Engineering a better future for over 20 years!

McDonald's Restaurant, Lot 703 Lisford Avenue, Two Rocks

Transport Impact Assessment

PREPARED FOR:
McDonald's Australia Limited

February 2024

Document history and status

Author	Revision	Approved by	Date approved	Revision type
Vladimir Baltic	r01	B Bordbar	19/02/2024	Draft
Vladimir Baltic	r01a	B Bordbar	29/02/2024	Final

File name: t24.015.vb.r01a.docx

Author: Vladimir Baltic

Project manager: Behnam Bordbar

Client: McDonald's Australia Limited

Project: McDonald's Restaurant, Two Rocks

Document revision: r01a

Project number: t24.015

TABLE OF CONTENTS

REPORT FIGURES

REPORT TABLES

1 Summary

This Transport Impact Assessment (TIA) report has been prepared with respect to the proposed McDonald's family restaurant at Lot 703 Lifford Avenue in Two Rocks, City of Wanneroo. The Lot 703 is located at the northwestern corner of the existing intersection of Lis ford Avenue/Charnwood Avenue.

The development proposal includes construction of a new fast-food restaurant with a dual-lane drive-through facility at the subject site.

As part of the development proposal a two-point access system is proposed to serve the restaurant with accesses off (future) Australis Drive at the south side and Azzurra Street at the north side of the site.

In accordance with the WAPC document "*Transport Impact Assessment Guidelines for Developments, Volume 4 – Individual Developments (2016)*" a Transport Impact Assessment is required for developments that are likely to generate high volumes of traffic and, therefore, would have a high overall impact on the surrounding land uses and transport networks.

The aim of this Transport Impact Assessment (TIA) is to estimate the traffic which will be generated by the development and establish the resultant traffic pattern on the surrounding road network. This assessment will include the capacity analysis of the two access points on Australis Drive and Azzurra Street including the adjacent, yet to be constructed, roundabout intersection of Lisford Avenue/Charnwood Avenue/ Australis Drive.

During the preparation of this report Transcore sourced information from the project associated with the subject site previously worked on in cooperation with the City of Wanneroo.

During the preparation of this report, Transcore has reviewed the following relevant reports and studies:

- Yanchep Two Rocks District Structure Plan (November 2010); and,
- Two Rocks Town Centre Structure Plan Agreed Structure Plan 70.

2 Introduction

This TIA has been prepared by Transcore on behalf of McDonalds Australia with regards to the proposed McDonald's restaurant at Lot 703 Lisford Avenue in Two Rocks, City of Wanneroo.

The subject site (approximately 3,066m^2) occupies space on the western side of Lisford Avenue, between Azzurra Street and the, yet to be constructed, Australis Drive, as shown in **Figure 1**. The site is also located a shorth distance southeast of the Two Rocks Marina complex. The subject site is presently vacant with the immediately surrounding road network currently under construction.

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, review of the proposed site crossovers and capacity analysis the proposed two site's crossovers and the adjacent intersections of Lisford Avenue/Azzurra Street and (future) Lisford Avenue/Charnwood Avenue/Australis Drive. It should be noted that, once constructed, Australis Drive will feature as a new, western leg, of the planned roundabout intersection which is currently operating in form of a priority-controlled, T-intersection of Lisford Avenue/Charnwood Avenue.

The location of the subject site within the *Metropolitan Region Scheme* context is illustrated in **Figure 2**. Review of the *MRS* confirms that all roads surrounding the subject site, except the Lisford Avenue, are local roads under care and control of City

of Wanneroo. Lisford Avenue is classified as an *"Other Regional Road"* under control of WAPC. The subject site is zoned as *"Urban"* in the *MRS*.

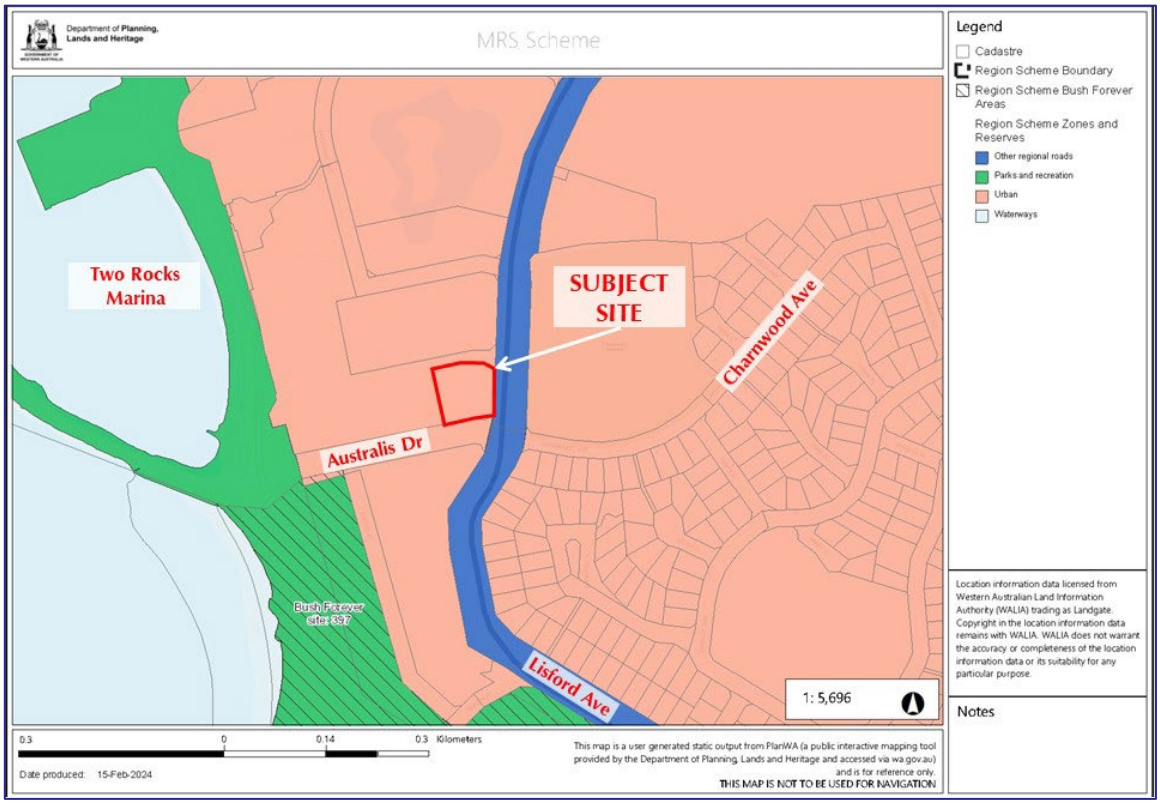


Figure 2. Site location within the Metropolitan Region Scheme

The immediately surrounding locality is currently being developed and local road network completed in line with the approved Two Rocks Town Centre Structure Plan for this area.

3 Development Proposal

The development proposal contemplates construction of a new McDonald's restaurant with a dual-lane drive through facility. The two drive-through lanes merge into a single lane incorporating a cashier and servery facility. The proposed McDonald's building floor area is approximately 380m^2 GFA.

The proposed McDonald's restaurant will provide a total of 22 car parking bays (including one ARCOD bay) for the use of customers and staff. Two additional waiting bays are also provided near the exit from the drive-through facility.

The drive-through facility entails a combined stacking length sufficient to accommodate at least 16 standard size passenger vehicles.

Two bike rails are provided immediately in front of the restaurant for patrons cycling to the site.

A loading bay is proposed at the northern side, between the restaurant building and the drive-through facility. Refer **Appendix A** for more details.

The proposed McDonald's restaurant is intended to be served by a two-point access system, as follows:

- A full-movement crossover on Azzurra Street at the northern end of the site, approximately 50m west of the Lisford Avenue intersection; and,
- A full-movement crossover on (yet to be constructed) Australis Drive at the southern end of the site, approximately 30m west of the (future) Lisford Avenue/Charnwood Avenue/Australis Drive roundabout, currently featuring as a priority-controlled T-intersection of Lisford Avenue/Charnwood Avenue.

It has been advised that medium size rigid service vehicles of 12.5m in length would be used for deliveries to the restaurant, while waste collection will be likely be undertaken using 8.8m long front loader waste collection trucks. The swept path assessments of the 12.5m rigid service vehicle, as a larger of the two vehicles, was undertaken to assess the suitability of the site to accommodate such vehicles. The relevant turn path plans are presented in **Appendix B.**

For the purpose of the traffic assessment, it is assumed that the proposed McDonald's restaurant would be completed and fully operational by the end of 2026.

4 Existing Situation

The subject site occupies space on the western side of Lisford Avenue, between Azzurra Street and Australis Drive. Australis Drive is planned as an east-west road which, once constructed, will form a western leg of the future Lisford Avenue/Charnwood Avenue/Australis Drive single-lane roundabout immediately southeast of the subject site. Australis Drive will bound the site along the southern side once constructed.

4.1 Existing Road Network

Lisford Avenue (northern extension of Two Rocks Road), at this locality, is constructed as a single-carriageway, two-way road, approximately 8.6m wide with a shared path along the western and a footpath along the eastern side. Section north of Blaxland Avenue is classified as a *District Distributor B* in the Main Roads WA *Functional Road Hierarchy* document.

It is however expected that with the planned carriageway duplication its classification will be upgraded to be consistent with the *Regional Distributor* classification of Two Rocks Road further to the south.

Lisford Avenue is covered by an *Other Regional Road* reservation (also known as *Blue Roads*) in the Metropolitan Region Scheme with the ultimate planning authority for this road being WAPC.

Australis Drive is the future road bounding the site along the southern side and is planned as a westbound extension of Charnwood Avenue providing another access to the Two Rocks Marina complex. Australis Drive entails a 30m wide reservation. According to the approved structure plan strategy, Australis Drive is intended to be classified as a *Local Distributor*.

Australis Drive is planned in form of a two-lane, boulevard-style road with a wide median, on-street cycling lanes and a shared path along the northern side.

Once constructed, Australis Drive will form a four-way roundabout intersection with Charnwood Avenue and Lisford Avenue at the southeast corner of the subject site, as it is envisaged in the *Two Rocks Town Centre Structure Plan*.

Azzurra Street is a recently constructed semi-circular road bounding the site along the northern side. It is built as a single-carriageway, two-lane road with a 7.4m wide trafficable width and embayed parallel parking along both sides. Footpaths on both sides of the road are in place to facilitate pedestrian traffic.

According to the approved structure plan strategy, Azzurra Street is intended to be classified as an *Access Street*.

Once fully constructed, Lisford Avenue/Charnwood Avenue/Australis Drive will form a single-lane roundabout adjacent to the site.

Azzurra Street forms a priority-controlled T-intersection with Lisford Street adjacent to the site.

4.2 Existing Traffic Volume on Roads

According to the latest available traffic count data sourced from Main Roads WA, Two Rocks Road (about 6km south of the subject site) carried about 6,470vpd in 2021/22. Heavy vehicles represented approximately 9.2% of the total traffic mix.

4.3 Heavy Vehicles

Restricted Access Vehicle (RAV) Network routes are designated for access by large heavy vehicle combinations, which is managed by Main Roads WA. All roads surrounding the subject site including section of Lisford Avenue (adjacent to the site) are classified as RAV Network 1 as shown **Figure 3**.

The RAV 1 Network classification permits operation of semi-trailers of up to 19m and short B-Doubles of up to 20m on these roads. However, Lisford Avenue, south of Marcon Street, is classified as RAV 4 road, designed to carry heavy vehicle combinations of up to 27.5m in length.

Figure 3. Existing heavy vehicle road network classification (RAV)

4.4 Public Transport Access

Existing bus route 490 (Butler Train Station to Two Rocks) runs along Lisford Avenue with bust stops immediately adjacent to the subject site. It provides 20min service during weekday peak periods and hourly service during the rest of the day, on weekends and public holidays.

4.5 Pedestrian and Cyclist Facilities

The existing pedestrian and cyclist paths are discussed in Section 4.1of the report.

4.6 Crash Data

The Main Roads WA website includes *summary crash history* data for all roads and intersections that recorded crashes over the 5-year period ending 31 December 2022.

No crashes were recorded at the Lisford Avenue/Charnwood Avenue intersection during this period.

