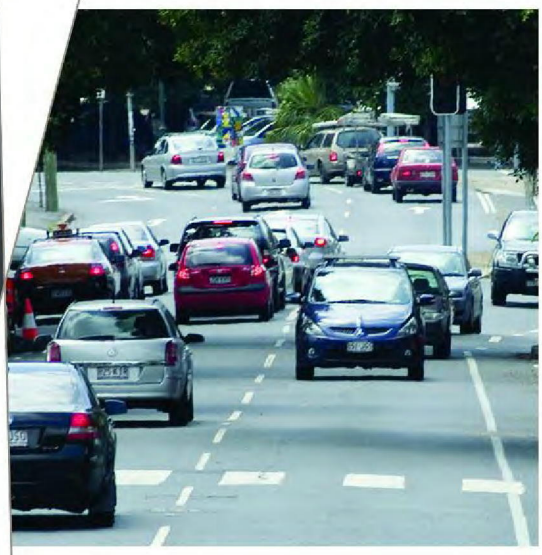
Appendix C
Traffic Impact Assessment

Traffic Impact Assessment

Chatswood Mixed Use Development

80818097



Prepared for
Reyhoda Pty Ltd

2 November 2020

Cardno

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1	15/12/2017	Draft (Internal Review)	Nabil Rahman	Hayden Calvey
2	16/12/2017	Final (Client Issue)	Nabil Rahman	Ghaith Farfour
3	24/09/2020	Final (Updated Development Plan)	Sabal Sharma	
4	28/09/2020	Final (Updates after Client Comments)	Sabal Sharma	
5	29/10/2020	Final(Updates after Council Comments	Sabal Sharma	
6	02/11/2020	Final	Sabal Sharma	

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1 Introduction

1.1 Background

Reyhoda Pty Ltd has appointed Cardno to prepare a Traffic Impact Assessment (TIA) for the proposed mixed-use development, located at the corner of Anderson St and Wilson Street, Chatswood.

This TIA has been undertaken to demonstrate the compliance of the development with relevant standards and Council controls and to review the basement parking, and access/egress for the mixed-use development.

This TIA has been prepared in accordance with the requirements of the RTA Guide to Traffic Generating development V2.2.

1.2 Scope of Work

The following works have been undertaken as part of this TIA:

- Summarise the existing land use, traffic and transport conditions in the vicinity of the development;
- Detail the traffic types and volumes likely to be generated by the development;
- Undertake traffic intersection surveys for Anderson Street/Wilson Street Intersection
- Undertake capacity analysis and modelling using SIDRA 7.0 software for the subject intersection representing the following scenarios;
  - 2017 Baseline conditions
  - 2017 Baseline plus subject development
  - 2027 Baseline (With growth rates)
  - 2027 Baseline plus subject development (With growth rates)
- Assess car park provision and design in accordance with relevant standards and policies. This includes:
  - Assessment of parking provisions against relevant DCP and / or RMS rates;
  - Assessment of compliance with AS2890 standards in respect to parking dimensions, ramp grades, sight lines, aisle widths, vertical clearance, bicycle parking, disabled parking;
  - Assessment of service vehicle, removal truck, waste truck access and loading provision as necessary;
- Assess site access suitability and visibility requirements in line with Australian Standards;
- Review of existing and future proposed transport services in the vicinity of the subject site; and
- Assess pedestrian and cyclist facilities with relevance to the subject site.

1.3 Reference Documents

The following documents have been reviewed and referenced in the preparation of this report:

- AS2890 (Australian/NZ Standards, 2004)
- Guide to Traffic Generating Developments (RTA, 2002);
- Guide to Traffic Generating Developments – Updated Traffic Surveys (RMS, TDT 2013/04a)
- Willoughby Development Control Plan (Willoughby City Council, 2006)

2 Existing Conditions

2.1 Site Location

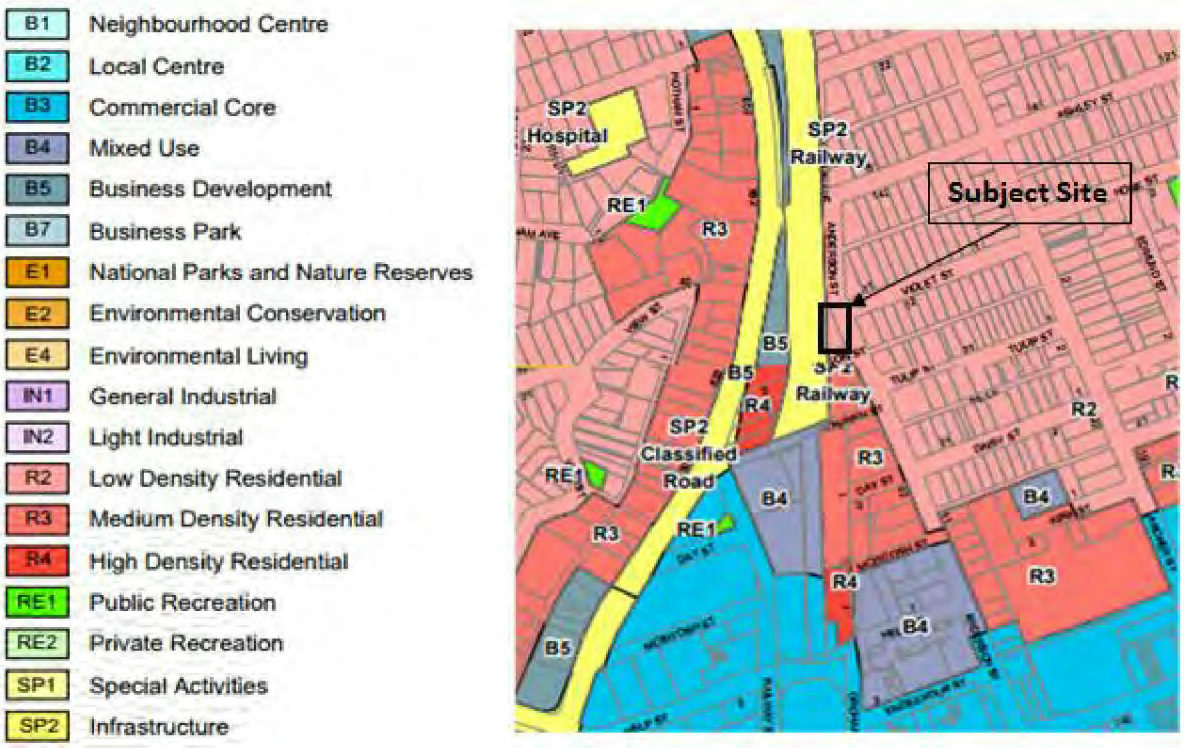
The proposed development is located at the corner of the Wilson Street and Anderson Street intersection, as shown in **Figure 2-1**. The site is currently occupied by has a single low density residential dwelling.

Figure 2-1 Development Location

2.2 Surrounding Land Use

As per the Willoughby Local Environmental Plan 2012 (LEP 2012), The site and lots surrounding the site currently consist mainly of R2 low density and R3 medium density residential lots, with Westfield and Chatswood commercial centre surrounding Chatswood train station. This is shown in **Figure 2-2**.

Figure 2-2 Surrounding Land Use



2.3 Existing Road Network

The existing road network surrounding the mixed use development consists of:

> **Anderson Street**

Anderson Street is a local, unclassified road under the care and maintenance of the local council, linking between Ashley Street and Victoria Avenue. The road is configured as a two lane undivided carriageway (one lane in each direction). Unrestricted kerbside parking is generally available along both sides of the road between Ashley Street and Victoria Avenue.

> **Wilson Street**

Wilson Street is a local, unclassified road under the care and maintenance of the local council, linking between Anderson Street and Pacific Highway. The road is configured as a two lane undivided carriageway (one lane in each direction). Unrestricted kerbside parking is generally available along both sides of the road between Anderson Street and Pacific Highway.

2.4 Traffic Surveys

An indication of the existing traffic volumes in the vicinity of the subject site is provided by peak hour traffic surveys undertaken by Traffic Information Specialist (TIS), on Thursday 7 December 2017 at the following locations:

2.4.1 Existing Traffic Volumes

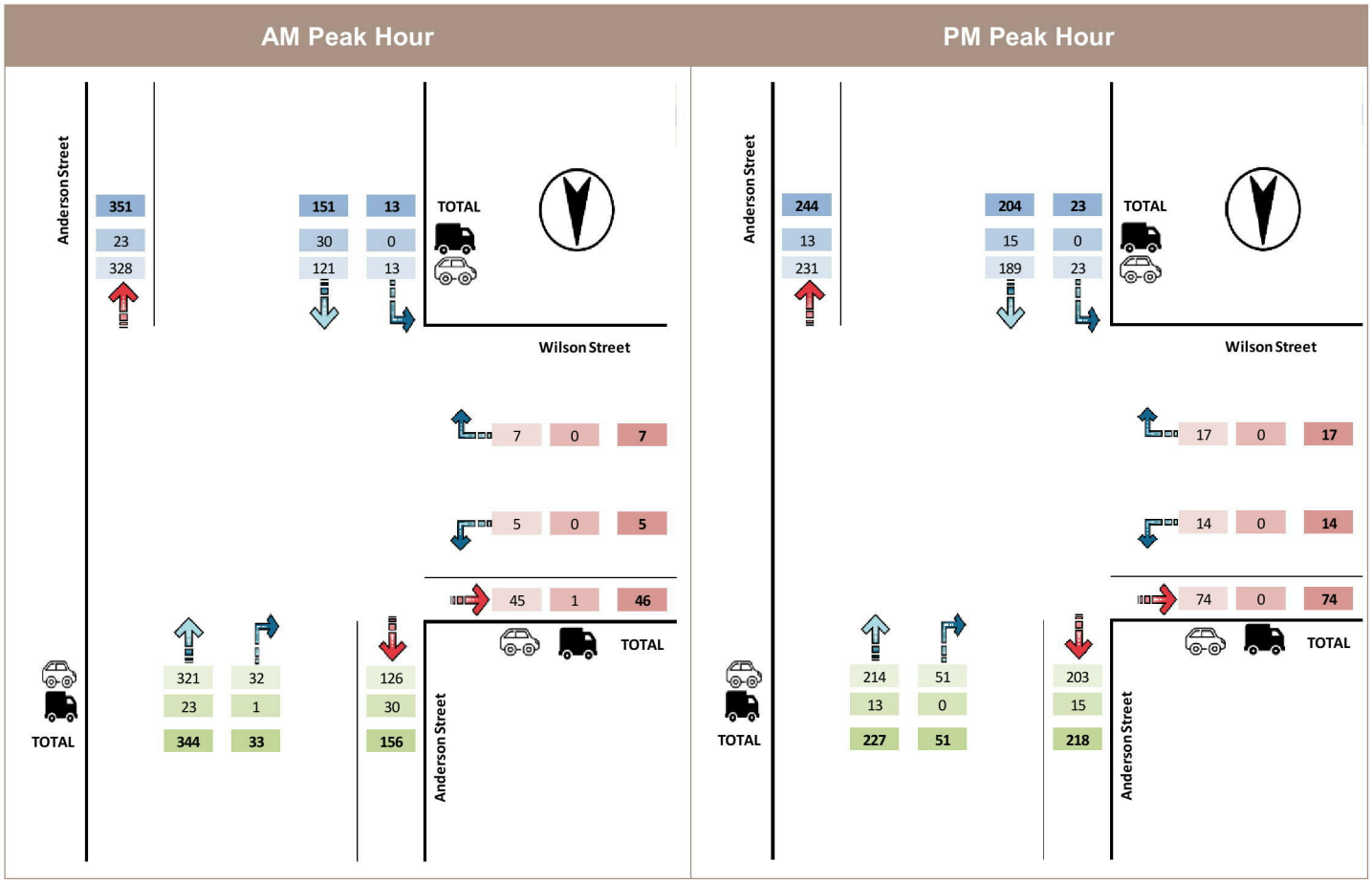
Based on the traffic surveys, peak hours were determined to be the following:

> AM Peak Hour: 07:30 to 08:30

> PM Peak Hour: 17:00 to 18:00

The full results of the traffic surveys are provided in **Appendix A** and summarised in **Table 2-1**.

Table 2-1 Peak Hour Volumes



Traffic volumes within the study area are summarised in **Table 2-2** below.

Table 2-2 Two-way Traffic Volumes

Road	Weekday AM (veh/hr)	Weekday PM (veh/hr)
Anderson Street	495	431
Wilson Street	58	105

The traffic volumes along Anderson Street remained relatively consistent across the two separate peak hours, however, Wilson Street peak hour volumes doubled from AM peak hour to PM peak hour.

2.5 Existing Public Transport

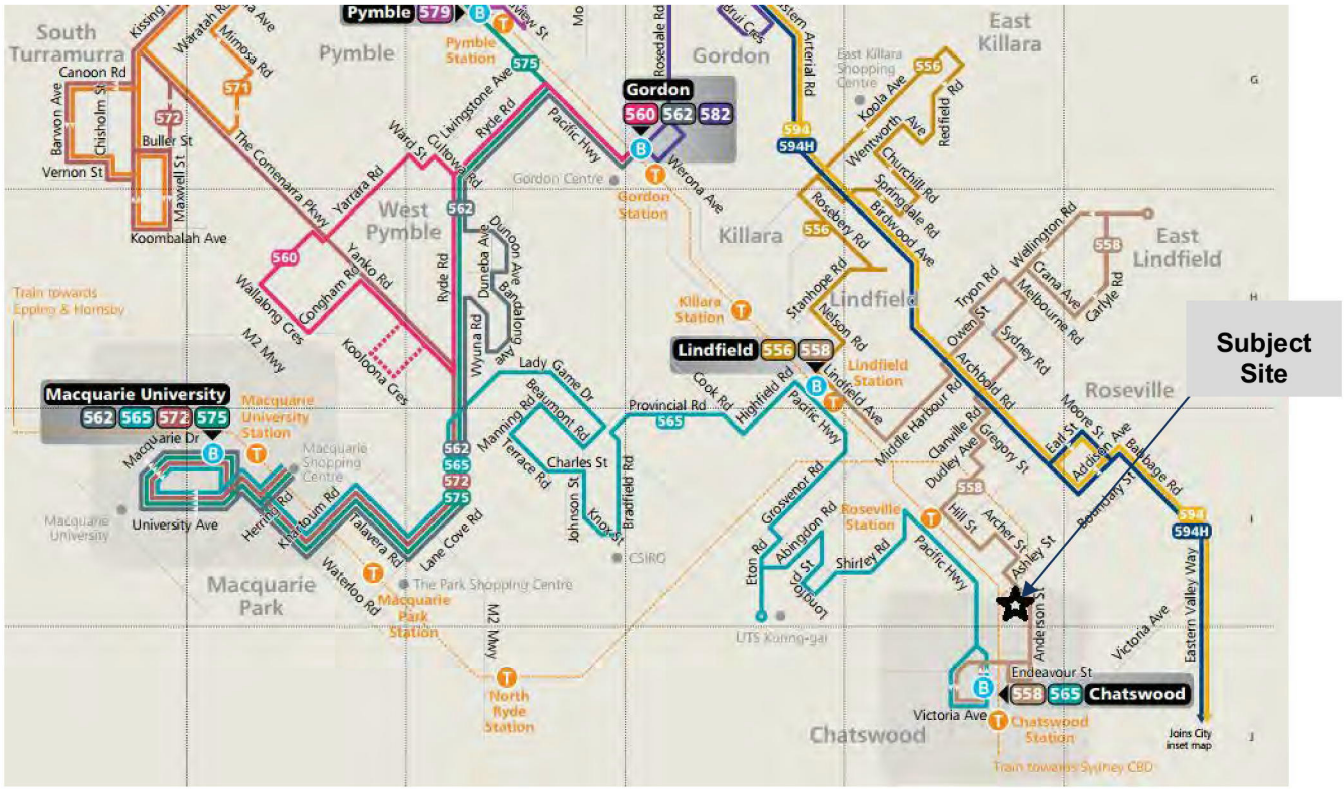
The proposed location of the subject site is currently well served by public transport services as it is located within 600 metres walk from Chatswood Station, which is on the North Shore Line services. This service typically operates at a frequency of less than 10 minutes during commuter peak periods and 15 minute intervals at other times including Saturdays and Sundays. The location of the development relative to the Chatswood Rail Station is shown in **Figure 2-3.**

In addition to train services, a bus route currently operates in the vicinity of the development including:

> Route 558 – Chatswood to Lindfield via Chatswood, Roseville and East Lindfield

On the above basis, the proposed development site is conveniently located to take advantage of the connectivity of existing public transport services and encourage the greater use of sustainable modes of transport, therefore reducing reliance on private vehicles.

