

FABCOT

PROPOSED WOOLWORTHS SUPERMARKET  
MARMION AVENUE / NEERABUP ROAD, MINDARIE  
TRAFFIC AND PARKING ASSESSMENT

March 2021



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## 1. EXECUTIVE SUMMARY

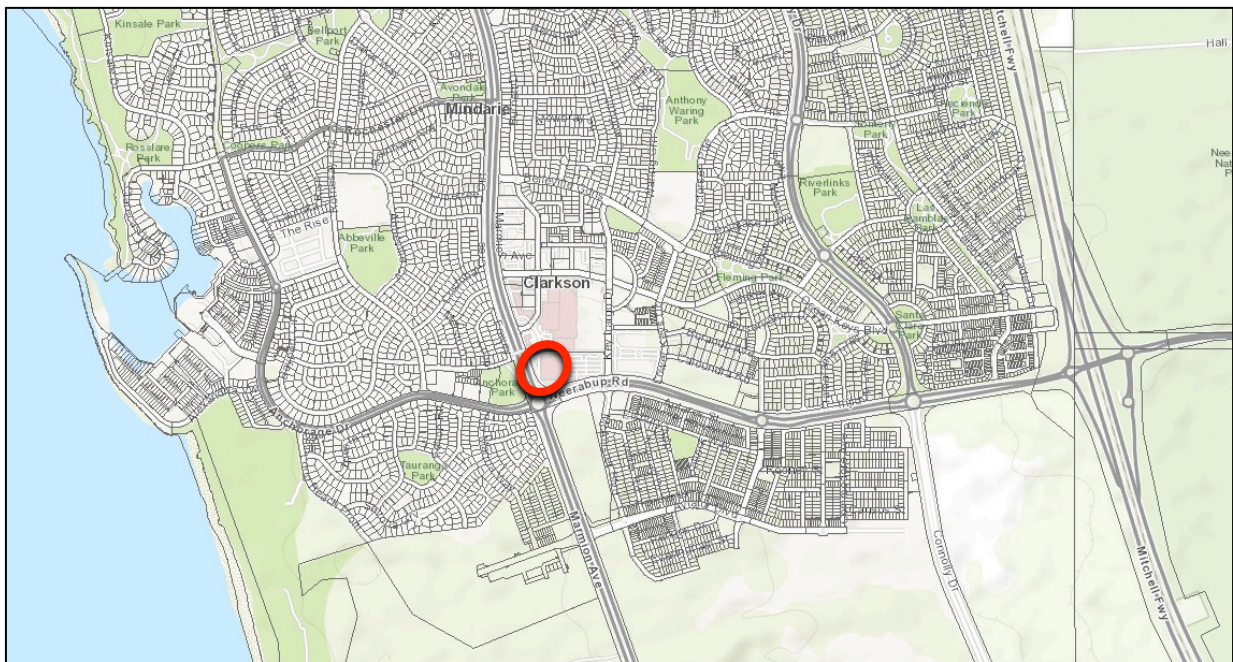
- 1.1. Riley Consulting has been commissioned by Fabcot Pty Ltd to prepare a traffic report for a proposed Woolworth's supermarket with liquor store and speciality retail at 19 Neerabup Road, Clarkson (Mindarie). The key findings of the traffic review are:
  - 1.1.1. The proposed development of a Woolworths supermarket on the subject site will replace an existing Woolworths supermarket located to the southern end of the Ocean Keys Shopping Centre. The entrances of the two stores are in the order of 100 metres apart.
  - 1.1.2. As the car parks share the same access roads, the proposed store will re-distribute traffic accessing the existing store. Based on the *RTA Guide to Traffic Generating Developments*, the proposed store could increase local traffic by 1,313 movements per day. During the Thursday evening peak an additional 128 vehicle movements are forecast.
  - 1.1.3. The forecast traffic generation has an increase of less than 10% to the affected surrounding road network capacity and under the *WAPC Transport Assessment Guidelines for Developments*, the development would be deemed to have no material traffic impact.
  - 1.1.4. Under the WAPC guidelines, local intersections are not materially affected based on the forecast traffic increases to road approaches and turning lanes.
  - 1.1.5. Assessment of the proposed access to the site indicates that acceptable Levels of Service can be expected during peak periods of site activity.
  - 1.1.6. Analysis of the surrounding road network indicates that adequate capacity exists to accommodate the proposed development. All affected intersections are shown to continue to operate in an acceptable manner.
  - 1.1.7. Appropriate car parking is provided for the proposed development.

## 2. CHECKLIST

ITEM	PROVIDED	COMMENTS/PROPOSALS
Summary	✓	
Introduction/Background	✓	
name of applicant and consultant	✓	
development location and context	✓	
brief description of development proposal	✓	
background information	✓	
Existing situation	✓	
existing site uses (if any)	✓	
existing parking and demand (if appropriate)		N/A
existing access arrangements	✓	
existing site traffic	✓	
surrounding land uses	✓	
surrounding road network	✓	
traffic management on frontage roads	✓	
traffic flows on surrounding roads (usually AM and PM peak hours)	✓	
traffic flows at major intersections (usually AM and PM peak hours)	✓	Thursday PM
operation of surrounding intersections		No material change
existing pedestrian/cycle networks	✓	
existing public transport services	✓	
crash data	✓	
<b>Development proposal</b>	✓	
proposed land uses	✓	
table of land uses and quantities	✓	
access arrangements	✓	
parking provision	✓	
end of trip facilities	✓	
intersection layouts and controls	✓	
pedestrian/cycle networks and crossing facilities	✓	
public transport services	✓	
<b>Integration with surrounding area</b>	✓	
surrounding major attractors/ generators	✓	
committed developments and transport proposals	✓	
proposed changes to land uses within 1200 metres	✓	
adequacy of existing transport networks	✓	
deficiencies in existing transport networks	✓	
remedial measures to address deficiencies	✓	
<b>Analysis of transport networks</b>	✓	
assessment years	✓	
time periods	✓	
development generated traffic and distribution	✓	
parking supply and demand	✓	
base and 'with development' traffic flows	✓	
analysis of development accesses impact on surrounding roads impact on intersections	✓	
road safety	✓	
public transport access	✓	
pedestrian / cycle access/amenity	✓	
<b>Conclusions</b>	✓	

### 3. THE SITE AND SURROUNDING ROAD NETWORK

- 3.1. Riley Consulting has been commissioned by Fabcot to consider the traffic and transport impacts of developing a Woolworth's supermarket on the corner of Marmion Avenue and Neerabup Road, Mindarie.
- 3.2. Figure 1 indicatively shows the site location.



**Figure 1 Site Location (PlanWA)**

- 3.3. The subject site is located at 19 Neerabup Road, Clarkson. The subject site is the corner lot between Marmion Avenue and Neerabup Road.
- 3.4. The site was previously occupied by a Bunning's warehouse, which relocated further east on Neerabup Road.
- 3.5. Roads of importance to the proposed development are discussed below.

#### **Marmion Avenue**

- 3.6. Marmion Avenue is classified as a distributor type A road in the Main Roads *Functional Road Hierarchy*. It is constructed as a four lane divided road for the majority of its length. It has a posted speed limit of 80kph.
- 3.7. Traffic data available on the Main Roads web site indicates 22,935 vehicles per day (vpd) to the north of Neerabup Road and 23,896vpd south of Portofino Promenade. The data is attached at Appendix A. During the weekday, MRWA traffic data indicate 1,878 vehicles in the evening peak compared to the weekend peak of 1,729 vehicles.

3.8. Reference to Appendix B indicates Marmion Avenue would be considered to have capacity for 40,500vpd operating at Level of Service D. Higher traffic demands would be possible, but are undesirable.

3.9. Footpaths are provided to both sides of Marmion Avenue.

#### **Neerabup Road**

3.10. Neerabup Road is classified as a distributor type A road in the Main Roads *Functional Road Hierarchy*. It is constructed as a four lane divided road and provides access between Marmion Avenue and the Mitchell Freeway. It has a posted speed limit of 70kph.

3.11. Traffic data on the Main Roads website shows 18,295vd west of Marmion Avenue. The data is attached at Appendix A.

3.12. Traffic signals control the intersection of Key Largo Drive / McAlister Boulevard.

3.13. Neerabup Road would also have capacity to carry 40,500vpd operating at Level of Service D.

3.14. Footpaths are provided to both sides of Neerabup Road.

#### **Key Largo Drive**

3.15. Key Largo Drive is classified as a local distributor road in the Main Roads *Functional Road Hierarchy*. It is constructed with a single pavement comprising two traffic lanes, with an additional southbound lane approaching the traffic signals at Neerabup Road.

3.16. Traffic data extracted from the MRWA traffic signal loops at Neerabup Road indicates a demand of about 10,500vpd. As a single carriageway road it would have capacity to carry 13,500vpd at Level of Service D (Appendix B).

3.17. Key Largo Drive provides the main southern entry to the Ocean Keys shopping centre.

3.18. A footpath is provided to the western side of Key Largo Drive (adjacent to the subject site).

#### **Pensacola Terrace (Northern Access Lane)**

3.19. Pensacola Terrace is classified as a local distributor in the Main Roads *Functional Road Hierarchy*. It is constructed with a single pavement of approximately 7.2 metres. It has a posted speed limit of 50kph.

3.20. Pensacola Terrace provides access to and from Marmion Avenue to the south side of the Ocean Keys shopping centre and links to Key Largo Boulevard. Movements at Marmion Avenue are restricted to left in / left out.

3.21. A roundabout controls is intersection with the northern access road linking back to Key Largo Drive and provides access to the shopping centre car parks and the subject site.

- 3.22. No traffic data is available for Pensacola Terrace. A peak hour count to the rear of the existing Woolworths store indicated 205 movements. This suggests the lane to the north of the subject site is carrying about 2,000vpd.
- 3.23. As a single lane road a capacity of 13,500vpd would be provided based on operation at Level of Service D. The spur leading to the subject site is not included in the hierarchy and is provided with a 6 metre wide pavement.

