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Yanchep Central Stage 3

Lot 395 Marmion Ave Yanchep

(Proposed Tavern and Dan Murphy's Liquor Store)

Transport Impact Assessment

PREPARED FOR:
FRP Capital

September 2023

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1 Introduction

This Transport Impact Assessment (TIA) has been prepared by Transcore in relation to the proposed Yanchep Central Stage 3 development including the proposed Tavern and Dan Murphy's liquor store located at Lot 395, Yanchep in City of Wanneroo.

Lot 395 (Yanchep Central Shopping Centre) is located on the north east side of the intersection of Marmion Avenue and Peony Boulevard, as shown in **Figure 1**.

Lot 50 (Yanchep Central Stage 1) is located opposite the existing Woolworths anchored shopping centre and was subject of a separate application which was approved by Metro Outer JDAP on 17 November 2021.

Figure 1 depicts the zones and reservations of the Metropolitan Region Scheme (MRS) overlaid on a current aerial photograph and shows the Other Regional Roads Reservations (blue road) for Marmion Avenue and Yanchep Beach Road.

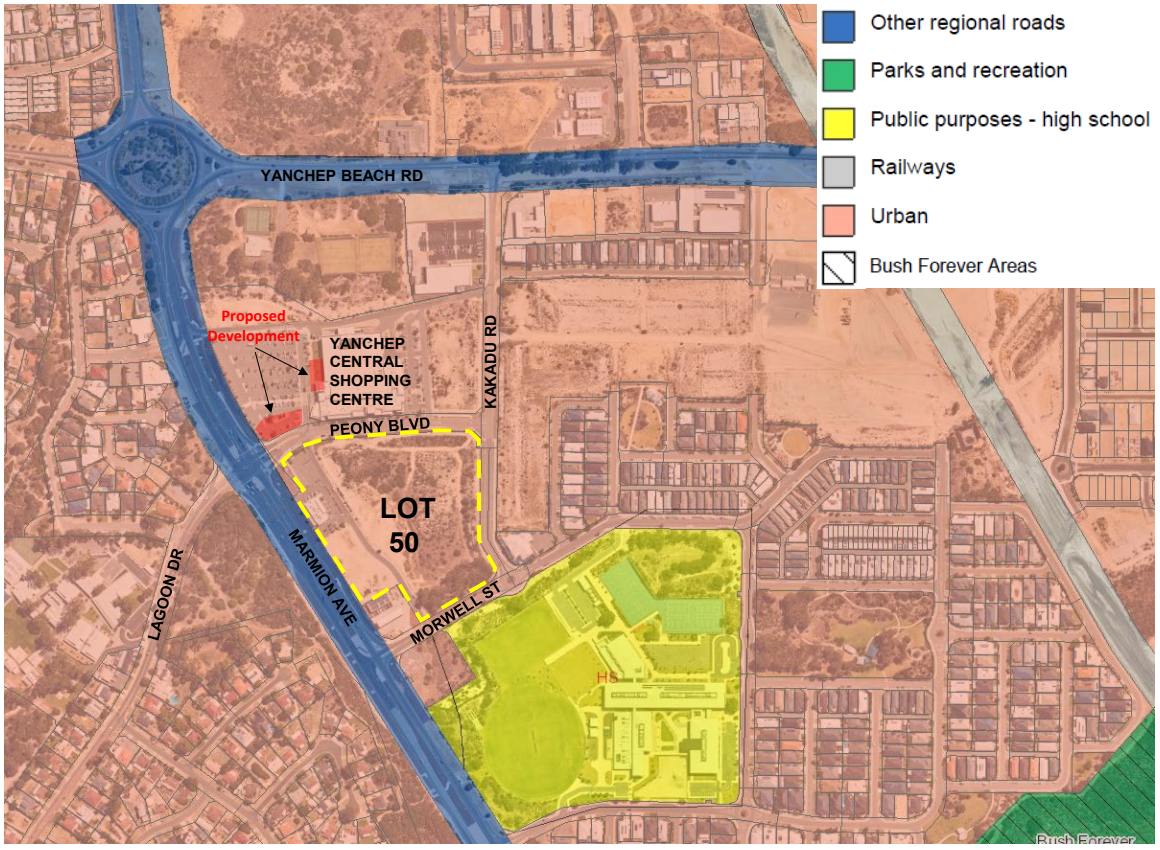

Figure 1: Site location

Key issues that will be addressed in this report include traffic generation and distribution, intersection capacity and service vehicle movements.

2 Development Proposal

The overall layout of the proposed development is shown on the proposed site plan in **Figure 2**. **Appendix A** provides more detailed plans for the proposed development.

The proposed development contemplates construction of a tavern and a Dan Murphy's liquor store within Lot 395. Specifically, the development proposal comprises the following elements:

- A Tavern with courtyards and lounges with combined approximately 870m^2 GFA floorspace at the north-east corner of the intersection of Marmion Avenue/ Peony Blvd; and,
- A Dan Murphy's liquor store (with approximately 721m^2 additional GFA plus 286m^2 existing GFA) fronting the existing Woolworths anchored shopping centre.

Ultimately, it is anticipated that the remaining vacant areas of precinct (at the northwest, and east of Lot 395) will also be developed as part of the overall Yanchep Central Master Plan in future but details of that potential future development and timing are currently unknown. Such future expansion is not part of the current development application and would be subject to a separate development application process.

Lot 50 which is the stage 1 development of the Yanchep Central is located to the south of Lot 395 and is currently under construction and would entail:

- New supermarket and specialty stores (total 4,885m^2 NLA);
- Medical / health (680m^2 NLA);
- Child care centre (565m^2 NLA);
- Two fast food restaurants (285m^2 and 265m^2 NLA); and,
- Fuel outlet (217m^2 NLA).

It is expected that Yanchep Central Stage 1 (Lot 50) would be completed by the time of the full development of the Yanchep Central Stage 3 (Lot 395). Therefore, the traffic generation of Lot 395 has been considered for the assessment of the future scenarios.

Access/ egress to/ from Lot 395 is currently provided by the following key intersections:

- Marmion Ave / Yanchep Central left in only driveway;
- Marmion Ave / Peony Blvd / Lagoon Dr signalised 4-way intersection; and,
- Peony Blvd T-intersection with a driveway about 60m east of Marmion Ave.

Deliveries and waste collections will be accommodated within the development sites. Pedestrians will access the developments via the existing pedestrian paths on all abutting roads.

Turn path analysis has been undertaken for 12.5m service vehicle servicing the proposed loading dock of the Dan Murphy's liquor store. The turn path analysis undertaken indicates satisfactory movements of the truck entering and exiting the proposed loading dock area.

The proposed tavern is expected to be serviced by service vehicles no bigger than 8.8m. The turn paths analysis for 8.8m service vehicle indicates satisfactory traffic movements in and out of the proposed loading area of the tavern. The turn path analyses are provided in **Appendix B**.

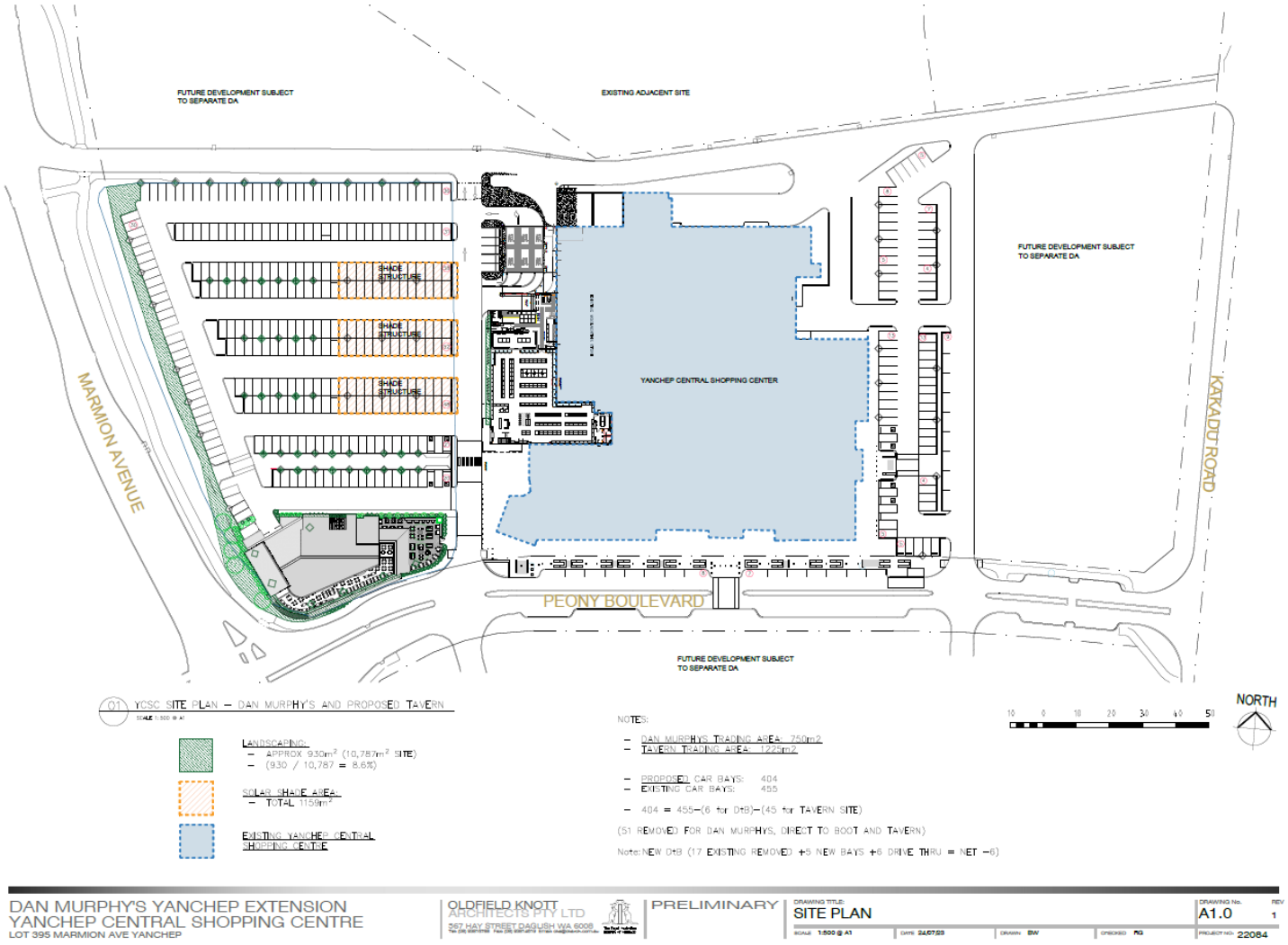

Figure 2: Proposed site plan

3 Existing Situation

3.1 Existing Land Use

As shown in **Figure 3**, Lot 395 (north of Peony Boulevard) is occupied by the existing shopping centre and Lot 50 (south of Peony Boulevard) is currently under construction as part of Stage 1 Yanchep Central development. Currently there is a Coles super market (which is under construction) and a McDonalds restaurant on Lot 50.

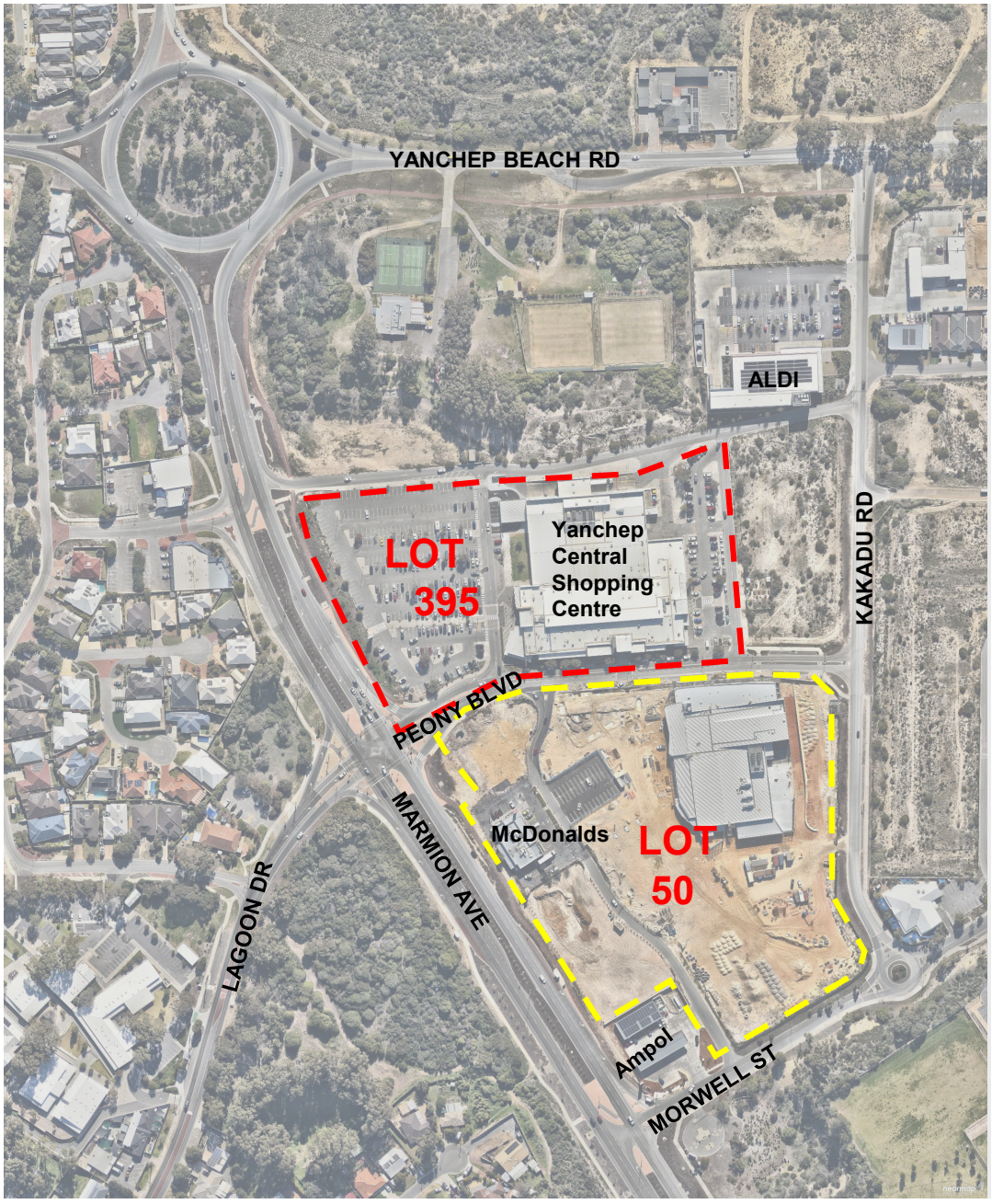

Figure 3: Existing land uses (July 2023)

Other land uses in the vicinity include an Aldi supermarket and Yanchep Sports Club north of the existing shopping centre and Yanchep Secondary College south of Morwell Street.