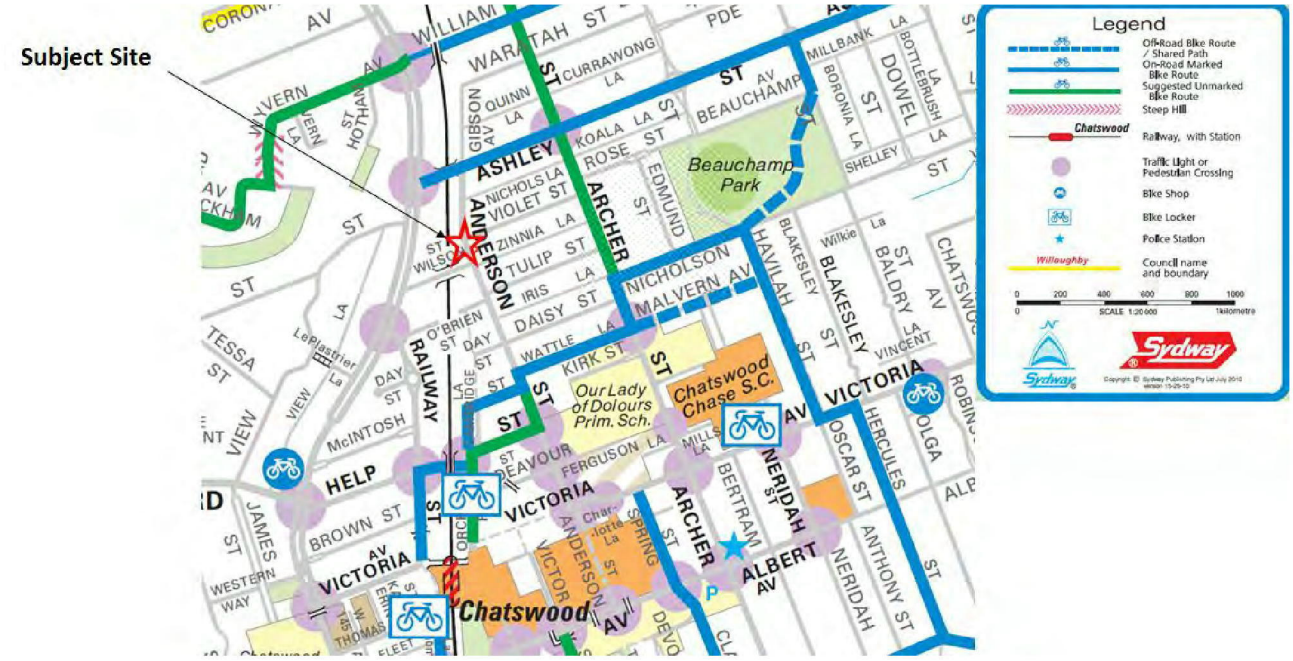
Figure 2-3 Public Transport Network Map



2.6 Cycle Network

The proposed development is to comply with the overall objectives of the cycling network in accordance with the *Willoughby Development Control Plan 2006.* The Willoughby bike plan, as shown in **Figure 2-4**, provides a plan to meet Council's aims of increasing cycling, reducing the impact of private motor vehicles on the region and promoting greater levels of community health.

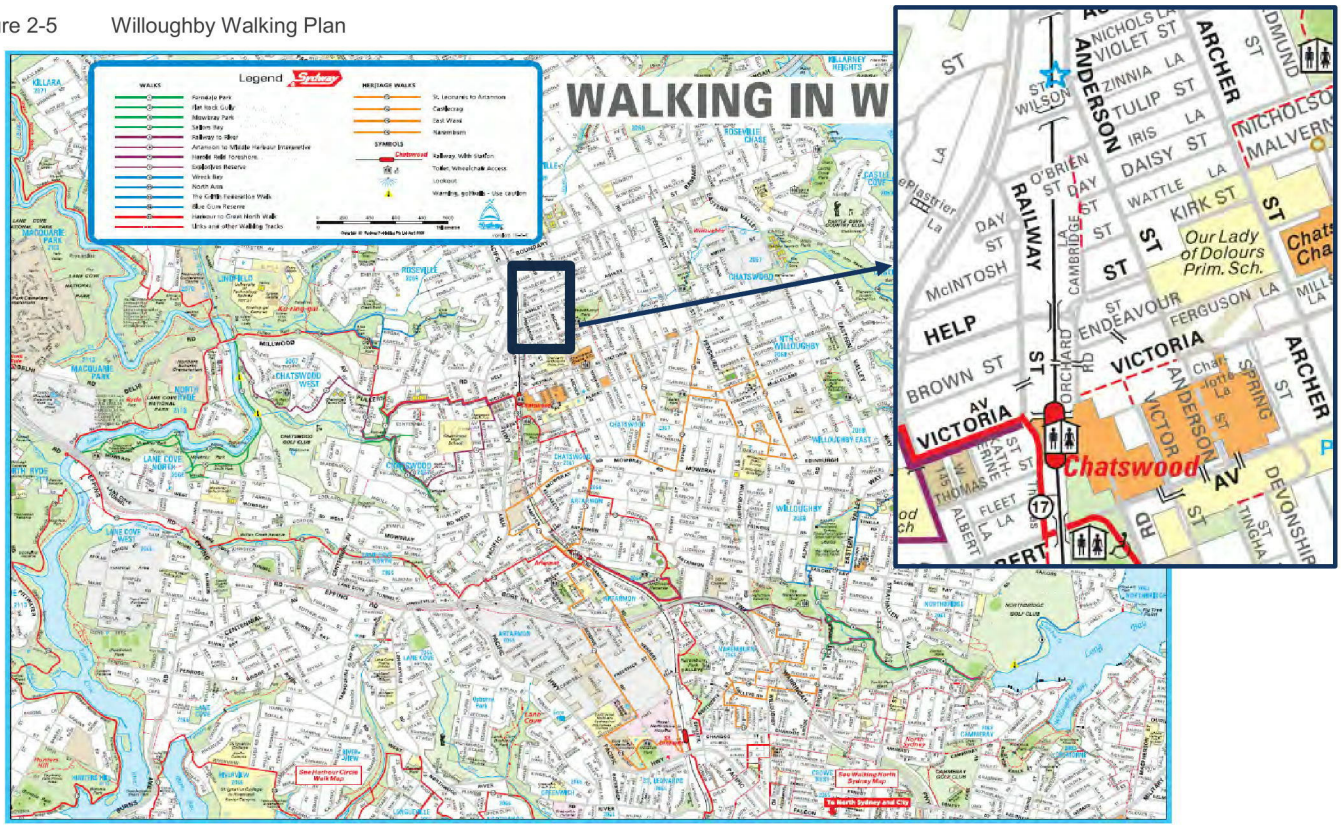
Figure 2-4 Willoughby Bike Plan



2.7 Pedestrian

The proposed development is to comply with the overall objectives of the Pedestrian network in accordance with the *Willoughby Development Control Plan 2006.* The Willoughby walking plan, as shown in **Figure 2-5**, provides a plan to meet Council's aims of increasing cycling, reducing the impact of private motor vehicles on the region and promoting greater levels of community health.

Figure 2-5 Willoughby Walking Plan



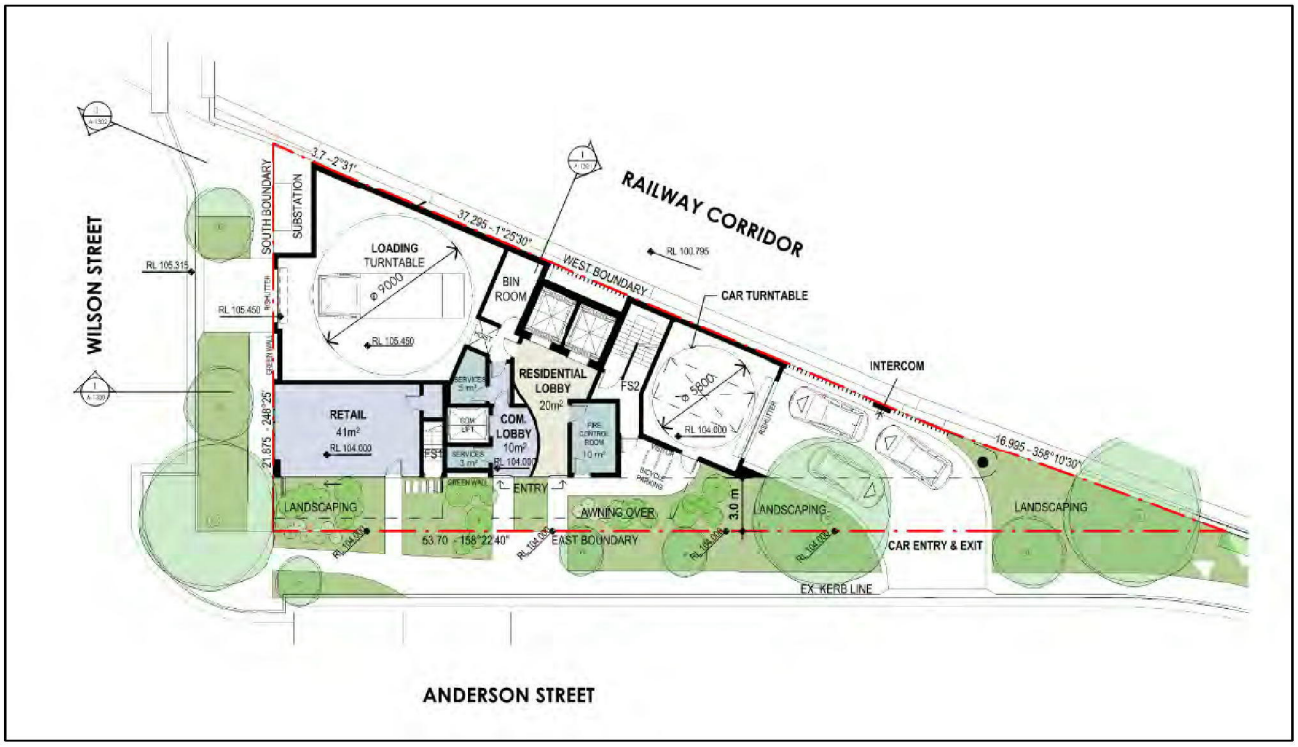
3 Development Proposal

The proposed development seeks to develop the site to accommodate 15 apartments, 45m² GFA of Retail and 505m² GFA of commercial.

Vehicular access into and out of the proposed development will be provided via Wilson Street and Anderson Street.

The general arrangement of the proposed precinct layout is illustrated in **Figure 3-1**. A larger version of the layout is provided in **Appendix B**.

Figure 3-1 Proposed precinct layout



3.2 Access Suitability

Given the site's constraints, it is recommended that the car parking access from Anderson Street be configured to a left in left out only. Although the left in left out configuration is not strictly required by the Australian Standard, it is recommended that the driveway be restricted to left in / left-out movements based on its located opposite the public intersection (Anderson Street / Violet Street).

4 Traffic Assessment

4.1 Development Traffic Generation

An indication of the traffic generation potential of the proposed development is sourced from the Roads and Maritime Technical Direction (TDT 2013/04a), which nominates the following traffic generation rates applicable to the proposed development (based on the Chatswood survey site assessed by the RMS). The retail generation rate is based on the RMS Guide.

- High Density Residential – Sydney Metropolitan Area
  - AM Peak: 0.14 peak hour vehicle trips per unit
  - PM Peak: 0.12 peak hour vehicle trips per unit
- Commercial
  - AM Peak: 1.03 peak hour vehicle trips per 100m² GFA
  - PM Peak: 0.84 peak hour vehicle trips per 100m² GFA
- Retail
  - 46 vehicle trips per 1000m²

Table 4-1 Traffic Generation Estimate

Land Use	Quantity	Traffic Generation	
		AM Peak	PM Peak
Residential	15 Apartments	2	2
Commercial	505 m² GFA	5	4
Retail	45 m² GFA		2
Total	-	7	8

Based on the development, the site is estimated to generate 7 trips during the AM peak hour, 8 trips during the PM peak hour, as set out in **Table 4-1**.

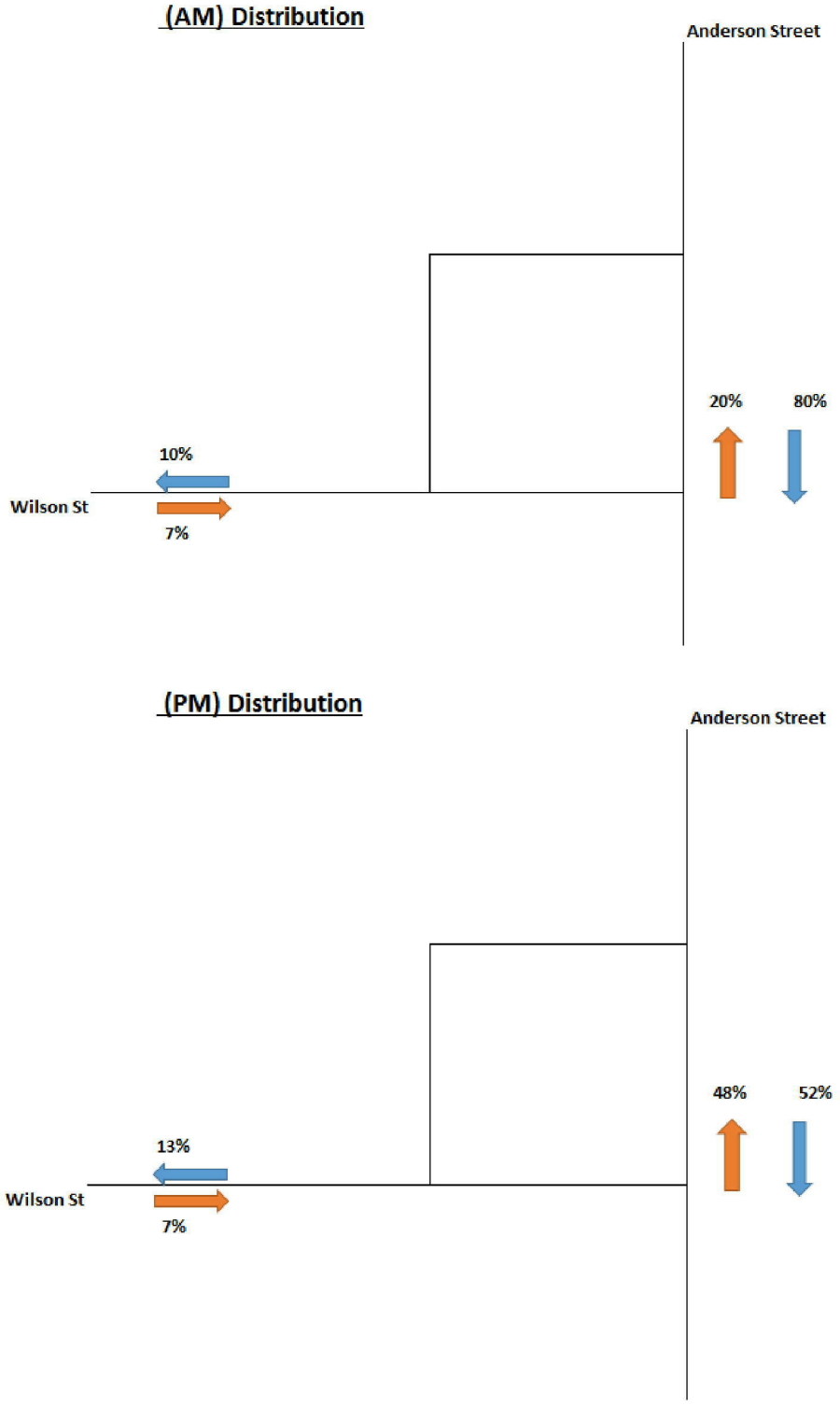
4.2 Traffic Assignment

The directional distribution and assignment of traffic generated by the proposed development will be influenced by a number of factors, including the:

- Configuration of the adjoining road network in the vicinity of the site;
- Existing operation of intersections providing access around the adjoining road network;
- Distribution of households in the vicinity of the site;
- Surrounding employment centres, retail centres and schools in relation to the site;
- Likely distribution of employee's residences in relation to the site, and
- Configuration of the access arrangement to the site.