A total of two crashes were recorded on Lisford Road during this period; both mid-blocks, about 70m south of the site. The two crashes were recorded as "Head on, Hospital" and "Hit object, PDO Major, Medical".

5 Changes to Surrounding Transport Networks

The immediately adjacent road network to the subject site is currently under construction in line with the relevant structure plan provisions.

According to the *Yanchep Two Rocks District Structure Plan* Lisford Avenue is classified as an *Integrator Arterial A* (formerly: *District Distributor A*) road with approximately 40m wide road reservation. In the *Two Rocks Town Centre Structure Plan* it is indicated as a District Distributor A south of the Australis Drive/Charnwood Avenue intersection and District Distributor B north of this intersection, adjacent to the subject site. It is forecast to carry between 8,000vpd (northern end) and 16,000vpd (southern end) once the area is fully developed (i.e., long-term time horizon).

Based on its classification and the estimated future traffic load, it is anticipated that, once the locality is fully developed or the traffic load reaches appropriate thresholds, Lisford Avenue will be upgraded to a four-lane divided road (Integrator Arterial A) south of the Australis Drive/Charnwood Avenue intersection and a two-lane boulevard-style standard (Integrator Arterial B) north of this intersection. However, this upgrade is some time away and as such subject to long-term planning.

The ultimate four-lane cross-section of Lisford Avenue would require a dual-lane roundabout control of the Lisford Avenue/Charnwood Avenue/Australis Drive intersection to safely and efficiently manage the anticipated future traffic flows through this intersection. However, this form of intersection is associated with full development of the locality and reaching the forecast long-term traffic volumes on the local road network. Hence, it is likely that the dual-lane roundabout format of this intersection is a long-term proposition and will not be required in the mid-term stage.

In the same approved structure planning documents, Azzurra Street (southern leg, adjacent to the site) intersection with Lisford Avenue is planned to ultimately be downgraded to a left-in/left-out only format once the traffic volumes are sufficiently high (at the time of planned Lisford Avenue duplication). In the meantime, the existing priority-controlled T-intersection format of the recently constructed intersection will remain as is.

Australis Drive is designed to entail a median break at the location of the proposed site's crossover to facilitate its full-movement format.

6 Integration with Surrounding Area

The proposed development is of a retail character and as such is fully in line with the strategic planning for the subject site.

7 Traffic Assessment

7.1 Assessment Period

A review of the existing traffic counts for the surrounding road network and other available information suggests that the combination of the traffic expected to be generated by the subject development and the peak road network traffic periods is likely to result in the greatest demand on the road network during the typical weekday morning and afternoon peak hours between 8:00-9:00AM and 3:00-4:00PM and on Saturdays during the 11:00-12:00noon midday peak hour.

As such, trip generation is estimated, and traffic analysis is undertaken for these periods which is in line with WAPC Transport Assessment Guidelines.

For the purpose of this assessment year 2026 assessment is assumed for the post-development scenario.

In line with the requirements of the document *"Transport Impact Assessment Guidelines for Developments, Volume 4 – Individual Developments (2016)"* additional assessment is undertaken for a (near) 10-year post-development time horizon (i.e., 2036 in this particular case).

7.2 Trip Generation and Distribution

Traffic generation rates for the proposed development were sourced from the *Institute of Transportation Engineers – Trip Generation Manual 11th Edition* (ITE) for Fast Food Restaurant + Drive Through. Refer **Table 1** for details on applied trip rates for this land use.

Table 1. Applied trip generation rates for the proposed development

Land Use	Units	Trip rate per unit			
		Daily	AM Peak	PM Peak	SAT Peak
Fast Food + Drive Thru	m^2	503.21	48.02	35.55	59.47

Accordingly, it is estimated that the proposed restaurant would generate approximately **1,912** total daily trips (both inbound and outbound) with approximately **182**, **135** and **149** trips (inbound and outbound) during a typical weekday AM and PM and Saturday midday peak hours, respectively.

The directional split of inbound and outbound trips for the proposed development is assumed to be 51/49, 52/48 and 51/49 during the AM weekday, PM weekday and

Saturday midday peak periods for in line with the *Institute of Transportation Engineers – Trip Generation Manual 11th Edition* (ITE) recommendations.

Trips associated with the proposed development also comprise a significant portion of passing-trade trips (and diverted trips) which are trips already present on the road network. Passing trade factors of 50% were applied in line with the *ITE Trip Generation Handbook*.

It is therefore estimated that the proposed development would generate approximately **956** additional daily trips with additional **91, 68** and **75** AM weekday**,** PM weekday and Saturday midday peak hour trips on the road network, respectively.

With respect to the assumed distribution and assignment of the development-generated traffic, consideration was given to the location of the site (adjacent to a major district-level route), the overwhelmingly passing trade nature of the development and the current and future available access and egress routes to and from the site.

Accordingly, the assumed directional traffic distribution is as follows:

- Approximately 35% of the traffic generated from the development would travel to/from Lisford Avenue north direction;
- Approximately 45% of the traffic generated from the development would travel to/from Lisford Avenue south direction;
- Approximately 15% of the traffic generated from the development would travel to/from Australis Drive/Azzurra Street west direction; and,
- Approximately 5% of the traffic generated from the development would travel to/from Charnwood Avenue east direction.

7.3 Traffic Flow

The traffic movements estimated to be generated by the proposed development have been manually assigned on the adjacent road network in line with the directional distribution assumptions outlined in the previous section.

The resulting year 2026 traffic movements generated by this development, during the typical weekday AM and PM peaks including the Saturday midday peak hour period, are shown in **Figure 4.**

The traffic distribution for the 2036 (10-year horizon) scenario will be slightly different to account for the anticipated downgrade of Lisford Avenue/Azzurra Street intersection to a left-in/left-out only format. Refer **Figure 5** for details.

Figure 4: Estimated traffic flows from the proposed development – Weekday morning/afternoon and Saturday midday peak hour traffic (post-development)

Figure 5: Estimated traffic flows from the proposed development – Weekday morning/afternoon and Saturday midday peak hour traffic (10-year horizon)

For the purpose of this assessment, the relevant weekday AM and PM as well as Saturday midday peak hour traffic movements at the intersection of Lisford Avenue/Charnwood Avenue and Lisford Avenue/Azzurra Street were established using Transcore's surveys undertaken on 15th and 17th February 2024 (refer **Figure 8**). The data collected in this survey was used to establish basis for the future traffic flows and patterns at relevant intersections.

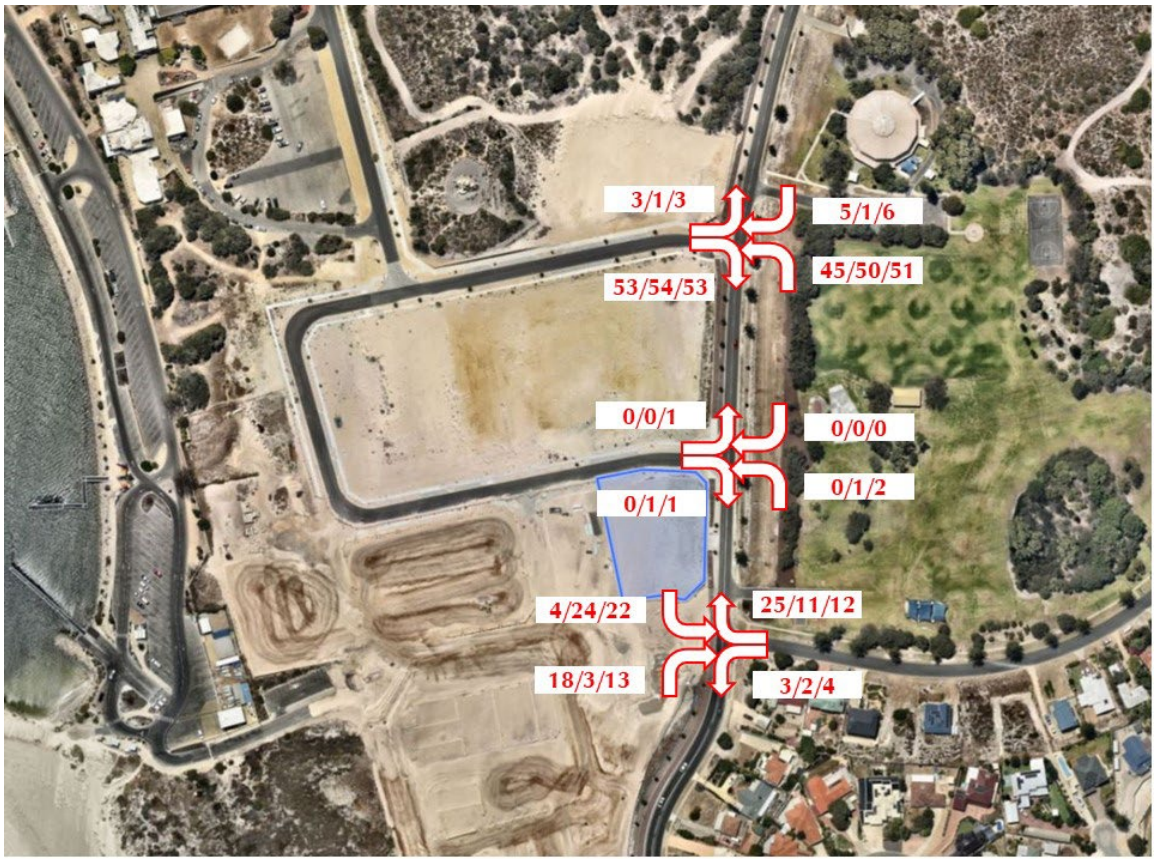


Figure 6. Weekday morning and afternoon and Saturday midday peak hour traffic flows at the relevant intersections (February 2024 survey)

7.4 Analysis of Local Intersections & Crossovers

The assessment of the site's crossovers and the two adjacent intersections was undertaken for the post-development (year 2026) and 10-year horizon (year 2036) scenarios.

Year 2026 scenario assumptions:

For the purpose of this assessment, it is assumed that Australis Drive and Lisford Avenue/Charnwood Avenue/Australis Drive single-lane roundabout have been fully constructed. The background traffic on Australis Drive and Azzurra Street have been assumed to be in order of 50% of their desirable capacity thresholds of 3,000vph and 100vph, respectively, in line with their intended road classification.

For this scenario, Lisford Avenue background traffic has been estimated to grow at a 10%p.a. rate (i.e., 20% cumulative) on recorded baseline 2021/22 traffic volumes (MRWA counts). This higher than usual yearly growth in background traffic accounts for the anticipated rapid development of the locality.

Year 2036 scenario assumptions:

The forecast traffic on Australis Drive and Azzurra Street in the 10-year horizon scenario assumes 100% capacity thresholds for the two roads which allows for full development of the locality. At this stage, it is assumed that Lisford Avenue/Azzurra Street intersection has been downgraded to a left-in/left-out only format.

Background traffic volumes for the Lisford Avenue/Charnwood Avenue/Australis Drive roundabout have been derived from the SKM's *Two Rocks Town Centre Traffic and Transport 2014* report (modelling of the ultimate Two Rocks structure plan development scenario) and extrapolated to establish the relevant traffic volumes during the relevant peak hour periods.

The Lisford Avenue/Charnwood Avenue/Australis Drive single-lane roundabout at this stage is upgraded to a dual-lane standard and Lisford Avenue is duplicated (four lane standard) in line with the long-term planning strategies.

The capacity analysis of the two site's crossovers and the two adjacent intersections of Lisford Avenue/Azzurra Street and Lisford Avenue/Charnwood Avenue/Australis Drive 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** 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 infrequent traffic flow up to one for saturated flow or capacity.
- **Level of Service** 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 NETWORK analysis are summarised in **Appendix C** and discussed in the subsequent paragraphs.

Lisford Avenue/Charnwood Avenue/Australis Drive

The SIDRA analysis indicates that this intersection currently operates satisfactorily and with overall LoS A during all three assessed peak hour periods. The intersection currently operates at below 20% capacity during all three assessed periods. Refer **Table 2** through to **Table 4** for more details.

