

# Appendix C

## Transport Assessment

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# Lot 55 Chapman Road, Glenfield

## Transport Impact Assessment

PREPARED FOR:

ASDC Pty Ltd

December 2016

## Document history and status

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**Author:** Mohammad Rasouli

**Project manager:** Behnam Bordbar

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# 1.0 Introduction

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Transcore has been commissioned by ASDC Pty Ltd to prepare a Transport Impact Assessment (TIA) report for the proposed mixed-use development located at Lot 55 Chapman Road (subject site) in the City of Greater Geraldton.

In March 2014, Transcore prepared a traffic report for Stage 1 of the Lot 55 Chapman Road development. The Stage 1 Site Plan entailed a total of about 5,000m<sup>2</sup> NLA retail (including a Supermarket, Tavern, Liquor Store and Fast Food shops) and about 1,710m<sup>2</sup> NLA or 2,120m<sup>2</sup> GFA commercial lands and a service station.

Based on the information provided to Transcore, It is our understanding that the Development Application for the subject site has been withdrawn and ASDC Pty Ltd is commencing a structure planning process based on Bulky Goods Showroom land uses.

The proposed mixed-use development on Lot 55 forms part of the Glenfield Beach Activity Centre Master Plan which extends to Lot 9000 located to the north of Lot 55. A copy of the proposed Glenfield District Activity Centre Precinct Conceptual Master Plan (hereafter referred to as the Master Plan) is provided in **Appendix A** of this report. The following documents have been reviewed and acknowledged for the preparation of this report:

- *The Integrated Transport Strategy for the City of Geraldton prepared by Cardno in April 2015; and,*
- *Traffic Impact Assessment report prepared by AECOM for the Glenfield Beach Activity Centre in October 2012 and revised in December 2013.*

The subject site is located on Lot 55 Chapman Road approximately 10 km north of the Geraldton central business district. The subject site is shown in **Figure 1**.