The ratio of the inbound and outbound traffic movements is assumed to be 20:80 in the AM peak hour and 70:30 in the PM peak hour.

Figure 4-1 Trip Distribution and Assignment

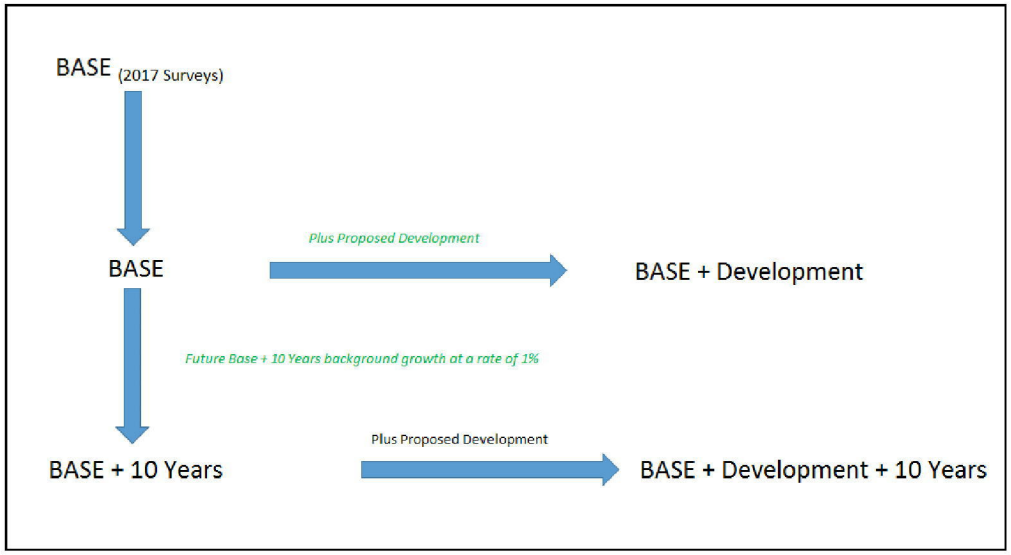


4.3 Base and Future Base Year Scenarios

The traffic surveys undertaken in 2017 were adopted as the base year traffic volumes and were used to estimate opening year and horizon year traffic volumes by applying a linear growth rate of 1% per annum, in accordance with RMS Traffic Volume Viewer (count station 33026).

On the above basis, the assessment scenarios are illustrated in **Figure 4-2**

Figure 4-2 Assessment scenarios



4.4 Key Intersections Operations and Performance

The existing intersection operation performance was assessed using the SIDRA Intersection 7.0 software package. The key indicator of intersection performance is typically the Level of Service (LoS), where results are placed on a scale from 'A' to 'F', outlined in **Table 4-2**.

Table 4-2 Level of Service Criteria for Intersections

Level of Service	Average Delay per Vehicle (sec/veh)	Traffic Signals, Roundabout	Giveway & Stop Signs
A	< 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 & accident study required
E	57 to 70	At Capacity, at signals incidents will cause excessive delays Roundabouts require other control mode	At capacity, requires other control mode
F	> 70	Unsatisfactory and requires additional capacity.	Unsatisfactory and requires additional capacity.

Source: Guide to Traffic Generating Developments (RMS, 2002)

The Average Vehicle Delay (AVD) provides a measure of the operational performance of an intersection and determines the LoS when applying the RMS method. It should be noted that the AVD's should be taken as a guide only as longer delays could be tolerated in some locations (i.e. inner city conditions) and on some roads (i.e. minor side street intersecting with a major arterial route). For traffic signals, the weighted average delay over all movements should be utilised. For roundabouts and priority control intersections (sign control) the critical movement for assessing LoS should be the movement with the highest average delay.

The Degree of Saturation (DoS) is another measure of the operational performance of individual intersections. For intersections controlled by traffic signals, both queue length and delay increase rapidly as DOS approaches 1.0. It is usual to attempt to keep DOS to less than 0.9. Degrees of Saturation in the order of 0.7 generally represent satisfactory intersection operation. When DOS exceed 0.9 queues can be anticipated.

4.4.2 Anderson Street / Wilson Street

The existing Anderson Street / Wilson Street intersection layout was modelled in SIDRA. The performance of the existing intersection layout was then assessed for the peak periods outlined in Section 2.4.1.

Figure 4-3 Anderson Street / Wilson Street

The SIDRA assessment of the Anderson Street / Wilson Street intersection for the various scenarios are summarised in **Table 4-3**, with full results attached in **Appendix E**.

Table 4-3 Anderson Street / Wilson Street Intersection SIDRA Results

Scenario	AM Peak			PM Peak		
	DoS	Delay (sec)	LoS	DoS	Delay (sec)	LoS
2017 Base	0.217	9.7	A	0.165	9.2	A
2027 Base (With Growth Rate)	0.239	10.2	A	0.182	9.7	A
2017 Base + Development	0.218	9.7	A	0.165	9.3	A
2027 Base + 10 years + Development (With Growth Rate)	0.239	10.3	A	0.182	9.7	A

The above SIDRA results indicate that the intersection will operate satisfactorily at LoS A in the AM and LoS A in the PM Peak in the future year scenarios with the additional traffic generated by the proposed development.

5 Parking Assessment

5.1 Car Parking Requirement

It should be noted that Willoughby City Council is in the process of reviewing car-parking rates in the Chatswood CBD and provided the following rates be considered for this assessment:

Office

1 space per 400 m² GFA

Retail

Less than 1000 m²: None

More than 1000 m²: 1 space per 300 m² GFA

Residential

Studio: 0.5 spaces per dwelling

1-bed: 0.5 spaces per dwelling

2+ bed: 1 space per dwelling

Visitor: 1 space per 10 dwellings

These are car-parking rates, are lower than *Willoughby Development Control Plan 2016* as Council is supportive of minimal car parking on the site.

Table 5-1 shows the number of parking required based on the rates provided by the Council.

Table 5-1 Car Parking Requirements

Land Use	Scale	Parking Requirement
Residential	12 x 2 bed	12
	3 x 4 bed	3
	Visitor Parking	2
Retail	45 m²	-
Commercial	505 m²	1
Total		**18**

The Disabled (Accessible) Parking is to be provided in accordance with Part C of Willoughby Development Control Plan 2016.

5.2 Motorcycle & Bicycle Parking Requirement

In accordance with *Willoughby Development Control Plan 2016, m*otorcycle parking must be provided at a rate of 1 motorcycle space per 25 car spaces. These spaces are to have an area of 1.2 metres x 3 metres.

Design of bicycle parking facilities is to be in accordance with the provisions of AS 2890.3. Table 5-3 shows the number of cycling parking requires for the proposed development

	Bicycle Lockers	Bicycle rail / racks	Lockers (required)	Rail / Racks (required)
Residential	1 per 10 units	1 per 12 units	2	2
Office / Business	1 per 600 m²	1 per 2500m²	1	-

Retail / Restaurant	1 per 450 m²	1 per 150m²	-	-

5.3 Car Parking Design

All car parking spaces must be provided in accordance with *Willoughby Development Control Plan 2016 and AS 2890.3,* with adequate turning area and aisle widths to ensure that all vehicles are able to move in a forward direction at all times when entering and leaving the site. Table 5-4 identifies the minimum dimension for a standard car space

Dimension of Parking Spaces	
Minimum Width	2.5 m
Minimum Length	5.4 m
Minimum Fittings	2.4 m

5.4 Service Vehicle & Loading

Garbage Collection

Loading bay dimensions must conform with the current Australian Standard 2890 – Off Street Parking, for a garbage truck to manoeuvre successfully around the loading zone. Table 5-2 identifies the minimum dimensions of a standard Medium Rigid Vehicle (MRV).

Table 5-2 Standard Medium Rigid Vehicle (MRV) Dimensions

Vehicle Class	Bay Width (Min)	Bay Length (m)	Platform Height (m)	Vertical Clearance (m)
MRV	3.5	8.8	0.95 to 1.10	4.5

Turntable

Turntable lift dimension must conform with the current Australian Standards 2890 – Off Street Parking, to allow a vehicle to obtain a favourable position when trying to manoeuvre into/ out of the parking sport.

Turning Path

A standard B85 Vehicle has been utilised for swept path analysis in AutoCAD. **Figure 5-1 and Figure 5-2** presents the swept path of the vehicle accessing the subject site from Anderson Street, and successfully entering and exiting the proposed access points in a forward motion. Details of the swept path analysis can be found in **Appendix B**.

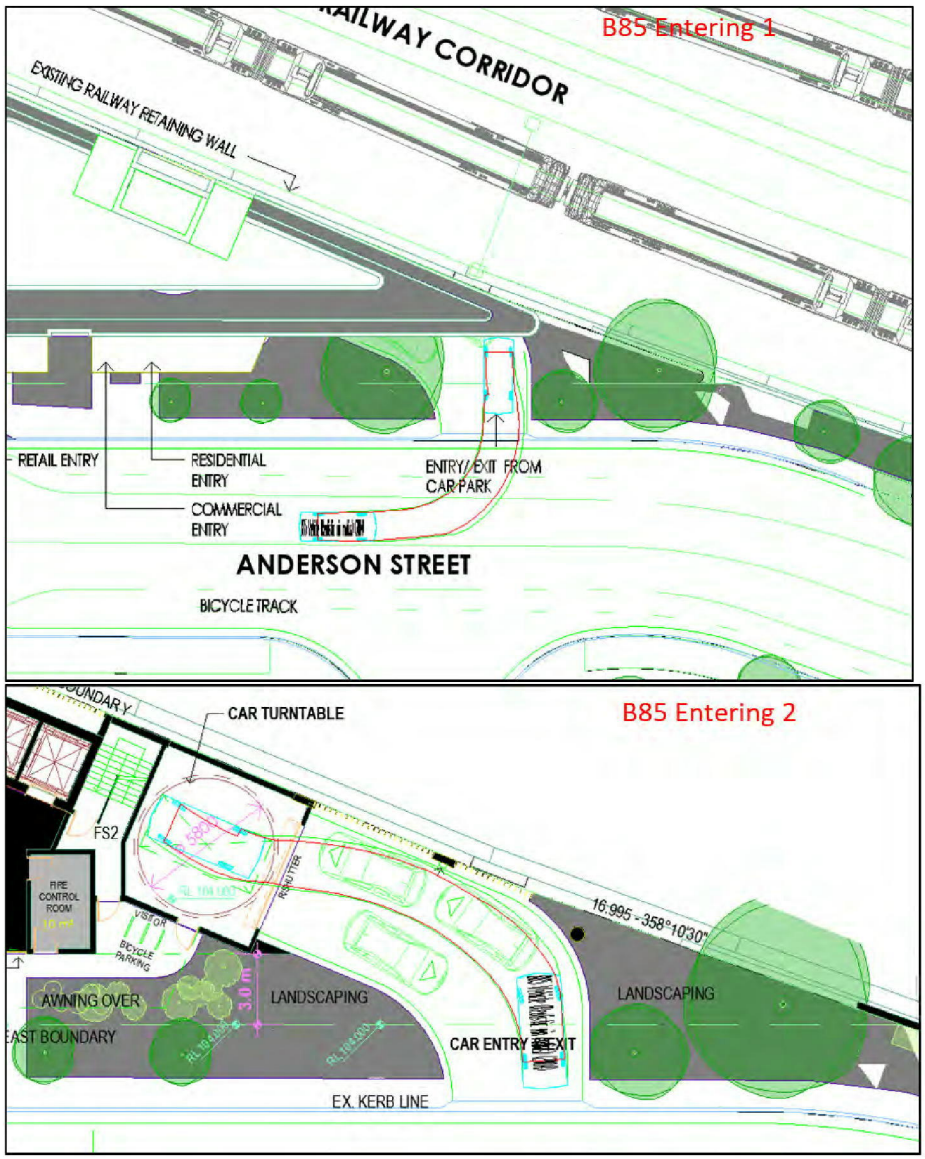


Figure 5-1 B85 entering the site-Left turn in

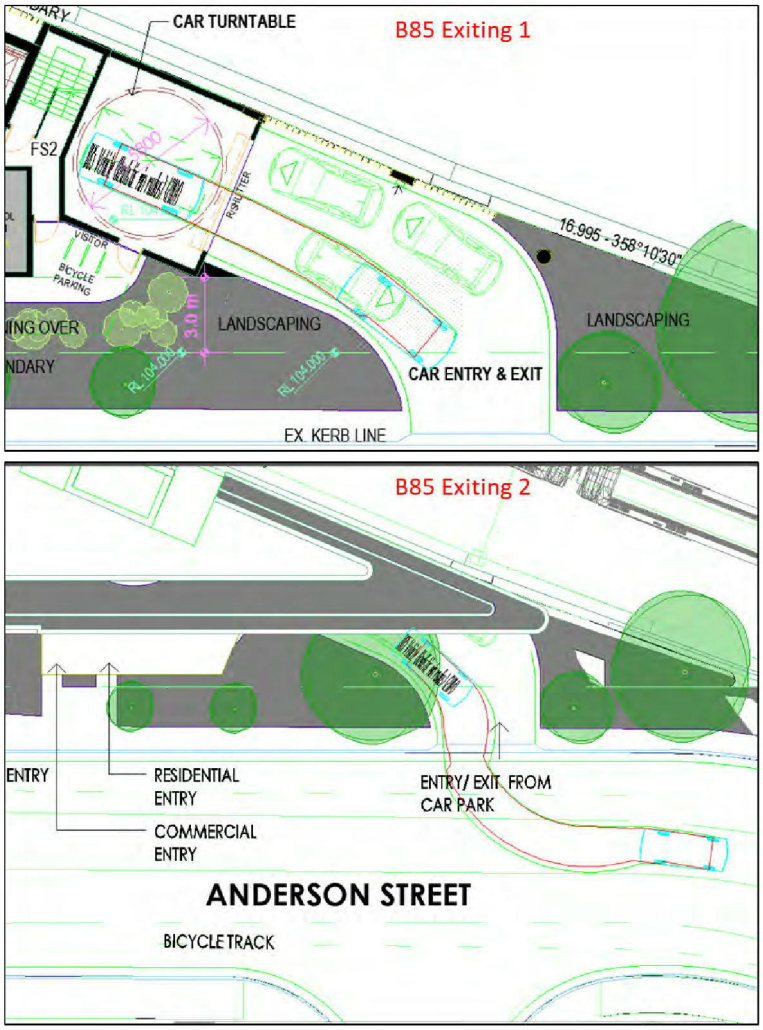


Figure 5-2 B85 exiting the site-left turn out

A standard MRV has been utilised for swept path analysis in AutoCAD. **Figure 5-3 , Figure 5-4 and Figure 5-5** presents the swept path of the vehicle accessing the subject site from Wilson Street.