The addition of development traffic, including the background traffic growth on constituent roads in 2026, will not have an adverse impact on the operation of this roundabout as overall intersection LoS A remains unchanged in all three scenarios. The roundabout at this stage operates at between 29% to 33% capacity with maximum queues of up to two vehicles anticipated only on Lisford Avenue south approach. Refer **Table 5** through to **Table 7** for more details.

Similarly, with the allowance for development-generated and full structure plan area development traffic, the (upgraded) roundabout maintains overall LoS A during the three assessed peak hour periods for the 10-year post-development stage (year 2036) with capacity levels ranging between 29% and 34%. Importantly, the queue backs from the intersection would not exceed two vehicles on any approach during either of the three assessed peak hour periods. Refer **Table 8** through to **Table 10** for more details.

Lisford Avenue/Azzurra Street intersection

Based on site survey results, this intersection presently records minimal traffic activity and as such detailed capacity assessment is not warranted.

The SIDRA analysis for post-development stage (year 2026) indicates that this intersection will operate satisfactorily during the three assessed peak hour periods with an overall LoS A and ranging between 14% and 24% capacity levels with no queueing concerns. Refer **Table 11** through to **Table 13** for more details.

At the 10-year horizon stage intersection of Lisford Avenue/Azzurra Street intersection will be restricted to left-in/left-out format and as such capacity issues are not anticipated, hence no detailed capacity assessment is warranted.

Azzarra Street and Australis Drive crossovers

The SIDRA analysis for post-development and 10-year horizon stages indicates overall LoS A operation with no capacity or queueing issues expected for either Azzurra Street or Australis Drive crossover as reported in **Table 14** through to **Table 24** for more details. Importantly, the Australis Drive crossover will operate with no capacity or queueing concerns post Lisford Avenue/Azzurra Street intersection downgrade.

Accordingly, the capacity analysis undertaken confirms that the proposed development will not result in adverse impacts on the operation of local road network and that the proposed site's crossovers will operate satisfactorily in all assessed peak hour scenarios.

7.5 Impact on Surrounding Roads and Neighbouring Areas

The estimated additional daily traffic on Lisford Avenue (north and south of the site) as a result of the development proposal is expected to be in order of about 760vpd and 1,050vpd respectively, representing 11.8% and 16.3% of existing daily traffic flows on this road. This level of additional traffic is well within the desirable daily traffic threshold for this type of road. As the proposed development is consistent with the long-term planning strategy for the subject locality the traffic impact from the proposed restaurant is accounted for in the transport modelling of the Two Rocks Town Centre structure plan. It should be noted that this assessment is conservative as the structure plan and its traffic report has already allowed for the development of this site.

The estimated additional traffic impact on Australis Drive and Azzurra Street is negligible and well within the respective road classification for the two roads (WAPC's *Liveable Neighbourhoods* policy).

7.6 Traffic Noise and Vibration

Due to the location of the proposed development and with respect to the surrounding land uses traffic noise and vibration are relevant only to the residential dwellings directly fronting Lisford Avenue and the two roads, which in this case is limited.

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 or noise on surrounding roads anywhere near this level.

7.7 Road Safety

No particular safety-related issues have been identified for the proposal.

7.8 Drive-Through Analysis

The McDonald's restaurants are generally deigned to operate with a two-lane drive-through facility which includes two Customer Order Booths (COB). The proposed drive-through facility provides approximately 16 car stacking capacity within the drive through facility of which eight bays are downstream of the COB.

For the purpose of this analysis, the anticipated customer activity was established using the estimated peak hour traffic generation assuming 1 customer = 2 trips. Based on the trip generation calculations discussed in Section 7.2 of the report, the peak business activity hour of the restaurant is expect to be experienced during the morning weekday period of 8:00-9:00AM recording 91 transactions/customers (resulting in

182 trips). These transactions generally comprise 75/25 split of drive-through/ park'n'sit customers, respectively.
Accordingly, it is estimated that the drive-through will accommodate about 68 customers during the typical weekday morning peak hour period.

It is further assumed that the order-taking cycle would average 1min (60sec) equating to a service rate of 60 customer per hour per COB.

A queue length analysis was undertaken to assess the provision of storage for vehicles within the drive through lane. For this purpose, an M/M/1 queuing model was adopted for each COB. The M/M/1 is a single-server queue model that can be used to approximate simple systems.

The queuing model adopts the following assumptions:

- Vehicles arrive randomly following Poisson's probability distribution;
- Service time is exponentially distributed;
- There is one server per queue, i.e., one COB per lane;
- The capacity of the queue in which arriving users wait before being served is infinite (for the purposes of identifying queue space requirements);
- The population of users (i.e., the pool of users) available to join the system is infinite; and,
- The queue is serviced on a first come, first served basis.

In summary, weekday AM peak hour queuing analysis of the drive-through system established the following:

- There is zero queuing 28% of the time;
- The expected number of vehicles in the system is two;
- The expected time in the queue is 88 seconds; and,
- The 95th percentile queue in the system is five vehicles maximum.

The queue length usually adopted for robust analysis is the 95th percentile queue. This queue length will not be exceeded 95% of the time.

Based on the queue analysis model, it is concluded that under typical peak conditions the queue backs from each COB will be comfortably accommodated within the site, with no impact on internal site driveways. The results of the queuing analysis are detailed in **Figure 7**.

M/M/s - Drive Through Queuing Analysis (Poisson Arrival and Service Rates)

M/M/s

	vph	vps
Arrival rate	68	0.018889
Service rate	60	0.016667
Number of servers	2	2

80 45

$ 32.00

80

Utilization	56.67%		56.67%	
P(0), probability that the system is empty	0.2766		0.2766	
Lq, expected queue length	0.5361	(cars)	6.0000	(metres)
L, expected number in system	1.6694	(cars)	12.0000	(metres)
Wq, expected time in queue	0.0079	(hours)	28.3797	(seconds)
W, expected total time in system	0.0245	(hours)	88.3797	(seconds)
Probability that a customer waits	0.4099		0.4099	
95% Queue	5.0000	(cars)	30.0000	(metres)

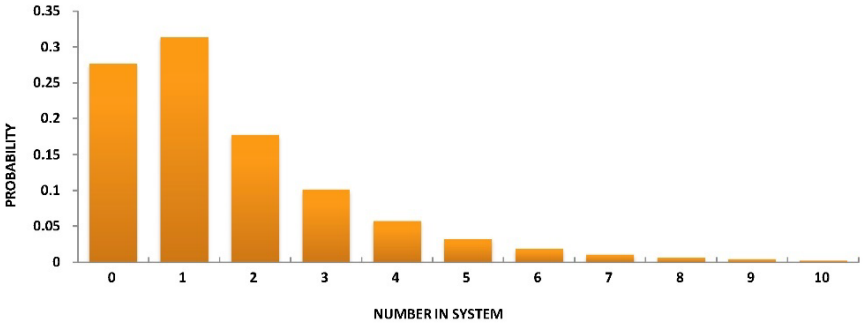


Figure 7. Peak weekday afternoon hour queueing analysis

8 Parking Assessment

The development is proposed to be served by a total of 22 on-site parking bays for patrons and staff (inclusive of one ACROD bay). This car parking provision does not include bays within the drive-through system which is estimated to have the capacity to accommodate additional 16 vehicles.

Based on the advice provided to Transcore, the proposed parking supply meets the statutory parking requirement for the restaurant.

9 Provision for Service Vehicles

A loading bay is provided on-site, immediately north of the restaurant building, between the building and the drive-through facility, for the delivery and waste-collection vehicles.

It has been advised that large rigid vehicles of up to 12.5 in length would be used for deliveries to the restaurant.

The trucks will enter the site, reverse into the loading bay and deliver goods or collect waste within the loading bay, and then exit the site moving in the forward gear.

Based on the advice provided by the waste consultant, the waste collection for the restaurant will likely be undertaken using 8.8m trucks.

The swept path assessments of the 12.5m rigid service vehicle was undertaken to confirm the suitability of the subject site to accommodate such vehicles, as presented in **Appendix B**.

In addition, a turn path assessment plan showing movement of a B99 size passenger vehicle through the drive-through is provided in **Appendix B,** confirming the suitability of the proposed drive-through facility design.

10 Public Transport Access

Details of the available public transport services in this locality are provided in **Section 4.4** of this report and will provide a satisfactory level of public transport accessibility to the site, particularly during business hours.

11 Pedestrian and Cyclist Access

Details of the pedestrian and cyclist facilities in this locality are provided in **Section 4.5** of the report. The existing facilities in this location provide satisfactory level of service for the proposed development.

12 Conclusions

This Transport Impact Assessment (TIA) report has been prepared with respect to the proposed McDonald's family restaurant at Lot 703 Lisford Avenue in Two Rocks, City of Wanneroo.

The subject site occupies space on the western side of Lisford Avenue, between Azzurra Street and the, yet to be constructed, Australis Drive. The site is presently vacant.

The development proposal contemplates construction of a new McDonald's restaurant with a dual-lane drive through facility and 22 on-site parking bays, to be served by two full movement crossovers on Azzurra Street and (yet to be constructed) Australis Drive.

The traffic analysis undertaken in this report shows that the traffic generation of the proposed development is expected to be in order of approximately **1,912** total daily trips with approximately **182**, **135** and **149** trips during a typical weekday AM and PM and Saturday midday peak hours, respectively. The capacity analysis undertaken in this report confirms that the proposed development will not have an adverse impact on the operation of local road network which will continue to operate satisfactorily in the future.

The site features good connectivity with the existing road, cyclist network and direct public transport coverage through existing bus service operating in the immediate vicinity of the site.

It is concluded that the findings of this Transport Impact Assessment are supportive of the proposed development.

Appendix A

PROPOSED DEVELOPMENT PLAN

transcore

Engineering a better future for over 20 years!

SITE AREA SCHEDULE	
IDENTITY	AREA
LOT AREA	3,066m2

BUILDING GFA SCHEDULE	
DESCRIPTOR	AREA m2
BUILDING GFA	380m2

SEATING SCHEDULE	
ROOM	SEATS
DINING ROOM	50

PARKING SUMMARY	
TYPE	NO
ACCESSIBLE BAY	1
STANDARD BAY	21
WAITING BAY	2

LANDSCAPING LEGEND	
COLOUR	DESCRIPTION
	NEW PROPOSED LANDSCAPING BY McDONALD'S 775m2 OR 25% OF OVERALL SITE
	EXISTING/PROPOSED LANDSCAPING BY DEVELOPER 535m2

DEVELOPMENT APPLICATION

Hindley and Associates Pty Ltd
Building Designers
Unit 4/468 Stirling Highway
Nedlands WA 6009
PO Box 199 Nedlands WA 6909
08 9386 6986
www.hindley.com.au

