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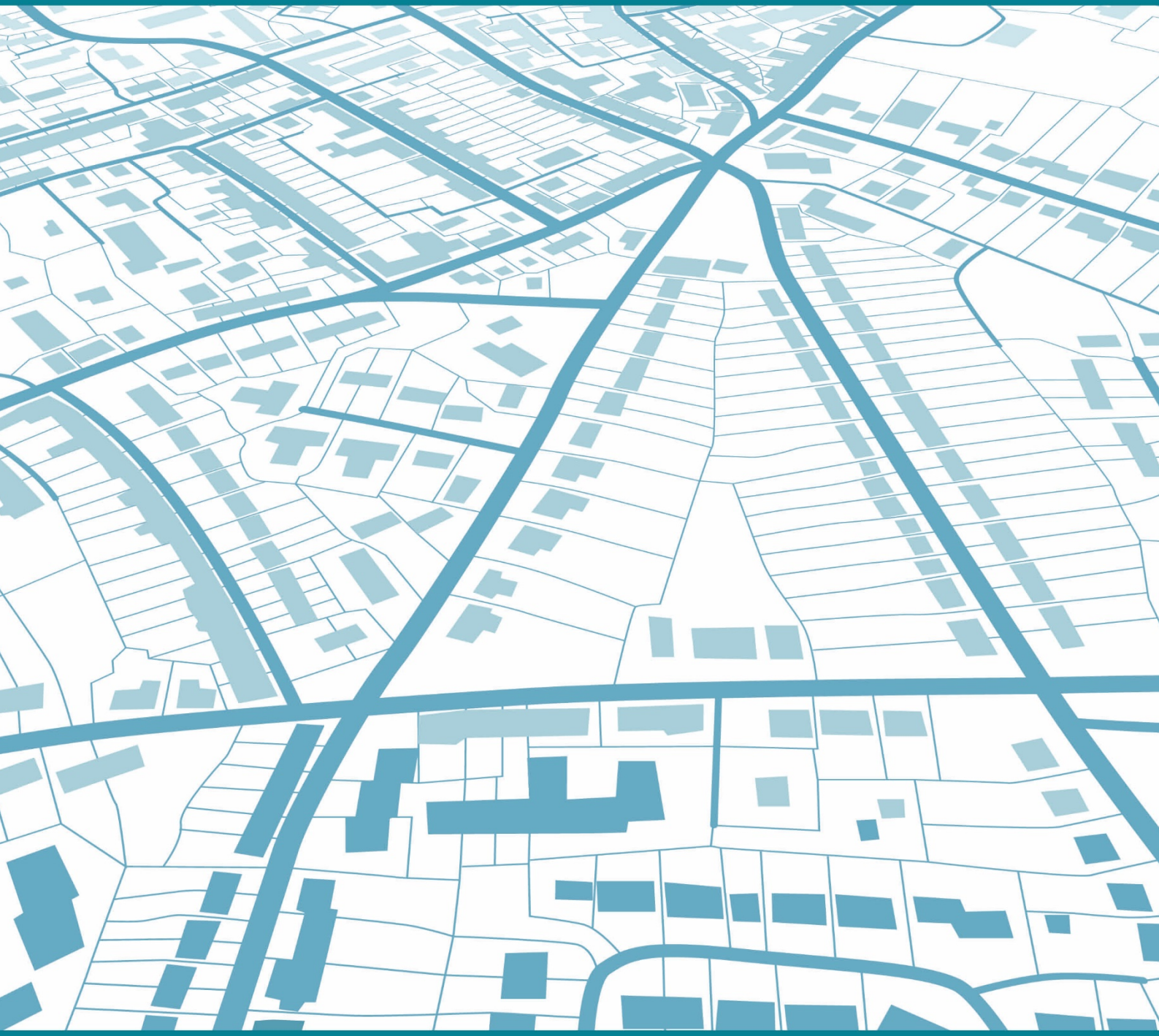

166 Epping Road, Lane Cove

Planning Proposal

Traffic and Parking Impact Assessment

Ref: 19102
Date: 21 August 2019
Issue: B

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1.0 Introduction

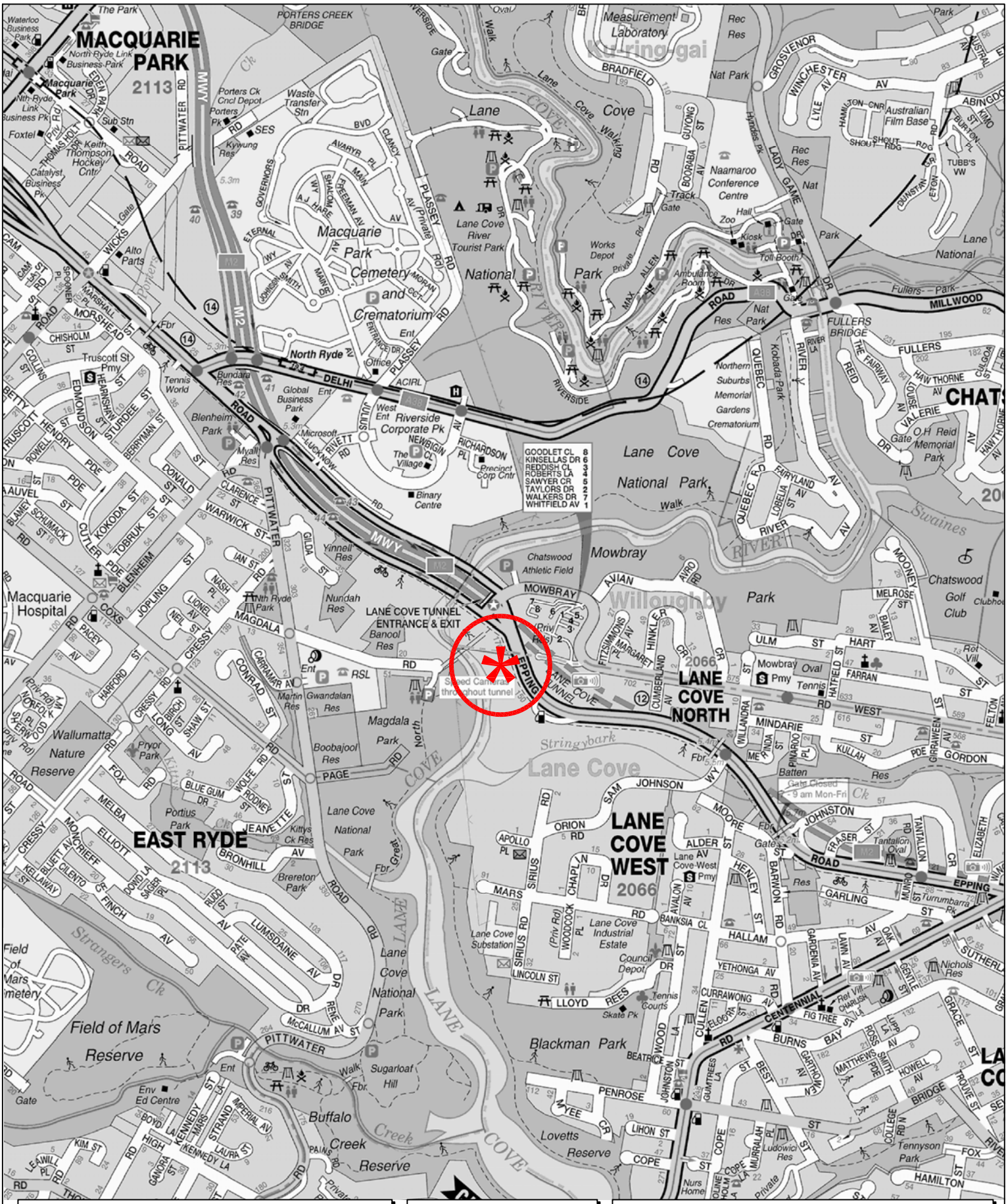
This report has been prepared to accompany a Planning Proposal to Lane Cove Council for a mixed-use development involving residential apartments, retail and office elements on a site located at 166 Epping Road, Lane Cove West (Figure 1).

The Planning Proposal seeks to rezone the land to permit a development scheme with the following envisaged yield:

- 316 Residential Apartments/Tourist Accommodation
- 525m^2 Retail floorspace
- 6,311m^2 Commercial floorspace
- 507 parking spaces

The purpose of this report is to:

- describe the site, its context, and the Planning Proposal
- describe the road network serving the site, the prevailing traffic conditions and transport services in the area
- assess the adequacy of the proposed parking provision
- assess the potential traffic implications
- assess the suitability of the proposed vehicle access, internal circulation and servicing arrangements



LEGEND

N

LOCATION

FIG 1

2.0 Proposed Development

2.1 Site, Context, and Existing Use

The development site (Figure 2) being Lot 13 DP 807958 occupies an irregular shaped area of some 9,128m^2 which has frontage of some 65m to the western side of Epping Road.

The site is adjoined to the east by Epping Road, to the west by bushland and the Lane Cove River, to the north by the Ingredion Flour Mill, and to the south the Meriton mixed use towers which comprises some 380 residential apartments with associated ground level commercial uses. Further south are clusters of light commercial/industrial land uses generally bounded by bush land and the Lane Cove River. The Lane Cove West 'village' is situated some 2.5km to the east.

Vehicle access to the enclave which contains the site is provided by a left turn off Epping Road on the eastern side and a westbound egress lane merging with Epping Road to the west. See images reproduced in the following:

Ingress

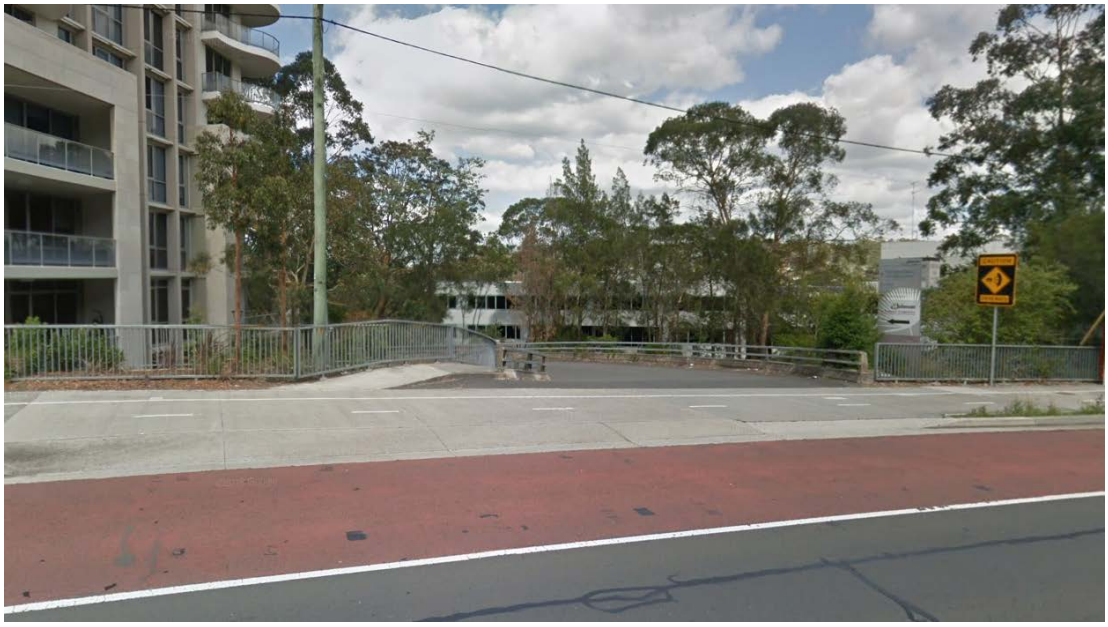


Image source: Google

Egress

Image source: Google

The site is currently occupied by the Riverview Park Business Centre which comprises a total of 7,129m^2 GFA commercial floor space. The site has a total of 235 onsite carpark.

2.2 Planning Proposal

It is proposed to demolish the existing buildings and structures and excavate the site for basement carparking. The envisaged development outcome will comprise multiple tower blocks with an integrated basement carparking in the following envisaged make up and yield:

- 316 Residential Apartments/Tourist Accommodation
- 525m^2 Retail floorspace
- 6,311m^2 Commercial floorspace
- 507 parking spaces

Vehicle access provisions will comprise:

- an upgraded ingress on Epping Road located at the eastern side
- retention of the existing egress on Epping Road towards the west

Details of the proposed development scheme are provided on the plans prepared by ZONE Designworks which accompany the Planning Proposal and are reproduced in part in Appendix A.

LEGEND

N

SITE

FIG 2

3.0 Road Network and Traffic Conditions

3.1 Road Network

The road network which serves the development site (Figure 3) comprises:

- *M2 Motorway* – State Road and arterial route connecting between the Warringah Freeway/Harbour Crossings and the M7 which runs parallel to Epping Road in tunnel between Mowbray Road West and the Pacific Highway
- *Epping Road* – a State Road and arterial route which connects between Epping and Lane Cove
- *Burns Bay Road/Centennial Avenue* – a State Road and sub-arterial route which connects between Gladesville Bridge and Epping
- *Mowbray Road West* – a Regional Road and major collector route which connects between Epping Road and the Pacific Highway extending to the east as Mowbray Road
- *Sam Johnson Way* – a minor collector route serving the Lane Cove West Industrial Area
- Delhi Road and Pittwater Road – major collector routes which connect to Epping Road just to the west of Lane Cove River

Barriers to the road system are presented by Lane Cove River, the M2 Motorway Lane Cove Park. Epping Road in the vicinity of the site has 2 westbound lanes, BUS LANES in each direction and 1 east bound lane with a right turn lane for the U-Turn bay.

3.2 Traffic Controls

The existing traffic controls which have been applied to the road system in the vicinity of the site (Figure 4) include:

- the traffic control signals at the Epping Road/Mowbray Road West intersection.
- the traffic control signals at the Epping Road/Sam Johnson Way intersection.
- the 'U-Turn' facility on Epping Road at the eastern side of the Meriton site
- the BUS LANE and NO STOPPING restrictions along Epping Road
- the 70 KMPH speed restriction on Epping Road
- the shared cyclist/pedestrian pathway running along the southern side of Epping Road

3.3 Traffic Conditions

An indication of the surrounding road network traffic operations is provided by the RMS SCATS signal traffic volume data at the 'upstream' intersection of Epping Road and Mowbray Road west and 'downstream' intersection of Epping Road and Sam Johnson Way. Those survey results are reproduced in Appendix B and summarised in Figure 5. The AM and PM network peak operational performances of these intersections are assessed using traffic modelling program SIDRA. The results of a SIDRA analysis of the intersections, which indicate a satisfactory outcome under existing traffic demand, are provided in Appendix C and summarised in the following while the criteria for interpreting SIDRA output is reproduced overleaf.

