



PROPOSED RESIDENTIAL DEVELOPMENT
149 Hansworth Street, Mulgrave

Traffic & Parking Impact Assessment Report

Advertised Copy

Prepared for: Tony Pong

A1614402V Version 1.1

January 2016

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1. INTRODUCTION

ML Traffic Engineers was commissioned by Tony Pong to undertake a traffic and car-parking assessment for a proposed residential development at 149 Hansworth Street, Mulgrave. It can be demonstrated that the parking demand associated with the proposal can be accommodated on-site, with minimal impacts on the surrounding streets.

In the course of preparing the report, the subject site and its surroundings have been inspected, plans of the development examined, and all relevant traffic and parking data collected and analysed.

2. BACKGROUND AND EXISTING CONDITIONS

2.1 Location and Land Use

The subject site, at 149 Hansworth Street, Mulgrave, is located near the corner of Hansworth Street and Police Road, Mulgrave and one side is bordered by the Monash Freeway. The site is currently a vacant triangular block site next to a Nursing Home and nearby residential homes. A large retail / commercial development, Waverley Gardens Shopping Centre is within walking distance. See Figure 1.

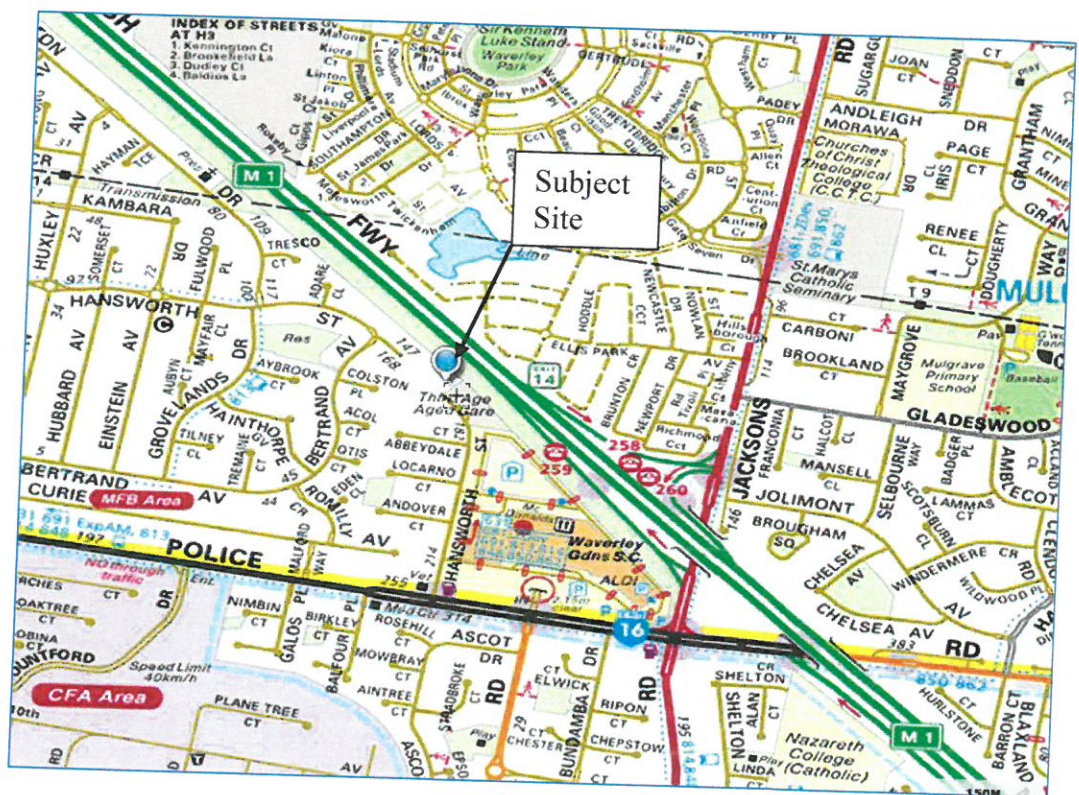


Figure 1: Location of the Subject Site

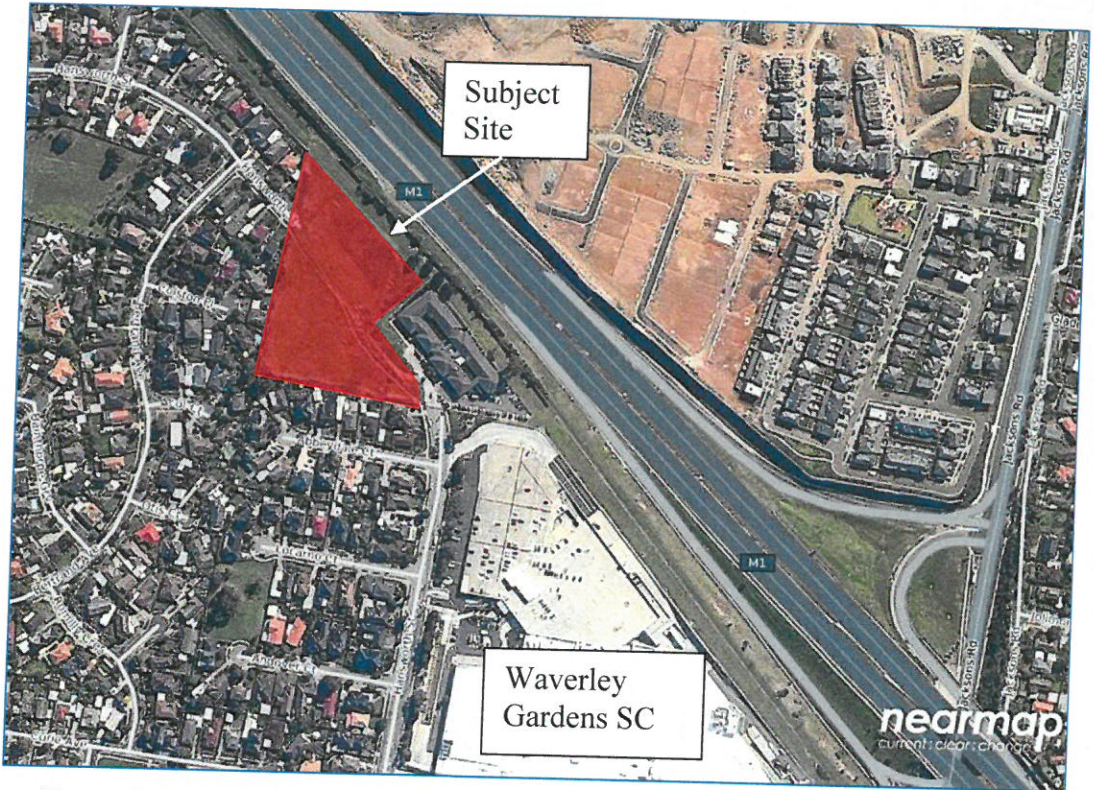


Figure 2: Aerial view of the Subject Site in the Context of its Surrounds



Figure 3: View of Site looking towards the North-West

2.2 Road Network

Hansworth Street is a local access road, with one lane each way. Hansworth Street operates with a local residential area with a speed limit of 50km/hr.



Figure 4: Hansworth Street – Looking towards the South. Subject Site in background (not shown)

2.3 Public Transport

The subject site has excellent access to public transport, namely buses. Bus Routes 631, 691, 813 and 850 all stop at the Hansworth Street end of Waverley Gardens Shopping Centre (SC), about 60m away from the site, and make it very accessible to public transport options.