Substantial residential development has already occurred on the western side of Marmion Avenue and east of the subject site around Yanchep Secondary College.

3.2 Existing Road Network

Marmion Avenue is covered by an Other Regional Roads reservation in the MRS as shown in **Figure 1**. It is understood that Marmion Avenue is now classified as a Primary Distributor under the care and control of Main Roads WA, however this change is yet to be incorporated in the MRS.

Marmion Avenue is constructed as a dual divided carriageway road with two lanes in each direction. This section of Marmion Avenue has a posted speed limit of 60km/h and no direct driveway access from abutting residential or commercial properties, apart from a left in only driveway connection (constructed to intersection standard with left turn deceleration lane on Marmion Avenue) at the north-western corner of the existing Woolworths shopping centre.

Peony Boulevard runs eastwards from Marmion Avenue to Kakadu Road. It is classified as an Access Road in the Main Roads WA functional road hierarchy and the is covered by the default built up area speed limit of 50km/h. Most of its length is constructed as one lane each way (3.5m traffic lanes) separated by a 2m-wide raised median, with parking bays indented on both sides. There is no parking on the western 60m section of Peony Boulevard, but it entails left and right turn lanes on approach to the signalised intersection at Marmion Avenue.

Morwell Street is classified as an Access Road in the Main Roads WA functional road hierarchy and the default built up area speed limit of 50km/h applies to this street. It is constructed as a two-lane, single-carriageway urban road with a full-movement T-intersection on Marmion Avenue at its western end and a single-lane roundabout at its intersection with Kakadu Road.

Kakadu Road is classified as an Access Road in the Main Roads WA functional road hierarchy and is covered by the default built up area speed limit of 50km/h. It is constructed as a two-lane, single-carriageway urban road with a left in / left out T-intersection on Yanchep Beach Road at its northern end and a single-lane roundabout with Morwell Street at its southern end.

The Marmion Ave / Peony Blvd / Lagoon Dr intersection is constructed as a signalised 4-way intersection with left and right turn lanes provided on each approach, as shown in **Figure 4**.

Figure 4: Existing Marmion Ave / Peony Blvd / Lagoon Dr intersection

3.3 Existing Traffic Volume on Roads

Traffic volume data from the Marmion Ave / Peony Blvd / Lagoon Dr signalised intersection indicates average weekday traffic flows on each road as shown in Table 1. For comparison purposes the SCATS data for February 2021(used for the Stage 1 Yanchep Central development) and February 2022 (latest available SCATS) are reported in this table.

Table 1: Existing Traffic Volumes

Date	Road	AM Peak Hour(VPH) (8-9AM)	PM Peak Hour(VPH) (3-4PM)	Average Weekday Traffic(VPD)
Feb 2021	Marmion Ave (N of Peony Blvd)	1,064	984	11,630
Feb 2022		1,191	996	11,910
% Change		0.12	0.01	0.02
Feb 2021	Marmion Ave (S of Peony Blvd)	1,068	968	11,236
Feb 2022		1,193	956	11,227
% Change		0.12	-0.01	0.00
Feb 2021	Peony Blvd (E of Marmion Ave)	375	463	4,804
Feb 2022		401	490	4,972
% Change		0.07	0.06	0.03
Feb 2021	Lagoon Dr(W of Marmion Ave)	576	426	4,675
Feb 2022		555	369	4,588
% Change		-0.04	-0.13	-0.02

As evident the traffic volumes on all approaches of the intersection have not changed significantly and in particular during the PM peak hour which is the critical hour for the proposed development. In particular the traffic change on Marmion Avenue north and south of Peony Blvd is about +1% and -1% respectively.

Traffic count information previously obtained from City of Wanneroo indicates that Marmion Avenue (south of Peony Boulevard) carried approximately 7,850 vehicles per weekday in 2013. **Table 1** indicates this had increased to 11,227vpd in 2022, which represents a traffic growth rate of approximately 5.4% per year.

Manual turn traffic counts were also undertaken by Transcore on Thursday 03 August 2023 (8-9AM and 3-4PM) and Saturday 05 August 2023 (11AM-12PM) at the left in driveway intersection on Marmion Avenue north of Peony Boulevard and the shopping centre driveway on Peony Boulevard. The results of those peak hour traffic counts and corresponding Thursday and Saturday peak hour flows from the February 2022 SCATS data at the signalised intersection are shown in **Figure 5**.

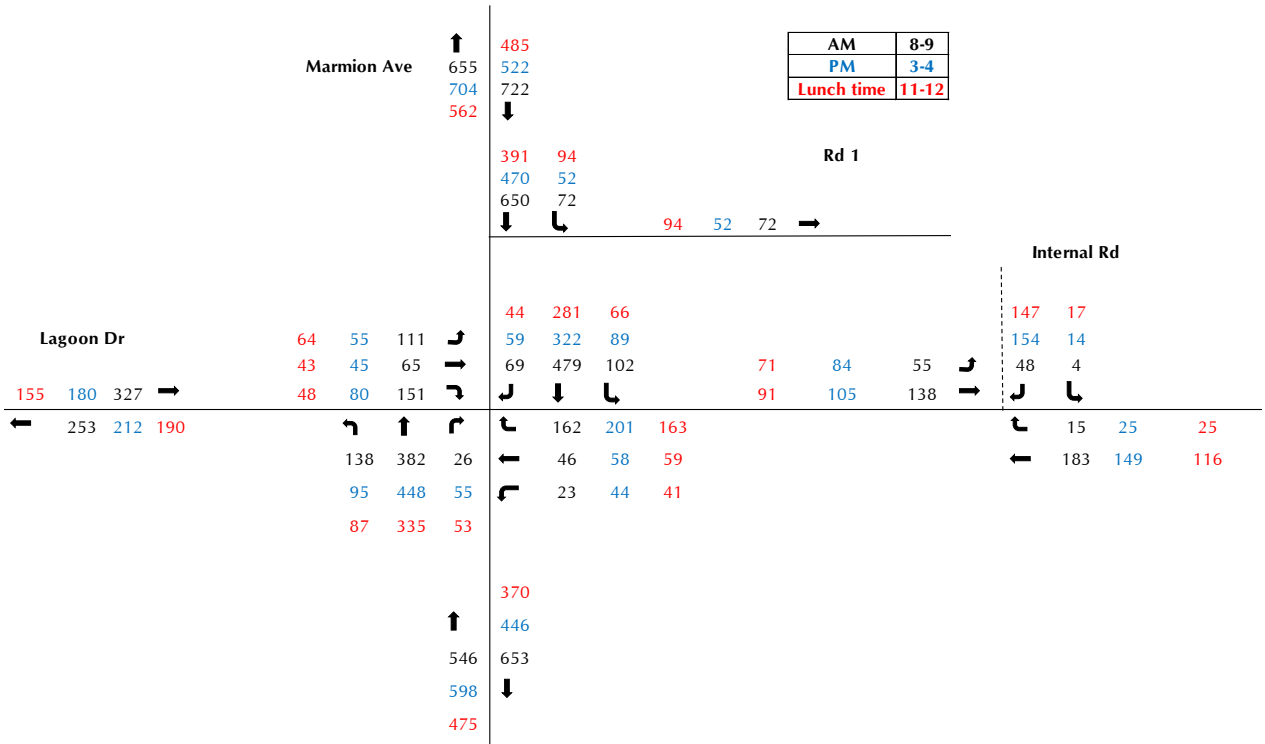

Figure 5: Existing peak hour traffic flows (2022/2023)

3.4 Crash Records

Information available on the Main Roads WA website indicates the following crashes were recorded at the four intersections around the subject site during the 2016 – 2020 five-year period.

- Marmion Ave / Peony Blvd / Lagoon Dr signalised intersection:
  - 7 crashes total
  - 1 injury requiring medical treatment, 5 PDO major, 1 PDO minor
  - 4 right turn / through and 3 rear end crashes
- Marmion Ave / Morwell St T-intersection:
  - 1 crash total
  - 1 PDO minor
  - 1 rear end crash
- Peony Blvd / Kakadu Rd T-intersection:
  - 1 crash total
  - 1 PDO minor
  - 1 right angle crash
- Morwell St / Kakadu Rd roundabout:
  - No crashes recorded

3.5 Public Transport Access

The closest existing Transperth bus routes to the subject site are route 490 (Butler Train Station – Two Rocks) and route 491 (Butler Station – Yanchep), which both travel along Marmion Avenue adjacent to the subject site, as shown in **Figure 6**.

Route 490 currently provides hourly service on all days and more frequent services during weekday AM and PM peak periods.

Route 491 currently provides hourly service on weekdays (two-hourly on Saturdays, Sundays and public holidays) and more frequent services during weekday AM and PM peak periods.

The closest bus stops are located on Marmion Avenue between Peony Boulevard and Morwell Avenue.

Figure 6: Existing public transport

3.6 Pedestrian and Cyclist Facilities

There is an existing 3m wide red asphalt path on the eastern verge of Marmion Avenue south of Yanchep Beach Road to Morwell Street, then 2.5m wide concrete path south of Morwell Street. The western verge of Marmion Avenue has 2.0m to 2.5m wide concrete path from 90m south of the Yanchep Beach Rd roundabout to about 170m south of Morwell Street.

Morwell Street has a 1.5m wide concrete path on the northern verge adjacent to the Ampol service station and a 2.5m wide concrete path on the southern verge adjacent to the school site.

Peony Boulevard has about 30m of 2.5m wide concrete path on the southern verge east of Marmion Avenue and 2.5m wide concrete path on the northern verge for the full length of the road.

Kakadu Road has a 2.5m wide concrete path on the eastern verge from Peony Boulevard to Morwell Street and on the western verge north of the subject site.

There is also a path on the northern side of the existing Woolworths shopping centre car park connecting from Marmion Avenue to the shopping centre and other paths connecting to that existing shopping centre and the McDonald's restaurant.

Marmion Avenue has 2m-wide on-road cycle lanes and 1.2 to 1.5m wide cycle lanes on Peony Blvd and Lagoon Dr approaches to the signalised intersection.

The Marmion Ave / Peony Blvd / Lagoon Dr signalised intersection includes pedestrian facilities across all four approaches, as can be seen in **Figure 4**.

4 Changes to Surrounding Transport Networks

City of Wanneroo *Local Planning Policy 3.8: Marmion Avenue Arterial Road Access* includes information on the type and location of vehicular access points on Marmion Avenue and other roads including Yanchep Beach Road. The relevant section of the spatial plan from LPP3.8 is shown in **Figure 7**.

Future intersection treatments shown on this plan at key intersections relevant to Yanchep Central are as follows:

- Marmion Ave / Peony Blvd / Lagoon Dr signalised intersection (existing);
- Marmion Ave / Morwell St full movement T-intersection (existing);
- Marmion Ave left in / left out access at the northern side of the existing shopping centre (currently left in only);
- Marmion Ave / Yanchep Beach Rd roundabout (existing); and
- Yanchep Beach Rd / Kakadu Rd full movement T-intersection (currently left in / left out only).

Figure 7: Local Planning Policy 3.8: Marmion Avenue Arterial Road Access

Figure 7 also shows the future railway alignment crossing Yanchep Beach Road further east from the subject site. It shows future train stations at Yanchep (north of Yanchep Beach Road) and Yanchep South (south of Yanchep Beach Road).

5 Integration with Surrounding Area

The proposed development is in line with the staged development of the Yanchep Central and in accordance with Yanchep Town Centre zone, as shown in **Figure 7**. Accordingly, the proposed land uses are consistent with the general planning intent and the surrounding area has been planned to integrate with this use of the subject site.

6 Traffic Assessment

6.1 Assessment Period

Due to the nature of the development, it is expected that the greatest demand on the local road network capacity will be experienced during the combined peak hour business activity of the development and the peak commuter traffic activity during the weekday afternoon and Saturday midday periods.

The proposed Stage 1 Lot 50 Development is expected to be completed by the end of 2023. Therefore, for the purpose of this TIA, the traffic generation of Stage 1 for Lot 50 Development has been considered in the traffic analysis. It is also assumed that Stage 3 of Lot 395 Development would be completed by end of 2024. However, considering the background traffic would not change significantly by 2024 the base year assumed to be 2023. In accordance with WAPC Transport Impact Assessment Guidelines the traffic assessment is to be undertaken for the year of opening and 10 years after opening, so assessment years of 2023 and 2033 has been adopted for this transport impact assessment.

The proposed tavern would operate from 10:00am till various night times and the proposed Dan Murphy's liquor store will operate from 9:00am till 9:00pm during the weekdays and Saturdays. On this basis, the proposed development would generate negligible traffic during the AM road network peak hour (8:00-9:00). Therefore, traffic and SIDRA analysis for AM peak hour is not undertaken in this TIA except for the existing situation.

6.2 Trip Generation

The traffic volumes likely to be generated by the proposed development have been estimated using trip generation rates derived from the *"Trip Generation Manual, Institute of Transport Engineers, 11th Edition"* publication. Hence, the trip rates which were used to estimate the proposed land uses are:

Tavern (Drinking Place)

- Weekday PM peak hour: 12.2 trips per 100m^2 GFA;
- Saturday mid-day peak hour: 8.55 trips per 100m^2 GFA; and,
- Weekday[1]: 104.56 trips per 100m^2 GFA;

Bottle Shop (Liquor Store)

- Weekday PM peak hour: 17.9 trips per 100m^2 GFA;

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1 Due to lack of weekday trip rates for "Drinking Place" land use daily trip rates for a similar type of use (Fast Casual Restaurant) have been applied in this instance

- Saturday mid-day peak hour: 7.0 trips per 100m^2 GFA; and
- Weekday: 143.10 trips per 100m^2 GFA;

Trips associated with the proposed tavern and Dan Murphy's liquor store also comprise passing-trade trips (trips already on the road network and not specifically generated by the proposed development).

The catchment area of the proposed tavern will include local residents and therefore some non-motorised patronage including walking is expected for the patrons. Other patrons who are not within walking distance may use their vehicles (including ride share), Uber or taxis. Therefore, the proposed ITE trip rates are expected to be conservative for the proposed tavern however, in order to provide a robust traffic assessment, the ITE trip rates were used for the purpose of this TIA.

Further, cross trade between the bottle shop and the tavern is expected. Similarly cross trade between the existing shopping centre and the bottle shop and tavern is expected. Accordingly, a cross trade of 20% is considered to be reasonable to allow for internal trips between the existing and proposed land uses within Lot 395.

