

APPENDIX 8. INVESTIGATIONS – TRAFFIC ASSESSMENT



South Australian Jockey Club Incorporated

MORPHETT ROAD GLENGOWRIE PROPOSED CODE AMENDMENT

TRAFFIC INVESTIGATIONS

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CONTENTS

1.0	INTF	ODUCTION	1
2.0	EXIS	TING SITUATION	2
	2.1	SUBJECT SITE	2
	2.2	SITE ACCESS	3
	2.3	ROAD NETWORK	3
	2.4	PUBLIC TRANSPORT	3
3.0	PRO	POSED REZONING	4
	3.1	POTENTIAL DEVELOPMENT	4
	3.2	FUTURE SITE ACCESS	4
	3.3	MORPHETT ROAD/TRAM CROSSING GRADE SEPARATION	5
4.0	TRA	FIC ASSESSMENT	6
	4.1	INFRASTRUCTURE DEED	7
5.0	PED	ESTRIANS	8
6.0	SUN	MARY	9
APPEN	DIX A	– MORPHETTVILLE RACECOURSE DPA TRAFFIC INVESTIGATIONS DRAFT REPORT	



1.0 INTRODUCTION

This report relates to the proposal by the South Australian Jockey Club (SAJC) to initiate an amendment to the Planning and Design Code for a site currently located within the Recreation Zone adjacent Morphettville Racecourse. The subject area was previously identified in the Racecourse (Morphettville) zone in the City of Marion's former Development Plan which provided the opportunity to provide for stabling of horses and residential use on the same property.

An earlier Development Plan Amendment (DPA) was completed for the racecourse site to facilitate development opportunities adjacent the racecourse, including the development area to the north of the tram line fronting Anzac Highway. While the subject land was originally to be considered as part of that DPA, the assessment progressed without nominating the land west of Morphett Road.

The initial traffic investigations, including detailed modelling of the Anzac Highway/Morphett Road intersection, however, included the area west of Morphett Road. A copy of the draft report which documents the traffic assessment is included in Appendix A.

This report documents subsequent traffic investigations which have been completed to inform the Code Amendment assessment. Specifically, it includes a review of the forecast volumes and provides a comparison of the volumes considered in the previous DPA investigations, concluding that any variation will be inconsequential.

In undertaking this assessment, consideration has been given to the requirements for access to the site. Further, the access investigations had regard to the future grade separation of the tram line and Morphett Road. While the design solution for this infrastructure has yet to be confirmed, the access location and configuration for the site is not expected to be significantly impacted.



2.0 EXISTING SITUATION

2.1 SUBJECT SITE

The land under consideration includes the land west of Morphett Road opposite Morphettville Racecourse. Figure 1 identifies the location of the CA area.



Figure 1: CA Area



The land is within the jurisdiction of the City of Marion. It is bordered by the Sturt River, the tram line and Morphett Road. It extends south to the boundary of the Glengowrie Ambulance Station.

2.2 SITE ACCESS

Access to the CA land is currently provided via Morphett Road at a number of locations which service individual allotments.

2.3 ROAD NETWORK

Morphett Road is an arterial road with a daily traffic volume in the order of 24,400 vehicles per day. It has a four lane divided carriageway for the majority of its length but widens to five lanes adjacent the northern portion of the subject land to provide for turning lanes on the approach to Anzac Highway. The road has a posted speed limit of 60 km/h.

Anzac Highway is a major arterial road with a daily traffic volume in the order of 33,600 vehicles per day. It has a six lane divided carriageway for the majority of its length but widens to eight lanes to provide for turning lanes on the approach to Morphett Road. The road has a posted speed limit of 60 km/h.

2.4 PUBLIC TRANSPORT

Public transport services provide an alternative mode of transport to and from the subject area. These services include the Glenelg to Adelaide tram and several bus routes on all major roads and provide convenient access to Adelaide City. Bus routes to from the site are available via:

- Bus routes 263 and 265 which travel on Anzac Highway to/from the city through the southern suburbs. The services operate at a frequency of approximately five minutes during the weekday peak period and 30 minutes during the off-peak periods. On weekends, the services operate at hourly intervals; and
- Bus routes J7 and J8 which travel on Morphett Road connecting the northern and southern suburbs. The routes service from West Lakes and Arndale interchanges (north) to Marion Centre Interchange (south). These services operate at a frequency of one hour during the weekday and do not operate on weekends.

The Glenelg Tram service is a high frequency service that travels between Glenelg and Adelaide. The route stops at a total of 17 stops. The subject site will be serviced by Stop 12 and Stop 11 which only operates on Race days. The service operates at a frequency of 5 minutes during the weekday peak periods and 10 minutes during the weekday offpeak and weekend peak periods. The trams are presently operating at capacity during the peak periods.



3.0 PROPOSED REZONING

3.1 POTENTIAL DEVELOPMENT

Cox Architecture Drawing No. SK01 identifies a potential development on the subject site and was prepared for the purpose of determining the potential yield on the site. The plans include the following:

- 136 x 2-bed apartments;
- a minimum of one parking space per apartment;
- a central playground and feature landscape area;
- greenspace between apartment buildings; and
- access via Morphett Road in two locations with a connecting aisle.

Figure 2 illustrates the yield study plan.



Figure 2: Yield Study Plan (source: Cox Architecture)

3.2 FUTURE SITE ACCESS

Access to the subject site will be consolidated and will be located to maximise separation to the existing rail crossing and to ensure it does not compromise future access requirements for the racecourse site.

The proposed access will require a channelised right turn lane in accordance with Austroads design criteria. This will result in a back to back right turn lanes and will be facilitated by the transfer of a portion of racecourse land to road reserve when that access is constricted. Figure 3 illustrates a sketch layout of the proposed access point;





Figure 3: Potential Access to Morphettville Racecourse and subject site

An additional access could be provided at the northern end of the site but would be limited to left-in/left-out movements.

3.3 MORPHETT ROAD/TRAM CROSSING GRADE SEPARATION

The SA Government has announced funding to complete investigatory works associated with the potential to grade separate the tram crossing and Morphett Road. Such a project is significant and has the potential to impact the subject land if the level of Morphett Road is to be altered.

