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# CONTENTS.

1.	Summary	ł
2.	Introduction and Background	ł
2.1.	Proponent	ł
2.2.	Site Location and Land Use	ł
3.	Site Proposal	5
3.1.	Regional Context	5
3.2.	Land Use	5
3.3.	Major Attractors and Generators of traffic	7
4.	Existing Situation7	7
4.1.	Existing Roads	}
4.2.	Intersections	)
4.3.	Road Hierarchy and Status	)
4.4.	Road Hierarchy vs Actual Flows	)
5.	Changes to Surrounding Transport Networks11	l
6.	Assessment Years 11	I
7.	Time Periods for Assessment	I
8.	Development Generation and Distribution	I
8.1.	Impact on Intersections	2
8.2.	Access Movements	}
8.3.	Changes to the Surrounding Network	3
9.	Parking	)
10.	Conclusions	)



## 1. Summary.

Shawmac was commissioned to assess the traffic impacts associated with the development of a concrete batching plant in Clunes Street Bassendean.

The assessment follows the recommended outline contained in the West Australian Planning Commission draft guideline "Transport Statement Guidelines for Developments". Potential traffic flow from the site was determined from operational characteristics advised by the proponent, which quantified the number of movements in and the number of movements out of the site when operating at expected peak levels of product.

Traffic was assigned to the adjacent existing road network and flows used as a basis for assessing traffic impacts associated with the site. Based on the assessment it was shown that the flows predicted can be accommodated within the existing network without unacceptable adverse impacts.

# 2. Introduction and Background.

#### 2.1. Proponent.

Shawmac was commissioned to assess the traffic impacts associated with the generation of traffic from the proposed concrete batching plant as proposed to be erected in Clunes Street Bassendean by the proponent, BGC.

#### 2.2. Site Location and Land Use.

The site is located as shown on Figure 1 and is within the Town of Bassendean. The site abuts Clunes Street and the City of Bayswater.



Figure 1 - Site Location



The study site is currently used for industrial purposes in accordance with the Town of Bassendean's Town Planning Scheme. The existing site together with the surrounding area is shown on the aerial photograph, refer Figure 2.



Figure 2 - Site Aerial Photograph

# 3. Site Proposal.

### 3.1. Regional Context.

The site is located within the Town of Bassendean approximately 8km northeast from the Perth CBD and has direct street frontage to Clune Street which connects to Jackson Street via Lavan Street. Jackson Street in turn connects to Collier Road to the north and Railway Parade to the south providing good access to the greater Perth Metropolitan Area.

### 3.2. Land Use.

It is proposed to develop the site for concrete batching purposes, generally as configured in Figure 3.





Figure 3 - Conceptual Plant Layout

The proposed use is consistent with the zoning of the site which is shown on Figure 4.





Figure 4 - Extract of Town of Bassendean Local Planning Scheme No 10

#### 3.3. Major Attractors and Generators of traffic.

Access to the site is via Clune Street and Lavan Street which provide connection to Jackson Street and from there to Collier Road and Railway Parade.

The site also has frontage to Wicks Street along its eastern boundary which is currently unmade between the subject site and Jackson Street. The Town of Bassendean has indicated that there is a Council Resolution relating to this road made in April 2013. This Council Resolution states that the Town is prepared to initiate the acquisition of the land required for roads on the confirmation that the owners of Lot 10 Railway Parade, Bayswater will meet all costs associated with the proposed acquisition and development. It should be noted that based on advice received in April 2016, no confirmation has been given to the Town of Bassendean.



## 4. Existing Situation.

#### 4.1. Existing Roads.

Jackson Street is classified as an Industrial Local Distributor under the MRWA Functional Road Hierarchy and is under the care and control of the Town of Bassendean. Clune Street and Lavan Street are classified as Industrial Access Roads and Lavan Street is under the care and control of the Town of Bassendean. Clune Street forms the boundary between the City of Bayswater and the Town of Bassendean. Clune Street forms a cul de sac at both the northern and southern ends. All three roads comprise two lane carriageways with pavement widths of 10.0 metres. Traffic count data sourced from MRWA indicates traffic volumes on Jackson Street of about 3,430 vehicles per day in 2003. No recent counts for Jackson Street, Lavan Street or Clune Street are available from MRWA. Enquiries to the Town of Bassendean indicated that counts were only available for Jackson Road and these were last taken in 2007. These counts recorded a significantly lower volume of traffic and are in the order of 2,004 vpd. No information was available from the City of Bayswater.