The assumptions used in this report are in line with the assumptions used in the TIA for the approved and under construction development on Lot 50. Data source and other assumptions are as follows:

- Tavern (drinking Place) trip rates from ITE land use 975 (Saturday peak hour assumed to be 70% of the PM peak hour as ITE 11 does not provide rates for Saturday);
- Liquor store rates from ITE land use 899 (weekday AM rate assumed to be zero as Dan Murphy's liquor store is closed before 9:00AM, Saturday peak hour assumed to be 70% of Saturday peak hour of generator.
- Directional splits of 50% in / 50% out assumed for all 2 uses as they are all dominated by customer arrival / departure.
- Pass-by rates from ITE Trip Generation Handbook 3rd Ed: High turnover sit down restaurant (#931) 43% for tavern, Fast food restaurant with drive through (#934) 50% for Liquor store. As ITE Trip Generation Handbook 3rd Ed does not provide pass-by rates for tavern and liquor stores.

Table 2 summarises the daily and peak hour trip generation of the proposed development. **Table 3** shows the passing and non-passing trade of the trip generation.

Accordingly, it is estimated that the proposed development would generate approximately 1,560 trips per regular weekday with approximately 190 trips (both inbound and outbound) during the weekday PM peak hour. The proposed development would generate negligible traffic during the AM road network peak hour as both tavern and Dan Murphy's would be closed during the AM road network peak hour. The trip generation of the proposed development during the Saturday peak hour is estimated to be about 98vph.

The primary trips associated with the proposed development during the PM peak hour is estimated to be about 101vph which will be distributed to the surrounding road and intersections.

Table 2: Trip generation of the proposed land uses

Land use	GFA	Daily Rate	Weekd-AM Peak	Sat-PM Peak	Weekd-PM Peak	Cross Trade	Weekd-AM trips	Sat-Lunch time trips	Weekd-PM trips	AM		Sat-Lunch time		PM	
										IN	OUT	IN	OUT	IN	OUT
Tavern	800	1.05	0	0.09	0.12	0.2	0	53	76	0	0	27	26	38	38
Liquor Store	796	1.43	0.00	0.07	0.18	0.2	0	45	114	0	0	22	23	57	57
Total traffic							**0**	**98**	**190**	**0**	**0**	**49**	**49**	**95**	**95**

Note: The additional GFA of the proposed liquor store is 721m². However, the trip generation and SIDRA analysis are conservatively based on 796m² GFA. The additional 75m²GFA is negligible in analysis and would not change the outcome of the analysis.

Table 3: Passing trade and non-passing trade component of the trip generation

Passing Trade Component

Passing Trade	AM		Sat-Lunch time		PM	
	IN	OUT	IN	OUT	IN	OUT
43%	0	0	12	11	16	16
50%	0	0	11	11	29	28
	0	**0**	**23**	**22**	**45**	**44**

Primary Trips Component

AM		Sat-Lunch time		PM	
IN	OUT	IN	OUT	IN	OUT
0	0	15	15	22	22
0	0	11	12	28	29
0	**0**	**26**	**27**	**50**	**51**

6.3 Trip Distribution

The distribution of trips that will be attracted to the subject site has been estimated based on the distribution of surrounding residential areas and the catchment area of other competing shopping centres that are planned in this area. The traffic distribution is in line with that used in the TIA for Lot 50.

The diagram at **Figure 8** shows MRS zones overlaid on a current aerial photo. As evident, the primary catchment area will mainly be south of Yanchep Beach Rd, so the future distribution used for the TIA has less traffic from the north and more from the south. The catchment area of the proposed tavern is expected to be mainly from the local area.

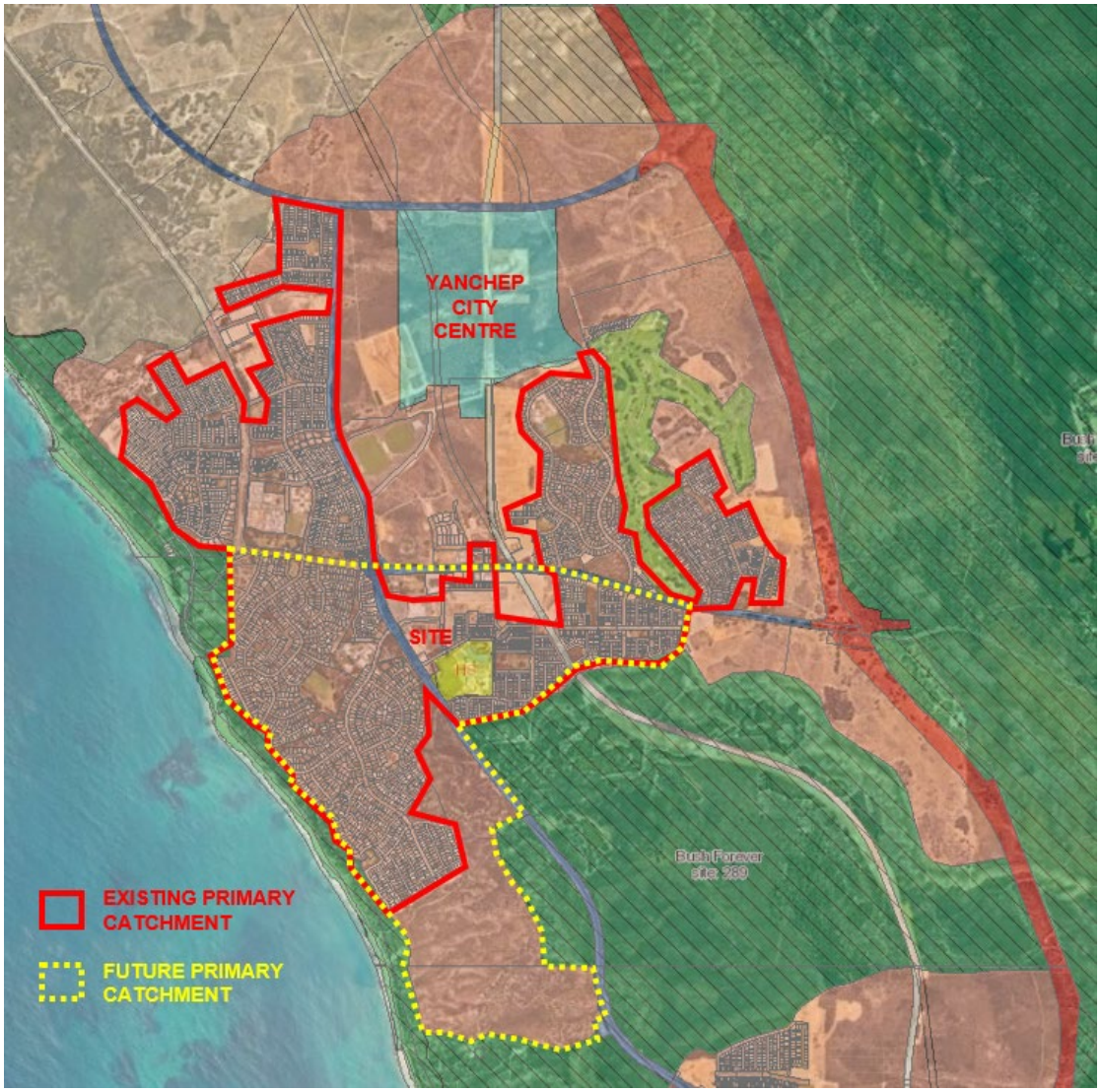


Figure 8: Existing and future primary catchment areas

Pass-by trips will be more strongly related to southbound traffic flows on Marmion Avenue because of convenience factor. The resulting modelled traffic distribution of the proposed development is summarised in **Table 4**.

Table 4: Traffic distribution

Approach / departure route	Primary Trips	Pass-by Trips
Marmion Ave north	20%	70%
Marmion Ave south	30%	20%
Lagoon Dr west	30%	-
Peony Blvd east	20%	10%

The traffic movements generated by the proposed development have been manually assigned on the adjacent road network and the resulting traffic movements generated by this development are shown in **Appendix B**.

Figure B1 shows the additional traffic flows generated by the Stage 3 Extensions that are the subject of this development application.

6.4 Traffic Flow

As documented in **section 4.3**, existing traffic flows on Marmion Avenue (south of Peony Boulevard) have grown by 5.4% per year between 2013 and 2021 with no significant growth from 2021 to 2022. However, Main Roads WA has advised that future traffic volumes on this section of Marmion Avenue are projected to increase at a compound growth rate of 7.82% per year.

Accordingly, future year base traffic flows (without the proposed development) have been estimated by factoring up the current through traffic flows on Marmion Avenue by applying a compound growth rate of 7.82% per year and adding the approved Stage 1 development traffic. The future total traffic flows during peak hours with the proposed development are shown in **Appendix B**.

Figure B2 shows the additional traffic flows generated by the Stage 1 development as per the previously approved development application. This traffic is used as the background traffic for 2023 and the Stage 3 traffic has been added to the 2023 background traffic.

Figure B3 illustrates 2023 with development traffic and **Figure B4** reflects the 2033 with development traffic.

6.5 Analysis of Local Intersections & Crossovers

Key intersections and driveways shown in Figures B2 to B4 (in Appendix B) have been analysed as a network of intersections using Network analysis in the SIDRA computer software package, for 2023 and 2033 PM peak hours and Saturday peak hour traffic flows as shown in Figures B3 (2023) and B4 (2033).

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.

Figure 9 illustrates the intersection network and layout modelled in SIDRA.

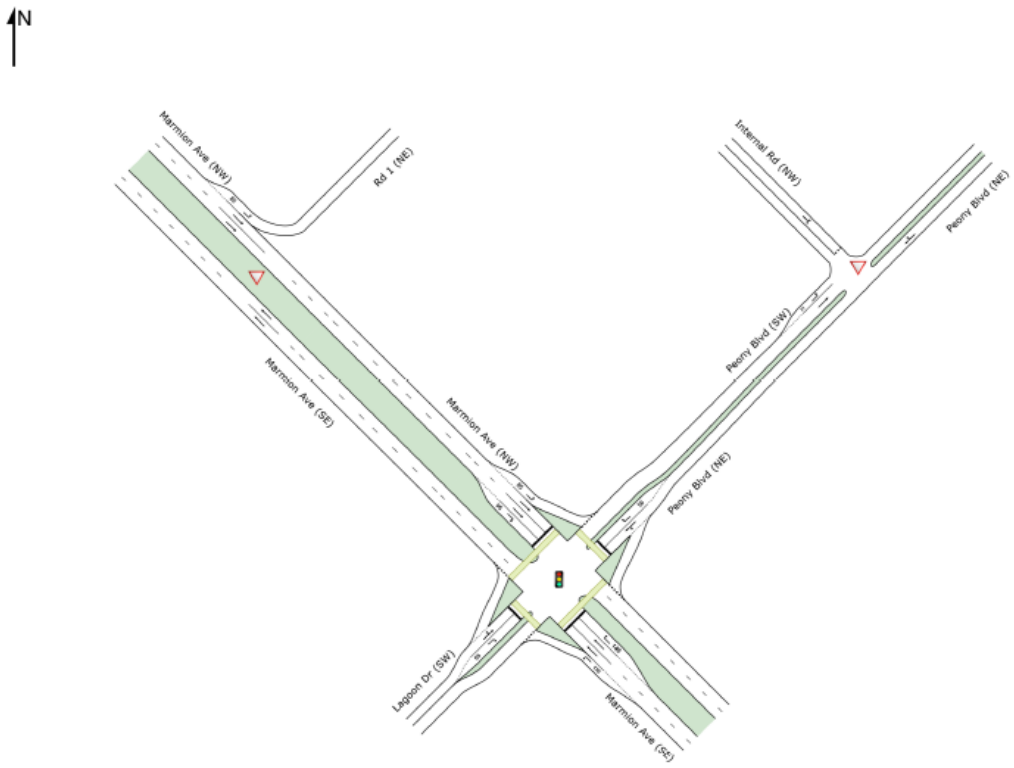


Figure 9: Intersection network and layouts modelled in SIDRA

The SIDRA analysis has been undertaken in accordance with current MRWA operational modelling guidelines including separate input of different classes of heavy vehicles and the parameters specified by MRWA for those vehicle classes.

The results of the SIDRA analysis are summarised in **Appendix D** (existing calibrated scenario), **Appendix E** (2023, post development scenario) and **Appendix F** (2033, 10 years post development scenario).

The SIDRA results in Appendix D indicate that the existing Marmion Ave / Peony Blvd / Lagoon Dr signalised intersection is currently operating satisfactory with overall LoS C and minimum queues and delays for all approaches of the intersection.

The SIDRA results in Appendix E indicate that the existing Marmion Ave / Peony Blvd / Lagoon Dr signalised intersection will operate at a degree of saturation ranging from 0.652 to 0.809 in the two 2023 peak periods analysed. Overall intersection level of service would be C in modelled peak periods with no movements at level of service E or F.

The SIDRA results in Appendix F indicate that the existing Marmion Ave / Peony Blvd / Lagoon Dr signalised intersection would operate at a degree of saturation ranging from 0.802 to 0.888 in the two 2033 peak periods analysed. Overall intersection level of service would be D in the weekday PM peak period (C in the Saturday peak) with no movements at level of service F. This is considered to represent a satisfactory level of service for this existing signalised intersection in 2033.

The SIDRA results indicate that the existing T-intersection of the north south driveways on Peony Boulevard is operating satisfactorily with LoS A. This intersection would continue to operate satisfactorily with LoS C or better for all approaches of the intersection in 2023 and 2033 future scenarios.

The existing left in only driveway from Marmion Avenue north of Peony Boulevard (labelled as "Rd 1" in the SIDRA analysis) is assessed in Appendix E and F (2023 and 2033 respectively). All movements will continue to operate at level of service A indicating very good operation in 2033.

6.6 Impact on Surrounding Roads and Neighbouring Areas

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 on any lanes on the surrounding road network by more than 100vph. Therefore, the proposed development will not increase traffic flows at or above the quoted WAPC threshold on most of the surrounding roads to warrant further detailed analysis.

6.7 Traffic Noise and Vibration

The WAPC's *State Planning Policy 5.4: Road and Rail Transport Noise and Freight Considerations in Land Use Planning* requires assessment of noise impact on noise-sensitive developments when a road carries more than 20,000vpd in an urban area or 5,000vpd in a rural area.

The traffic generation of the proposed development will only be just below 1,600vpd and will not increase the traffic flows on any surrounding roads to anywhere near the abovementioned traffic thresholds, so no noise impacts on surrounding areas are anticipated.

6.8 Road Safety

No particular road safety issues have been identified in relation to the proposed development.

7 Parking Assessment

The parking demand analysis for the proposed developments is subject to a different study.

8 Public Transport Access

The existing bus services in this area have been noted in Section 3.5 of this report and will provide a satisfactory level of public transport accessibility to the site.