Bus route 631 operates from Southland Shopping Centre (SC) to Waverley Gardens SC, in the vicinity of the site, via Clayton and Monash University. The bus route operates all day/evening services from 6.00am to 9.00pm, from Monday to Saturday at 30 minute intervals. On Sunday and public holidays, the bus operates at hourly intervals from 8.40am till 9.40pm.

Bus route 691 operates from Boronia to Waverley Gardens SC, in the vicinity of the site, via Ferntree Gully and Rowville / Stud Park. The bus route operates from 6.10am to 9.05pm from Monday to Friday at 20-30 minute intervals. On Saturday and public holidays, the route operates from 8.15am to 7.00pm at 40 minute intervals. On Sunday and public holidays, the bus operates at hourly intervals from 8.25am till 6.40pm.

Bus route 813 operates from Dandenong Railway Station to Waverley Gardens SC, in the vicinity of the site, via Keysborough (Parkmore shopping centre), Springvale Road and Springvale train station and Police Road/Noble Park. The bus route operates from 5.20am to 9.20pm from Monday to Friday at hourly intervals. On Saturday and public holidays, the route operates from 7.30am to 9.05pm at hourly intervals. On Sunday and public holidays, the bus operates at hourly intervals from 9.30am till 9.05pm.

Bus route 850 operates from Dandenong Railway Station to Glen Waverley railway station via Police road and Waverley Gardens Shopping centre, which is near the site. Intermediate stops include Brandon Park shopping centre, Waverley Park residential area, Jacksons Road at Dandenong Valley Private Hospital. The bus route operates from 6.20am to 9.20pm from Monday to Friday at 30 minute intervals. On Saturday and public holidays, the route operates from 7.15am to 9.25pm at hourly intervals. On Sunday and public holidays, the bus operates at hourly intervals from 9.25am till 9.25pm.

2.4 Existing Traffic Conditions

Turning movement surveys were undertaken at the intersection of Hansworth Street and Police Road, between 7.45am and 8.45am and between 4.30pm and 5.30pm on Thursday, 22nd November 2012. See Figures 5 and 6.