Based on the likely traffic catchments and the land use within the traffic catchments, daily traffic on Clune Street east of Lavan Street and on Lavan Street were estimated as being in the order of that shown below.

Clune Street	4.5 hectare light industrial @ 153 <sup>1</sup> vpd per Ha	= 690 vpd
	4.5 hectare light industrial @ 21 vph per Ha	= 95 vph
Lavan Street	7.7 hectare light industrial @ 153 vpd per Ha	= 1,178 vpd
	4.5 hectare light industrial @ 21 vph per Ha	= 162 vph

In order to validate the assumptions regarding potential flows, traffic movements at both the intersection of Clune Street and Lavan street and Lavan Street and Jackson Street were surveyed between 10:00 AM and 11:00 AM on Thursday the 10<sup>th</sup> of December and the results are shown on Figure 5.

<sup>&</sup>lt;sup>1</sup> Generation rate from the ITE Trip Generation Rates





Figure 5 - Hourly Movements 1000 hours to 1100 hours

Based on the count it is predicted that daily flows on the streets surveyed would be in the order of that shown below.

Clune Street – west of Lavan Street	560 vpd.
Clune Street east of Lavan Street	840 vpd
Lavan Street between Clune Street and Jackson Street	830 vpd
Jackson Street west of Lavan Street	1,860 vpd
Jackson Street east of Lavan Street	1,860 vpd

As such the predicted volumes based on adjacent land use generation and adopted for assessment are likely to be conservative and over represent actual volumes.

#### 4.2. Intersections

The intersections of Clune Street and Lavan Street and Lavan Street and Jackson Street are both unchannelised "T" Junctions with unrestricted movements.

#### 4.3. Road Hierarchy and Status.

Figure 6 indicates the Road Hierarchy for the road network adjacent to and around the site as sourced from the MRWA website. Characteristics of the classifications as relevant to the immediate road network are as summarised below:

Local Distributors: These carry traffic within a cell and link District Distributors at the boundary to access roads. The route of the Local Distributor typically discourages through traffic so that the cell formed by the grid of



Local Distributors only carries traffic belonging to, or serving the area. These roads should accommodate buses but discourage trucks (unless they are in an industrial zone). They are managed by local government.

Access Roads: These provide access to abutting properties and connect to Local Distributors. They are managed by local government.



Figure 6 - Road Hierarchy

### 4.4. Road Hierarchy vs Actual Flows

Table 1 details the comparison of existing traffic flows against the maximum desirable flows as determined by the MRWA Functional Hierarchy criteria.

Locatio	on and date of count.	Classification	Desirable Max Traffic Volume (vpd)	Actual Daily Traffic Flows (vpd)	
Jackson Street	South of Collier Road	Industrial Local Distributor	7,000 vpd.	3,340 vpd	
Clune Street	East of Lavan Street	Industrial Access Road	3,000 vpd.	690 vpd (estimated)	
Lavan Street	North of Clune Street	Industrial Access Road	3,000 vpd.	1,178 vpd (estimated)	

Table 1. Desirable Maximum Flows vs Actual Flows

The table above indicates that all roads are operating in accordance within their capacity.



## 5. Changes to Surrounding Transport Networks

There are no known planned changes to the adjacent network that have the potential to affect the assessment. Notwithstanding this, a 2012 Outline Development Plan covering Lot 10 Railway Parade, Bayswater indicates the provision of road access onto Clunes Street which if it occurred would have implications in terms of increased traffic flow and the need to upgrade a number of adjacent intersections.

## 6. Assessment Years

The development is assessed on current network conditions.

# 7. Time Periods for Assessment

Assessment is based on both daily traffic and peak hour periods.

## 8. Development Generation and Distribution.

Potential traffic flows from the site were calculated based on the target maximum production as advised by BGC and summarised below:

- The following vehicles will deliver materials to the subject site:
- Aggregate deliveries (27.5m in length) approximately 10-15 per day;
- Cement deliveries (27.5m in length) approximately 2-3 per day; and
- Admixture/pigment deliveries (19.0m) approximately 2 per week.

Maximum of 18 vehicles entering off Clune Street and 18 vehicles exiting onto Clune Street daily

The following vehicles will export material from the subject site:

- Concrete agitator truck (12.0m) approximately 80-100 per day;
- Concrete waste (12.0m) approximately 1 per fortnight; and
- Waste collection vehicles (12.0m) as required.

Maximum of 100 vehicles entering off Clune Street and 100 vehicles exiting onto Clune Street daily

Staff arrivals and departures: Allow 10 arrivals and 10 departures via Clune Street – Lavan Street.

