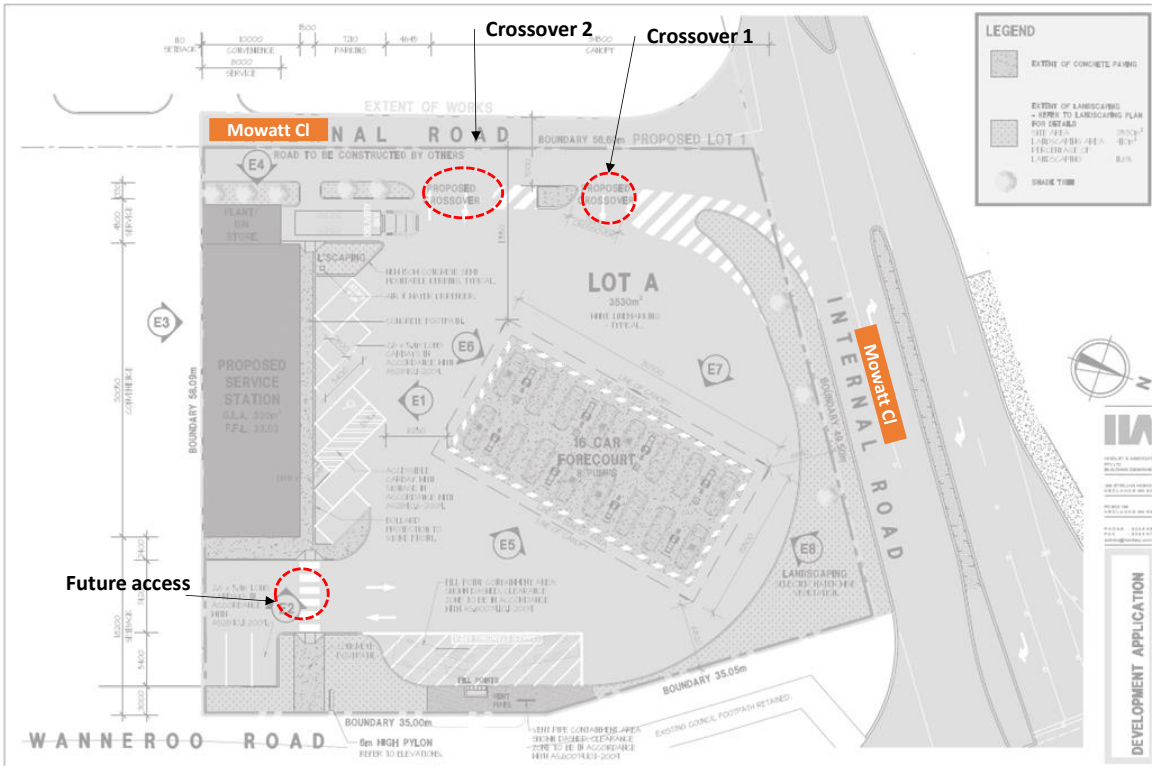


Figure 9: Proposed development access/ egress points

4 Changes to Surrounding Transport Networks

The recent changes to the surrounding road network include signalisation of the Wanneroo Road/ Clarkson Avenue/ Mowatt Close and construction of the grade separated interchange at Wanneroo Road and Joondalup Drive intersection.

According to the information obtained from Main Roads WA Wanneroo Road may be upgraded to six lanes in this vicinity in the longer term.

5 Integration with Surrounding Area

The proposed development land use is in line with existing and planned land uses in the locality. The proposed development promotes internal connectivity with other planned uses in the Central Precinct area.

Drovers Place connects with Mowatt Close via a connection through the approved development to the north of Mowatt Close.

6 Traffic Assessment

6.1 Assessment Years and Time Periods

The assessment years that have been adopted for this analysis are immediately post-development (assumed as 2021) and 2031 for the 10-year post development scenarios.

6.2 Trip Generation and Distribution

6.2.1 Proposed Development Traffic Generation

The traffic volumes that would be generated by the proposed development have been estimated using trip generation rates derived from:

- ITE Trip Generation Manual 10th Edition

The trip rates which were used to estimate the proposed development traffic generation are as following:

Gasoline/Service Station with Convenience Market (945) – Regular Fuelling Points

- AM Peak hour: 12.47 trips per fuelling point.
- PM Peak hour: 13.99 trips per fuelling point.
- Weekday: 206 trips per fuelling point.

The proposed development plan entails a convenience store with 16 light vehicle fuelling positions (8 bowsers). As outlined earlier the number of bowsers proposed by the current operator is to improved customer amenity, reduce wait times and reduce the risk of internal congestion. As such the trip generation won't be proportional with number of bowsers. As a result, the increased number of bowsers is not expected to increase the traffic generation of the development in any significant way, particularly considering that another service station is located immediately north of Mowatt Close. Accordingly, the estimation of the proposed development traffic generation was based on the typical service stations with 8 bowsers.

As detailed in **Table 2**, it is estimated that the proposed development would generate approximately 1,314 trips per day (both inbound and outbound) with approximately 100 and 90 trips during AM and PM peak hours respectively.

For this development conservatively 60% passing trade is assumed. Therefore, the net addition of traffic when accounting for passing trade is **+525vpd (daily), +40vph (AM peak hour) and +36vph (PM peak hour)** on the surrounding road.

The directional split of inbound and outbound trips for the proposed development is estimated to be about 50/50 for inbound/outbound trips during the peak hours.

The total proposed development traffic is outlined in **Figure 10**.

Table 2: Estimated proposed development traffic generation

Land use	Quantity	Daily Rate	AM Peak	PM Peak	Cross Trade	Daily Trips	AM Trips	PM Trips	AM		PM	
									IN	OUT	IN	OUT
Service Station + Convenience Strore	8	205.36	12.47	13.99	0.20	1314	100	90	50	50	45	45
TOTAL TRAFFIC						**1314**	**100**	**90**	**50**	**50**	**45**	**45**

Passing Trade Component

	AM		PM	
Daily Trips	IN	OUT	IN	OUT
789	30	30	27	27
789	**30**	**30**	**27**	**27**

Non Passing Trade Component

	AM		PM	
Daily Trips	IN	OUT	IN	OUT
525	20	20	18	18
525	**20**	**20**	**18**	**18**

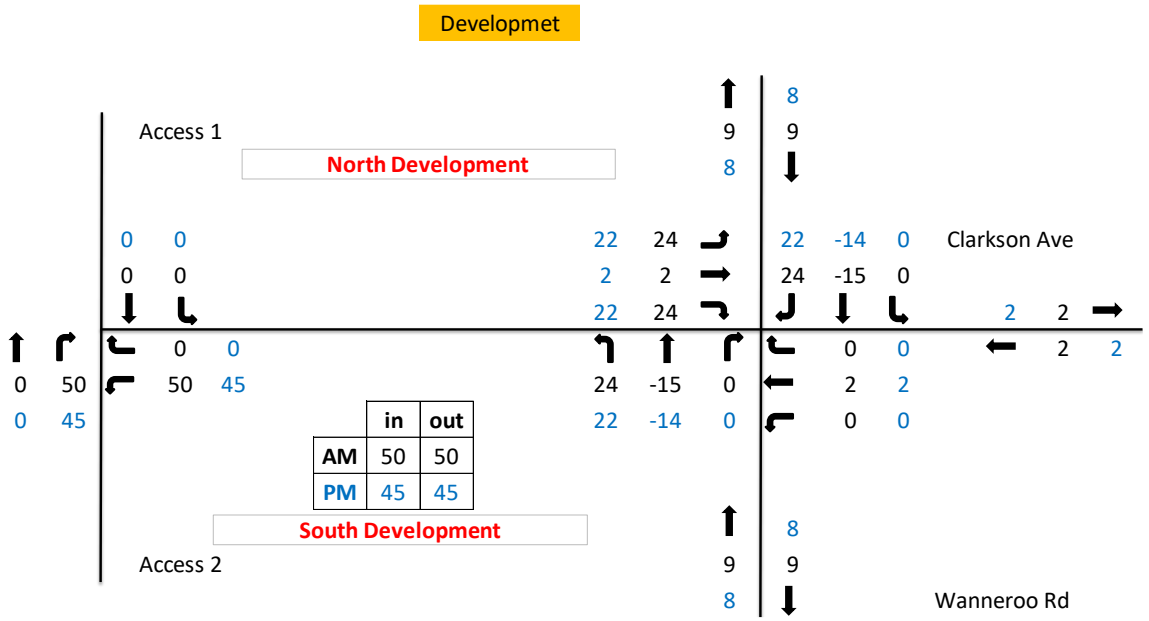


Figure 10: Total peak hour traffic generated by the proposed development –AM and PM peak hours

6.3 Traffic Flows

The existing traffic counts for the relevant roads were established from February 2021 SCATS data (refer **Figure 4**). The total post development traffic for the assessment year of 2021 is detailed in **Figure 11**. It should be noted that the post development traffic volumes include the traffic from the approved and under construction development on the northern side of Mowatt Close

To approximate the 10-year post development traffic, a conservative traffic growth of 20% was applied to the background traffic through the intersection of Wanneroo Road/ Clarkson Avenue/ Mowatt Close.