#### **Anchorage Drive**

- 3.24. Anchorage Drive is classified as a local distributor road in the Main Roads Functional Road Hierarchy. It is constructed as a four lane divided road between Marmion Avenue and Ocean Falls Boulevard. It has a posted speed limit of 60kph.
- 3.25. Traffic data available on the Main Roads web site indicates 16,749vpd to the west of Marmion Avenue (2020/21). The traffic data is attached at Appendix A.
- 3.26. Based on Appendix B it is estimated that Anchorage Drive would have capacity to carry 36,000vpd operating at Level of Service D.

#### **Crash Data**

- 3.27. Reference to MRWA crash data indicates that the roundabout at the intersection of Marmion Avenue and Neerabup Road has experienced 101 crashes in the past 5 years. The data shows that rear end crashes are most common (48.5%) with right angle movements comprising 23% of the total. Four crashes have required hospital attention and 57% of crashes have resulted in major damage. There have been no fatal crashes.
- 3.28. The intersection of Marmion Avenue / Pensacola Terrace has experienced 2 damage only crashes in the past 5 years.
- 3.29. The intersection of Neerabup Road and Key Largo Drive has experienced 42 crashes in the past 5 years. 74% of crashes are right turning movements. 3 crashes have required hospital attendance. There have been no fatalities.
- 3.30. It is hard to quantify if the proposed supermarket development would lead to an increase in crashes on the local road network. The proposed supermarket will attract patronage from the local area who are already using the local roads to access the existing store close-by. Given the increase to more localised trips, it is considered that the proposed supermarket would not be expected to impact local road safety in a detrimental manner.

#### **Other Development**

- 3.31. The subject site is one of the last land parcels available for large scale development in the local area. A Bunning's warehouse formally occupied the site.

- 3.32. In 2018 GTA prepared a structure plan traffic report for the subject land based on the development of 10,000m<sup>2</sup> of commercial land uses.
- 3.33. To the south of Neerabup Road a new residential precinct is under construction that will continue to increase local traffic demands, of which the new development will attract home-based trips.

### Public Transport

- 3.34. Reference to the Transperth web site indicates there are 2 bus services operating adjacent to the subject site. The bus service, route 474, operates along Marmion Avenue between Clarkson railway station and Joondalup town centre. It operates on an hourly basis Monday to Friday.
- 3.35. Route 481 operates on Marmion Avenue and Anchorage Drive between Clarkson railway station and Quinns Rocks. It operates on a half hourly basis during the week and hourly at weekends.
- 3.36. Figure 2 shows the local bus services.

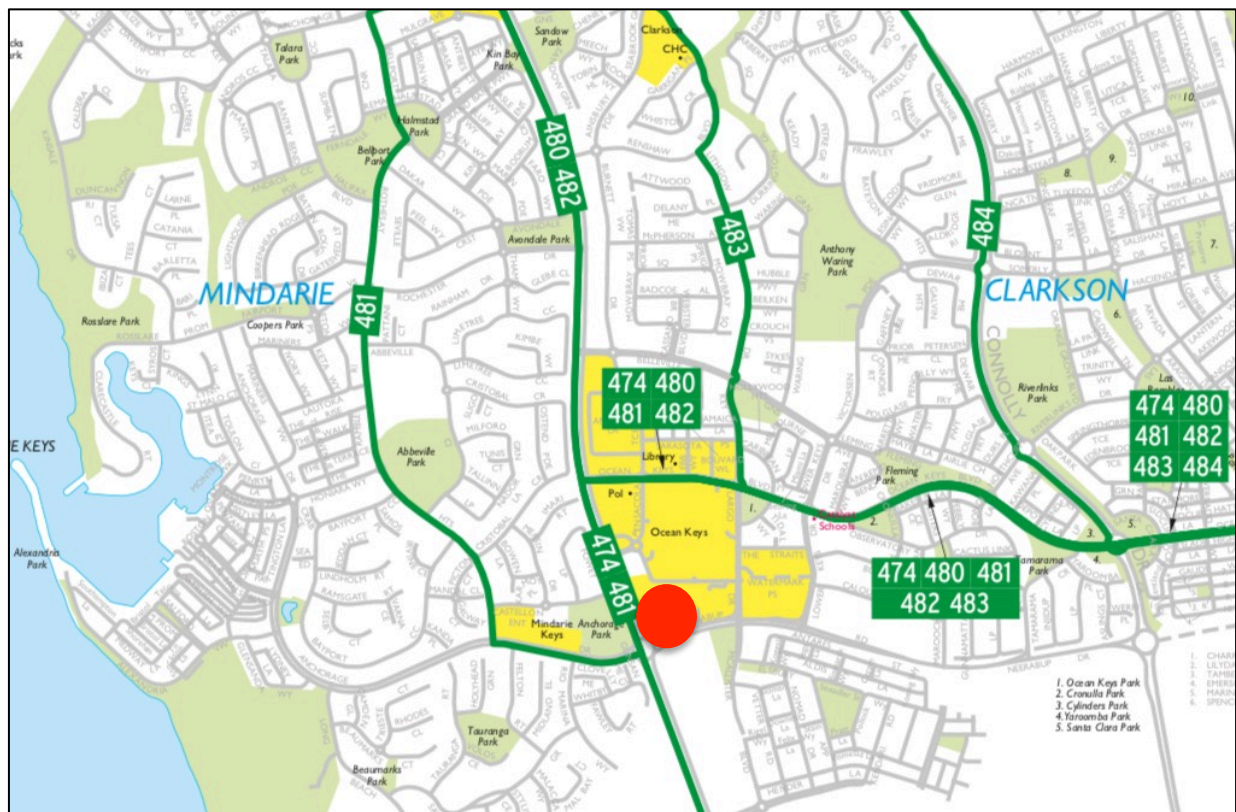


Figure 2 Local Bus Services

### Cycling

- 3.37. An acceptable cycling environment exists in the Mindarie precinct, with on-street cycle lanes provided to Marmion Avenue and Neerabup Road.



- 3.38. A cycle route is provided to the north of the subject site to access the underpass to Marmion Avenue, creating a safe link between the residential area and the Ocean Keys shopping precinct.
- 3.39. Figure 3 shows the local cycling network.



**Figure 3 Local Cycling Network**

### Changes to Surrounding Transport Networks

- 3.40. There are no changes currently proposed to the local road network that would affect the proposed development.
- 3.41. An approved development is located to the south side of Neerabup Road that will see continued residential expansion. However, the locality of Mindarie is close to full development.

### Integration with Surrounding Area

- 3.42. The site is located at the southern edge of Ocean Keys shopping centre and fits well with surrounding development.
- 3.43. The site has been previously used as a Bunning's warehouse and higher levels of traffic attraction are consistent with the previous and proposed land uses. It is calculated that the Bunning's store had a floor area of about 9,500m<sup>2</sup>.

### Assessment Years and Time Periods

- 3.44. The proposed development is considered for the year of opening.
- 3.45. Shopping centres traditionally experience peak demand on Thursday evenings between 5pm and 6pm and Saturday mornings between 11am and 12pm.
- 3.46. Reference to local traffic data indicates that Marmion Avenue and Neerabup Road experience peak demands between 3pm and 4pm during the week and

12pm to 1pm at the weekend. It can be seen that the road network peak does not coincide with the peak demand of the proposed development.

- 3.47. However, reference to Ocean Keys Boulevard traffic signals data suggests the town centre peaks between 5pm and 6pm on a Thursday and then 1pm to 2pm on a Saturday. However, traffic demands on the surrounding road network are approximately 10% lower during the Saturday peak suggesting that acceptable operation during the Thursday PM peak will equate to acceptable operation during the Saturday peak.
- 3.48. For the purpose of traffic assessment the Thursday evening peak between 4pm and 5pm is used, as local road network traffic demands are slightly higher than the 5pm-6pm peak of the proposed development.
- 3.49. As the proposed development is a relocation of an existing adjacent supermarket, long term planning horizon assessment is not considered to be necessary.

#### **4. THE PROPOSED DEVELOPMENT**

- 4.1. It is proposed to develop the site to provide a Woolworths supermarket, a liquor store and speciality retail opportunity. In total a gross floor area of 5,663m<sup>2</sup> is expected. At grade parking is to be provided with access to Neerabup Road and the northern service lane.
- 4.2. It is noted that the site plan indicates pad sites fronting Key Largo Boulevard and the northern access lane. The pad sites are indicative of possible future uses, but do not form part of the development application.
- 4.3. Figure 4 shows the indicative concept plan for the site. Refer to the development application plans for detail.



RETAIL TENANCY BREAKDOWN	
TENANCY 1	600 m <sup>2</sup>
TENANCY 2	61 m <sup>2</sup>
TENANCY 3	71 m <sup>2</sup>
TENANCY 4	71 m <sup>2</sup>
TENANCY 5	71 m <sup>2</sup>
TENANCY 6	71 m <sup>2</sup>
TENANCY 7	71 m <sup>2</sup>
TOTAL	2068 m <sup>2</sup>

SITE DESCRIPTION	
CENTRE SITE AREA	2308 m <sup>2</sup>
PAD SITE A	2485 m <sup>2</sup>
PAD SITE B	1000 m <sup>2</sup>
PAD SITE C	1940 m <sup>2</sup>
PAD SITE D	1000 m <sup>2</sup>
TOTAL SITE AREA	2994 m <sup>2</sup>

AREA SCHEDULE - OTHER	
AVENUE MALL	2485 m <sup>2</sup>
CENTRE AREAS	71 m <sup>2</sup>
WON'T PAID ROOM	100 m <sup>2</sup>
CENTRE SHAWER	100 m <sup>2</sup>

CAR PARKING SCHEDULE	
STANDARD PARKING	231

Figure 4 Site Layout Extract (refer to DA Plans)

## 5. TRAFFIC GENERATION AND DISTRIBUTION

- 5.1. The proposed development will relocate an existing Woolworths supermarket in Ocean Keys shopping centre to an adjacent site formally occupied by a Bunning's warehouse.
- 5.2. It would be normal in a traffic assessment to remove the previous use traffic generation of the site prior to distributing the traffic generated by the proposed development. However, in this instance, the old use of the site ceased many years ago and the use relocated further east on Neerabup Road. Therefore the previous use traffic is still on the local road network.
- 5.3. As the development will relocate an existing supermarket, it is appropriate to consider the existing supermarket traffic on the surrounding road network. However, it could be argued that the relocation of the store would actually have no traffic increase as customers are on the road network accessing the site next door. The relocation would only result in a redistribution of traffic on the network to the new access and egress points.
- 5.4. For the purpose of this traffic study, the existing supermarket floor area is used to identify the expected existing traffic demands and the new store floor area is used to identify what traffic increase could be anticipated. The difference between the two floor areas is distributed over the local road network to identify any potential traffic impacts.