Preliminary discussions with DIT has identified that the option could demonstrate the tram line being raised. While there are substantial investigations to be completed to confirm a preferred scenario (and indeed a project), maintaining Morphett Road atgrade would have less impact on the Anzac Highway intersection. Further, should Morphett Road be raised, negotiations in respect to land acquisition would be required, regardless of the zone.



4.0 TRAFFIC ASSESSMENT

The traffic study prepared for the Morphettville Racecourse DPA was included extensive analysis, including detailed SIDRA and Aimsun modelling. This modelling included forecast volumes associated with development on the subject land.

While the DPA area was amended prior to approval the modelling was not adjusted. The draft traffic report (Appendix A) associated with the DPA identified the following potential development that was not ultimately included the approved zone change:

- 120 apartments on the land fronting Morphett Road, south of Bray Street; and
- A mixed use development on the subject site area.

While the number of apartments was not specified for the subject land in the report, the modelling suggests that volumes associated with 100 apartments were forecast on this land.

This traffic assessment has therefore been based on a comparison of the previous volumes which were attributed to the subject area compared with the potential which could be realised as a result of the proposed Code Amendment.

The yield study identifies a potential increase of approximately 36 apartments when compared with the concept plan considered previously (albeit it does not include a ground level commercial component). Table 1 shows a comparison of forecast volumes previously modelled for the racecourse DPA with the additional volumes relevant for the current Code Amendment.

	DPA Forecast	СА
Forecast	1055 veh/hr	1000 veh/hr
Proposed Housing		68 veh/hr
TOTAL	1055 veh/hr	1068 veh/hr

Table 1: Traffic forecast for pm peak hour for scenarios

It can be seen from the above table that there could be a minor increase in volumes associated with the subject Code Amendment. However, the change in volume would be in the order of 1% which is within the $\pm 5\%$ fluctuation on the road network and will have negligible impact on the modelling previously completed (particularly when distributed on the broader road network).

This confirms that potential increase in traffic volumes associated with the proposed Code Amendment will be negligible when compared with those considered in the detailed modelling and there will be no change in nature or function of the road network as a result of the proposed amendment to the zone.



4.1 INFRASTRUCTURE DEED

The South Australian Jockey Club and the Department for Infrastructure and Transport are parties to a Deed which identifies when road infrastructure works will be required. These triggers relate to development on the Morphettville Racecourse site and identify the level of development which can occur prior to the works being required.

Preliminary liaison with DIT confirmed that the additional modelling would not be required to inform this Code Amendment. DIT did, however, identify that there may be a requirement for alterations to the Deed to incorporate the subject land.

The mechanism by which the works are defined includes specifying development areas which trigger particular infrastructure works to which the potential traffic generation will relate. Subject to discussions with DIT, there may be a requirement to include the subject land as an additional area within the Deed.



5.0 PEDESTRIANS

Pedestrian facilities within the area the subject of the Code Amendment are limited but have been improved by the installation of signalised crossing facilities adjacent the atgrade level crossing on Morphett Road.

Notwithstanding the above, the proposed channelised turn lanes present an opportunity for pedestrian crossing facilities between the subject land and the racecourse to be improved through the installation of refuges. Such devices could be incorporated into the design of the median between the turn lanes.

The desirability of refuges or other pedestrian facilities will need to be further investigated in terms of likely warrants and road safety criteria. The ultimate design for a grade separated facility at the tram crossing will influence the type and location of pedestrian crossing facility and should be incorporated within the review of the preferred treatment.



6.0 SUMMARY

This report has considered the potential traffic impact associated with changes to the zoning of the Recreation Zone in the City of Marion. This land was previously considered during detailed traffic investigations associated with future potential development on the Morphettville Racecourse site. This review has confirmed that this earlier analysis can be referenced when considering the impacts associated with the Code Amendment.

Access for the land will be consolidated and treatments proposed to facilitate turning to the site. This will provide for improved safety along Morphett Road and a safe and convenient access to the site. An allowance for future widening of Morphett Road within the racecourse land had previously been identified and this will facilitate the provision of a channelised right turn lane treatment at the access.

The installation of signalised pedestrian crossings at the level tram crossing have improved safety for pedestrians crossing Morphett Road. Investigations associated with a future grade separated facilitate of Morphett Road and the tram line will inform future pedestrian facilities required.



APPENDIX A

MORPHETTVILLE RACECOURSE DPA TRAFFIC INVESTIGATIONS DRAFT REPORT



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MORPHETTVILLE RACECOURSE DPA

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CONTENTS

1.0	INTR	ODUCTION	. 1
2.0	EXIS	TING SITUATION	. 2
	2.1	SUBJECT SITE	. 2
	2.2		. ג ג
	2.5		. J 4
3.0	PRO	POSED REZONING	. 5
	3.1	POTENTIAL DEVELOPMENT	. 5
	3.2	FUTURE SITE ACCESS	. 6
	3.3	MORPHETT ROAD UPGRADE	.7
4.0	TRA	FFIC ASSESSMENT	8
	4.1	EXISTING TRAFFIC VOLUMES	. 8
	4.2	FORECAST TRAFFIC GENERATION	. 8
	4.3	TRAFFIC DISTRIBUTION	10
	4.4	DEVELOPMENT TRAFFIC VOLUMES	11
	4.5	TRAFFIC IMPACTS	13
		4.5.1 MORPHETT ROAD/ANZAC HIGHWAY INTERSECTION	13
		4.5.2 MORPHETT ROAD/BRAY STREET INTERSECTION	14
		4.5.3 PROPOSED ANZAC HIGHWAY U-TURN FACILITY	15
		4.5.4 MARION ROAD/BRAY STREET/RAGLAN AVENUE INTERSECTION	15
		4.5.5 MARION ROAD/SOUTH TERRACE INTERSECTION	15 16
5.0	PUB	LIC TRANSPORT	17
	51	ТВАМ	17
	5.2	BUSES	18
6.0	PEDI	ESTRIANS 1	19
7.0	SUM	IMARY	20
APPEN	DIX A	– DISTRIBUTION OF TRAFFIC	
APPEN	DIX B	– SIDRA OUTPUTS	



1.0 INTRODUCTION

This report relates to the proposed Development Plan Amendment for a site currently located within the Racecourse (Morphettville) zone in the City of Marion's Development Plan and Commercial zone in the City of West Torrens's Development Plan. Changes to the zoning are proposed to provide potential for a mixed use development inclusive of residential, retail and hospitality developments.