The total ten-year post-development traffic volumes are presented in **Figure 12.**

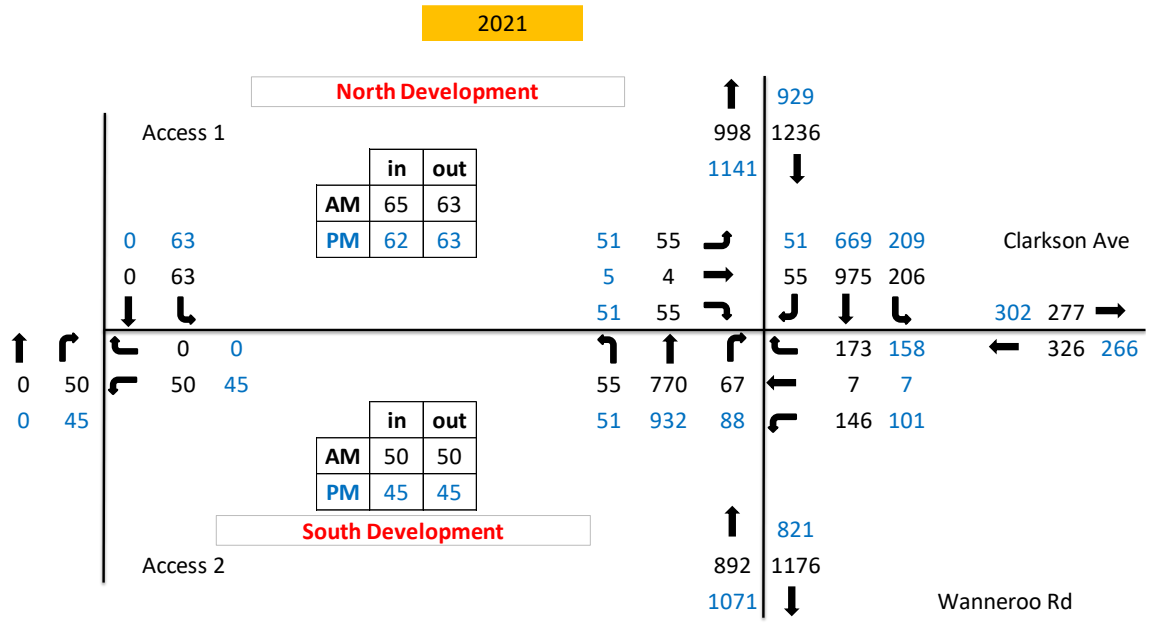


Figure 11: Post-development traffic flows–2021 AM and PM peak hours

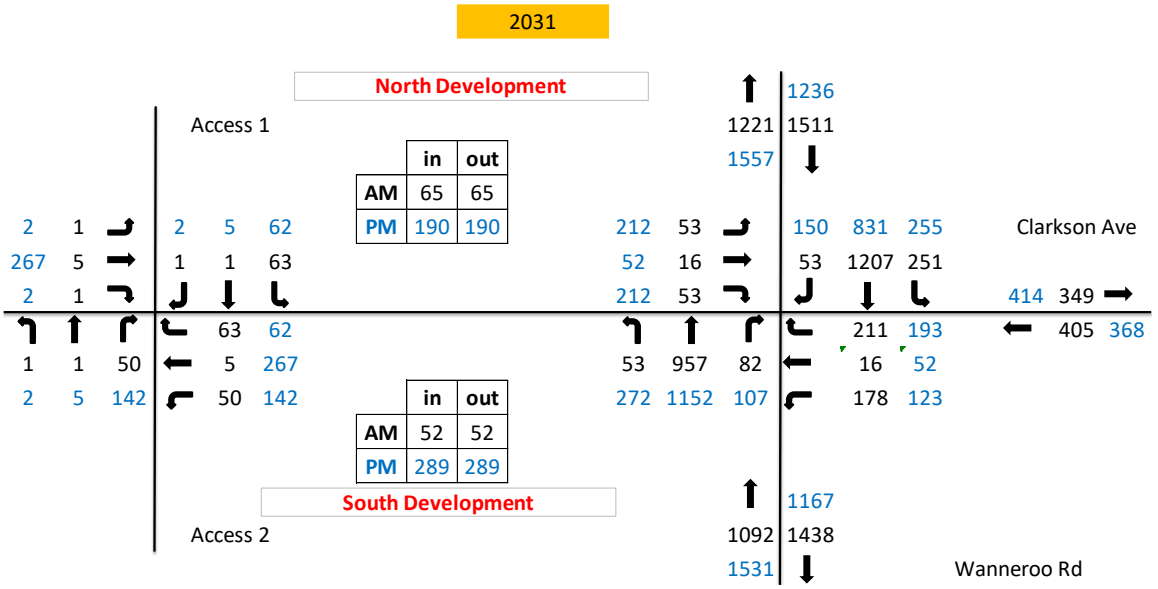


Figure 12: Estimated 10-year total post-development traffic flows – 2031 AM and PM peak hours

6.4 Analysis of Intersections and Development Accesses

The operation of the four-way intersection of Wanneroo Road/ Clackson Avenue/Mowatt Close and the development connection to Mowatt Close has been analysed for existing, post-development and 10-year post development scenarios for the weekday AM and PM peak hours.

Capacity analysis was undertaken using the SIDRA Network computer software package. SIDRA is an intersection modelling tool commonly used by traffic engineers for all types of intersections. SIDRA outputs are presented in the form of Degree of Saturation, Level of Service, Average Delay and 95% Queue. These characteristics are defined as follows:

- **Degree of Saturation (DoS)**: is the ratio of the arrival traffic flow to the capacity of the approach during the same period. The Degree of Saturation ranges from close to zero for varied traffic flow up to one for saturated flow or capacity.
- **Level of Service (LoS)**: is the qualitative measure describing operational conditions within a traffic stream and the perception by motorists and/or passengers. In general, there are 6 levels of service, designated from A to F, with Level of Service A representing the best operating condition (i.e. free flow) and Level of Service F the worst (i.e. forced or breakdown flow).
- **Average Delay**: is the average of all travel time delays for vehicles through the intersection.
- **95% Queue**: is the queue length below which 95% of all observed queue lengths fall.

The results of the SIDRA analysis are detailed in **Appendix D** and briefly explained in this section of the report.

A Network SIDRA model was prepared to assess the exiting intersection of Wanneroo Road/ Clackson Avenue/Mowatt Close and the connection to Mowatt Close. A conceptual diagram of the SIDRA model developed for analysis is shown in **Figure 13**.

The SIDRA model was coded with reference to the *Main Roads Operation Modelling Guidelines Version No. 1.1.* All relevant parameters such as heavy vehicle groups, PCU factors etc. were coded as per Main Roads Guidelines.

NETWORK LAYOUT

Network: N101 [(2019) - PM]

New Network
Network Category: (None)

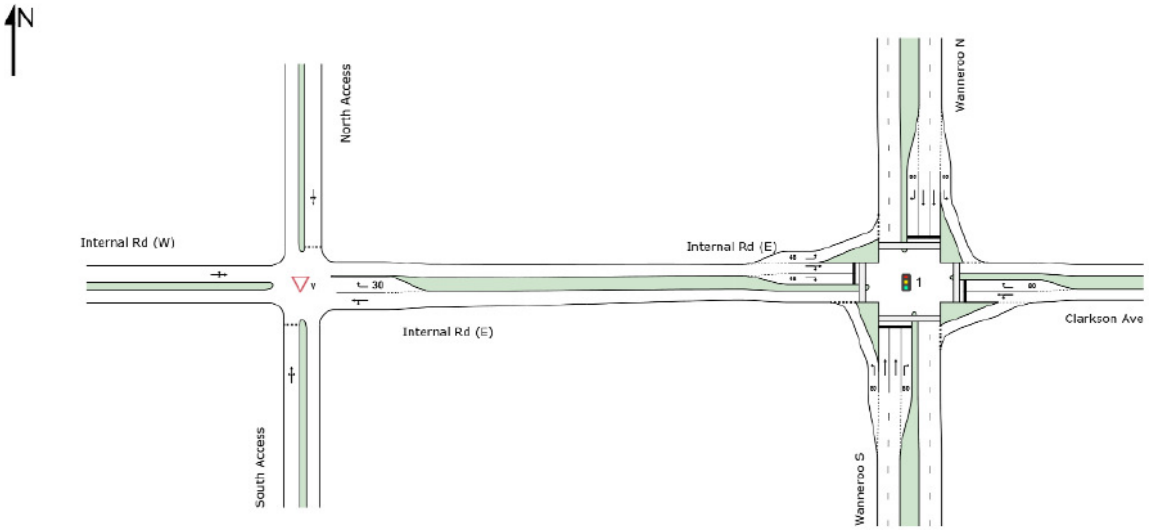


Figure 13: post development SIDRA Network Model

Wanneroo Road traffic lights

SIDRA analysis indicates that this intersection will operate satisfactorily with overall level of service C and D during the post development (2021) AM and PM scenarios respectively. The 95% queue back at the traffic lights on Mowatt Close is approximately 15m-17m for both AM and PM peak hours.

The 10-year post development analysis reported overall level of service of D for both AM and PM peak hours. Increased delays and queues are reported for the through traffic on Wanneroo Road. However, the anticipated delays will not result in excessive queuing and are within the range of what can reasonably be expected during the peak hours in 10 years' time. According to the information obtained from Main Roads WA Wanneroo Road may be upgraded to six lanes in this vicinity sometime in the future which will improve traffic operations at the intersection.

Internal 4-way intersection on Mowatt Close

SIDRA analysis indicates that the internal intersection on Mowatt Close will operate satisfactorily in the post development and 10 year post development scenarios during both AM and PM peak hours. All movements operate well with minimal delays and queuing.

6.5 Network Operation

Relevant SIDRA network outputs were reviewed for both AM and PM peak hours to assess the operation of the proposed internal intersection and the signalised intersection at Wanneroo Road as a network.