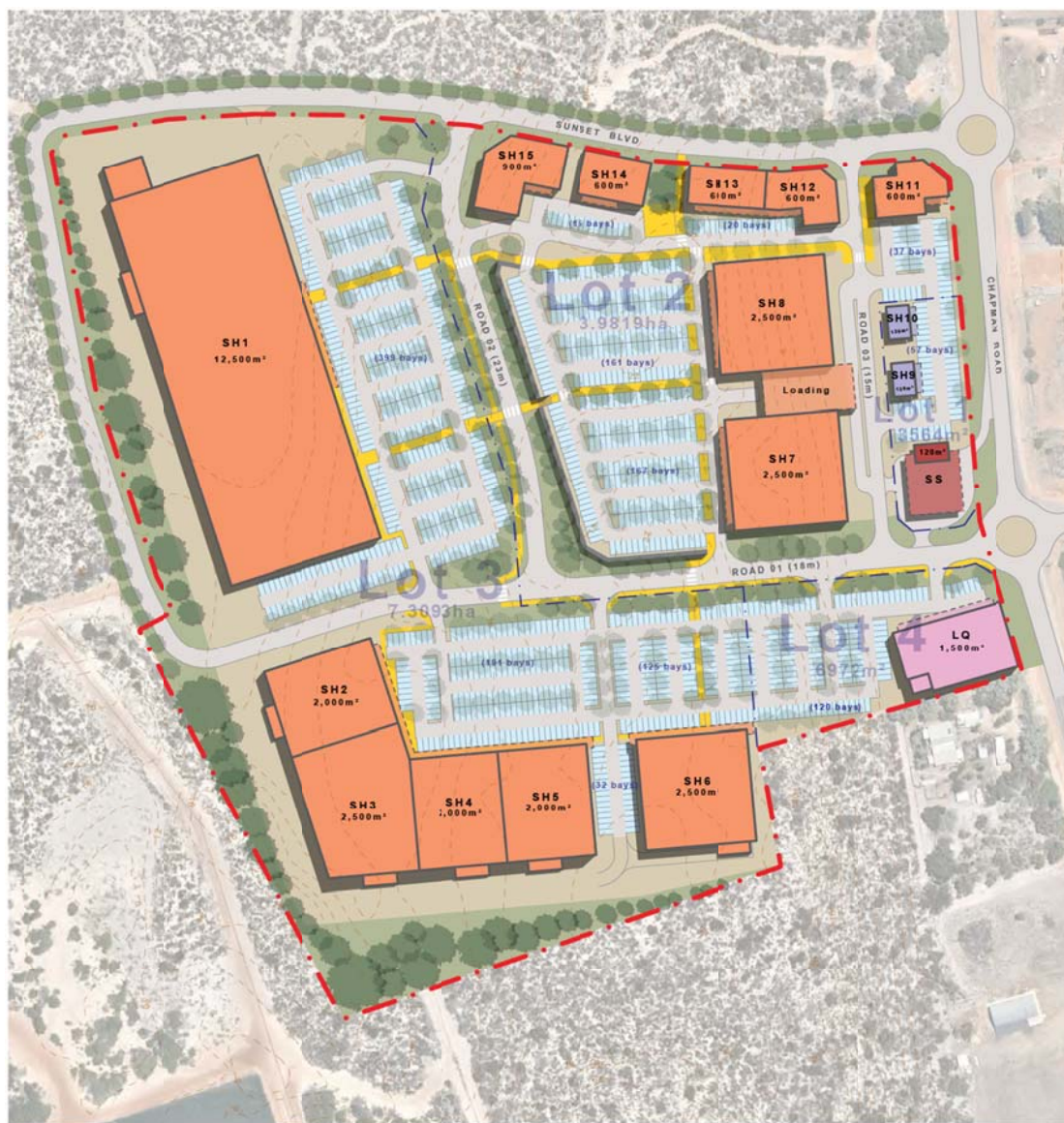


Figure 1: Location of the Subject Site



## 2.0 Proposed Development Concept Plan

The proposed Development Concept Plan (DCP) is illustrated in **Figure 2**. The DCP comprises a total of about 32,040m<sup>2</sup> GFA bulky goods showroom land use, a 120m<sup>2</sup> service station and 1,500m<sup>2</sup> liquor store.



**Figure 2: Proposed Development Concept Plan**

A total of 1,323 parking bays are proposed for the DCP area which meets and exceeds the City of Greater Geraldton parking requirement. Access and egress to the proposed DCP area is through two roundabout intersections on Chapman Road which is in line with the proposed Master Plan for the Glenfield Activity Centre. The internal road network of the proposed DCP area consists of a series of neighbourhood connector roads including Sunset Blvd, road 01, road 02 and an access road (road 03).



## 3.0 Existing Situation

### 3.1 Existing Land Use

Currently, the site is vacant. Adjacent land uses to the south and north are also vacant. There are few existing residential lots to the east of Chapman Road.

### 3.2 Existing Road Network

**Chapman Road** forms the eastern boundary of the subject site with a posted speed limit of 90km/h in the vicinity of the site. It is currently constructed to 2 lanes undivided standard with approximately 8m sealed width (3.5m traffic lanes, 0.5m sealed shoulder and wider unsealed shoulder width). In the vicinity of the subject site, it is classified as a Neighbourhood Connector road. Further south, Chapman Road is classified as a District Distributor Road. According to the information obtained from the City of Greater Geraldton, in June 2011, Chapman Road carried about 3,000vpd south of Glenfield Beach Drive and 3,230vpd north of Oklahoma Road. The heavy vehicle component is reported about 7% at these two locations.

