



**MIDDLETON LAND
CODE AMENDMENT**

TRANSPORT INVESTIGATIONS



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Client: Mr Grant Lewis

Client contact: Mr Andrew Humby, Humby Consulting

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CIRQA Pty Ltd

ABN 12 681 029 983

PO Box 144, Glenside SA 5065

150 Halifax Street, Adelaide SA 5000

(08) 7078 1801

www.cirqa.com.au

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1. INTRODUCTION

CIRQA has been engaged to provide traffic impact investigations for the potential rezoning of an area of land at the western side of the township of Middleton. Specifically, CIRQA's investigations relate to the proposed rezoning of the subject land from Deferred Urban to a zone which would facilitate residential development on the subject land.

This report includes assessment of the potential traffic generation associated with the potential rezoning and redevelopment of the subject land, the associated impact on the adjacent existing road network, active and sustainable transport provisions and consideration of appropriate infrastructure upgrades/requirements.

2. BACKGROUND

2.1 STUDY AREA

The subject land is located at the western side of the existing Middleton township on the Fleurieu Peninsula. Specifically, the subject site comprises the following sites:

- CT5799/377 (Lot 104); and
- CT5799/208 (Lot 105).

The Affected Area is bound by Port Elliot Road to the north, Mindacowie Terrace to the east, a rail corridor to the south and Basham Beach Road to the west.

Figure 1 illustrates the subject site and adjacent road network.



Figure 1 – Subject site and adjacent road network

The Planning and Design Code identifies that the site is currently located within a Deferred Urban Zone. The land is primarily used for primary production purposes. The site is currently serviced by a number of minor access points on the bounding roads (including Port Elliot Road). A previous rezoning proposal was investigated in 2019 however did not proceed. The 2019 proposal included additional land on the northern side of Port Elliot Road (between Glenford Gully

Road and Ocean Road) with a greater potential yield associated with future development of the previous area considered.

2.2 ADJACENT ROAD NETWORK

Port Elliot Road is a Direct/Scenic Tourist Route under the care and control of the Department for Infrastructure and Transport (DIT). The road comprises a single traffic lane and sealed shoulder in each direction separated by a marked centreline. Generally, an 80 km/h speed limit applies on Port Elliot Road adjacent the site (which reduces to 50 km/h at the eastern end of the site). DIT data indicates the road has an Average Annual Daily Traffic (AADT) volume of approximately 11,000 vehicles per day (albeit higher volumes are likely experienced during peak holiday periods).

The remaining roads adjacent the site are all local roads under the care and control of Alexandrina Council. These roads all comprise two-way sealed roads with a single traffic lane in each direction separated by marked centrelines. The roads primarily function to accommodate direct access to adjacent residential and primary production properties. Basham Beach Road and Mindacowie Terrace also provide access to nearby public coastal areas and beaches.

A rail corridor is located adjacent the subject land's southern boundary (along which the Cockle Train operates). Passive level (rail) crossings are located on both Basham Beach Road and Mindacowie Terrace (one on each road). Due to the angle of the rail corridor (relative to Port Elliot Road), there is relatively limited separation (50 m) between the level crossing on Mindacowie Terrace and the intersection of Mindacowie Terrace and Port Elliot Road.

As illustrated in Figure 1, the intersection of Port Elliot Road with Glenford Gully Road and Basham Beach Road forms staggered (left-right) T-intersections. Similarly, a staggered (left-right) T-intersection is also formed at the intersection of Port Elliot Road with Ocean Road and Mindacowie Terrace. Vehicles turning right from Port Elliot Road into the respective side streets overlap at each intersection due to the left-right staggers.

Crash data provided by DIT for the subject area (for the five-year period from 2016 to 2020 inclusive) has been reviewed. The crash data indicates the following crashes have been reported within this period on the roads adjacent the site:

- four crashes at the Mindacowie Terrace/Port Elliot Road/Ocean Road intersection (one resulted in an injury, the remaining three were property damage only);
- three crashes at the Basham Beach Road/Port Elliot Road/Glenford Gully Road intersection (two resulted in an injury, the remaining crash resulted in property damage only); and

- no other crashes were reported on other adjacent intersections or mid-block locations immediately adjacent the Affected Area.

The above crash rates at the two intersections are not considered significant, albeit notable given the staggered T-intersection arrangements.

2.3 WALKING AND CYCLING

The majority of the adjacent roads do not have existing formalised footpaths, with the exception of Mindacowie Terrace which has a sealed footpath on the eastern side of the road. Similarly, there are no formalised on-road cyclist facilities on the adjacent roads (cyclists would utilise the shoulders where present or share the traffic lanes with vehicles).