PROPOSED McDONALD'S RESTAURANT
TWO ROCKS

LOT 701 LISFORD AVENUE TWO ROCKS WA

1:400 @ A3 | BIO MOD 389

SITE PLAN

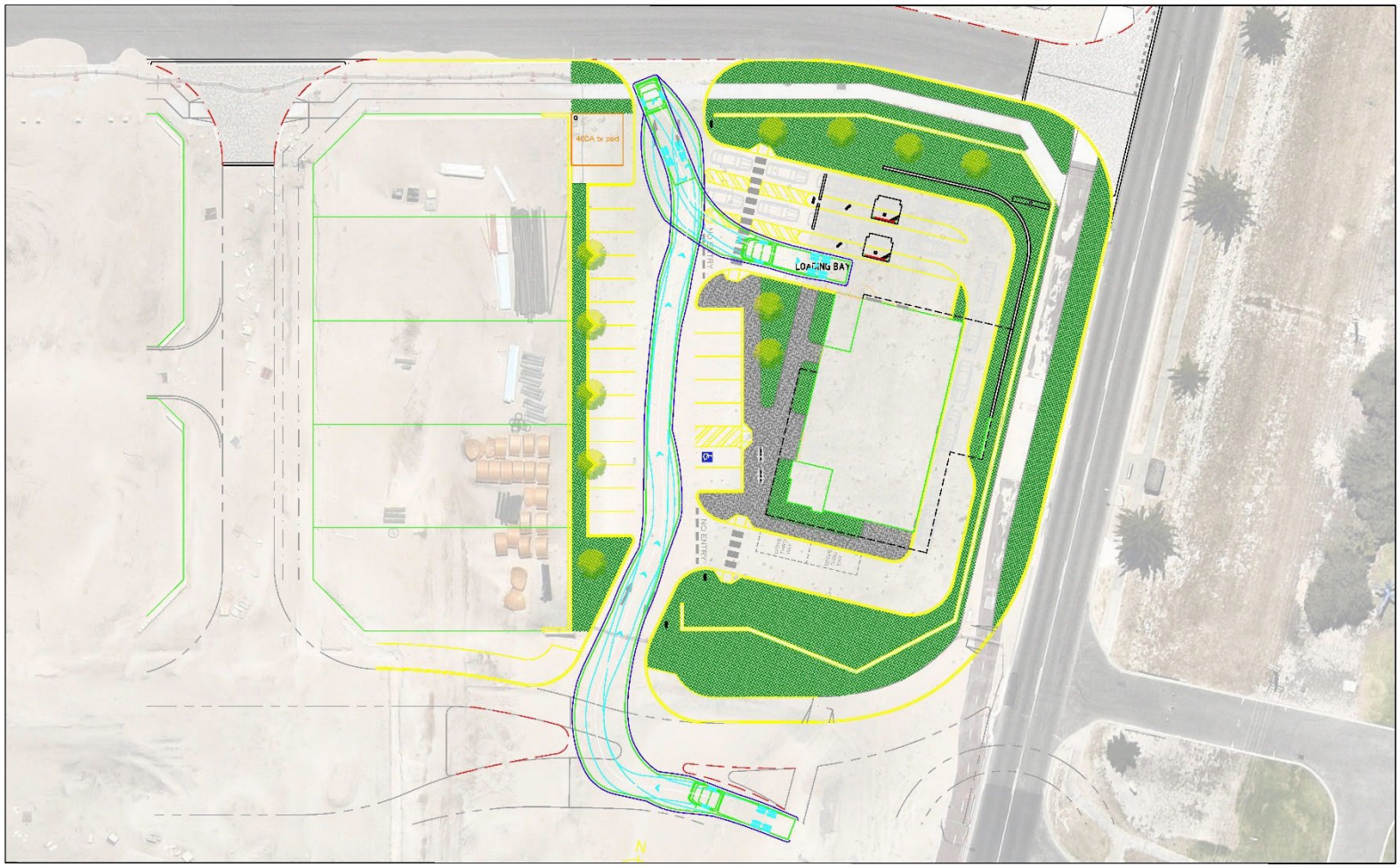
0868 | DA02 | 0

Appendix B

TURN PATH PLANS

transcore

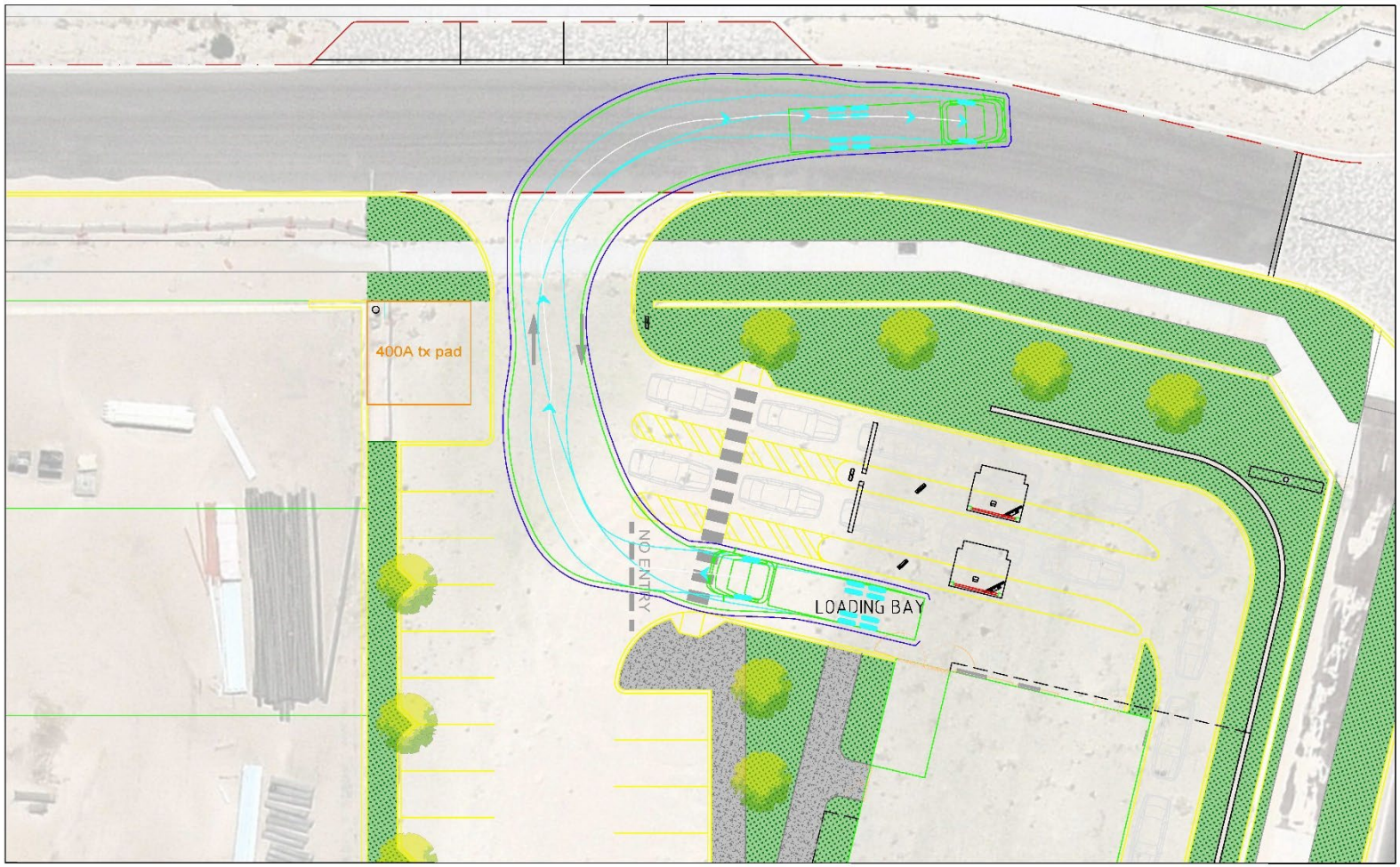
Engineering a better future for over 20 years!



Lot 703 Lisford Ave, Two Rocks - Proposed McDonald's
12.5 m Service Truck
Delivery Bay Entry

LEGEND
Vehicle Body
Wheel Path
300mm Clearance

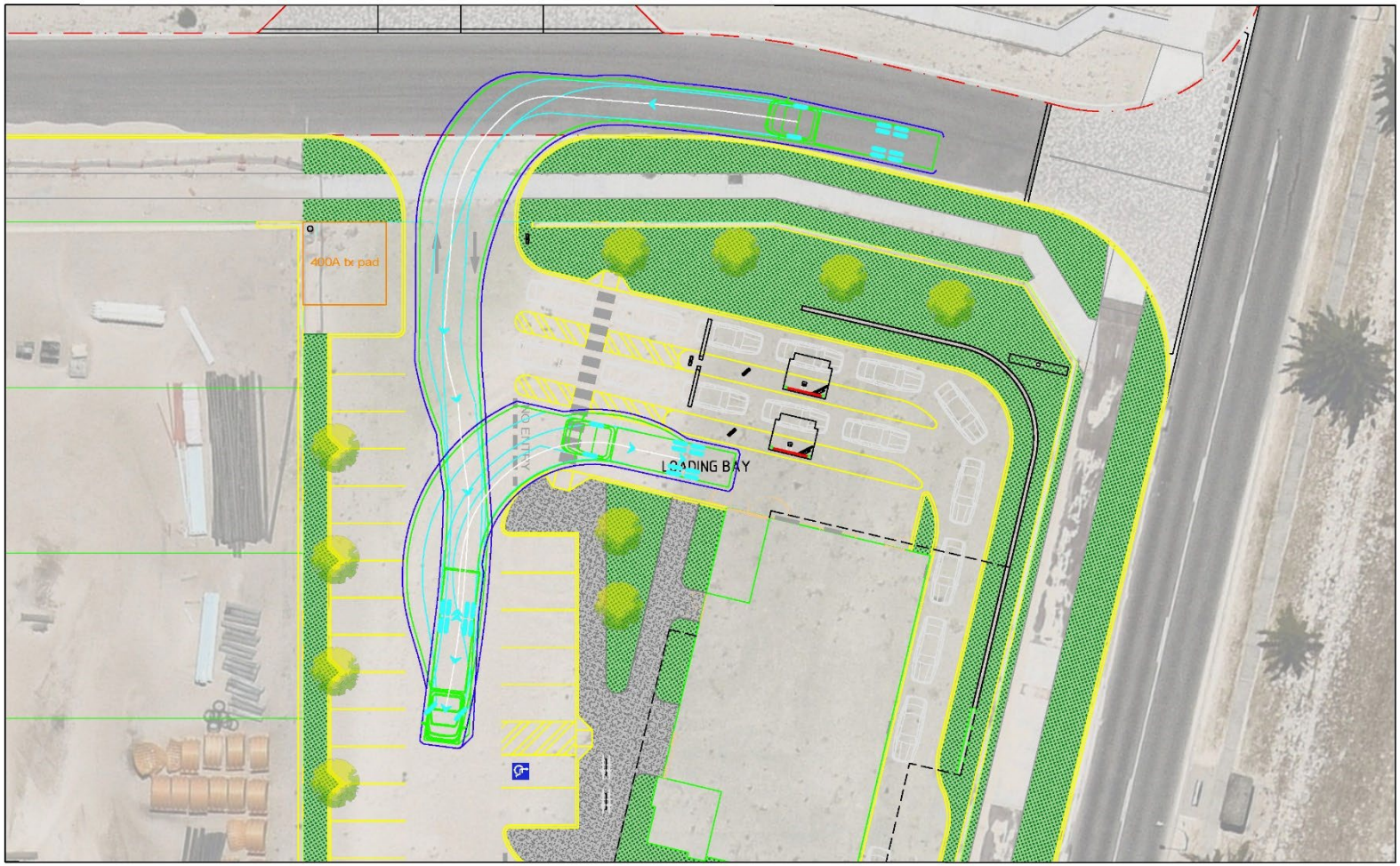
t24.015.sk01
31/01/2024
Scale: 1:200 @ A3



Lot 703 Lisford Ave, Two Rocks - Proposed McDonald's
12.5 m Service Truck
Delivery Bay Exit