According to the information obtained from MRWA Chapman Road carried about 2,600vpd in 2014/2015 north of Glenfield Beach Drive and 5,700vpd north of Chapman Valley Road.

### 3.3 Public Transport

The closest existing bus route to the subject site is Bus Route No. 850 which traverses along Chapman Road and terminates at Drummond Cove (refer **Figure 3**). The closest bus stop is about 170m north of Hagan Road.



Figure 3: Existing Bus Route

### ***3.4 Pedestrian and Cyclist Facilities***

Currently, there is no pedestrian or cyclist facility on Chapman Road in the vicinity of the subject site.

### ***3.5 Changes to the Surrounding Road Network***

The changes to the surrounding road network due to the proposed DCP area are the construction of two roundabout intersections on Chapman Road.

*The Integrated Transport Strategy for City of Geraldton* (April 2015) indicates that the current hierarchy classification of Chapman Road is Local Distributor, between Cathedral Avenue and Phelps Street; and District Distributor north of Phelps Street and in the vicinity of the subject site.

The strategy proposes the transition to urban cross section for Chapman Road, from Sunset Beach to Drummonds Cove through the future Glenfield Activity Centre, incorporating on and off road cycle lanes.

### ***3.6 Public Transport Network Planning***

The City of Greater Geraldton has prepared a Local Planning Strategy for the City. The Strategy includes an indicative rapid transit alignment running parallel to the coast from Cape Burney to Oakajee via central Geraldton, as shown in the Geraldton Urban Area Strategy Plan (refer **Appendix B**).