This equates to about 128 trips per day or 256 vehicle movements.

The distribution of traffic is expected to be split as summarised on Table 3.



Location	Daily Traffic (Existing / Predicted)	AM Peak (Existing / Predicted)	PM Peak (Existing / Predicted)
Clune Street west of Wicks Street	690 / 946 vpd	95 / 121 vph	95 / 121 vph
Lavan Street north of Clune Street	1,178 / 1,434 vpd	162 / 188 vph	162 / 188 vph

Table 2. Midblock Traffic Prediction Adjacent Network

Having a site area of 5,000 square metres, the theoretical generation based on a light industrial land use and applying the generation rates indicated by the Institute of Transportation Engineers is indicated as being in the order of 77 vehicles per day.

#### 8.1. Impact on Intersections

Based assignment of the additional traffic, turning movements for a typical peak hour were predicted for both Clune Street and Lavan Street and Clune Street and Jackson Street intersections and these are shown on Figure 7.



Figure 7 - Typical Peak Hour Turning Movements - Clune Street - Lavan Street / Lavan Street - Jackson Street

The performance of the intersections operating under typical peak hour flows were evaluated using SIDRA intersection software and the results are shown below.



Movem	nent Po	erformance	- Vehic	cles							
Mov ID	Turn	Demand Flow	HV C	Deg. Satn	Average Delay	Level of Service	95% Back Vehicles	of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South E	ast: Clu	ine Street									
22	Т	11	15.0	0.083	0.9	LOS A	0.4	2.9	0.24	0.00	54.1
23	R	56	15.0	0.083	10.0	LOS A	0.4	2.9	0.24	0.69	47.8
Approac	h	66	15.0	0.083	8.5	NA	0.4	2.9	0.24	0.58	48.7
North Ea	ast: Lav	an Street									
24	L	74	15.0	0.104	9.1	LOS A	0.4	3.2	0.10	0.62	48.5
26	R	24	15.0	0.104	9.4	LOS A	0.4	3.2	0.10	0.71	48.2
Approac	h	98	15.0	0.104	9.2	LOS A	0.4	3.2	0.10	0.65	48.4
North W	est: Clu	une Street									
27	L	31	15.0	0.021	8.7	LOS A	0.0	0.0	0.00	0.71	49.0
28	Т	5	15.0	0.021	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approac	h	36	15.0	0.021	7.5	NA	0.0	0.0	0.00	0.60	50.3
All Vehic	cles	200	15.0	0.104	8.7	NA	0.4	3.2	0.13	0.62	48.9

Figure 8 - Typical Peak Hour – Clune Street – Lavan Street.

Moven	nent Pe	erformance	- Vehi	cles							
Mov ID	Turn	Demand Flow	ΗV	Deg. Satn	Average Delay	Level of Service	95% Back Vehicles	of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South E	ast: Jac	kson Street									
21	L	47	15.0	0.087	8.7	LOS A	0.0	0.0	0.00	0.92	49.0
22	Т	105	15.0	0.087	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approad	ch	153	15.0	0.087	2.7	NA	0.0	0.0	0.00	0.29	56.1
North W	est: Jac	ckson Street									
28	Т	105	15.0	0.139	2.7	LOS A	1.1	8.6	0.47	0.00	51.0
29	R	47	15.0	0.139	11.8	LOS B	1.1	8.6	0.47	0.88	47.3
Approad	ch	153	15.0	0.139	5.6	NA	1.1	8.6	0.47	0.27	49.8
South W	/est: La	van Street									
30	L	47	15.0	0.149	11.5	LOS B	0.6	4.6	0.38	0.63	46.0
32	R	47	15.0	0.149	11.8	LOS B	0.6	4.6	0.38	0.78	45.9
Approad	ch	95	15.0	0.149	11.6	LOS B	0.6	4.6	0.38	0.71	45.9
All Vehi	cles	400	15.0	0.149	5.9	NA	1.1	8.6	0.27	0.38	51.0

Figure 9 - Typical Peak Hour – Clune Street – Lavan Street.

Intersection volumes are low and performance under peak hour flow conditions is predicted to be good.

#### 8.2. Access Movements

Proposed access and egress to and from the site is shown on Figure 10.





Figure 10 - Proposed Access and Egress

Preliminary details have been produced for the crossovers showing locations and widths; detailed design will be undertaken to ensure that the geometry provides for the intended design vehicles. Turning paths for access to and from the site by all vehicle classes are shown on Figure 11 and Figure 12.