### Existing Supermarket

- 5.5. The Woolworths supermarket in the Ocean Keys shopping centre has a floor area of 3,647m<sup>2</sup> and has a primary access from a car park situated off Pensacola Terrace and a rooftop car park accessed from the northern lane (to the subject site). It is anticipated that the majority of shoppers to Woolworths will use these access points during peak trading periods.

### Trip Rates

- 5.6. For the purpose of the traffic assessment, reference is made to the RTA (NSW) *Guide to Traffic Generating Developments* (RTA Guide). Whilst the guide is now old (2002) and is not reflective of current trading, it is perhaps still the most reliable source for mixed uses within an Australian shopping centre.
- 5.7. The formula within the guide is used to identify the peak hour shopping centre trip rates for the various land uses to assist an understanding of how traffic demands can be expected to change. The model suggest:
  - Thursday  $V=155(\text{supermarket}) + 46 (\text{speciality}) / 1,000\text{m}^2 \text{ GLFA}$
  - Saturday  $V=147 (\text{supermarket}) + 108 (\text{speciality}) / 1,000\text{m}^2 \text{ GLFA}$
  - Daily  $V=1475 (\text{supermarket}) + 555 (\text{speciality}) / 1,000\text{m}^2 \text{ GLFA}$

- 5.8. The RTA Guide advises that generation rates given are based on (GFLA) which provides a better indication of trip generation than gross floor area. As a general guide, the RTA advises that 100m<sup>2</sup> gross floor area equals 75m<sup>2</sup> gross leasable floor area. These factors are applied to the Gross Floor Areas advised by the architect.

### Existing Store

- 5.9. The existing store has a gross floor area of 3,647m<sup>2</sup> which equates to an area of 2,735m<sup>2</sup> GLFA. Based on the RTA model the existing supermarket would be expected to generate:

Thursday PM peak	424 trips
Saturday Peak	402 trips
Daily	4,034 trips

### Proposed Development

- 5.10. The proposed development will comprise of a Woolworths supermarket with a liquor store, speciality outlets and a cafe. The gross floor areas are as follows:

• Supermarket	3,814m <sup>2</sup>
• Liquor Store	599m <sup>2</sup> (inc BoH)
• Tenancies	1,117m <sup>2</sup>
• Total net area	5,663m <sup>2</sup>

- 5.11. As applied to the existing store, the gross floor areas are factored to reflect the GLFA. The liquor store is considered as supermarket floor area, which will tend to over estimate the potential traffic attraction (particularly when 200m<sup>2</sup> is a store room). The derived RTA GLFA floor areas for the purpose of trip generation are; Supermarket (food and liquor) 3,309m<sup>2</sup> Speciality 837m<sup>2</sup>. Applying the RTA formula indicates the following traffic generation:

• Thursday PM peak	552 trips
• Saturday Peak	576 trips
• Daily	5,347 trips

### Pass-by Trade

- 5.12. Reference to Austroads suggests that a supermarket / shopping centre can attract 50% of patronage from traffic already passing the site.
- 5.13. In regard to the proposed development, it is feasible that all traffic is already passing the site accessing the existing store and other local stores, as the local area is an expanding residential precinct.
- 5.14. Structure planning of new residential areas would have forecast appropriate trips to the town centre.

- 5.15. For the purpose of this traffic report, no pass-by trips are assumed and the difference in traffic between the existing store and the new store will be assumed as new trips.

#### **Resultant Traffic Generation**

- 5.16. Table 1 shows the forecast traffic generation of the proposed development and the resulting new trips that could access the local road network.

**Table 1 Forecast Traffic Generation**

<b>Land Use</b>	<b>Daily trips</b>	<b>PM Peak</b>	<b>Saturday peak</b>
Existing Supermarket	4,034	424	402
Development	5,347	552	576
<b>New Trips</b>	<b>+1,313</b>	<b>+128</b>	<b>+174</b>

#### **Distribution and Assignment**

- 5.17. Traffic attracted to the proposed supermarket will be drawn from the surrounding residential dwellings and from traffic using the Mitchell Freeway during the peaks.
- 5.18. As discussed, a Woolworths store is located to the north side of the northern access road and assessment of the traffic using that store and the existing peak traffic movements associated with Ocean Keys shopping centre has been undertaken.
- 5.19. Based on the data available, Table 2 shows the derived peak hour distribution. The assumptions have been applied to the existing store and the new store to determine the expected traffic increases to the surrounding road network.

**Table 2 Distribution Assumptions (Peak Hours)**

<b>Peak</b>	<b>Movement</b>	<b>North</b>	<b>South</b>	<b>East</b>	<b>West</b>
Thursday	Arrive	36%	20%	31%	13%
	Depart	52%	6%	28%	14%
Saturday	Arrive	43%	20%	31%	6%
	Depart	52%	1%	28%	19%
<b>Average</b>		<b>46%</b>	<b>12%</b>	<b>30%</b>	<b>13%</b>

## 6. DAILY TRAFFIC IMPACT

- 6.1. Reference to the WAPC Transport Assessment Guidelines for Developments - (Volume 4) states that:

*“where a traffic increase as a result of a proposed development is less than 10% of current road capacity, it would not normally have a material impact”.*

- 6.2. Table 1 shows the expected traffic increase as a result of the existing store relocating to the new site. In total it is calculated that the new store will generate an additional 1,313 vehicle movements per day to the surrounding road network.
- 6.3. Table 3 provides an assessment of the impact that the forecast traffic increases may have. The forecast is based on the impact to the roads operational capacity at Level of Service D. In reality the actual capacity is as shown in Appendix B for a Level of Service F.

**Table 3 Daily Increases to Local Road Network**

Road	Increase	Capacity	% Capacity
Marmion Avenue north	341	40,500	0.84%
Marmion Avenue south	105	40,500	0.26%
Anchorage Drive	171	40,500	0.42%
Neerabup Road	420	40,500	1.04%
Key Largo Drive	263	13,500	1.94%

The increase of 13 vehicles to McAlister Boulevard is not shown above as structure planning will have accounted for shopping trips on this link.

- 6.4. It can be seen from Table 3 that the traffic increases to the surrounding road network are less than 10% of the capacity at a Level of Service D and therefore would be considered to have no material traffic impact based on the WAPC *Transport Assessment Guidelines for Developments*.
- 6.5. It is concluded that from a daily traffic flow perspective the proposed development can be accommodated by the local road network.

## 7. PEAK HOUR IMPACT

- 7.1. The assessment of the proposed development is shown to have little material traffic impact based on the change to daily traffic flows when measured against the WAPC guidelines.
- 7.2. During the peak periods of development activity, some impacts may occur to local intersections.

- 7.3. Reference to the WAPC *Transport Assessment Guidelines for Developments - (Volume 4)* states that the traffic assessment should cover “*all intersections where flows on any leg would increase by 10 per cent, or any movement by 20 per cent.*”
- 7.4. Traffic demand plans have been created to distribute the peak hour movements of the existing store and the proposed new store. The plans have been used to identify the expected change to turning movements at affected intersections. The forecast changes are shown in Appendix D for the Thursday and Saturday peaks.
- 7.5. The largest change to traffic demands is the increase to vehicles entering the store from Neerabup Road as would be expected. Changes to existing intersection approaches and turning movements are considered in Table 4 below and are shown in Appendix D. The table considers the highest change in any traffic movement.

**Table 4 Peak Intersection Changes**

Approach	Increase	Flow	% Change
Neerabup Rd Eastbound	+80	811	9.8%
Key Largo Drive northbound	+17	395	4.3%
Marmion Avenue Northbound	+15	1,480	<1%
Ocean Keys Boulevard	+13	557	2.3%

- 7.6. Table 4 demonstrates that no movement is forecast to experience an increase of more than 10% of the current peak hour flow and no turn movement changes by more than 20%. Therefore no further assessment is required under the WAPC guidelines.
- 7.7. Whilst no assessment is required under the WAPC assessment guidelines, Sidra analysis of the Neerabup Road / Key Largo Drive intersection is undertaken to ensure that intersection will continue to operate in an appropriate manner.
- 7.8. Sidra network has been used to consider the existing operation and the operation with the proposed development for the Thursday evening peak. Appendix E shows the Level of Service plans for the existing and with development scenarios.
- 7.9. Appendix E indicates that the only change will be to Key Largo Drive, which is shown to reduce from LoS D to LoS E. In reality the Sidra model shows that an increase in delay of about 10 seconds occurs to this approach, which changes



the LoS (noting that RTA LoS criteria would retain LoS D). The movement summary is included in Appendix D.

- 7.10. Assessment of possible signal phasing changes indicates that the approach Levels of Service could be maintained. However, as Mindarie is still expanding to the south with new residential development, it can be expected that future changes to the traffic signals will be required regardless of the subject site development.