LEGEND
Vehicle Body
Wheel Path
300mm Clearance

t24.015.sk02
31/01/2024
Scale: 1:300 @ A3

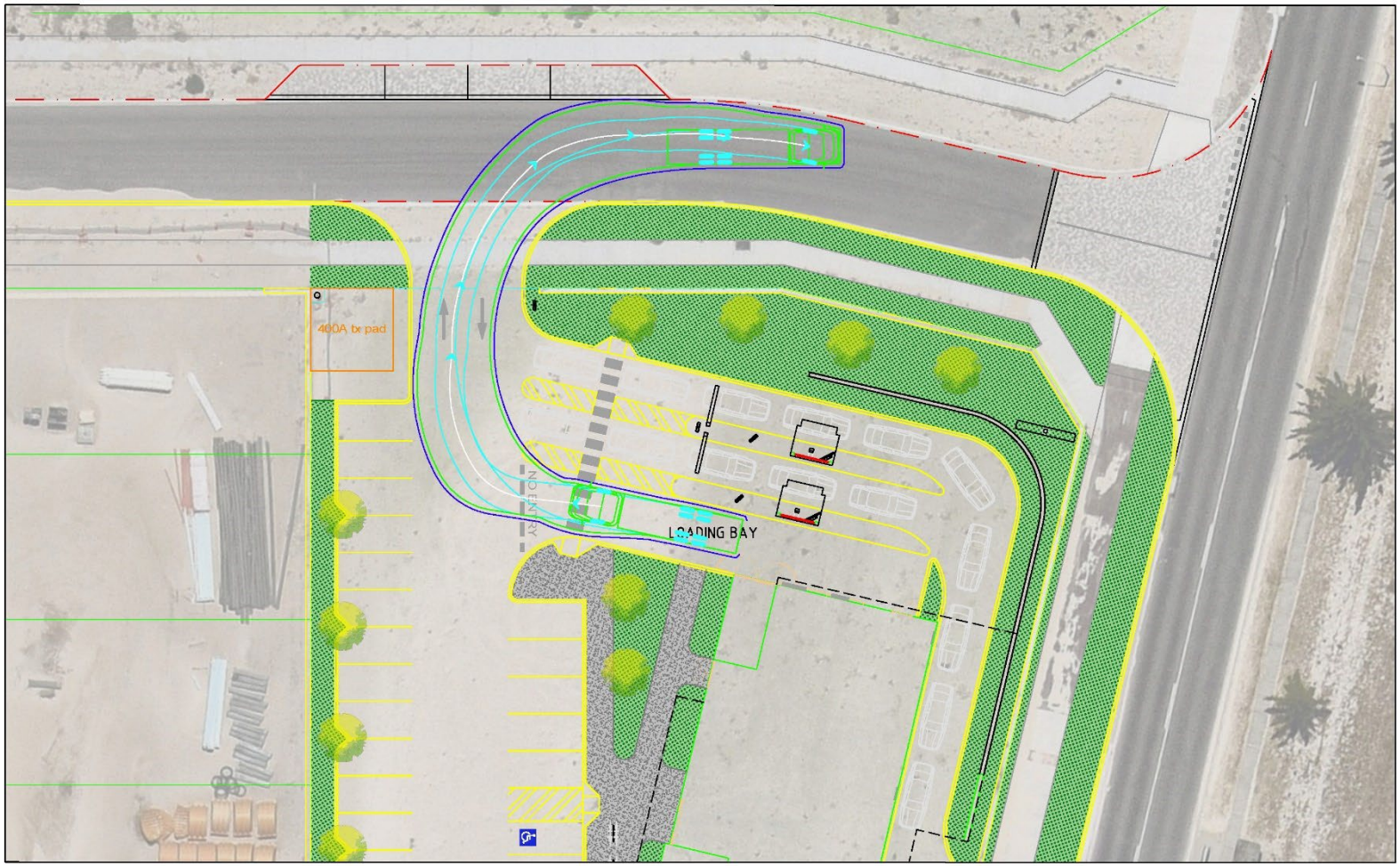


Lot 703 Lisford Ave, Two Rocks - Proposed McDonald's
12.5 m Service Truck
Delivery Bay Entry

LEGEND
Vehicle Body
Wheel Path
300mm Clearance

t24.015.sk04
01/02/2024
Scale: 1:250 @ A3

transcore

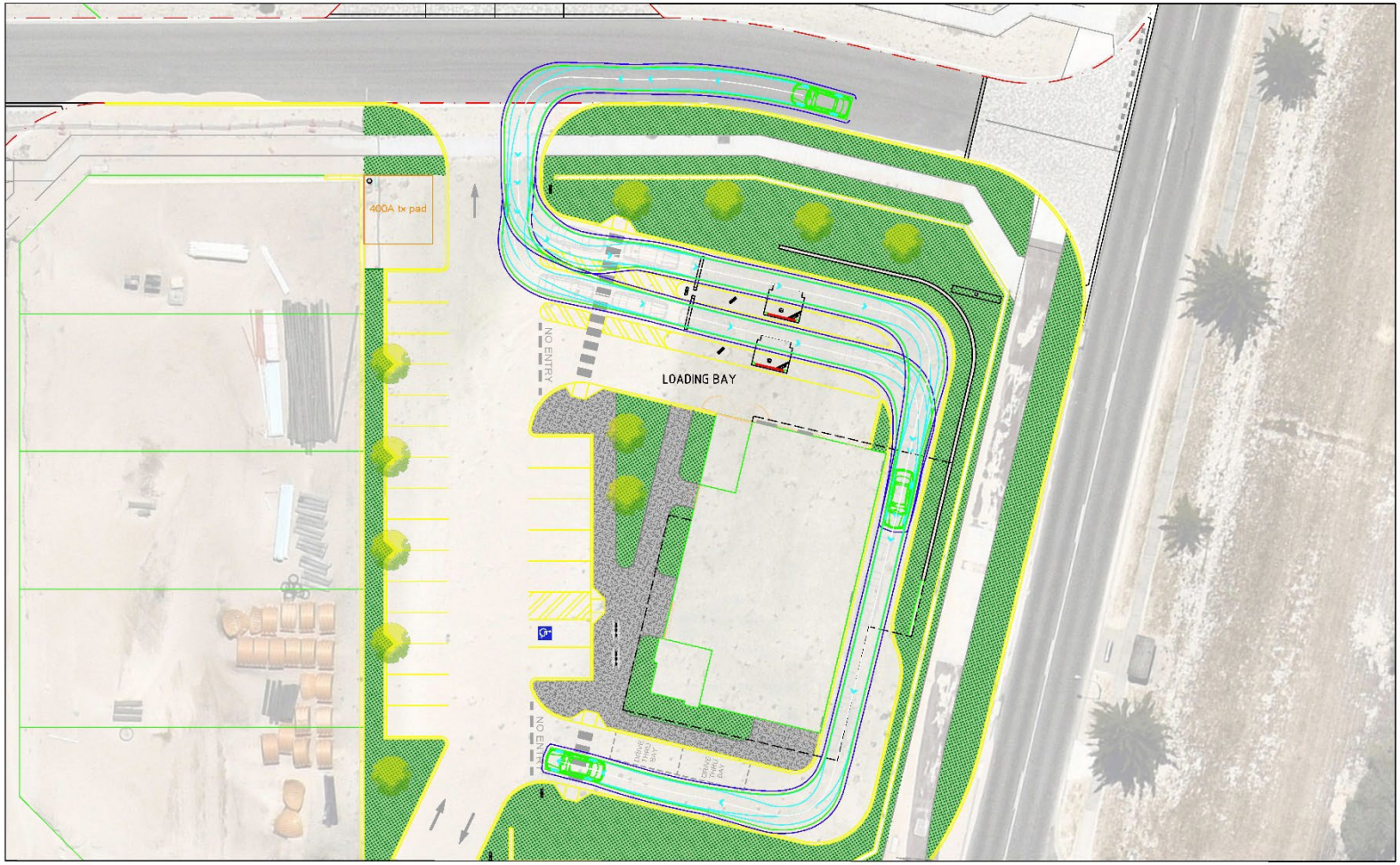


Lot 703 Lisford Ave, Two Rocks - Proposed McDonald's
12.5 m Service Truck
Delivery Bay Exit

LEGEND
Vehicle Body
Wheel Path
300mm Clearance

t24.015.sk05
01/02/2024
Scale: 1:250 @ A3

transcore



Lot 703 Lisford Ave, Two Rocks - Proposed McDonald's

B99 Passenger Car

McDonald's Drive-Through Entry and Exit

LEGEND

Vehicle Body

Wheel Path

300mm Clearance

t24.015.sk03

31/01/2024

Scale: 1:300 @ A3

Appendix C

SIDRA RESULTS

Engineering a better future for over 20 years!

Table 2. SIDRA Results – Lisford Avenue/Charnwood Avenue intersection – Weekday AM Peak hour (Existing situation)

Vehicle Movement Performance														
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lisford Avenue (S)															
2	T1	All MCs	217	12.4	217	12.4	0.137	0.2	LOS A	0.2	1.4	0.09	0.11	0.09	59.1
3	R2	All MCs	19	2.0	19	2.0	0.137	7.0	LOS A	0.2	1.4	0.09	0.11	0.09	52.2
Approach			236	11.6	236	11.6	0.137	0.7	NA	0.2	1.4	0.09	0.11	0.09	58.5
East: Charnwood Avenue (E)															
4	L2	All MCs	3	3.0	3	3.0	0.042	5.9	LOS A	0.1	1.0	0.48	0.69	0.48	46.6
6	R2	All MCs	26	3.0	26	3.0	0.042	7.7	LOS A	0.1	1.0	0.48	0.69	0.48	46.5
Approach			29	3.0	29	3.0	0.042	7.5	LOS A	0.1	1.0	0.48	0.69	0.48	46.5
North: Lisford Avenue (N)															
7	L2	All MCs	4	2.0	4	2.0	0.195	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	56.6
8	T1	All MCs	343	12.4	343	12.4	0.195	0.1	LOS A	0.0	0.0	0.00	0.01	0.00	59.8
Approach			347	12.3	347	12.3	0.195	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8
All Vehicles			613	11.6	613	11.6	0.195	0.7	NA	0.2	1.4	0.06	0.08	0.06	58.5

Table 3. SIDRA Results – Lisford Avenue/Charnwood Avenue intersection – Weekday PM Peak hour (Existing situation)

Vehicle Movement Performance														
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lisford Avenue (S)															
2	T1	All MCs	334	12.4	334	12.4	0.190	0.0	LOS A	0.0	0.2	0.01	0.01	0.01	59.9
3	R2	All MCs	3	2.0	3	2.0	0.190	6.0	LOS A	0.0	0.2	0.01	0.01	0.01	52.7
Approach			337	12.3	337	12.3	0.190	0.1	NA	0.0	0.2	0.01	0.01	0.01	59.8
East: Charnwood Avenue (E)															
4	L2	All MCs	12	3.0	12	3.0	0.013	5.7	LOS A	0.0	0.4	0.39	0.56	0.39	47.4
6	R2	All MCs	2	3.0	2	3.0	0.013	8.1	LOS A	0.0	0.4	0.39	0.56	0.39	47.3
Approach			14	3.0	14	3.0	0.013	6.0	LOS A	0.0	0.4	0.39	0.56	0.39	47.4
North: Lisford Avenue (N)															
7	L2	All MCs	25	2.0	25	2.0	0.181	5.6	LOS A	0.0	0.0	0.00	0.05	0.00	56.3
8	T1	All MCs	299	12.4	299	12.4	0.181	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	59.4
Approach			324	11.6	324	11.6	0.181	0.5	NA	0.0	0.0	0.00	0.05	0.00	59.2
All Vehicles			675	11.8	675	11.8	0.190	0.4	NA	0.0	0.4	0.01	0.04	0.01	59.2

Table 4. SIDRA Results – Lisford Avenue/Charnwood Avenue intersection – Saturday Midday Peak hour (Existing situation)

Vehicle Movement Performance																	
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lisford Avenue (S)																	
2	T1	All MCs	244	12.4	244	12.4	0.147	0.1	LOS A	0.1	1.0	0.05	0.07	0.05	59.4
3	R2	All MCs	14	2.0	14	2.0	0.147	6.8	LOS A	0.1	1.0	0.05	0.07	0.05	52.4
Approach			258	11.8	258	11.8	0.147	0.5	NA	0.1	1.0	0.05	0.07	0.05	59.0
East: Charnwood Avenue (E)																	
4	L2	All MCs	4	3.0	4	3.0	0.021	5.6	LOS A	0.1	0.5	0.44	0.62	0.44	47.0
6	R2	All MCs	13	3.0	13	3.0	0.021	7.3	LOS A	0.1	0.5	0.44	0.62	0.44	46.8
Approach			17	3.0	17	3.0	0.021	6.9	LOS A	0.1	0.5	0.44	0.62	0.44	46.9
North: Lisford Avenue (N)																	
7	L2	All MCs	23	2.0	23	2.0	0.169	5.6	LOS A	0.0	0.0	0.00	0.05	0.00	56.3
8	T1	All MCs	279	12.4	279	12.4	0.169	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	59.5
Approach			302	11.6	302	11.6	0.169	0.5	NA	0.0	0.0	0.00	0.05	0.00	59.2
All Vehicles			577	11.5	577	11.5	0.169	0.7	NA	0.1	1.0	0.04	0.07	0.04	58.7

Table 5. SIDRA Results – Lisford Avenue/Charnwood Avenue/Australis Drive intersection – Weekday AM Peak hour (post-development)