This route, which is a long-term proposal at this stage, runs along Chapman Road in the vicinity of the subject site and will ultimately provide a bus 'spine' linking the Geraldton Urban Area from north to south.

Investigation of a BRT as a long term option is also acknowledged in the Integrated Transport Strategy for City of Geraldton (April 2015).

## 4.0 Proposed Transport Network

### 4.1 Road Hierarchy

Figure 4 indicates the proposed road hierarchy of the roads within the Glenfield Beach District Activity Centre. According to this figure, Chapman Road would be classified as an Integrator B road in the short to medium term and in the long term, this road is proposed to be widened to two lanes in each direction and upgraded to an Integrator 'A' road.

Sunset Blvd and Road 01 which provide connections to Chapman Road are classified as Neighbourhood Connector B roads as per Figure 4. Road 02 and Road 03 are not shown in Figure 4. Road 02 would be classified as Neighbourhood Connector B road. Road 03 is 15m Access Street.



Figure 4: Proposed Road Hierarchy

(Source: AECOM Traffic Impact Assessment, Dec 2013)

## 4.2 Public Transport

As outlined in Section 3.3 and 3.6 of this report, currently bus route 850 traverses along Chapman Road and will service the subject site. According to the Local Planning Strategy for the City, in future an indicative rapid transit alignment running parallel to the coast would traverse along Chapman Road in this vicinity.

## 4.3 Integration with Surrounding Area

The proposed land uses for the proposed DCP area are mixed-use which is in line with the existing land uses in this area and the proposed land uses within the Master Plan.

The road network of the DCP area is planned to connect to Chapman Road and the future adjacent land uses within the Glenfield Beach District Activity Centre from the north.

## 4.4 Pedestrian and Cyclist Facilities

The Glenfield Beach Development Transport Assessment (AECOM, 2013) indicates dedicated cycle lanes and footpaths on both sides of Chapman Road and a shared path along Sunset Blvd. **Figure 5** illustrates the proposed pedestrian routes within the DCP area.



Figure 5: Pedestrian Routes

## 5.0 Analysis of the Transport Network

### 5.1 Assessment Period

The assessment year that has been adopted for this analysis is 2018 (the outset of the development) and year 2031 with the assumption that the DCP area and surrounding future developments would be fully developed and occupied by the year 2031. The development peak hour is expected to be in the evening during the typical weekdays and at lunch time during the weekends. The combination of the development traffic and road network traffic is expected to be higher during the road network PM peak hours. Therefore the intersection analysis is based on the PM peak hours.

### 5.2 Traffic generation and distribution

The “Guide to Traffic Generating Developments, Roads and Traffic Authority (RTA) of New South Wales” (2002) document was used to establish the applicable traffic generation rates for the proposed development. For the trip generation of the proposed service station the Institute of Transportation Engineers, USA guidelines were sourced. **Table 1** summarises the trip generation of the proposed development.

The proposed development comprises a total of about 32,040m<sup>2</sup> GFA bulky goods showroom land uses. For the purpose of trip generation estimation the proposed 32,040m<sup>2</sup> GFA land uses were split into three different categories as described in Table 1.

**Table 1: PM Peak Hour Trip Generation**

| Land uses         | GFA (m <sup>2</sup> )    | Trip Rate per 100m <sup>2</sup> GFA (vph) | Trip Generation (vph) |
|-------------------|--------------------------|-------------------------------------------|-----------------------|
| Showroom (large)  | 12,500                   | 2.76                                      | 345                   |
| Showroom (medium) | 19,300                   | 3.94                                      | 760                   |
| Showroom (small)  | 240                      | 5.67                                      | 14                    |
| Service Station   | 120<br>(assume 4 bowser) | 13.33 per bowser                          | 53                    |
| Liquor Store      | 1,500                    | 2                                         | 30                    |
| Total             |                          |                                           | 1,200vph              |

Accordingly, the total trip generation of the DCP area during the development peak hours is estimated to be about 1,200vph. Considering that the proposed mixed-use development is located within the Glenfield Beach Activity Centre, a significant level of cross-trade and multi-purpose trips is expected for the development. Accordingly, it is assumed that about 30% of the total trips are internal trips and about 70% or **840** trips would be distributed to the external roads during the PM peak hours.

It is expected that about 80% of the development traffic would travel to/ from the south and about 20% to/ from the north. **Figure 6** illustrates the traffic distribution of the proposed development on the surrounding roads and intersections.

It must be noted that the proposed service station within the development is not expected to generate additional traffic, but it will attract the passing traffic on Chapman Road.