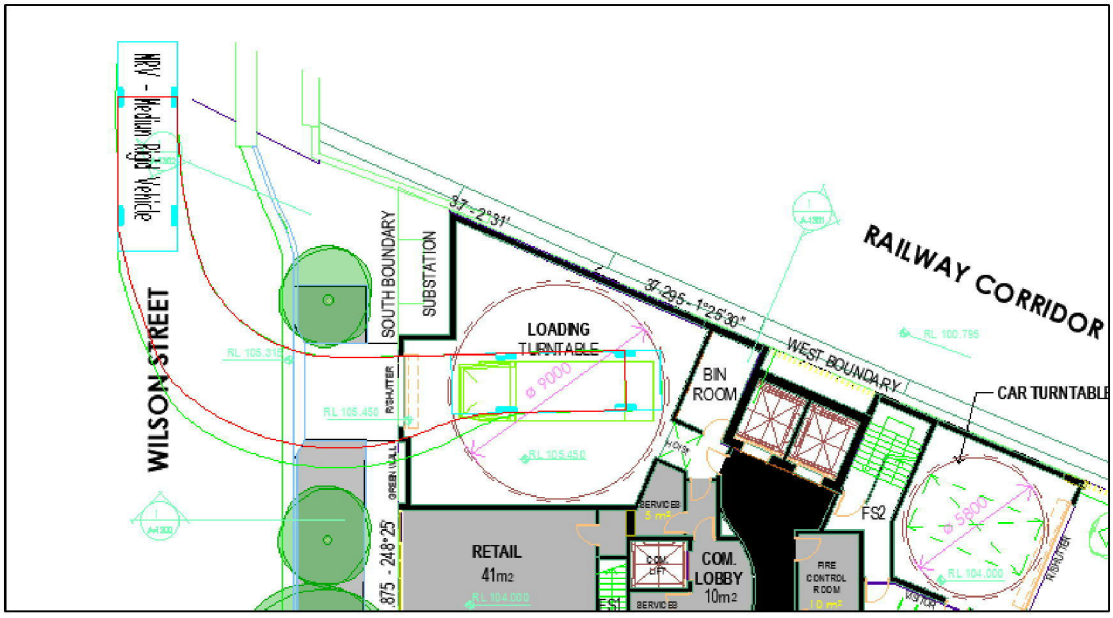


Figure 5-3 MRV entering the loading bay-Left turn in

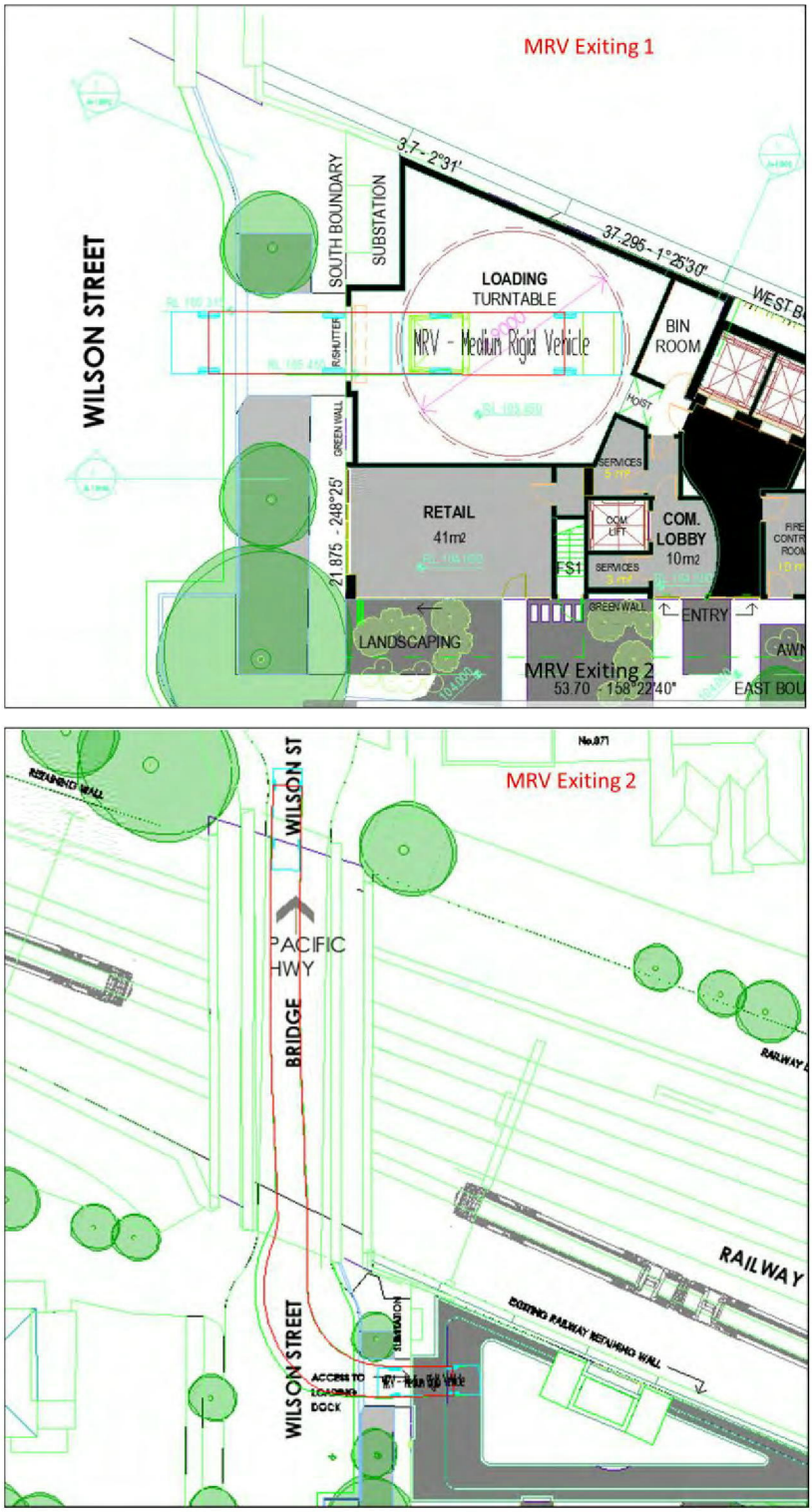


Figure 5-4 MRV exiting the loading bay-right turn out

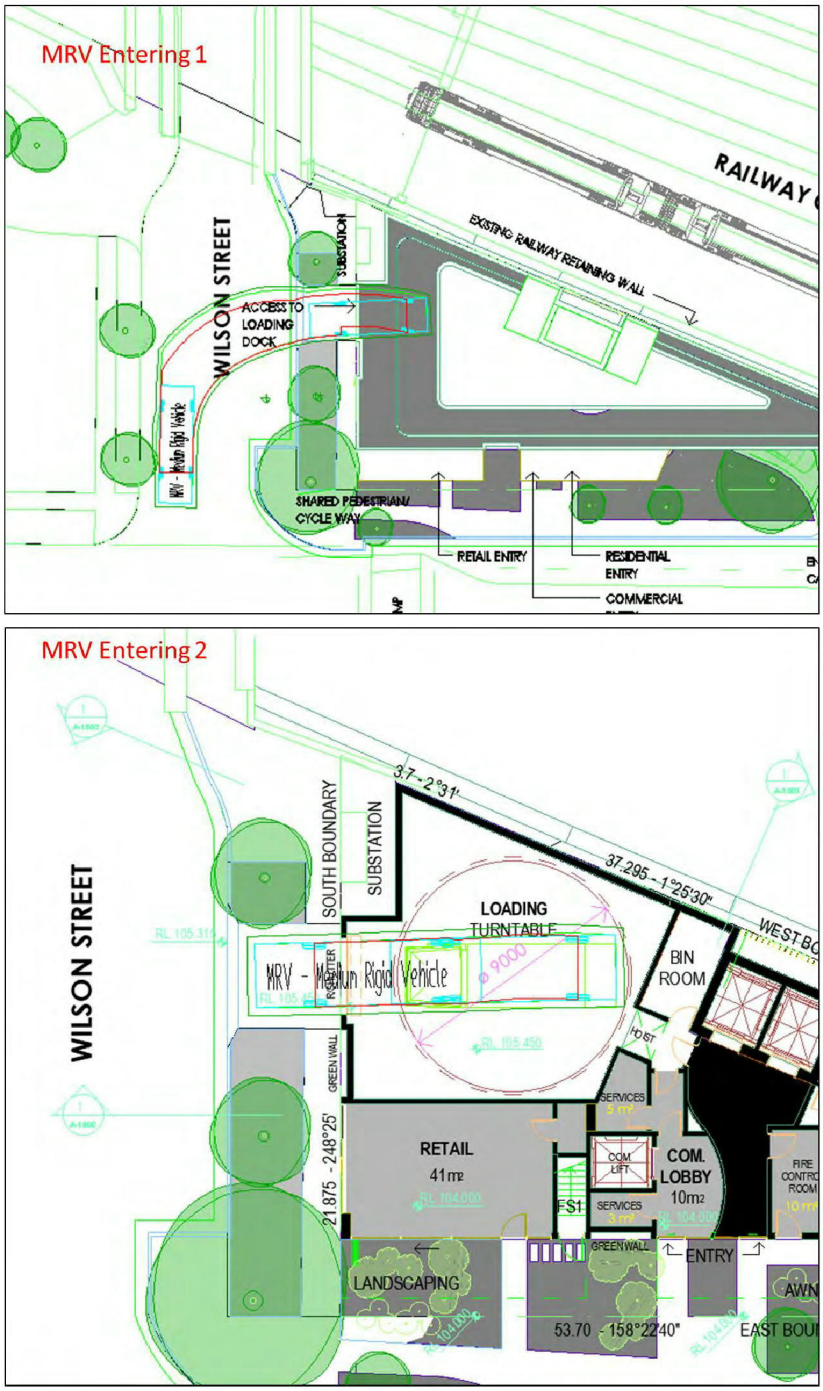


Figure 5-5 MRV right turn entry to Loading bay

It appears that from **Figure 5-3**, there is restricted space for a Standard MRV to take a left turn entry from Wilson Street to the Loading Bay, as it conflicts with the on-street parking located at the Wilson street. Therefore, it is recommended that the MRV vehicles should take a right turn movement from Wilson Street, in order to enter to the loading bay. As shown in **Figure 5-5**, a Standard MRV is successfully entering the loading bay in a forward direction (via right turn entry). Details of the swept path analysis can be found in **Appendix B**.

5.5 Queuing

The site must be able to contain the vehicles waiting to access parking. The number of spaces (i.e. length) required for the queuing area can be estimated through the Austroads Guide to Traffic Engineering Practice – Roadway Capacity which provides a methodology to predict the duration and length of expected queues.

The Technical Direction (TDT 13/04a) which provides an update to trip generation rates contained within the Roads and Maritime Services Guide to Traffic Generation specifies a peak hour generation rate of 0.15-0.19 trips per unit per hour (peak hour) for high density developments. More specifically, the technical direction update includes Chatswood as a similar survey site which shows peak trip generation of 0.14 trips per unit per hour. Therefore, based on this trip rate (0.14 per unit), the site is estimated to generate 2 trips per hour in one direction (for the peak hour). Typically, the peak direction is 80% outbound and 20% outbound in the AM period and the reverse in the PM period. As a conservative approach, the 4 trips in one direction were adopted (consisting of a worst case outcome). This equates to 1 vehicle every 15 minutes.

A variant of the Wohr 740 Multiparker has been previously implemented for 268 Orchard Road, Singapore at a capacity of 62 spaces with a maximum retrieval time of 1 vehicle per 170 seconds. It can be expected that the proposed development with a lower capacity would operate at a similar or lower maximum retrieval time for the site under consideration. Another system was adopted in Cremorne for an approved DA which utilised the Wohr Crossparker 558 and operated with an average retrieval time of 140 to 150 seconds.

Adopting a maximum retrieval time of 170 seconds results in the following outcomes for the peak hour (worst case) based on the Austroads Guide to Traffic Engineering Practice – Roadway Capacity:

- Average number of customers in the system is 0.23.
- Probability of there being more than one vehicle in the system (i.e. queuing) is 3.5%.
- Probability of there being more than one vehicle queued is 0.64%.
- One (1) waiting bay is recommended.

The information above should be considered when designing temporary waiting bays for vehicles. Additional consideration may be required to prevent drivers from using the temporary waiting bays as longer term parking.

6 Conclusion

Cardno has been appointed by Reyhoda Pty Ltd to undertake a Traffic Impact Assessment (TIA) for a proposed mixed use development, to demonstrate its compliance with the relevant standards and Council controls.

The following conclusion outlines the analysis and discussions presented within this report:

- The proposed development is expected to generate 7 trips during the AM peak hour, 8 trips during the PM peak hour.
- The Anderson Street / Wilson Street intersection will operate at LoS A in the AM and LoS A in the PM Peak in the future year scenarios with the additional traffic generated by the proposed development.
- The provision of car parking is adequate to service the development.
- The geometric design of the proposed parking facilities is to be ultimately constructed in accordance with the *Willoughby Development Control Plan 2016* and Austroad 2890.3 –Off street parking.