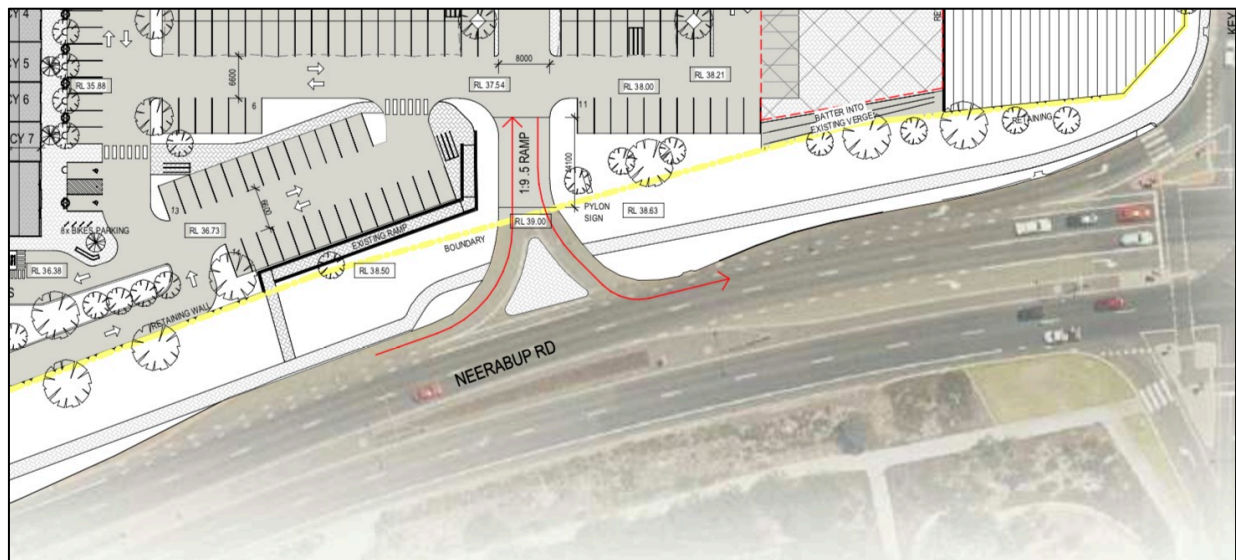
## **8. LONG-TERM ASSESSMENT**

- 8.1. As the proposed development is shown to have no material traffic impact, it is considered that no long-term assessment is required.
- 8.2. It is noted that the proposed development of a Woolworths supermarket and speciality retail will replace an existing Woolworths supermarket within the Ocean Keys shopping centre. As a result, a new tenant for the vacant floor area in the shopping centre will be sought.
- 8.3. At this time it is speculation as to the future tenant, however, given that both major food retailers are represented in the locality, it is unlikely that a food retailer would lease the site. On this basis, a lesser traffic generating land use such as a discount or department store type land use is perhaps most likely.
- 8.4. Reference to the RTA guide suggests that during the peak periods, land uses such as discount and speciality stores generate about 70% less traffic than a supermarket. A department store is indicated to generate about 87% less traffic than a supermarket.
- 8.5. It is speculated that should a discount type store (such as target) occupy the old Woolworths store site, the level of new traffic, particularly in the peak hour, would be minimal. With major outlets already present in the shopping centre, a new outlet will attract a significant level of reciprocal attraction to existing stores. It is also noted that residential development is not completed and additional traffic attraction will be occurring over the coming years regardless of any land use changes.

## **9. ACCESS**

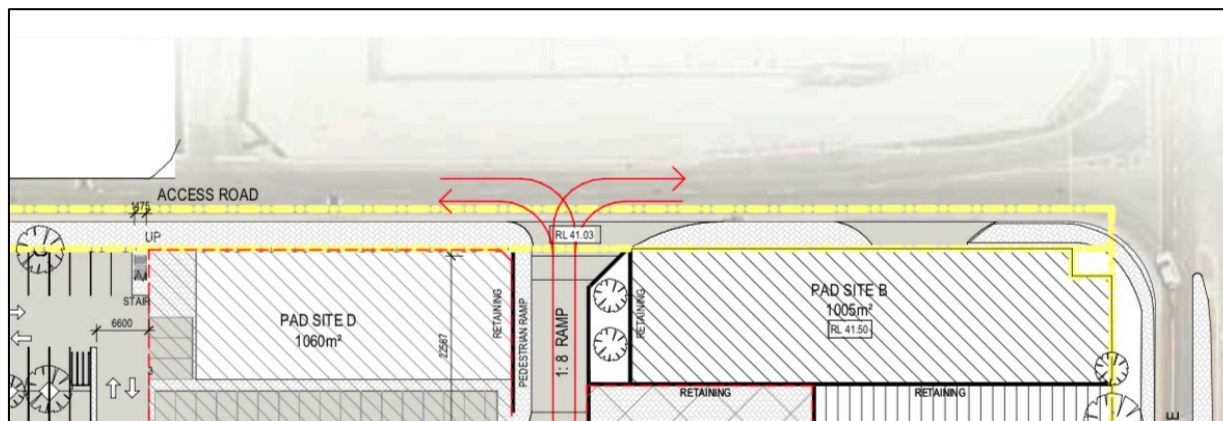
- 9.1. Access to the proposed store will be taken using the existing cross over to Neerabup Road and relocating the existing crossover to the northern lane and providing an additional cross over to the northern lane at its western end.

- 9.2. The access to Neerabup Road is restricted to left-in /left-out movements and was created for the previous use of the site (Bunning's). The access is appropriately located in regard to separation to Marmion Avenue and Key Largo Drive. An existing left turn slip lane is provided for the access and a median splitter island to prohibit right turn movements. Analysis of the access indicates that Level of Service A is provided to all traffic movements (refer Appendix D Sidra network plan).
- 9.3. Access to Neerabup Road is shown in Figure 5.



**Figure 5 Access to Neerabup Road**

- 9.4. Access to the northern lane will create a new straight access approach to the northern lane. The access is being located approximately 70 metres west of Key Largo Drive and will provide far greater separation than the existing access. Further, the existing tight bends on the access will be removed to provide safer entry and exit to the subject site. The proposed access will be located about 15m west of the shopping centre service yard access and is in accordance with AS2890.1.
- 9.5. Analysis of the access to the lane indicates that during peak periods Level of Service A is provided to all movements. No interaction with Key Largo Boulevard is shown to occur refer Appendix D Sidra network plan).
- 9.6. The access is shown in Figure 6.



**Figure 6 Access the Northern Lane**

9.7. A new access to the northern access lane is proposed adjacent to the service area access. The access will provide convenient access to and from Marmion Avenue and is in close proximity to the existing Woolworths basement car park. The access location is convenient for shopping centre customers to access the Woolworths car park.

9.8. Visibility in accordance with AS2890.1 is provided at all access locations.

#### **Service Vehicle Access**

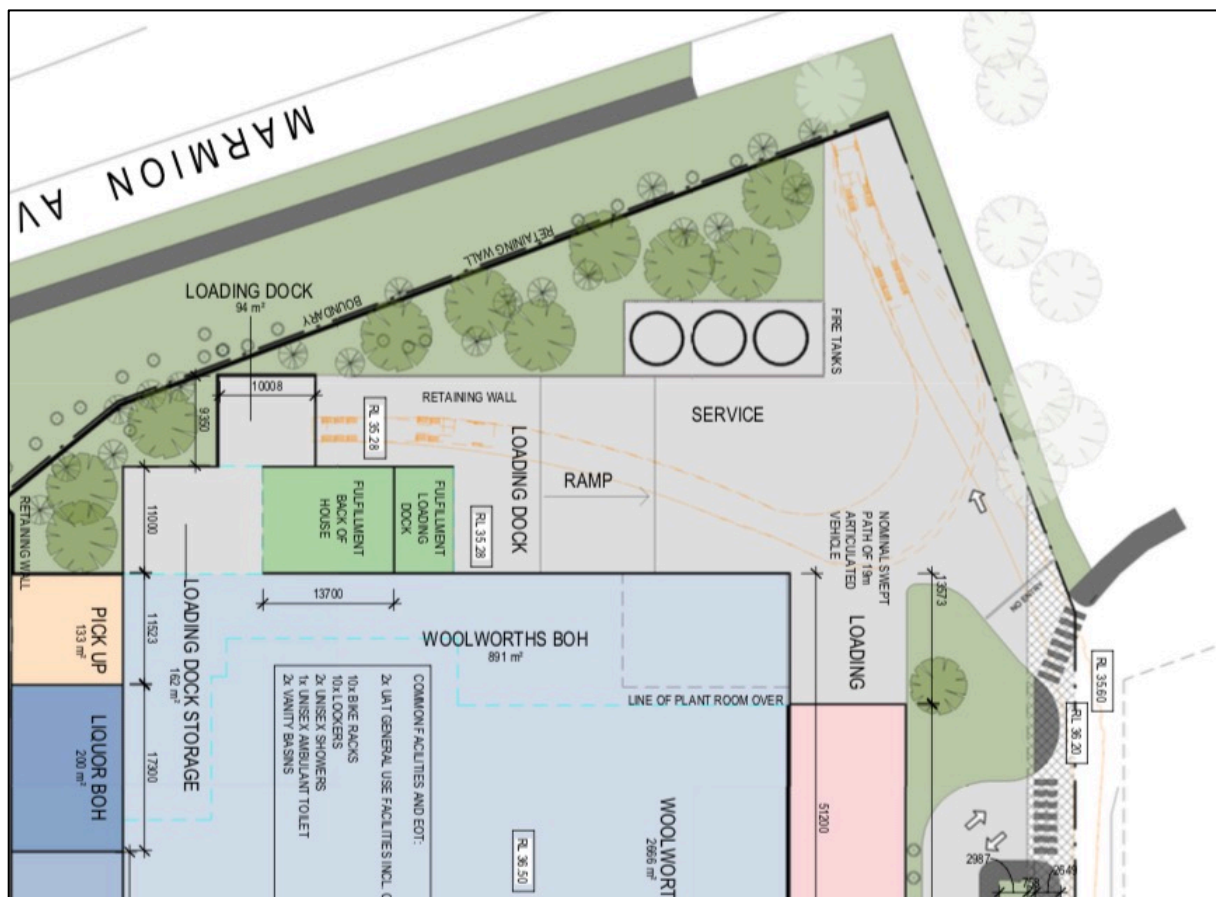
9.9. Service vehicles will access the loading dock located to the west side of the proposed store. The dock can be accessed from the northern lane either from Marmion Avenue (Pensacola Terrace) or Key Largo Drive.

9.10. It is expected that at least one 19 metre articulated vehicle and about 10 rigid vehicles will access the site each day (up to 12 metres). During holiday periods up to 3 articulated vehicles may need to access the site during the day. It is expected that the number of deliveries will be slightly higher than the existing store located to the opposite side of the lane due to the additional tenancies co-located on the site.