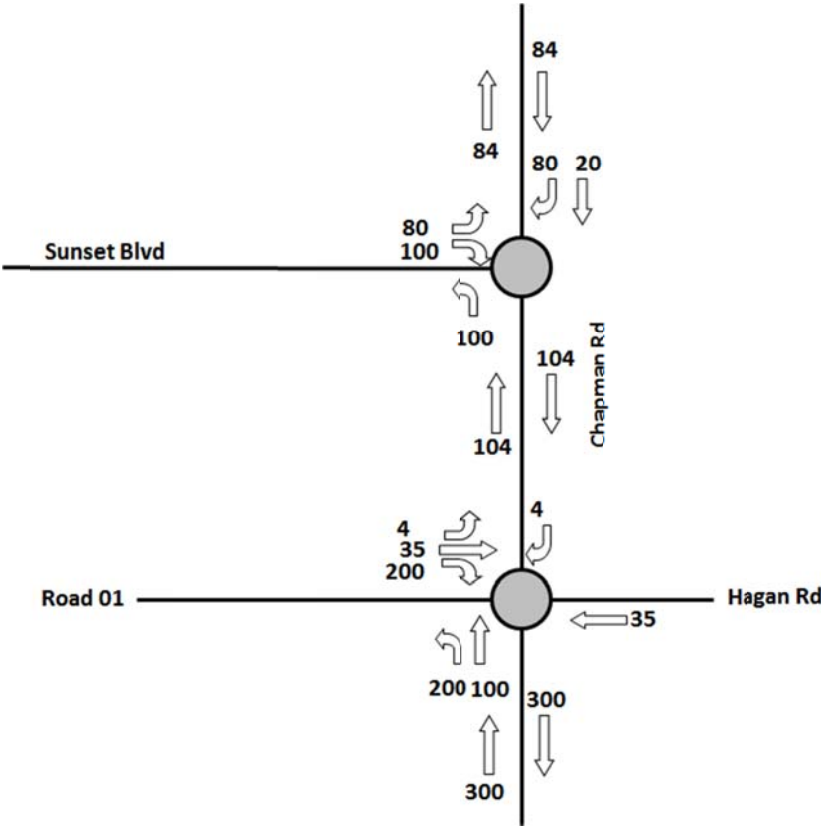


Figure 6: Peak Hour Trip Distribution of the DCP Area

### 5.3 Traffic Flow Forecasts

The existing traffic counts and the expected traffic increase due to the proposed development on the surrounding roads are summarised in **Table 2**.



**Table 2: Existing and Increase in Peak Hour Traffic Flows**

| Road         | Location              | Existing (vph) | Traffic Increase | Total Traffic (vph) |
|--------------|-----------------------|----------------|------------------|---------------------|
| Chapman Road | North of the DCP area | 300            | 168              | 468                 |
| Chapman Road | South of the DCP area | 323            | 600              | 923                 |
| Road 01      | Fronting the DCP area | 0              | 480              | 480                 |
| Sunset Blvd  | Fronting the DCP area | 0              | 360              | 360                 |

#### ***5.4 Intersection Analysis***

The proposed roundabout at the intersection of Chapman Road/ Hagan Road/ Road 01 is expected to be busier than the northern one after full development of the DCP area and therefore the operation of this roundabout has been analysed in detail in this report.

Intersection operation has been analysed using the SIDRA intersection analysis software program for the development peak hour. SIDRA outputs are presented in the form of Degree of Saturation, Level of Service, Average Delay and 95% Queue. These items 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 0% for very low traffic flow up to 100% 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 and Level of Service F the worst. In SIDRA intersection analysis the level of service is based on the average delays experienced by each traffic movement.

**Average Delay:** is the average of all travel time delays for vehicles through the intersection.

**95% Queue:** is the queue length below which 95% of all observed queue lengths fall.

The analysis has been undertaken for the PM peak hour on a typical day which is expected to be busier than the AM peak hour due to the nature of the proposed development. The projected turning movements at the proposed roundabout during the PM peak hour are illustrated in **Figure 6**. The projected traffic volume on Chapman Road for year 2018 has been established by assuming 2% annual traffic growth on Chapman Road by the year 2018 (outset of the development). The 2031 traffic volume on Chapman Road has been extracted from the Glenfield Beach Development Transport Assessment (AECOM, 2013). In the year 2031 it is assumed that Chapman Road would be upgraded to 4 lanes. The appropriate results from the detailed SIDRA outputs are presented in **Appendix C**.



**Figure C1** and **Figure C2** provide the SIDRA diagram of the intersection layout that has been analysed with SIDRA for the year 2018 and 2031 respectively.