Vehicle Movement Performance																	
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lisford Ave (S)																	
1	L2	All MCs	53	2.0	53	2.0	0.242	4.3	LOS A	1.4	11.8	0.28	0.44	0.28	50.8
2	T1	All MCs	232	12.4	232	12.4	0.242	4.6	LOS A	1.4	11.8	0.28	0.44	0.28	50.8
3	R2	All MCs	23	2.0	23	2.0	0.242	9.1	LOS A	1.4	11.8	0.28	0.44	0.28	49.2
Approach			307	9.8	307	9.8	0.242	4.9	LOS A	1.4	11.8	0.28	0.44	0.28	50.6
East: Charnwood Ave (E)																	
4	L2	All MCs	4	2.0	4	2.0	0.053	5.8	LOS A	0.3	2.2	0.61	0.66	0.61	46.5
5	T1	All MCs	6	2.0	6	2.0	0.053	5.6	LOS A	0.3	2.2	0.61	0.66	0.61	40.5
6	R2	All MCs	35	2.0	35	2.0	0.053	10.2	LOS B	0.3	2.2	0.61	0.66	0.61	40.5
Approach			45	2.0	45	2.0	0.053	9.1	LOS A	0.3	2.2	0.61	0.66	0.61	41.4
North: Lisford Ave (N)																	
7	L2	All MCs	5	2.0	5	2.0	0.331	4.5	LOS A	2.2	18.1	0.39	0.47	0.39	44.0
8	T1	All MCs	343	12.4	343	12.4	0.331	4.7	LOS A	2.2	18.1	0.39	0.47	0.39	45.6
9	R2	All MCs	44	2.0	44	2.0	0.331	9.4	LOS A	2.2	18.1	0.39	0.47	0.39	32.0
Approach			393	11.1	393	11.1	0.331	5.3	LOS A	2.2	18.1	0.39	0.47	0.39	45.1
West: Australis Dr (W)																	
10	L2	All MCs	44	2.0	44	2.0	0.153	3.4	LOS A	0.9	6.6	0.50	0.60	0.50	22.2
11	T1	All MCs	16	2.0	16	2.0	0.153	3.6	LOS A	0.9	6.6	0.50	0.60	0.50	42.9
12	R2	All MCs	96	2.0	96	2.0	0.153	7.6	LOS A	0.9	6.6	0.50	0.60	0.50	46.3
Approach			156	2.0	156	2.0	0.153	6.0	LOS A	0.9	6.6	0.50	0.60	0.50	43.7
All Vehicles			901	8.6	901	8.6	0.331	5.5	LOS A	2.2	18.1	0.38	0.49	0.38	46.4

Table 6. SIDRA Results – Lisford Avenue/Charnwood Avenue/Australis Drive intersection – Weekday PM Peak hour (post-development)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lisford Ave (S)															
1	L2	All MCs	66	2.0	66	2.0	0.317	4.3	LOS A	2.0	16.6	0.25	0.42	0.25	51.3
2	T1	All MCs	352	12.4	352	12.4	0.317	4.5	LOS A	2.0	16.6	0.25	0.42	0.25	51.3
3	R2	All MCs	4	2.0	4	2.0	0.317	9.0	LOS A	2.0	16.6	0.25	0.42	0.25	49.4
Approach			422	10.7	422	10.7	0.317	4.5	LOS A	2.0	16.6	0.25	0.42	0.25	51.3
East: Charnwood Ave (E)															
4	L2	All MCs	3	2.0	3	2.0	0.030	5.3	LOS A	0.2	1.2	0.55	0.60	0.55	47.1
5	T1	All MCs	7	2.0	7	2.0	0.030	5.1	LOS A	0.2	1.2	0.55	0.60	0.55	41.3
6	R2	All MCs	17	2.0	17	2.0	0.030	9.7	LOS A	0.2	1.2	0.55	0.60	0.55	41.3
Approach			27	2.0	27	2.0	0.030	8.0	LOS A	0.2	1.2	0.55	0.60	0.55	42.4
North: Lisford Ave (N)															
7	L2	All MCs	31	2.0	31	2.0	0.300	4.2	LOS A	2.0	16.7	0.31	0.44	0.31	44.4
8	T1	All MCs	312	12.4	312	12.4	0.300	4.3	LOS A	2.0	16.7	0.31	0.44	0.31	46.0
9	R2	All MCs	43	2.0	43	2.0	0.300	9.1	LOS A	2.0	16.7	0.31	0.44	0.31	33.1
Approach			385	10.4	385	10.4	0.300	4.9	LOS A	2.0	16.7	0.31	0.44	0.31	45.4
West: Australis Dr (W)															
10	L2	All MCs	29	2.0	29	2.0	0.115	3.9	LOS A	0.6	4.8	0.55	0.63	0.55	21.3
11	T1	All MCs	13	2.0	13	2.0	0.115	4.1	LOS A	0.6	4.8	0.55	0.63	0.55	42.5
12	R2	All MCs	66	2.0	66	2.0	0.115	8.1	LOS A	0.6	4.8	0.55	0.63	0.55	45.8
Approach			108	2.0	108	2.0	0.115	6.5	LOS A	0.6	4.8	0.55	0.63	0.55	43.2
All Vehicles			943	9.3	943	9.3	0.317	5.0	LOS A	2.0	16.7	0.32	0.46	0.32	47.5

Table 7. SIDRA Results – Lisford Avenue/Charnwood Avenue/Australis Drive intersection – Saturday Midday Peak hour (post-development)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lisford Ave (S)															
1	L2	All MCs	64	2.0	64	2.0	0.256	4.2	LOS A	1.5	12.5	0.25	0.43	0.25	51.1
2	T1	All MCs	255	12.4	255	12.4	0.256	4.5	LOS A	1.5	12.5	0.25	0.43	0.25	51.1
3	R2	All MCs	17	2.0	17	2.0	0.256	9.0	LOS A	1.5	12.5	0.25	0.43	0.25	49.4
Approach			336	9.9	336	9.9	0.256	4.7	LOS A	1.5	12.5	0.25	0.43	0.25	51.0
East: Charnwood Ave (E)															
4	L2	All MCs	38	2.0	38	2.0	0.073	5.2	LOS A	0.4	3.1	0.56	0.60	0.56	48.0
5	T1	All MCs	9	2.0	9	2.0	0.073	5.1	LOS A	0.4	3.1	0.56	0.60	0.56	42.5
6	R2	All MCs	20	2.0	20	2.0	0.073	9.7	LOS A	0.4	3.1	0.56	0.60	0.56	42.5
Approach			67	2.0	67	2.0	0.073	6.6	LOS A	0.4	3.1	0.56	0.60	0.56	46.3
North: Lisford Ave (N)															
7	L2	All MCs	28	2.0	28	2.0	0.285	4.5	LOS A	1.8	14.8	0.37	0.47	0.37	44.1
8	T1	All MCs	269	12.4	269	12.4	0.285	4.7	LOS A	1.8	14.8	0.37	0.47	0.37	45.7
9	R2	All MCs	40	2.0	40	2.0	0.285	9.4	LOS A	1.8	14.8	0.37	0.47	0.37	32.2
Approach			338	10.3	338	10.3	0.285	5.2	LOS A	1.8	14.8	0.37	0.47	0.37	45.0
West: Australis Dr (W)															
10	L2	All MCs	40	2.0	40	2.0	0.152	3.5	LOS A	0.9	6.5	0.50	0.60	0.50	22.2
11	T1	All MCs	20	2.0	20	2.0	0.152	3.6	LOS A	0.9	6.5	0.50	0.60	0.50	42.9
12	R2	All MCs	95	2.0	95	2.0	0.152	7.6	LOS A	0.9	6.5	0.50	0.60	0.50	46.3
Approach			155	2.0	155	2.0	0.152	6.0	LOS A	0.9	6.5	0.50	0.60	0.50	43.8
All Vehicles			896	8.1	896	8.1	0.285	5.3	LOS A	1.8	14.8	0.36	0.49	0.36	47.0

Table 8. SIDRA Results – Lisford Avenue/Charnwood Avenue intersection – Weekday AM Peak hour (10-year Horizon)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lisford Ave (S)															
1	L2	All MCs	60	2.0	60	2.0	0.158	4.8	LOS A	0.9	7.1	0.33	0.46	0.33	50.7
2	T1	All MCs	322	12.4	322	12.4	0.158	4.9	LOS A	0.9	7.1	0.34	0.46	0.34	50.5
3	R2	All MCs	11	2.0	11	2.0	0.158	9.4	LOS A	0.8	7.1	0.35	0.46	0.35	48.9
Approach			393	10.5	393	10.5	0.158	5.0	LOS A	0.9	7.1	0.34	0.46	0.34	50.4
East: Charnwood Ave (E)															
4	L2	All MCs	11	2.0	11	2.0	0.070	5.9	LOS A	0.3	2.1	0.58	0.71	0.58	47.1
5	T1	All MCs	14	2.0	14	2.0	0.070	5.8	LOS A	0.3	2.1	0.58	0.71	0.58	41.3
6	R2	All MCs	24	2.0	24	2.0	0.070	10.4	LOS B	0.3	2.1	0.58	0.71	0.58	41.3
Approach			48	2.0	48	2.0	0.070	8.1	LOS A	0.3	2.1	0.58	0.71	0.58	43.1
North: Lisford Ave (N)															
7	L2	All MCs	21	2.0	21	2.0	0.245	4.7	LOS A	1.5	12.7	0.39	0.45	0.39	44.2
8	T1	All MCs	469	12.4	469	12.4	0.245	4.7	LOS A	1.5	12.7	0.40	0.48	0.40	45.4
9	R2	All MCs	115	2.0	115	2.0	0.245	9.5	LOS A	1.5	12.0	0.40	0.54	0.40	30.1
Approach			605	10.1	605	10.1	0.245	5.6	LOS A	1.5	12.7	0.40	0.49	0.40	44.3
West: Australis Dr (W)															
10	L2	All MCs	91	2.0	91	2.0	0.285	3.7	LOS A	1.4	10.3	0.52	0.64	0.52	21.8
11	T1	All MCs	32	2.0	32	2.0	0.285	3.9	LOS A	1.4	10.3	0.52	0.64	0.52	43.1
12	R2	All MCs	125	2.0	125	2.0	0.285	7.9	LOS A	1.4	10.3	0.52	0.64	0.52	46.5
Approach			247	2.0	247	2.0	0.285	5.9	LOS A	1.4	10.3	0.52	0.64	0.52	42.9
All Vehicles			1294	8.4	1294	8.4	0.285	5.6	LOS A	1.5	12.7	0.41	0.52	0.41	45.8

Table 9. SIDRA Results – Lisford Avenue/Charnwood Avenue/Australis Drive intersection – Weekday PM Peak hour (10-year Horizon)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lisford Ave (S)															
1	L2	All MCs	96	2.0	96	2.0	0.335	4.9	LOS A	2.1	17.5	0.38	0.46	0.38	50.4
2	T1	All MCs	740	12.4	740	12.4	0.335	5.1	LOS A	2.1	17.5	0.39	0.46	0.39	50.2
3	R2	All MCs	11	2.0	11	2.0	0.335	9.6	LOS A	2.1	17.5	0.40	0.46	0.40	48.8
Approach			846	11.1	846	11.1	0.335	5.1	LOS A	2.1	17.5	0.39	0.46	0.39	50.2
East: Charnwood Ave (E)															
4	L2	All MCs	11	2.0	11	2.0	0.075	5.4	LOS A	0.3	2.2	0.53	0.66	0.53	47.6
5	T1	All MCs	23	2.0	23	2.0	0.075	5.3	LOS A	0.3	2.2	0.53	0.66	0.53	42.0
6	R2	All MCs	23	2.0	23	2.0	0.075	9.8	LOS A	0.3	2.2	0.53	0.66	0.53	42.0
Approach			57	2.0	57	2.0	0.075	7.1	LOS A	0.3	2.2	0.53	0.66	0.53	43.6
North: Lisford Ave (N)															
7	L2	All MCs	21	2.0	21	2.0	0.195	4.4	LOS A	1.2	10.0	0.30	0.42	0.30	44.7
8	T1	All MCs	383	12.4	383	12.4	0.195	4.3	LOS A	1.2	10.0	0.30	0.45	0.30	45.8
9	R2	All MCs	109	2.0	109	2.0	0.195	9.1	LOS A	1.2	9.4	0.31	0.52	0.31	30.6
Approach			514	9.8	514	9.8	0.195	5.3	LOS A	1.2	10.0	0.31	0.47	0.31	44.6
West: Australis Dr (W)															
10	L2	All MCs	85	2.0	85	2.0	0.270	5.4	LOS A	1.2	9.0	0.65	0.76	0.65	18.7
11	T1	All MCs	19	2.0	19	2.0	0.270	5.6	LOS A	1.2	9.0	0.65	0.76	0.65	41.8
12	R2	All MCs	74	2.0	74	2.0	0.270	9.6	LOS A	1.2	9.0	0.65	0.76	0.65	45.1
Approach			178	2.0	178	2.0	0.270	7.2	LOS A	1.2	9.0	0.65	0.76	0.65	39.5
All Vehicles			1595	9.3	1595	9.3	0.335	5.5	LOS A	2.1	17.5	0.40	0.50	0.40	47.0