	AM		PM	
	LOS	**AVD**	**LOS**	**AVD**
Epping/Mowbray	C	30.0s	B	21.4s
Epping/Sam Johnson	D	43.9s	C	36.8s

Criteria for Interpreting Results of SIDRA Analysis

1. Level of Service (LOS)

LOS	Traffic Signals and Roundabouts	Give Way and Stop Signs
'A'	Good	Good
'B'	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
'C'	Satisfactory	Satisfactory but accident study required
'D'	Operating near capacity	Near capacity and Accident Study required
'E'	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode	At capacity and requires other control mode
'F'	Unsatisfactory and requires additional capacity	Unsatisfactory and requires other control mode

2. Average Vehicle Delay (AVD)

The AVD provides a measure of the operational performance of an intersection as indicated on the table below, which relates AVD to LOS. The AVD's listed in the table should be taken as a guide only as longer delays could be tolerated in some locations (ie inner city conditions) and on some roads (ie minor side street intersecting with a major arterial route).

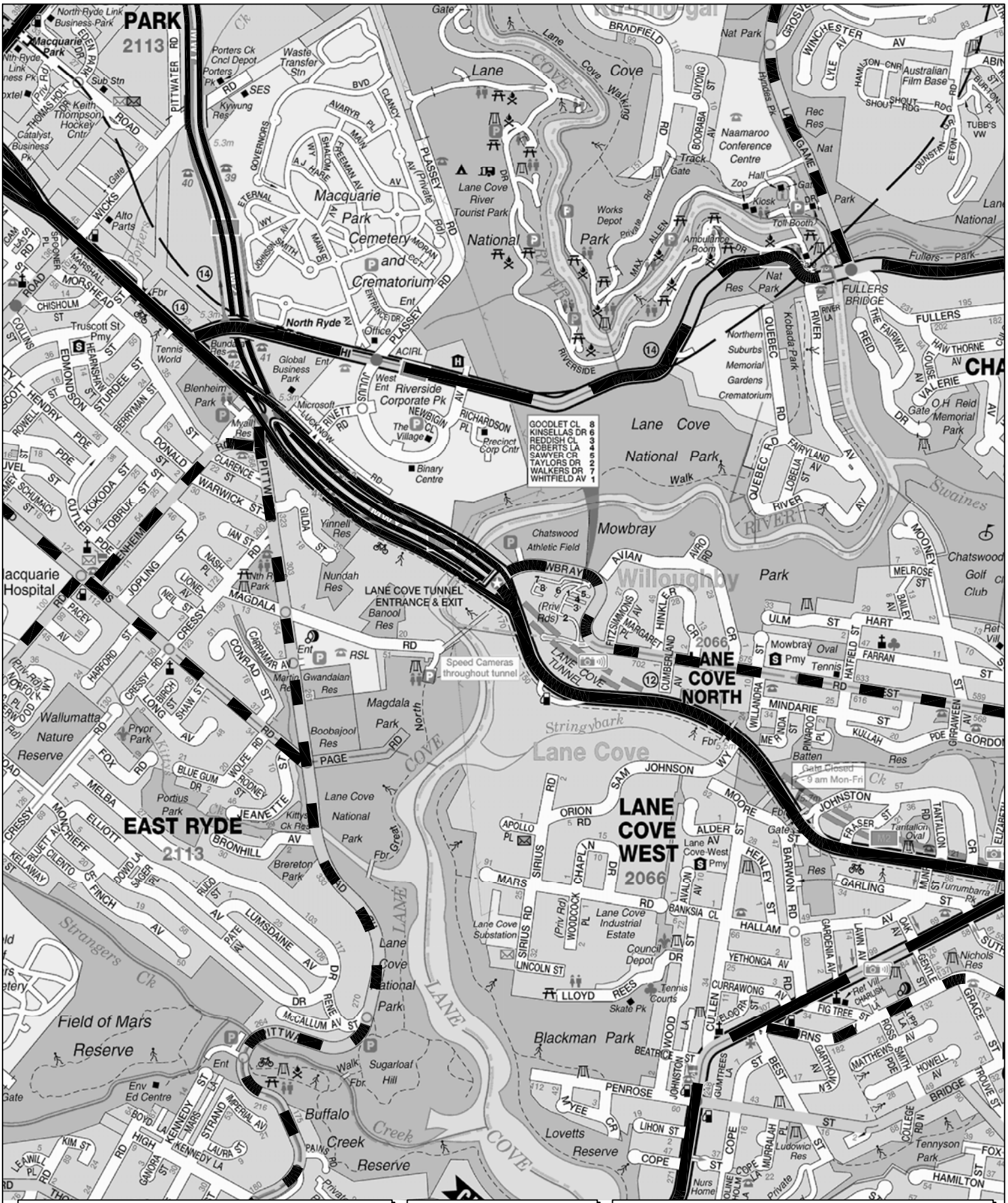
Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabouts	Give Way and Stop Signs
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode	At capacity and requires other control mode

3. Degree of Saturation (DS)

The DS is another measure of the operational performance of individual intersections.

For intersections controlled by **traffic signals**[1] both queue length and delay increase rapidly as DS approaches 1, and it is usual to attempt to keep DS to less than 0.9. Values of DS in the order of 0.7 generally represent satisfactory intersection operation. When DS exceeds 0.9 queues can be anticipated. For intersections controlled by a **roundabout or GIVE WAY or STOP signs**, satisfactory intersection operation is indicated by a DS of 0.8 or less.

[1] *the values of DS for intersections under traffic signal control are only valid for cycle length of 120 secs*

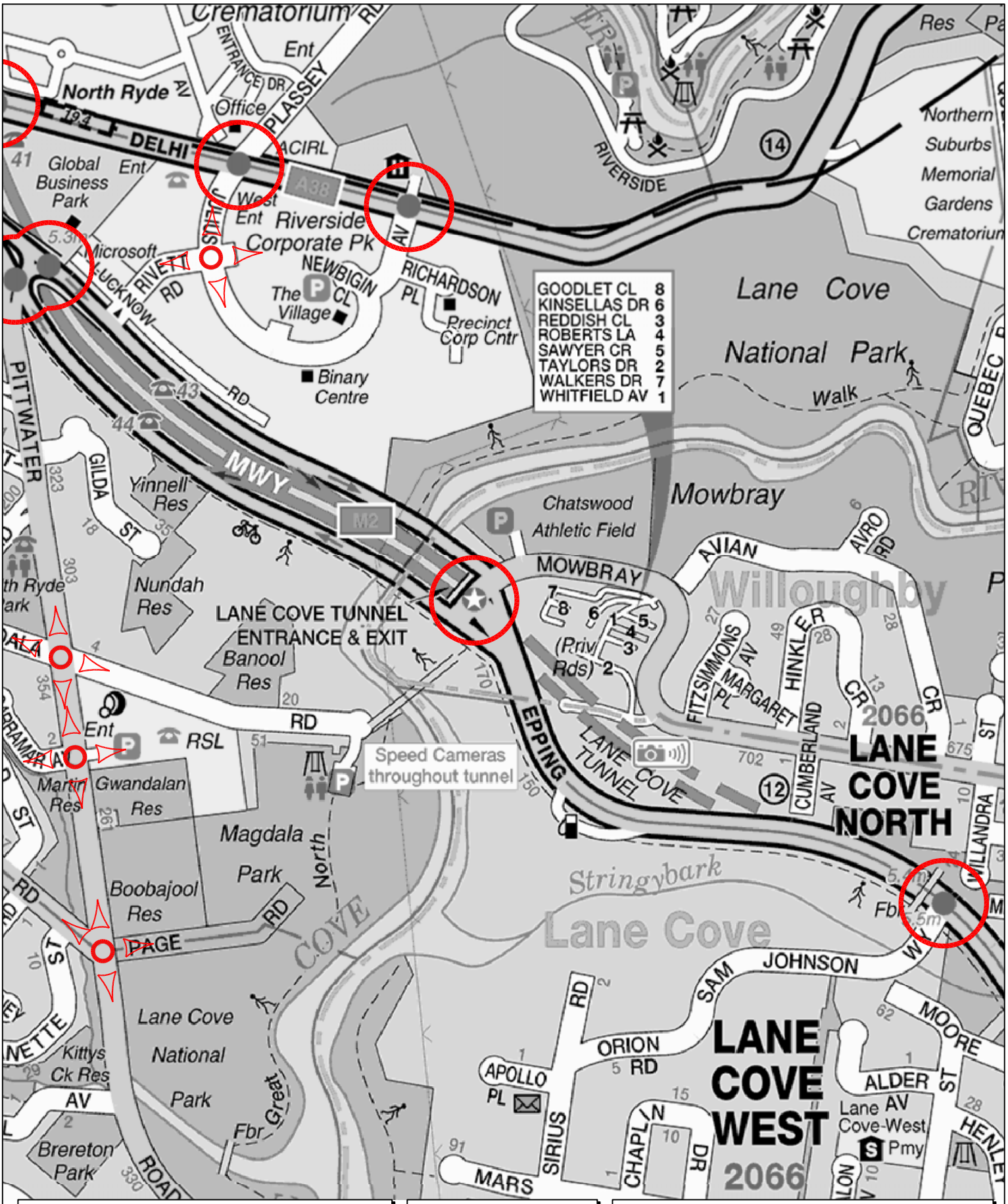


LEGEND

- ARTERIAL
- SUB-ARTERIAL
- COLLECTOR

ROAD NETWORK

FIG 3

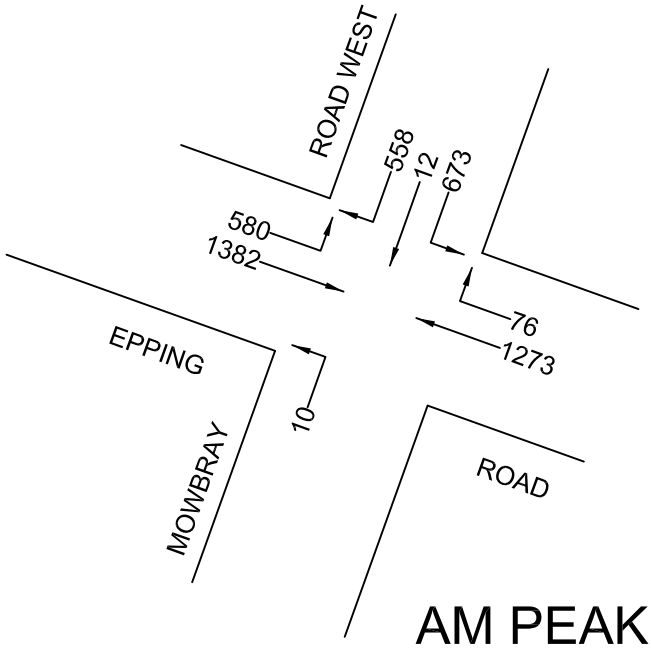


LEGEND

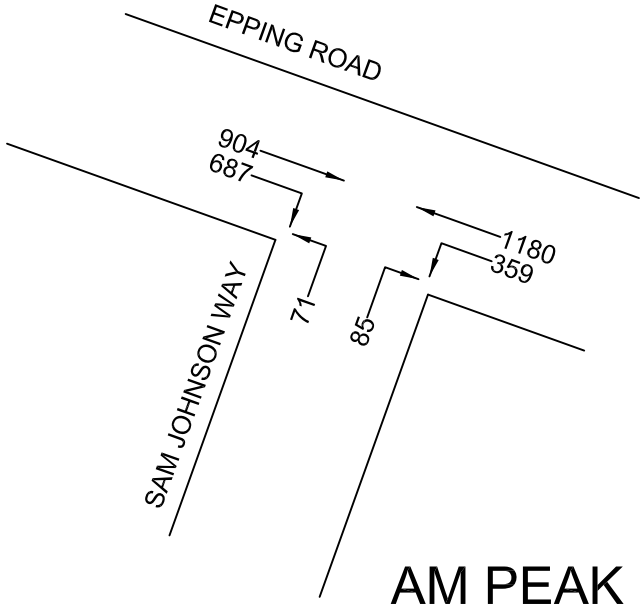
- TRAFFIC SIGNAL CONTROL
- ROUNDABOUT
- RESTRICTED TURNING MOVEMENT

TRAFFIC CONTROLS

FIG 4



AM PEAK



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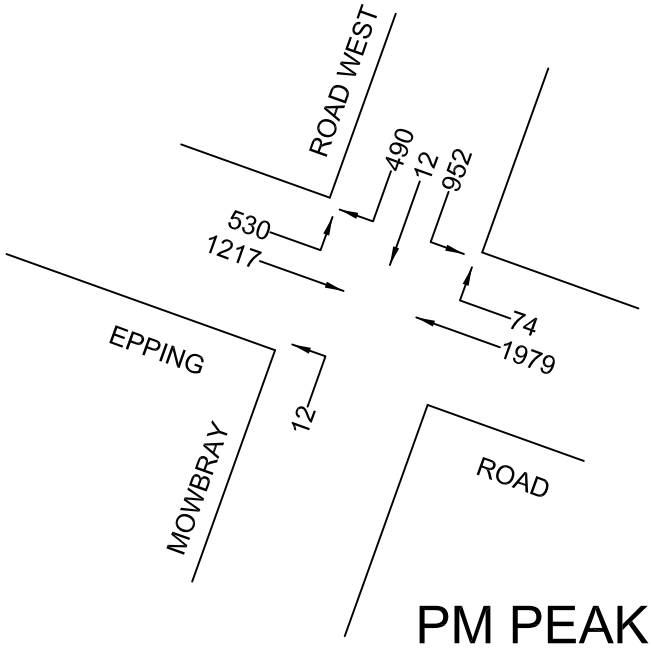
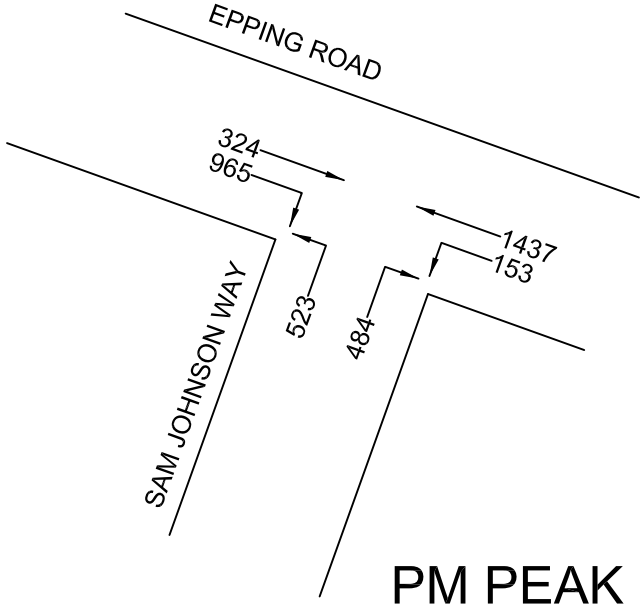