9.11. The loading dock is located off the northern access lane, opposite the existing Woolworths store loading dock. The access roads to the loading dock are already in use by 19 metre articulated vehicles for the existing Woolworths and were used by the previous use of the site (Bunning's). No swept path assessment of the external road network is therefore considered to be required.

9.12. Assessment of the internal loading area indicates ample room for vehicles to enter the site and access the loading dock, then leave in forward gear. Figure 8 shows the delivery vehicle turn paths.

9.13. Access to the subject site can be achieved in an appropriate manner.



**Figure 8 Delivery Vehicle Swept Path**

**10. PARKING**

- 10.1. Car parking for the proposed new store is required to meet the City of Wanneroo’s Town Planning Scheme, which requires that a shopping centre (<10,000m<sup>2</sup> NLA) should provide 7 bays for every 100m<sup>2</sup> NLA.
- 10.2. Based on the architects plans, the derived NLA floor areas are;
 

Supermarket (food 2,666 and liquor 599)	3,265m <sup>2</sup> (@7 /100)	228.5
Speciality	1,021m <sup>2</sup> (@7/100)	71.47
Café	96m <sup>2</sup> (80 persons @ 1 /4)	20
- 10.3. Based on the derived NLA it can be derived that the proposed development would require (319.9) 320 bays to comply.
- 10.4. Reference to the architects plan for the site shows that 291 parking bays are provided on-site, comprising ;271 standard bays, 6 powered bays, 7 parent bays and 7 pick up bays.
- 10.5. The number of car parking bays provided on site falls short of the requirements of the City of Wanneroo’s Town Planning Scheme by 29 bays or 9% of the requirement.

- 10.6. It is understood that the City has discretion to reduce the car parking requirement and the following should assist with the justification of the number of bays provided.

#### **Justification of Lower Parking Provision**

- 10.7. It is noted that the car parking requirement is based on the NLA of each land uses and includes the 200m<sup>2</sup> back of house storage area for the proposed liquor store. The liquor back of house would require 14 bays. If this storage area is not counted, then the parking requirement reduces to 306 bays.
- 10.8. The Woolworths pick up bays provide for a turnover of customers that would normally be expected to park and shop in-store. Based on a 6 minute dwell time, each pick up bay can service 10 vehicles in each hour. The 7 pick up bays can be considered to provide 70 additional parking places during peak times of store activity. It is not unrealistic to consider that commuting customers on the freeway can pre-order (before leaving work) and collect on their way home, rather than parking and personally going into the store. It could be considered that each pick up bay is the equivalent of at least 3 standard car parking bays (assuming a minimum parking stay of 20 minutes for each bay). From a numerical perspective this could reduce the car parking requirement by 21 bays, reducing the shortfall to just (320 – 21 = 299) 9 bays.
- 10.9. As further justification for the proposed number of parking bays, reference is made to the RTA *Guide to Traffic Generating Developments*. This document is the recognised source used to determine the traffic generation of the proposed development and identifies that a shopping centre <10,000m<sup>2</sup> should aim to provide 6.1 bays per 100m<sup>2</sup> NLA. With a total NLA of 4,315m<sup>2</sup>, the Guide would recommend a minimum of 264 bays. It can be seen therefore that the 284 general purpose parking bays provided (excludes pick up bays) is greater than the recommended minimum.
- 10.10. It is considered therefore that the car parking shortfall can be supported.

#### **Car Park Layout**

- 10.11. The car has been laid out to allow easy entry from Neerabup Road and reduce the potential for car parking manoeuvres to interfere with the car park entry.
- 10.12. Access through the car park is not direct and fast movements between the accesses should not occur and thus rat-running through the car park will be minimised.
- 10.13. Access to the northern access lane has been re-align to remove the sharp bend originally constructed. The new alignment will improve capacity and visibility and as a result it can be expected to operate safer.

- 10.14. All parking bays are to be provided in accordance with AS2890.1.
- 10.15. It is to be noted that Woolworths have a policy that the car park should not include trip hazards, such as wheel stops and kerbing wherever possible. Where a wheel stop is considered to be beneficial, a bollard will be used as an alternative.

### **Cycle Parking**

- 10.16. Cycle parking is required to be provided at the rate of 1 cycle bay for every 300m<sup>2</sup> GFA for staff and 1 bay per 500m<sup>2</sup> GFA for visitors. With a floor area of 4,315m<sup>2</sup> 14 staff and 9 visitor cycle bays should be provided.
- 10.17. The Architects plan indicates that 10 staff bays are provided with end of trip facilities. A group of 8 cycle racks are provided to the north and south of the proposed building (16 racks in total) offering safe and visible customer cycle parking.
- 10.18. Whilst a small shortfall of staff cycle bays is noted, there are more than adequate visitor bays provide that can be used.

## **11. PUBLIC TRANSPORT, PEDESTRIANS AND CYCLISTS**

- 11.1. The proposed store has its frontage and pedestrian access to Neerabup Road and Pensacola Terrace. Appropriate footpaths are already provided and an underpass provides a safe crossing of Marmion Avenue.
- 11.2. As a stand-alone supermarket, it is unlikely that many customers would specifically walk to the store for groceries, but can be expected to walk between Ocean Keys shopping centre and the residential area west of Marmion Avenue. An appropriate path network is provided to the store.

### **Cycling**

- 11.3. There are cycle lanes in the locality and an underpass to Marmion Avenue that provides a safe link to the western residential area.
- 11.4. Bicycle parking is provided to the eastern side of the proposed store in proximity to the southern tenancy and the café. The cycle racks are conveniently located close to the store entry.
- 11.5. End of trip facilities and secure cycle storage are provided internally as per local government requirements. Good provision for cyclists is provided by the proposed development.

### **Public Transport**

- 11.6. As discussed, local bus routes service the locality. It is not anticipated that the proposed development would warrant the provision of additional services.

- 11.7. The proposed supermarket is ideally located for local people to undertake convenience shopping on their way home from work.

## **12. ROAD SAFETY**

- 12.1. The existing local road network is shown to be experiencing some crashes, which is not surprising given the high traffic demands. It is unlikely that any development would affect current crash levels at existing intersections, unless a significant volume occurred to an uncontrolled movement.
- 12.2. The proposed store would be attractive to local people who are cognisant of the surrounding road network. The majority of customers can be expected to already be passing the subject site using alternative facilities. It is expected that the majority of traffic to the new store will be a redistribution of existing customers using the adjacent Woolworths supermarket.
- 12.3. Given the traffic increase is more localised trips, it is considered that the proposed supermarket would not be expected to impact local road safety in a detrimental manner. Further, no material traffic impacts have been forecast.

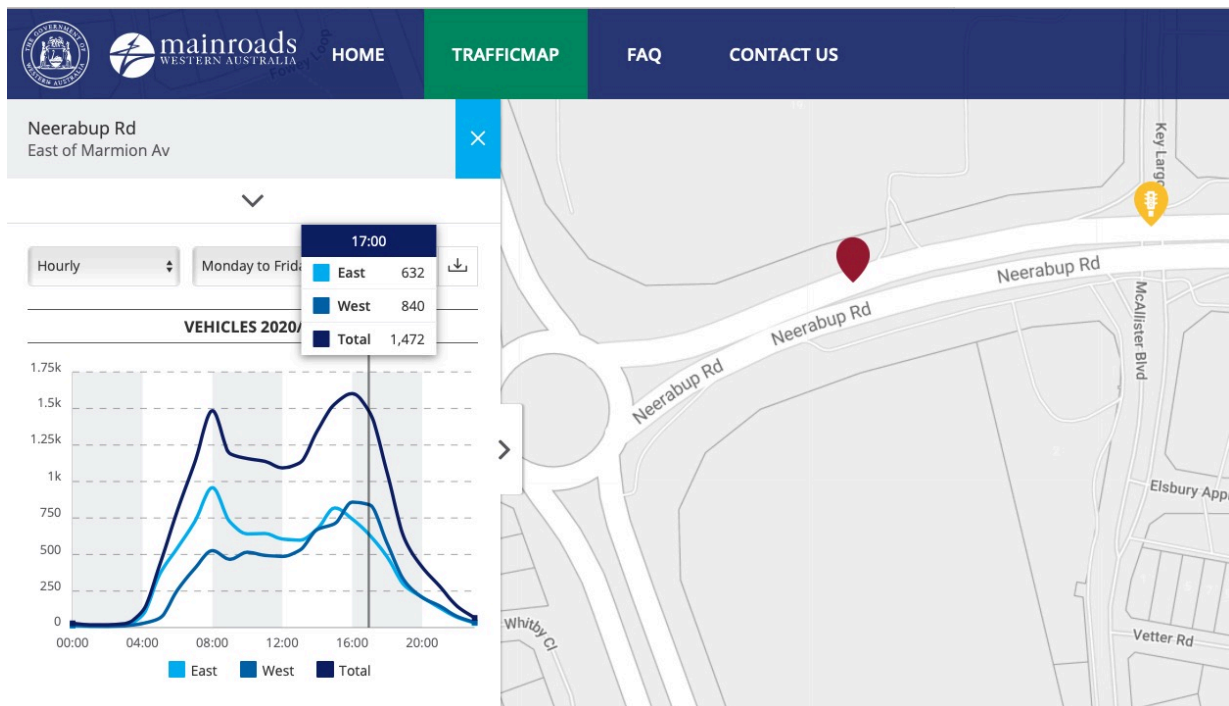
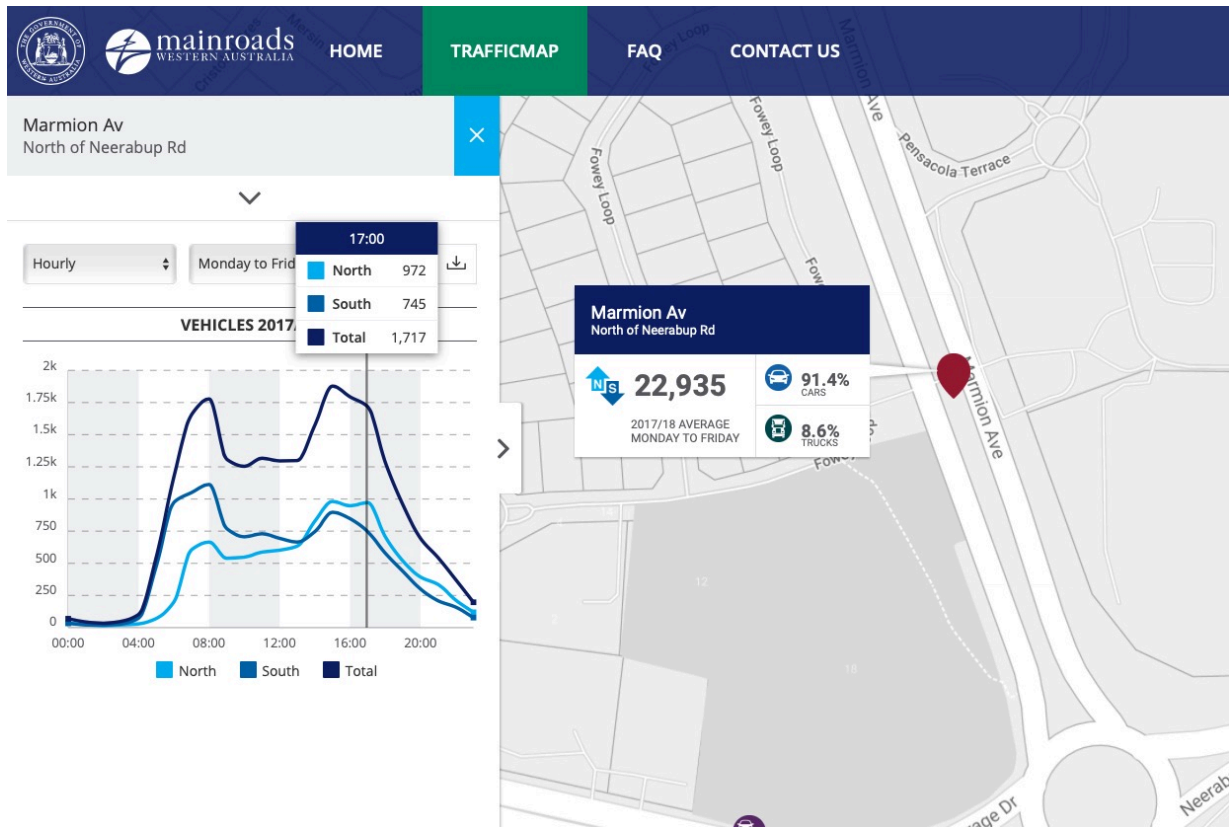
## **13. CONCLUSIONS**