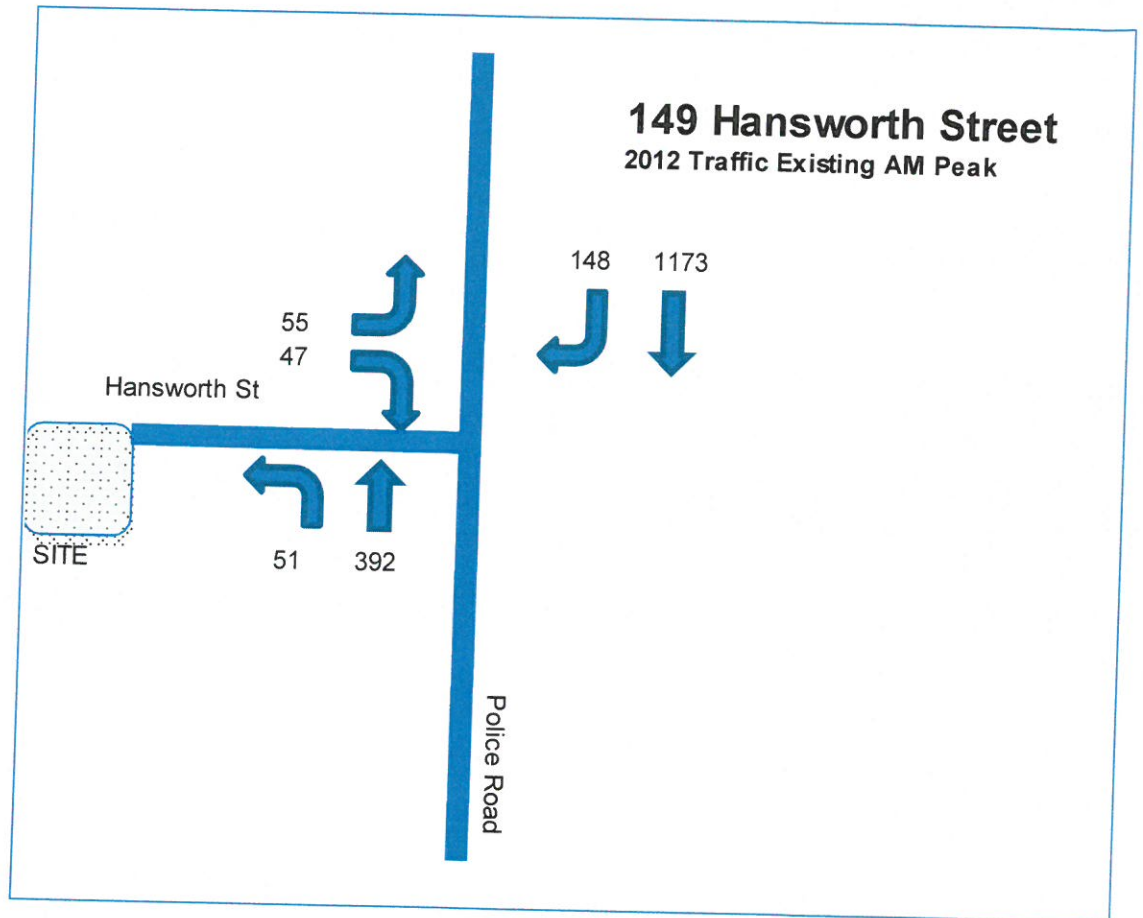


Figure 5: Existing 7.45am to 8.45am Morning Peak Hour Traffic

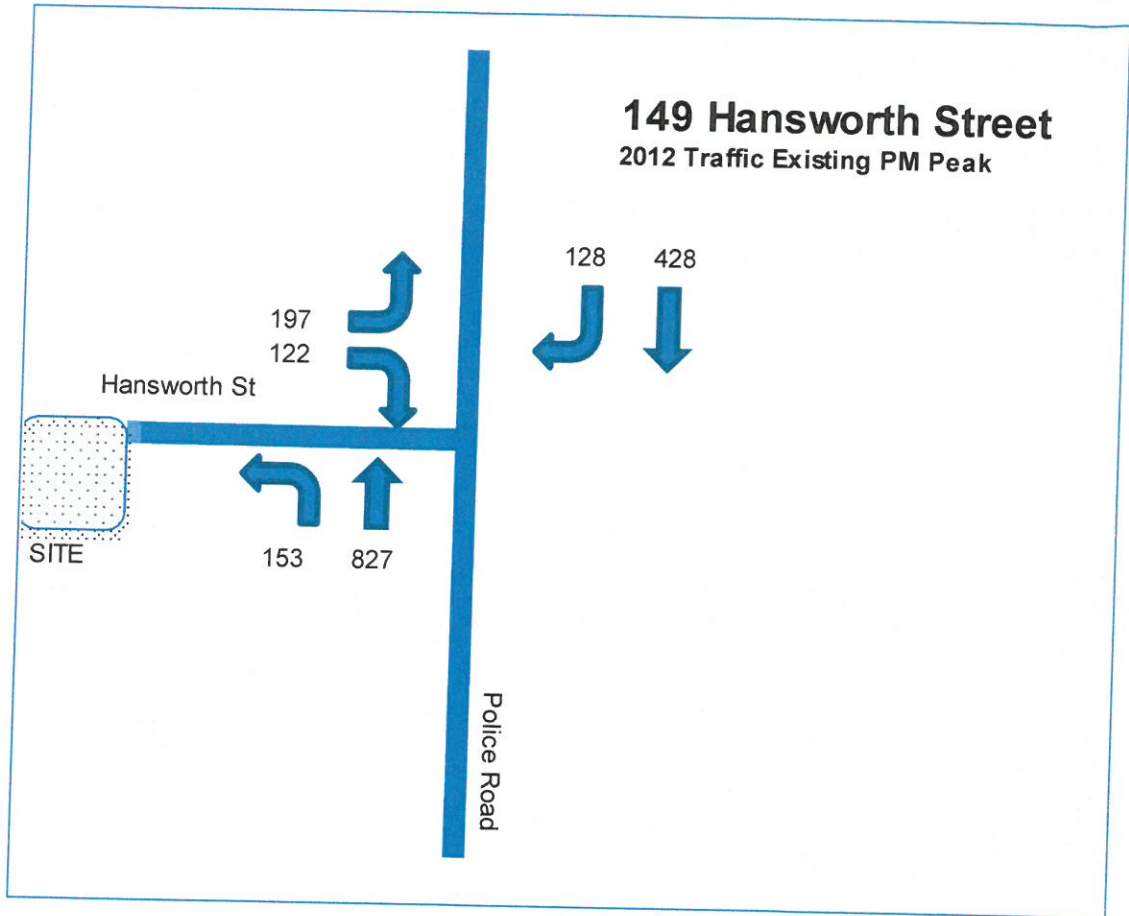


Figure 6: Existing 4.30pm to 5.30pm Afternoon Peak Hour Traffic

2.5 Intersection Assessment

Intersection operation for Hansworth Street and Police Road was assessed using SIDRA 5.1. SIDRA analyses show no operational issues under existing traffic conditions.

MOVEMENT SUMMARY

Site: AM Existing

AM Existing
 Signals - Fixed Time Cycle Time = 30 seconds (Practical Cycle Time)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Police Rd											
8	T	1235	2.0	0.802	12.7	LOS B	10.1	72.1	0.94	0.98	41.6
9	R	156	2.0	0.172	16.4	LOS B	0.9	6.2	0.74	0.75	41.3
Approach		1391	2.0	0.802	13.1	LOS B	10.1	72.1	0.92	0.95	41.6
North: Hansworth St											
10	L	58	2.0	0.158	19.8	LOS B	0.8	5.4	0.86	0.74	38.9
12	R	49	2.0	0.135	19.7	LOS B	0.6	4.6	0.85	0.73	38.9
Approach		107	2.0	0.158	19.7	LOS B	0.8	5.4	0.86	0.73	38.9
West: Police Rd											
1	L	54	2.0	0.305	15.2	LOS B	2.4	17.3	0.72	0.86	44.4
2	T	413	2.0	0.305	6.9	LOS A	2.5	17.5	0.72	0.59	47.2
Approach		466	2.0	0.305	7.9	LOS A	2.5	17.5	0.72	0.62	46.9
All Vehicles		1964	2.0	0.802	12.2	LOS B	10.1	72.1	0.87	0.86	42.6

Level of Service (LOS) Method: Delay (HCM 2000).
 Vehicle movement LOS values are based on average delay per movement.
 Intersection and Approach LOS values are based on average delay for all vehicle movements.
 SIDRA Standard Delay Model used.

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Table 1: SIDRA Output for Year 2012 No Development AM Peak hour Traffic – Hansworth Street / Police Road Intersection

MOVEMENT SUMMARY

Site: PM Existing

PM Existing
 Signals - Fixed Time Cycle Time = 30 seconds (Practical Cycle Time)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Police Rd											
8	T	451	2.0	0.293	6.9	LOS A	2.3	16.7	0.72	0.59	47.6
9	R	135	2.0	0.228	20.2	LOS C	0.9	6.5	0.87	0.75	38.6
Approach		585	2.0	0.293	10.0	LOS A	2.3	16.7	0.75	0.63	45.2
North: Hansworth St											
10	L	207	2.0	0.566	21.3	LOS C	3.1	21.8	0.95	0.83	37.8
12	R	128	2.0	0.351	20.4	LOS C	1.8	12.6	0.90	0.77	38.4
Approach		336	2.0	0.566	20.9	LOS C	3.1	21.8	0.93	0.81	38.1
West: Police Rd											
1	L	161	2.0	0.675	17.5	LOS B	6.9	49.1	0.88	0.92	42.5
2	T	871	2.0	0.675	9.3	LOS A	7.0	49.8	0.88	0.80	44.3
Approach		1032	2.0	0.675	10.5	LOS B	7.0	49.8	0.88	0.82	44.0
All Vehicles		1953	2.0	0.675	12.2	LOS B	7.0	49.8	0.85	0.76	43.2

Level of Service (LOS) Method: Delay (HCM 2000)
 Vehicle movement LOS values are based on average delay per movement
 Intersection and Approach LOS values are based on average delay for all vehicle movements.
 SIDRA Standard Delay Model used

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Table 2: SIDRA Output for Year 2012 No Development PM Peak hour Traffic – Hansworth Street / Police Road Intersection

3. PROPOSAL

The proposed development comprises 17 townhouses and 150 apartments, with the following characteristics:

- 5 residential towers with:
 - 99 two-bedroom apartments.
 - 51 three-bedroom apartments.
 - 239 car parking spaces, comprising 201 occupier spaces, 25 visitor spaces within the lower ground floor of the apartment complex and 13 on the ground level configured as 90-degree angled parking spaces that are accessible from the driveways serving the townhouses. Visitor parking provision of 38 spaces is in excess of the 30-space requirement for 150 apartment dwellings.

- Townhouses:
 - 2 two-bedroom dwellings with single garages.
 - 15 three-bedroom dwellings with double garages.
 - 32 occupier car parking spaces.
 - 3 visitor parking spaces located on the ground level, configured as 90-degree angled parking spaces that are accessible from the driveways serving the townhouses.

- 60 bicycle parking spaces.

- Internal driveways with:
 - Mountable roundabouts.
 - Minimum 5.5m of unobstructed driveway widths for 2-way traffic. Where obstructions exist on one-side (e.g. parallel parked cars), the minimum width will be 5.8m. Where obstructions exist on both sides, the minimum width will be 6.1m.

This represents a total of 167 dwellings (comprising 101 two-bedroom dwellings and 66 three-bedroom dwellings) with 274 car parking spaces (comprising 233 occupier spaces and 41 visitor parking spaces).

4. CAR PARKING CONSIDERATIONS

4.1 Planning Scheme Assessment

The car parking requirements for the proposal are contained within Clause 52.06 of the City of Monash Planning Scheme. The Planning Scheme parking requirements are:

- Dwellings: 1 space to each one or two bedroom dwelling plus 2 spaces to each three or more bedroom dwelling (with studies or studios that are separate rooms counted as bedrooms) plus 1 space for visitors to every five dwellings for developments of five or more dwellings.

Based on these rates, the parking requirements are:

Apartments:

- 99 resident spaces and 19.8 visitor spaces for 99 two-bedroom dwellings.
- 102 resident spaces and 10.2 visitor spaces for 51 three-bedroom dwellings.

Town-houses:

- 2 resident spaces and 0.4 visitor spaces for 2 two-bedroom dwellings.
- 30 resident spaces and 6 visitor spaces for 15 three-bedroom dwellings.

The proposal requires 269 car parking spaces, i.e. 201 resident (occupier) spaces and 30 visitor spaces for the apartments and 32 resident (occupier) spaces and 6 visitor spaces for the town houses. With 274 on-site parking spaces provided, the proposed development fully satisfies Clause 52.06's car parking requirements.

4.2 Adequacy of Vehicular Access, Car Parking and Site Servicing Layout

The proposed access and car parking layout have been assessed against requirements of Clause 52.06 and AS2890.1:2004 Part 1: Off-Street Car Parking. The following points are noted:

- Mountable roundabout islands with swale kerbs will be provided – to enable 10.4m long refuse collection vehicles and furniture removalist trucks (typically 8.8m long) to manoeuvre. Swept paths for 10.4m long waste collection vehicles are shown in Appendix B.