This report documents the traffic investigations which have been completed to inform the DPA assessment. Specifically it includes a review of the forecast volumes and any resultant impact which could be generated by the site should development, as envisaged by the DPA, be realised.

The traffic assessment currently considers the existing and full development scenarios and includes analysis of the potential impact at individual intersections. It will be supplemented by additional network modelling along Morphett Road. The network model will include the Bray Street/Morphett Road intersection, the level railway crossing on Morphett Road and the Morphett Road/Anzac Highway intersection. This model will be prepared for the base case (existing) scenario and the forecast 2036 situation.

In undertaking this assessment, particular attention has been paid to the requirements for access to the subject areas, given the restrictions created by the tram line and the existing road network. The report identifies appropriate access arrangements for the development precincts within the land to be rezoned as part of the DPA. Further, it reviews pedestrian safety and access requirements to/from and between anticipated development precincts within the subject zone.

A key component of the master plan which forms the basis of the DPA review is the relocation of the existing tram station to be incorporated within the precinct. Provision of this infrastructure presents a number of technical challenges in relation to both safety and operation. These have been identified in this report.



2.0 EXISTING SITUATION

2.1 SUBJECT SITE

The land under consideration includes the Morphettville Race Course and additional land to the west of Morphett Road and south of Bray Street. The bulk of the subject site is bounded by Morphett Road to the west, Anzac Highway to the north, Park Terrace to the east and Bray Street to the south. Tram lines dissect the subject land at the northern end. Figure 1 identifies the location of the DPA area.



Figure 1: DPA Area

The land south of the tram lines is within the jurisdiction of the City of Marion. The Council's Development Plan (consolidated 28 April 2016) identifies that the land to the east of Morphett Road is currently within the Racecourse (Morphettville) zone while



the land west of Morphett Road is zoned Residential (albeit the use on these parcels primarily consists of tram storage and warehousing.

The land north of the tram lines is within the jurisdiction of the City of West Torrens. The Council's Development Plan (consolidated 5 May 2016) identifies that the land is currently zoned for commercial use. The Junction Tavern and McDonalds occupy the subject land.

2.2 SITE ACCESS

Access to the DPA land is currently provided in the following locations:

- to/from the racecourse via Morphett Road. All turning movements are currently permitted at this access;
- to/from the previously used TAFE site via Park Terrace. This access provides for all movements;
- on Anzac Highway to access the Tavern, where all turning movements are currently permitted;
- via left-in/left-out access to the McDonalds site on both Morphett Road and Anzac Highway; and
- via a number of crossovers on Morphett Road and the adjacent street network to the land west of Morphett Road and south of Bray Street.

2.3 ROAD NETWORK

Morphett Road is an arterial road with a daily traffic volume in the order of 24,400 vehicles per day. It has a four lane divided carriageway for the majority of its length but widens to five lanes adjacent the northern portion of the subject land to provide for turning lanes on the approach to Anzac Highway. The road has a posted speed limit of 60 km/h.

Anzac Highway is a major arterial road with a daily traffic volume in the order of 33,600 vehicles per day. It has a six lane divided carriageway for the majority of its length but widens to eight lanes to provide for turning lanes on the approach to Morphett Road. The road has a posted speed limit of 60 km/h.

Bray Street is a collector road with a daily traffic volume in the order of 8,700 vehicles per day. The urban default speed limit of 50 km/h applies to the road. The road forms a signalised T-intersection with Morphett Road at its western end and a signalised four-way intersection with Marion Road and Raglan Avenue at its eastern end. All movements are permitted at the intersections.



Marion Road is a major arterial road with a daily traffic volume in the order of 36,300 vehicles per day. It has a four lane divided carriageway for the majority of its length but widens to five lanes on the approach to the Bray Street intersection to provide for turning lanes. The road has a posted speed limit of 60 km/h.

Park Terrace, South Terrace and Wattle Terrace are minor collector streets located in close proximity to the subject area. The urban default speed limit of 50 km/h applies to these roads.

2.4 PUBLIC TRANSPORT

Public transport services provide an alternative mode of transport to and from the subject area. These services include the Glenelg to Adelaide tram and several bus routes on all major roads and provide convenient access to Adelaide City. Bus routes to from the site are available via:

- Bus routes 263 and 265 which travel on Anzac Highway to/from the city through the southern suburbs. The services operate at a frequency of approximately five minutes during the weekday peak period and 30 minutes during the off-peak periods. On weekends, the services operate at hourly intervals;
- Bus route 245 which travels on South Terrace to/from the city through the southern suburbs. The services operate at a frequency of approximately 15 minutes during the weekday peak period and 30 minutes during the off-peak periods. On weekends, the services operate at half-hourly intervals;
- Bus route 190 which travels on Bray Street to/from the city through the western suburbs and terminating at the Glenelg Interchange. The service operates at a frequency of 30 minutes during the weekday and at hourly intervals during the weekend peak; and
- Bus routes J7 and J8 which travel on Morphett Road connecting the northern and southern suburbs. The routes service from West Lakes and Arndale interchanges (north) to Marion Centre Interchange (south). These services operate at a frequency of one hour during the weekday and do not operate on weekends.

The Glenelg Tram service is a high frequency service that travels between Glenelg and Adelaide. The route stops at a total of 17 stops. The subject site will be serviced by Stop 12 and Stop 11 which only operates on Race days. The service operates at a frequency of 5 minutes during the weekday peak periods and 10 minutes during the weekday off-peak and weekend peak periods. The trams are presently operating at capacity during the peak periods.