Table 10. SIDRA Results – Lisford Avenue/Charnwood Avenue/Australis Drive intersection – Saturday Midday Peak hour (10-year Horizon)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lisford Ave (S)															
1	L2	All MCs	82	2.0	82	2.0	0.185	4.9	LOS A	1.0	8.4	0.35	0.47	0.35	50.6
2	T1	All MCs	363	12.4	363	12.4	0.185	5.0	LOS A	1.0	8.5	0.37	0.47	0.37	50.3
3	R2	All MCs	11	2.0	11	2.0	0.185	9.5	LOS A	1.0	8.5	0.37	0.47	0.37	48.9
Approach			456	10.3	456	10.3	0.185	5.1	LOS A	1.0	8.5	0.36	0.47	0.36	50.3
East: Chamwood Ave (E)															
4	L2	All MCs	11	2.0	11	2.0	0.077	5.6	LOS A	0.3	2.4	0.55	0.68	0.55	47.4
5	T1	All MCs	21	2.0	21	2.0	0.077	5.5	LOS A	0.3	2.4	0.55	0.68	0.55	41.7
6	R2	All MCs	25	2.0	25	2.0	0.077	10.0	LOS B	0.3	2.4	0.55	0.68	0.55	41.7
Approach			57	2.0	57	2.0	0.077	7.5	LOS A	0.3	2.4	0.55	0.68	0.55	43.3
North: Lisford Ave (N)															
7	L2	All MCs	21	2.0	21	2.0	0.211	4.7	LOS A	1.3	10.7	0.37	0.45	0.37	44.3
8	T1	All MCs	384	12.4	384	12.4	0.211	4.6	LOS A	1.3	10.7	0.37	0.48	0.37	45.5
9	R2	All MCs	124	2.0	124	2.0	0.211	9.4	LOS A	1.3	10.0	0.38	0.55	0.38	29.8
Approach			529	9.5	529	9.5	0.211	5.7	LOS A	1.3	10.7	0.37	0.49	0.37	44.0
West: Australis Dr (W)															
10	L2	All MCs	91	2.0	91	2.0	0.279	3.9	LOS A	1.3	10.0	0.54	0.65	0.54	21.5
11	T1	All MCs	32	2.0	32	2.0	0.279	4.1	LOS A	1.3	10.0	0.54	0.65	0.54	43.0
12	R2	All MCs	113	2.0	113	2.0	0.279	8.1	LOS A	1.3	10.0	0.54	0.65	0.54	46.4
Approach			235	2.0	235	2.0	0.279	5.9	LOS A	1.3	10.0	0.54	0.65	0.54	42.5
All Vehicles			1277	8.1	1277	8.1	0.279	5.6	LOS A	1.3	10.7	0.41	0.52	0.41	46.0

Table 11. SIDRA Results – Lisford Avenue/Azzurra Street intersection – Weekday AM Peak hour (post-development)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lisford Avenue (S)															
7	L2	All MCs	31	2.0	31	2.0	0.174	5.5	LOS A	0.0	0.0	0.00	0.06	0.00	54.5
8	T1	All MCs	280	12.4	280	12.4	0.174	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	58.9
Approach			311	11.4	311	11.4	0.174	0.6	NA	0.0	0.0	0.00	0.06	0.00	58.8
North: Lisford Avenue (N)															
2	T1	All MCs	331	12.4	331	12.4	0.212	0.2	LOS A	0.3	2.6	0.10	0.12	0.10	58.0
3	R2	All MCs	36	2.0	36	2.0	0.212	6.9	LOS A	0.3	2.6	0.10	0.12	0.10	58.0
Approach			366	11.4	366	11.4	0.212	0.9	NA	0.3	2.6	0.10	0.12	0.10	58.0
West: Azzurra St (W)															
4	L2	All MCs	26	2.0	26	2.0	0.052	4.6	LOS A	0.2	1.3	0.44	0.61	0.44	46.3
6	R2	All MCs	19	2.0	19	2.0	0.052	7.3	LOS A	0.2	1.3	0.44	0.61	0.44	21.3
Approach			45	2.0	45	2.0	0.052	5.7	LOS A	0.2	1.3	0.44	0.61	0.44	42.8
All Vehicles			722	10.8	722	10.8	0.212	1.0	NA	0.3	2.6	0.08	0.13	0.08	57.5

Table 12. SIDRA Results – Lisford Avenue/Azzurra Street intersection – Weekday PM Peak hour (post-development)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lisford Avenue (S)															
7	L2	All MCs	42	2.0	42	2.0	0.222	5.5	LOS A	0.0	0.0	0.00	0.06	0.00	54.1
8	T1	All MCs	356	12.4	356	12.4	0.222	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	58.8
Approach			398	11.3	398	11.3	0.222	0.6	NA	0.0	0.0	0.00	0.06	0.00	58.7
North: Lisford Avenue (N)															
2	T1	All MCs	315	12.4	315	12.4	0.193	0.2	LOS A	0.2	1.6	0.07	0.09	0.07	58.7
3	R2	All MCs	20	2.0	20	2.0	0.193	7.4	LOS A	0.2	1.6	0.07	0.09	0.07	58.7
Approach			335	11.8	335	11.8	0.193	0.6	NA	0.2	1.6	0.07	0.09	0.07	58.7
West: Azzurra St (W)															
4	L2	All MCs	27	2.0	27	2.0	0.028	5.0	LOS A	0.1	0.8	0.42	0.58	0.42	47.0
6	R2	All MCs	2	2.0	2	2.0	0.028	7.6	LOS A	0.1	0.8	0.42	0.58	0.42	22.9
Approach			29	2.0	29	2.0	0.028	5.2	LOS A	0.1	0.8	0.42	0.58	0.42	46.6
All Vehicles			762	11.2	762	11.2	0.222	0.8	NA	0.2	1.6	0.05	0.10	0.05	58.1

Table 13. SIDRA Results – Lisford Avenue/Azzurra Street intersection – Saturday Midday Peak hour (post-development)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lisford Avenue (S)															
7	L2	All MCs	53	2.0	53	2.0	0.175	5.5	LOS A	0.0	0.0	0.00	0.10	0.00	51.4
8	T1	All MCs	262	12.4	262	12.4	0.175	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	58.3
Approach			315	10.7	315	10.7	0.175	0.9	NA	0.0	0.0	0.00	0.10	0.00	58.0
North: Lisford Avenue (N)															
2	T1	All MCs	262	12.4	262	12.4	0.180	0.3	LOS A	0.4	3.0	0.15	0.18	0.15	57.2
3	R2	All MCs	44	2.0	44	2.0	0.180	6.9	LOS A	0.4	3.0	0.15	0.18	0.15	57.2
Approach			306	10.9	306	10.9	0.180	1.2	NA	0.4	3.0	0.15	0.18	0.15	57.2
West: Azzurra St (W)															
4	L2	All MCs	42	2.0	42	2.0	0.057	4.6	LOS A	0.2	1.5	0.39	0.58	0.39	47.0
6	R2	All MCs	16	2.0	16	2.0	0.057	6.7	LOS A	0.2	1.5	0.39	0.58	0.39	22.7
Approach			58	2.0	58	2.0	0.057	5.2	LOS A	0.2	1.5	0.39	0.58	0.39	45.1
All Vehicles			679	10.0	679	10.0	0.180	1.4	NA	0.4	3.0	0.10	0.17	0.10	56.5

Table 14. SIDRA Results – Azzurra Street crossover – Weekday PM Peak hour (post-development)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Crossover (S)															
4	L2	All MCs	1	2.0	1	2.0	0.016	2.2	LOS A	0.1	0.4	0.11	0.45	0.11	50.4
6	R2	All MCs	19	2.0	19	2.0	0.016	2.1	LOS A	0.1	0.4	0.11	0.45	0.11	20.9
Approach			20	2.0	20	2.0	0.016	2.1	LOS A	0.1	0.4	0.11	0.45	0.11	31.2
East: Azzurro Street (E)															
7	L2	All MCs	43	2.0	43	2.0	0.033	3.7	LOS A	0.0	0.0	0.00	0.39	0.00	32.6
8	T1	All MCs	19	2.0	19	2.0	0.033	0.0	LOS A	0.0	0.0	0.00	0.39	0.00	55.7
Approach			62	2.0	62	2.0	0.033	2.6	NA	0.0	0.0	0.00	0.39	0.00	48.2
West: Azzurro Steet (W)															
2	T1	All MCs	11	2.0	11	2.0	0.006	0.0	LOS A	0.0	0.0	0.03	0.06	0.03	58.8
3	R2	All MCs	1	2.0	1	2.0	0.006	5.6	LOS A	0.0	0.0	0.03	0.06	0.03	57.0
Approach			12	2.0	12	2.0	0.006	0.5	NA	0.0	0.0	0.03	0.06	0.03	58.6
All Vehicles			94	2.0	94	2.0	0.033	2.2	NA	0.1	0.4	0.03	0.36	0.03	49.5

Table 15. SIDRA Results – Azzurra Street crossover – Saturday Midday Peak hour (post-development)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Crossover (S)															
4	L2	All MCs	3	2.0	3	2.0	0.029	2.2	LOS A	0.1	0.7	0.15	0.46	0.15	50.3
6	R2	All MCs	32	2.0	32	2.0	0.029	2.3	LOS A	0.1	0.7	0.15	0.46	0.15	20.5
Approach			35	2.0	35	2.0	0.029	2.3	LOS A	0.1	0.7	0.15	0.46	0.15	35.0
East: Azzurro Street (E)															
7	L2	All MCs	71	2.0	71	2.0	0.052	3.7	LOS A	0.0	0.0	0.00	0.41	0.00	32.2
8	T1	All MCs	26	2.0	26	2.0	0.052	0.0	LOS A	0.0	0.0	0.00	0.41	0.00	55.5
Approach			97	2.0	97	2.0	0.052	2.7	NA	0.0	0.0	0.00	0.41	0.00	47.0
West: Azzurro Steet (W)															
2	T1	All MCs	26	2.0	26	2.0	0.016	0.0	LOS A	0.0	0.1	0.05	0.08	0.05	58.5
3	R2	All MCs	3	2.0	3	2.0	0.016	5.8	LOS A	0.0	0.1	0.05	0.08	0.05	56.7
Approach			29	2.0	29	2.0	0.016	0.7	NA	0.0	0.1	0.05	0.08	0.05	58.3
All Vehicles			161	2.0	161	2.0	0.052	2.2	NA	0.1	0.7	0.04	0.36	0.04	49.8

Table 16. SIDRA Results – Azzurra Street crossover – Weekday AM Peak hour (10-year Horizon)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Crossover (S)															
4	L2	All MCs	2	2.0	2	2.0	0.023	2.2	LOS A	0.1	0.6	0.14	0.46	0.14	50.3
6	R2	All MCs	26	2.0	26	2.0	0.023	2.2	LOS A	0.1	0.6	0.14	0.46	0.14	20.5
Approach			28	2.0	28	2.0	0.023	2.2	LOS A	0.1	0.6	0.14	0.46	0.14	33.5
East: Azzurro Street (E)															
7	L2	All MCs	31	2.0	31	2.0	0.030	3.7	LOS A	0.0	0.0	0.00	0.31	0.00	35.0
8	T1	All MCs	25	2.0	25	2.0	0.030	0.0	LOS A	0.0	0.0	0.00	0.31	0.00	56.6
Approach			56	2.0	56	2.0	0.030	2.0	NA	0.0	0.0	0.00	0.31	0.00	52.4
West: Azzurro Steet (W)															
2	T1	All MCs	38	2.0	38	2.0	0.021	0.0	LOS A	0.0	0.1	0.02	0.03	0.02	59.3
3	R2	All MCs	2	2.0	2	2.0	0.021	5.6	LOS A	0.0	0.1	0.02	0.03	0.02	57.4
Approach			40	2.0	40	2.0	0.021	0.3	NA	0.0	0.1	0.02	0.03	0.02	59.2
All Vehicles			124	2.0	124	2.0	0.030	1.5	NA	0.1	0.6	0.04	0.25	0.04	54.4