- Satisfactory turning provisions for B85 car access into and out of parking spaces, and for a B85 car and a B99 car travelling simultaneously in opposite directions along the ramp – see Appendix A.

4.3 Loading / Unloading

The site is accessible by furniture removalist trucks – typically 8.8m long Medium Rigid Vehicles.

4.4 Waste Management

Waste collection will be undertaken by a private contractor as per the applicant's waste management plan. A 10.4m long Rigid Vehicle is able to enter the site, internally manoeuvre and exit the site in a forward direction. Refuse trucks that are commonly used for servicing medium density dwellings are smaller than ones that service suburban single dwelling lots. They range from 6.35m to 10.4m long. Turning paths for 10.4 refuse collection vehicles are contained in Appendix B.

The internal roundabouts are mountable with swale profiled kerbs to allow refuse vehicles to drive over them.

5. BICYCLE PARKING CONSIDERATIONS

5.1 Planning Scheme – Clause 52.34

The bicycle parking requirements for proposed uses are contained within Clause 52.34 – Bicycle Parking, of the Monash Planning Scheme. The bicycle parking requirements are:

Dwelling (In developments of four or more storeys)

- 1 space per 5 dwellings for residents.
- 1 space per 10 dwellings for visitors.

All 150 apartments are located in towers that have more than 4 storeys.

The bicycle requirement for the apartments and townhouses is:

- 33 resident spaces and 16 visitor spaces.

The applicant will be providing storage for 60 bicycles within a secured area on-site.

6. TRAFFIC IMPACT CONSIDERATIONS

6.1 Traffic Generation

The NSW RTA Guide to Traffic Generating Developments 2002 sets out the following traffic generation rates for a medium density residential building:

Smaller units and flats (up to two bedrooms):

- Daily vehicle trips = 4-5 per dwelling
- Weekday peak hour vehicle trips = 0.4-0.5 per dwelling.

Larger units and town houses (three or more bedrooms):

- Daily vehicle trips = 5.0-6.5 per dwelling
- Weekday peak hour vehicle trips = 0.5-0.65 per dwelling.

For assessment purposes, we have conservatively used a peak hour rate of 0.7 trip per dwelling for two bedroom units (apartments and townhouses) and 1 trip per dwelling for three bedroom units (apartments and townhouses). Directional split of 80% outbound and 20% inbound applies to the AM peak period. Directional split of 70% inbound and 30% outbound applies to the PM peak period. Traffic Generation was carried out for the 7.45am to 8.45am peak hour and the 4.30pm to 5.30pm peak hour.

The proposed 167 unit residential development with 101 two-bedroom dwellings and 66 three-bedroom dwellings will generate 140 trips during the commuter peak hour. See Table 4.

Use	AM Peak Hour		PM Peak Hour	
	In	Out	In	Out
2-bedroom Dwellings	14	55	48	20
3-bedroom Dwellings	14	57	50	22
TOTAL	28	112	98	42

Table 4: Peak Hourly Traffic Generation

6.2 Traffic Distribution

Traffic is expected to be evenly distributed between areas to the north, east, south and west, with 50% of trips heading towards Jacksons Road and the Monash Freeway to the east and 50% of trips heading towards Princess Highway to the west. See Figures 7 and 8.

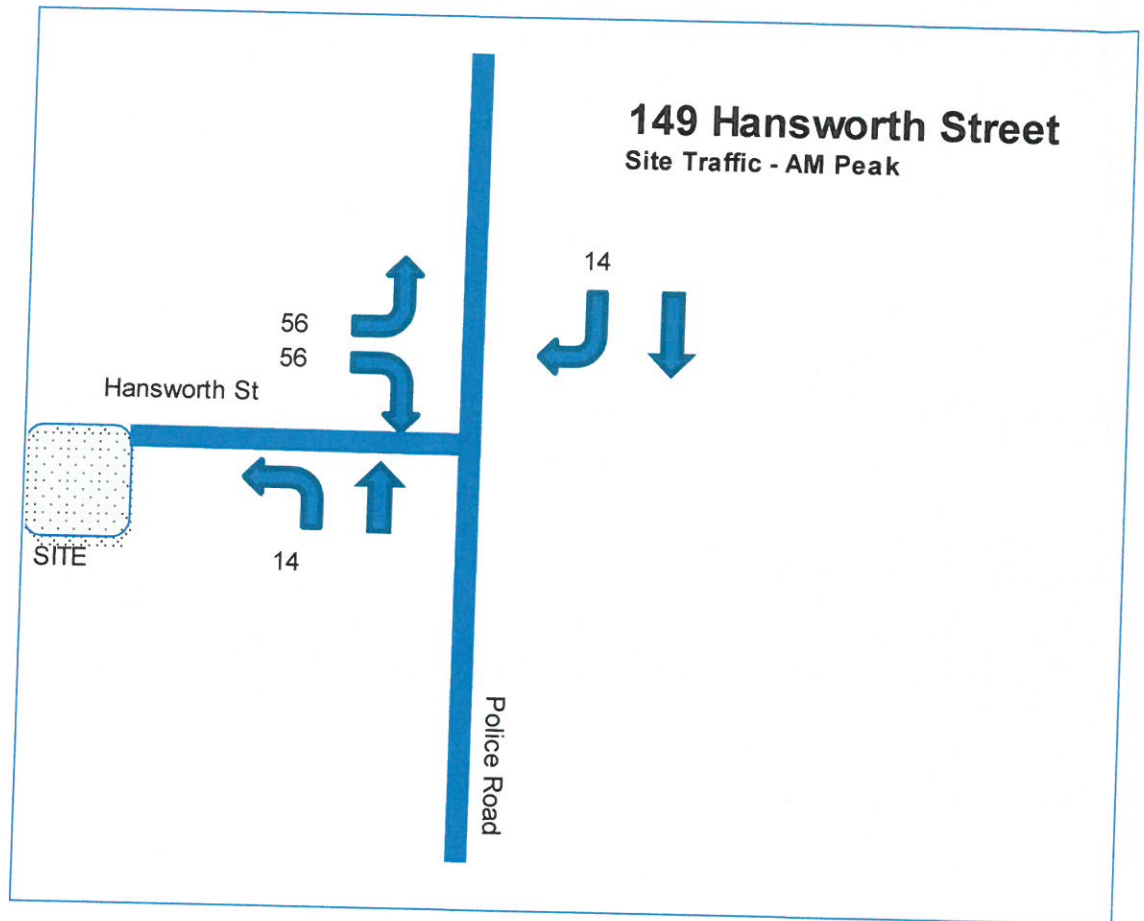


Figure 7: Site Only Traffic Volumes – AM Peak Hour (7.45am to 8.45am)