The Encounter Bikeway is located approximately 330 m south of the subject site. The Bikeway provides a 30 km shared cyclist and pedestrian link between Victor Harbor and Goolwa (via Port Elliot and Middleton).

2.4 PUBLIC TRANSPORT

Middleton is serviced by LinkSA bus services which operate between Adelaide Central (Bus) Station and Goolwa (including stops at Marion, Noarlunga Centre and Victor Harbor). The services operate six times each weekday and three times a day on weekends in each direction. The closest stops to the subject site are adjacent the General Store (approximately 400 to 450 m east of the site).

The Middleton Train Station is also located immediately adjacent the subject site (to the south). The train station is serviced by the Cockle Train which primarily provides tourist services between Victor Harbor and Goolwa. Trains operate on a variable timetable with services typically undertaken on Saturdays, Sundays and Wednesdays outside of school holidays, with additional services on other days of the week also operating during school holidays. There are generally three services per day but additional services operate during peak periods (such as Christmas holidays). Trains only stop at Middleton Train Station by request.

3. PROPOSED REZONING

It is proposed to rezone the subject area to enable future residential development on the site. It is anticipated that the site will be rezoned to a Residential Zone or similar.

CIRQA has been advised that in the order of 52 allotments could be developed within the subject land following its rezoning (a significant reduction compared to the yields previously considered for the larger 2019 rezoning proposal).

For the purposes of this assessment, it has been assumed that each allotment would accommodate a single detached dwelling. The future development of the site (subsequent to rezoning) would be expected to include a new internal road network to provide direct access to individual residential allotments with connections to the adjacent existing roads.

The concept plan (refer Appendix A) prepared for the rezoning and subsequent development identifies the potential for a single access point on Port Elliot Road (towards the eastern side of the Affected Area) and a single access point on Basham Beach Road. In addition, a small number of allotments (in the order of five) would have direct access to/from Basham Beach Road. The identification of the potential access locations has taken into consideration previous transport investigations prepared for the larger 2019 rezoning proposal. The previous investigations recommended that primary access for the subject land (and additional area considered in the 2019 proposal) should be accommodated via Port Elliot Road with secondary access possible via the adjacent side streets.

4. TRAFFIC GENERATION AND DISTRIBUTION

A daily traffic generation rate of 7.5 to 8 trips per dwelling is typically adopted for residential development in SA. While there are limited public transport provisions servicing the subject site (which could result in a higher traffic generation), there would also be a proportion of dwellings utilised as 'holiday homes' with minimal traffic generation for much of the year. The rate of 8 trips per dwelling is considered appropriate for assessment of the subject proposal. On this basis, the future development of the rezoned land could generate in the order of 416 vehicle movements per day. Assuming that 10% of the daily trips occur during the peak hours there would be approximately 42 peak hour trips generated by development of the site (in both the am and pm peak hours).

Movements are forecast to be distributed relatively evenly to the east and west of the site (i.e. 50% to/from the east and 50% to/from the west). Assuming movements are split 30% in/70% out in the am peak hour and vice versa in the pm peak hour, the following broad distribution has been assumed:

- in from the west – 6 am and 15 pm trips;
- in from the east – 6 am and 15 pm trips;
- out to the west – 15 am and 6 pm trips; and
- out to the east – 15 am and 6 pm trips.

The movements would be further split between the new intersection on Port Elliot Road and the new intersection on Basham Beach Road. The resulting turning movements at each of the access points/intersections would be very low (10 movements or less per turning movements).

5. TRANSPORT INFRASTRUCTURE PROVISIONS

5.1 ACCESS ARRANGEMENTS

As noted above, the location of the access arrangements for the concept plan have taken into account the previous review of access provision prepared for the 2019 rezoning proposal. The previous investigations sought primary access via Port Elliot Road. For the (now) Affected Area, secondary access was also considered appropriate via Basham Beach Road. However, it was previously noted that, given the restricted length of site frontage to Mindacowie Terrace and proximity of both Port Elliot Road and the rail corridor, it would be undesirable to provide a primary site access on Mindacowie Terrace. While direct access for individual allotments would be appropriate via Basham Beach Road, it was also recommended that no direct access be provided for allotments via Port Elliot Road (given the road's function). Such recommendations are considered to remain relevant to the current rezoning proposal.

The future volumes at the primary access point would warrant the provision of a full separated right turn lane and short separated left turn lane (primarily due to the volume of traffic on Port Elliot Road rather than the turning volumes into/out of the Affected Area). These could be designed to suit the existing 80 km/h speed limit (90 km/h design speed), however could be reduced in length if a speed reduction was undertaken (i.e. the 80 to 50 km/h speed limit change shifted to west of Glenford Gully Road).