**Table C1** and **Table C2** present the SIDRA results for the post-development traffic flows for the year 2018 and 2031 respectively. The proposed roundabout performs well in the PM peak hour, with overall level of service A for both time horizons, which indicates this roundabout will operate satisfactorily with considerable spare capacity still available.

### ***5.5 Pedestrian / Cycle Networks***

The proposed network of shared paths and footpaths are described in section 4.4 of this report. This network of paths will provide accessibility and permeability for pedestrians and cyclists within the DCP area and facilitate connections to adjacent developments and the surrounding road network.

### ***5.6 Access to Public Transport***

The existing Bus Route No. 850 and potential future rapid transit route along Chapman Road will provide public transport access to the DCP area with bus stops being in walking distance from the site.

## 6.0 Conclusions

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The proposed Development Concept Plan for Lot 55 Chapman Road comprises a total of about 32,040m<sup>2</sup> GFA bulky goods showroom land use, a 120m<sup>2</sup> service station and 1,500m<sup>2</sup> liquor store.

Total traffic generation of the site is expected to be about 1,200vph. 30% of the total traffic is expected to be internal trips and about 70%, or 840vph is expected to be distributed to the external roads and intersections.

The proposed single lane roundabout at the intersection of Chapman Road/ Hagan Road/ Road 01 is expected to operate satisfactorily during peak hours at the outset of the development and the year 2031.

The existing standard of Chapman Road would be able to accommodate the development traffic at the outset of the development. Chapman Road would be classified as Integrator B road in the short to medium term and in the long term this road is proposed to be widened to two lanes in each direction and upgraded to an Integrator 'A' road.

# Appendix A

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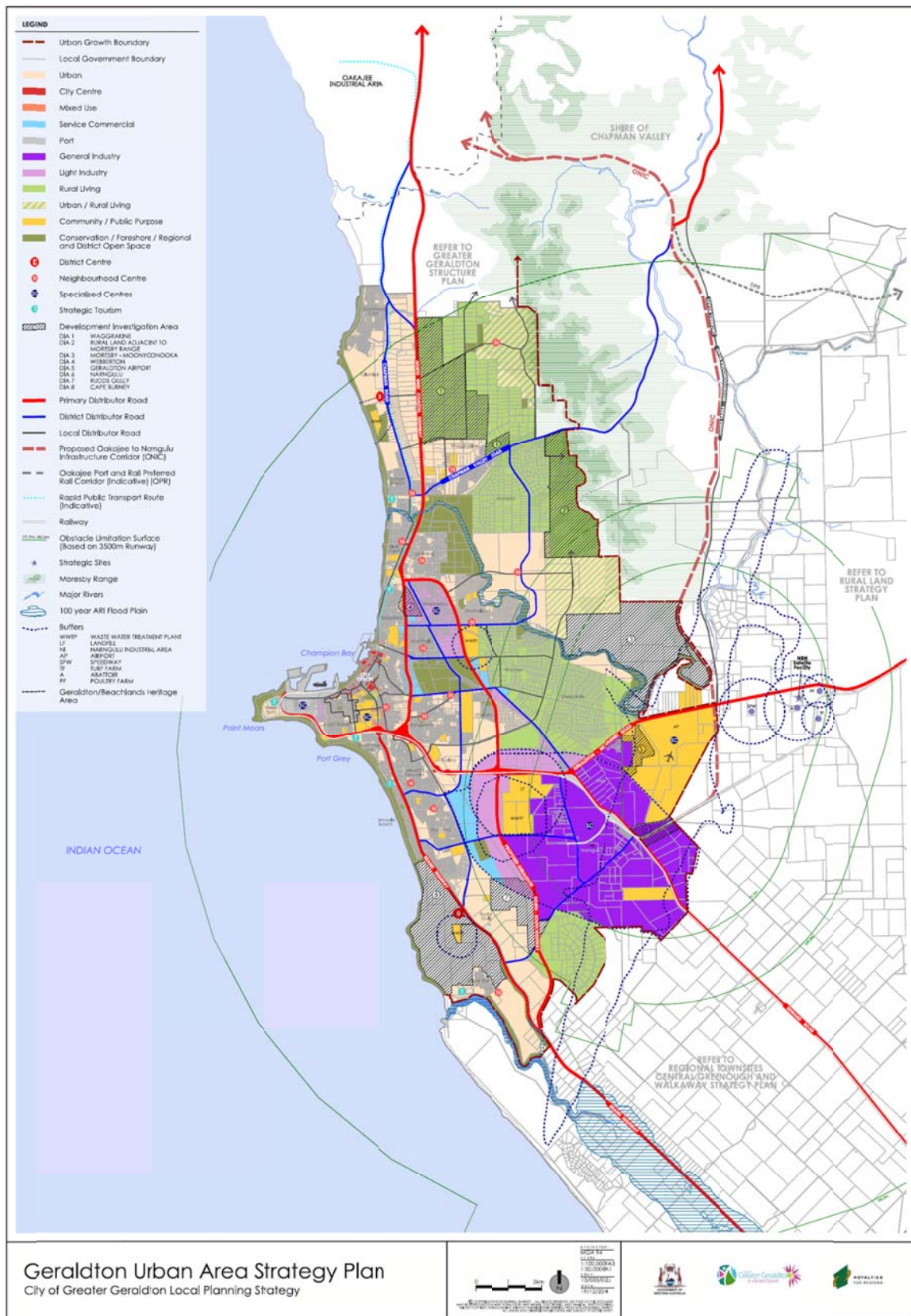
## Glenfield District Activity Centre Precinct Conceptual Master Plan