APPENDIX

A

TRAFFIC SURVEY COUNT

Location	Anderson Street	Duration	0630 - 0930
	Wilson Street		1500 - 1800
	Anderson Street		-
	-	Day/Date	Thursday, 7 December 2017
Suburb	CHATSWOOD	Weather	-

All Vehicles Time Per 15 Mins	NORTH *Anderson Street*										EAST *Wilson Street*										TOTAL		
	L			T			R				L			T			R						
	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ	TOTAL	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ	TOTAL	LIGHT	HEAVY	TOTAL
6:30 - 6:45	3	0	**3**	18	4	**22**				**25**	0	0	**0**				1	0	**1**	**1**	43	6	**49**
6:45 - 7:00	3	0	**3**	15	0	**15**				**18**	0	0	**0**				3	1	**4**	**4**	65	4	**69**
7:00 - 7:15	0	0	**0**	20	2	**22**				**22**	0	0	**0**				0	0	**0**	**0**	75	5	**80**
7:15 - 7:30	3	0	**3**	16	5	**21**				**24**	2	0	**2**				0	0	**0**	**2**	86	11	**97**
7:30 - 7:45	2	0	**2**	35	13	**48**				**50**	1	0	**1**				3	0	**3**	**4**	111	18	**129**
7:45 - 8:00	6	0	**6**	30	6	**36**				**42**	1	0	**1**				2	0	**2**	**3**	130	17	**147**
8:00 - 8:15	3	0	**3**	30	4	**34**				**37**	1	0	**1**				1	0	**1**	**2**	128	9	**137**
8:15 - 8:30	2	0	**2**	26	7	**33**				**35**	2	0	**2**				1	0	**1**	**3**	130	10	**140**
8:30 - 8:45	6	0	**6**	16	3	**19**				**25**	1	0	**1**				4	0	**4**	**5**	105	7	**112**
8:45 - 9:00	4	0	**4**	22	3	**25**				**29**	4	0	**4**				2	0	**2**	**6**	145	5	**150**
9:00 - 9:15	4	0	**4**	17	3	**20**				**24**	1	0	**1**				2	0	**2**	**3**	131	5	**136**
9:15 - 9:30	5	0	**5**	21	6	**27**				**32**	5	0	**5**				3	0	**3**	**8**	129	8	**137**
Period End	**41**	**0**	**41**	**266**	**56**	**322**				**363**	**18**	**0**	**18**				**22**	**1**	**23**	**41**	**1278**	**105**	**1383**
15:00 - 15:15	7	1	**8**	26	4	**30**				**38**	3	0	**3**				4	0	**4**	**7**	92	5	**97**
15:15 - 15:30	3	0	**3**	25	4	**29**				**32**	2	0	**2**				1	0	**1**	**3**	83	8	**91**
15:30 - 15:45	8	0	**8**	26	6	**32**				**40**	3	0	**3**				5	0	**5**	**8**	109	16	**125**
15:45 - 16:00	4	0	**4**	31	7	**38**				**42**	3	0	**3**				2	0	**2**	**5**	99	16	**115**
16:00 - 16:15	6	0	**6**	32	3	**35**				**41**	2	0	**2**				5	1	**6**	**8**	106	5	**111**
16:15 - 16:30	3	0	**3**	29	7	**36**				**39**	1	0	**1**				5	0	**5**	**6**	96	12	**108**
16:30 - 16:45	4	0	**4**	35	3	**38**				**42**	5	0	**5**				4	0	**4**	**9**	111	9	**120**
16:45 - 17:00	6	0	**6**	39	6	**45**				**51**	3	0	**3**				0	0	**0**	**3**	103	10	**113**
17:00 - 17:15	3	0	**3**	50	4	**54**				**57**	4	0	**4**				4	0	**4**	**8**	128	7	**135**
17:15 - 17:30	6	0	**6**	54	4	**58**				**64**	3	0	**3**				4	0	**4**	**7**	137	6	**143**
17:30 - 17:45	6	0	**6**	42	2	**44**				**50**	0	0	**0**				5	0	**5**	**5**	117	7	**124**
17:45 - 18:00	8	0	**8**	43	5	**48**				**56**	7	0	**7**				4	0	**4**	**11**	126	8	**134**
Period End	**64**	**1**	**65**	**432**	**55**	**487**				**552**	**36**	**0**	**36**				**43**	**1**	**44**	**80**	**1023**	**80**	**1416**

All Vehicles Time Per 15 Mins	SOUTH *Anderson Street*										WEST -										TOTAL		
	L			T			R				L			T			R						
	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ	TOTAL	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ	TOTAL	LIGHT	HEAVY	TOTAL
6:30 - 6:45				19	2	**21**	2	0	**2**	**23**											43	6	**49**
6:45 - 7:00				43	3	**46**	1	0	**1**	**47**											65	4	**69**
7:00 - 7:15				50	3	**53**	5	0	**5**	**58**											75	5	**80**
7:15 - 7:30				57	6	**63**	8	0	**8**	**71**											86	11	**97**
7:30 - 7:45				66	5	**71**	4	0	**4**	**75**											111	18	**129**
7:45 - 8:00				84	10	**94**	7	1	**8**	**102**											130	17	**147**
8:00 - 8:15				81	5	**86**	12	0	**12**	**98**											128	9	**137**
8:15 - 8:30				90	3	**93**	9	0	**9**	**102**											130	10	**140**
8:30 - 8:45				77	4	**81**	1	0	**1**	**82**											105	7	**112**
8:45 - 9:00				94	2	**96**	19	0	**19**	**115**											145	5	**150**
9:00 - 9:15				97	2	**99**	10	0	**10**	**109**											131	5	**136**
9:15 - 9:30				83	2	**85**	12	0	**12**	**97**											129	8	**137**
Period End				**841**	**47**	**888**	**90**	**1**	**91**	**979**											**1278**	**105**	**1383**
15:00 - 15:15				48	0	**48**	4	0	**4**	**52**											92	5	**97**
15:15 - 15:30				45	3	**48**	7	1	**8**	**56**											83	8	**91**
15:30 - 15:45				60	10	**70**	7	0	**7**	**77**											109	16	**125**
15:45 - 16:00				52	9	**61**	7	0	**7**	**68**											99	16	**115**
16:00 - 16:15				52	1	**53**	9	0	**9**	**62**											106	5	**111**
16:15 - 16:30				49	5	**54**	9	0	**9**	**63**											96	12	**108**
16:30 - 16:45				52	6	**58**	11	0	**11**	**69**											111	9	**120**
16:45 - 17:00				48	4	**52**	7	0	**7**	**59**											103	10	**113**
17:00 - 17:15				51	3	**54**	16	0	**16**	**70**											128	7	**135**
17:15 - 17:30				59	2	**61**	11	0	**11**	**72**											137	6	**143**
17:30 - 17:45				51	5	**56**	13	0	**13**	**69**											117	7	**124**
17:45 - 18:00				53	3	**56**	11	0	**11**	**67**											126	8	**134**
Period End				**620**	**51**	**671**	**112**	**1**	**113**	**784**											**1023**	**80**	**1416**

Traffic Information Specialists
ABN: 42 613 389 923
Email info@trafficinfospecialist.com.au

Location	Anderson Street		Duration	0630 - 0930	
	Wilson Street			1500 - 1800	
	Anderson Street			-	
	-		Day/Date	Thursday, 7 December 2017	
Suburb	CHATSWOOD		Weather	-	

All Vehicles Time Per Hour	NORTH Anderson Street										EAST Wilson Street										TOTAL		TOTAL
	L			T			R				L			T			R						
	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ	TOTAL	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ	TOTAL	LIGHT	HEAVY	
6:30 - 7:30	9	0	9	69	11	80				89	2	0	2				4	1	5	7	269	26	295
6:45 - 7:45	8	0	8	86	20	106				114	3	0	3				6	1	7	10	337	38	375
7:00 - 8:00	11	0	11	101	26	127				138	4	0	4				5	0	5	9	402	51	453
7:15 - 8:15	14	0	14	111	28	139				153	5	0	5				6	0	6	11	455	55	510
7:30 - 8:30	13	0	13	121	30	151				164	5	0	5				7	0	7	12	499	54	553
7:45 - 8:45	17	0	17	102	20	122				139	5	0	5				8	0	8	13	493	43	536
8:00 - 9:00	15	0	15	94	17	111				126	8	0	8				8	0	8	16	508	31	539
8:15 - 9:15	16	0	16	81	16	97				113	8	0	8				9	0	9	17	511	27	538
8:30 - 9:30	19	0	19	76	15	91				110	11	0	11				11	0	11	22	510	25	535
Period End	122	0	122	841	183	1024				1146	51	0	51				64	2	66	117	3984	350	4334
15:00 - 16:00	22	1	23	108	21	129				152	11	0	11				12	0	12	23	383	45	428
15:15 - 16:15	21	0	21	114	20	134				155	10	0	10				13	1	14	24	397	45	442
15:30 - 16:30	21	0	21	118	23	141				162	9	0	9				17	1	18	27	410	49	459
15:45 - 16:45	17	0	17	127	20	147				164	11	0	11				16	1	17	28	412	42	454
16:00 - 17:00	19	0	19	135	19	154				173	11	0	11				14	1	15	26	416	36	452
16:15 - 17:15	16	0	16	153	20	173				189	13	0	13				13	0	13	26	438	38	476
16:30 - 17:30	19	0	19	178	17	195				214	15	0	15				12	0	12	27	479	32	511
16:45 - 17:45	21	0	21	185	16	201				222	10	0	10				13	0	13	23	485	30	515
17:00 - 18:00	23	0	23	189	15	204				227	14	0	14				17	0	17	31	508	28	536
Period End	179	1	180	1307	171	1478				1658	104	0	104				127	4	131	235	3928	345	4273

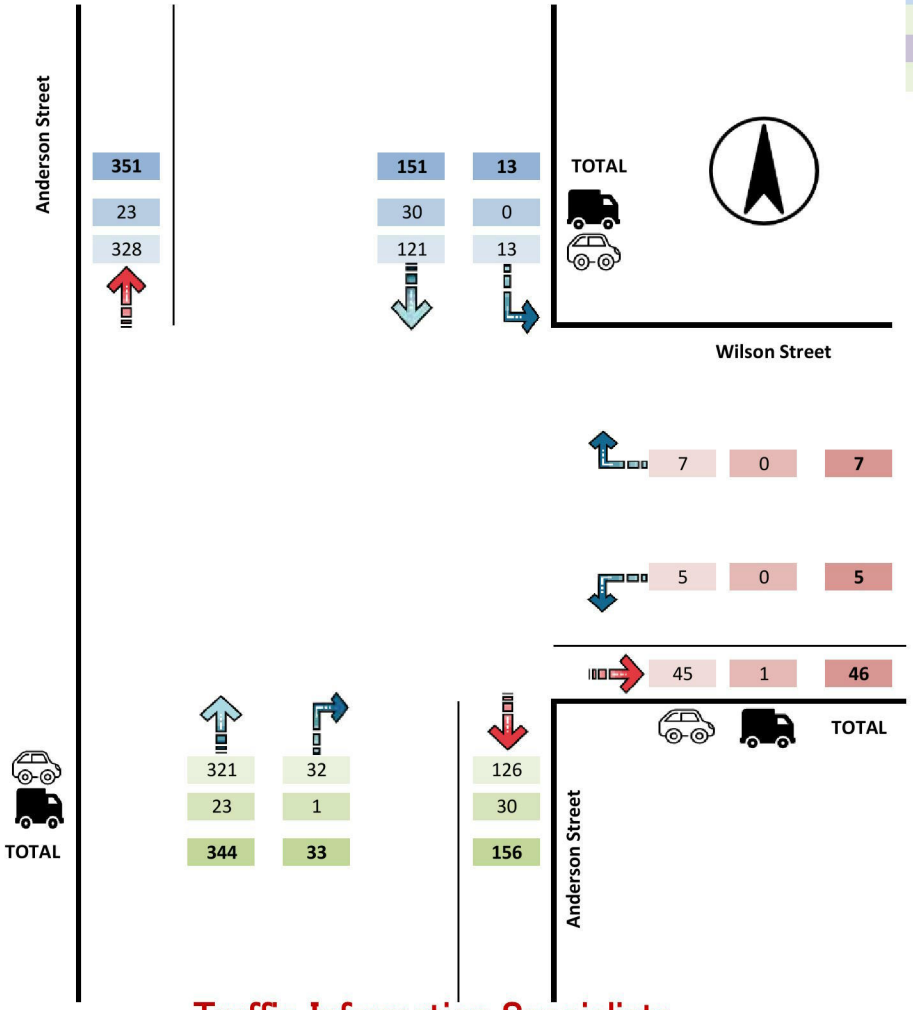
All Vehicles Time Per Hour	SOUTH Anderson Street										WEST -										TOTAL		TOTAL
	L			T			R				L			T			R						
	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ	TOTAL	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ	TOTAL	LIGHT	HEAVY	
6:30 - 7:30				169	14	183	16	0	16	199											269	26	295
6:45 - 7:45				216	17	233	18	0	18	251											337	38	375
7:00 - 8:00				257	24	281	24	1	25	306											402	51	453
7:15 - 8:15				288	26	314	31	1	32	346											455	55	510
7:30 - 8:30				321	23	344	32	1	33	377											499	54	553
7:45 - 8:45				332	22	354	29	1	30	384											493	43	536
8:00 - 9:00				342	14	356	41	0	41	397											508	31	539
8:15 - 9:15				358	11	369	39	0	39	408											511	27	538
8:30 - 9:30				351	10	361	42	0	42	403											510	25	535
Period End				2634	161	2795	272	4	276	3071											3984	350	4334
15:00 - 16:00				205	22	227	25	1	26	253											383	45	428
15:15 - 16:15				209	23	232	30	1	31	263											397	45	442
15:30 - 16:30				213	25	238	32	0	32	270											410	49	459
15:45 - 16:45				205	21	226	36	0	36	262											412	42	454
16:00 - 17:00				201	16	217	36	0	36	253											416	36	452
16:15 - 17:15				200	18	218	43	0	43	261											438	38	476
16:30 - 17:30				210	15	225	45	0	45	270											479	32	511
16:45 - 17:45				209	14	223	47	0	47	270											485	30	515
17:00 - 18:00				214	13	227	51	0	51	278											508	28	536
Period End				1866	167	2033	345	2	347	2380											3928	345	4273

Location	Anderson Street	Duration	0630 - 0930
	Wilson Street		1500 - 1800
	Anderson Street		-
	-	Day/Date	Thursday, 7 December 2017
Suburb	CHATSWOOD	Weather	-

DATA SELECTION

Select Time: PEAK

TIME RANGE		
PEAK	-	AM
PEAK		
7:30	-	8:30



-

Traffic Information Specialists

ABN: 42 613 389 923

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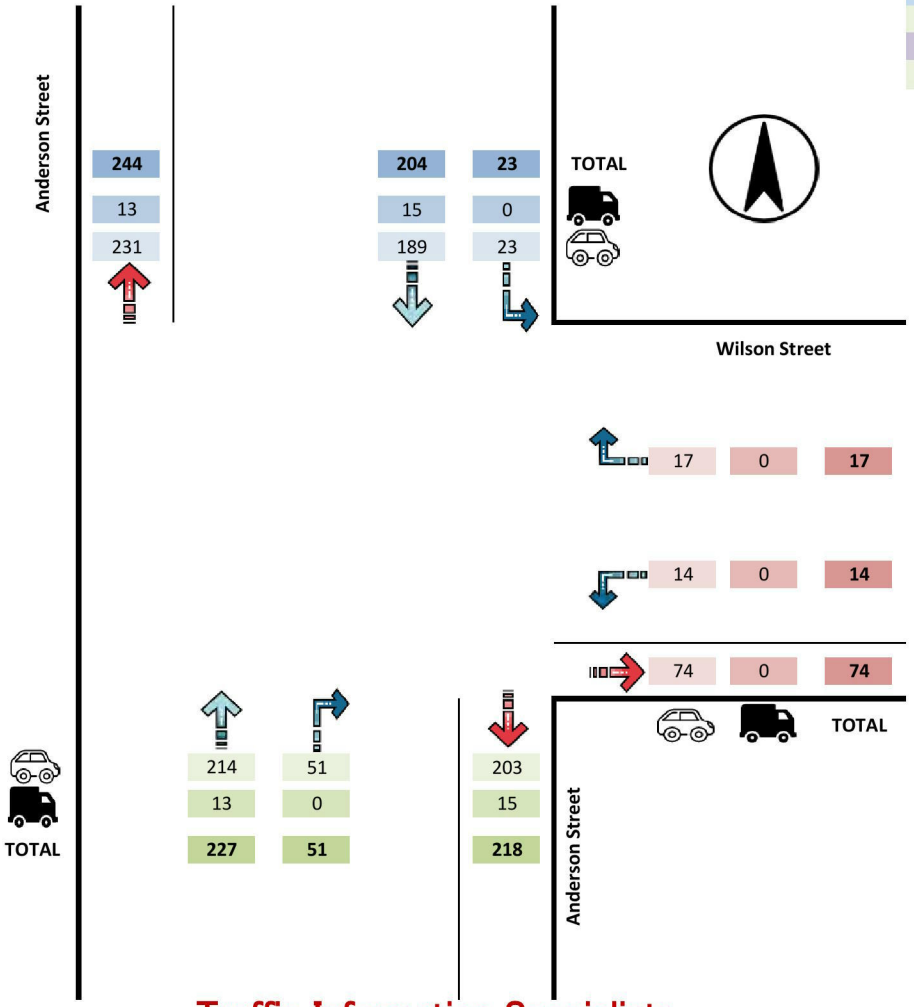
Location	Anderson Street	Duration	0630 - 0930
	Wilson Street		1500 - 1800
	Anderson Street		-
	-	Day/Date	Thursday, 7 December 2017
Suburb	CHATSWOOD	Weather	-