In order to consider impacts of the potential T-intersection on Port Elliot Road, SIDRA intersection modelling software has been utilised to assess future conditions at the access points. The assessment has been based on extrapolation of the existing through movement data on Port Elliot Road to a 10-year design horizon (at a rate of 2% growth per annum) plus additional development related volumes (at full completion). The analysis has also been based on the assumption that all movements are undertaken via the T-intersection (in reality, some movements would occur via Basham Beach Road and this provides a conservative analysis). Results of the SIDRA analysis are provided in Appendix B. The SIDRA analysis confirms that the relatively low volume of traffic associated with the new intersection would be easily accommodated with negligible impact on through movements on Port Elliot Road.

5.2 INTERNAL ROAD NETWORK

The internal road network should generally provide a high level of permeability for pedestrians and cyclists. Given the relatively low traffic volumes, all roads within the site would be classed as 'local roads' (less than 1,500 vehicles per day).

The internal road networks would desirably include pedestrian facilities (at least on one side of the road). Given the low traffic volumes, cyclists could safely share

the roads with vehicles or the footpaths with pedestrians. The pedestrian (and cycling) network would desirably provide a high level of connection to the existing Middleton town centre as well as local beach destinations (such as Basham Beach). Depending on the broader site considerations, there may also be opportunity for a linear reserve with pedestrian and cyclist connections adjacent the rail corridor which could link the town centre, the Affected Area and Basham Beach (refer Figure 2).



Figure 2 – Possible cyclist (and pedestrian) routes

6. BROADER TRAFFIC IMPACTS

Based on the forecast traffic volumes, the future redevelopment of the subject land would distribute in the order of 21 peak hour trips to both the east and west of the site at full completion of site development (and depending on yield realised). Such volumes equate to an increase of approximately 2% of the existing peak hour volumes.

These movements would primarily be distributed to through bound movements on Port Elliot Road (Victor Harbor–Goolwa Road). However, there will be minor increases in turning movements at intersections along this road. Namely, the intersections of Waterport Road/Port Elliot Road (right-in and left-out) and Flagstaff Hill Road/Port Elliot Road (left-in and right-out). However, the additional volumes distributed to any one turning movement at these two intersections would be very low (in the order of five trips or less in the peak hour). The impacts on conditions at these intersections as a result of the forecast increases would be very low.

In addition to the surrounding intersections, it is noted that the impact on the adjacent passive level crossings will be minimal. The majority of traffic movements generated by development of the subject land will not be undertaken across the level crossings. There will therefore be negligible impact on queuing and safety conditions at the crossings as a result of the rezoning and subsequent development.

In addition to the above, it is understood that a potential bypass route has been proposed for Middleton (north of the subject site). This was discussed with representatives of DIT, however they were unable to provide any detail on the bypass proposal. Council information identifies that the bypass forms part of the proposed South Coast Freight Corridor. The Freight Corridor is identified at providing a key regional freight route between the Kangaroo Island Ferry Terminal (at Cape Jervis) to the South Eastern Freeway at Callington. In the vicinity of Middleton, the Freight Corridor is proposed to connect Waterport Road (west of the site) to Airport Road (east of the site) via new connections to Lines Road (located north of the site). Specific timing for the Freight Corridor has not been identified. Nevertheless, it is anticipated that such a bypass (if connections were provided to Glenford Gully Road and/or Ocean Road) would result in broader distribution of movements associated with the site and reduced volumes at any one location on the adjacent road network. Importantly, the rezoning would not impact the provision of the bypass road, nor would the bypass road impact the appropriateness of the rezoning.

7. PARKING ASSESSMENT

The Planning and Design Code identifies the following parking provision requirements for various forms of residential development:

- **detached dwelling/row dwelling (not rear loaded)/semi-detached dwelling**
 - one-bedroom dwelling – one space per dwelling;
 - two or more bedroom dwelling – two spaces per dwelling;
- **rear loaded row dwelling (not rear loaded)/semi-detached dwelling**
 - one or two bedroom dwelling – one space per dwelling;
 - three or more bedroom dwelling – two spaces per dwelling;
- **group dwelling/residential flat building**
 - one or two bedroom dwelling – one space per dwelling;
 - three or more bedroom dwelling – two spaces per dwelling; plus
 - 0.33 spaces per dwelling for visitor parking (where three or more dwellings are proposed in the one development).

The above rates are considered appropriate for application to future residential development on the subject land.

In addition, the Planning and Design Code also seeks that land division should provide sufficient space for on-street visitor car parking. Specifically, the Planning and Design Code seeks 0.33 on-street spaces per dwelling. The design of the internal road network should therefore seek to meet (or exceed) this rate.