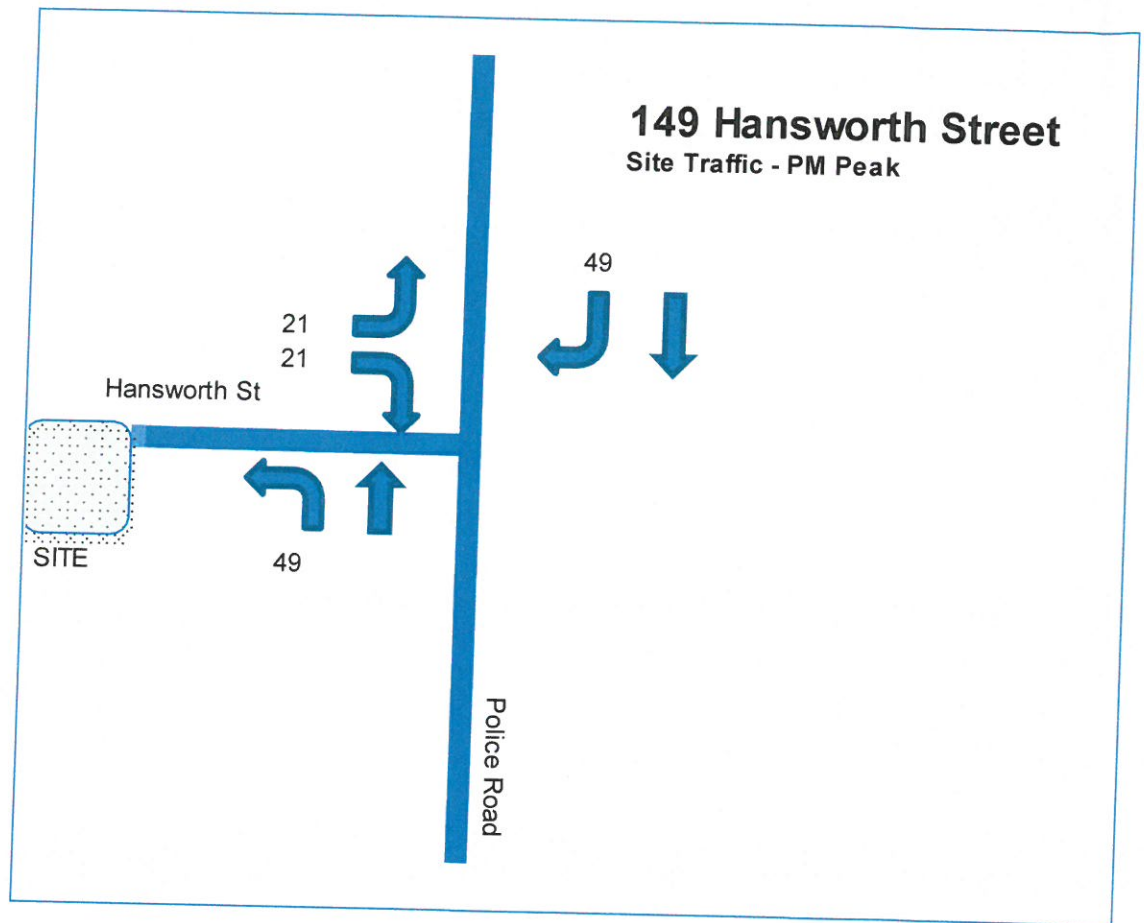


Figure 8: Site Only Traffic Volumes – PM Peak Hour (4.30pm to 5.30pm)

6.3 Projected Traffic Volumes

Projected (i.e. existing + development site's) AM and PM peak hourly traffic volumes are presented in Figures 9 and 10.

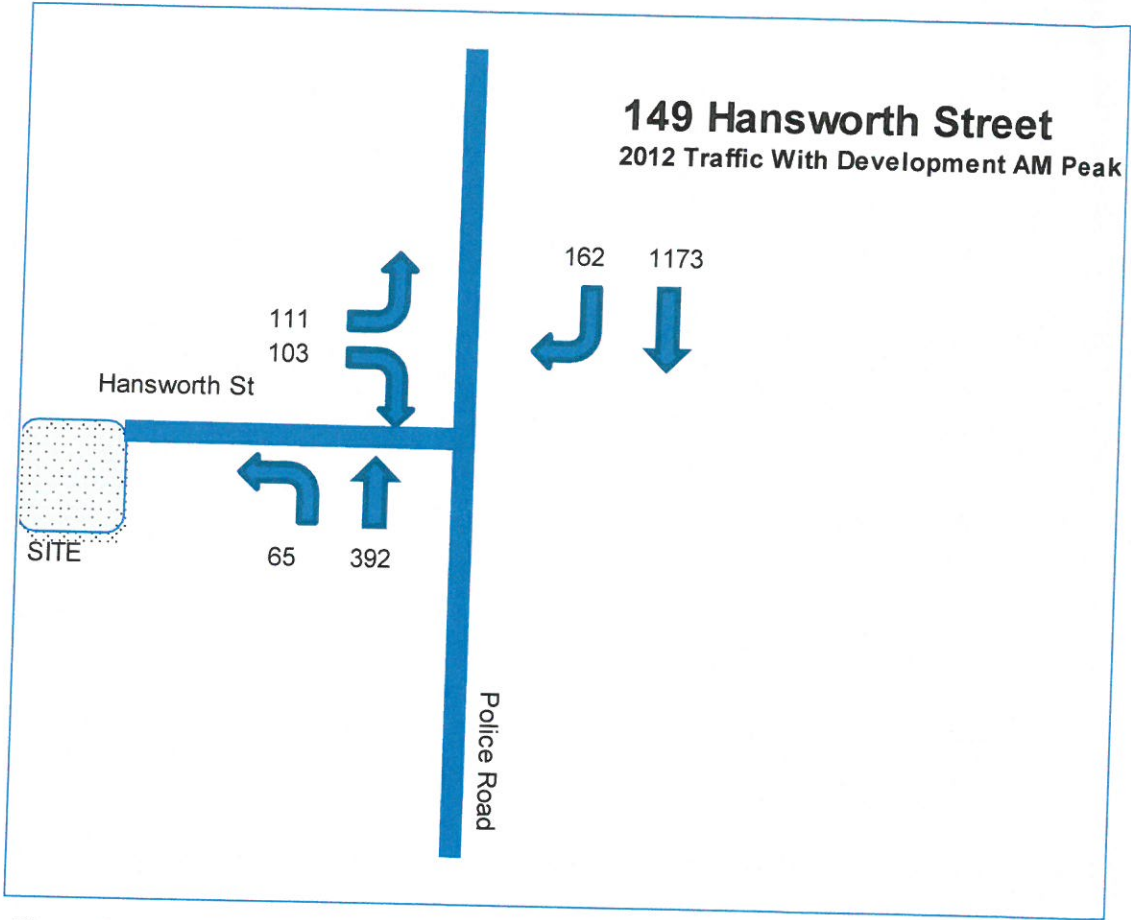


Figure 9: Projected With "Development" Traffic Volumes – AM Peak Hour (7.45am to 8.45am)