DATA SELECTION

Select Time: PEAK

TIME RANGE		
PEAK	-	PM
PEAK		
17:00	-	18:00



-

Traffic Information Specialists

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APPENDIX

B

CONCEPT LAYOUT

ARCHITECTURAL DRAWINGS

A-0000	COVER SHEET	L
A-0001	LOCALITY PLAN	L
A-0002	SITE SURVEY	L
A-0999	TYPICAL CAR STACKER PLAN (3 LEVELS)	L
A-1000	BASEMENT FLOOR PLAN	L
A-1001	GROUND FLOOR PLAN	L
A-1002	LEVEL 1 FLOOR PLAN	L
A-1003	LEVEL 2 & LEVEL 3 PLANS	L
A-1004	TYPICAL LEVELS 04 - 09 & 10 - 12	L
A-1005	LEVEL 13 - ROOFTOP TERRACE PLANS	L
A-1200	EAST ELEVATION	L
A-1201	WEST ELEVATION	L
A-1202	NORTH & SOUTH ELEVATIONS	L
A-1300	SECTION 1	L
A-1301	SECTION 2	L
A-1302	SECTION 3	L
A-1303	MASSING SECTION	L
A-7500	SHADOW DIAGRAM JUNE 21 - HOURS 9am & 10am	L
A-7501	SHADOW DIAGRAM JUNE 21 - HOURS 11am & 12pm	L
A-7502	SHADOW DIAGRAM JUNE 21 - HOURS 1pm & 2pm	L
A-7503	SHADOW DIAGRAM JUNE 21 - HOURS 3pm	L
A-7600	GFA PLANS & SCHEDULES	L
A-7700	MASSING STUDY -VIEW TOWARDS FUTURE CHATSWOOD CBD	L
A-7701	MASSING STUDY - ARIAL VIEW OF FUTURE CHATSWOOD CBD LOOKING WEST	L
A-7702	MASSING STUDY - ARIAL VIEW FROM RAILWAY CORRIDOR TOWARD FUTURE CHATSWOOD CBD	L
A-7703	MASSING STUDY - VIEWS OF 58 ANDERSON STREET	L
A-7704	MASSING STUDY - VIEWS OF 58 ANDERSON STREET	L
A-7705	MASSING STUDY - PODIUM VIEWS	L
A-7706	MASSING STUDY - 3D VIEW FROM ANDERSON STREET LOOKING SOUTH	L
A-7707	MASSING STUDY - 3D VIEW FROM ANDERSON STREET LOOKING NORTH	L
A-7708	MASSING STUDY - 3D VIEW FROM VIOLET STREET LOOKING SOUTH WEST	L
A-7709	MASSING STUDY - 3D VIEW FROM ANDERSON STREET TOWARD FUTURE CHATSWOOD CBD	L
A-7710	PRECEDENT IMAGES - ROOFTOP	L
A-7800	LANDSCAPE CONCEPT PLAN - GROUND FLOOR	L
A-7801	LANDSCAPE CONCEPT PLANS - LEVEL 3 AND LEVEL 13	L

PROJECT STATISTICS

Site Area	565 m²
FSR Commercial	0.97 : 1
FSR Residential	3.03 : 1
Commercial GFA	550 m²
Residential GFA	1710 m²

TOTAL GFA	**2260 m²**
TOTAL FSR	**4 : 1**

APARTMENT SCHEDULE

	Unit Mix		*Total*
Level	2 Bed	4 Bed	
Level 4	2		2
Level 5	2		2
Level 6	2		2
Level 7	2		2
Level 8	2		2
Level 9	2		2
Level 10		1	1
Level 11		1	1
Level 12		1	1

TOTAL %	**80%**	**20%**	**100%**
TOTAL	**12**	**3**	**15**

Scale 1: 2000

0 10000 20000 50000 100000

L	ISSUED FOR COUNCIL SUBMISSION	28/10/2020
K	ISSUED FOR COUNCIL SUBMISSION	17/09/2020
P3	ISSUED FOR INFORMATION	16/09/2020
J	ISSUED FOR COUNCIL SUBMISSION	08/09/2020
P2	ISSUED FOR INFORMATION	07/09/2020
P1	ISSUED FOR INFORMATION	04/09/2020
REV.	DESCRIPTION	DATE

DREW DICKSON **ARCHITECTS**
DREW DICKSON ARCHITECTS PTY LIMITED - ABN 12 168 892 153
SUITE 2,GROUND FLOOR, 83 ALEXANDER STREET
CROWS NEST NSW 2065 AUSTRALIA
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NOMINATED ARCHITECT'S REG. NO. 4215

Project
MIXED USE DEVELOPMENT
58 ANDERSON STREET CHATSWOOD 2067 NSW

Client
REYHODA PTY LTD

N

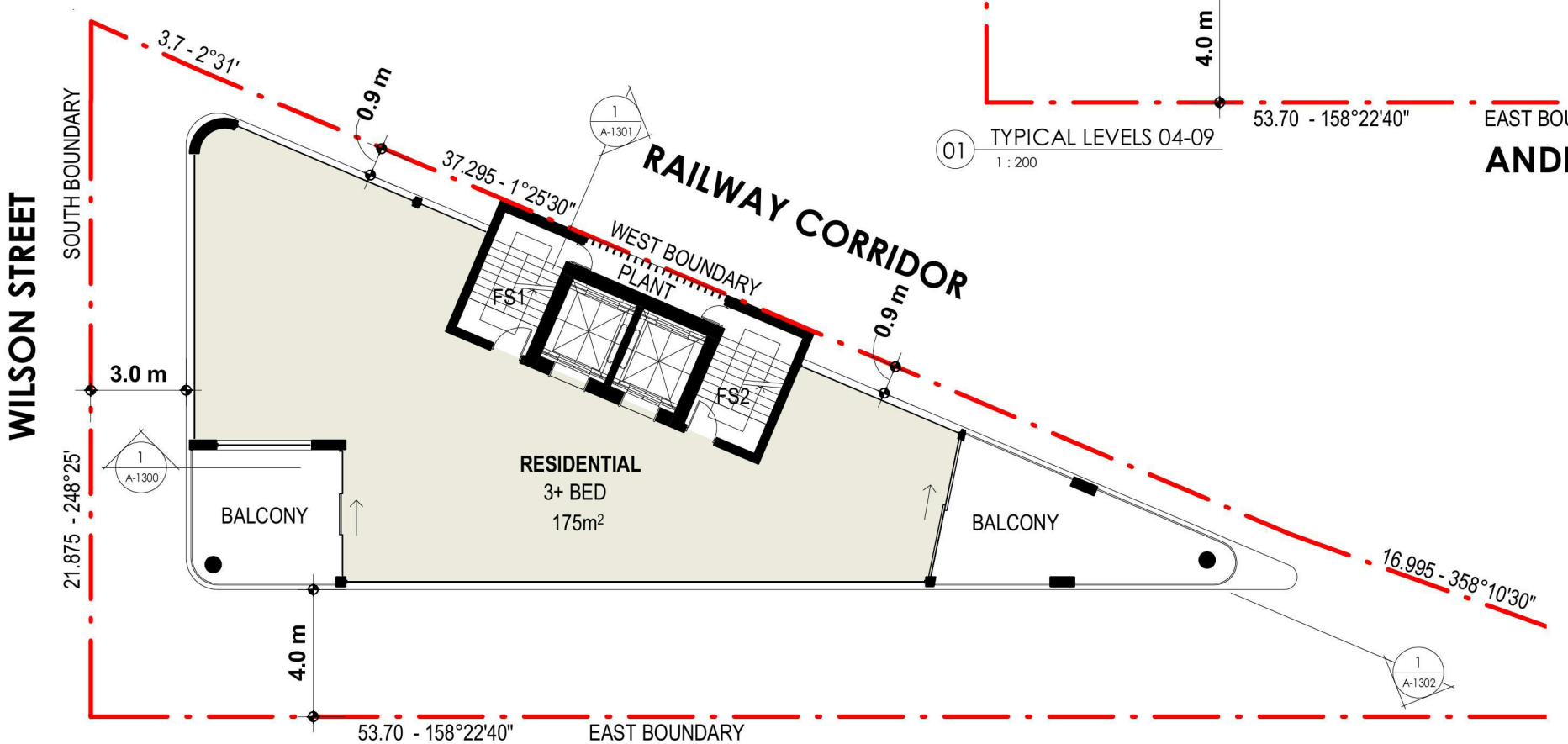
Drawing
COVER SHEET

Drawing No.
A-0000

Revision
L

Scales	Drawn	Date:	Project Status	Project No.
1 : 2000 @ A3	LH	OCT 2020	PLANNING PROPOSAL	18014

Plot Date: 29/10/2020 11:16:11 AM



01 TYPICAL LEVELS 04-09
1 : 200

02 Typical Levels 10 - 12
1 : 200

Scale 1: 200

0 1000 2000 5000 10000

REV.	DESCRIPTION	DATE
L	ISSUED FOR COUNCIL SUBMISSION	28/10/2020
K	ISSUED FOR COUNCIL SUBMISSION	17/09/2020
P3	ISSUED FOR INFORMATION	16/09/2020
J	ISSUED FOR COUNCIL SUBMISSION	08/09/2020
P2	ISSUED FOR INFORMATION	07/09/2020
P1	ISSUED FOR INFORMATION	04/09/2020

DO NOT SCALE FROM THIS DRAWING. USE GIVEN DIMENSIONS ONLY.
CHECK ALL DIMENSIONS ON THE JOB PRIOR TO COMMENCEMENT OF SHOP DRAWINGS OR FABRICATION. ANY DISCREPANCIES ARE TO BE REFERRED TO THE ARCHITECT/ENGINEER/DESIGNER PRIOR TO COMMENCEMENT OF WORK.

DREW DICKSON **ARCHITECTS**
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SUITE 2,GROUND FLOOR, 83 ALEXANDER STREET
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NOMINATED ARCHITECT'S REG. NO. 4215

Project
MIXED USE DEVELOPMENT
58 ANDERSON STREET CHATSWOOD 2067 NSW

Client
REYHODA PTY LTD

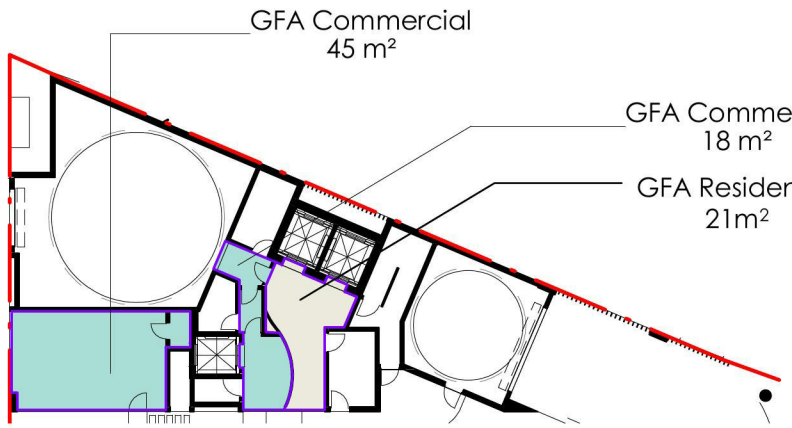
Drawing
TYPICAL LEVELS 04 - 09 & 10 - 12

Drawing No.
A-1004

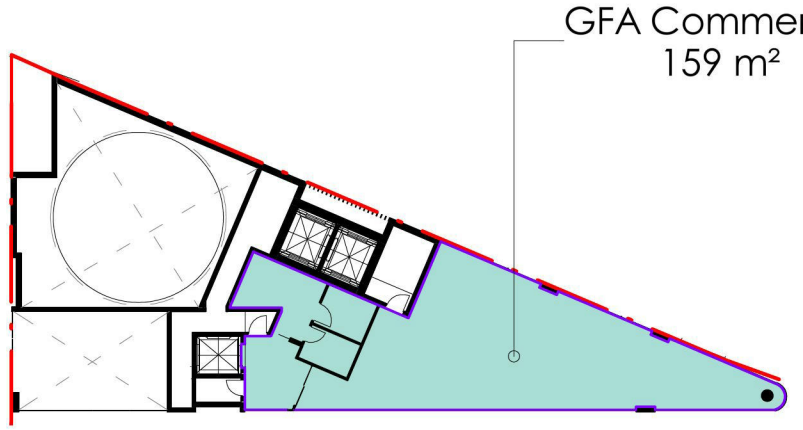
Revision
L

Scales	Drawn	Date:	Project Status	Project No.
1 : 200 @ A3	LH	OCT 2020	PLANNING PROPOSAL	18014

29/10/2020 11:18:21 AM Plot Date:



01 GROUND FLOOR
1 : 400



02 LEVEL 1
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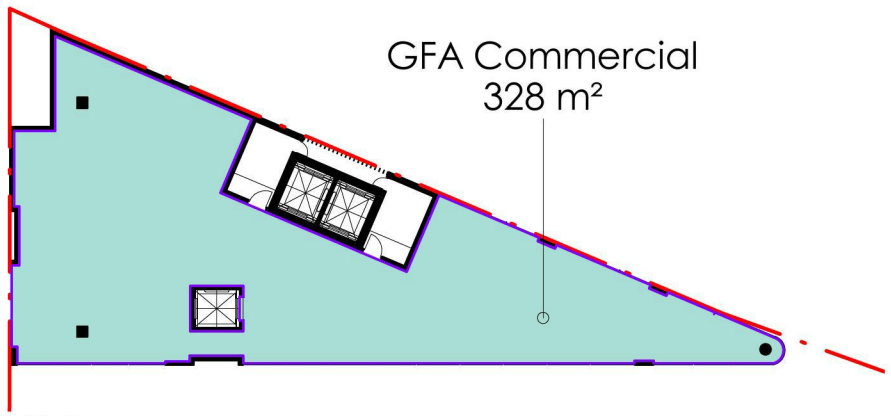

03 LEVEL 2
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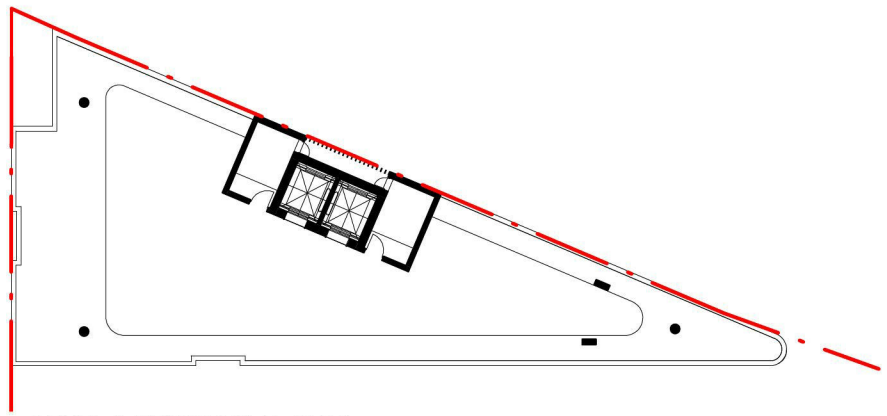

04 LEVEL 3 RESIDENTIAL COS
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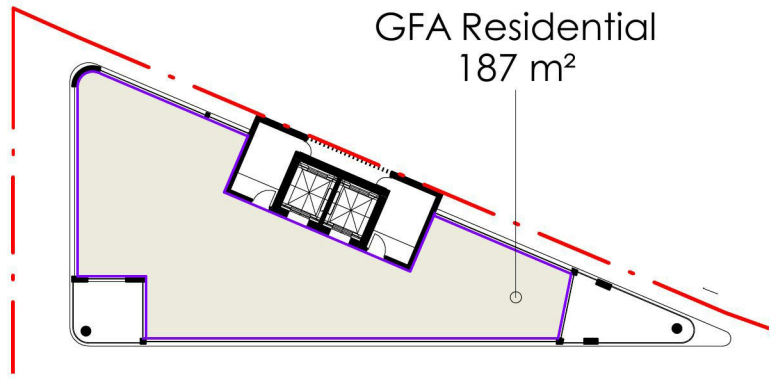

05 TYPICAL LEVELS 04 - 09
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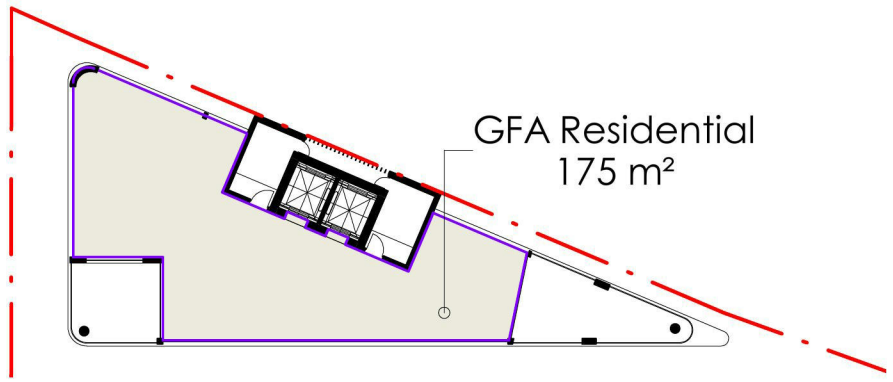
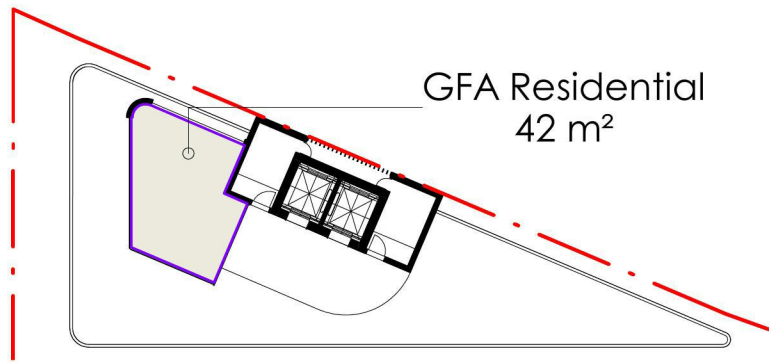


06 TYPICAL LEVELES 10-12
1 : 400



07 LEVEL 13 ROOFTOP TERRACE
1 : 400

COMMERCIAL GFA SCHEDULE

Level	*Area*	*# of floors*	*Area all floors*
Ground Floor	63 m²	1	63 m²
Level 1	159 m²	1	159 m²
Level 2	328 m²	1	328m²

TOTAL COMMERCIAL GFA	**550 m²**
TOTAL COMMERCIAL FSR	**0.97 : 1**

RESIDENTIAL GFA SCHEDULE

Level	*Area*	*# of floors*	*Area all floors*
Ground Floor	21 m²	1	21 m²
Level 4 - 09	187 m²	6	1122 m²
Level 10 - 12 Typical	175 m²	3	525 m²
Level 13 Rooftop Terrace	42 m²	1	42 m²

TOTAL RESIDENTIAL GFA	**1710m²**
TOTAL RESIDENTIAL FSR	**3.03 : 1**

PROJECT STATISTICS

Site Area	565 m²
FSR Commercial	0.97 : 1
FSR Residential	3.03 : 1
Commercial GFA	550 m²
Residential GFA	1710 m²

TOTAL GFA	**2260 m²**
TOTAL FSR	**4 : 1**

GFA Colour Legend

GFA Commercial

GFA Residential

Scale 1: 400

0 2000 4000 10000 20000

REV.	DESCRIPTION	DATE
L	ISSUED FOR COUNCIL SUBMISSION	28/10/2020
K	ISSUED FOR COUNCIL SUBMISSION	17/09/2020
P3	ISSUED FOR INFORMATION	16/09/2020
J	ISSUED FOR COUNCIL SUBMISSION	08/09/2020
P2	ISSUED FOR INFORMATION	07/09/2020
P1	ISSUED FOR INFORMATION	04/09/2020

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Project
MIXED USE DEVELOPMENT
58 ANDERSON STREET CHATSWOOD 2067 NSW

Client
REYHODA PTY LTD

Drawing
GFA PLANS & SCHEDULES

Drawing No.
A-7600

Revision
L

Scales
1 : 400 @ A3

Drawn
LH

Date:
OCT 2020

Project Status
PLANNING PROPOSAL

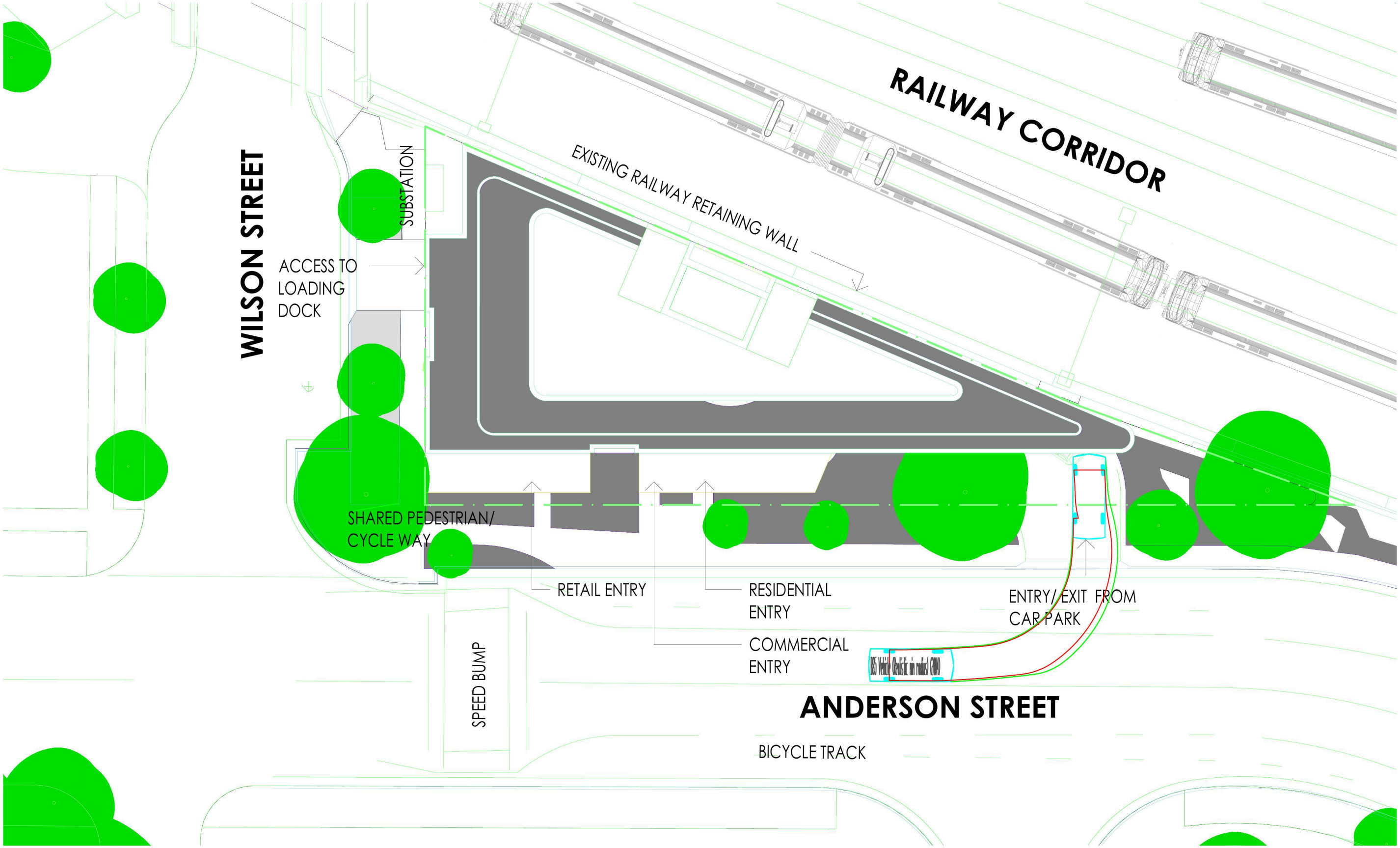
Project No.
18014

Plot Date:
29/10/2020 11:22:01 AM

APPENDIX

C

SWEPT PATH ANALYSIS



0 0.02 0.04 0.06 0.08 0.1m

SCALE 1:1 @A1

VEHICLE LEGEND

VEHICLE BODY PATH

VEHICLE BODY PATH

600mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 5km/h

Preliminary Plan

FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE
WITHOUT NOTIFICATION

Cardno
Shaping the Future
Cardno (NSW/ACT) Pty Ltd | ABN 95 001 145 035
Level 9, The Forum, 203 Pacific Highway
St. Leonards, NSW 2065
Tel: 02 9496 7700 Fax: 02 9439 5170
Web: www.cardno.com.au

Client ##########

Project ##########
##########
##########

Title ##########
##########
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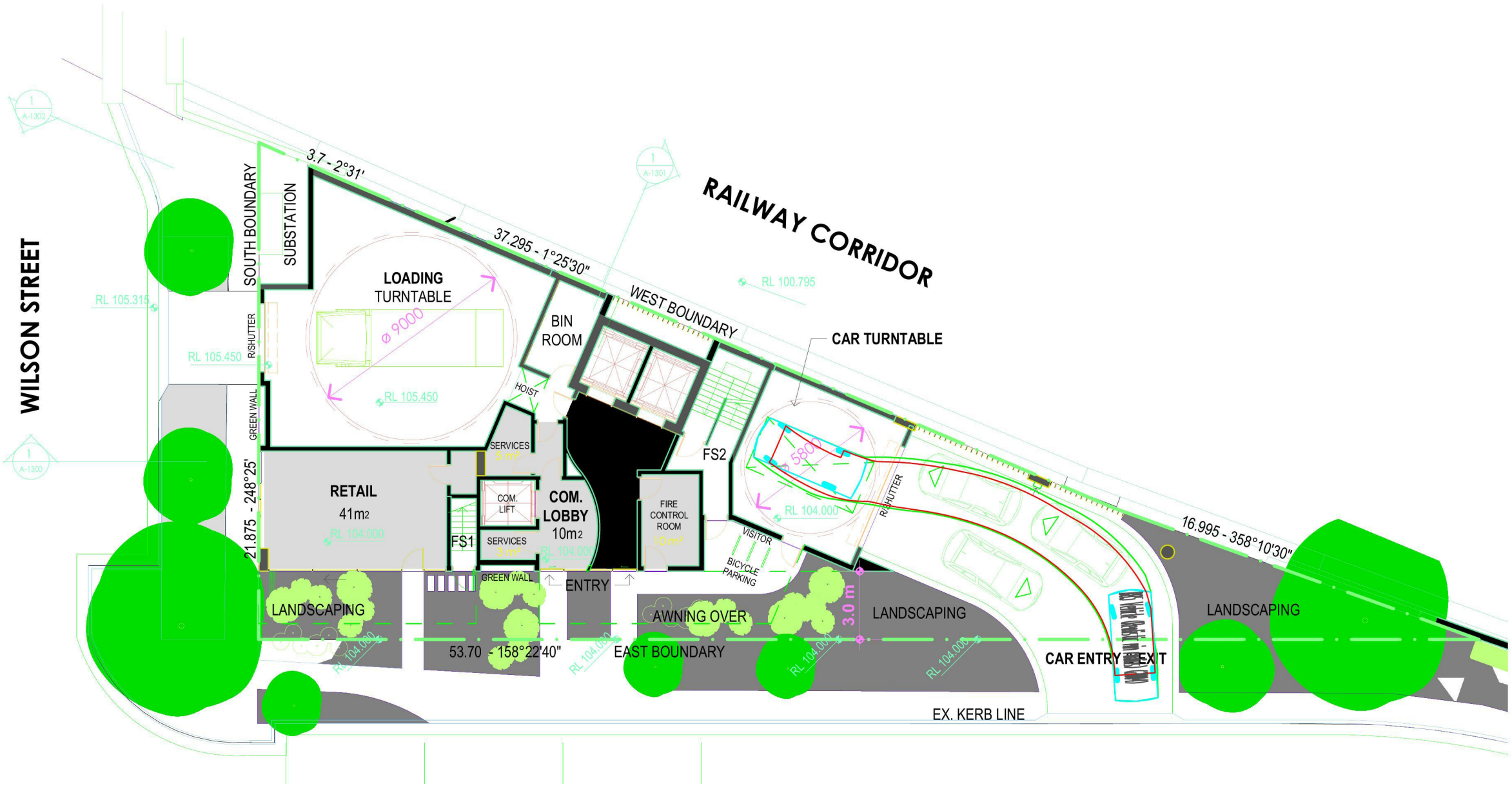

0 0.02 0.04 0.06 0.08 0.1m

SCALE 1:1 @A1

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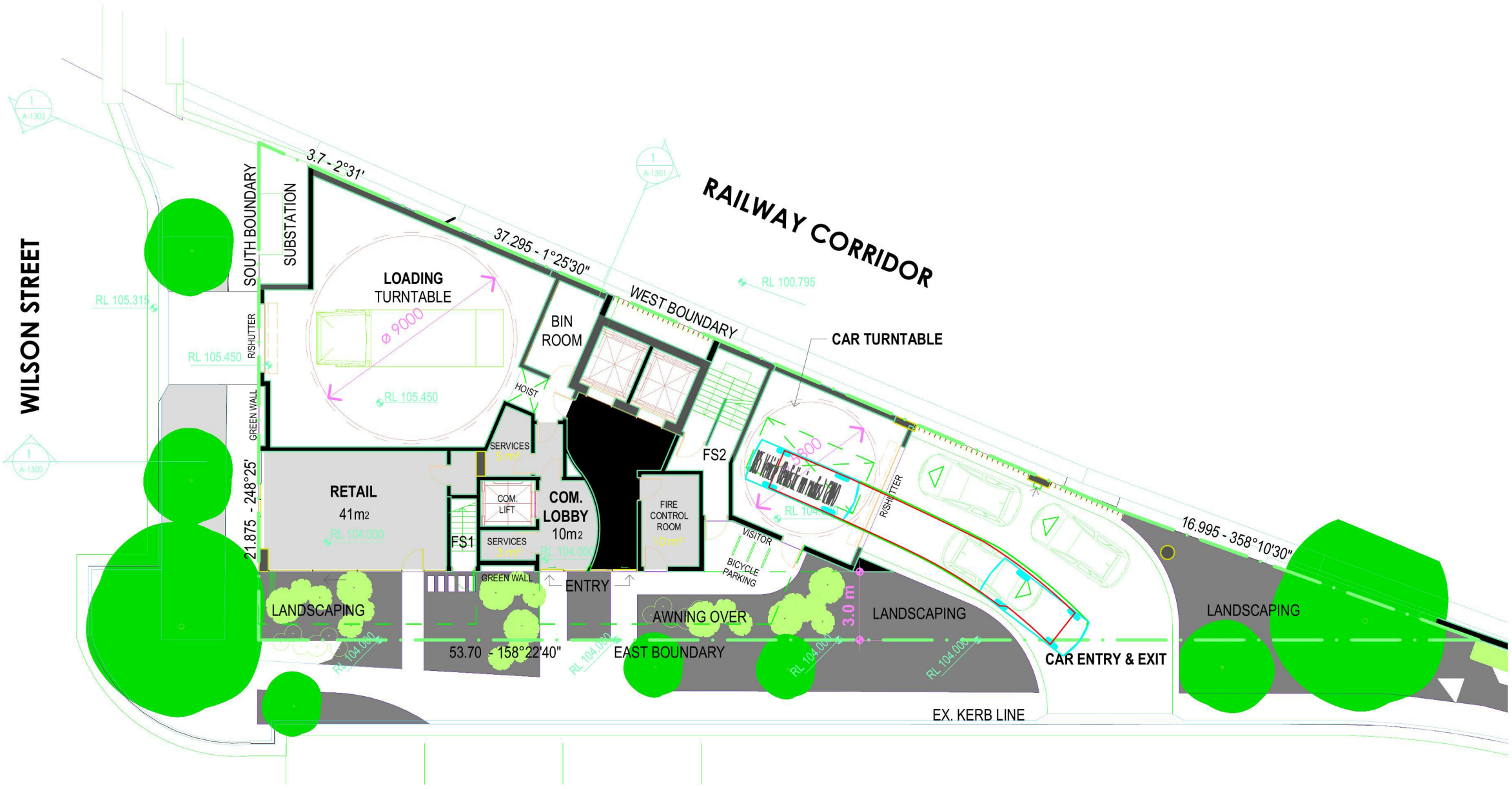