As detailed in **Figure 14** and **Figure 15**, no queue back from the traffic lights to the internal four-way intersection is reported during the 2031 AM peak hour. During the 2031 PM peak hour 95% queue back would extend to the internal intersection at Mowatt Close however due to the relatively low level of turn movements at this intersection, no internal queues (back to the shared access easement) are expected. The reported queue back on the internal road is occurring occasionally (5% of the time) during the PM peak hours only and on average the reported queue is about 40m which would not pass the internal intersection. The reported good level of service for all movements at the four-way intersection confirms satisfactory traffic operations during the 2031 AM and PM peak hours.

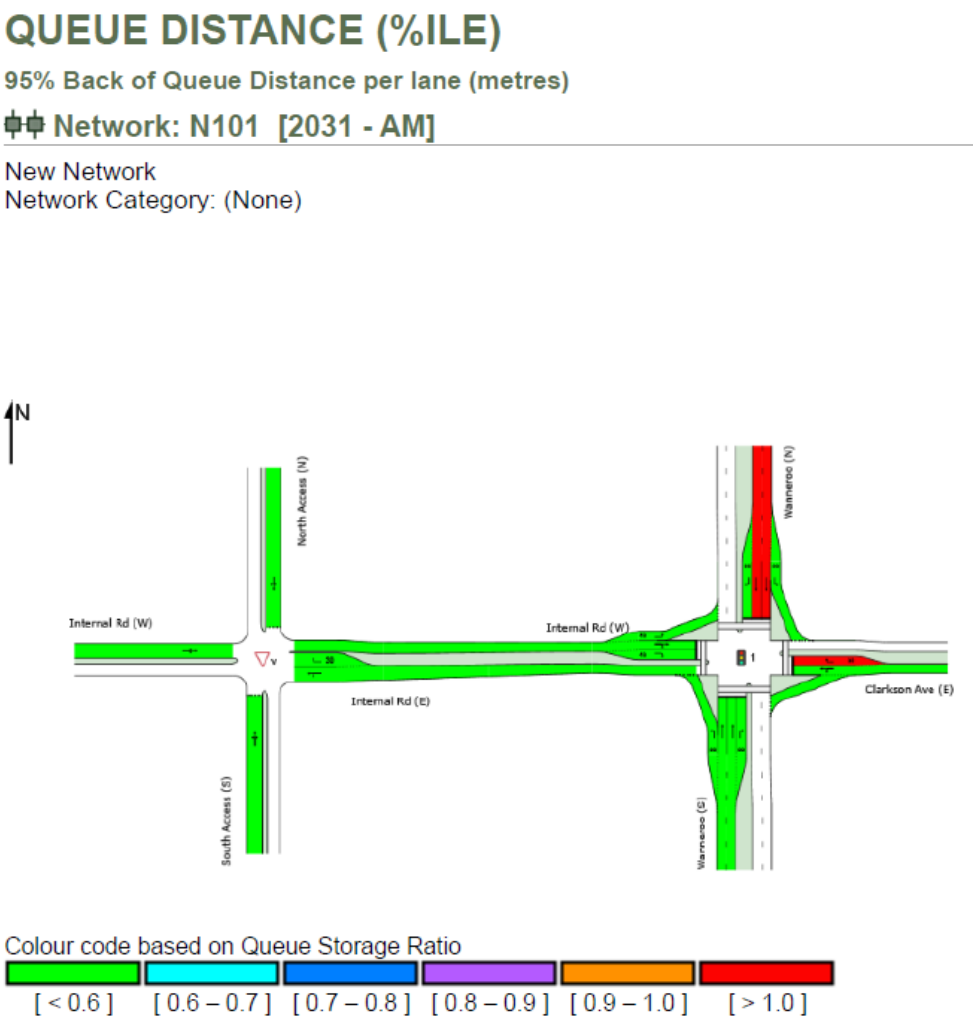


Figure 14: 10-year Post-development weekday AM peak hour network analysis – queue storage ratio

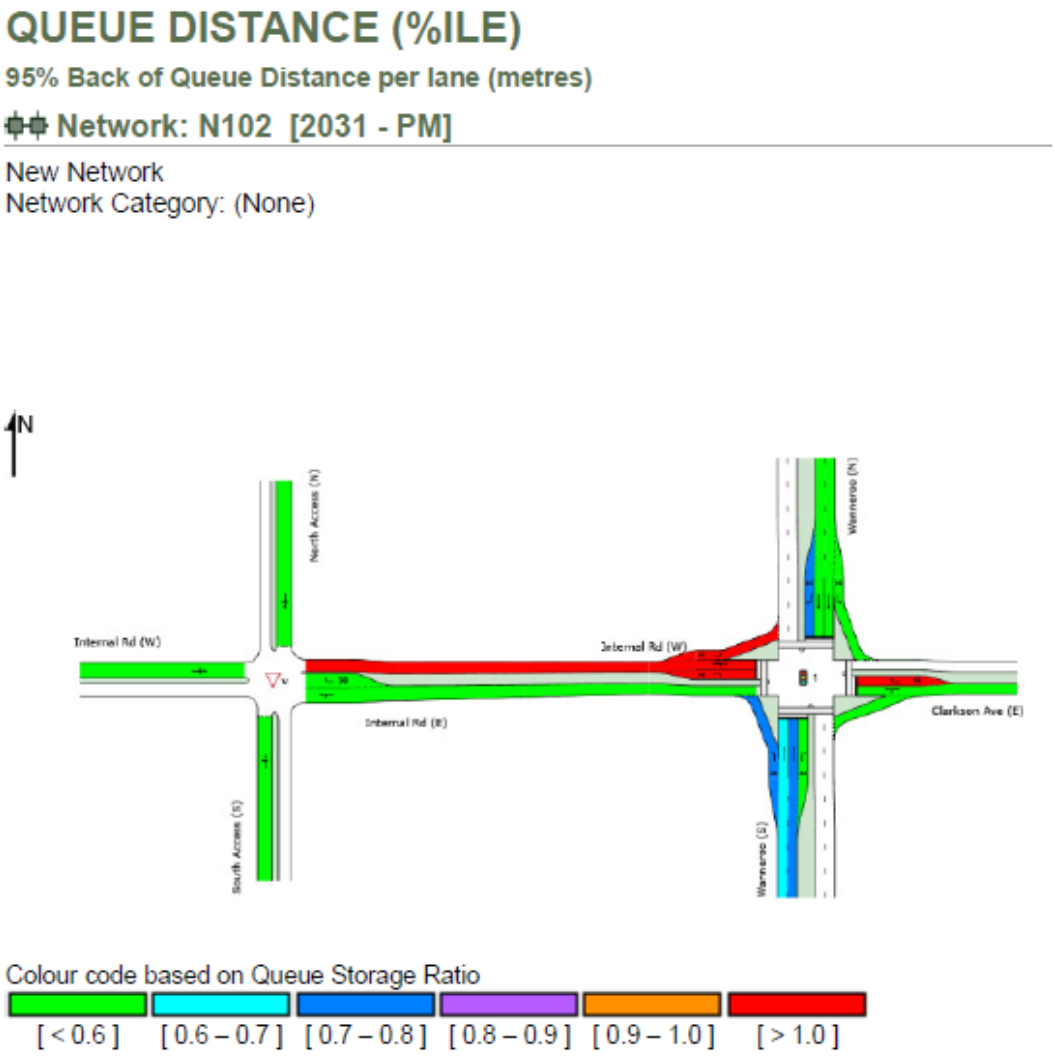


Figure 15: 10-year post-development weekday PM peak hour network analysis – queue storage ratio

As outlined earlier, the anticipated future upgrade of Wanneroo Road in this vicinity will improve traffic operations at the signalised intersection and will reduce the queue back on Mowatt Close.

6.6 Impact on Surrounding Roads

The WAPC *Transport Impact Assessment Guidelines* (2016) provides the following guidance on the assessment of traffic impacts:

"As a general guide, an increase in traffic of less than 10 percent of capacity would not normally be likely to have a material impact on any particular section of road, but increases over 10 percent may. All sections of road with an increase greater than 10 percent of capacity should therefore be included in the analysis. For ease of assessment,

an increase of 100 vehicles per hour for any lane can be considered as equating to around 10 percent of capacity. Therefore, any section of road where development traffic would increase flows by more than 100 vehicles per hour for any lane should be included in the analysis."

The proposed development will not increase traffic flows near the quoted WAPC threshold to warrant further detailed analysis. Accordingly, the impact on the surrounding road network will be insignificant.

6.7 Impact on Neighbouring Areas

The traffic generated by the proposed development is not expected to significantly affect surrounding areas and the road network has been designed to accommodate this type of development traffic.

6.8 Traffic Noise and Vibration

It generally requires a doubling of traffic volumes on a road to produce a perceptible 3dB (A) increase in road noise. The proposed development will not increase traffic volumes on surrounding roads anywhere near this level.

7 Parking

The proposed development will provide 9 car parking spaces including one ACROD bay and one air & water bay.

It is therefore considered that the proposed parking provision is sufficient to accommodate the needs of the proposed development.

8 Provision for Heavy Vehicles

The largest truck which is expected to use the service station would be 19.0m long fuel tanker which would enter and exit the site from the proposed development crossovers on Mowatt Close.

12.5m service vehicle will enter/exit the site in a similar manner to the 19.0m long fuel tanker. Service vehicles enter the site from the northern entry only crossover on Mowatt Close, pull up near the bin store and then turn around within the site and exit the site from the southern full movement crossover on Mowatt Close.