3.0 PROPOSED REZONING

3.1 POTENTIAL DEVELOPMENT

The Morphettville Racecourse Draft Master Plan identifies the following potential developments on the site:

- retail developments totalling 4,770 m² in area;
- hospitality developments totalling 5,065 m² in area;
- a bulky goods development approximately 530 m² in area;
- an office 1,120 m² in area;
- the existing tavern to be redeveloped to a floor area of 1,300 m² in area;
- residential development in a mixture of medium to high density residential apartments, detached dwellings and affordable housing; and
- parking facilities

The proposal also includes a proposition to upgrade the existing Morphettville tram stop (or potentially amalgamate this facility and the stop currently west of Morphett Road) and creation of a pedestrian plaza in order to provide connectivity for patrons and residents between the various land uses. Figure 2 illustrates the master plan for the racecourse land.



Figure 2: Racecourse redevelopment Master Plan



In addition to the racecourse site, the following development could be realised:

- approximately 120 dwellings on the land fronting Morphett Road, south of Bray Street; and
- a mixed use (likely to be commercial at ground level with medium or high density residential).

While the existing tram storage facility is included in the DPA area, its existing use is unlikely to change and hence there will be limited (if any) impact on traffic volumes.

3.2 FUTURE SITE ACCESS

Access to the subject site will generally be retained as per the existing situation with the following exceptions:

an additional access point proposed to be created on Morphett Road. This access
point will include left and right turn movements to the subject site and left turn
movement from the subject site and will be located so as that it does not interfere
with the existing operation of the Morphett Road/Anzac Highway intersection.
That is, there will be adequate separation to the entry of the right turn lane to
avoid the existing back of queue that is currently observed on Morphett Road, on
the northbound approach to the Anzac Highway intersection.

There will be a requirement to widen the road to effect a channelised right turn lane in accordance with Austroads design criteria. This will necessitate transfer of a portion of racecourse land to road reserve. Figure 3 illustrates a sketch layout of the proposed access point;



Figure 3: Potential Access to Morphettville Racecourse



- modification of the access point on Anzac Highway to restrict movements to leftin/left-out turns. Access for drivers from the eastbound carriageway of Anzac Highway will be facilitated via U-turn facilities in the median. The facility will be located so that it allows for adequate weaving distance to enter and exit the subject site; and
- other access as may be required to facilitate development along Morphett Road.

3.3 MORPHETT ROAD UPGRADE

The current configuration of Morphett Road does not provide for channelised right turn facilities and all movements are permitted to and from access point for the majority of its length. DPTI has identified a desire to be able to provide separation along this road but this can only be realised by widening the road reserve. This will impact on existing land adjacent Morphett Road. Figure 4 illustrates potential land take on the eastern side of Morphett Road if the road is to be widened to facilitate a central median and a channelised right turn lane into the racecourse site.



Figure 4: Potential land take should Morphett Road be widened to facilitate a central median



4.0 TRAFFIC ASSESSMENT

4.1 EXISTING TRAFFIC VOLUMES

SCATS traffic data for the Anzac Highway/Morphett Road, Morphett Road/Bray Street and Bray Street/Marion Road/Raglan Avenue intersections were obtained from DPTI for the week beginning Monday, 12 September 2016. The following peak periods were identified:

- weekday am and pm peak periods were identified on Friday, 16 September 2016 as being 7:45 am to 8:45 am and 4:45 pm to 5:45 pm respectively; and
- weekend peak was identified on Saturday, 17 September 2016 as being 11:45 am to 12:45 pm. It is relevant to note that there was a race occurring at the Morphettville Racecourse on this date.

To ascertain existing traffic volumes at the Marion Road/South Terrace intersection and the Junction Tavern access point, traffic surveys were undertaken by AusTraffic on Thursday, 8 December 2016 during the weekday peak hours. Weekend peak hour traffic volumes were calculated based on the SCATS data provided by DPTI.

Observations at the subject intersections were undertaken by MFY on Thursday, 1 June 2017 and Friday, 2 June 2017 to aid the traffic assessment. Specifically, the queue lengths and delays were identified to calibrate the SIDRA models.

4.2 FORECAST TRAFFIC GENERATION

Table 1 represents the traffic generation rates anticipated for the potential land uses within the subject DPA.

Dovelonment Type	Tri	Units		
Development Type	am peak	pm peak	sat peak	
Retail	2.0	9.0	12.5	Per 100 m ²
Bulky Goods	0.5	1.0	2.2	Per 100 m ²
Tavern	2.0	5.0	5.0	Per 100 m ²
Office	2.0	2.0	0	Per 100 m ²
High Rise Residential	0.5	0.5	0.5	Per unit
Medium Rise Residential	0.5	0.5	0.5	Per unit
Low Rise Residential	0.65	0.65	0.65	Per unit
Affordable Housing	0.15	0.15	0.2	Per unit
Detached Housing	0.8	0.8	0.8	Per unit

Table 1: Traffic Generation Rates



First principal analysis was used to assess the traffic generated by the zones marked for hospitality use. The assumptions were as follows:

- The Junction Tavern has been discounted as it is being reduced in floor area; and
- traffic volume generation for the proposed hospitality venues is based on anticipated development area and patron numbers.

The following scenarios were considered when assessing the traffic generated by the potential function area development during the am, pm and weekend peak periods:

- arrival for a conference with capacity for 350 persons in the am peak;
- departure for the conference in the pm peak; and
- arrival for a 1,000-seat banquet lunch for weekend peak (such as on a race day).

The proposed conference would be expected to generate a peak parking demand for approximately 120 vehicles. If all of these trips were to arrive or depart during the peak hour periods and the conference facility was to be full, it would equate to a generation rate of 120 vehicle trips during the peak hours. In reality such a situation would be infrequent.

The banquet lunch would typically coincide with a race day event. In the unlikely event that all the anticipated trips are made in the hour preceding the event, then there would be a traffic generation in the order of 500 trips in the weekend peak hour, assuming that all trips were by car and there was an average occupancy of two persons per car. In reality, it is expected that at least 25% of the patronage would access the site via other travel modes given the nature of these events and the close proximity of the tram station. Accordingly, the forecast volume associated with the event would be 375 trips.

Of note is that there are currently events at the subject site and, hence, the volumes associated with existing race events will not be additional to the road network. This has been accounted for in this assessment by assuming that other race day facilities are all existing or will be redeveloped to be comparable to existing.