Figure 11 - Turning Paths - Material Delivery Trucks





Figure 12 - Turning Paths - Agitator Trucks

### 8.3. Changes to the Surrounding Network

As part of the consideration associated with the development of an Outline Development Plan for Lot 10 Railway Parade, Bayswater, Transcore prepared a report<sup>2</sup> in 2012 that assessed various options for the eastern access and egress to and from the ODP site shown on Figure 13. These options included:

<sup>&</sup>lt;sup>2</sup> Lot 10 Railway Parade, Bayswater, Proposed Outline Development & Subdivision Concept Plan, Eastern Access Assessment



- Construction of Wicks Street with a roundabout at its intersection with Jackson Street. Transcore indicates that this is the preferred east west link.
- Utilisation of Clune Street and Lavan Street to provide connectivity between the ODP area and Jackson Street.
- Utilisation of Clune Street and Duffy Street to provide connectivity between the ODP area and Jackson Street.

In assessing the options, Transcore concluded that:

- The Wicks Street connection to Jackson Street option represented the only direct road connection between the ODP area and Jackson Street and was indicated as being the preferred east west option; however the acquisition and re-instating of the section of Wicks Street reserve previously sold would be required to enable the construction of Wicks Street road link to Jackson Street. As previously indicated it is understood that the Town of Bassendean have resolved that the Town is prepared to initiate the acquisition of the land required for roads on the confirmation that the owners of Lot 10 Railway Parade, Bayswater will meet all costs associated with the proposed acquisition and development; to date no confirmation has been given to the Town of Bassendean.
- The Lavan Street connection to Jackson Street would require widening of the pavement at the
  intersections of Wicks Street/Clune Street and Clune Street/Lavan Street to accommodate a B-double
  design vehicle. Transcore indicated that the construction of a roundabout at the intersection of
  Lavan Street/Jackson Street could be accommodated with some minor land acquisition, however
  this would impact on current access to Lot 206 (Hofmann Engineering) located on Jackson Street
  opposite Lavan Street.
- The Duffy Street connection to Jackson Street would require widening of the pavement at the
  intersections of Wicks Street/Clune Street and Clune Street/Duffy Street to accommodate a B-double
  design vehicle. Transcore indicated that the construction of a roundabout at the intersection of
  Lavan Street/Jackson Street could be accommodated with some minor land acquisition; however
  this may present a safety concern, particularly because of mix of traffic including B-doubles and road
  trains using Jackson Street.

Should Lot 10 Clune Street be developed in accordance with the ODP, and Wicks Street be extended from the ODP site to Clune Street there may be a requirement for some adjustment of the geometry of the southernmost crossover to the subject site. However this would be dependent on future considerations.





Figure 13 - ODP Lot 10



# 9. Parking.

The Town of Bassendean Town Planning Scheme (TPS 10) requires 1 parking bay for every 50 square metres of gross floor area for general and light industrial developments and 20 square metres of gross office floor area. The proposed development will occupy the existing buildings on the northern portion of the subject site. This equates to approximately 27 square metres of office floor area and 561 square metres of warehouse floor area. Therefore the proposal requires 12.55 (13) bays. However, given the nature of the operation it is expected that parking demand will be greater than that indicated by the TPS determination and to that end it is proposed to provide 18 dedicated truck bays and 18 dedicated car bays (including 1 disabled car bay). It is considered that this is sufficient to meet predicted demand; noting however, that ample room is available on site to accommodate additional parking needs should they arise.

## 10. Conclusions

A review of the traffic impacts associated with the proposed establishment and operation of a concrete batching plant in Clune Street Bassendean indicated the following:

- Under the development scenario, the predicted generation from the site is in the order of 256 vehicles per day, based on the predicted maximum output from the site.
- Expected increase in traffic using these roads is predicted to be in the order of 26 movements per hour with these movements accommodated on Clune Street, Lavan Street and Jackson Street.
- The Modelling suggests that the increased traffic moving through the intersections will not result in any
  adverse impacts being experienced and all affected intersections are expected to function at a high level
  of service.
- The proposed configuration of the plant provides separation between trucks delivering raw materials and agitator trucks loading and delivering product; to this end it is intended that the larger material delivery trucks will enter from Clune Street via the southernmost crossover, and either exist via the centre crossover for northernmost crossover. It is intended that the Agitator trucks enter via the southern crossover and exit via the centre crossover.
- Adequate parking in excess of the requirements of the Town of Bassendean Town Planning Scheme is to be provided onsite.

Overall, the intended use is in keeping with the zoning of the site and compatible with the surrounding land uses.