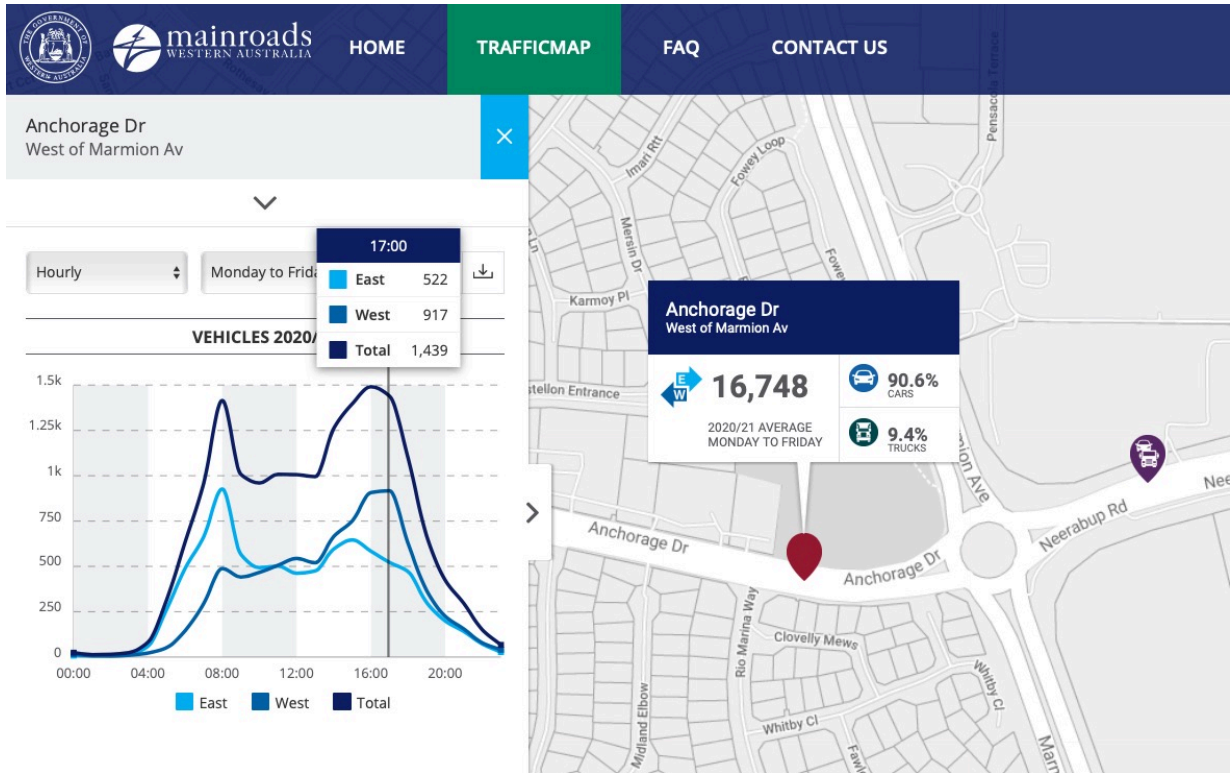
- 13.1. The proposed development of a Woolworths supermarket at the corner of Marmion Avenue and Neerabup Road will replace an existing store currently located within the Ocean Keys Shopping Centre. The existing store is adjacent to the proposed store site.
- 13.2. The traffic forecasts used in this report are based on the RTA (NSW) shopping centre data which forecasts higher traffic generation than the ITE Trip Generation manual (USA) and data provided in the WAPC Transport Assessment Guidelines. This traffic report therefore provides a very robust assessment of the potential traffic impacts that may occur.
- 13.3. It is noted that whilst this report contemplates an increase in traffic as a result of the changes in floor areas, as an established centre the traffic demands may not actually change.
- 13.4. The analysis of the forecast traffic increase indicates that, based on the WAPC guidelines, no material traffic impact is expected. Local roads and intersections are shown to experience changes to turning movements below the thresholds identified by the WAPC that would require further analysis.

- 13.5. Analysis of the Neerabup Road / Key Largo Drive intersection indicates that operation within capacity is retained and only minor increases to delay are indicated. As new development expands to the south, the traffic signals will need to be adjusted to cater for that increased demand.
- 13.6. It is concluded therefore that the local road network can accommodate the forecast traffic increases without significant detrimental impact.



## APPENDIX A TRAFFIC DATA





**APPENDIX B LEVELS OF SERVICE BY ROAD TYPE**

LOS	Single Carriageway <sup>1</sup>	2-Lane Boulevard <sup>2</sup>	Dual Carriageway (4-Lanes) <sup>3</sup>	Dual Carriageway (4-lane Clearway) <sup>3</sup>
A	2,400vpd	2,600vpd	24,000vpd	27,000vpd
B	4,800vpd	5,300vpd	28,000vpd	31,500vpd
C	7,900vpd	8,700vpd	32,000vpd	36,000vpd
D	13,500vpd	15,000vpd	36,000vpd	40,500vpd
E	22,900vpd	25,200vpd <sup>4</sup>	40,000vpd	45,000vpd
F	>22,900vpd	>25,200vpd <sup>4</sup>	>40,000vpd	>45,000vpd

<sup>1</sup> Based on Table 3.9 Austroads - Guide to Traffic Engineering Practice Part 2

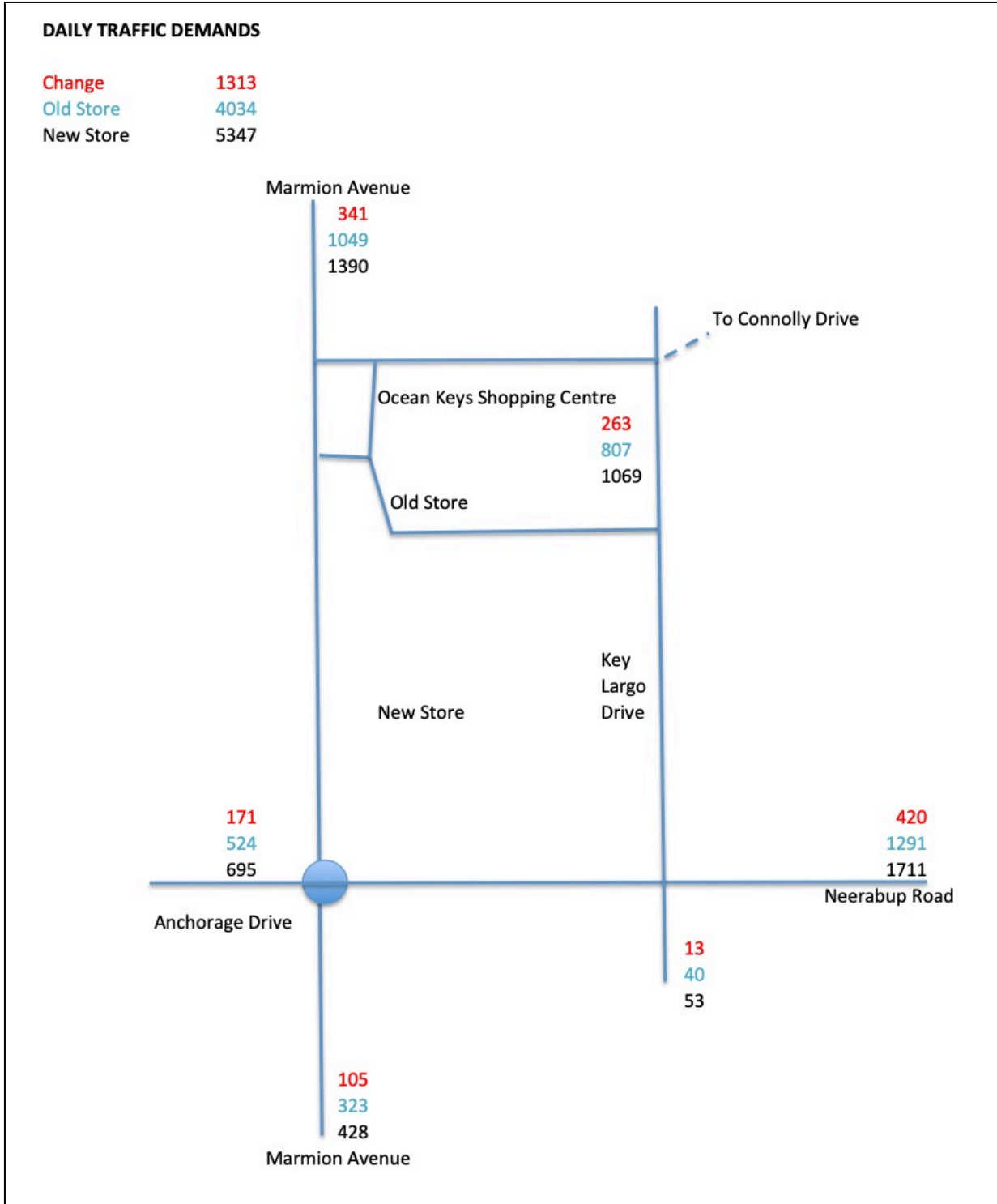
<sup>2</sup> Based on single carriageway +10% (supported by Table 3.1 Austroads - Guide to Traffic Engineering Practice Part 3) – Boulevard or division by medians.