9 Pedestrian and Cyclist Access

The existing pedestrian and cyclist facilities in this area have been noted in Section 3.6 of this report.

The proposed development will use the existing pedestrian and cyclist facilities on the surrounding roads and intersections.

10 Conclusions

This Transport Impact Assessment has been prepared by Transcore in relation to the proposed Yanchep Central Stage 3 for Lot 395 Development in Yanchep in the City of Wanneroo.

Lot 50 (Yanchep Central Stage 1) is located opposite the existing Woolworths shopping centre and was subject of a separate application which was approved by Metro Outer JDAP on 17 November 2021. Therefore, the traffic generation of Lot 50 development has been allowed for in SIDRA analysis for future scenarios (post development and 10 years after) of the current developments.

Traffic analysis has been undertaken for weekday PM peak hours and the Saturday peak period of the road network. The proposed development would generate negligible traffic during the AM road network peak hour (8:00-9:00). Therefore, SIDRA analysis for AM peak hour was not undertaken.

The trip generation of the proposed development during the Saturday peak hour is estimated to be about 98vph. The primary trips associated with the proposed development during the PM peak hour is estimated to be about 191vph.

The traffic analysis undertaken for 2033 confirms that the existing Marmion Ave / Peony Blvd / Lagoon Dr signalised intersection will operate satisfactorily with the traffic from the proposed Stage 1 of Lot 50 Development and Stage 3 for Lot 395 Development.

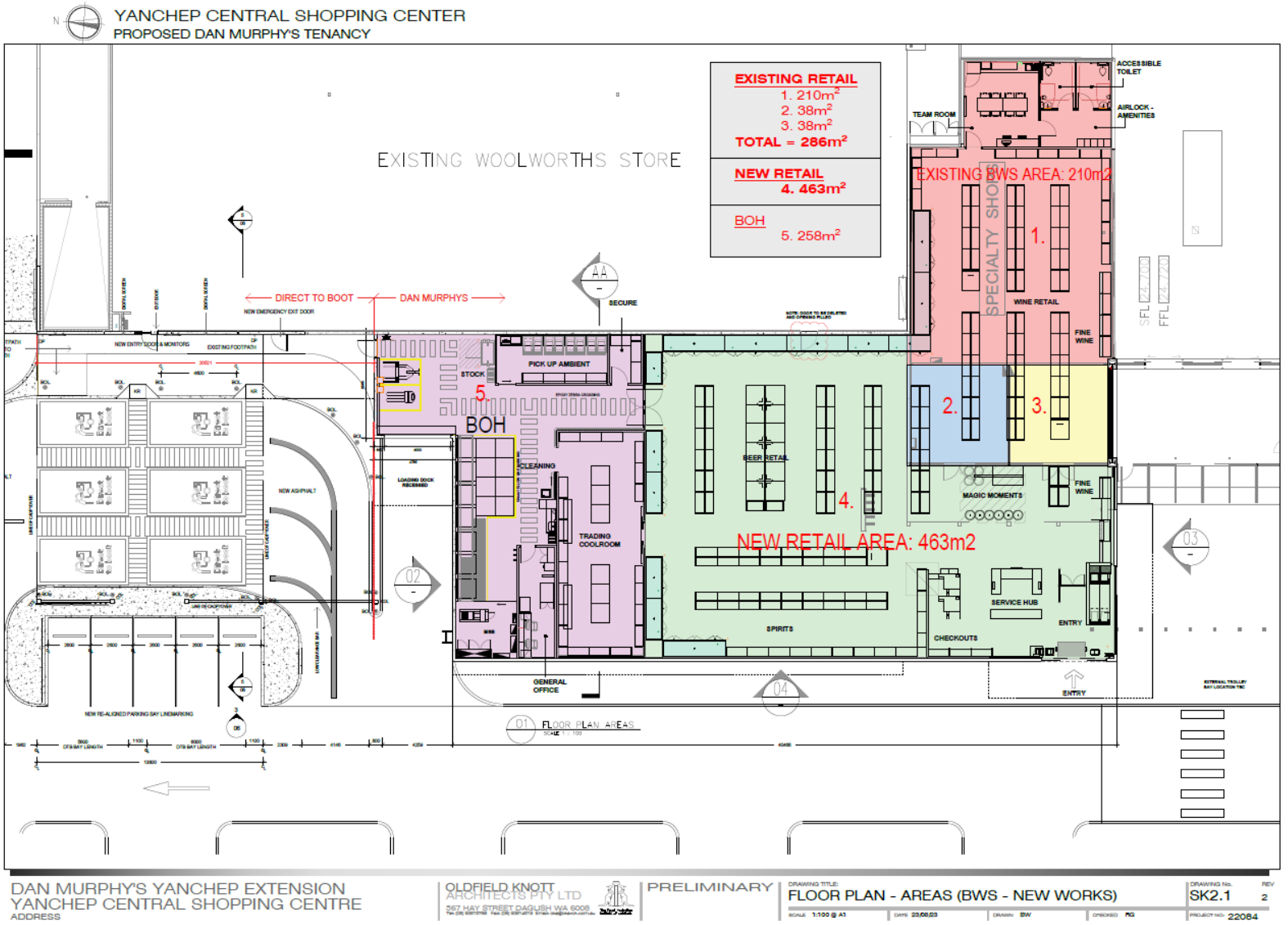
In conclusion, the findings of this Transport Impact Assessment are supportive of the proposed developments.

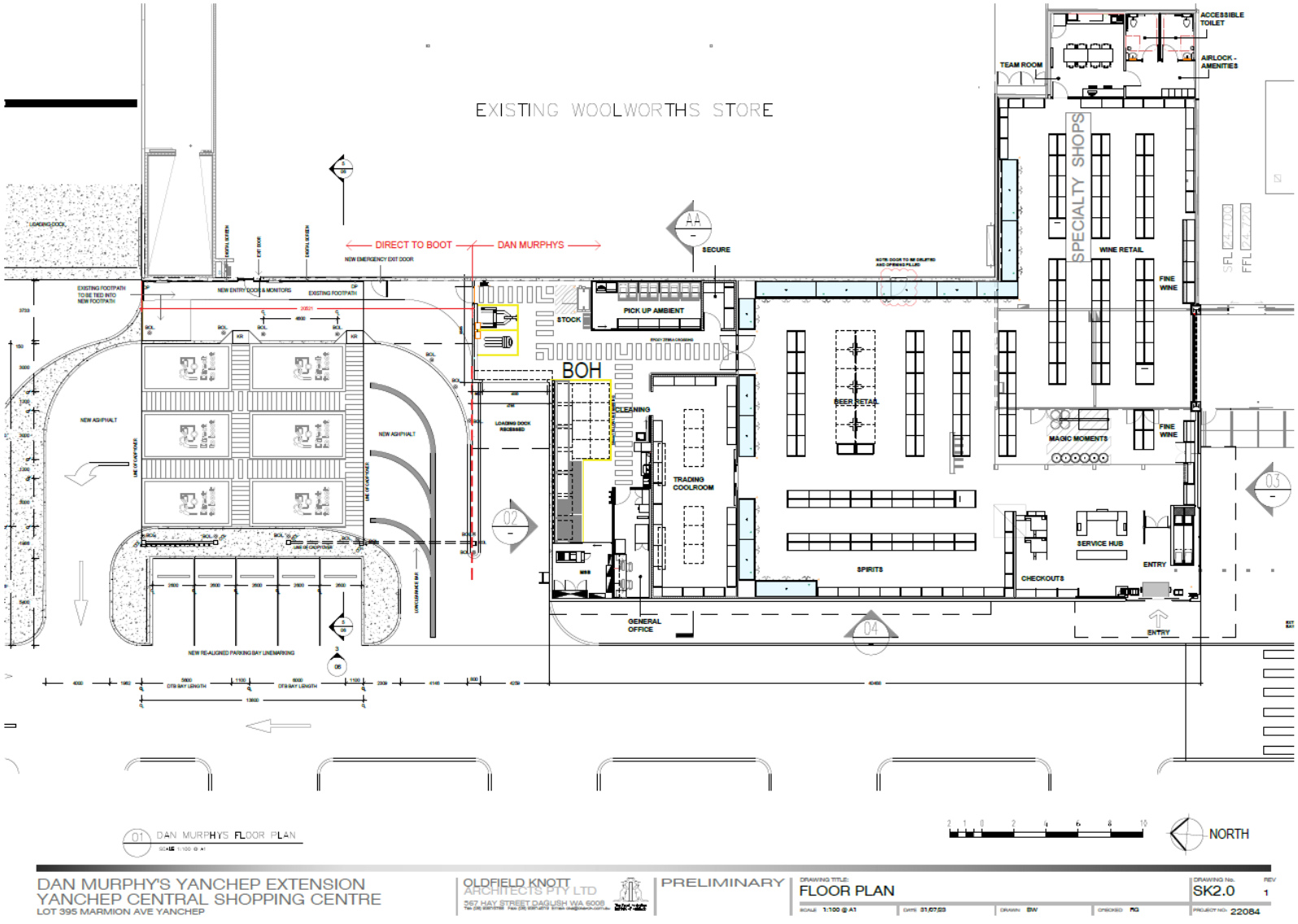
Appendix A

PROPOSED DEVELOPMENT PLANS

transcore

Engineering a better future for over 20 years!


YANCHEP CENTRAL SHOPPING CENTER
PROPOSED DAN MURPHY'S TENANCY
EXISTING WOOLWORTHS STORE
EXISTING RETAIL
1. 210m²
2. 38m²
3. 38m²
TOTAL = 286m²
NEW RETAIL
4. 463m²
BOH
5. 258m²
EXISTING BWS AREA: 210m2
NEW RETAIL AREA: 463m2
DIRECT TO BOOT
DAN MURPHYS
SECURE
BOH
STOCK
PICK UP AMBIENT
CLEANING
TRADING COOLROOM
GENERAL OFFICE
BEER RETAIL
WINE RETAIL
FINE WINE
MAGIC MOMENTS
SPIRITS
SERVICE HUB
CHECKOUTS
ENTRY
TEAM ROOM
ACCESSIBLE TOILET
AIRLOCK - AMENITIES
SPECIALTY SHOP
NEW ASPHALT
NEW RE-ALIGNED PARKING BAY LINEMARKING
FLOOR PLAN AREAS
DAN MURPHY'S YANCHEP EXTENSION
YANCHEP CENTRAL SHOPPING CENTRE
ADDRESS
OLDFIELD KNOTT ARCHITECTS PTY LTD
PRELIMINARY
FLOOR PLAN - AREAS (BWS - NEW WORKS)
SK2.1
2
1:100 @ A1
22084

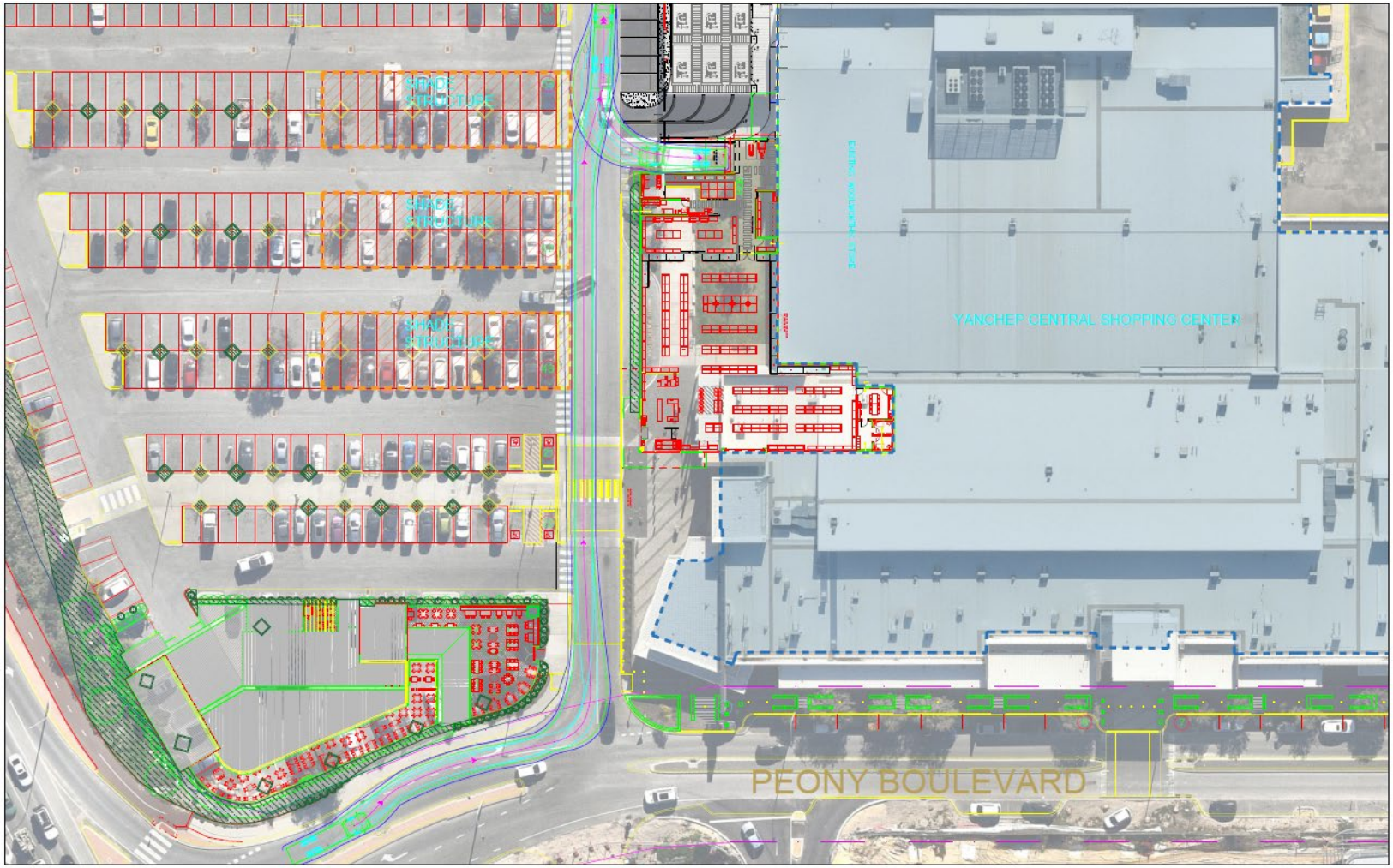

EXISTING WOOLWORTHS STORE
DIRECT TO BOOT
DAN MURPHYS
SECURE
PICK UP AMBIENT
STOCK
BOH
CLEANING
TRADING COOLROOM
BEER RETAIL
SPECIALTY SHOPS
WINE RETAIL
FINE WINE
MAGIC MOMENTS
SERVICE HUB
ENTRY
CHECKOUTS
SPIRITS
GENERAL OFFICE
TEAM ROOM
ACCESSIBLE TOILET
AIRLOCK - AMENITIES
NEW ASPHALT
NEW RE-ALIGNED PARKING BAY LINEMARKING
01 DAN MURPHYS FLOOR PLAN
NORTH
DAN MURPHY'S YANCHEP EXTENSION
YANCHEP CENTRAL SHOPPING CENTRE
LOT 395 MARMION AVE YANCHEP
OLDFIELD KNOTT ARCHITECTS PTY LTD
PRELIMINARY
DRAWING TITLE: FLOOR PLAN
DRAWING No. SK2.0
REV 1
SCALE 1:100 @ A1
DATE 31.07.23
PROJECT NO. 22084