Turn path analysis undertaken for 19.0m fuel tanker and 12.5m service vehicle confirm satisfactory access, egress and circulation within the site. Turn path plans are included in **Appendix E**.

9 Public Transport Access

The existing public transport services within the vicinity of the site are outlined in sections 3.5 and 3.7 of this report.

10 Pedestrian Access

Details of the pedestrian and cyclist facilities in this locality are detailed in section 3.6 of the report.

11 Conclusions

This Transport Impact Assessment (TIA) is prepared by Transcore with respect to the proposed service station and convenience store development to be located on Lot 1 (No. 1351) Wanneroo Road, Tapping, in the City of Wanneroo.

Transcore was the traffic engineer for the previous BP service station project at this location (which has not been proceed based on our understanding). Accordingly, the proposed access/ egress and layout of the development has been developed in accordance with the City's requirements (as per our previous discussions with the City officers for the previous project) for this site. Further the same traffic modelling methodology and assumptions from the previous project, which has been accepted by approval authorities, has been adopted but updated for this project.

The proposed development layout has been assessed with respect to the movements of fuel tankers and service vehicles. Swept path analysis confirms that the proposed entry and egress arrangements and the site layout facilitate safe and efficient vehicle circulation.

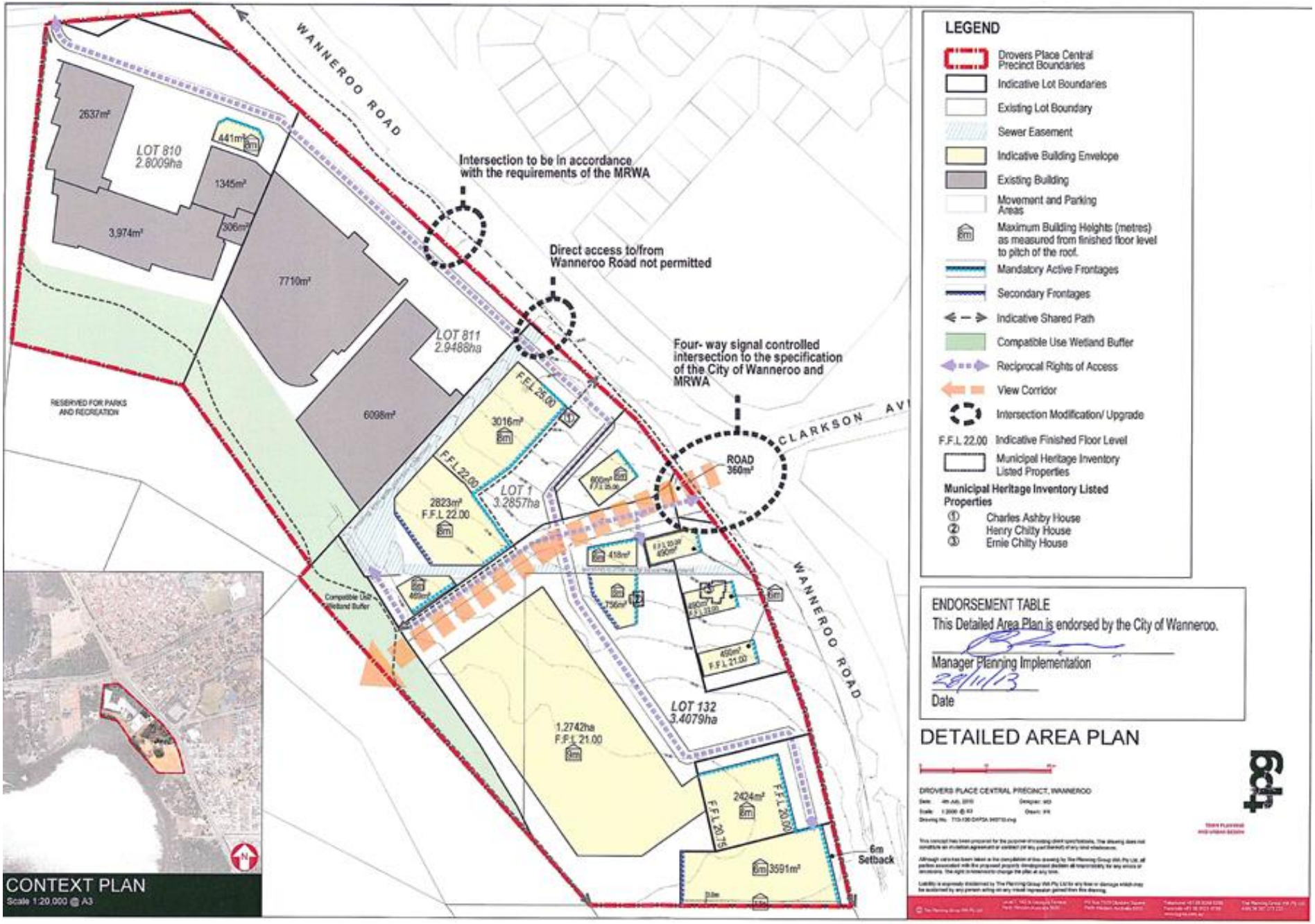
The SIDRA Network analysis undertaken as part of the Transport Impact Assessment allows for the approved development traffic to the north of Mowatt Close/subject site and confirms satisfactory operation of the 4-way intersection on Mowatt Close and the existing signalised intersection of Wanneroo Road/ Clarkson Avenue/Mowatt Close for post-development and 10 years post-development scenarios.

The proposed car parking is considered to satisfactorily meet the needs of the proposed development.

In conclusion, the findings of this Transport Impact Assessment are supportive of the proposed development.

Appendix A

ENDORSE DETAIL AREA PLAN


WANNEROO ROAD
Intersection to be in accordance with the requirements of the MRWA
Direct access to/from Wanneroo Road not permitted
Four- way signal controlled intersection to the specification of the City of Wanneroo and MRWA
CLARKSON AV
WANNEROO ROAD
LOT 810 2.8009ha
LOT 811 2.9486ha
LOT 1 3.2857ha
LOT 132 3.4079ha
2637m²
441m²
1345m²
3,974m²
806m²
7710m²
6098m²
3016m²
2823m²
F.F.L 22.00
F.F.L 25.00
ROAD 360m²
418m²
756m²
1.2742ha
F.F.L 21.00
2424m²
F.F.L 20.00
F.F.L 20.75
3591m²
6m Setback
RESERVED FOR PARKS AND RECREATION
Compatible Use Wetland Buffer
CONTEXT PLAN
Scale 1:20,000 @ A3
LEGEND
Drovers Place Central Precinct Boundaries
Indicative Lot Boundaries
Existing Lot Boundary
Sewer Easement
Indicative Building Envelope
Existing Building
Movement and Parking Areas
Maximum Building Heights (metres) as measured from finished floor level to pitch of the roof.
Mandatory Active Frontages
Secondary Frontages
Indicative Shared Path
Compatible Use Wetland Buffer
Reciprocal Rights of Access
View Corridor
Intersection Modification/ Upgrade
F.F.L 22.00 Indicative Finished Floor Level
Municipal Heritage Inventory Listed Properties
Municipal Heritage Inventory Listed Properties
① Charles Ashby House
② Henry Chilty House
③ Emie Chilty House
ENDORSEMENT TABLE
This Detailed Area Plan is endorsed by the City of Wanneroo.
Manager Planning Implementation
28/11/13
Date
DETAILED AREA PLAN
DROVERS PLACE CENTRAL PRECINCT, WANNEROO