PM PEAK



PM PEAK

LEGEND

EXISTING PEAK TRAFFIC VOLUMES

FIG 5

3.4 Transport Services

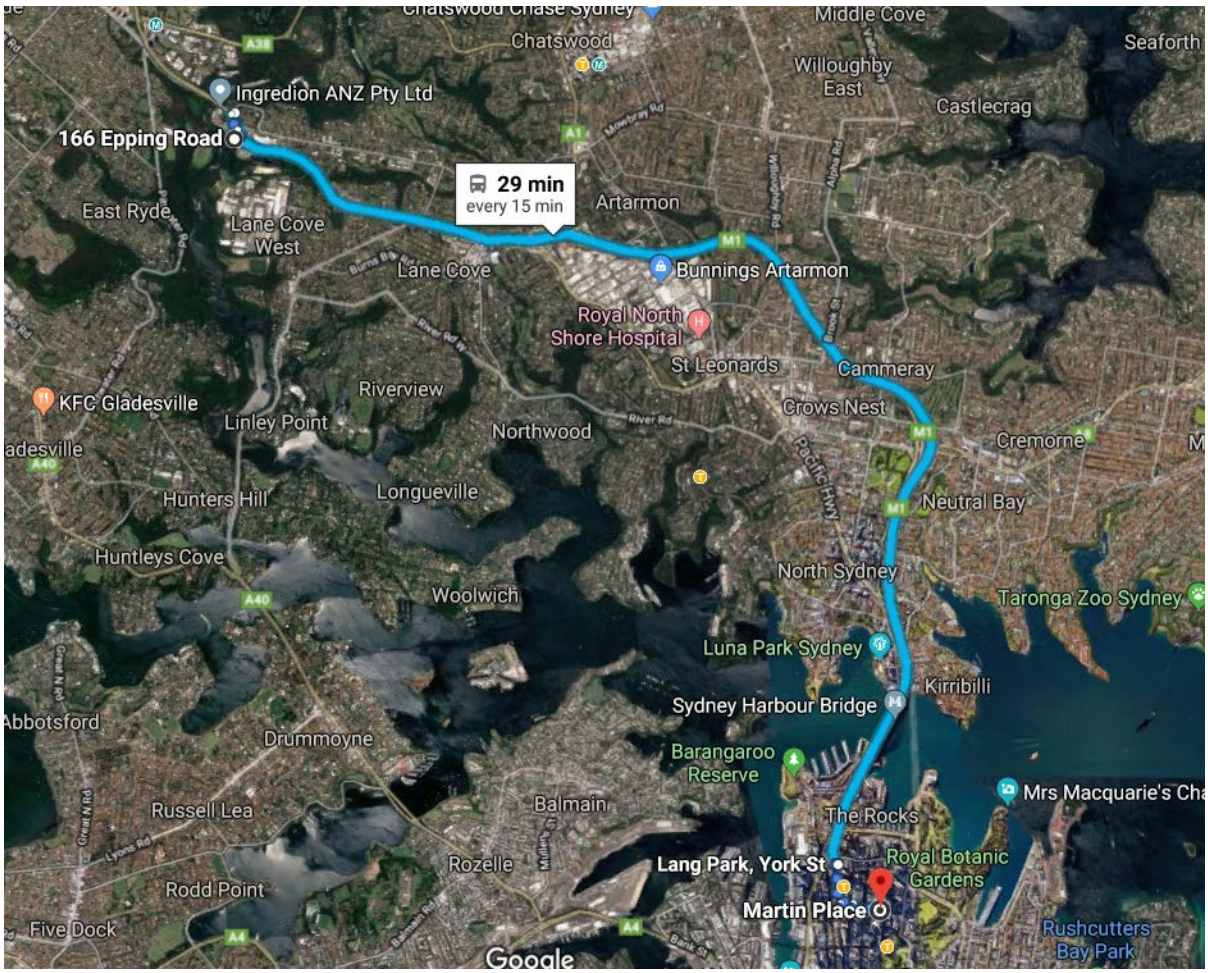
The site is ideally located in relation to high frequency bus services operating along Epping Road (80m east of the site and 130m to the north on the Westbound services and 180m to the north on the eastbound services as indicated in the following).

Source: Google Maps

An indication of the frequency of the local bus services which are facilitated by the BUS LANES extending to from the Harbour crossing is provided in the following:

Route	AM	PM	Off Peak	Sat	Sun/Public Holiday
288	8	10	15	15	60
286	15	30	-	-	-
287	15	30	-	-	-
290	15	20	60	60	60
294	7	-	-	-	-

A desktop review of public transit travel time using Google Maps indicate a 29-minute journey between the site and the Sydney CBD (Martin Place) and such a bus service is offered on a 1 service per 15 minutes basis. This is indicated in the following:



Source: Google Travel Planner

The multiple bus services offered on the Epping Road Transitway in fact result in a higher frequency than a typical train route (i.e. 15 minutes). As such, the transport 'accessibility' of this site could be deemed as more superior than that of a railway station. On this basis, it is assessed that the site is suitably located in relation to public transport services.

4.0 Parking

Lane Cove Council's DCP 2016 (Part R) specifies the following carparking criteria:

Residential (Shop Top Housing)

1 Bedroom	-	1 space per unit
2 Bedroom	-	1 space per unit
3 Bedroom	-	1 space per unit
Adaptable	-	1 space per unit

Serviced Apartment

Guest parking

1 space per 4 apartments

1 disabled space per 10 car spaces

Staff parking

1 space per 2 staff

Retail/Commercial

Shops	-	1 space per 40m^2 GFA
Commercial	-	1 space per 60m^2 GFA

Ancillary Elements

Visitors	-	1 space per 4 units
Loading	-	1 bay per 100 units
Car Wash	-	1 bay per 50 units

Application of this criteria to the proposed development would indicate the following:

284 units (excl. adaptable units)	284 spaces
32 x Adaptable units	32 spaces
Visitors (316 units in total)	79 spaces
Retail 525m^2	13 spaces

Commercial 6,311m^2	105 spaces
Car Wash	6 spaces
Total:	**519 spaces**
Loading	
Loading	3 bays

It is advised that the residential component may incorporate some element of serviced apartments. Because the service apartment parking requirement is only some 25% of that for residential, the assessment will be based on residential only in order to provide a conservative basis.

The DCP states (in Cl 2.2) that its parking criteria are neither maximum nor minimum, and that a lower parking rate would be considered under specific circumstances as follows (two circumstances which the site reasonably satisfy):

- *that there are realistic transport alternatives to private car ownership in the locality*

  As comprehensively discussed in Section 3.5 of this report, the site is advantaged by a comprehensive, high frequency and high capacity transport services along the Epping Road arterial corridor.

- *that there are exceptional site constraints which limit available onsite parking*

  It is advised that the proposed basement is within 3m of the mean sea level of 0.000m and it is not feasible to provide an additional basement to accommodate additional carparking.

Furthermore, the RMS Guide to Traffic Generating Developments specify reduced rates for visitors' parking of between 1 space per 5 units to 1 space per 7 units (in lieu of 1 space per 4 units which the DCP is based upon) where viable public transport is in close proximity of the site. The suitability of the site with respect to access to transport services has been established in the preceding paragraph as well as in Section 3.5 of this report.

In addition to the above, other necessary and relevant consideration in car parking planning in terms of supply and demand in mixed use development of this nature include the following:

- the retail use will essentially only be largely convenience-driven trade by the local residents.

- the commercial visitors' parking spaces will not be used in the weekends when the demand for residential visitors' spaces is highest, thus presenting some level of 'cross-utilisation' between the two types of parking spaces in the carpark.

- the residential units and the vast commercial elements will have some level of overlap wherein employees of the offices have tendencies (for reasons of convenience and economy) lease/purchase the residential apartments within the same 'precinct'.

As such, having taken into consideration the above, applying the more realistic visitor's parking rate of 1 space per 7 units would indicate a reduced quantum for visitor's parking spaces of 45 spaces, thus an overall reduced car parking requirement of 483 spaces.

Notwithstanding, it is proposed to provide a total of 507 car parking spaces plus 3 loading bays to serve the needs of the development. These will be composed of:

344 spaces	Residential
105 spaces	Commercial
13 spaces	Retail
45 spaces	Visitors (including 6 fitted for car wash purpose)
3 spaces	Loading Bay

On balance, the assessment has established that the proposed parking provision is suitable in that it has regard for and is consistent with the DCP's as well as the RMS' recommendations, the site's public transport accessibility, and the complimentary

uses envisaged of the site.

5.0 Traffic

The traffic implications resulting from the proposal will essentially be due to the net additional traffic movements generated by the new uses over that of the existing commercial uses on the site.

The RMS Guidelines to Traffic Generating Developments specify a peak traffic generation rate for commercial/retail uses of 2 vtph per 100m^2 GFA. On this basis, the existing commercial floor area of 7,129m^2 would indicate a peak traffic generation outcome of some 143 vtph.

A guide to the potential traffic generation of the proposed residential apartments is provided by the recently released RMS Circular TDT 2013-04. The criteria contained in this RMS publication (Sydney Average) is 0.19 vtph per apartment in the AM peak and 0.15 vtph in the PM peak (while it is noted that the site is not situated within 800m of a 'railway station', up to 25% of the sites surveyed by RMS for this study were not also serviced by heavy rail). Notwithstanding, the comparability and to some extent the superiority of the comprehensive bus services offered by the Epping Road Transitway over a standard railway station have been discussed comprehensively in Section 3.5 of this report. The suitability of this reduced rate is further substantiated by the constrained parking provision for shop top housing as applicable in the context of this envisaged development.

Similarly, while the RMS Guide does not specify a traffic generation rate for serviced apartments, peak traffic movements associated with tourist accommodation are constrained by the standard check in and check out times i.e. arrivals at 2pm and departures at 10am. The typical movements are largely bounded by these allocated times, thus a significant proportion of the set down and pick up movements will occur outside of the commuter peak periods. For this reason, the assessment of traffic will be based on residential development only in this regard in order to provide a more conservative outcome.

On this basis, the peak traffic generation of the existing and proposed uses on the site are summarised in the following:

	Peak Traffic Generation (vtph)	
Proposed	**AM**	**PM**
Residential (316 units)	60 vtph	47 vtph
Retail (525m^2)	11 vtph	11 vtph
Commercial (6,311m^2)	126 vtph	126 vtph
Less existing uses	*-143 vtph*	*-143 vtph*
Net Additional Traffic	**54 vtph**	**41 vtph**

Access to the site will only be provided via a left turn in and left turn out arrangement connecting with the Epping Road westbound traffic lanes. The RMS data indicates the following AM and PM peak westbound traffic flows on Epping Road:

AM	1,251 vph
PM	1,960 vph

The additional traffic activities resulting from the envisaged uses represent minor proportions of some 4.3% and 2.1% of the Epping Road westbound traffic flows during the AM and PM peak hours respectively. The assessment has established that the additional traffic generation of this order of magnitude is not significant in the context of the Epping Road arterial function.

Nevertheless, to improve the traffic flow at Epping Road, a suitably dimensioned left turn storage lane ('deceleration lane') could be provided to accommodate ingress. Details of the potential deceleration lane treatment, which will be subject to detailed design in a latter stage of this proposal, are indicated in the following diagram.

Based on the above, it is assessed that the traffic activities resulting from the Planning Proposal will have no adverse implications on the existing Epping Road operations.

6.0 Access, Internal Circulation and Servicing

6.1 Access

A two-way driveway (minimum width of 6m) will be provided in the existing driveway location to accommodate primary access movements between the carpark and the access road way.

The existing driveway is suitably located with respect to sight lines and the proposed access intends to retain these attributes. As such, it is envisaged that the proposed driveway will have no undue difficulty (particularly in relation to site constraints) in achieving and satisfying the AS2890.1 design criteria for a driveway of this nature.

6.2 Internal Circulation

The design of the carparking areas and their access connections, which will be subject to detailed design at the latter stage of this proposal, will comply with the AS 2890.1 criteria with suitable and appropriate ramps, aisles, bays etc.

A set down and pick up area will also be provided on the ground level and it is envisaged that this facility will serve the access requirement of a larger passenger vehicle e.g. a 15-seat van i.e. in the event that serviced apartments are provided in this development.

6.3 Servicing

A total of 3 loading docks capable of accommodating up to an 8.8m long MRV each will be provided in the Basement 1 level. Refuse will be removed from the Garbage Room by a truck standing in the loading dock while service personnel etc will also be able to use the retail/visitor parking spaces.

Details of the turning path assessment for the design vehicles indicating satisfactory provision for internal circulation are shown on the diagrams in Appendix D.

7.0 Active Transport Provisions

Pedestrians

The proposed development will facilitate pedestrian amenity by:

- the proposed 'canopy walk' which connects directly to the Epping Road Shared Path towards the west (i.e. nearest to the local bus stops)
- the proposed 'canopy walk' which connects to the Lane Cove River walk paths

Cyclists

Provision will be made on-site for bicycle storage/parking and this will have easy direct access to the Regional Bicycle Route (along Epping Road) and its connections to the Metropolitan bicycle network.

8.0 Conclusion

This report documents an assessment of the potential traffic, transport and parking implications of a Planning Proposal which would eventuate with a residential apartment based mixed use development on 166 Epping Road at Lane Cove West.