<sup>3</sup> Based on RRR Table 3.5 - mid-block service flow rates (SF.) for urban arterial roads with interrupted flow. Using 60/40 peak split.

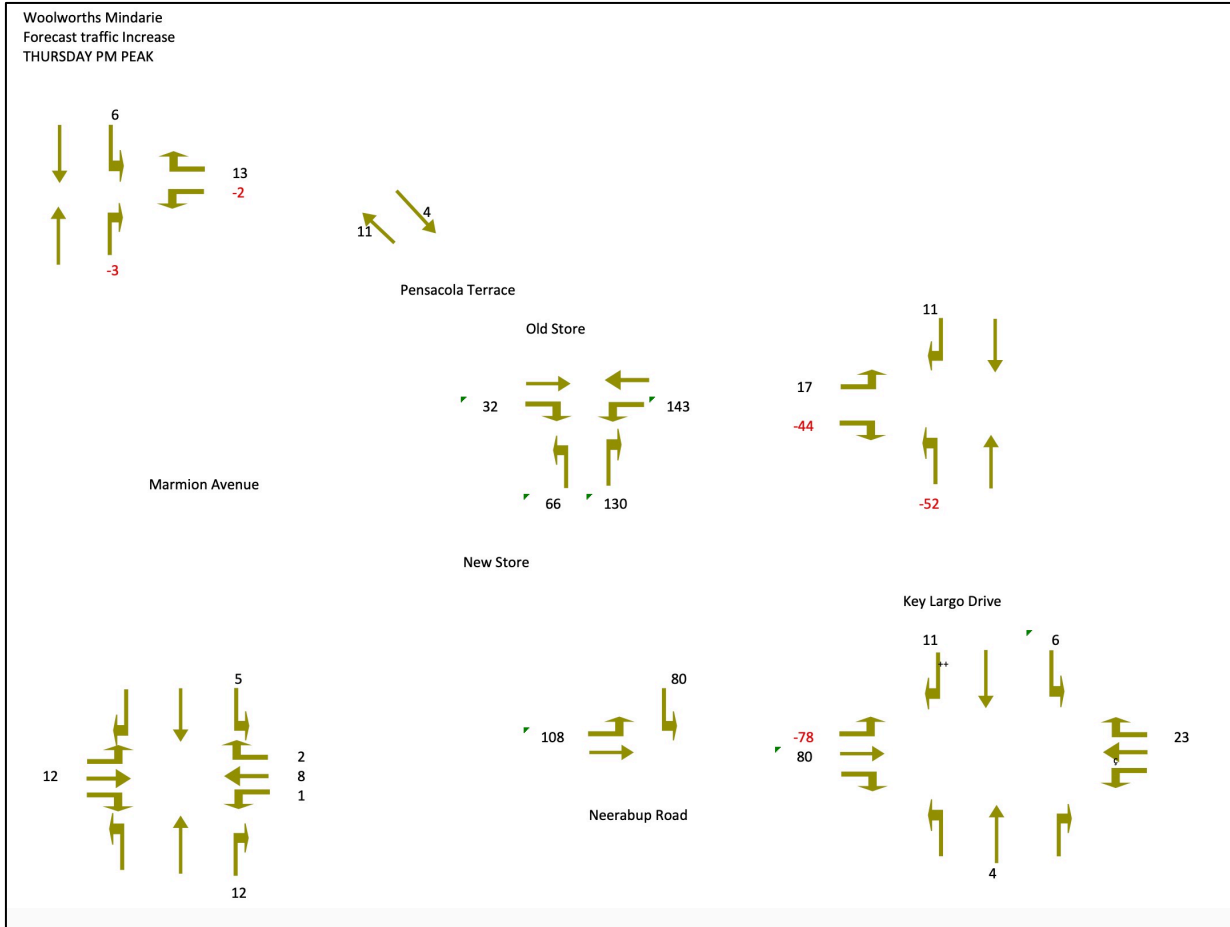
<sup>4</sup> Note James Street Guildford passes 28,000vpd.

For the purposes of planning, the capacity of a road can be taken as the value between Level of Service E and F. However, a Level of Service D is the lowest preferred operational Level of Service.

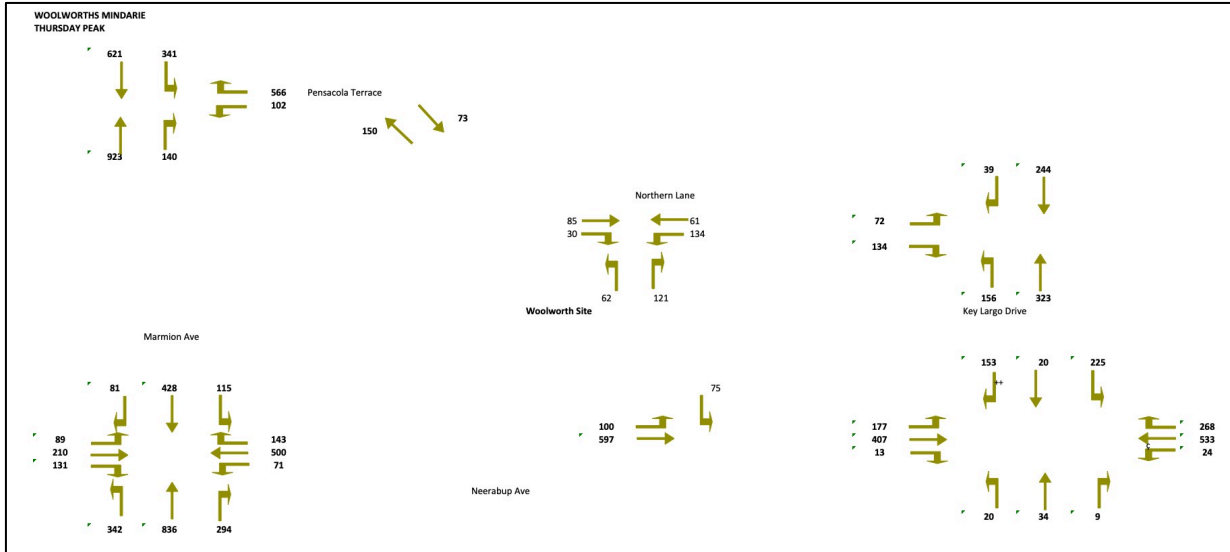
**APPENDIX C FORECAST DAILY DEMANDS**



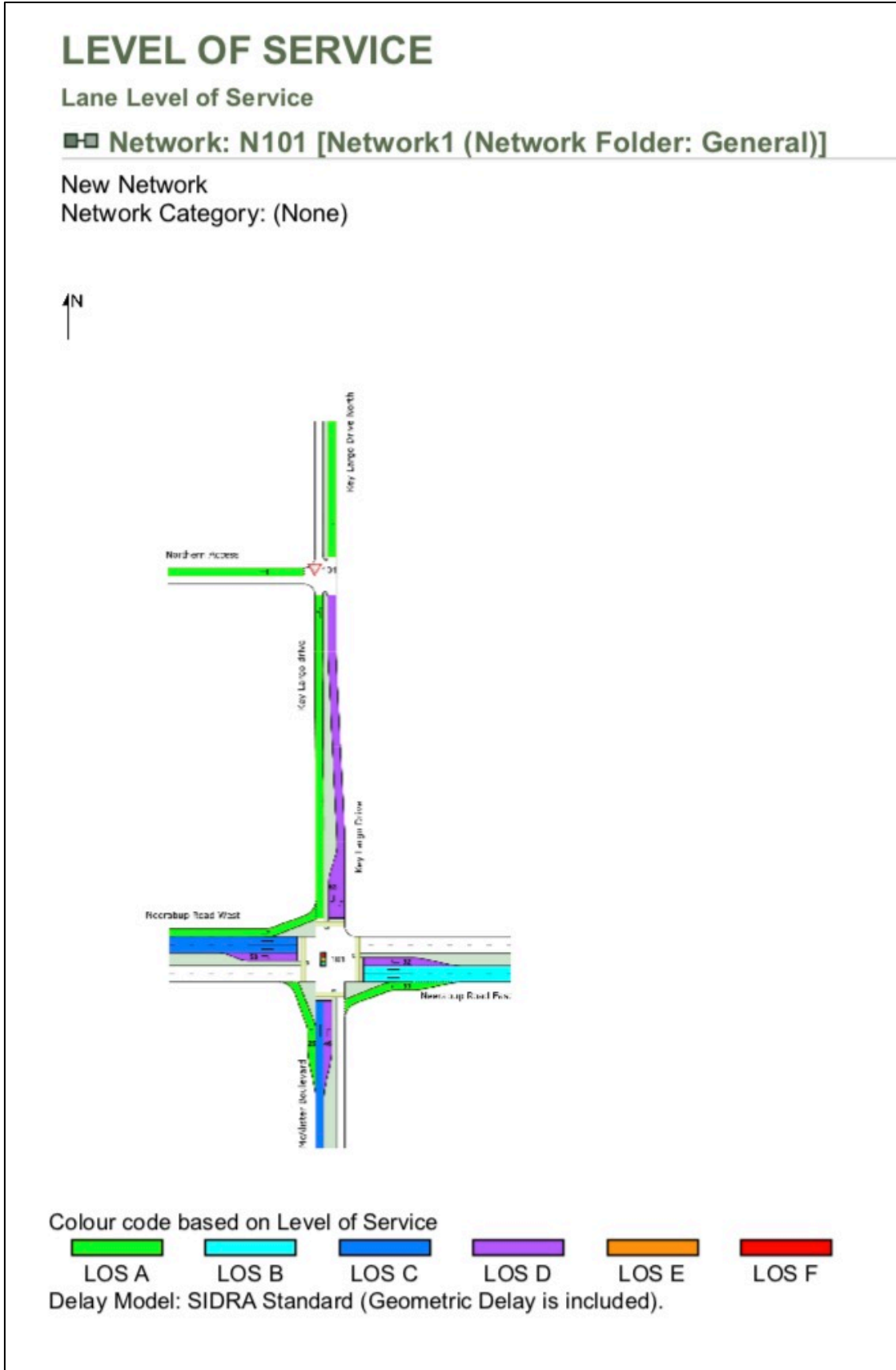
**APPENDIX D CHANGES TO PEAK HOUR FLOWS**