Appendix B

PROPOSED ORIGINAL SITE PLAN

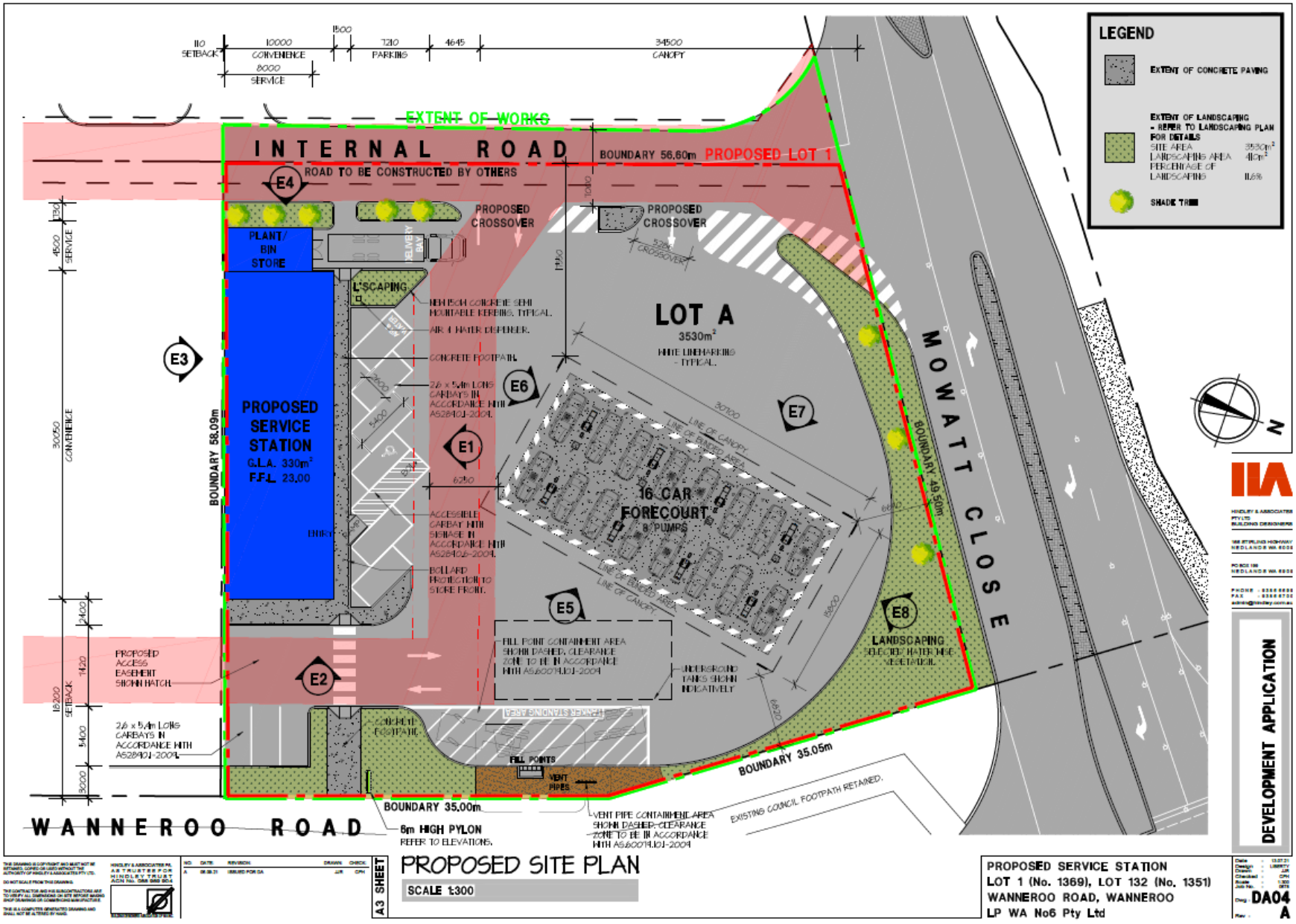
SITE & GROUND FLOOR PLAN

COMPOSITE SITE CRITERIA

1. Site Area		62,712m²		
2. Landscaping (8% of site required)		5,016m²		
a. Hard		5,040m²		
b. Soft		4,020m²		
Total		9,060m² (15.2% of site)		
3. Floor Areas				
a.	T1 - T3 Fast Foods	734m²	@ 1/15	30 cars
b.	T4,5,16-17 Mixed Use	3,644m²	@ 1/30	126.7 cars
c.	T6 - T27 Showroom	13,000m²	@ 1/30	433.3 cars
	Warehouse	2,000m²	@ 1/50	40.0 cars
d.	T9 Mixed Use	330m²		16 cars
e.	T11 Gym	600m²	40sqm @ 1/4sqm	10 cars
f.	T28 Mixed Use	750m²		40 cars
g.	T29 Mixed Use	2,561.5m²		33 cars
Total		23,609.5m²		742.8cars
4. Car Parking				
a. Cars Required		743 cars		
b. Cars Provided		809 cars		
i) On Grade		780 cars		
ii) Drive Thru		29 cars		

Appendix C

DEVELOPMENT SITE PLAN


LEGEND
EXTENT OF CONCRETE PAVING
EXTENT OF LANDSCAPING - REFER TO LANDSCAPING PLAN FOR DETAILS
SITE AREA 3530m²
LANDSCAPING AREA 410m²
PERCENTAGE OF LANDSCAPING 11.6%
SHADE TREE
EXTENT OF WORKS
INTERNAL ROAD
ROAD TO BE CONSTRUCTED BY OTHERS
BOUNDARY 56.60m
PROPOSED LOT 1
PROPOSED CROSSOVER
PROPOSED CROSSOVER
PLANT/ BIN STORE
L'SCAPING
LOT A
3530m²
WHITE LINEMARKING - TYPICAL.
PROPOSED SERVICE STATION
G.L.A. 330m²
F.F.L. 23.00
BOUNDARY 58.09m
16 CAR FORECOURT
8 PUMPS
MOWATT CLOSE
BOUNDARY 49.50m
LANDSCAPING
PROPOSED ACCESS EASEMENT SHOWN HATCH
2.6 x 5.4m LONG CARBAYS IN ACCORDANCE WITH AS2890.1-2004.
FILL POINT CONTAINMENT AREA SHOWN DASHED. CLEARANCE ZONE TO BE IN ACCORDANCE WITH AS3000.1.01-2004
UNDERGROUND TANKS SHOWN INDICATIVELY
FILL POINTS
VENT PIPES
BOUNDARY 35.05m
BOUNDARY 35.00m
WANNEROO ROAD
6m HIGH PYLON REFER TO ELEVATIONS.
VENT PIPE CONTAINMENT AREA SHOWN DASHED. CLEARANCE ZONE TO BE IN ACCORDANCE WITH AS3000.1.01-2004
EXISTING COUNCIL FOOTPATH RETAINED.
N
DEVELOPMENT APPLICATION
A3 SHEET
PROPOSED SITE PLAN
SCALE 1:300
PROPOSED SERVICE STATION
LOT 1 (No. 1369), LOT 132 (No. 1351)
WANNEROO ROAD, WANNEROO
LP WA No6 Pty Ltd
DA04
A

Appendix D

SIDRA OUTPUTS

MOVEMENT SUMMARY

Site: 1 [Clarkson Ave & Wanneroo Rd - 2021 - AM] **Network: N101 [2021 - AM]**

Wanneroo Rd/ Clarkson Ave
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 150 seconds (Site Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: Wanneroo (S)														
1	L2	58	3.9	58	3.9	0.050	11.8	LOS B	1.1	8.3	0.31	0.65	0.31	48.7
2	T1	811	9.7	811	9.7	0.603	25.8	LOS C	19.1	158.1	0.84	0.73	0.84	46.9
3	R2	71	4.1	71	4.1	0.289	39.4	LOS D	2.5	19.9	0.93	0.76	0.93	37.4
Approach		939	8.9	939	8.9	0.603	25.9	LOS C	19.1	158.1	0.81	0.73	0.81	46.0
East: Clarkson Ave (E)														
4	L2	154	4.1	154	4.1	0.148	14.4	LOS B	4.0	31.4	0.41	0.65	0.41	49.5
5	T1	7	6.1	7	6.1	0.148	8.8	LOS A	4.0	31.4	0.41	0.65	0.41	41.3
6	R2	182	3.9	182	3.9	0.742	75.6	LOS E	13.4	103.7	1.00	0.86	1.08	27.0
Approach		343	4.1	343	4.1	0.742	46.8	LOS D	13.4	103.7	0.72	0.76	0.76	34.2
North: Wanneroo (N)														
7	L2	217	4.3	217	4.3	0.145	6.8	LOS A	0.3	2.2	0.03	0.59	0.03	56.8
8	T1	1026	10.3	1026	10.3	0.876	48.9	LOS D	37.0	306.2	0.89	0.87	0.99	36.2
9	R2	58	4.1	58	4.1	0.414	46.0	LOS D	2.5	19.6	0.97	0.75	0.97	25.7
Approach		1301	9.1	1301	9.1	0.876	41.8	LOS D	37.0	306.2	0.75	0.82	0.83	38.2
West: Internal Rd (W)														
10	L2	58	4.1	58	4.1	0.067	13.4	LOS B	1.4	11.1	0.40	0.64	0.40	44.4
11	T1	4	3.7	4	3.7	0.126	61.2	LOS E	2.0	15.6	0.91	0.72	0.91	20.9
12	R2	58	3.8	58	3.8	0.126	65.6	LOS E	2.0	15.6	0.91	0.72	0.91	21.0
Approach		120	3.9	120	3.9	0.126	40.3	LOS D	2.0	15.6	0.67	0.68	0.67	28.2
All Vehicles		2703	8.2	2703	8.2	0.876	36.8	LOS D	37.0	306.2	0.76	0.77	0.81	39.6

MOVEMENT SUMMARY

Site: v [Internal Rd & Access 1 & Access 2 - 2021 - AM]

Network: N101 [2021 - AM]

Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: South Access (S)														
1	L2	1	4.0	1	4.0	0.064	5.6	LOS A	0.3	2.0	0.19	0.57	0.19	52.5
2	T1	1	4.0	1	4.0	0.064	5.4	LOS A	0.3	2.0	0.19	0.57	0.19	53.0
3	R2	53	4.0	53	4.0	0.064	6.8	LOS A	0.3	2.0	0.19	0.57	0.19	49.4
Approach		55	4.0	55	4.0	0.064	6.8	LOS A	0.3	2.0	0.19	0.57	0.19	49.6
East: Internal Rd (E)														
4	L2	53	4.0	53	4.0	0.030	4.3	LOS A	0.0	0.0	0.00	0.52	0.00	51.1
5	T1	4	4.0	4	4.0	0.030	0.0	LOS A	0.0	0.0	0.00	0.52	0.00	53.8
6	R2	68	4.0	68	4.0	0.039	4.3	LOS A	0.2	1.2	0.03	0.55	0.03	50.2
Approach		125	4.0	125	4.0	0.039	4.2	NA	0.2	1.2	0.02	0.54	0.02	50.7
North: North Access (N)														
7	L2	66	4.0	66	4.0	0.044	5.6	LOS A	0.2	1.4	0.02	0.56	0.02	50.8
8	T1	1	4.0	1	4.0	0.044	5.5	LOS A	0.2	1.4	0.02	0.56	0.02	53.9
9	R2	1	4.0	1	4.0	0.044	6.1	LOS A	0.2	1.4	0.02	0.56	0.02	53.1
Approach		68	4.0	68	4.0	0.044	5.6	LOS A	0.2	1.4	0.02	0.56	0.02	50.9
West: Internal Rd (W)														
10	L2	1	4.0	1	4.0	0.003	5.7	LOS A	0.0	0.1	0.07	0.19	0.07	56.2
11	T1	4	4.0	4	4.0	0.003	0.0	LOS A	0.0	0.1	0.07	0.19	0.07	56.1
12	R2	1	4.0	1	4.0	0.003	5.7	LOS A	0.0	0.1	0.07	0.19	0.07	55.9
Approach		6	4.0	6	4.0	0.003	1.9	NA	0.0	0.1	0.07	0.19	0.07	56.1
All Vehicles		255	4.0	255	4.0	0.064	5.1	NA	0.3	2.0	0.06	0.54	0.06	50.7