The assessment has established that:

- the traffic generated by the proposed development will only be some 2-4% of the existing Epping Road traffic flows and will not have any adverse impact on the local road network operation

- the actual traffic generation outcome will be less as a proportion of the residential units will be developed as serviced apartments (i.e. 25% less parking and less commuter peak traffic movements)

- the proposed parking provision will be adequate for the needs of the development and has regard for the RMS and Council's planning controls

- the vehicle access, parking and servicing provisions have been designed in accordance with all relevant planning controls and standards

- the provision for a deceleration lane at the Epping Road access will provide a more superior traffic operations outcome (in terms of network efficiency) over the existing arrangement

- the provision of pedestrian connectivity between the site and Epping Road Shared Path is appropriate and consistent with Council's planning objectives

- the provision of active transport elements will be incorporated into the development to encourage the uptake of these mode thus minimizing reliance on private vehicle ownership

Appendix A

Concept Plans

LEGEND		AREA/NO.
	PLANT ROOM	164m²
	RESIDENTIAL STORAGE	343m²
CB	CHARGING BAYS	2
	CAR WASHING BAYS	2

PLANT ROOM:	100m²
RESIDENTIAL STORAGE:	206m²
CPS PROVIDED PER LEVEL	111 BAYS
TOTAL CPS PROVIDED ON LEVELS 3-5	333 BAYS
TOTAL CPS PROVIDED FOR DEVELOPMENT	512 BAYS
TOTAL CPS REQUIRED FOR DEVELOPMENT	507 BAYS

SCALE: 1:500 @ A3

0 0.5 1 2 4 m

N

05 INDICATIVE DESIGN

5.2 CAR PARK BASEMENT LEVELS 3-5 PLAN

ZONE DESIGNWORKS
architecture | interiors | urban planning

LEGEND		AREA/NO.
	PLANT ROOM	354m²
	RESIDENTIAL STORAGE	202m²
	BICYCLE RACKS	69
CB	CHARGING BAYS	2

PLANT ROOM:	100m²
RESIDENTIAL STORAGE:	206m²
CPS PROVIDED ON LEVEL 2:	99 BAYS
TOTAL CPS PROVIDED FOR DEVELOPMENT:	512 BAYS
TOTAL CPS REQUIRED FOR DEVELOPMENT:	507 BAYS

SCALE: 1:500 @ A3

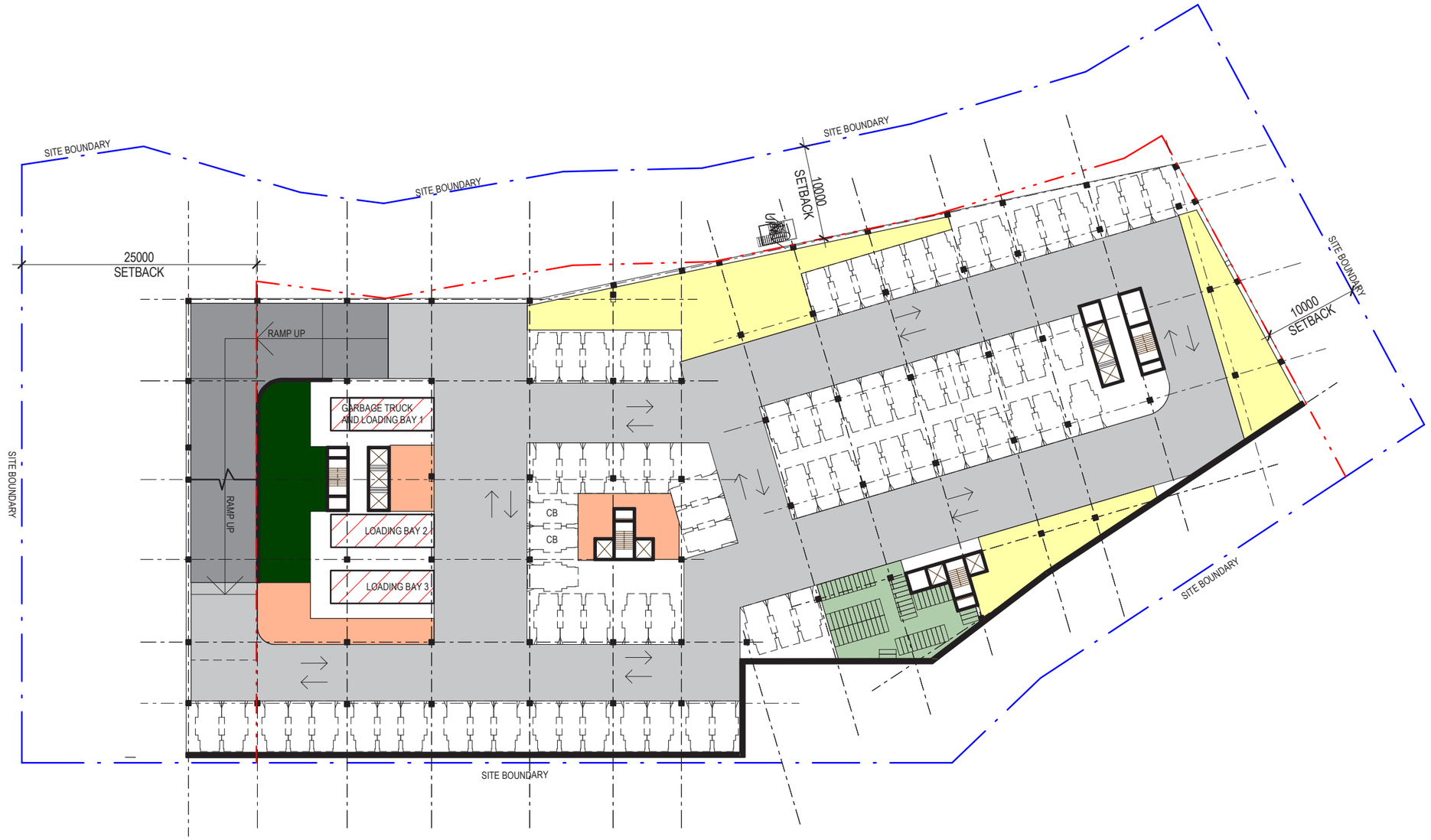
0 0.5 1 2 4 m

N

05 INDICATIVE DESIGN

5.3 CAR PARK BASEMENT LEVEL 2 PLAN

ZONE DESIGNWORKS
architecture | interiors | urban planning



LEGEND		AREA/NO.
	PLANT ROOM	423m²
	RESIDENTIAL STORAGE	161m²
	BICYCLE RACKS	69
	WASTE ROOM	100m²
	LOADING BAYS	3
CB	CHARGING BAYS	2

PLANT ROOM:	100m²
RESIDENTIAL STORAGE:	206m²
CPS PROVIDED ON LEVEL 1:	80 BAYS
TOTAL CPS PROVIDED FOR DEVELOPMENT:	512 BAYS
TOTAL CPS REQUIRED FOR DEVELOPMENT:	507 BAYS

SCALE: 1:500 @ A3

0 0.5 1 2 4 m

N

05 INDICATIVE DESIGN

5.4 CAR PARK BASEMENT LEVEL 1 PLAN

ZONE DESIGNWORKS
architecture | interiors | urban planning

COMMERCIAL:	1,402m²
PLAZA FRONT RETAIL:	525m²
CORRIDOR/ LOBBY:	575m²
ABOVE GROUND LANDSCAPING:	305m²

SCALE: 1:500 @ A3

0 0.5 1 2 4 m

N

05 INDICATIVE DESIGN

5.5 COMMERCIAL GROUND LEVEL PLAN

ZONE DESIGNWORKS
architecture | interiors | urban planning

Appendix B

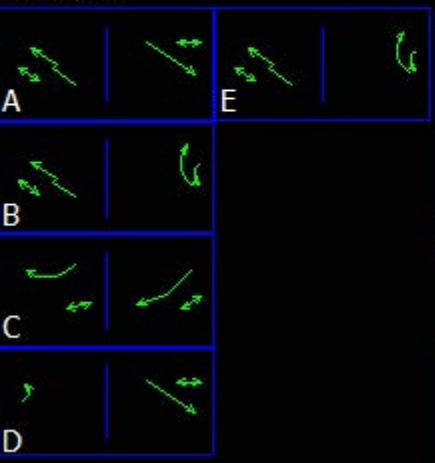
RMS Traffic Data

TCS 805

LANE COVE 194K12

EPP SS=1

5 PHASES



Site: 805 Thursday, 1 August 2019 Traffic Flow filename:EPP_20190801

Thursday, 01 August 2019

	Approach	detector(s)...											
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00:30	Approach 1	0	4	15	2	45	12	0	0	5	9	0	4	96
00:45	Approach 1	0	4	9	0	56	13	0	0	1	5	0	7	95
01:00	Approach 1	0	4	15	1	23	10	0	0	2	3	0	6	64
01:15	Approach 1	0	2	15	3	31	8	0	0	4	5	0	4	72
01:30	Approach 1	0	2	15	1	23	1	0	1	4	3	0	2	52
01:45	Approach 1	0	3	13	1	25	7	0	0	2	2	0	2	55
02:00	Approach 1	0	4	13	0	24	6	1	1	1	4	0	1	55
02:15	Approach 1	0	1	12	1	17	3	1	0	3	2	0	5	45
02:30	Approach 1	0	1	13	0	19	3	0	2	1	3	0	2	44
02:45	Approach 1	0	2	8	0	29	7	0	0	0	2	0	3	51
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03:30	Approach 1	0	1	14	0	12	1	0	1	2	1	0	2	34
03:45	Approach 1	0	4	21	0	16	5	1	3	1	0	0	4	55
04:00	Approach 1	0	8	23	1	16	6	0	0	1	2	0	6	63
04:15	Approach 1	0	3	22	0	17	4	0	4	3	1	0	8	62
04:30	Approach 1	1	8	39	0	26	9	0	1	4	5	0	12	105
04:45	Approach 1	0	20	72	2	23	12	1	2	3	2	2	12	151
05:00	Approach 1	0	13	88	1	16	9	0	3	5	4	0	21	160
05:15	Approach 1	4	28	115	4	31	14	2	2	9	5	3	31	248
05:30	Approach 1	1	49	130	2	47	30	1	2	11	7	5	48	333
05:45	Approach 1	0	68	194	6	61	51	5	6	10	13	8	42	464
06:00	Approach 1	4	93	218	5	79	76	2	4	19	21	5	61	587
06:15	Approach 1	10	104	212	5	99	95	5	5	20	25	5	69	654
06:30	Approach 1	9	146	235	10	117	114	5	6	15	24	4	115	800
06:45	Approach 1	10	174	207	7	117	119	8	11	26	38	1	131	849
07:00	Approach 1	17	167	192	8	120	110	18	15	38	41	1	151	878
07:15	Approach 1	7	135	258	5	132	164	12	6	31	40	3	123	916
07:30	Approach 1	9	129	205	10	157	164	16	13	55	67	2	153	980
07:45	Approach 1	8	157	197	8	138	158	24	22	57	77	2	157	1005
08:00	Approach 1	10	128	194	8	135	166	25	14	71	88	1	148	988
08:15	Approach 1	12	106	213	10	154	174	28	18	59	74	4	139	991
08:30	Approach 1	12	127	218	9	138	175	37	22	57	87	3	136	1021
08:45	Approach 1	11	132	187	20	144	154	41	22	59	82	2	118	972
09:00	Approach 1	10	143	202	14	142	180	34	3	51	70	2	112	963
09:15	Approach 1	10	115	185	9	158	188	46	24	48	74	0	101	958
09:30	Approach 1	5	115	202	5	171	163	23	9	43	59	4	103	902
09:45	Approach 1	8	120	195	14	160	143	10	13	52	60	1	100	876
10:00	Approach 1	7	123	237	12	167	149	16	11	34	55	1	99	911
10:15	Approach 1	2	79	188	10	147	131	14	9	29	49	2	84	744
10:30	Approach 1	3	70	181	7	145	124	18	9	37	44	2	72	712
10:45	Approach 1	1	69	177	11	175	145	9	10	21	38	2	80	738
11:00	Approach 1	3	73	174	8	172	126	12	13	30	46	0	84	741
11:15	Approach 1	3	70	178	14	161	146	13	8	37	41	1	69	741
11:30	Approach 1	1	61	170	4	166	124	7	11	24	36	3	67	674
11:45	Approach 1	4	78	192	5	170	123	12	8	34	43	2	86	757

12:00 Approach	1	4	59	169	6	165	142	11	7	36	36	1	71	707
12:15 Approach	1	4	68	171	2	144	119	14	10	29	38	4	75	678
12:30 Approach	1	3	58	156	6	172	146	14	7	34	50	4	55	705
12:45 Approach	1	0	85	171	11	175	169	16	10	38	42	5	77	799
13:00 Approach	1	5	69	183	10	160	148	21	8	40	46	3	59	752
13:15 Approach	1	2	66	181	6	154	132	13	9	33	39	4	79	718
13:30 Approach	1	4	94	166	11	173	152	12	11	44	49	2	74	792
13:45 Approach	1	1	67	182	8	147	133	12	12	42	45	5	70	724
14:00 Approach	1	5	82	206	11	193	161	15	7	44	57	3	74	858
14:15 Approach	1	7	81	176	10	228	237	15	12	42	50	3	82	943
14:30 Approach	1	6	79	192	10	209	185	17	8	50	58	2	104	920
14:45 Approach	1	5	80	163	12	212	206	8	10	36	40	4	78	854
15:00 Approach	1	7	73	181	7	211	202	19	10	41	62	3	104	920
15:15 Approach	1	2	106	188	15	228	197	16	13	40	57	1	94	957
15:30 Approach	1	4	90	196	10	244	248	30	8	46	55	2	82	1015
15:45 Approach	1	4	76	171	8	236	253	12	9	66	70	2	93	1000
16:00 Approach	1	4	97	190	11	221	229	17	17	54	71	3	114	1028
16:15 Approach	1	6	82	183	17	246	249	17	14	66	78	3	100	1061
16:30 Approach	1	8	133	196	18	240	250	17	17	53	67	3	106	1108
16:45 Approach	1	5	111	202	10	232	220	17	13	57	57	4	117	1045
17:00 Approach	1	9	114	195	12	252	232	25	20	54	67	1	121	1102
17:15 Approach	1	7	109	193	16	243	254	17	21	61	67	2	147	1137
17:30 Approach	1	10	126	136	20	242	246	19	20	64	75	5	145	1108
17:45 Approach	1	6	96	176	19	203	217	19	15	57	67	2	154	1031
18:00 Approach	1	10	107	180	30	210	243	25	16	69	72	3	140	1105
18:15 Approach	1	5	127	192	21	229	226	13	20	63	82	9	136	1123
18:30 Approach	1	5	93	198	15	217	207	9	7	54	58	2	122	987
18:45 Approach	1	3	126	211	21	210	182	12	15	55	64	1	117	1017
19:00 Approach	1	4	77	164	13	204	200	15	11	49	57	1	95	890
19:15 Approach	1	4	57	154	6	192	189	6	6	37	57	0	79	787
19:30 Approach	1	5	63	144	7	169	153	14	10	45	51	0	66	727
19:45 Approach	1	0	36	122	8	150	140	9	5	31	46	1	59	607
20:00 Approach	1	3	57	132	6	159	139	7	9	28	35	0	55	630
20:15 Approach	1	0	49	129	5	139	122	6	2	25	36	1	59	573
20:30 Approach	1	2	44	107	15	142	120	12	7	29	42	0	47	567
20:45 Approach	1	1	36	121	4	122	91	8	5	28	43	0	48	507
21:00 Approach	1	2	40	124	2	130	95	7	10	21	41	2	46	520
21:15 Approach	1	1	50	130	5	123	89	6	8	24	47	1	47	531
21:30 Approach	1	2	40	126	4	122	77	5	4	30	42	0	57	509
21:45 Approach	1	0	43	86	1	139	108	4	1	33	39	0	41	495
22:00 Approach	1	1	31	74	8	139	99	6	11	26	41	0	48	484
22:15 Approach	1	0	28	71	9	148	113	3	7	19	21	0	35	454
22:30 Approach	1	1	23	95	5	130	86	5	5	24	25	0	38	437
22:45 Approach	1	2	22	62	3	111	83	4	1	19	25	0	25	357
23:00 Approach	1	1	23	41	3	83	64	4	3	17	22	0	22	283
23:15 Approach	1	2	15	51	1	68	41	1	1	12	23	0	13	228
23:30 Approach	1	1	17	45	3	79	30	2	1	7	9	0	16	210
23:45 Approach	1	0	17	35	2	67	31	1	1	2	9	0	9	174
24:00 Approach	1	1	13	29	2	62	24	0	2	3	7	0	10	153