Traffic associated with the function facility will also occur during weekday periods, albeit the volume during the pm commuter peak will be low.

Adopting the traffic generation rates and scenarios described above, the forecast trip generation for the subject site is:

- 720 vph during the weekday am peak;
- 1,055 vph during the weekday pm peak; and



• 1,470 vph during the weekend peak.

4.3 TRAFFIC DISTRIBUTION

The following traffic distribution to and from the DPA land has been adopted for this assessment:

- 25% from the north;
- 15% from the east;
- 25% from the south; and
- 35% from the west.

Consideration has also been given to the varying restrictions on each site's access point. As such, a more detailed origin-destination type of distribution was undertaken to aid in the forecast of the anticipated traffic volumes. These distribution diagrams are provided in Appendix A.

In regards to the movement split of traffic entering/exiting the subject site, it is anticipated that:

- Residential developments will have:
 - 20% in and 80% out in the am peak;
 - 30% in and 70% out in the pm peak; and
 - 40% in and 60% out in the sat peak.
- Retail developments will have:
 - 90% in and 10% out in the am peak;
 - 40% in and 60% out in the pm peak; and
 - 50% in and 50% out in the sat peak.
- Bulky goods development will have:
 - 60% in and 40% out in the am peak;
 - 30% in and 70% out in the pm peak; and
 - 50% in and 50% out in the sat peak.
- Office development will have:
 - 80% in and 20% out in the am peak; and
 - 20% in and 80% out in the pm peak.



4.4 DEVELOPMENT TRAFFIC VOLUMES

The volumes that could be generated by the proposed developments within the DPA will be distributed to the proposed access points and intersections based on the distributions illustrated in Appendix A.

Figure 5 illustrates the estimated increase in peak hour traffic volumes at the Anzac Highway/Morphett Road intersection.



Figure 5: Anzac Highway/Morphett Road intersection estimated peak hour traffic volumes am(pm)[sat]

Figure 6 illustrates the estimated additional peak hour traffic volumes at the Bray Street/Morphett Road intersection.



Figure 6: Bray Street/Morphett Road intersection estimated additional peak hour traffic volumes am(pm)[sat]

Figure 7 illustrates the estimated additional peak hour traffic volumes at the proposed U-turn facility on Anzac Highway.



Anzac Highway			
35(90)[60]	Ş		
	Ê	45(75)[105]	

Figure 7: Anzac Highway proposed U-turn facility estimated additional peak hour traffic volumes am(pm)[sat]

Figure 8 illustrates the estimated peak hour traffic volumes at the Bray Street/Marion Road/Raglan Avenue intersection associated with the development.



Figure 8: Bray Street/Marion Road/Raglan Avenue intersection estimated peak hour traffic volumes am(pm)[sat]

Figure 9 illustrates the estimated additional peak hour traffic volumes at the South Terrace/Marion Road intersection.



Figure 9: South Terrace/Marion Road intersection estimated peak hour traffic volumes am(pm)[sat]



Figure 10 illustrates the estimated additional peak hour traffic volumes at the proposed access point on Morphett Road.



Figure 10: proposed access point on Morphett Road estimated additional peak hour traffic volumes am(pm)[sat]

4.5 TRAFFIC IMPACTS

SIDRA Intersection 6.1 software has been used to analyse the potential impact on the subject intersections and access points for the weekday morning commuter peak hour, weekday evening commuter peak hour, and weekend development peak hour periods. The following sections summarise the analysis and the detailed SIDRA outputs are provided in Appendix B

4.5.1 MORPHETT ROAD/ANZAC HIGHWAY INTERSECTION

	am (pm) [weekend]		
Scenario	Degree of Saturation	Level of Service (intersection)	Average Delay (sec)
Existing	0.87 (0.97) [0.87]	E (E) [D]	51.7 (56.8) [53.5]
Existing plus development	0.99 (0.96) [0.98]	E (E) [E]	59.9 (62.4) [67.6]

 Table 2: Performance indicators for the Morphett Road/Anzac Highway intersection

As shown in Table 2, the SIDRA analysis indicates that the Morphett Road/Anzac Highway intersection would appear to be operating near capacity during the afternoon peak period but has spare capacity during the morning peak hour and on weekends. The higher saturation, however, only occurs for drivers turning left from Anzac Highway to Morphett Road and this movement is restricted by the tram crossing. The primary traffic movements on Anzac Highway identified a degree of saturation of 0.88.

The analysis also identified that the queue currently exceeds the storage length in the right turn lane on Anzac Highway (for eastbound traffic waiting to turn to Morphett



Road). The northbound queue is identified as extending beyond the tram crossing on Morphett Road, although the shared lane arrangement does not provide clarity as to whether the queue is more influenced by right turning or through traffic movements.

The additional volumes associated with full development of the proposal would result in the intersection operating almost at capacity during the am and pm peak and when a large event is scheduled at the racecourse on a weekend. There would be an increase in delays for drivers at the intersection of approximately 30 seconds but the signal would still operation with a Level of Service E for most movements.

The functionality of the intersection is also impacted by the close proximity of the tram crossing on Morphett Road. The limited separation between the signal and the atgrade crossing means that there is insufficient queuing distance for southbound drivers to store between the boom gate and the signals when a tram is crossing. Similarly, the northbound queues on Morphett Road at the traffic signals can extend across the tram lines. This, in effect, means that the signal does not operate as efficiently as might be envisaged in the SIDRA results. This is evident on-site during the pm peak where queues do not clear the intersection each cycle.

SIDRA analysis identified that the queue in the eastbound right turn lane would extend further outside the channelised right turn lane and the storage would need to be extended to accommodate this queue.

The network Aimsun analysis that is being completed in parallel with this assessment will better inform the anticipated operation of the intersection in parallel with the operation of the adjacent tram crossing. This review and subsequent reporting should be referenced in relation to potential amelioration measures at this intersection.