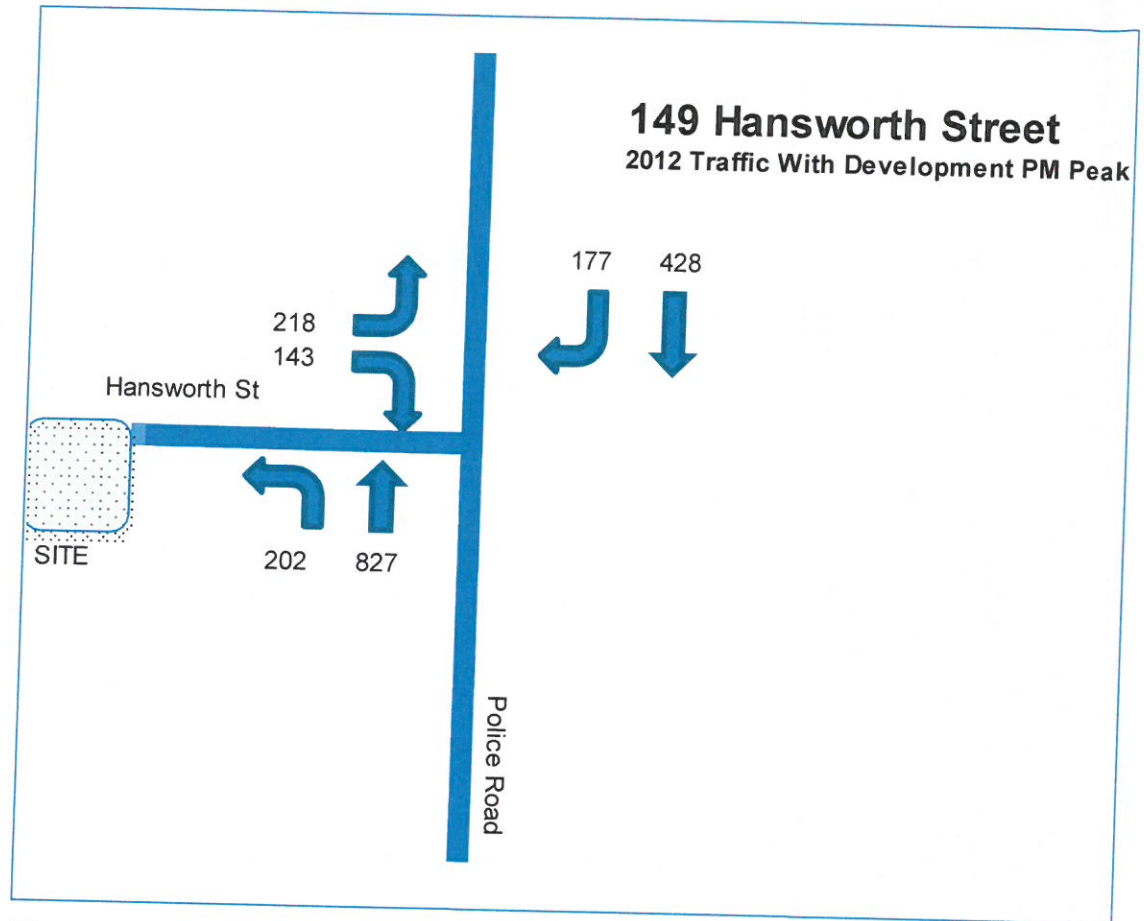


Figure 10: Projected “With Development” Traffic Volumes – PM Peak Hour (4.30pm to 5.30pm)

6.4 Intersection Assessment

Intersection operation for proposed traffic volumes at the intersection of Nile Street and Wellington Street priority controlled intersection was assessed using SIDRA 5.1.

SIDRA analyses for “with development” traffic show:

- Modelled delay for left and right turning traffic from Hansworth Street into Police Road in Year 2012 is 20.2s (an increase of 0.5s) in the AM peak hour and 21.3s (an increase of 0.4s) in the PM peak hour.
- Modelled delay right turning traffic from Police Road into Hansworth Street in Year 2012 is 16.5s (an increase of 0.1s) in the AM peak hour and 21.4s (an increase of 1.2s) in the PM peak hour.
- Minimal impact on intersection operation due to the proposal.

MOVEMENT SUMMARY

Site: AM Proposed

AM Proposed

Signals - Fixed Time Cycle Time = 30 seconds (Practical Cycle Time)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Police Rd											
8	T	1235	2.0	0.802	12.7	LOS B	10.1	72.1	0.94	0.98	41.6
9	R	171	2.0	0.191	16.5	LOS B	1.0	6.8	0.74	0.75	41.3
Approach		1405	2.0	0.802	13.2	LOS B	10.1	72.1	0.92	0.95	41.6
North: Hansworth St											
10	L	117	2.0	0.319	20.3	LOS C	1.6	11.3	0.89	0.77	38.5
12	R	108	2.0	0.296	20.2	LOS C	1.5	10.5	0.89	0.76	38.6
Approach		225	2.0	0.319	20.2	LOS C	1.6	11.3	0.89	0.77	38.5
West: Police Rd											
1	L	68	2.0	0.315	15.2	LOS B	2.5	17.9	0.72	0.85	44.2
2	T	413	2.0	0.315	7.0	LOS A	2.6	18.2	0.72	0.60	47.1
Approach		481	2.0	0.315	8.1	LOS A	2.6	18.2	0.72	0.63	46.7
All Vehicles		2112	2.0	0.802	12.8	LOS B	10.1	72.1	0.87	0.86	42.3

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model used.

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SIDRA INTERSECTION

Table 8: SIDRA Output for Year 2012 With Development AM Peak hour Traffic – Hansworth Street / Police Road Intersection

MOVEMENT SUMMARY

Site: PM Proposed

PM Proposed
 Signals - Fixed Time Cycle Time = 30 seconds (Practical Cycle Time)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Police Rd											
8	T	451	2.0	0.293	6.9	LOS A	2.3	16.7	0.72	0.59	47.6
9	R	186	2.0	0.324	21.4	LOS C	1.3	9.5	0.92	0.76	37.8
Approach		637	2.0	0.324	11.1	LOS B	2.3	16.7	0.76	0.64	44.3
North: Hansworth St											
10	L	229	2.0	0.627	21.6	LOS C	3.5	24.6	0.96	0.86	37.5
12	R	151	2.0	0.411	20.6	LOS C	2.1	15.0	0.91	0.78	38.3
Approach		380	2.0	0.627	21.3	LOS C	3.5	24.6	0.94	0.83	37.8
West: Police Rd											
1	L	213	2.0	0.710	18.2	LOS B	7.6	54.0	0.89	0.94	41.7
2	T	871	2.0	0.710	9.9	LOS A	7.7	54.9	0.89	0.84	43.6
Approach		1083	2.0	0.710	11.6	LOS B	7.7	54.9	0.89	0.86	43.2
All Vehicles		2100	2.0	0.710	13.2	LOS B	7.7	54.9	0.87	0.79	42.4

Level of Service (LOS) Method: Delay (HCM 2000).
 Vehicle movement LOS values are based on average delay per movement.
 Intersection and Approach LOS values are based on average delay for all vehicle movements.
 SIDRA Standard Delay Model used.