Approach 1 AM peak 4021 07:40 - 08:40 PM peak 4412 16:25 - 17:25 Daily Total 59207

TCS 2819

LANE COVE WEST 194N14

STL SS=49

4 PHASES

Site: 2819 Thursday, 1 August 2019 Traffic Flow filename:STL_20190801

Thursday, 01 August 2019

	Approach	detector(s)...										
	Approach 1	1	2	3	4	5	6	7	8	9	10	11
00:15	Approach 1	62	10	0	0	2	21	4	1	1	2	0	103
00:30	Approach 1	49	8	0	0	4	15	3	2	1	2	4	88
00:45	Approach 1	58	7	0	0	1	10	3	1	0	1	4	85
01:00	Approach 1	24	3	1	1	1	19	4	5	0	0	1	59
01:15	Approach 1	33	6	2	2	0	11	3	0	0	3	1	61
01:30	Approach 1	23	1	0	0	1	15	4	4	0	0	0	48
01:45	Approach 1	28	5	1	1	0	15	1	1	0	1	1	54
02:00	Approach 1	25	4	0	0	0	13	1	0	1	3	0	47
02:15	Approach 1	18	1	0	0	0	14	2	0	1	1	0	37
02:30	Approach 1	23	2	1	1	0	11	2	2	1	1	3	47
02:45	Approach 1	26	4	1	1	1	10	2	4	1	0	1	51
03:00	Approach 1	18	4	1	1	1	10	1	1	0	2	0	39
03:15	Approach 1	17	4	0	0	3	23	1	3	1	0	0	52
03:30	Approach 1	11	1	1	1	0	16	1	3	0	3	1	38
03:45	Approach 1	16	4	0	0	0	18	2	2	0	1	1	44
04:00	Approach 1	20	3	3	3	2	28	3	0	0	3	5	70
04:15	Approach 1	18	2	0	0	1	19	3	0	1	5	0	49
04:30	Approach 1	28	6	3	3	3	38	1	2	2	4	1	91
04:45	Approach 1	21	10	2	2	8	61	4	3	1	15	0	127
05:00	Approach 1	17	6	4	4	4	74	4	2	1	26	2	144
05:15	Approach 1	31	11	1	1	10	102	7	2	3	26	3	197
05:30	Approach 1	55	20	7	7	5	130	8	1	0	29	1	263
05:45	Approach 1	68	47	12	10	10	195	19	4	2	52	0	419
06:00	Approach 1	93	47	19	20	9	219	31	3	3	54	1	499
06:15	Approach 1	123	66	15	15	9	278	29	5	3	35	3	581
06:30	Approach 1	126	104	29	29	13	288	38	10	5	45	2	689
06:45	Approach 1	129	103	17	24	8	308	41	4	6	51	7	698
07:00	Approach 1	145	103	24	32	11	286	62	10	3	68	6	750
07:15	Approach 1	143	143	33	43	15	269	53	13	12	68	6	798
07:30	Approach 1	166	136	31	39	15	225	77	8	11	70	4	782
07:45	Approach 1	148	138	32	48	18	225	74	10	8	81	10	792
08:00	Approach 1	154	141	31	46	14	210	98	14	8	91	13	820
08:15	Approach 1	152	150	41	63	21	169	86	11	15	84	16	808
08:30	Approach 1	151	146	44	68	25	185	101	20	12	95	18	865
08:45	Approach 1	157	134	43	58	21	164	102	14	21	102	13	829
09:00	Approach 1	144	144	39	70	15	164	127	21	14	104	19	861
09:15	Approach 1	178	162	27	47	15	205	133	25	25	80	24	921
09:30	Approach 1	155	134	25	34	13	187	82	22	16	76	27	771
09:45	Approach 1	192	124	26	36	10	230	95	12	14	64	17	820
10:00	Approach 1	165	102	38	51	19	247	78	16	19	62	25	822
10:15	Approach 1	170	113	24	28	11	210	69	21	15	52	20	733
10:30	Approach 1	142	98	26	33	8	179	54	27	23	44	29	663
10:45	Approach 1	191	89	20	21	13	187	53	27	26	30	30	687
11:00	Approach 1	162	89	20	25	10	178	50	24	35	34	21	648
11:15	Approach 1	169	110	24	25	6	208	57	26	29	26	28	708
11:30	Approach 1	174	71	11	13	11	204	51	27	29	24	32	647
11:45	Approach 1	172	96	19	19	22	199	48	26	34	32	30	697

12:00 Approach	1	159	91	14	15	8	191	48	30	35	25	33	649
12:15 Approach	1	134	88	21	26	8	182	56	32	39	27	39	652
12:30 Approach	1	171	108	14	13	11	168	51	29	43	23	41	672
12:45 Approach	1	179	113	20	23	5	186	64	36	38	37	41	742
13:00 Approach	1	170	112	21	28	6	212	63	26	31	27	31	727
13:15 Approach	1	156	108	22	24	14	203	46	29	30	37	33	702
13:30 Approach	1	169	114	25	28	14	184	62	23	31	32	35	717
13:45 Approach	1	154	108	22	27	7	198	55	26	19	35	31	682
14:00 Approach	1	192	105	24	26	15	221	62	44	59	38	33	819
14:15 Approach	1	174	149	15	23	16	201	63	58	83	32	46	860
14:30 Approach	1	217	123	20	23	14	216	46	31	46	20	28	784
14:45 Approach	1	206	128	17	17	15	203	49	33	61	22	31	782
15:00 Approach	1	215	156	23	28	9	196	65	24	40	26	32	814
15:15 Approach	1	194	163	23	25	18	249	50	38	65	21	39	885
15:30 Approach	1	215	156	19	22	12	227	56	45	80	28	36	896
15:45 Approach	1	240	187	31	33	14	218	53	41	64	21	40	942
16:00 Approach	1	211	152	20	20	13	238	56	46	60	19	48	883
16:15 Approach	1	235	149	26	25	15	232	46	59	90	16	71	964
16:30 Approach	1	204	177	31	32	16	242	44	47	83	21	64	961
16:45 Approach	1	217	152	31	31	11	273	39	55	70	21	60	960
17:00 Approach	1	194	139	20	30	17	228	43	76	92	23	85	947
17:15 Approach	1	197	185	31	38	11	190	39	79	108	19	95	992
17:30 Approach	1	195	158	40	49	11	197	32	79	108	18	99	986
17:45 Approach	1	186	128	25	27	19	262	27	63	98	18	63	916
18:00 Approach	1	217	146	19	18	15	251	34	53	87	10	62	912
18:15 Approach	1	205	140	43	41	10	248	34	62	63	10	55	911
18:30 Approach	1	201	145	26	27	22	253	34	49	54	11	41	863
18:45 Approach	1	230	131	25	24	15	269	30	31	31	6	26	818
19:00 Approach	1	220	139	24	24	13	225	32	27	26	13	22	765
19:15 Approach	1	216	124	12	13	7	175	21	24	23	8	23	646
19:30 Approach	1	180	111	8	8	14	187	22	12	22	5	16	585
19:45 Approach	1	168	102	7	6	3	154	14	5	9	9	12	489
20:00 Approach	1	191	112	10	12	12	156	18	10	6	2	8	537
20:15 Approach	1	173	75	14	13	15	147	10	12	8	4	9	480
20:30 Approach	1	151	87	8	8	12	137	25	5	8	3	7	451
20:45 Approach	1	150	70	7	7	9	148	11	4	6	0	4	416
21:00 Approach	1	142	72	9	9	16	132	10	8	3	1	8	410
21:15 Approach	1	139	65	8	9	10	154	13	2	11	4	7	422
21:30 Approach	1	135	59	5	7	18	145	10	2	4	1	13	399
21:45 Approach	1	163	74	4	4	9	110	8	9	9	3	3	396
22:00 Approach	1	157	80	5	5	10	90	8	3	4	4	3	369
22:15 Approach	1	162	73	3	3	5	93	11	22	21	0	6	399
22:30 Approach	1	142	65	3	3	5	110	5	7	13	0	6	359
22:45 Approach	1	124	48	0	0	8	80	5	2	1	0	1	269
23:00 Approach	1	102	40	3	3	6	59	4	2	1	1	2	223
23:15 Approach	1	71	29	1	1	4	58	5	1	3	0	3	176
23:30 Approach	1	96	17	2	3	4	55	5	0	1	1	0	184
23:45 Approach	1	74	22	0	0	8	43	4	0	1	0	2	154
24:00 Approach	1	69	15	2	2	4	34	2	0	1	1	1	131

Approach 1 AM peak 3476 08:15 - 09:15 PM peak 3885 16:30 - 17:30 Daily Total 51800

Appendix C

SIDRA Traffic Model Output

MOVEMENT SUMMARY

Site: 101 [Epping Road and Sam Johnson Way PEAK AM]

Epping Road and Sam Johnson Way
Site Category: -
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total 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	Aver. No. Cycles	Average Speed km/h
SouthEast: Epping Road												
4	L2	359	2.0	0.905	70.0	LOS E	24.4	173.7	1.00	0.98	1.30	27.6
5	T1	1180	2.0	0.910	53.6	LOS D	42.8	304.5	0.97	1.05	1.20	32.0
Approach		1539	2.0	0.910	57.4	LOS E	42.8	304.5	0.98	1.03	1.22	30.8
NorthWest: Epping Road												
11	T1	904	2.0	0.687	12.0	LOS A	31.0	220.8	0.65	0.60	0.65	50.2
12	R2	687	2.0	0.895	57.8	LOS E	29.0	206.4	0.96	0.92	1.12	30.5
Approach		1591	2.0	0.895	31.8	LOS C	31.0	220.8	0.79	0.74	0.85	39.2
SouthWest: Sam Johnson Way												
1	L2	71	2.0	0.073	19.8	LOS B	2.0	14.0	0.51	0.69	0.51	44.3
3	R2	85	2.0	0.137	46.2	LOS D	2.6	18.3	0.84	0.73	0.84	33.7
Approach		156	2.0	0.137	34.2	LOS C	2.6	18.3	0.69	0.71	0.69	37.8
All Vehicles		3286	2.0	0.910	43.9	LOS D	42.8	304.5	0.87	0.88	1.02	34.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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 is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	SouthWest Full Crossing	53	54.3	LOS E	0.2	0.2	0.95	0.95
All Pedestrians		53	54.3	LOS E			0.95	0.95

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [Epping Road and Sam Johnson Way PEAK PM]

Epping Road and Sam Johnson Way
Site Category: -
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total 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	Aver. No. Cycles	Average Speed km/h
SouthEast: Epping Road												
4	L2	153	2.0	0.323	44.4	LOS D	7.3	51.7	0.85	0.78	0.85	34.1
5	T1	1437	2.0	0.857	36.0	LOS C	42.6	303.3	0.94	0.91	1.02	37.8
Approach		1590	2.0	0.857	36.8	LOS C	42.6	303.3	0.93	0.90	1.00	37.4
NorthWest: Epping Road												
11	T1	965	2.0	0.781	16.3	LOS B	39.9	284.2	0.78	0.73	0.78	47.3
12	R2	324	2.0	0.844	65.0	LOS E	13.1	93.5	0.99	0.88	1.15	28.7
Approach		1289	2.0	0.844	28.6	LOS C	39.9	284.2	0.83	0.77	0.87	40.7
SouthWest: Sam Johnson Way												
1	L2	523	2.0	0.851	42.8	LOS D	26.6	189.5	0.83	0.89	0.97	34.7
3	R2	484	2.0	0.851	52.4	LOS D	16.0	113.7	0.91	0.87	1.04	31.9
Approach		1007	2.0	0.851	47.4	LOS D	26.6	189.5	0.87	0.88	1.00	33.3
All Vehicles		3886	2.0	0.857	36.8	LOS C	42.6	303.3	0.88	0.85	0.96	37.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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 is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	SouthWest Full Crossing	53	54.3	LOS E	0.2	0.2	0.95	0.95
All Pedestrians		53	54.3	LOS E			0.95	0.95

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [Mowbray Road West and Epping Road PEAK AM]

Mowbray Road West and Epping Road
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total 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	Aver. No. Cycles	Average Speed km/h
SouthEast: Epping Road												
2	T1	1273	2.0	0.826	36.1	LOS C	36.1	257.2	0.94	0.89	0.99	37.7
3	R2	76	2.0	0.498	65.0	LOS E	4.5	31.8	1.00	0.77	1.00	28.7
Approach		1349	2.0	0.826	37.7	LOS C	36.1	257.2	0.94	0.88	0.99	37.1
NorthEast: Mowbray Road West												
4	L2	114	2.0	0.182	35.1	LOS C	4.6	33.1	0.74	0.75	0.74	37.4
5	T1	12	2.0	0.778	51.5	LOS D	15.8	112.7	0.99	0.89	1.09	23.0
6	R2	558	2.0	0.778	57.3	LOS E	17.4	123.9	0.99	0.89	1.09	30.6
Approach		684	2.0	0.778	53.5	LOS D	17.4	123.9	0.95	0.87	1.04	31.5
NorthWest: Epping Road												
7	L2	580	2.0	0.386	6.6	LOS A	4.6	32.4	0.22	0.62	0.22	53.4
8	T1	1382	2.0	0.818	20.7	LOS B	41.3	293.9	0.80	0.73	0.80	44.9
Approach		1962	2.0	0.818	16.5	LOS B	41.3	293.9	0.63	0.70	0.63	47.1
SouthWest:												
10	L2	10	2.0	0.024	43.3	LOS D	0.5	3.2	0.80	0.67	0.80	26.3
Approach		10	2.0	0.024	43.3	LOS D	0.5	3.2	0.80	0.67	0.80	26.3
All Vehicles		4005	2.0	0.826	30.0	LOS C	41.3	293.9	0.79	0.79	0.82	40.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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 is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	SouthEast Full Crossing	53	54.3	LOS E	0.2	0.2	0.95	0.95
P2	NorthEast Full Crossing	53	54.3	LOS E	0.2	0.2	0.95	0.95
P4	SouthWest Full Crossing	53	54.3	LOS E	0.2	0.2	0.95	0.95
All Pedestrians		158	54.3	LOS E			0.95	0.95