CARPARKING
SITE BOUNDARY
PEONY BLVD
MARMION AVE
NORTH
SUMMARY OF FLOOR AREA
INTERNAL AREAS:
LOUNGE 2 154.12m²
LOUNGE 3 / DINING / FUNCTION 118.44m²
LOUNGE 1 84.66m²
SERVICE AREA 90.30m²
BAR 30.86m²
STORE 70.45m²
KITCHEN 76.70m²
LIQUID COOL ROOM 33.00m²
HALL 27.70m²
OFFICE 14.19m²
COOL ROOM 11.43m²
MALE TOILET 18.50m²
FEMALE TOILET 18.80m²
FREEZER 10.70m²
LIQUOR STORAGE 11.77m²
STORE 2 7.21m²
COMMS 3.32m²
UAT 5.65m²
STAFF MALE TOILET 6.50m²
STAFF FEMALE TOILET 6.50m²
TOTAL 800.82m²
EXTERNAL AREAS:
COURTYARD 2 190.48m²
VERANDAH 59.50m²
COURTYARD 1 46.30m²
SERVICE YARD 27.48m²
COURTYARD 3 22.47m²
BINS 15.33m²
TOTAL 361.56m²
1 A300 PROPOSED TAVERN GROUND FLOOR PLAN
SCALE: 1:100 @ A1
OLDFIELD KNOTT ARCHITECTS PTY LTD
PROPOSED TAVERN - YANCHEP CENTRAL
CNR MARMION AVE & PEONY BOULEVARD,
YANCHEP for FRP CAPITAL
Proposed Tavern Floor Plan
22084
A201
1

Appendix B

TURN PATH ANALYSIS

Engineering a better future for over 20 years!

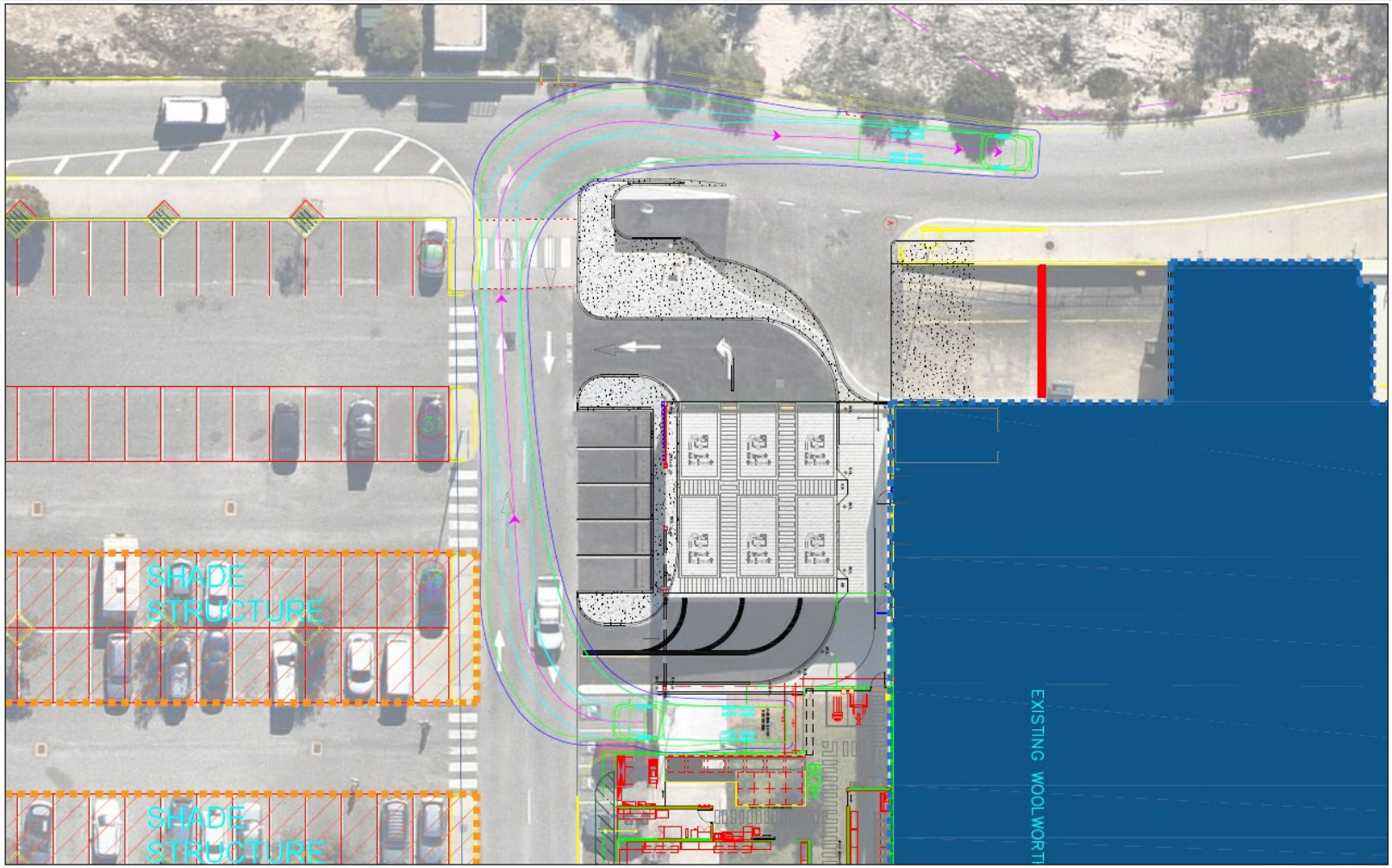


Yanchep Central
Austroads 2013: 12.5m Service Vehicle
Service Vehicle Entry - Dan Murphy

LEGEND
Vehicle Body
Wheel Path
500mm Clearance

t23.094.sk01
14/08/2023
Scale: 1:500 @ A3

transcore



Yanchep Central
Austroads 2013: 12.5m Service Vehicle
Service Vehicle Exit - Dan Murphy

LEGEND
Vehicle Body
Wheel Path
500mm Clearance

t23.094.sk02
14/08/2023
Scale: 1:500 @ A3

transcore

Yanchep Central
Austroads 2013: 8.8m Service Vehicle
Service Vehicle Entry - Tavern

LEGEND
Vehicle Body
Wheel Path
500mm Clearance

t23.094.sk03
14/08/2023
Scale: 1:500 @ A3

transcore

Yanchep Central
Austroads 2013: 8.8m Service Vehicle
Service Vehicle Exit - Tavern

LEGEND
Vehicle Body
Wheel Path
500mm Clearance

t23.094.sk04
14/08/2023
Scale: 1:500 @ A3

transcore

Appendix C

FUTURE TRAFFIC FLOWS

Engineering a better future for over 20 years!

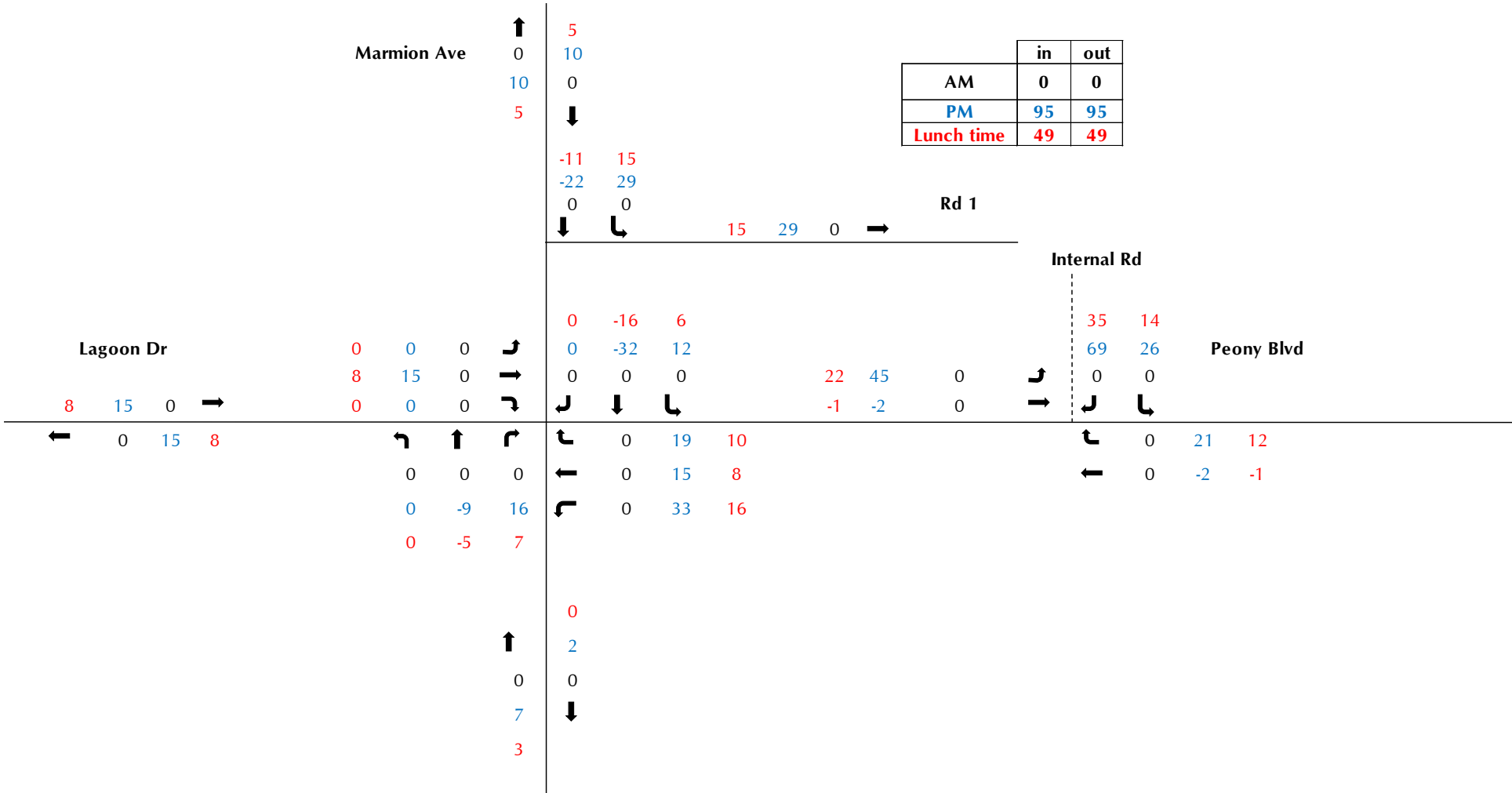


Figure B1: Additional Traffic Flows Generated by Stage 3 Lot 395 Development only