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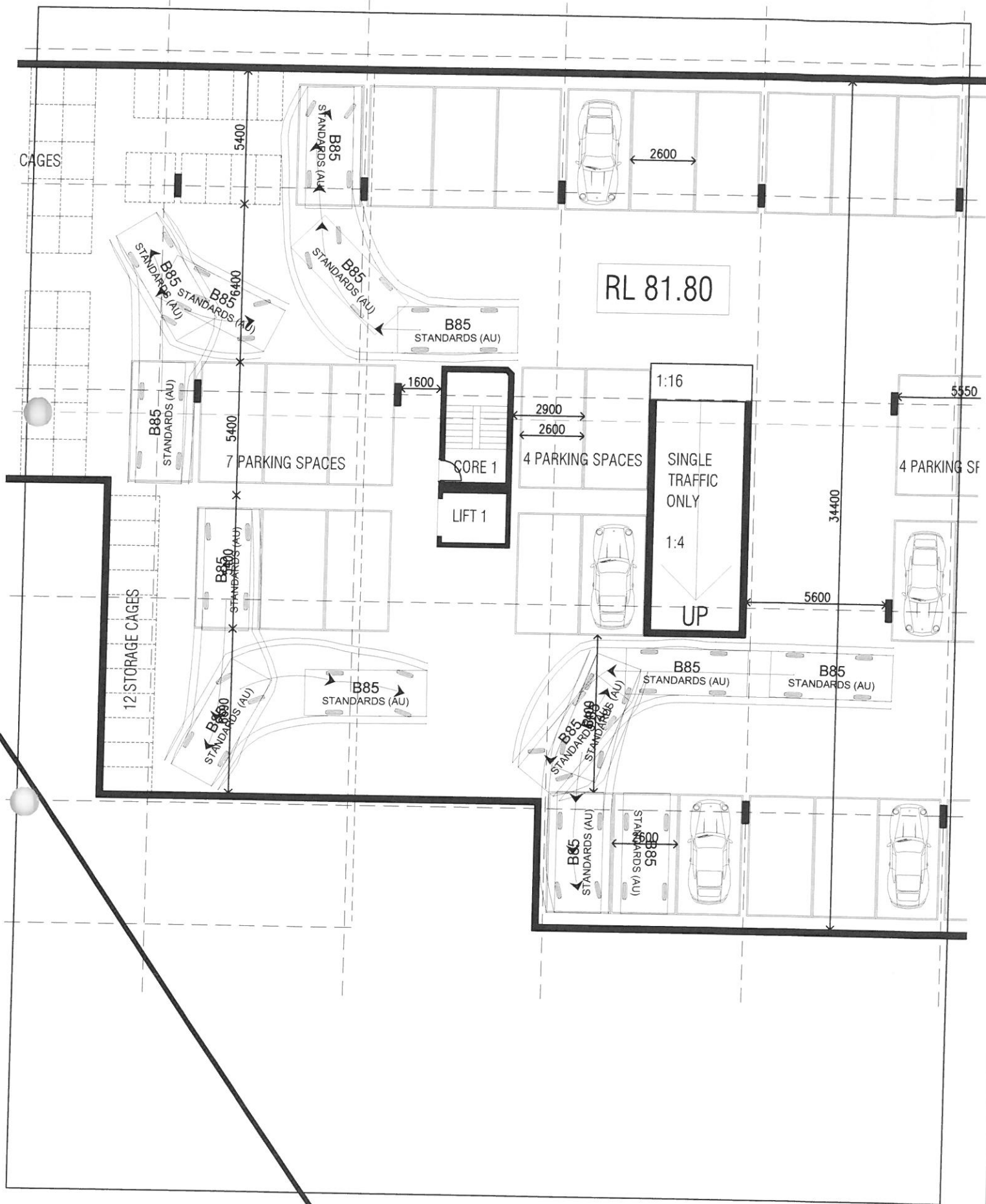
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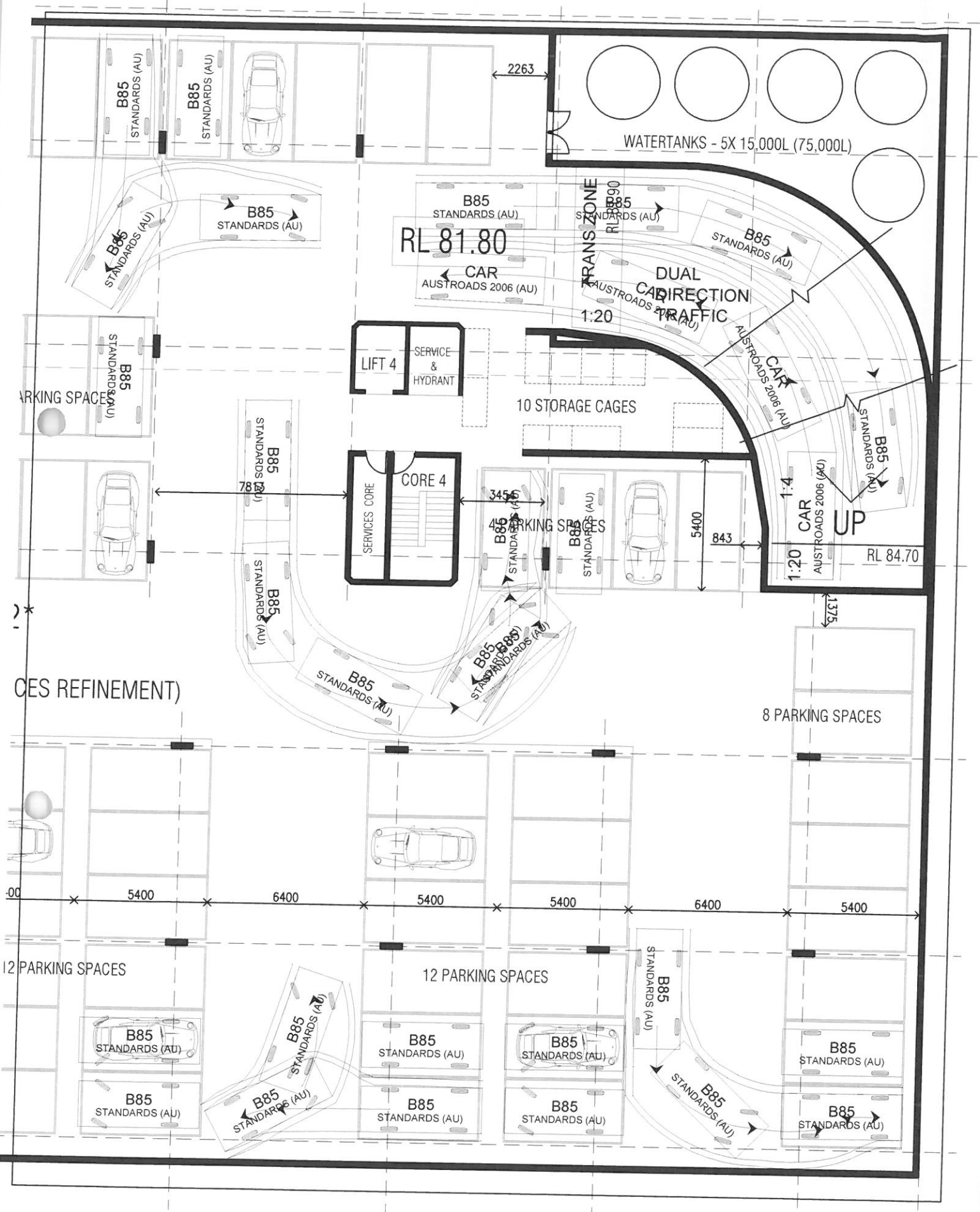
Table 9: SIDRA Output for Year 2012 With Development PM Peak hour Traffic – Hansworth Street / Police Road Intersection

7. CONCLUSIONS

Based on the considerations presented in this report, it is considered that:

- The proposal requires 269 car parking spaces, i.e. 201 resident (occupier) spaces and 30 visitor spaces for the apartments and 32 resident (occupier) spaces and 6 visitor spaces for the town houses. With 274 on-site parking spaces provided, the proposed development fully satisfies Clause 52.06's car parking requirements.
- The proposed access, car parking and site servicing layout is satisfactory.
- All vehicles are able to enter the site, internally manoeuvre and exit the site in a forward direction.
- Waste collection will be undertaken by a private contractor as per the applicant's waste management plan. A 10.4m long Rigid Vehicle is able to enter the site, internally manoeuvre and exit the site in a forward direction. Refuse trucks that are commonly used for servicing medium density dwellings are smaller than ones that service suburban single dwelling lots. They range from 6.35m to 10.4m long.
- The internal roundabouts are mountable with swale profiled kerbs to allow refuse vehicles to drive over them.
- The proposed townhouse and apartment development requires 33 resident (occupier) and 16 visitor bicycle parking spaces. The applicant will be providing storage for 60 bicycles within a secured area on-site.
- The proposed residential development with 102 two-bedroom dwellings and 67 three-bedroom dwellings will generate 140 trips during the commuter peak hour.
- The impact on the signalised intersection of Hansworth Street and Police Road is minimal. SIDRA analyses indicate:
 - Modelled delay for left and right turning traffic from Hansworth Street into Police Road in Year 2012 is 20.2s (an increase of 0.5s) in the AM peak hour and 21.3s (an increase of 0.4s) in the PM peak hour.
 - Modelled delay right turning traffic from Police Road into Hansworth Street in Year 2012 is 16.5s (an increase of 0.1s) in the AM peak hour and 21.4s (an increase of 1.2s) in the PM peak hour.
- There are no traffic engineering reasons why a planning permit for a proposed residential development at 149 Hansworth Street, Mulgrave, should be refused.