4.5.2 MORPHETT ROAD/BRAY STREET INTERSECTION

	am (pm) [weekend]		
Scenario	Degree of Saturation	Level of Service (worst movement)	Average Delay (sec)
Existing	0.64 (0.73) [0.57]	C (C) [C]	20.7 (23.2) [22.8]
Existing plus development	0.81 (0.84) [0.74]	C (C) [C]	27.4 (28.2) [26.9]

 Table 3: Performance indicators for the Morphett Road/Bray Street intersection

Table 3 highlights that the Morphett Road/Bray street intersection will continue to operate within capacity with drivers experiencing minimal increase in delays. More importantly the maximum queue length observed on Bray Street is anticipated to be 89 metres and will not cross the Ellis Avenue intersection.



4.5.3 PROPOSED ANZAC HIGHWAY U-TURN FACILITY

The critical period for the capacity of the U-turn facility on Anzac Highway was identified as the pm peak when eastbound opposing traffic on Anzac Highway is at its highest. The SIDRA model was calibrated using the delays, queues and platooning observed at the existing access point. Table 4 summarises the SIDRA analysis.

Table 4: Performance indicators of critical movements for the Marion Road/South Terrace	9
intersection	

Sconario	U-turn on Anzac Highway		
Scenario	DOS	Average Delay (s)	Queue Distance (m)
Existing	0.25	52.6	4
Existing plus development	0.96	100.1	40

The results identify that a U-turn facility would operate within capacity. The analysis identified that drivers performing the manoeuvre would experience an increase in delay of about 50 seconds, albeit the actual increase will be more related to the platooning effect of traffic on Anzac Highway. Nonetheless, the queue length will be accommodated within the existing storage facility even if this queue length was to be realised.

4.5.4 MARION ROAD/BRAY STREET/RAGLAN AVENUE INTERSECTION

Table 5: Performance indicators for the Marion Road/Bray Street/Raglan Avenue intersection

		am (pm) [weekend]	
Scenario	Degree of Saturation	Level of Service (worst movement)	Average Delay (sec)
Existing	0.98 (0.99) [0.98]	E (D) [D]	57.4 (42.1) [52.3]
Existing plus development	0.97 (0.97) [0.98]	E (D) [D]	61.3 (54.8) [51.8]

SIDRA analysis indicates that the existing Marion Road/Bray Street/Raglan Avenue intersection is operating close to capacity and that the additional traffic volumes will have limited impact on the operation.

4.5.5 MARION ROAD/SOUTH TERRACE INTERSECTION

The critical peak period for the intersection was identified as the pm peak period due to the additional number of vehicles turning right from Marion Road. A SIDRA model of the subject intersection was calibrated based on the observation of delays and queue lengths made at the intersection. Table 6 summarises the critical movement to/from the proposed development.



Table 6: Performance indicators of critical movements for the Marion road/South Terrac	е
intersection	

Sconorio	Right turn from Marion Road to site		Left turn from site to Marion Road	
Scenario	Average Delay (s)	Queue Distance (m)	Average Delay (s)	Queue Distance (m)
Existing	14.7	7	9.2	2
Existing plus development	17.2	11	9.7	5

SIDRA analysis indicates that drivers accessing the subject site using Marion Road/South Terrace intersection will experience minimal increases to existing delays and queue lengths.

4.5.6 PROPOSED ACCESS POINT ON MORPHETT ROAD

The proposed access point on Morphett Road provides for drivers accessing the site via a right turn from the south. Right turn out from the site will not be permissible. The critical period for the access point was identified to the weekend peak due to the high volume of traffic generated by the Hospitality development. Table 7 summarises the SIDRA analysis for the critical period.

Table 7: Performance indicators of critical movements for the proposed access on MorphettRoad

Sconaria	Right turn from Morphett Road to site			
Scenano	DOS	Average Delay (s)	Queue Distance (m)	
Existing plus development	0.45	18.3	13	

The results identify that the proposed access point will operate satisfactorily and with minimal delays for the drivers accessing the site. It would require a storage length of 13 metres (two vehicles) which would be readily provided.



5.0 PUBLIC TRANSPORT

The proposal includes incorporation of a central public realm facility which will focus on a tram stop (at approximately the same location as the event day stop which is used when a large event is hosted at the racecourse). This area will provide for accessibility for facilities in the new precinct for patrons using public transport but also the stop will be in close proximity for residents who choose to live within the future development precinct. There is therefore an opportunity to maximise the public transport mode of travel to and from the site.

5.1 TRAM

The ideology of providing housing, event, commuter and retail facilities in close proximity to a tram station is sound in that it provides a key opportunity for travel via a public transport facility and reduce the need for vehicles on the road. However, in order for this goal to be realised there are a number of technical aspects which warrant further review to ascertain the potential to increase the use of trams to and from the subject site, including:

- The trams are currently used to capacity during peak commuter periods. This means that there is no potential to increase patronage on the trams in peak periods;
- There is limited (if any) potential to increase the number of services during the peak commuter periods, given that the tram schedules are governed by the services on King William Street (in the CBD). Further, any increase in tram service during the peak periods (currently operating at five minute intervals) would result in an additional impact on Morphett Road, given that the boom gates would then be activated more often;
- Subject to provision of fleet (there would be a need to increase carriage numbers), there would be potential to increase the number of services during the shoulder periods either side of the peaks. Accordingly, the potential to attract additional patrons on the tram would be greater outside the peak commuter periods; and
- The amalgamation (relocation) of the tram stops or creation of an additional stop would need to consider any increases in delays for the tram service, particularly during the peak periods when there is already a short period between services. The creation of a plaza type area would have the effect of necessitating a reduce traffic speed which would impact the service time and potential scheduling.

In addition to the capacity constraints, the following safety issues would need to be considered if the new tram facility was to be created:



- The safety implications for various transport modes to share the plaza area will need to be considered and an audit undertaken of the design of this area (should it progress). Potential conflict between vehicles and pedestrians will need to be addressed;
- Tram employees will need to walk further from the depot to and from the tram stop should it be relocated. There is some concern that this will impact on working time for drivers (as it will take longer to walk between the depot and the tram stop). This matter should be reviewed when the detail of the plaza area is further investigated and may require consideration of additional infrastructure, such as a small depot on-site for transferring drivers; and
- Structures over the tram tracks will necessitate a number of specific assessments, including numerous structural engineering assessments and clearance requirements. Treatments to prevent obstacles being thrown onto the tracks will need to be considered and identified, both from any pedestrian bridge and from proposed residences.