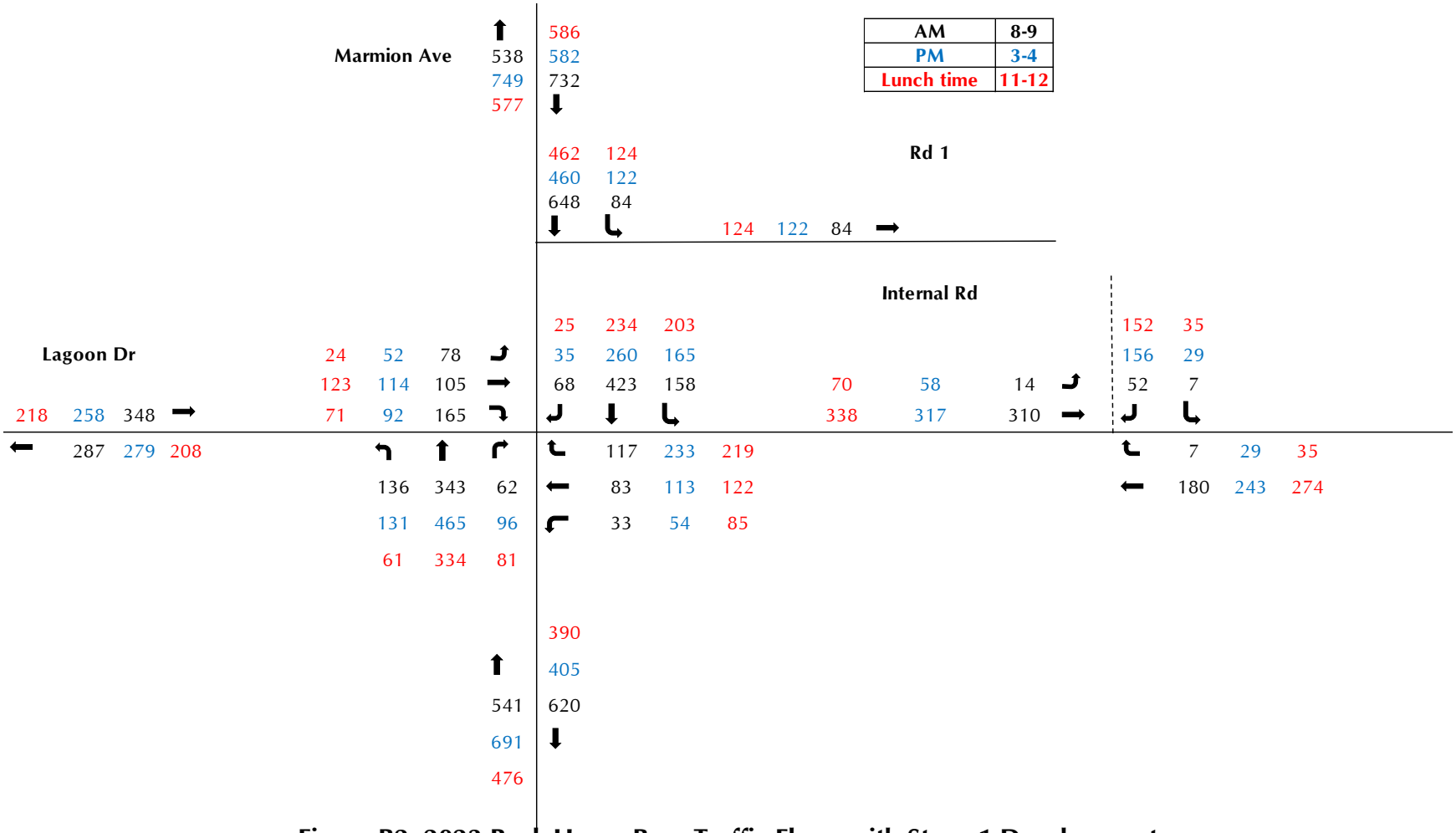


Figure B2: 2023 Peak Hours Base Traffic Flows with Stage 1 Development

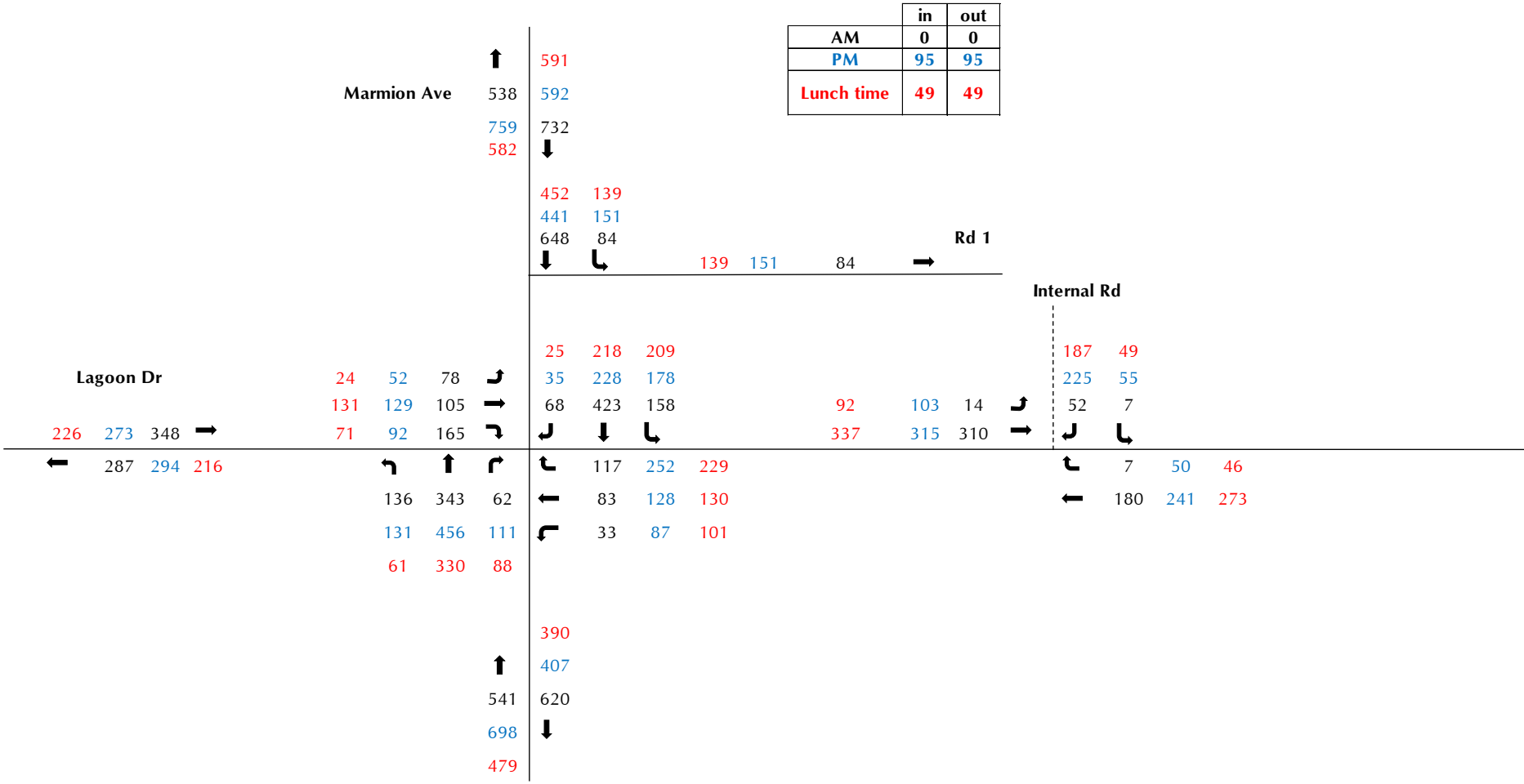


Figure B3: 2023 Peak Hours Total Traffic Flows with Stage 3 Lot 395 Development

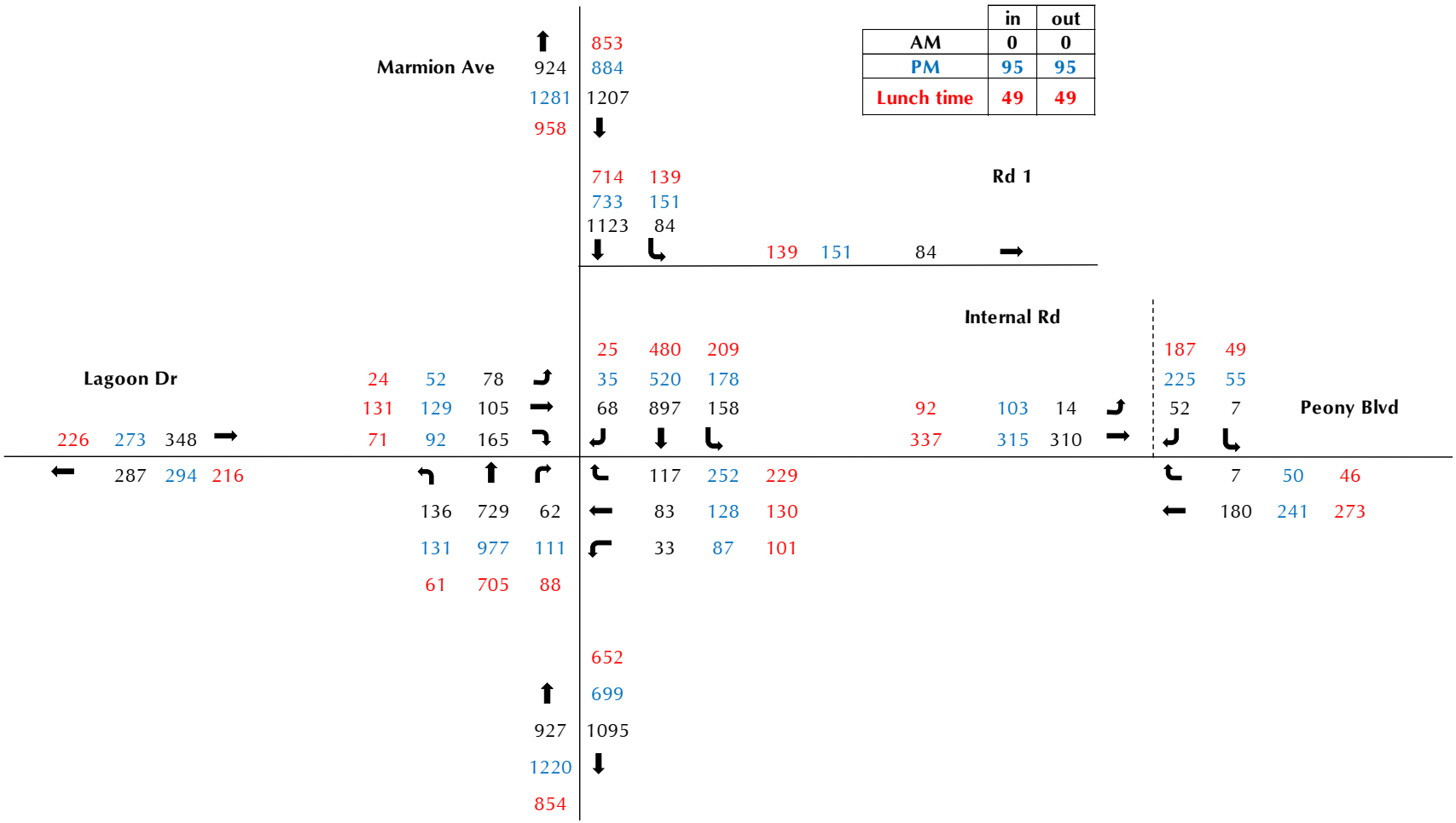


Figure B4: 2033 Peak Hours Total Traffic Flows with Stage 3 Lot 395 Development

Appendix D

INTERSECTION ANALYSIS

(EXISTING CALIBRATED SCENARIO)

Engineering a better future for over 20 years!

MOVEMENT SUMMARY

Site: [Marmion Ave & Peony Blvd & Lagoon Dr - 2023 - Existing - AM (Site Folder: Existing (2023))]

Network: N101 [AM (Network Folder: Existing (2023))]

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

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Marmion Ave (SE)														
10	L2	145	2.0	145	2.0	0.108	6.7	LOS A	0.8	5.9	0.25	0.62	0.25	45.7
11	T1	402	10.0	402	10.0	0.602	33.3	LOS C	7.5	61.1	0.97	0.80	0.97	19.7
12	R2	27	2.0	27	2.0	0.200	45.6	LOS D	1.1	8.1	0.97	0.71	0.97	15.9
Approach		575	7.6	575	7.6	0.602	27.2	LOS C	7.5	61.1	0.78	0.75	0.79	25.2
NorthEast: Peony Blvd (NE)														
1	L2	24	2.0	24	2.0	0.106	14.6	LOS B	1.4	10.4	0.67	0.57	0.67	35.5
2	T1	48	2.0	48	2.0	0.106	10.4	LOS B	1.4	10.4	0.67	0.57	0.67	33.8
3	R2	171	2.0	171	2.0	*0.829	48.7	LOS D	7.5	56.4	1.00	0.99	1.36	5.5
Approach		243	2.0	243	2.0	0.829	37.7	LOS D	7.5	56.4	0.90	0.87	1.15	11.8
NorthWest: Marmion Ave (NW)														
4	L2	107	2.0	107	2.0	0.126	16.4	LOS B	2.2	16.6	0.60	0.68	0.60	24.4
5	T1	504	16.9	504	16.9	*0.808	39.6	LOS D	10.7	93.8	1.00	0.98	1.24	23.9
6	R2	73	2.0	73	2.0	*0.535	47.3	LOS D	3.0	22.4	1.00	0.77	1.03	20.4
Approach		684	13.0	684	13.0	0.808	36.8	LOS D	10.7	93.8	0.94	0.91	1.12	23.4
SouthWest: Lagoon Dr (SW)														
7	L2	117	2.0	117	2.0	0.183	9.8	LOS A	2.6	19.7	0.49	0.57	0.49	35.8
8	T1	68	2.0	68	2.0	*0.183	5.3	LOS A	2.6	19.7	0.49	0.57	0.49	35.8
9	R2	159	2.0	159	2.0	0.703	44.1	LOS D	6.5	48.8	1.00	0.87	1.14	23.8
Approach		344	2.0	344	2.0	0.703	24.7	LOS C	6.5	48.8	0.73	0.71	0.79	27.3
All Vehicles		1846	7.8	1846	7.8	0.829	31.7	LOS C	10.7	93.8	0.85	0.82	0.96	23.2

MOVEMENT SUMMARY

Site: [Marmion Ave & Rd 1 - 2023 - Existing - AM (Site Folder: Existing (2023))]

Network: N101 [AM (Network Folder: Existing (2023))]

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Marmion Ave (SE)														
2	T1	689	10.0	689	10.0	0.194	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		689	10.0	689	10.0	0.194	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
NorthWest: Marmion Ave (NW)														
7	L2	76	2.0	76	2.0	0.041	7.5	LOS A	0.0	0.0	0.00	0.64	0.00	40.9
8	T1	684	16.9	684	16.9	0.206	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		760	15.4	760	15.4	0.206	0.8	NA	0.0	0.0	0.00	0.06	0.00	55.2
All Vehicles		1449	12.8	1449	12.8	0.206	0.4	NA	0.0	0.0	0.00	0.03	0.00	58.1

MOVEMENT SUMMARY

Site: [Peony Blvd & Internal Rd - 2023 - Existing - AM (Site Folder: Existing (2023))]

Network: N101 [AM (Network Folder: Existing (2023))]

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
NorthEast: Peony Blvd (NE)														
2	T1	193	2.0	193	2.0	0.113	0.1	LOS A	0.2	1.1	0.06	0.04	0.06	44.6
3	R2	16	2.0	16	2.0	0.113	4.0	LOS A	0.2	1.1	0.06	0.04	0.06	25.6
Approach		208	2.0	208	2.0	0.113	0.4	NA	0.2	1.1	0.06	0.04	0.06	38.0
NorthWest: Internal Rd (NW)														
4	L2	4	2.0	4	2.0	0.066	0.5	LOS A	0.3	2.0	0.41	0.31	0.41	19.9
6	R2	51	2.0	51	2.0	0.066	2.3	LOS A	0.3	2.0	0.41	0.31	0.41	18.4
Approach		55	2.0	55	2.0	0.066	2.2	LOS A	0.3	2.0	0.41	0.31	0.41	18.5
SouthWest: Peony Blvd (SW)														
7	L2	58	2.0	58	2.0	0.033	4.3	LOS A	0.0	0.0	0.00	0.53	0.00	36.4
8	T1	145	2.0	145	2.0	0.072	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		203	2.0	203	2.0	0.072	1.2	NA	0.0	0.0	0.00	0.15	0.00	43.1
All Vehicles		466	2.0	466	2.0	0.113	1.0	NA	0.3	2.0	0.07	0.12	0.07	34.4

MOVEMENT SUMMARY

Site: [Marmion Ave & Peony Blvd & Lagoon Dr - 2023 - Existing - PM (Site Folder: Existing (2023))]

Network: N101 [PM (Network Folder: Existing (2023))]

Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Marmion Ave (SE)														
10	L2	100	2.0	100	2.0	0.073	6.7	LOS A	0.6	4.3	0.22	0.61	0.22	45.7
11	T1	472	10.0	472	10.0	*0.662	37.3	LOS D	10.0	81.3	0.98	0.83	1.01	18.2
12	R2	58	2.0	58	2.0	0.475	52.7	LOS D	2.6	20.0	1.00	0.75	1.00	14.3
Approach		629	8.0	629	8.0	0.662	33.9	LOS C	10.0	81.3	0.86	0.79	0.88	21.2
NorthEast: Peony Blvd (NE)														
1	L2	46	2.0	46	2.0	0.152	13.6	LOS B	1.6	12.2	0.66	0.60	0.66	36.1
2	T1	61	2.0	61	2.0	*0.152	9.4	LOS A	1.6	12.2	0.66	0.60	0.66	34.4
3	R2	212	2.0	212	2.0	*0.651	42.9	LOS D	9.0	68.0	0.98	0.84	1.01	6.1
Approach		319	2.0	319	2.0	0.651	32.3	LOS C	9.0	68.0	0.87	0.76	0.90	13.8
NorthWest: Marmion Ave (NW)														
4	L2	94	2.0	94	2.0	0.100	15.8	LOS B	2.0	15.0	0.54	0.67	0.54	25.0
5	T1	339	16.9	339	16.9	0.509	35.6	LOS D	6.8	59.9	0.94	0.77	0.94	25.4
6	R2	62	2.0	62	2.0	*0.515	52.9	LOS D	2.9	21.5	1.00	0.76	1.01	19.0
Approach		495	12.2	495	12.2	0.515	34.0	LOS C	6.8	59.9	0.87	0.75	0.87	24.2
SouthWest: Lagoon Dr (SW)														
7	L2	58	2.0	58	2.0	0.126	12.5	LOS B	1.8	13.7	0.58	0.58	0.58	33.1
8	T1	47	2.0	47	2.0	0.126	8.0	LOS A	1.8	13.7	0.58	0.58	0.58	33.1
9	R2	84	2.0	84	2.0	0.262	39.8	LOS D	3.3	24.7	0.90	0.75	0.90	25.1
Approach		189	2.0	189	2.0	0.262	23.5	LOS C	3.3	24.7	0.72	0.66	0.72	27.8
All Vehicles		1633	7.4	1633	7.4	0.662	32.4	LOS C	10.0	81.3	0.85	0.75	0.86	21.8

MOVEMENT SUMMARY

Site: [Marmion Ave & Rd 1 - 2023 - Existing - PM (Site Folder: Existing (2023))]

Network: N101 [PM (Network Folder: Existing (2023))]

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Marmion Ave (SE)														
2	T1	741	10.0	741	10.0	0.208	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		741	10.0	741	10.0	0.208	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
NorthWest: Marmion Ave (NW)														
7	L2	55	2.0	55	2.0	0.030	7.5	LOS A	0.0	0.0	0.00	0.64	0.00	40.9
8	T1	495	16.9	495	16.9	0.149	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		549	15.4	549	15.4	0.149	0.8	NA	0.0	0.0	0.00	0.06	0.00	55.3
All Vehicles		1291	12.3	1291	12.3	0.208	0.3	NA	0.0	0.0	0.00	0.03	0.00	58.5

MOVEMENT SUMMARY

Site: [Peony Blvd & Internal Rd - 2023 - Existing - PM (Site Folder: Existing (2023))] **Network: N101 [PM (Network Folder: Existing (2023))]**

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
NorthEast: Peony Blvd (NE)														
2	T1	157	2.0	157	2.0	0.120	0.2	LOS A	0.2	1.8	0.10	0.08	0.10	40.9
3	R2	26	2.0	26	2.0	0.120	3.9	LOS A	0.2	1.8	0.10	0.08	0.10	25.2
Approach		183	2.0	183	2.0	0.120	0.7	NA	0.2	1.8	0.10	0.08	0.10	33.1
NorthWest: Internal Rd (NW)														
4	L2	15	2.0	15	2.0	0.235	0.4	LOS A	0.9	6.6	0.39	0.32	0.39	20.1
6	R2	162	2.0	162	2.0	0.235	2.1	LOS A	0.9	6.6	0.39	0.32	0.39	18.5
Approach		177	2.0	177	2.0	0.235	2.0	LOS A	0.9	6.6	0.39	0.32	0.39	18.6
SouthWest: Peony Blvd (SW)														
7	L2	88	2.0	88	2.0	0.051	4.3	LOS A	0.0	0.0	0.00	0.53	0.00	36.4
8	T1	111	2.0	111	2.0	0.055	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		199	2.0	199	2.0	0.055	1.9	NA	0.0	0.0	0.00	0.23	0.00	40.9
All Vehicles		559	2.0	559	2.0	0.235	1.6	NA	0.9	6.6	0.16	0.21	0.16	27.4

MOVEMENT SUMMARY

Site: [Marmion Ave & Peony Blvd & Lagoon Dr - 2023 - Existing - Sat (Site Folder: Existing (2023))]

Network: N101 [Sat (Network Folder: Existing (2023))]

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

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Marmion Ave (SE)														
10	L2	92	2.0	92	2.0	0.067	6.4	LOS A	0.4	2.9	0.21	0.60	0.21	45.9
11	T1	353	10.0	353	10.0	*0.566	33.9	LOS C	6.6	53.6	0.96	0.79	0.96	19.5
12	R2	56	2.0	56	2.0	*0.407	46.6	LOS D	2.2	16.9	0.99	0.74	0.99	15.6
Approach		500	7.6	500	7.6	0.566	30.3	LOS C	6.6	53.6	0.83	0.75	0.83	23.0
NorthEast: Peony Blvd (NE)														
1	L2	43	2.0	43	2.0	0.136	11.8	LOS B	1.3	10.1	0.63	0.58	0.63	38.2
2	T1	62	2.0	62	2.0	*0.136	7.6	LOS A	1.3	10.1	0.63	0.58	0.63	36.3
3	R2	172	2.0	172	2.0	*0.751	44.9	LOS D	7.1	53.8	1.00	0.91	1.20	5.9
Approach		277	2.0	277	2.0	0.751	31.4	LOS C	7.1	53.8	0.86	0.78	0.98	14.8
NorthWest: Marmion Ave (NW)														
4	L2	69	2.0	69	2.0	0.084	16.8	LOS B	1.4	10.9	0.60	0.67	0.60	24.1
5	T1	296	16.9	296	16.9	0.508	33.6	LOS C	5.5	47.8	0.95	0.77	0.95	26.3
6	R2	46	2.0	46	2.0	0.341	46.3	LOS D	1.8	13.9	0.98	0.74	0.98	20.7
Approach		412	12.7	412	12.7	0.508	32.2	LOS C	5.5	47.8	0.90	0.75	0.90	25.2
SouthWest: Lagoon Dr (SW)														
7	L2	67	2.0	67	2.0	0.116	9.6	LOS A	1.4	10.8	0.49	0.55	0.49	36.2
8	T1	45	2.0	45	2.0	0.116	5.1	LOS A	1.4	10.8	0.49	0.55	0.49	36.2
9	R2	51	2.0	51	2.0	0.223	40.0	LOS D	1.9	14.0	0.94	0.73	0.94	25.1
Approach		163	2.0	163	2.0	0.223	17.8	LOS B	1.9	14.0	0.63	0.61	0.63	30.1
All Vehicles		1352	7.3	1352	7.3	0.751	29.6	LOS C	7.1	53.8	0.83	0.74	0.86	23.0

MOVEMENT SUMMARY

Site: [Marmion Ave & Rd 1 - 2023 - Existing - Sat (Site Folder: Existing (2023))]

Network: N101 [Sat (Network Folder: Existing (2023))]

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Marmion Ave (SE)														
2	T1	592	10.0	592	10.0	0.166	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		592	10.0	592	10.0	0.166	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
NorthWest: Marmion Ave (NW)														
7	L2	99	2.0	99	2.0	0.054	7.5	LOS A	0.0	0.0	0.00	0.64	0.00	40.9
8	T1	412	16.9	412	16.9	0.124	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		511	14.0	511	14.0	0.124	1.5	NA	0.0	0.0	0.00	0.12	0.00	52.1
All Vehicles		1102	11.9	1102	11.9	0.166	0.7	NA	0.0	0.0	0.00	0.06	0.00	57.1

MOVEMENT SUMMARY

Site: [Peony Blvd & Internal Rd - 2023 - Existing - Sat (Site Folder: Existing (2023))]

Network: N101 [Sat (Network Folder: Existing (2023))]

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
NorthEast: Peony Blvd (NE)														
2	T1	122	2.0	122	2.0	0.085	0.2	LOS A	0.2	1.7	0.11	0.09	0.11	39.7
3	R2	26	2.0	26	2.0	0.085	3.8	LOS A	0.2	1.7	0.11	0.09	0.11	25.1
Approach		148	2.0	148	2.0	0.085	0.8	NA	0.2	1.7	0.11	0.09	0.11	31.6
NorthWest: Internal Rd (NW)														
4	L2	18	2.0	18	2.0	0.182	0.3	LOS A	0.8	6.1	0.35	0.26	0.35	20.3
6	R2	155	2.0	155	2.0	0.182	1.7	LOS A	0.8	6.1	0.35	0.26	0.35	18.8
Approach		173	2.0	173	2.0	0.182	1.6	LOS A	0.8	6.1	0.35	0.26	0.35	19.0
SouthWest: Peony Blvd (SW)														
7	L2	75	2.0	75	2.0	0.043	4.3	LOS A	0.0	0.0	0.00	0.53	0.00	36.4
8	T1	96	2.0	96	2.0	0.048	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		171	2.0	171	2.0	0.048	1.9	NA	0.0	0.0	0.00	0.23	0.00	40.9
All Vehicles		492	2.0	492	2.0	0.182	1.5	NA	0.8	6.1	0.16	0.20	0.16	26.9

Appendix E

2023 INTERSECTION ANALYSIS

(POST DEVELOPMENT SCENARIO)

Engineering a better future for over 20 years!

MOVEMENT SUMMARY

Site: [Marmion Ave & Peony Blvd & Lagoon Dr - 2023 - PM (Site Folder: 2023 + Development)]

Network: N101 [PM (Network Folder: 2023+Development)]

Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Marmion Ave (SE)														
10	L2	138	2.0	138	2.0	0.101	6.7	LOS A	0.8	6.1	0.23	0.61	0.23	45.7
11	T1	480	10.0	480	10.0	*0.809	44.8	LOS D	11.4	92.7	1.00	0.96	1.23	16.0
12	R2	117	2.0	117	2.0	*0.719	53.0	LOS D	5.5	41.3	1.00	0.86	1.18	14.2
Approach		735	7.2	735	7.2	0.809	39.0	LOS D	11.4	92.7	0.86	0.88	1.03	19.6
NorthEast: Peony Blvd (NE)														
1	L2	92	2.0	92	2.0	0.331	15.3	LOS B	3.8	28.7	0.75	0.67	0.75	34.4
2	T1	135	2.0	135	2.0	*0.331	11.1	LOS B	3.8	28.7	0.75	0.67	0.75	32.9
3	R2	265	2.0	265	2.0	*0.768	45.5	LOS D	12.0	90.6	1.00	0.91	1.14	5.8
Approach		492	2.0	492	2.0	0.768	30.4	LOS C	12.0	90.6	0.89	0.80	0.96	16.3
NorthWest: Marmion Ave (NW)														
4	L2	187	2.0	187	2.0	0.150	7.5	LOS A	1.6	12.1	0.30	0.63	0.30	35.9
5	T1	240	16.9	240	16.9	0.433	37.6	LOS D	4.9	43.0	0.94	0.75	0.94	24.6
6	R2	37	2.0	37	2.0	0.229	48.9	LOS D	1.6	12.0	0.96	0.73	0.96	20.0
Approach		464	9.7	464	9.7	0.433	26.4	LOS C	4.9	43.0	0.68	0.70	0.68	25.8
SouthWest: Lagoon Dr (SW)														
7	L2	55	2.0	55	2.0	0.322	24.3	LOS C	5.0	37.5	0.79	0.73	0.79	24.6
8	T1	136	2.0	136	2.0	0.322	19.8	LOS B	5.0	37.5	0.79	0.73	0.79	24.6
9	R2	97	2.0	97	2.0	0.283	39.0	LOS D	3.7	28.1	0.90	0.76	0.90	25.4
Approach		287	2.0	287	2.0	0.322	27.1	LOS C	5.0	37.5	0.83	0.74	0.83	25.0
All Vehicles		1978	5.7	1978	5.7	0.809	32.2	LOS C	12.0	92.7	0.82	0.80	0.90	21.0

MOVEMENT SUMMARY

Site: [Marmion Ave & Rd 1 - 2023 - PM (Site Folder: 2023 + Development)]

Network: N101 [PM (Network Folder: 2023+Development)]

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Marmion Ave (SE)														
2	T1	799	10.0	799	10.0	0.224	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		799	10.0	799	10.0	0.224	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
NorthWest: Marmion Ave (NW)														
7	L2	159	2.0	159	2.0	0.087	7.5	LOS A	0.0	0.0	0.00	0.64	0.00	40.9
8	T1	464	16.9	464	16.9	0.139	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		623	13.1	623	13.1	0.139	1.9	NA	0.0	0.0	0.00	0.16	0.00	50.4
All Vehicles		1422	11.4	1422	11.4	0.224	0.9	NA	0.0	0.0	0.00	0.07	0.00	56.5

MOVEMENT SUMMARY

Site: [Peony Blvd & Internal Rd - 2023 - PM (Site Folder: 2023 + Development)] **Network: N101 [PM (Network Folder: 2023+Development)]**

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
NorthEast: Peony Blvd (NE)														
2	T1	254	2.0	254	2.0	0.302	0.7	LOS A	0.7	5.0	0.22	0.10	0.22	33.9
3	R2	53	2.0	53	2.0	0.302	5.4	LOS A	0.7	5.0	0.22	0.10	0.22	24.4
Approach		306	2.0	306	2.0	0.302	1.5	NA	0.7	5.0	0.22	0.10	0.22	29.0
NorthWest: Internal Rd (NW)														
4	L2	58	2.0	58	2.0	0.753	9.1	LOS A	4.5	33.6	0.65	1.37	1.50	14.7
6	R2	237	2.0	237	2.0	0.753	13.9	LOS B	4.5	33.6	0.65	1.37	1.50	13.0
Approach		295	2.0	295	2.0	0.753	13.0	LOS B	4.5	33.6	0.65	1.37	1.50	13.4
SouthWest: Peony Blvd (SW)														
7	L2	108	2.0	108	2.0	0.063	4.3	LOS A	0.0	0.0	0.00	0.53	0.00	36.4
8	T1	332	2.0	332	2.0	0.165	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		440	2.0	440	2.0	0.165	1.1	NA	0.0	0.0	0.00	0.13	0.00	43.8
All Vehicles		1041	2.0	1041	2.0	0.753	4.6	NA	4.5	33.6	0.25	0.47	0.49	23.2

MOVEMENT SUMMARY

Site: [Marmion Ave & Peony Blvd & Lagoon Dr - 2023 - Sat (Site Folder: 2023 + Development)]

Network: N101 [Sat (Network Folder: 2023 +Development)]

Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Marmion Ave (SE)														
10	L2	64	2.0	64	2.0	0.047	6.6	LOS A	0.3	2.5	0.21	0.60	0.21	45.9
11	T1	347	10.0	347	10.0	*0.627	40.1	LOS D	7.5	61.1	0.99	0.82	1.01	17.3
12	R2	93	2.0	93	2.0	*0.652	53.0	LOS D	4.3	32.5	1.00	0.82	1.12	14.2
Approach		504	7.5	504	7.5	0.652	38.2	LOS D	7.5	61.1	0.89	0.79	0.93	19.3
NorthEast: Peony Blvd (NE)														
1	L2	106	2.0	106	2.0	0.338	14.7	LOS B	4.3	32.2	0.73	0.67	0.73	34.9
2	T1	137	2.0	137	2.0	*0.338	10.5	LOS B	4.3	32.2	0.73	0.67	0.73	33.3
3	R2	241	2.0	241	2.0	*0.625	39.9	LOS D	9.9	74.5	0.96	0.82	0.96	6.5
Approach		484	2.0	484	2.0	0.625	26.1	LOS C	9.9	74.5	0.85	0.75	0.85	18.7
NorthWest: Marmion Ave (NW)														
4	L2	220	2.0	220	2.0	0.172	7.6	LOS A	1.9	14.5	0.30	0.64	0.30	35.8
5	T1	229	16.9	229	16.9	0.443	38.6	LOS D	4.8	41.7	0.95	0.76	0.95	24.2
6	R2	26	2.0	26	2.0	0.187	49.9	LOS D	1.1	8.6	0.97	0.71	0.97	19.8
Approach		476	9.2	476	9.2	0.443	24.9	LOS C	4.8	41.7	0.65	0.70	0.65	26.1
SouthWest: Lagoon Dr (SW)														
7	L2	25	2.0	25	2.0	0.313	29.4	LOS C	4.4	33.0	0.83	0.75	0.83	22.2
8	T1	138	2.0	138	2.0	0.313	24.9	LOS C	4.4	33.0	0.83	0.75	0.83	22.2
9	R2	75	2.0	75	2.0	0.196	36.5	LOS D	2.7	20.7	0.86	0.74	0.86	26.2
Approach		238	2.0	238	2.0	0.313	29.0	LOS C	4.4	33.0	0.84	0.75	0.84	23.9
All Vehicles		1702	5.6	1702	5.6	0.652	29.7	LOS C	9.9	74.5	0.80	0.75	0.82	21.6

MOVEMENT SUMMARY

Site: [Marmion Ave & Rd 1 - 2023 - Sat (Site Folder: 2023 + Development)]

Network: N101 [Sat (Network Folder: 2023 +Development)]

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Marmion Ave (SE)														
2	T1	613	10.0	613	10.0	0.172	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		613	10.0	613	10.0	0.172	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
NorthWest: Marmion Ave (NW)														
7	L2	146	2.0	146	2.0	0.080	7.5	LOS A	0.0	0.0	0.00	0.64	0.00	40.9
8	T1	476	16.9	476	16.9	0.143	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		622	13.4	622	13.4	0.143	1.8	NA	0.0	0.0	0.00	0.15	0.00	50.9
All Vehicles		1235	11.7	1235	11.7	0.172	0.9	NA	0.0	0.0	0.00	0.08	0.00	56.2

MOVEMENT SUMMARY

Site: [Peony Blvd & Internal Rd - 2023 - Sat (Site Folder: 2023 + Development)]

Network: N101 [Sat (Network Folder: 2023 +Development)]

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
NorthEast: Peony Blvd (NE)														
2	T1	287	2.0	287	2.0	0.257	0.7	LOS A	0.6	4.9	0.20	0.09	0.20	35.1
3	R2	48	2.0	48	2.0	0.257	5.6	LOS A	0.6	4.9	0.20	0.09	0.20	24.5
Approach		336	2.0	336	2.0	0.257	1.4	NA	0.6	4.9	0.20	0.09	0.20	30.2
NorthWest: Internal Rd (NW)														
4	L2	52	2.0	52	2.0	0.534	4.3	LOS A	2.7	20.3	0.64	0.95	1.03	16.5
6	R2	197	2.0	197	2.0	0.534	9.6	LOS A	2.7	20.3	0.64	0.95	1.03	14.8
Approach		248	2.0	248	2.0	0.534	8.5	LOS A	2.7	20.3	0.64	0.95	1.03	15.2
SouthWest: Peony Blvd (SW)														
7	L2	97	2.0	97	2.0	0.056	4.3	LOS A	0.0	0.0	0.00	0.53	0.00	36.4
8	T1	355	2.0	355	2.0	0.176	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		452	2.0	452	2.0	0.176	0.9	NA	0.0	0.0	0.00	0.11	0.00	44.4
All Vehicles		1036	2.0	1036	2.0	0.534	2.9	NA	2.7	20.3	0.22	0.31	0.31	26.3

Appendix F

2033 INTERSECTION ANALYSIS

(10 YEARS POST DEVELOPMENT SCENARIO)

Engineering a better future for over 20 years!

MOVEMENT SUMMARY

Site: [Marmion Ave & Peony Blvd & Lagoon Dr - 2033 - PM (Site Folder: 2033 + Development)]

Network: N101 [PM (Network Folder: 2033+Development)]

Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Marmion Ave (SE)														
10	L2	138	2.0	138	2.0	0.096	6.6	LOS A	0.9	6.7	0.18	0.60	0.18	45.9
11	T1	1028	10.0	1028	10.0	*0.868	49.5	LOS D	32.0	261.6	1.00	1.01	1.15	14.8
12	R2	117	2.0	117	2.0	0.590	62.6	LOS E	6.8	51.1	1.00	0.79	1.00	12.5
Approach		1283	8.4	1283	8.4	0.868	46.1	LOS D	32.0	261.6	0.91	0.95	1.04	16.8
NorthEast: Peony Blvd (NE)														
1	L2	92	2.0	92	2.0	0.354	23.7	LOS C	6.4	48.3	0.79	0.73	0.79	27.8
2	T1	135	2.0	135	2.0	0.354	19.5	LOS B	6.4	48.3	0.79	0.73	0.79	26.9
3	R2	265	2.0	265	2.0	*0.888	66.6	LOS E	13.0	97.9	0.99	1.01	1.31	4.1
Approach		492	2.0	492	2.0	0.888	45.7	LOS D	13.0	97.9	0.90	0.88	1.07	12.1
NorthWest: Marmion Ave (NW)														
4	L2	187	2.0	187	2.0	0.141	7.8	LOS A	2.0	15.3	0.26	0.62	0.26	35.5
5	T1	547	16.9	547	16.9	0.598	41.0	LOS D	14.0	122.8	0.92	0.79	0.92	23.4
6	R2	37	2.0	37	2.0	*0.407	69.5	LOS E	2.2	16.9	1.00	0.73	1.00	15.9
Approach		772	12.6	772	12.6	0.598	34.3	LOS C	14.0	122.8	0.77	0.75	0.77	23.7
SouthWest: Lagoon Dr (SW)														
7	L2	55	2.0	55	2.0	0.430	42.2	LOS D	7.5	56.6	0.89	0.86	0.89	17.2
8	T1	136	2.0	136	2.0	*0.430	37.6	LOS D	7.5	56.6	0.89	0.86	0.89	17.2
9	R2	97	2.0	97	2.0	0.402	57.2	LOS E	5.3	40.2	0.96	0.78	0.96	20.5
Approach		287	2.0	287	2.0	0.430	45.1	LOS D	7.5	56.6	0.91	0.83	0.91	18.7
All Vehicles		2834	7.8	2834	7.8	0.888	42.7	LOS D	32.0	261.6	0.87	0.87	0.96	18.0

MOVEMENT SUMMARY

Site: [Marmion Ave & Rd 1 - 2033 - PM (Site Folder: 2033 + Development)]

Network: N101 [PM (Network Folder: 2033+Development)]

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Marmion Ave (SE)														
2	T1	1348	10.0	1348	10.0	0.379	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.7
Approach		1348	10.0	1348	10.0	0.379	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.7
NorthWest: Marmion Ave (NW)														
7	L2	159	2.0	159	2.0	0.087	7.5	LOS A	0.0	0.0	0.00	0.64	0.00	40.9
8	T1	772	16.9	772	16.9	0.232	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		931	14.4	931	14.4	0.232	1.3	NA	0.0	0.0	0.00	0.11	0.00	52.7
All Vehicles		2279	11.8	2279	11.8	0.379	0.6	NA	0.0	0.0	0.00	0.04	0.00	57.6

MOVEMENT SUMMARY

Site: [Peony Blvd & Internal Rd - 2033 - PM (Site Folder: 2033 + Development)] **Network: N101 [PM (Network Folder: 2033+Development)]**

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
NorthEast: Peony Blvd (NE)														
2	T1	254	2.0	254	2.0	0.187	0.7	LOS A	2.2	16.4	0.22	0.10	0.22	34.0
3	R2	53	2.0	53	2.0	0.187	5.4	LOS A	2.2	16.4	0.22	0.10	0.22	24.4
Approach		306	2.0	306	2.0	0.187	1.5	NA	2.2	16.4	0.22	0.10	0.22	29.0
NorthWest: Internal Rd (NW)														
4	L2	58	2.0	58	2.0	0.848	15.2	LOS C	5.8	43.7	0.65	1.80	2.00	12.9
6	R2	237	2.0	237	2.0	0.848	20.0	LOS C	5.8	43.7	0.65	1.80	2.00	11.2
Approach		295	2.0	295	2.0	0.848	19.0	LOS C	5.8	43.7	0.65	1.80	2.00	11.5
SouthWest: Peony Blvd (SW)														
7	L2	108	2.0	108	2.0	0.063	4.3	LOS A	0.0	0.0	0.00	0.53	0.00	36.4
8	T1	332	2.0	332	2.0	0.165	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		440	2.0	440	2.0	0.165	1.1	NA	0.0	0.0	0.00	0.13	0.00	43.8
All Vehicles		1041	2.0	1041	2.0	0.848	6.3	NA	5.8	43.7	0.25	0.59	0.63	21.1

MOVEMENT SUMMARY

Site: [Marmion Ave & Peony Blvd & Lagoon Dr - 2033 - Sat (Site Folder: 2033 + Development)]

Network: N101 [Sat (Network Folder: 2033 +Development)]

Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 100 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Marmion Ave (SE)														
10	L2	64	2.0	64	2.0	0.046	6.6	LOS A	0.4	2.7	0.20	0.59	0.20	45.9
11	T1	742	10.0	742	10.0	*0.802	41.9	LOS D	18.5	150.7	1.00	0.95	1.12	16.8
12	R2	93	2.0	93	2.0	*0.724	59.9	LOS E	4.9	36.7	1.00	0.85	1.20	12.9
Approach		899	8.6	899	8.6	0.802	41.3	LOS D	18.5	150.7	0.94	0.91	1.06	17.7
NorthEast: Peony Blvd (NE)														
1	L2	106	2.0	106	2.0	0.376	17.2	LOS B	4.9	36.7	0.78	0.70	0.78	32.6
2	T1	137	2.0	137	2.0	*0.376	13.0	LOS B	4.9	36.7	0.78	0.70	0.78	31.2
3	R2	241	2.0	241	2.0	*0.776	51.3	LOS D	12.2	91.9	1.00	0.91	1.15	5.2
Approach		484	2.0	484	2.0	0.776	33.0	LOS C	12.2	91.9	0.89	0.81	0.96	16.0
NorthWest: Marmion Ave (NW)														
4	L2	220	2.0	220	2.0	0.167	7.6	LOS A	2.1	15.5	0.28	0.63	0.28	35.8
5	T1	505	16.9	505	16.9	0.584	35.4	LOS D	10.9	95.9	0.93	0.78	0.93	25.5
6	R2	26	2.0	26	2.0	0.208	55.6	LOS E	1.3	9.7	0.98	0.71	0.98	18.4
Approach		752	12.0	752	12.0	0.584	27.9	LOS C	10.9	95.9	0.74	0.74	0.74	26.2
SouthWest: Lagoon Dr (SW)														
7	L2	25	2.0	25	2.0	0.348	37.5	LOS D	5.4	40.6	0.86	0.80	0.86	18.9
8	T1	138	2.0	138	2.0	0.348	32.9	LOS C	5.4	40.6	0.86	0.80	0.86	18.9
9	R2	75	2.0	75	2.0	0.243	44.1	LOS D	3.2	24.3	0.91	0.75	0.91	23.8
Approach		238	2.0	238	2.0	0.348	36.9	LOS D	5.4	40.6	0.88	0.78	0.88	20.9
All Vehicles		2373	7.7	2373	7.7	0.802	34.9	LOS C	18.5	150.7	0.86	0.82	0.92	20.3

MOVEMENT SUMMARY

Site: [Marmion Ave & Rd 1 - 2033 - Sat (Site Folder: 2033 + Development)]

Network: N101 [Sat (Network Folder: 2033 +Development)]

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Marmion Ave (SE)														
2	T1	1008	10.0	1008	10.0	0.283	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		1008	10.0	1008	10.0	0.283	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.8
NorthWest: Marmion Ave (NW)														
7	L2	146	2.0	146	2.0	0.080	7.5	LOS A	0.0	0.0	0.00	0.64	0.00	40.9
8	T1	752	16.9	752	16.9	0.226	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		898	14.5	898	14.5	0.226	1.2	NA	0.0	0.0	0.00	0.11	0.00	53.0
All Vehicles		1906	12.1	1906	12.1	0.283	0.6	NA	0.0	0.0	0.00	0.05	0.00	57.4

MOVEMENT SUMMARY

Site: [Peony Blvd & Internal Rd - 2033 - Sat (Site Folder: 2033 + Development)]

Network: N101 [Sat (Network Folder: 2033 +Development)]

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
NorthEast: Peony Blvd (NE)														
2	T1	287	2.0	287	2.0	0.336	0.8	LOS A	0.7	5.3	0.20	0.09	0.21	34.5
3	R2	48	2.0	48	2.0	0.336	5.7	LOS A	0.7	5.3	0.20	0.09	0.21	24.4
Approach		336	2.0	336	2.0	0.336	1.5	NA	0.7	5.3	0.20	0.09	0.21	29.8
NorthWest: Internal Rd (NW)														
4	L2	52	2.0	52	2.0	0.689	7.5	LOS A	3.3	24.7	0.64	1.18	1.30	15.2
6	R2	197	2.0	197	2.0	0.689	12.8	LOS B	3.3	24.7	0.64	1.18	1.30	13.5
Approach		248	2.0	248	2.0	0.689	11.7	LOS B	3.3	24.7	0.64	1.18	1.30	13.9
SouthWest: Peony Blvd (SW)														
7	L2	97	2.0	97	2.0	0.056	4.3	LOS A	0.0	0.0	0.00	0.53	0.00	36.4
8	T1	355	2.0	355	2.0	0.176	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		452	2.0	452	2.0	0.176	0.9	NA	0.0	0.0	0.00	0.11	0.00	44.4
All Vehicles		1036	2.0	1036	2.0	0.689	3.7	NA	3.3	24.7	0.22	0.36	0.38	24.9