WATERTANKS - 5X 15,000L (75,000L)

RL 81.80

DUAL CAR DIRECTION TRAFFIC

LIFT 4 SERVICE & HYDRANT

10 STORAGE CAGES

CORE 4 SERVICES CORE

UP

RL 84.70

DESIGN REFINEMENT

8 PARKING SPACES

12 PARKING SPACES

12 PARKING SPACES

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B85 STANDARDS (AU)

B85 STANDARDS (AU)

B85 STANDARDS (AU)

B85 STANDARDS (AU)

B85 STANDARDS (AU)

B85 STANDARDS (AU)

2263

785

5455

5400

843

1375

1:20

1:4

1:20

TRANSITION ZONE

RL 81.90

AUSTRROADS 2006 (AU)

AUSTRROADS 2006 (AU)

AUSTRROADS 2006 (AU)

AUSTRROADS 2006 (AU)

AUSTRROADS 2006 (AU)

AUSTRROADS 2006 (AU)

AUSTRROADS 2006 (AU)

AUSTRROADS 2006 (AU)

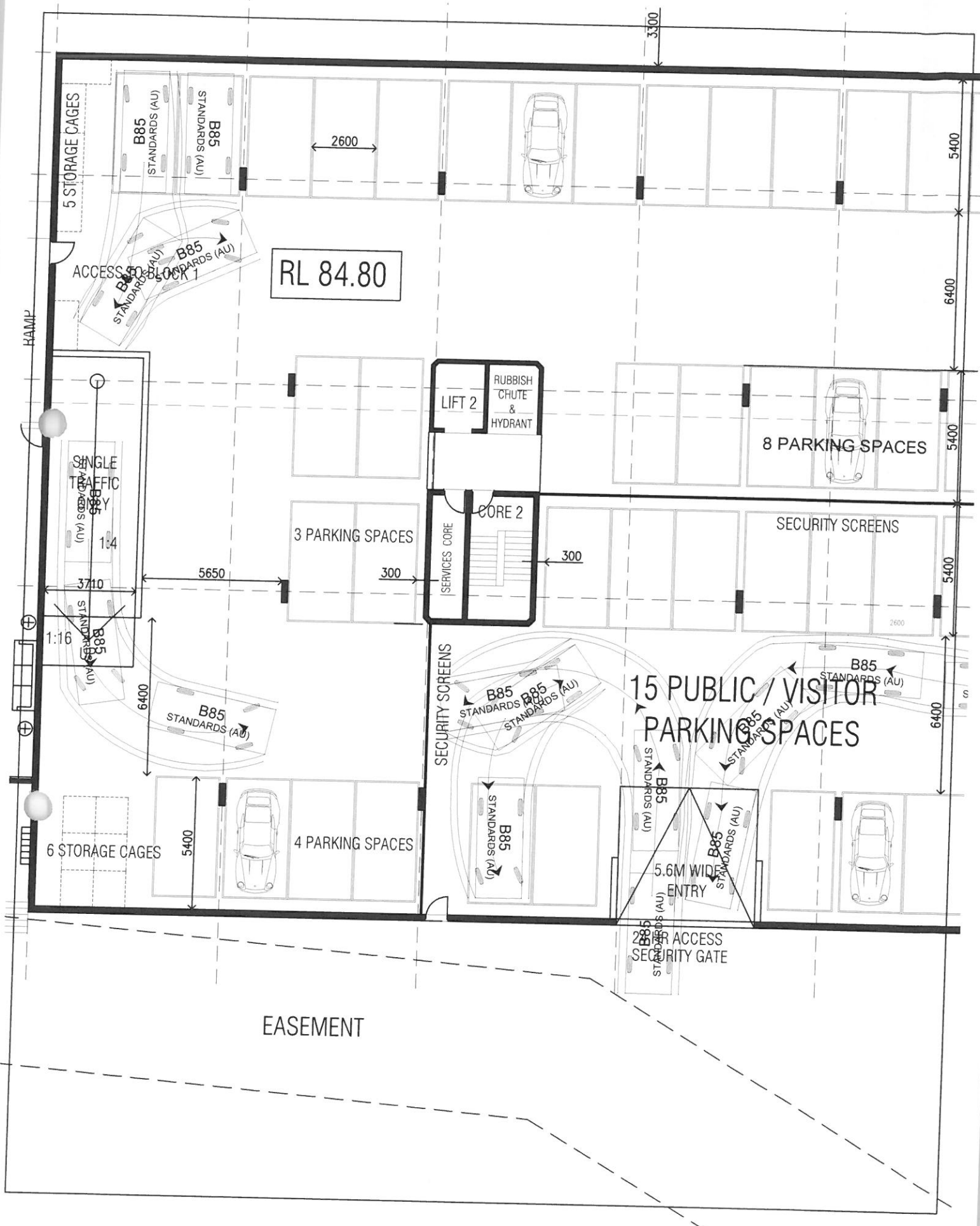
AUSTRROADS 2006 (AU)

AUSTRROADS 2006 (AU)

AUSTRROADS 2006 (AU)

AUSTRROADS 2006 (AU)

AUSTRROADS 2006 (AU)



Appendix B: AutoTURN Plots – 10.4m Refuse Truck



AGED CARE FACILITY

182

10

11

12

13

RL 87.60

RL 87.0

TEDDY LANE

A&C02-71
198-27
217.2-29

DRIVEWAY

POS

SPOS

SPOS

SPOS

SPOS

POS

POS

POS

POS

164-95-53

20-95

96.2

96.6

96.8

87.0

87.2

87.4

87.6

87.8

88.0

88.2

88.4

88.6

89.0

89.2

89.4

89.6

89.8

90.0

90.2

90.4

90.6

90.8

91.0

35.0

40.0

45.0

50.0

55.0

60.0

65.0

70.0

75.0

80.0

85.0

90.0

95.0

100.0

105.0

110.0

115.0

120.0

125.0

130.0

135.0

140.0

145.0

150.0

155.0

160.0

164-95-53

20-95

96.2

96.6

96.8

87.0

87.2

87.4

87.6

87.8

88.0

88.2

88.4

88.6

89.0

89.2

89.4

89.6

89.8

90.0

90.2

90.4

90.6

90.8

91.0

35.0

40.0

45.0

50.0

55.0

60.0

65.0

70.0

75.0

80.0

85.0

90.0

95.0

100.0

105.0

110.0

115.0

120.0

125.0

130.0

135.0

140.0

145.0

150.0

155.0

160.0

164-95-53

20-95

96.2

96.6

96.8

87.0

87.2

87.4

87.6

87.8

88.0

88.2

88.4

88.6

89.0

89.2

89.4

89.6

89.8

90.0

90.2

90.4

90.6

90.8

91.0

35.0

40.0

45.0

50.0

55.0

60.0

65.0

70.0

75.0

80.0

85.0

90.0

95.0

100.0

105.0

110.0

115.0

120.0

125.0

130.0

135.0

140.0

145.0

150.0

155.0

160.0



AGED CARE FACILITY

A4C2-71
R112-26

182

10

11

12

13

14