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [Mowbray Road West and Epping Road PEAK PM]

Mowbray Road West and Epping Road
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total 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	Aver. No. Cycles	Average Speed km/h
SouthEast: Epping Road												
2	T1	1979	2.0	0.815	16.0	LOS B	43.7	311.2	0.79	0.73	0.79	47.5
3	R2	74	2.0	0.539	66.4	LOS E	4.4	31.4	1.00	0.77	1.00	28.4
Approach		2053	2.0	0.815	17.8	LOS B	43.7	311.2	0.79	0.73	0.79	46.4
NorthEast: Mowbray Road West												
4	L2	78	2.0	0.146	39.2	LOS C	3.4	23.9	0.78	0.74	0.78	35.9
5	T1	12	2.0	0.839	59.5	LOS E	15.4	109.5	1.00	0.93	1.22	21.2
6	R2	490	2.0	0.839	65.2	LOS E	16.1	114.6	1.00	0.93	1.21	28.7
Approach		580	2.0	0.839	61.6	LOS E	16.1	114.6	0.97	0.90	1.15	29.4
NorthWest: Epping Road												
7	L2	530	2.0	0.344	6.4	LOS A	3.6	25.4	0.20	0.61	0.20	53.5
8	T1	1217	2.0	0.652	14.3	LOS A	28.6	203.4	0.64	0.58	0.64	48.6
Approach		1747	2.0	0.652	11.9	LOS A	28.6	203.4	0.50	0.59	0.50	50.0
SouthWest:												
10	L2	12	2.0	0.157	68.6	LOS E	0.7	5.2	0.99	0.68	0.99	20.0
Approach		12	2.0	0.157	68.6	LOS E	0.7	5.2	0.99	0.68	0.99	20.0
All Vehicles		4392	2.0	0.839	21.4	LOS B	43.7	311.2	0.70	0.70	0.73	44.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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 is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

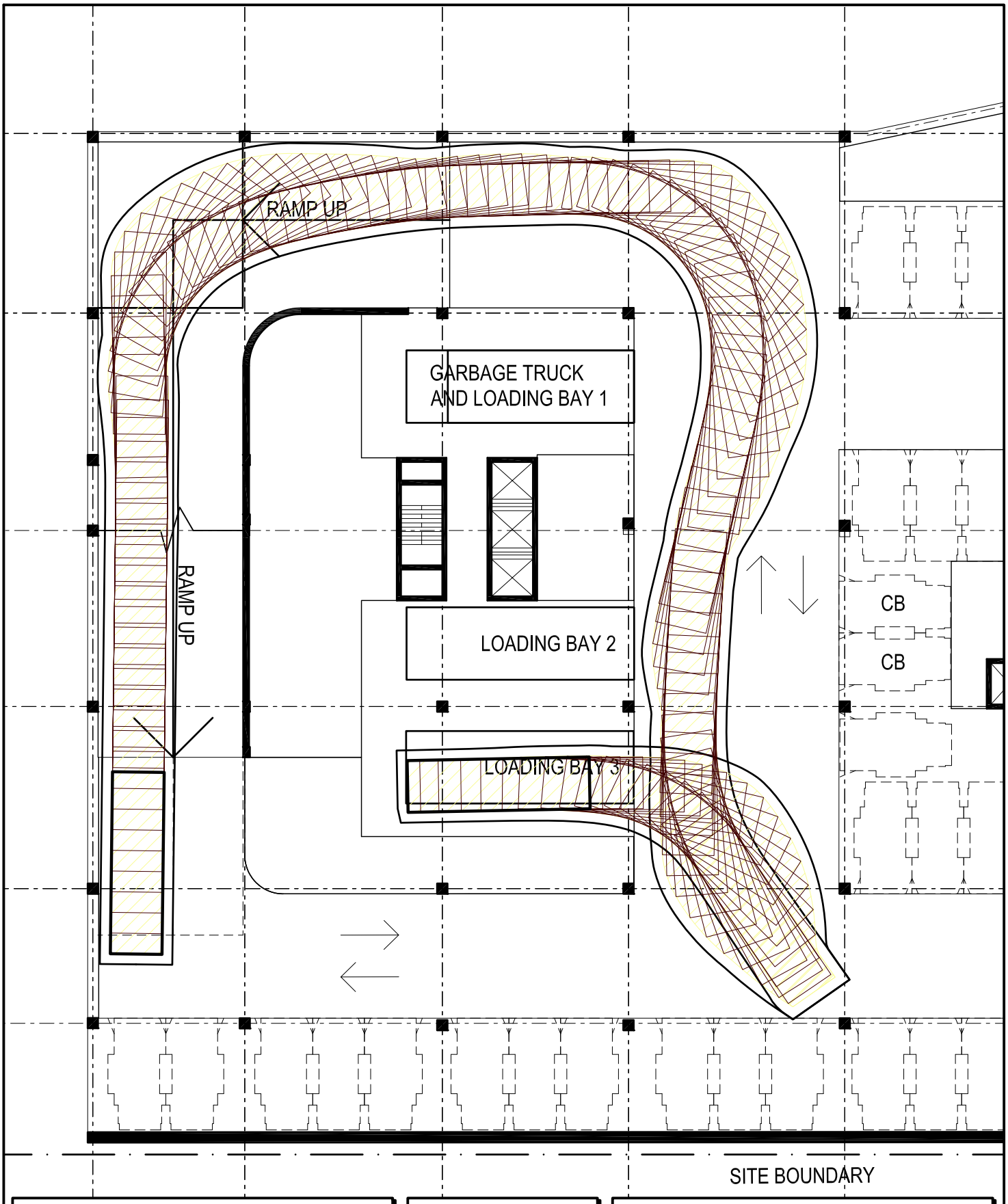
Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	SouthEast Full Crossing	53	54.3	LOS E	0.2	0.2	0.95	0.95
P2	NorthEast Full Crossing	53	54.3	LOS E	0.2	0.2	0.95	0.95
P4	SouthWest Full Crossing	53	54.3	LOS E	0.2	0.2	0.95	0.95
All Pedestrians		158	54.3	LOS E			0.95	0.95

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

Appendix D

Swept Path Analyses



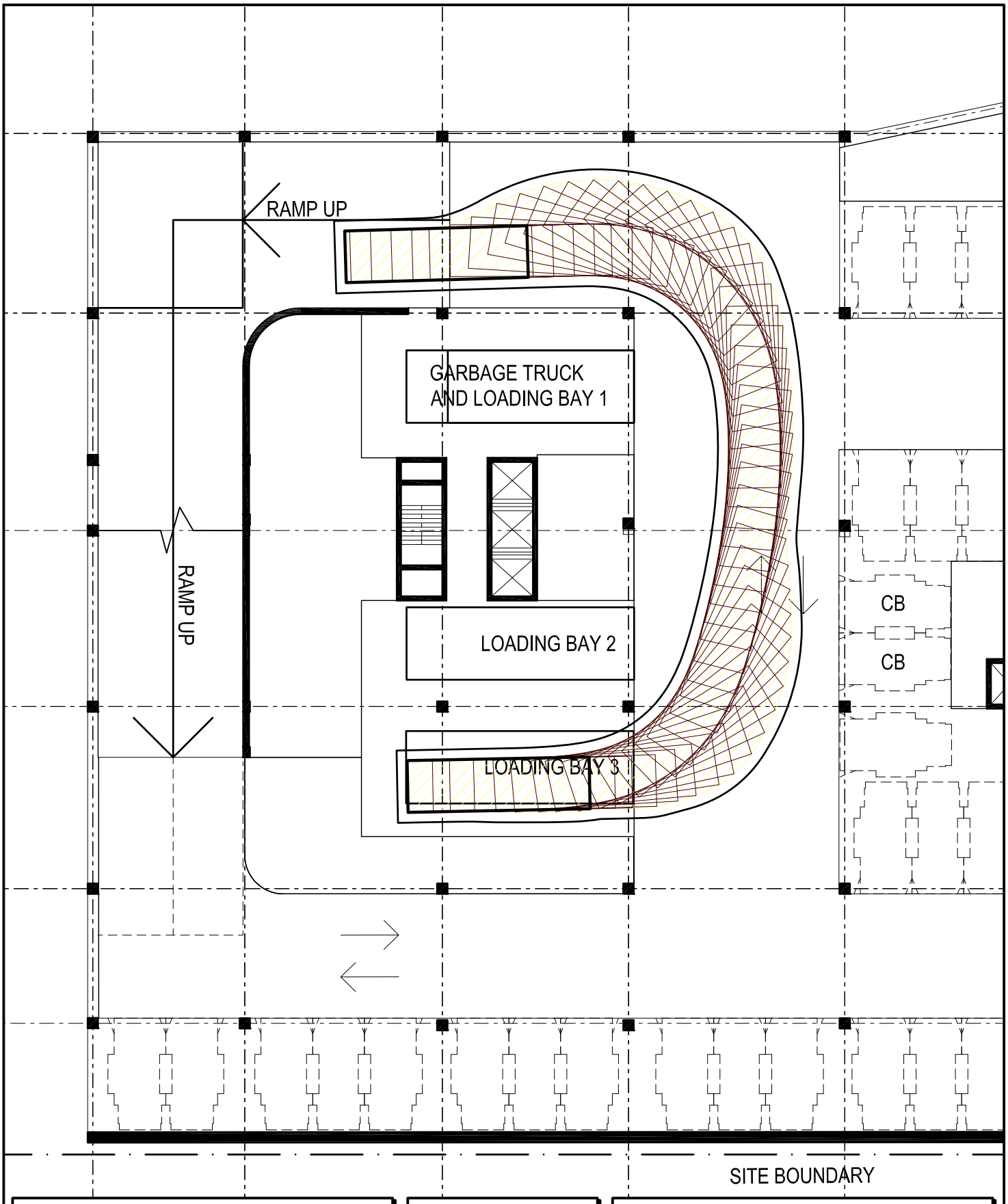
LEGEND

This drawing has been prepared using vehicle modelling computer software AutoTrack V5.00a in conjunction with AutoCAD 2013. The vehicle used is based upon vehicle data provided by Austroads and incorporates a reasonable degree of tolerance. However, it is not possible to account for all vehicle types/characteristics and/or driver ability.

N

SWEPT PATH ANALYSIS OF AN 8.8m RIGID VEHICLE ENTERING THE SITE

SP 1



LEGEND

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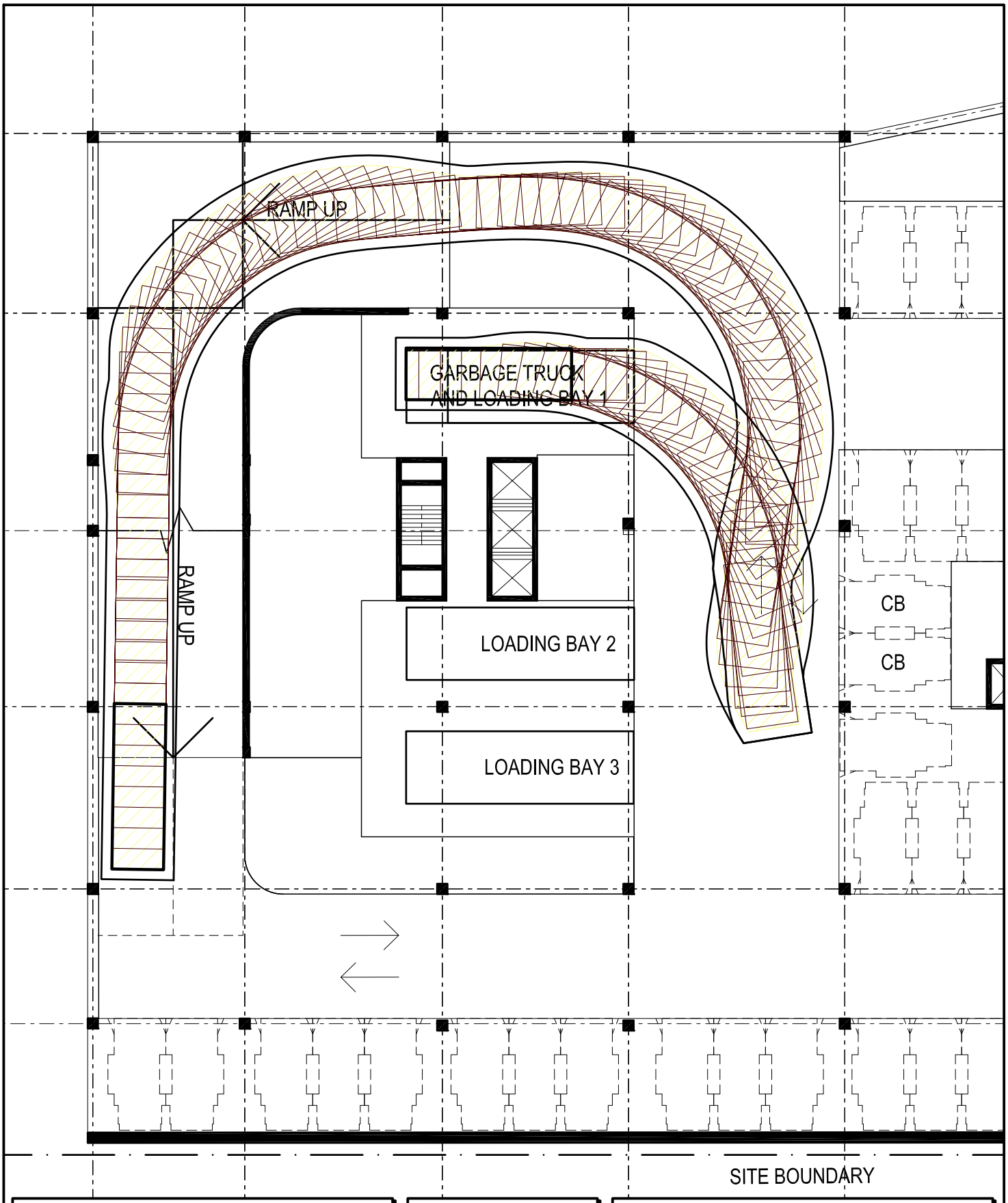
N