# Appendix B

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## Geraldton Urban Area Strategy Plan



# Appendix C

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## Intersection Analysis



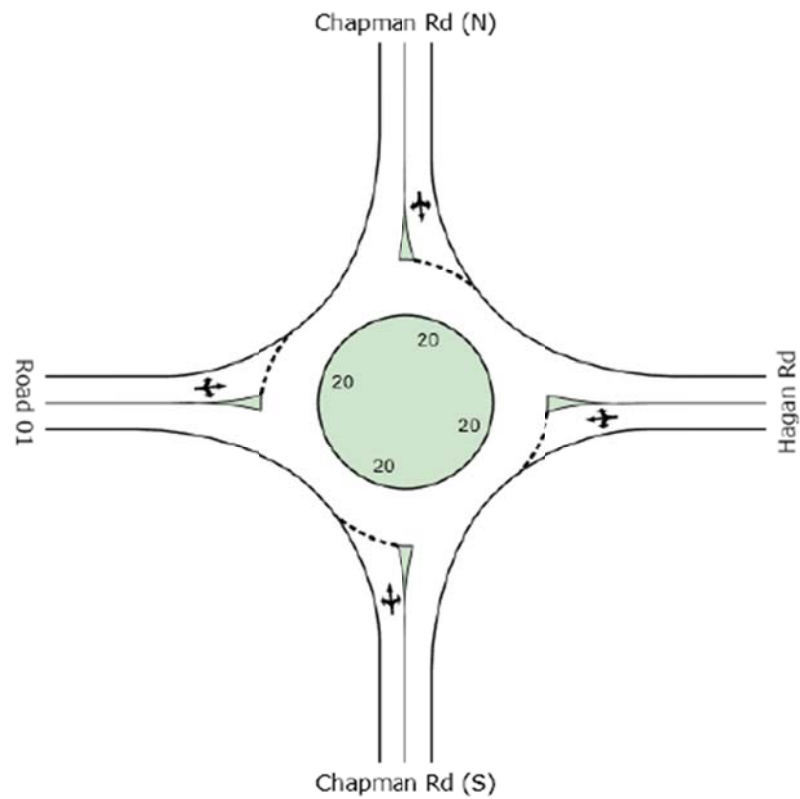


Figure C1: Proposed Intersection Layout, 2018

| Movement Performance - Vehicles |      |                      |         |                  |                      |                  |                                      |               |              |                                |                       |
|---------------------------------|------|----------------------|---------|------------------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| Mov ID                          | Turn | Demand Flow<br>veh/h | HV<br>% | Deg. Satn<br>v/c | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
| South: Chapman Rd (S)           |      |                      |         |                  |                      |                  |                                      |               |              |                                |                       |
| 1                               | L    | 211                  | 7.0     | 0.342            | 6.8                  | LOS A            | 2.4                                  | 18.1          | 0.23         | 0.52                           | 49.9                  |
| 2                               | T    | 283                  | 7.0     | 0.342            | 5.8                  | LOS A            | 2.4                                  | 18.1          | 0.23         | 0.44                           | 50.5                  |
| 3                               | R    | 11                   | 7.0     | 0.342            | 11.6                 | LOS B            | 2.4                                  | 18.1          | 0.23         | 0.78                           | 46.3                  |
| Approach                        |      | 504                  | 7.0     | 0.342            | 6.3                  | LOS A            | 2.4                                  | 18.1          | 0.23         | 0.48                           | 50.1                  |
| East: Hagan Rd                  |      |                      |         |                  |                      |                  |                                      |               |              |                                |                       |
| 4                               | L    | 11                   | 7.0     | 0.063            | 9.0                  | LOS A            | 0.3                                  | 2.5           | 0.57         | 0.65                           | 48.0                  |
| 5                               | T    | 37                   | 7.0     | 0.063            | 8.0                  | LOS A            | 0.3                                  | 2.5           | 0.57         | 0.60                           | 48.1                  |
| 6                               | R    | 11                   | 7.0     | 0.063            | 13.8                 | LOS B            | 0.3                                  | 2.5           | 0.57         | 0.79                           | 45.0                  |
| Approach                        |      | 58                   | 7.0     | 0.063            | 9.3                  | LOS A            | 0.3                                  | 2.5           | 0.57         | 0.64                           | 47.4                  |
| North: Chapman Rd (N)           |      |                      |         |                  |                      |                  |                                      |               |              |                                |                       |
| 7                               | L    | 11                   | 7.0     | 0.270            | 8.0                  | LOS A            | 1.7                                  | 12.4          | 0.50         | 0.64                           | 48.6                  |
| 8                               | T    | 283                  | 7.0     | 0.270            | 7.0                  | LOS A            | 1.7                                  | 12.4          | 0.50         | 0.58                           | 48.8                  |
| 9                               | R    | 4                    | 7.0     | 0.270            | 12.8                 | LOS B            | 1.7                                  | 12.4          | 0.50         | 0.82                           | 46.0                  |
| Approach                        |      | 298                  | 7.0     | 0.270            | 7.1                  | LOS A            | 1.7                                  | 12.4          | 0.50         | 0.59                           | 48.8                  |
| West: Road 01                   |      |                      |         |                  |                      |                  |                                      |               |              |                                |                       |
| 10                              | L    | 4                    | 7.0     | 0.233            | 8.2                  | LOS A            | 1.3                                  | 9.9           | 0.50         | 0.61                           | 47.8                  |
| 11                              | T    | 37                   | 7.0     | 0.233            | 7.2                  | LOS A            | 1.3                                  | 9.9           | 0.50         | 0.56                           | 48.0                  |
| 12                              | R    | 211                  | 7.0     | 0.233            | 13.0                 | LOS B            | 1.3                                  | 9.9           | 0.50         | 0.73                           | 44.8                  |
| Approach                        |      | 252                  | 7.0     | 0.233            | 12.1                 | LOS B            | 1.3                                  | 9.9           | 0.50         | 0.71                           | 45.3                  |
| All Vehicles                    |      | 1112                 | 7.0     | 0.342            | 8.0                  | LOS A            | 2.4                                  | 18.1          | 0.38         | 0.57                           | 48.4                  |

Table C1: SIDRA results – 2018  
Chapman Road / Hagan Road / Road 01, PM Peak Hour