MOVEMENT SUMMARY

Site: 1 [Clarkson Ave & Wanneroo Rd - 2021 - PM]

Network: N101 [2021 - PM]

Wanneroo Rd/ Clarkson Ave
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 140 seconds (Site Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: Wanneroo (S)														
1	L2	54	3.9	54	3.9	0.048	11.8	LOS B	1.0	7.5	0.33	0.65	0.33	48.6
2	T1	981	9.7	981	9.7	0.815	33.2	LOS C	26.1	215.4	0.96	0.88	1.01	42.8
3	R2	93	4.1	93	4.1	0.354	37.0	LOS D	3.1	24.4	0.94	0.77	0.94	38.3
Approach		1127	9.0	1127	9.0	0.815	32.5	LOS C	26.1	215.4	0.93	0.86	0.97	42.5
East: Clarkson Ave (E)														
4	L2	106	4.1	106	4.1	0.093	9.3	LOS A	1.7	13.2	0.29	0.60	0.29	53.2
5	T1	7	6.1	7	6.1	0.093	3.6	LOS A	1.7	13.2	0.29	0.60	0.29	46.7
6	R2	166	3.9	166	3.9	0.632	67.0	LOS E	10.9	84.4	0.99	0.82	0.99	28.8
Approach		280	4.1	280	4.1	0.632	43.4	LOS D	10.9	84.4	0.71	0.73	0.71	35.2
North: Wanneroo (N)														
7	L2	220	4.3	220	4.3	0.151	6.8	LOS A	0.3	2.3	0.03	0.59	0.03	56.8
8	T1	704	10.3	704	10.3	0.647	39.9	LOS D	18.5	153.3	0.82	0.71	0.82	39.7
9	R2	54	4.1	54	4.1	0.358	44.2	LOS D	2.3	18.1	0.96	0.74	0.96	26.4
Approach		978	8.6	978	8.6	0.647	32.7	LOS C	18.5	153.3	0.65	0.69	0.65	42.0
West: Internal Rd (W)														
10	L2	54	4.1	54	4.1	0.064	16.1	LOS B	1.5	11.3	0.47	0.65	0.47	42.0
11	T1	5	3.7	5	3.7	0.112	55.7	LOS E	1.8	13.7	0.90	0.71	0.90	22.2
12	R2	54	3.8	54	3.8	0.112	60.1	LOS E	1.8	13.7	0.90	0.71	0.90	22.3
Approach		113	3.9	113	3.9	0.112	38.9	LOS D	1.8	13.7	0.69	0.68	0.69	28.7
All Vehicles		2498	8.1	2498	8.1	0.815	34.1	LOS C	26.1	215.4	0.78	0.77	0.80	40.8

MOVEMENT SUMMARY

Site: v [Internal Rd & Access 1 & Access 2 - 2021 - PM]

Network: N101 [2021 - PM]

Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: South Access (S)														
1	L2	2	4.0	2	4.0	0.063	5.6	LOS A	0.3	2.0	0.09	0.56	0.09	52.6
2	T1	5	4.0	5	4.0	0.063	5.3	LOS A	0.3	2.0	0.09	0.56	0.09	53.1
3	R2	47	4.0	47	4.0	0.063	6.8	LOS A	0.3	2.0	0.09	0.56	0.09	49.5
Approach		55	4.0	55	4.0	0.063	6.6	LOS A	0.3	2.0	0.09	0.56	0.09	50.3
East: Internal Rd (E)														
4	L2	47	4.0	47	4.0	0.026	4.3	LOS A	0.0	0.0	0.00	0.54	0.00	50.9
5	T1	2	4.0	2	4.0	0.026	0.0	LOS A	0.0	0.0	0.00	0.54	0.00	53.6
6	R2	65	4.0	65	4.0	0.038	4.3	LOS A	0.1	1.1	0.03	0.55	0.03	50.2
Approach		115	4.0	115	4.0	0.038	4.2	NA	0.1	1.1	0.02	0.54	0.02	50.6
North: North Access (N)														
7	L2	66	4.0	66	4.0	0.048	5.6	LOS A	0.2	1.5	0.03	0.56	0.03	50.8
8	T1	5	4.0	5	4.0	0.048	5.5	LOS A	0.2	1.5	0.03	0.56	0.03	53.9
9	R2	1	4.0	1	4.0	0.048	6.1	LOS A	0.2	1.5	0.03	0.56	0.03	53.1
Approach		73	4.0	73	4.0	0.048	5.6	LOS A	0.2	1.5	0.03	0.56	0.03	51.3
West: Internal Rd (W)														
10	L2	1	4.0	1	4.0	0.004	5.7	LOS A	0.0	0.1	0.08	0.21	0.08	55.9
11	T1	5	4.0	5	4.0	0.004	0.1	LOS A	0.0	0.1	0.08	0.21	0.08	55.6
12	R2	2	4.0	2	4.0	0.004	5.7	LOS A	0.0	0.1	0.08	0.21	0.08	55.7
Approach		8	4.0	8	4.0	0.004	2.2	NA	0.0	0.1	0.08	0.21	0.08	55.7
All Vehicles		251	4.0	251	4.0	0.063	5.1	NA	0.3	2.0	0.04	0.54	0.04	50.9

MOVEMENT SUMMARY

Site: 1 [Clarkson Ave & Wanneroo Rd - 2031 - AM] **Network: N101 [2031 - AM]**

Wanneroo Rd/ Clarkson Ave
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 150 seconds (Site Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: Wanneroo (S)														
1	L2	56	3.9	56	3.9	0.048	11.8	LOS B	1.0	8.0	0.31	0.65	0.31	48.7
2	T1	1007	9.7	1007	9.7	0.755	27.8	LOS C	25.5	210.6	0.90	0.80	0.90	45.7
3	R2	86	4.1	86	4.1	0.354	39.8	LOS D	3.2	24.6	0.95	0.77	0.95	37.2
Approach		1149	9.0	1149	9.0	0.755	28.0	LOS C	25.5	210.6	0.88	0.79	0.88	45.0
East: Clarkson Ave (E)														
4	L2	187	4.1	187	4.1	0.263	24.0	LOS C	7.8	60.6	0.59	0.71	0.59	43.9
5	T1	17	6.1	17	6.1	0.263	18.3	LOS B	7.8	60.6	0.59	0.71	0.59	34.3
6	R2	222	3.9	222	3.9	0.904	89.7	LOS F	18.5	143.4	1.00	0.97	1.32	24.5
Approach		426	4.1	426	4.1	0.904	58.0	LOS E	18.5	143.4	0.80	0.85	0.97	30.8
North: Wanneroo (N)														
7	L2	264	4.3	264	4.3	0.180	6.8	LOS A	0.4	3.0	0.03	0.60	0.03	56.8
8	T1	1271	10.3	1271	10.3	1.099	161.9	LOS F	87.2	721.0	1.00	1.52	1.78	16.8
9	R2	56	4.1	56	4.1	0.399	45.9	LOS D	2.4	18.9	0.97	0.74	0.97	25.7
Approach		1591	9.1	1591	9.1	1.099	132.0	LOS F	87.2	721.0	0.84	1.34	1.46	19.2
West: Internal Rd (W)														
10	L2	56	4.1	56	4.1	0.071	18.8	LOS B	1.7	13.5	0.50	0.66	0.50	39.9
11	T1	17	3.7	17	3.7	0.146	61.4	LOS E	2.4	18.4	0.91	0.71	0.91	21.2
12	R2	56	3.8	56	3.8	0.146	65.8	LOS E	2.4	18.4	0.91	0.72	0.91	21.1
Approach		128	3.9	128	3.9	0.146	44.8	LOS D	2.4	18.4	0.73	0.69	0.73	26.6
All Vehicles		3295	8.2	3295	8.2	1.099	82.7	LOS F	87.2	721.0	0.84	1.06	1.17	25.9

MOVEMENT SUMMARY

Site: v [Internal Rd & Access 1 & Access 2 - 2031 - AM] **Network: N101 [2031 - AM]**

Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: South Access (S)														
1	L2	1	4.0	1	4.0	0.064	5.6	LOS A	0.3	2.0	0.21	0.57	0.21	52.5
2	T1	1	4.0	1	4.0	0.064	5.4	LOS A	0.3	2.0	0.21	0.57	0.21	53.0
3	R2	53	4.0	53	4.0	0.064	6.8	LOS A	0.3	2.0	0.21	0.57	0.21	49.4
Approach		55	4.0	55	4.0	0.064	6.8	LOS A	0.3	2.0	0.21	0.57	0.21	49.6
East: Internal Rd (E)														
4	L2	53	4.0	53	4.0	0.030	4.3	LOS A	0.0	0.0	0.00	0.51	0.00	51.2
5	T1	5	4.0	5	4.0	0.030	0.0	LOS A	0.0	0.0	0.00	0.51	0.00	53.9
6	R2	66	4.0	66	4.0	0.038	4.3	LOS A	0.1	1.1	0.03	0.55	0.03	50.2
Approach		124	4.0	124	4.0	0.038	4.1	NA	0.1	1.1	0.02	0.53	0.02	50.8
North: North Access (N)														
7	L2	66	4.0	66	4.0	0.044	5.6	LOS A	0.2	1.4	0.03	0.56	0.03	50.7
8	T1	1	4.0	1	4.0	0.044	5.5	LOS A	0.2	1.4	0.03	0.56	0.03	53.8
9	R2	1	4.0	1	4.0	0.044	6.1	LOS A	0.2	1.4	0.03	0.56	0.03	53.1
Approach		68	4.0	68	4.0	0.044	5.6	LOS A	0.2	1.4	0.03	0.56	0.03	50.9
West: Internal Rd (W)														
10	L2	1	4.0	1	4.0	0.004	5.7	LOS A	0.0	0.1	0.06	0.16	0.06	56.4
11	T1	5	4.0	5	4.0	0.004	0.0	LOS A	0.0	0.1	0.06	0.16	0.06	56.6
12	R2	1	4.0	1	4.0	0.004	5.7	LOS A	0.0	0.1	0.06	0.16	0.06	56.2
Approach		7	4.0	7	4.0	0.004	1.7	NA	0.0	0.1	0.06	0.16	0.06	56.5
All Vehicles		255	4.0	255	4.0	0.064	5.0	NA	0.3	2.0	0.06	0.54	0.06	50.7

MOVEMENT SUMMARY

Site: 1 [Clarkson Ave & Wanneroo Rd - 2031 - PM] **Network: N102 [2031 - PM]**

Wanneroo Rd/ Clarkson Ave
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 165 seconds (Site Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: Wanneroo (S)														
1	L2	288	3.9	288	3.9	0.236	14.2	LOS B	7.3	56.8	0.39	0.69	0.39	45.8
2	T1	1213	9.7	1213	9.7	0.930	52.7	LOS D	46.4	383.1	0.95	0.99	1.14	34.9
3	R2	113	4.1	113	4.1	0.444	43.4	LOS D	4.9	38.4	0.96	0.78	0.96	35.9
Approach		1614	8.3	1614	8.3	0.930	45.1	LOS D	46.4	383.1	0.85	0.92	0.99	35.8
East: Clarkson Ave (E)														
4	L2	129	4.1	129	4.1	0.311	26.8	LOS C	5.9	46.5	0.77	0.73	0.77	43.2
5	T1	55	6.1	55	6.1	0.311	21.1	LOS C	5.9	46.5	0.77	0.73	0.77	33.4
6	R2	203	3.9	203	3.9	0.910	98.9	LOS F	18.6	143.9	1.00	0.97	1.32	23.0
Approach		387	4.3	387	4.3	0.910	63.8	LOS E	18.6	143.9	0.89	0.86	1.06	28.5
North: Wanneroo (N)														
7	L2	268	4.3	268	4.3	0.189	6.9	LOS A	0.5	4.0	0.03	0.60	0.03	56.7
8	T1	875	10.3	875	10.3	0.736	35.1	LOS D	23.7	196.3	0.73	0.64	0.73	41.9
9	R2	158	4.1	158	4.1	0.877	56.5	LOS E	8.1	63.1	1.00	0.89	1.23	22.5
Approach		1301	8.3	1301	8.3	0.877	31.9	LOS C	23.7	196.3	0.62	0.66	0.65	41.9
West: Internal Rd (W)														
10	L2	223	4.1	223	4.1	0.306	28.6	LOS C	10.1	78.9	0.65	0.74	0.65	33.6
11	T1	55	3.7	55	3.7	0.617	74.7	LOS E	10.9	84.5	1.00	0.81	1.00	18.6
12	R2	223	3.8	223	3.8	0.617	79.2	LOS E	10.9	84.5	1.00	0.81	1.00	18.6
Approach		501	3.9	501	3.9	0.617	56.1	LOS E	10.9	84.5	0.84	0.78	0.84	23.2
All Vehicles		3803	7.3	3803	7.3	0.930	44.0	LOS D	46.4	383.1	0.77	0.81	0.86	35.1

MOVEMENT SUMMARY

Site: v [Internal Rd & Access 1 & Access 2 - 2031 - PM]

Network: N102 [2031 - PM]

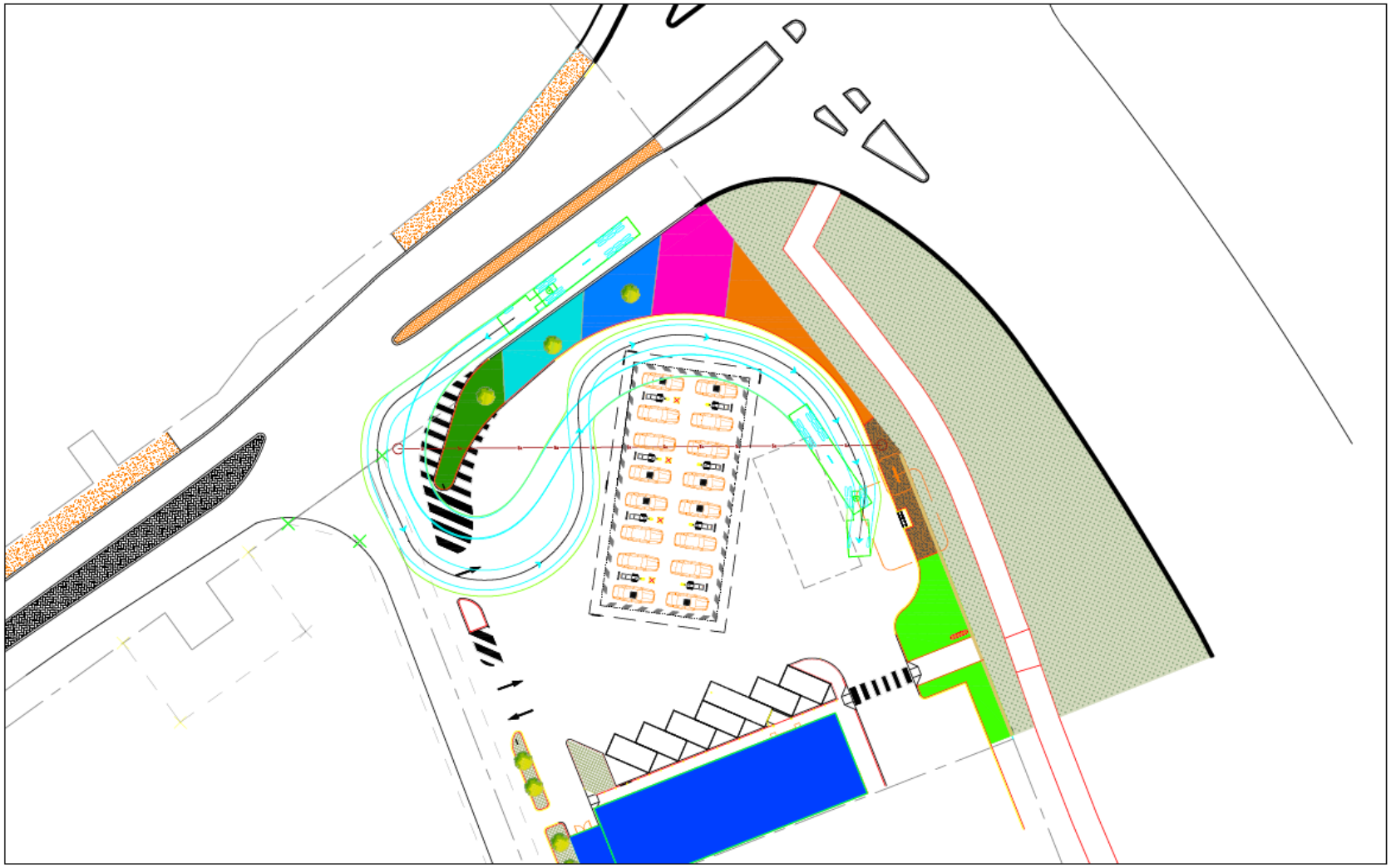
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: South Access (S)														
1	L2	2	4.0	2	4.0	0.678	15.5	LOS C	2.8	21.4	0.77	1.11	1.47	41.8
2	T1	5	4.0	5	4.0	0.678	20.7	LOS C	2.8	21.4	0.77	1.11	1.47	42.1
3	R2	149	4.0	149	4.0	0.678	24.9	LOS C	2.8	21.4	0.77	1.11	1.47	33.5
Approach		157	4.0	157	4.0	0.678	24.7	LOS C	2.8	21.4	0.77	1.11	1.47	34.1
East: Internal Rd (E)														
4	L2	149	4.0	149	4.0	0.220	4.3	LOS A	0.0	0.0	0.00	0.20	0.00	54.4
5	T1	281	4.0	281	4.0	0.220	0.0	LOS A	0.0	0.0	0.00	0.20	0.00	57.4
6	R2	65	4.0	65	4.0	0.049	5.3	LOS A	0.2	1.4	0.30	0.58	0.30	49.1
Approach		496	4.0	496	4.0	0.220	2.0	NA	0.2	1.4	0.04	0.25	0.04	55.3
North: North Access (N)														
7	L2	65	4.0	65	4.0	0.107	6.6	LOS A	0.3	2.2	0.40	0.62	0.40	48.7
8	T1	5	4.0	5	4.0	0.107	12.2	LOS B	0.3	2.2	0.40	0.62	0.40	52.7
9	R2	2	4.0	2	4.0	0.107	12.1	LOS B	0.3	2.2	0.40	0.62	0.40	51.9
Approach		73	4.0	73	4.0	0.107	7.2	LOS A	0.3	2.2	0.40	0.62	0.40	49.4
West: Internal Rd (W)														
10	L2	2	4.0	2	4.0	0.224	6.9	LOS A	0.0	0.3	0.01	0.01	0.01	57.9
11	T1	281	4.0	281	4.0	0.224	0.0	LOS A	0.0	0.3	0.01	0.01	0.01	59.7
12	R2	2	4.0	2	4.0	0.224	7.6	LOS A	0.0	0.3	0.01	0.01	0.01	57.7
Approach		285	4.0	285	4.0	0.224	0.1	NA	0.0	0.3	0.01	0.01	0.01	59.7
All Vehicles		1011	4.0	1011	4.0	0.678	5.4	NA	2.8	21.4	0.17	0.34	0.28	51.0