SWEPT PATH ANALYSIS OF AN 8.8m RIGID VEHICLE EXITING THE SITE

SP 2



LEGEND

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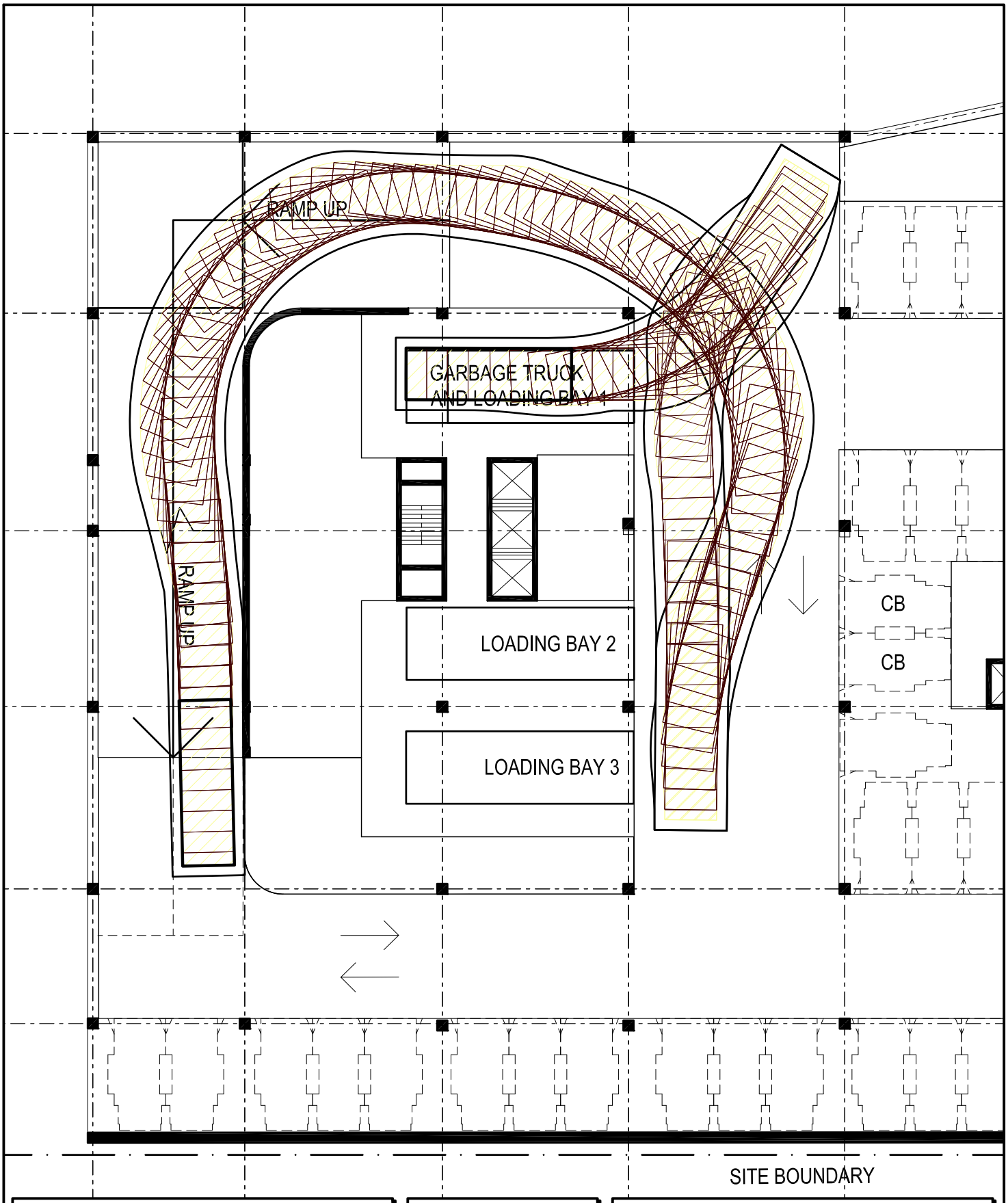
N

SWEPT PATH ANALYSIS OF AN 8.0m REFUSE VEHICLE ENTERING THE SITE

SP 3



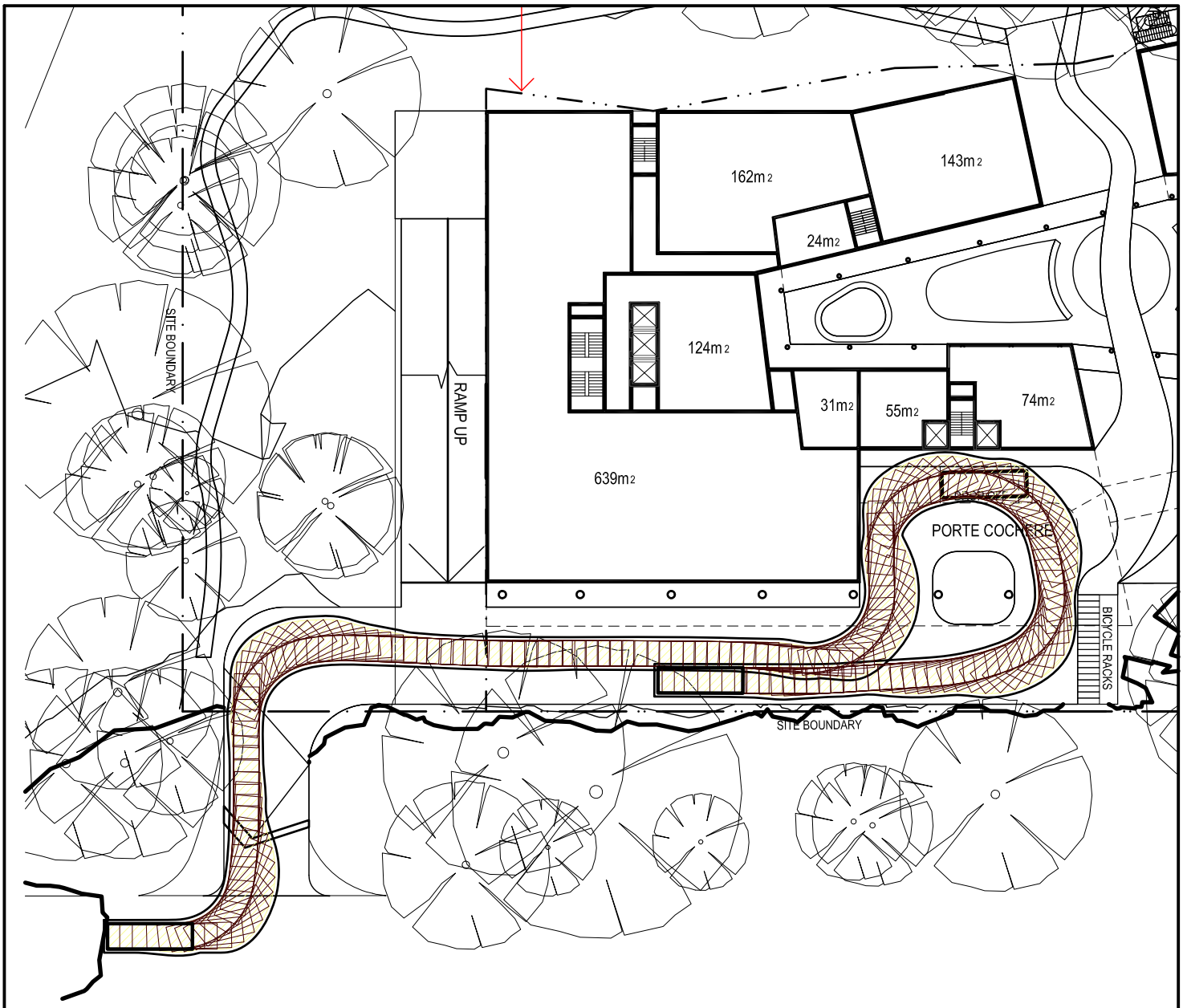
LEGEND

This drawing has been prepared using vehicle modelling computer software AutoTrack V5.00a in conjunction with AutoCAD 2013. The vehicle used is based upon vehicle data provided by Austroads and incorporates a reasonable degree of tolerance. However, it is not possible to account for all vehicle types/characteristics and/or driver ability.

N

SWEPT PATH ANALYSIS OF AN 8.0m REFUSE VEHICLE EXITING THE SITE

SP 4



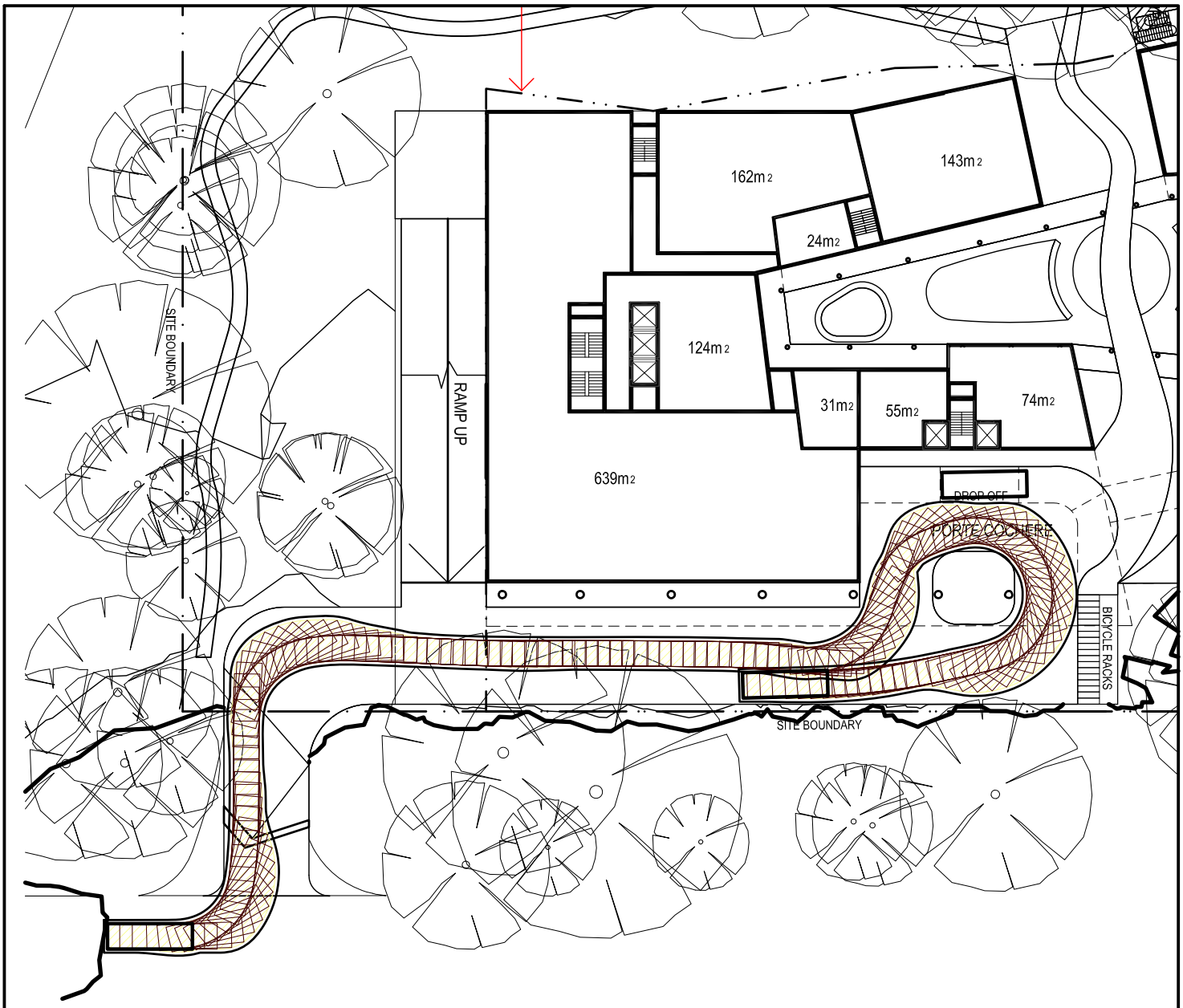
LEGEND

This drawing has been prepared using vehicle modelling computer software AutoTrack V5.00a in conjunction with AutoCAD 2013. The vehicle used is based upon vehicle data provided by Austroads and incorporates a reasonable degree of tolerance. However, it is not possible to account for all vehicle types/characteristics and/or driver ability.