5.2 BUSES

The existing bus services on Anzac Highway and Morphett Road are not currently used to capacity. Further, the timetabling indicates that there is capacity to increase the number of services along some or all of the existing routes to potentially increase patronage.

This provides an opportunity to further supplement the tram by increasing the capacity on the bus service and developing a public transport regime for the site which provides for convenient bus access during peak periods.

Should the bus services to/from and within the subject area increase, there would be a need to address timetabling and fleet capacity, but also any impact there may be as a result of increased buses crossing the Morphett Road railway level crossing at Belair.



6.0 PEDESTRIANS

Pedestrian facilities within the area the subject of the DPA are limited to the crossing facilities at the signals and one adjacent the tram crossing. In addition, crossing movements across the tram line are also limited and are discouraged by DPTI.

The proposal will include a pedestrian linkage across Anzac Highway. While the exact configuration is not specified, the creation of this facility is desirable given the high visitor patronage to the subject area.

In addition to the above, pedestrian crossing facilities between racecourse users on the western side of Morphett Road and the racecourse will need to be further investigated in terms of likely warrants, the potential for the future Morphett Road median to address pedestrian safety concerns and the ability to explore the use of other access or road safety treatments to also resolve pedestrian accessibility and safety.


7.0 SUMMARY

This report has considered the potential traffic impact associated with changes to the zoning of the Racecourse (Morphettville) zone and Commercial zone in the City of Marion and West Torrens respectively. Particular consideration has been given to the available access points and the restrictions to identify the traffic distribution to/from the proposed development, given the constraint imposed by the tram lines.

Preliminary SIDRA identifies that the road network will sufficiently accommodate the additional traffic volumes generated by the development, albeit the Anzac Highway/Morphett Road intersection requires careful analysis to determine the extent of potential upgrade that maybe required to ameliorate existing and future queuing issues on the surrounding road network. The SIDRA analysis indicates that some minor treatments (such as extending right turn lane storage) would address the queueing issues at the intersection (except when the tram crossing impacts the queues). Further, the proposed Aimsun analysis will provide a more detailed assessment of any required upgrades at the intersection and will consider 2036 traffic volumes.

Access for the land will be consolidated and treatments proposed to facilitate turning to/from each direction. This will provide for good accessibility for patrons while removing some existing movements to improve safety. An allowance for future widening of Morphett Road will facilitate future widening of the road to create a median. Development on the site will need to account for this additional land.

Further investigations as to how to improve patronage should be undertaken as part of the design investigations for the proposed facility. Increasing availability to grow the tram patronage during the peak periods will be beneficial.



APPENDIX A

DISTRIBUTION DIAGRAMS





DISCLAIMER THESE ARE CONCEPT PLANS ONLY AND NOT INTENDED TO BE USED FOR CONSTRUCTION. MFY P/L DOES NOT REPRESENT THAT THE PLANS ARE IN ANY WAY SUITABLE FOR USE FOR CONSTRUCTION PURPOSES AND DOES NOT GIVE CONSENT TO THEIR USE FOR CONSTRUCTION PURPOSES PURPOSES. ANY PARTY USING THE PLANS FOR CONSTRUCTION DOES SO AT THE PARTY'S OWN RISK AND WITHOUT THE CONSENT OF MFY P/L

Morphettyille Racecourse DPA								
Traffic Distribution Residential	Drawing: Project Name Client:	MFY_150440_03_SH01 Morphettville Racecourse DPA South Australian Jockey Club Incorporated	Project Number: Drawn: Date:	15-0440 BH 26.05.2015	Revision: Scale: Paper Size:	B 1:125 A3	nry	Unit 6, 224 Glen Osmond Road FULLARTON SA 5063 T: +61 8 8338 8888 E: mfya@mfy.com.au
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Morphettville Racecourse DPA Traffic Distribution	Drawing: Project Name: Client:	MFY_150440_03_SH02 Morphettville Racecourse DPA South Australian Jockey Club Incorporated	Project Number: Drawn: Date:	15-0440 BH 31.05.2015	Revision: Scale: Paper Size:	B 1:125 A3	níų	Unit 6, 224 Glen Osmond Road FULLARTON SA 5063 T: +61 8 8338 8888 F: mfva@mfv com au
Retail							Traffic e Parking e Transport —	L. mya@my.com.au





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Morphettville Racecourse DPA								
Traffic Distribution	Drawing: Project Name: Client:	MFY_150440_03_SH03 Morphettville Racecourse DPA South Australian Jockey Club Incorporated	Project Number: Drawn: Date:	15-0440 SV 23.05.2015	Revision: Scale: Paper Size:	A 1:125 A3	mry	Unit 6, 224 Glen Osmond Road FULLARTON SA 5063 T: +61 8 8338 8888 E: mfya@mfy.com.au
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APPENDIX B

SIDRA ANALYSIS



JOB NUMBER:	15-0440]	INTERSECTION:	MORPHETT ROAD/ANZAC HIGHWAY
		1	SCENADIO:	
FROJECT NAME.			SCENARIO.	





JOB NUMBER:	15-0440		INTERSECTION:	MORPHETT ROAD/ANZAC HIGHWAY
		_		
PROJECT NAME:	MORPHETTVILLE DPA		SCENARIO:	EXISTING PM PEAK





JOB NUMBER:	15-0440		INTERSECTION:	MORPHETT ROAD/ANZAC HIGHWAY
	-	-		
PROJECT NAME:	MORPHETTVILLE DPA		SCENARIO:	EXISTING WEEKEND PEAK





JOB NUMBER:	15-0440]	INTERSECTION:	MORPHETT ROAD/ANZAC HIGHWAY
		-		
PROJECT NAME:	MORPHETTVILLE DPA		SCENARIO:	EXISTING AM PEAK + DEVELOPMENT VOLUMES





JOB NUMBER:	15-0440		INTERSECTION:	MORPHETT ROAD/ANZAC HIGHWAY
		1		
PROJECT NAME:	MORPHETTVILLE DPA		SCENARIO:	EXISTING PM PEAK + DEVELOPMENT VOLUMES