Appendix E

TURN PATH ANALYSIS



Lot 1 (No. 1351) Wanneroo Road, Tapping
Austroads 2013: 19.0m Semi-Trailer
Fuel tanker entry

LEGEND
Vehicle Body
Wheel Path

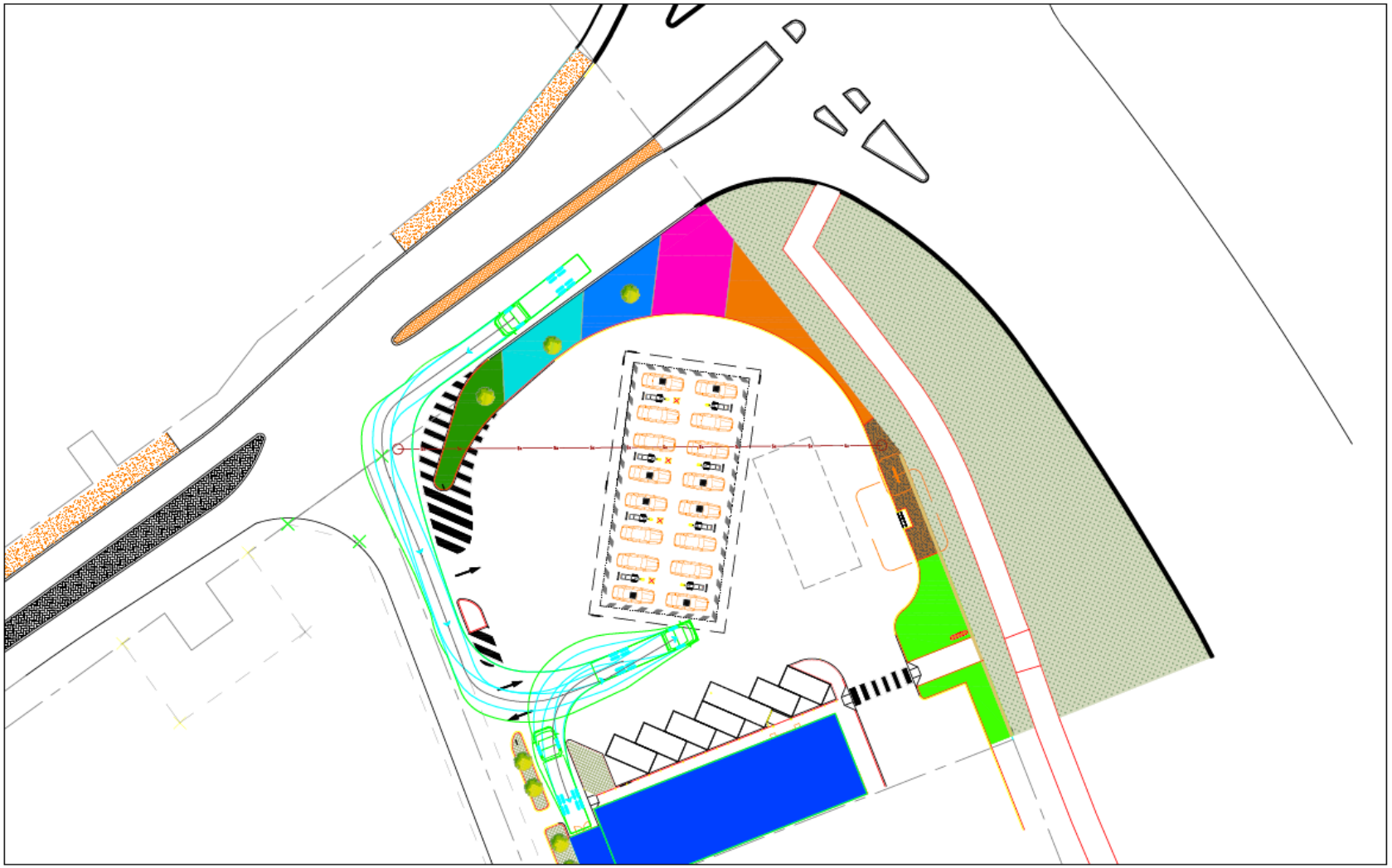
t21.142.sk01a
6/09/2021
Scale: 1:400 @ A3

transcore

Lot 1 (No. 1351) Wanneroo Road, Tapping
Austroads 2013: 19.0m Semi-Trailer
Fuel tanker exit

LEGEND
Vehicle Body
Wheel Path

t21.142.sk02a
6/09/2021
Scale: 1:400 @ A3

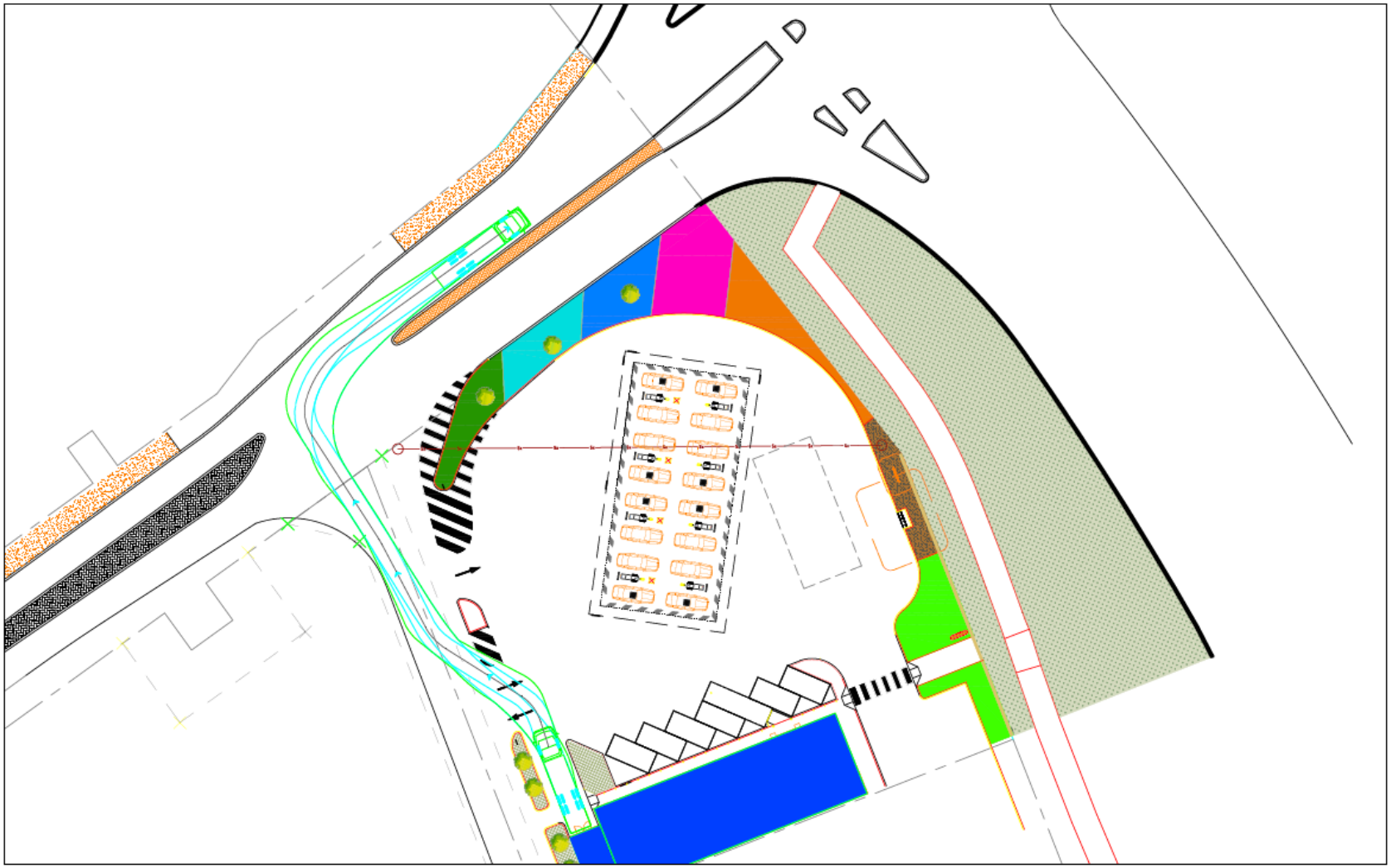


Lot 1 (No. 1351) Wanneroo Road, Tapping
Austroads 2013: 12.5m SU Truck
Service truck entry

LEGEND
Vehicle Body
Wheel Path

t21.142.sk03a
6/09/2021
Scale: 1:400 @ A3

transcore



Lot 1 (No. 1351) Wanneroo Road, Tapping
Austroads 2013: 12.5m SU Truck
Service truck exit

LEGEND
Vehicle Body
Wheel Path

t21.142.sk04a
6/09/2021
Scale: 1:400 @ A3

transcore