N

SWEPT PATH ANALYSIS OF A 6.99m MINIBUS ENTERING AND EXITING THE SITE

SP 1



LEGEND

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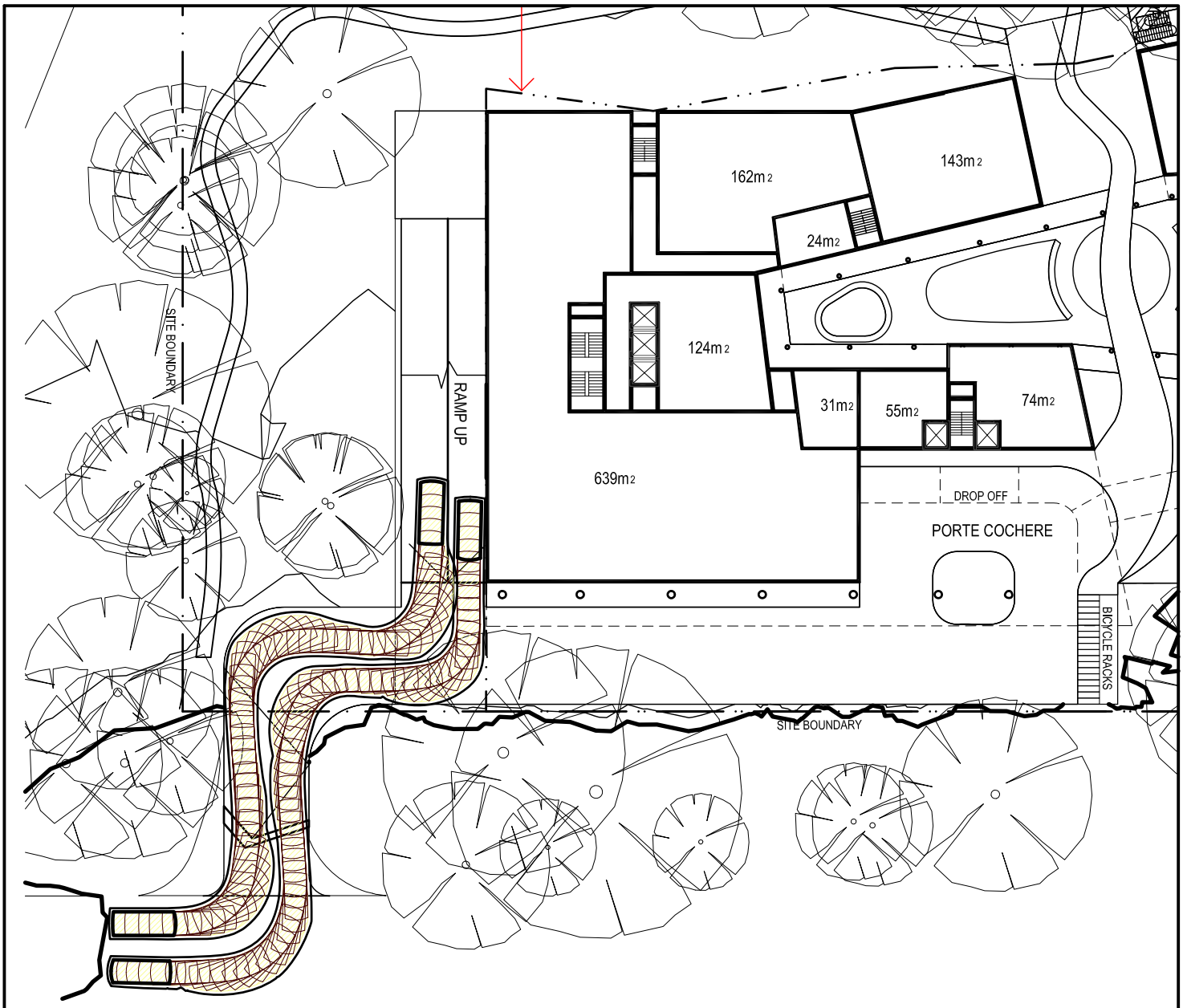
N

SWEPT PATH ANALYSIS OF A 6.99m MINIBUS ENTERING AND EXITING THE SITE PAST A STOPPED MINIBUS

SP 2



LEGEND

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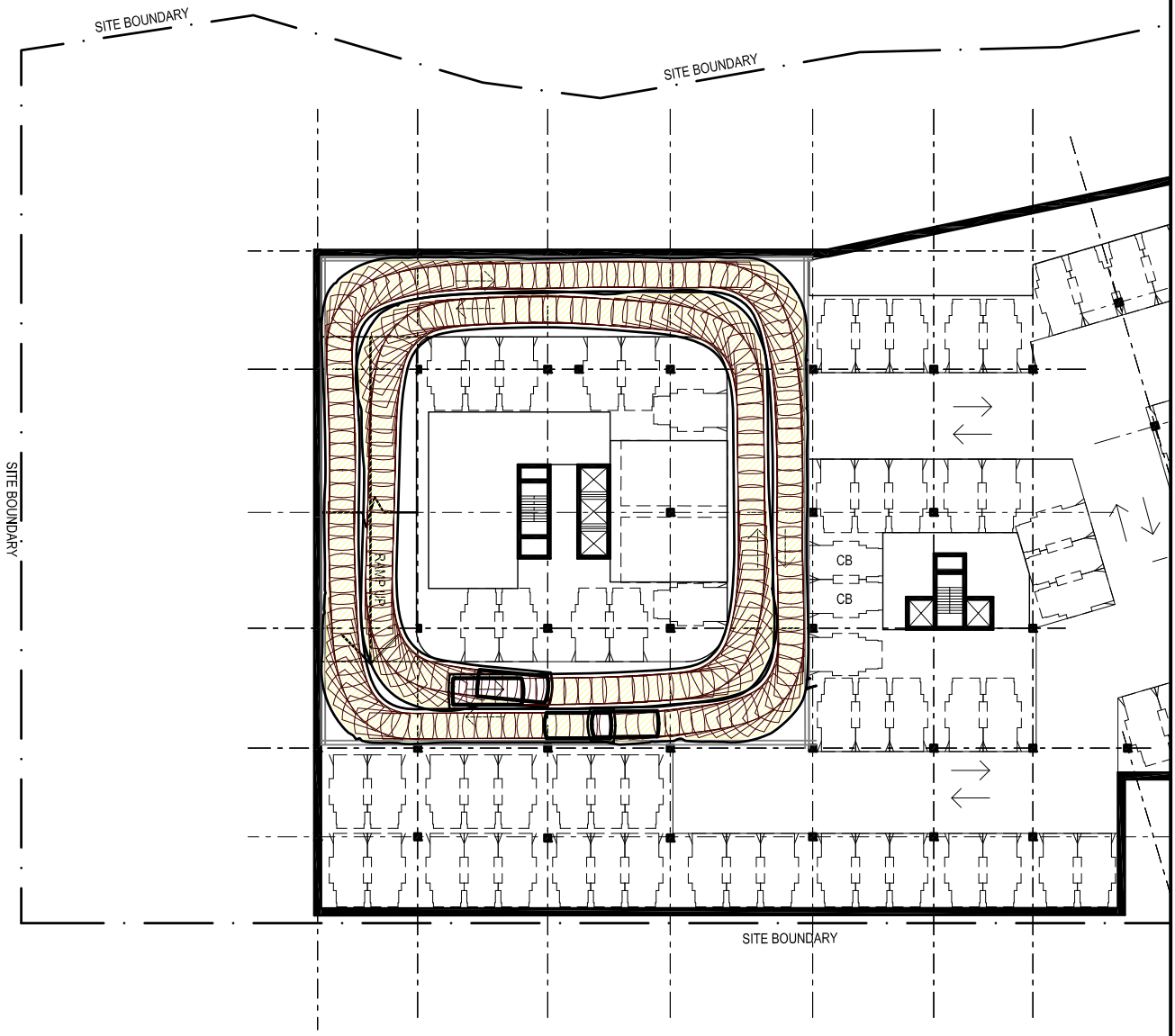
N

SWEPT PATH ANALYSIS OF A 99th AND AN 85th PERCENTILE VEHICLE PASSING

SP 3



LEGEND

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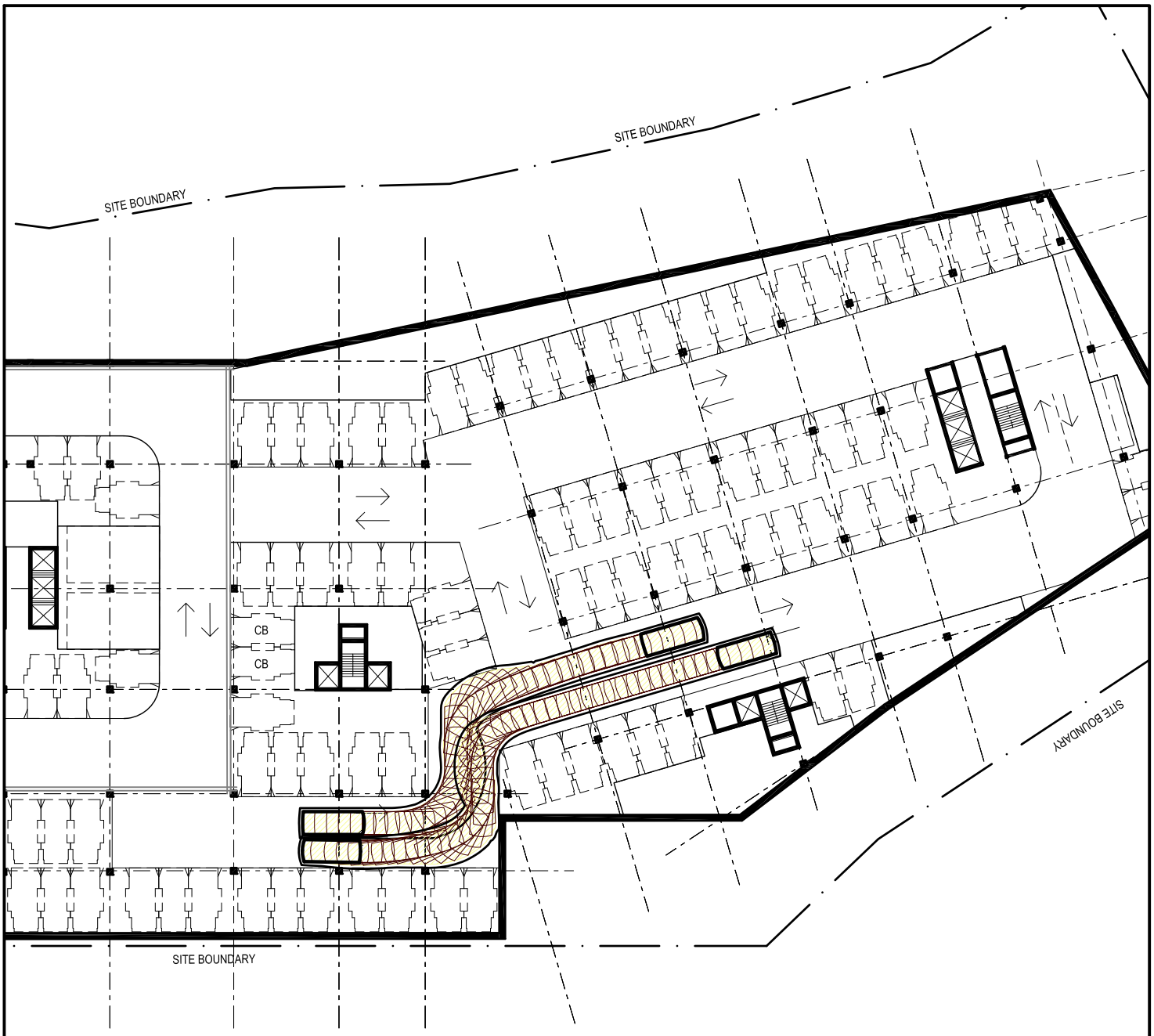
SWEPT PATH ANALYSIS OF A 99th AND AN 85th PERCENTILE VEHICLE PASSING

SP 4



LEGEND

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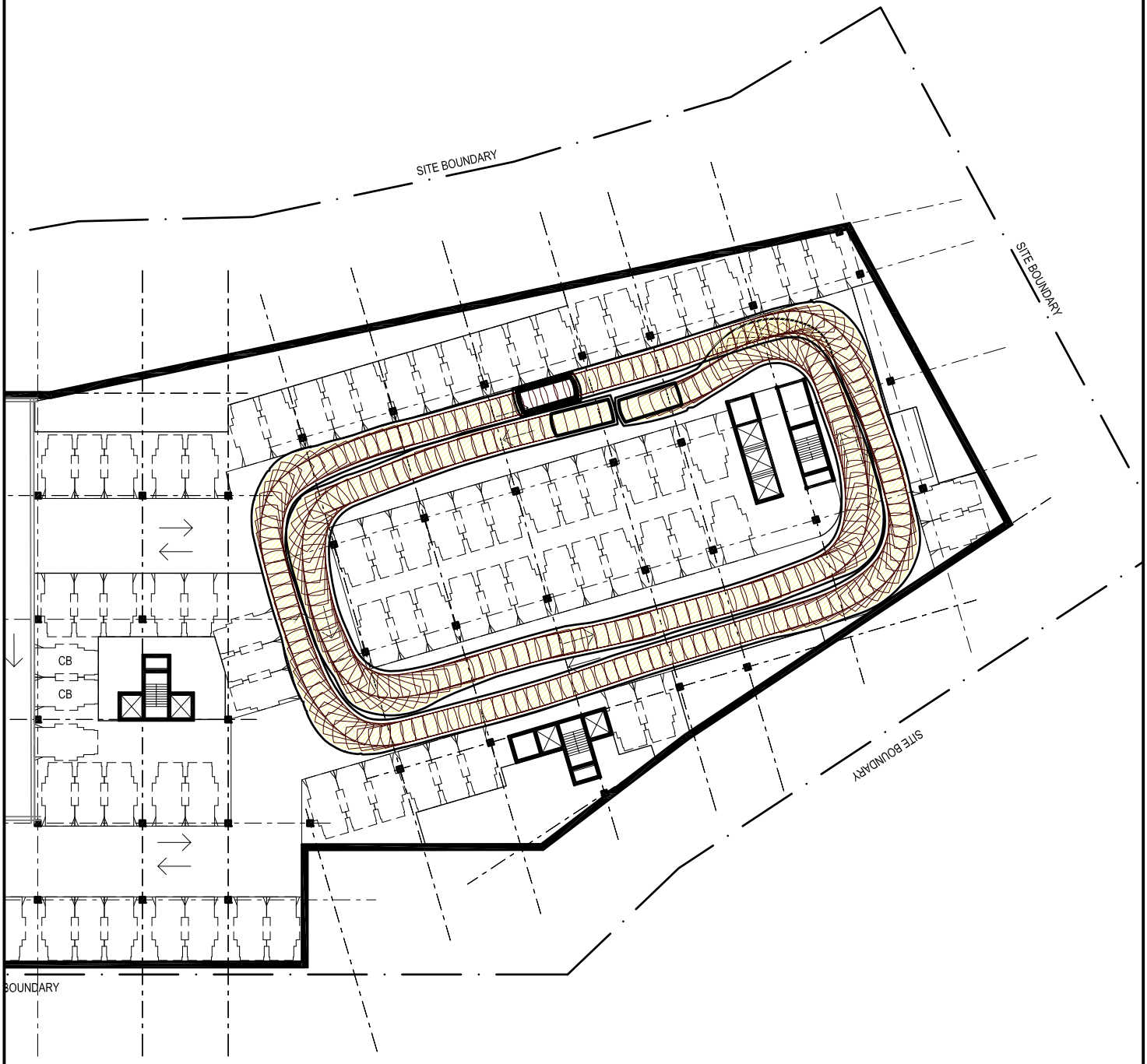
N

SWEPT PATH ANALYSIS OF A 99th AND AN 85th PERCENTILE VEHICLE PASSING

SP 5



LEGEND

This drawing has been prepared using vehicle modelling computer software AutoTrack V5.00a in conjunction with AutoCAD 2013. The vehicle used is based upon vehicle data provided by Austroads and incorporates a reasonable degree of tolerance. However, it is not possible to account for all vehicle types/characteristics and/or driver ability.

N

SWEPT PATH ANALYSIS OF A 99th AND AN 85th PERCENTILE VEHICLE PASSING

SP 6


ttpa