8. SUMMARY

The subject rezoning (Code Amendment) within Middleton will facilitate the future redevelopment of the Affected Area for residential development. It is anticipated that in the order of 52 dwellings could ultimately be developed within the overall site.

It is considered preferable that primary access to/from the site be accommodated via a new intersection of Port Elliot Road. Secondary access (as well as direct allotment access) via Basham Beach Road is also considered appropriate.

The design of the future internal road network should seek to provide permeability and connectivity for pedestrian and cyclist movements. Opportunities to improve connections between the existing Middleton township, the train station and the Encounter Bikeway/Basham Beach should also be considered.

Assessment of the future traffic generation and distribution associated with development of the land (subsequent to its rezoning) indicates that volumes generated by the development of the Affected Area would generate a low number of additional traffic movements. The additional traffic volumes would be easily accommodated the new intersections with high levels of service. Similarly, the number of additional movements distributed to the broader road network is very low and there would not be significant impact as a result of the rezoning (and future development).

Parking provisions associated with future development would be assessed as part of separate development applications. However, it is considered that the rates identified in the Planning and Design Code (including on-street and off-street provisions) for residential uses are appropriate for application to the subject site.

APPENDIX A

CONCEPT PLAN



LEGEND

- Allotment
- Easement
- Road
- Reserve
- Vegetated Screening
- Bicycle/Walking Reserve
- Playground
- Pond
- Trees
- Train Platform
- Train Track

**Proposed
Concept Plan**

Middleton Rezoning

**LOT 104 PORT ELLIOT RD &
LOT 105 MINDACOWIE TCE**

52 Allotments

February 2022
Scale 1:3000



APPENDIX B

SIDRA ANALYSIS

MOVEMENT SUMMARY

Site: 101 [Southern Future AM (Site Folder: General)]

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist m]				
South: Southern Access														
1	L2	15	2.0	16	2.0	0.019	8.3	LOS A	0.1	0.5	0.53	0.67	0.53	52.1
3	R2	15	2.0	16	2.0	0.159	41.8	LOS E	0.5	3.3	0.93	0.97	0.94	34.7
Approach		30	2.0	32	2.0	0.159	25.1	LOS D	0.5	3.3	0.73	0.82	0.73	41.7
East: Port Elliot Rd (E)														
4	L2	6	2.0	6	2.0	0.327	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	58.0
5	T1	592	2.0	623	2.0	0.327	0.1	LOS A	0.0	0.0	0.00	0.01	0.00	59.7
Approach		598	2.0	629	2.0	0.327	0.2	NA	0.0	0.0	0.00	0.01	0.00	59.7
West: Port Elliot Rd (W)														
11	T1	819	2.0	862	2.0	0.448	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	59.7
12	R2	6	2.0	6	2.0	0.007	8.2	LOS A	0.0	0.2	0.55	0.64	0.55	51.3
Approach		825	2.0	868	2.0	0.448	0.2	NA	0.0	0.2	0.00	0.00	0.00	59.6
All Vehicles		1453	2.0	1529	2.0	0.448	0.7	NA	0.5	3.3	0.02	0.02	0.02	59.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [Southern Future PM (Site Folder: General)]

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist m]				
South: Southern Access														
1	L2	6	2.0	6	2.0	0.010	9.9	LOS A	0.0	0.2	0.62	0.72	0.62	51.0
3	R2	6	2.0	6	2.0	0.060	38.4	LOS E	0.2	1.3	0.92	0.97	0.92	35.8
Approach		12	2.0	13	2.0	0.060	24.2	LOS C	0.2	1.3	0.77	0.84	0.77	42.1
East: Port Elliot Rd (E)														
4	L2	15	2.0	16	2.0	0.429	5.7	LOS A	0.0	0.0	0.00	0.01	0.00	57.9
5	T1	768	2.0	808	2.0	0.429	0.2	LOS A	0.0	0.0	0.00	0.01	0.00	59.6
Approach		783	2.0	824	2.0	0.429	0.3	NA	0.0	0.0	0.00	0.01	0.00	59.6
West: Port Elliot Rd (W)														
11	T1	625	2.0	658	2.0	0.345	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
12	R2	15	2.0	16	2.0	0.024	10.1	LOS B	0.1	0.6	0.64	0.77	0.64	50.0
Approach		640	2.0	674	2.0	0.345	0.3	NA	0.1	0.6	0.02	0.02	0.02	59.5
All Vehicles		1435	2.0	1511	2.0	0.429	0.5	NA	0.2	1.3	0.01	0.02	0.01	59.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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