0.7 – 0.8]	[0.8-0.9]	[0.9 - 1.0]	[> 1.0]	Continuous





JOB NUMBER:	15-0440	INTERSECTION:	MORPHETT ROAD/ANZAC HIGHWAY
PROJECT NAME:	MORPHETTVILLE DPA	SCENARIO:	EXISTING WEEKEND PEAK + DEVELOPMENT VOLUMES





JOB NUMBER:	15-0440	INTERSECTION:	MORPHETT ROAD/BRAY STREET
PROJECT NAME:	MORPHETTVILLE DPA	SCENARIO:	EXISTING AM PEAK



File: 15-0440 Morphett Road Bray Street EXAM







JOB NUMBER:	15-0440]	INTERSECTION:	MORPHETT ROAD/BRAY STREET
		_		
PROJECT NAME:	MORPHETTVILLE DPA		SCENARIO:	EXISTING AM PEAK + DEVELOPMENT VOLUMES











File: 15-0440 Anzac Highway U-turn EXAM



File: 15-0440 Anzac Highway U-turn EXPM



File: 15-0440 Anzac Highway U-turn EXSAT







Colour code based on Level of Service						
LOS A	LOS B	LOS C	LOS D	LOS E	LOS F	Continuous

JOB NUMBER:	15-0440	INTERSECTION:	ANZAC HIGHWAY/JUNCTION TAVERN ACCESS
PROJECT NAME:	MORPHETTVILLE DPA	SCENARIO:	PROPOSED U-TURN FACILITY
			AM PEAK

⊿N

95%ile QUEUE DISTANCE (metres)





File: 15-0440 Anzac Highway U-turn PRAM



Colour code	based on Degree of Satura	tion			Colour code	based on Queue Sto
[< 0.6]	[0.6 – 0.7] [0.7 – 0.8]	[0.8 – 0.9] [0.9 – 1.0]	[> 1.0]	Continuous	[< 0.6]	[0.6 – 0.7] [0.7





Colour code based on Level of Service						
LOS A	LOS B	LOS C	LOS D	LOS E	LOS F	Continuous

JOB NUMBER:	15-0440	INTERSECTION:	ANZAC HIGHWAY/JUNCTION TAVERN ACCESS
PROJECT NAME:	MORPHETTVILLE DPA	SCENARIO:	PROPOSED U-TURN FACILITY
			PM PEAK





File: 15-0440 Anzac Highway U-turn PRPM



Colour code based on Degree of Saturation			Colour code	based on Queue Sto
[< 0.6] [0.6 - 0.7] [0.7 - 0.8] [0.8 - 0.9] [0.9 - 1.0]	[> 1.0]	Continuous	[< 0.6]	[0.6 – 0.7] [0.7 -





Colour code based on Level of Service						
LOS A	LOS B	LOS C	LOS D	LOS E	LOS F	Continuous

JOB NUMBER:	15-0440	INTERSECTION:	ANZAC HIGHWAY/JUNCTION TAVERN ACCESS
PROJECT NAME:	MORPHETTVILLE DPA	SCENARIO:	PROPOSED U-TURN FACILITY
			WEEKEND PEAK





File: 15-0440 Anzac Highway U-turn PRSAT



JOB NUMBER:	15-0440		INTERSECTION:	MARION ROAD/BRAY STREET/RAGLAN AVENUE
		_		
PROJECT NAME:	MORPHETTVILLE DPA		SCENARIO:	EXISTING AM PEAK

Storage R	latio			
J.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]	Continuous





JOB NUMBER:	15-0440	INTERSECTION:	MARION ROAD/BRAY STREET/RAGLAN AVENUE
PROJECT NAME:	MORPHETTVILLE DPA	SCENARIO:	EXISTING PM PEAK

Storage R	Ratio			
0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]	Continuous





JOB NUMBER:	15-0440	INTERSECTION:	MARION ROAD/BRAY STREET/RAGLAN AVENUE
PROJECT NAME:	MORPHETTVILLE DPA	SCENARIO:	EXISTING WEEKEND PEAK

Storage R	atio			
0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]	Continuous



File: 15-0440 Marion Road Bray Street EXSAT



JOB NUMBER:	15-0440	INTERSECT	ION:	MARION ROAD/BRAY STREET/RAGLAN AVENUE
PROJECT NAME:	MORPHETTVILLE DPA	SCENARIO		EXISTING AM PEAK + DEVELOPMENT VOLUMES

Storage R	atio			
0.7 - 0.8]	[0.8 - 0.9]	[0.9 – 1.0]	[> 1.0]	Continuous





JOB NUMBER:	15-0440]	INTERSECTION:	MARION ROAD/BRAY STREET/RAGLAN AVENUE
PROJECT NAME:	MORPHETTVILLE DPA		SCENARIO:	EXISTING PM PEAK + DEVELOPMENT VOLUMES





JOB NUMBER:	15-0440]	INTERSECTION:	MARION ROAD/BRAY STREET/RAGLAN AVENUE
PROJECT NAME:	MORPHETTVILLE DPA]	SCENARIO:	EXISTING WEEKEND PEAK + DEVELOPMENT VOLUMES

Storage R	atio			
0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]	Continuous





PROJECT NAME:	MORPHETTVILLE DPA	SCENARIO:	EXISTING AM PEAK

File: 15-0440 Marion Road South Terrace EXAM



PROJECT NAME:	MORPHETTVILLE DPA	SCENARIO:	EXISTING PM PEAK



PROJECT NAME:	MORPHETTVILLE DPA	SCENARIO:	EXISTING WEEKEND PEAK

File: 15-0440 Marion Road South Terrace EXSAT



PROJECT NAME:	MORPHETTVILLE DPA	SCENARIO:	EXISTING AM PEAK + DEVELOPMENT VOLUMES




PROJECT NAME:	MORPHETTVILLE DPA	SCENARIO:	EXISTING PM PEAK + DEVELOPMENT VOLUMES



PROJECT NAME:	MORPHETTVILLE DPA	SCENARIO:	EXISTING WEEKEND PEAK + DEVELOPMENT VOLUMES







File: 15-0440 Morphett Road Access PRPM



File: 15-0440 Morphett Road Access PRSAT