**APPENDIX E SIDRA ANALYSIS TRAFFIC FLOWS**



### Sidra Assessment of Existing Operation



### Sidra Assessment of Operation with Development

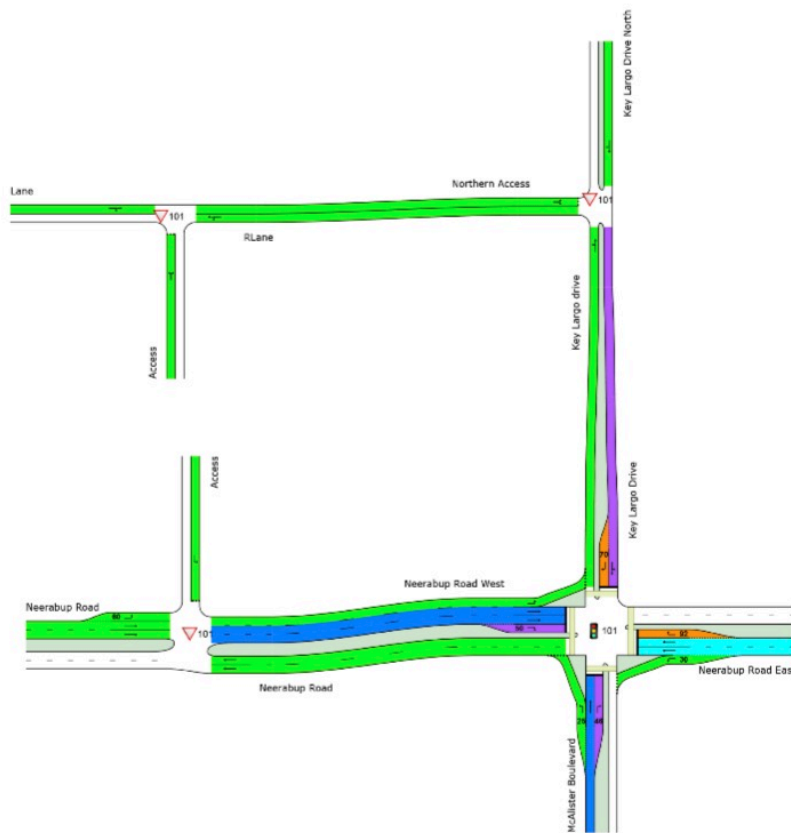
## LEVEL OF SERVICE

Lane Level of Service

■ Network: N102 [Thursday PM Peak + Dev (Network Folder: General)]

New Network

Network Category: (None)



Colour code based on Level of Service



Delay Model: SIDRA Standard (Geometric Delay is included).



## Sidra Movement Summary of Key Largo Drive Traffic Signals

### Existing Operation

#### MOVEMENT SUMMARY

Site: 101 [NeerPM1 (Site Folder: General)]

Neerabup Road / Key Largo  
 Existing PM Peak  
 Site Category: Base Year  
 Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] %	[ Total veh/h	HV ] %	v/c	sec		[ Veh. veh	Dist ] m				km/h
South: McAlister Boulevard														
1	L2	20	0.0	21	0.0	0.017	7.0	LOS A	0.1	1.0	0.25	0.59	0.25	51.0
2	T1	34	0.0	36	0.0	0.113	31.5	LOS C	1.2	8.5	0.89	0.65	0.89	32.6
3	R2	9	0.0	9	0.0	0.051	41.9	LOS D	0.3	2.4	0.93	0.67	0.93	35.2
Approach		63	0.0	66	0.0	0.113	25.2	LOS C	1.2	8.5	0.69	0.63	0.69	37.7
East: Neerabup Road East														
4	L2	24	0.0	25	0.0	0.017	6.2	LOS A	0.1	0.6	0.17	0.58	0.17	53.7
5	T1	533	3.0	561	3.0	*0.510	15.5	LOS B	6.7	48.0	0.88	0.73	0.88	44.6
6	R2	268	1.0	282	1.0	*0.874	50.2	LOS D	12.8	90.7	1.00	0.99	1.39	24.7
Approach		825	2.3	868	2.3	0.874	26.5	LOS C	12.8	90.7	0.90	0.81	1.03	36.6
North: Key Largo Drive														
7	L2	225	1.0	237	1.0	0.857	49.1	LOS D	11.5	81.0	1.00	0.99	1.35	25.5
8	T1	20	0.0	21	0.0	*0.857	43.6	LOS D	11.5	81.0	1.00	0.99	1.35	26.0
9	R2	153	1.0	161	1.0	*0.873	53.5	LOS D	7.4	51.9	1.00	1.01	1.50	16.7
Approach		398	0.9	419	0.9	0.873	50.5	LOS D	11.5	81.0	1.00	1.00	1.41	22.4
West: Neerabup Road West														
10	L2	177	1.0	186	1.0	0.151	8.6	LOS A	1.9	13.6	0.37	0.65	0.37	32.9
11	T1	407	3.0	428	3.0	0.427	26.9	LOS C	7.1	50.8	0.88	0.73	0.88	34.7
12	R2	13	0.0	14	0.0	*0.098	44.8	LOS D	0.5	3.7	0.96	0.68	0.96	26.6
Approach		597	2.3	628	2.3	0.427	21.8	LOS C	7.1	50.8	0.73	0.70	0.73	34.1
All Vehicles		1883	1.9	1982	1.9	0.874	30.1	LOS C	12.8	90.7	0.86	0.81	1.00	32.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 Vehicle movement LOS values are based on average delay per movement.

### Operation With Proposed New Store

#### MOVEMENT SUMMARY

Site: 101 [NeerPM2 (Site Folder: General)]

Neerabup Road / Key Largo  
 PM Peak With Development  
 Site Category: Future Conditions 1  
 Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] %	[ Total veh/h	HV ] %	v/c	sec		[ Veh. veh	Dist ] m				km/h
South: McAlister Boulevard														
1	L2	20	0.0	21	0.0	0.014	6.7	LOS A	0.1	0.9	0.22	0.58	0.22	51.3
2	T1	37	0.0	39	0.0	0.133	32.6	LOS C	1.4	9.5	0.90	0.67	0.90	32.1
3	R2	9	0.0	9	0.0	0.051	41.9	LOS D	0.3	2.4	0.93	0.67	0.93	35.2
Approach		66	0.0	69	0.0	0.133	26.0	LOS C	1.4	9.5	0.70	0.64	0.70	37.2
East: Neerabup Road East														
4	L2	24	0.0	25	0.0	0.017	6.2	LOS A	0.1	0.6	0.17	0.58	0.17	53.7
5	T1	533	3.0	561	3.0	*0.489	14.8	LOS B	6.5	46.8	0.87	0.72	0.87	45.1
6	R2	285	1.0	300	1.0	*0.868	49.0	LOS D	13.5	95.4	1.00	0.99	1.35	25.1
Approach		842	2.2	886	2.2	0.868	26.1	LOS C	13.5	95.4	0.89	0.81	1.01	36.7
North: Key Largo Drive														
7	L2	230	0.0	242	0.0	0.931	59.5	LOS E	13.2	92.5	1.00	1.10	1.62	22.8
8	T1	20	0.0	21	0.0	*0.931	53.9	LOS D	13.2	92.5	1.00	1.10	1.62	23.2
9	R2	161	0.0	169	0.0	*0.903	56.3	LOS E	8.0	56.1	1.00	1.05	1.60	16.1
Approach		411	0.0	433	0.0	0.931	57.9	LOS E	13.2	92.5	1.00	1.08	1.61	20.5
West: Neerabup Road West														
10	L2	99	0.0	104	0.0	0.085	8.7	LOS A	1.1	7.5	0.36	0.64	0.36	32.8
11	T1	482	3.0	507	3.0	0.505	27.5	LOS C	8.6	61.7	0.90	0.75	0.90	34.3
12	R2	13	0.0	14	0.0	*0.098	44.8	LOS D	0.5	3.7	0.96	0.68	0.96	26.6
Approach		594	2.4	625	2.4	0.505	24.8	LOS C	8.6	61.7	0.81	0.73	0.81	34.0
All Vehicles		1913	1.7	2014	1.7	0.931	32.5	LOS C	13.5	95.4	0.88	0.84	1.07	31.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 Vehicle movement LOS values are based on average delay per movement.