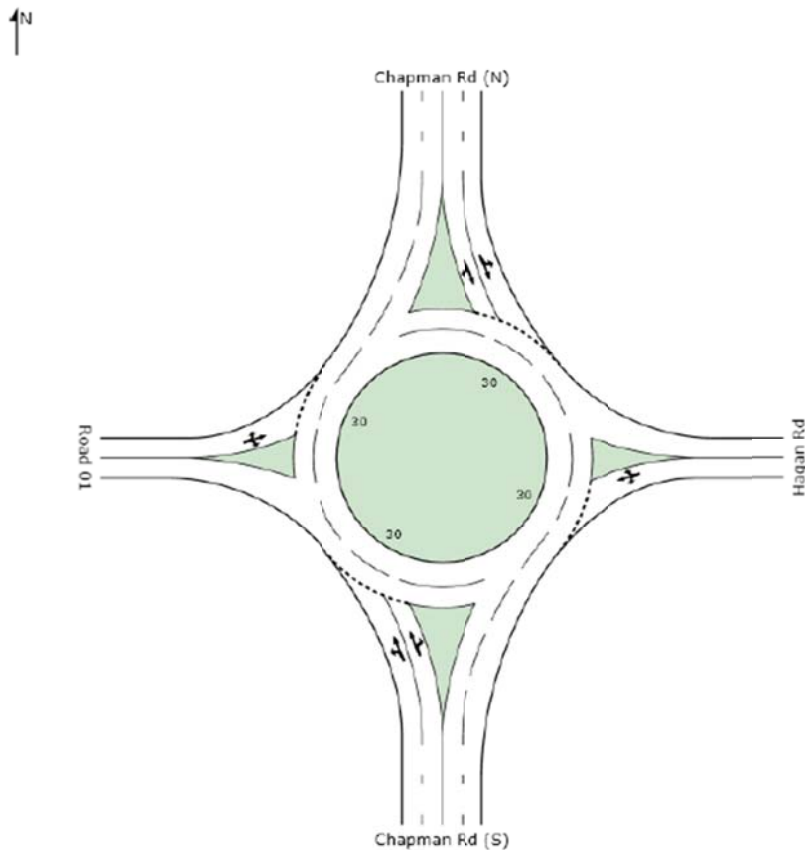


Figure C2: Proposed Intersection Layout, 2031

| Movement Performance - Vehicles |      |                   |      |               |                   |                  |                                |            |              |                             |                    |
|---------------------------------|------|-------------------|------|---------------|-------------------|------------------|--------------------------------|------------|--------------|-----------------------------|--------------------|
| Mov ID                          | Turn | Demand Flow veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: Chapman Rd (S)           |      |                   |      |               |                   |                  |                                |            |              |                             |                    |
| 1                               | L    | 211               | 0.0  | 0.574         | 5.6               | LOS A            | 4.8                            | 34.9       | 0.07         | 0.51                        | 51.6               |
| 2                               | T    | 1653              | 7.0  | 0.574         | 4.5               | LOS A            | 4.8                            | 35.7       | 0.08         | 0.37                        | 53.0               |
| 3                               | R    | 11                | 0.0  | 0.574         | 11.2              | LOS B            | 4.8                            | 35.7       | 0.08         | 0.94                        | 46.7               |
| Approach                        |      | 1874              | 6.2  | 0.574         | 4.7               | LOS A            | 4.8                            | 35.7       | 0.07         | 0.39                        | 52.8               |
| East: Hagan Rd                  |      |                   |      |               |                   |                  |                                |            |              |                             |                    |
| 4                               | L    | 1                 | 0.0  | 0.005         | 9.1               | LOS A            | 0.0                            | 0.2        | 0.69         | 0.64                        | 47.6               |
| 5                               | T    | 1                 | 0.0  | 0.005         | 8.1               | LOS A            | 0.0                            | 0.2        | 0.69         | 0.61                        | 47.5               |
| 6                               | R    | 1                 | 0.0  | 0.005         | 15.0              | LOS B            | 0.0                            | 0.2        | 0.69         | 0.76                        | 44.2               |
| Approach                        |      | 3                 | 0.0  | 0.005         | 10.7              | LOS B            | 0.0                            | 0.2        | 0.69         | 0.67                        | 46.3               |
| North: Chapman Rd (N)           |      |                   |      |               |                   |                  |                                |            |              |                             |                    |
| 7                               | L    | 11                | 0.0  | 0.464         | 6.8               | LOS A            | 3.2                            | 24.0       | 0.53         | 0.60                        | 49.2               |
| 8                               | T    | 1093              | 7.0  | 0.464         | 5.8               | LOS A            | 3.2                            | 24.0       | 0.53         | 0.52                        | 49.4               |
| 9                               | R    | 4                 | 0.0  | 0.464         | 12.6              | LOS B            | 3.1                            | 23.3       | 0.54         | 0.85                        | 46.6               |
| Approach                        |      | 1107              | 6.9  | 0.464         | 5.8               | LOS A            | 3.2                            | 24.0       | 0.53         | 0.52                        | 49.4               |
| West: Road 01                   |      |                   |      |               |                   |                  |                                |            |              |                             |                    |
| 10                              | L    | 4                 | 0.0  | 0.381         | 11.7              | LOS B            | 1.8                            | 12.8       | 0.73         | 0.89                        | 44.7               |
| 11                              | T    | 37                | 0.0  | 0.381         | 10.7              | LOS B            | 1.8                            | 12.8       | 0.73         | 0.87                        | 45.0               |
| 12                              | R    | 211               | 0.0  | 0.381         | 17.6              | LOS B            | 1.8                            | 12.8       | 0.73         | 0.97                        | 41.7               |
| Approach                        |      | 252               | 0.0  | 0.381         | 16.5              | LOS B            | 1.8                            | 12.8       | 0.73         | 0.96                        | 42.2               |
| All Vehicles                    |      | 3236              | 5.9  | 0.574         | 6.0               | LOS A            | 4.8                            | 35.7       | 0.28         | 0.48                        | 50.5               |

Table C2: SIDRA results – 2031  
Chapman Road / Hagan Road / Road 01, PM Peak Hour