Table 17. SIDRA Results – Azzurra Street crossover – Weekday PM Peak hour (10-year Horizon)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Crossover (S)															
4	L2	All MCs	1	2.0	1	2.0	0.017	2.2	LOS A	0.1	0.4	0.14	0.45	0.14	50.3
6	R2	All MCs	19	2.0	19	2.0	0.017	2.2	LOS A	0.1	0.4	0.14	0.45	0.14	20.5
Approach			20	2.0	20	2.0	0.017	2.2	LOS A	0.1	0.4	0.14	0.45	0.14	30.9
East: Azzurro Street (E)															
7	L2	All MCs	23	2.0	23	2.0	0.032	3.7	LOS A	0.0	0.0	0.00	0.22	0.00	38.3
8	T1	All MCs	38	2.0	38	2.0	0.032	0.0	LOS A	0.0	0.0	0.00	0.22	0.00	57.6
Approach			61	2.0	61	2.0	0.032	1.4	NA	0.0	0.0	0.00	0.22	0.00	55.6
West: Azzurro Steet (W)															
2	T1	All MCs	25	2.0	25	2.0	0.014	0.0	LOS A	0.0	0.0	0.01	0.02	0.01	59.4
3	R2	All MCs	1	2.0	1	2.0	0.014	5.6	LOS A	0.0	0.0	0.01	0.02	0.01	57.6
Approach			26	2.0	26	2.0	0.014	0.2	NA	0.0	0.0	0.01	0.02	0.01	59.4
All Vehicles			107	2.0	107	2.0	0.032	1.3	NA	0.1	0.4	0.03	0.21	0.03	55.7

Table 18. SIDRA Results – Azzurra Street crossover – Saturday Midday Peak hour (10-year Horizon)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Crossover (S)															
4	L2	All MCs	3	2.0	3	2.0	0.029	2.2	LOS A	0.1	0.7	0.15	0.46	0.15	50.3
6	R2	All MCs	32	2.0	32	2.0	0.029	2.3	LOS A	0.1	0.7	0.15	0.46	0.15	20.5
Approach			35	2.0	35	2.0	0.029	2.3	LOS A	0.1	0.7	0.15	0.46	0.15	35.1
East: Azzurro Street (E)															
7	L2	All MCs	37	2.0	37	2.0	0.036	3.7	LOS A	0.0	0.0	0.00	0.30	0.00	35.2
8	T1	All MCs	32	2.0	32	2.0	0.036	0.0	LOS A	0.0	0.0	0.00	0.30	0.00	56.6
Approach			68	2.0	68	2.0	0.036	2.0	NA	0.0	0.0	0.00	0.30	0.00	52.6
West: Azzurro Steet (W)															
2	T1	All MCs	32	2.0	32	2.0	0.018	0.0	LOS A	0.0	0.1	0.03	0.06	0.03	58.8
3	R2	All MCs	3	2.0	3	2.0	0.018	5.6	LOS A	0.0	0.1	0.03	0.06	0.03	56.9
Approach			35	2.0	35	2.0	0.018	0.5	NA	0.0	0.1	0.03	0.06	0.03	58.6
All Vehicles			138	2.0	138	2.0	0.036	1.7	NA	0.1	0.7	0.05	0.28	0.05	53.4

Table 19. SIDRA Results – Australis Drive crossover – Weekday AM Peak hour (post-development)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Australis Drive (E)															
2	T1	All MCs	68	2.0	68	2.0	0.057	0.1	LOS A	0.2	1.5	0.14	0.21	0.14	57.7
3	R2	All MCs	35	2.0	35	2.0	0.057	3.2	LOS A	0.2	1.5	0.14	0.21	0.14	34.4
Approach			103	2.0	103	2.0	0.057	1.2	NA	0.2	1.5	0.14	0.21	0.14	56.0
North: Crossover (N)															
4	L2	All MCs	64	2.0	64	2.0	0.045	2.4	LOS A	0.2	1.3	0.18	0.45	0.18	21.0
6	R2	All MCs	2	2.0	2	2.0	0.045	2.7	LOS A	0.2	1.3	0.18	0.45	0.18	49.7
Approach			66	2.0	66	2.0	0.045	2.4	LOS A	0.2	1.3	0.18	0.45	0.18	27.4
West: Australis Drive (W)															
7	L2	All MCs	2	2.0	2	2.0	0.048	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	55.0
8	T1	All MCs	92	2.0	92	2.0	0.048	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.7
Approach			94	2.0	94	2.0	0.048	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.6
All Vehicles			263	2.0	263	2.0	0.057	1.1	NA	0.2	1.5	0.10	0.20	0.10	56.0

Table 20. SIDRA Results – Australis Drive crossover – Weekday PM Peak hour (post-development)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Australis Drive (E)															
2	T1	All MCs	88	2.0	88	2.0	0.063	0.1	LOS A	0.2	1.2	0.08	0.15	0.08	58.4
3	R2	All MCs	28	2.0	28	2.0	0.063	3.1	LOS A	0.2	1.2	0.08	0.15	0.08	37.0
Approach			117	2.0	117	2.0	0.063	0.8	NA	0.2	1.2	0.08	0.15	0.08	57.4
North: Crossover (N)															
4	L2	All MCs	45	2.0	45	2.0	0.031	2.3	LOS A	0.1	0.9	0.15	0.45	0.15	21.4
6	R2	All MCs	2	2.0	2	2.0	0.031	2.6	LOS A	0.1	0.9	0.15	0.45	0.15	49.8
Approach			47	2.0	47	2.0	0.031	2.3	LOS A	0.1	0.9	0.15	0.45	0.15	29.7
West: Australis Drive (W)															
7	L2	All MCs	2	2.0	2	2.0	0.033	5.6	LOS A	0.0	0.0	0.00	0.02	0.00	54.9
8	T1	All MCs	62	2.0	62	2.0	0.033	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.6
Approach			64	2.0	64	2.0	0.033	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.5
All Vehicles			228	2.0	228	2.0	0.063	0.9	NA	0.2	1.2	0.07	0.18	0.07	56.8

Table 21. SIDRA Results – Australis Drive crossover – Saturday Midday Peak hour (post-development)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Australis Drive (E)															
2	T1	All MCs	69	2.0	69	2.0	0.063	0.1	LOS A	0.2	1.8	0.14	0.24	0.14	57.5
3	R2	All MCs	44	2.0	44	2.0	0.063	3.2	LOS A	0.2	1.8	0.14	0.24	0.14	33.4
Approach			114	2.0	114	2.0	0.063	1.3	NA	0.2	1.8	0.14	0.24	0.14	55.2
North: Crossover (N)															
4	L2	All MCs	78	2.0	78	2.0	0.054	2.3	LOS A	0.2	1.6	0.17	0.45	0.17	21.2
6	R2	All MCs	3	2.0	3	2.0	0.054	2.7	LOS A	0.2	1.6	0.17	0.45	0.17	49.7
Approach			81	2.0	81	2.0	0.054	2.4	LOS A	0.2	1.6	0.17	0.45	0.17	28.7
West: Australis Drive (W)															
7	L2	All MCs	3	2.0	3	2.0	0.041	5.6	LOS A	0.0	0.0	0.00	0.02	0.00	54.9
8	T1	All MCs	77	2.0	77	2.0	0.041	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.6
Approach			80	2.0	80	2.0	0.041	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.4
All Vehicles			275	2.0	275	2.0	0.063	1.3	NA	0.2	1.8	0.11	0.24	0.11	54.9

Table 22. SIDRA Results – Australis Drive crossover – Weekday AM Peak hour (10-year Horizon)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Australis Drive (E)															
2	T1	All MCs	126	2.0	126	2.0	0.107	0.3	LOS A	0.4	2.9	0.21	0.26	0.21	57.5
3	R2	All MCs	62	2.0	62	2.0	0.107	3.6	LOS A	0.4	2.9	0.21	0.26	0.21	33.5
Approach			188	2.0	188	2.0	0.107	1.4	NA	0.4	2.9	0.21	0.26	0.21	55.7
North: Crossover (N)															
4	L2	All MCs	64	2.0	64	2.0	0.049	2.7	LOS A	0.2	1.4	0.28	0.48	0.28	20.0
6	R2	All MCs	2	2.0	2	2.0	0.049	3.5	LOS A	0.2	1.4	0.28	0.48	0.28	49.4
Approach			66	2.0	66	2.0	0.049	2.7	LOS A	0.2	1.4	0.28	0.48	0.28	26.3
West: Australis Drive (W)															
7	L2	All MCs	2	2.0	2	2.0	0.095	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	55.1
8	T1	All MCs	183	2.0	183	2.0	0.095	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.8
Approach			185	2.0	185	2.0	0.095	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8
All Vehicles			440	2.0	440	2.0	0.107	1.0	NA	0.4	2.9	0.13	0.19	0.13	56.8

Table 23. SIDRA Results – Australis Drive crossover – Weekday PM Peak hour (10-year Horizon)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Australis Drive (E)															
2	T1	All MCs	180	2.0	180	2.0	0.124	0.1	LOS A	0.3	2.4	0.12	0.16	0.12	58.4
3	R2	All MCs	48	2.0	48	2.0	0.124	3.4	LOS A	0.3	2.4	0.12	0.16	0.12	37.2
Approach			228	2.0	228	2.0	0.124	0.8	NA	0.3	2.4	0.12	0.16	0.12	57.6
North: Crossover (N)															
4	L2	All MCs	45	2.0	45	2.0	0.034	2.5	LOS A	0.1	1.0	0.23	0.46	0.23	20.5
6	R2	All MCs	2	2.0	2	2.0	0.034	3.4	LOS A	0.1	1.0	0.23	0.46	0.23	49.5
Approach			47	2.0	47	2.0	0.034	2.5	LOS A	0.1	1.0	0.23	0.46	0.23	28.7
West: Australis Drive (W)															
7	L2	All MCs	2	2.0	2	2.0	0.069	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	55.1
8	T1	All MCs	133	2.0	133	2.0	0.069	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.8
Approach			135	2.0	135	2.0	0.069	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.7
All Vehicles			411	2.0	411	2.0	0.124	0.8	NA	0.3	2.4	0.09	0.15	0.09	57.7

Table 24. SIDRA Results – Australis Drive crossover – Saturday Midday Peak hour (10-year Horizon)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Australis Drive (E)															
2	T1	All MCs	149	2.0	149	2.0	0.129	0.3	LOS A	0.5	3.6	0.20	0.26	0.20	57.5
3	R2	All MCs	78	2.0	78	2.0	0.129	3.5	LOS A	0.5	3.6	0.20	0.26	0.20	33.5
Approach			227	2.0	227	2.0	0.129	1.4	NA	0.5	3.6	0.20	0.26	0.20	55.6
North: Crossover (N)															
4	L2	All MCs	78	2.0	78	2.0	0.059	2.6	LOS A	0.2	1.8	0.26	0.48	0.26	20.2
6	R2	All MCs	3	2.0	3	2.0	0.059	3.6	LOS A	0.2	1.8	0.26	0.48	0.26	49.4
Approach			81	2.0	81	2.0	0.059	2.6	LOS A	0.2	1.8	0.26	0.48	0.26	27.6
West: Australis Drive (W)															
7	L2	All MCs	3	2.0	3	2.0	0.082	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	55.0
8	T1	All MCs	157	2.0	157	2.0	0.082	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.8
Approach			160	2.0	160	2.0	0.082	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.6
All Vehicles			468	2.0	468	2.0	0.129	1.2	NA	0.5	3.6	0.14	0.21	0.14	56.2