0 0.02 0.04 0.06 0.08 0.1m

SCALE 1:1 @A1

VEHICLE LEGEND

VEHICLE BODY PATH

VEHICLE BODY PATH

600mm CLEARANCE FROM VEHICLE BODY

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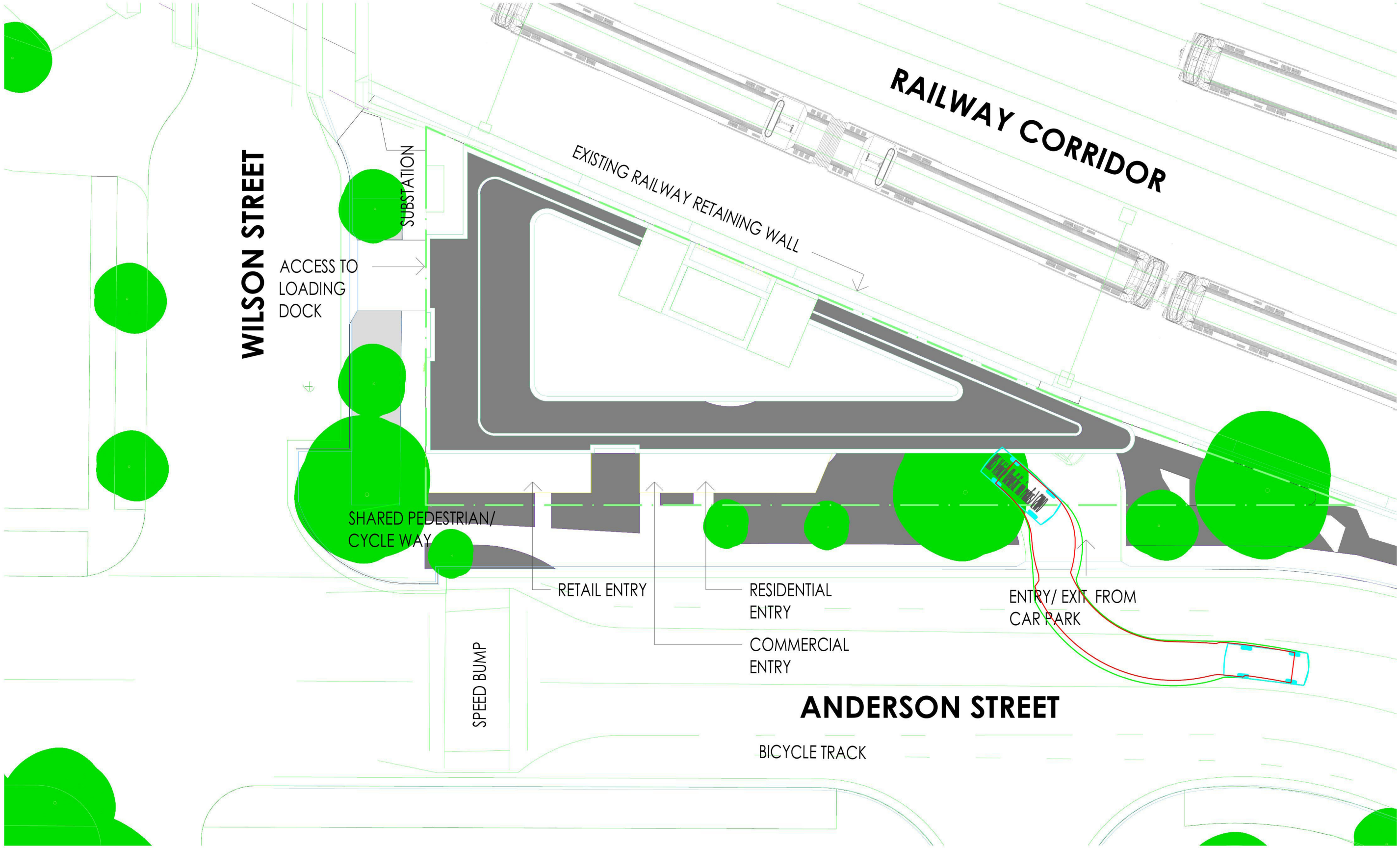

0 0.02 0.04 0.06 0.08 0.1m

SCALE 1:1 @A1

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VEHICLE BODY PATH

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600mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 5km/h

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Client ##########

Project ##########
##########
##########

Title ##########
##########
##########

RAILWAY

RETAINING WALL

RAILWAY

WILSON ST

BRIDGE

PACIFIC HWY

No.671

RAILWAY LAND

RETAINING WALL

RAILWAY CORRIDOR

G

No.56

WILSON STREET

SUBSTATION

ACCESS TO LOADING DOCK

EXISTING RAILWAY RETAINING WALL

MRV - Medium Rigid Vehicle

SHARED PEDESTRIAN/ CYCLE WAY

RETAIL ENTRY

RESIDENTIAL ENTRY

COMMERCIAL ENTRY

ENTRY/ EXIT FROM CAR PARK

UMP

0 0.02 0.04 0.06 0.08 0.1m

SCALE 1:1 @A1

VEHICLE LEGEND

VEHICLE BODY PATH

VEHICLE BODY PATH

600mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 5km/h

Preliminary Plan

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Client ##########

Project ##########
##########
##########

Title ##########
##########
##########

RAILWAY

RETAINING WALL

RAILWAY

WILSON ST

PACIFIC HWY

BRIDGE

No.671

RAILWAY LAND

RETAINING WALL

RAILWAY CORRIDOR

G

No.56

WILSON STREET

SUBSTATION

EXISTING RAILWAY RETAINING WALL

ACCESS TO LOADING DOCK

MRV - Medium Rigid Vehicle

SHARED PEDESTRIAN/ CYCLE WAY

RETAIL ENTRY

RESIDENTIAL ENTRY

COMMERCIAL ENTRY

ENTRY/ EXIT FROM CAR PARK

UMP

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SCALE 1:1 @A1

VEHICLE LEGEND

VEHICLE BODY PATH

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600mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 5km/h

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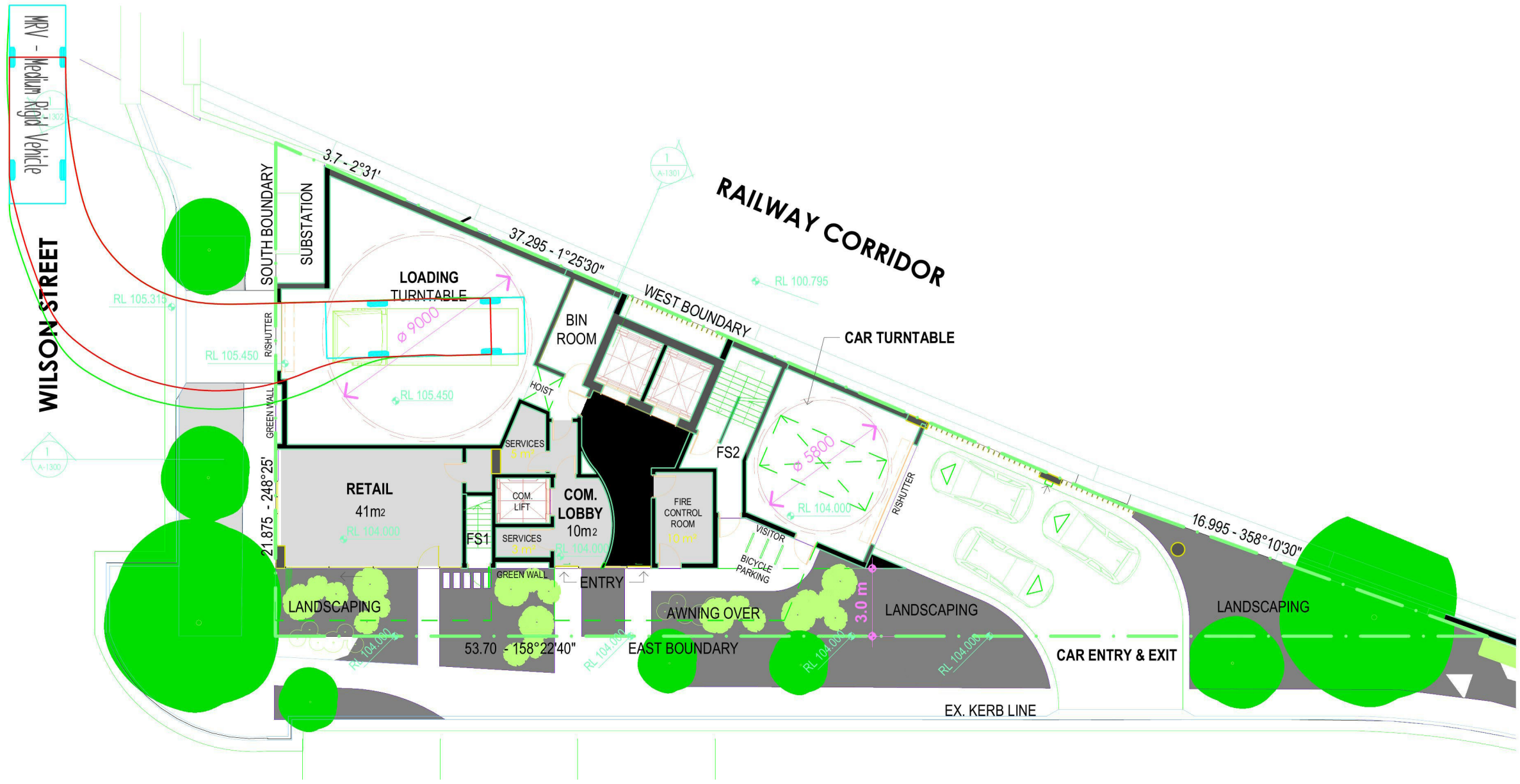
Client ##################

Project ##################
##################
##################

Title ##################
##################
##################



ANDERSON STREET

0 0.02 0.04 0.06 0.08 0.1m

SCALE 1:1 @A1

VEHICLE LEGEND

VEHICLE BODY PATH

VEHICLE BODY PATH

600mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 5km/h

Preliminary Plan

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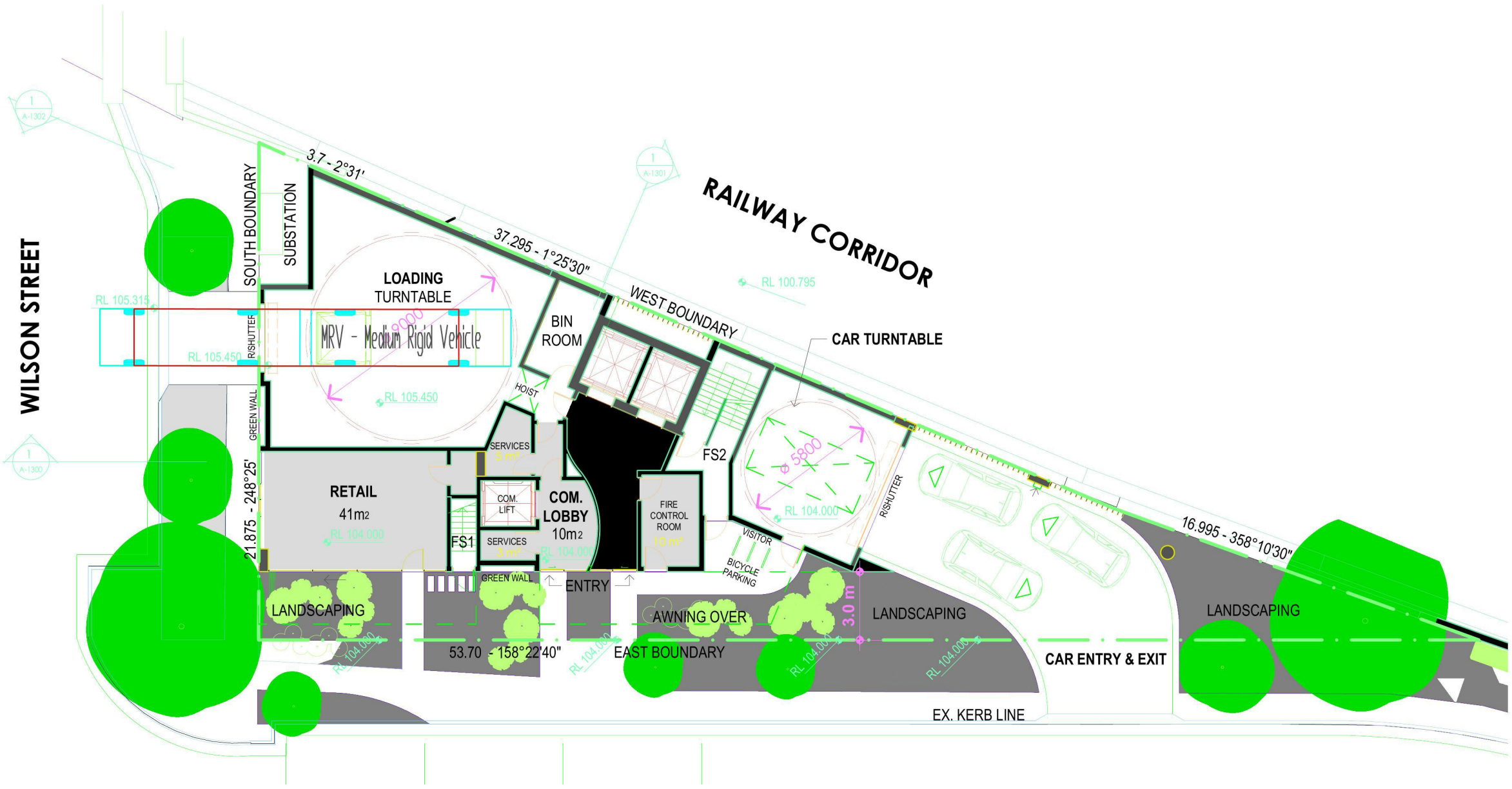

ANDERSON STREET

0 0.02 0.04 0.06 0.08 0.1m

SCALE 1:1 @A1

VEHICLE LEGEND

VEHICLE BODY PATH

VEHICLE BODY PATH

600mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 5km/h

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APPENDIX

D

SPREADHSEET MODEL

Mixed Land Use Development - Chatswood - Info

Total	15	Apartments
Commercial	505	m² GFA
Retail	45	m² GFA

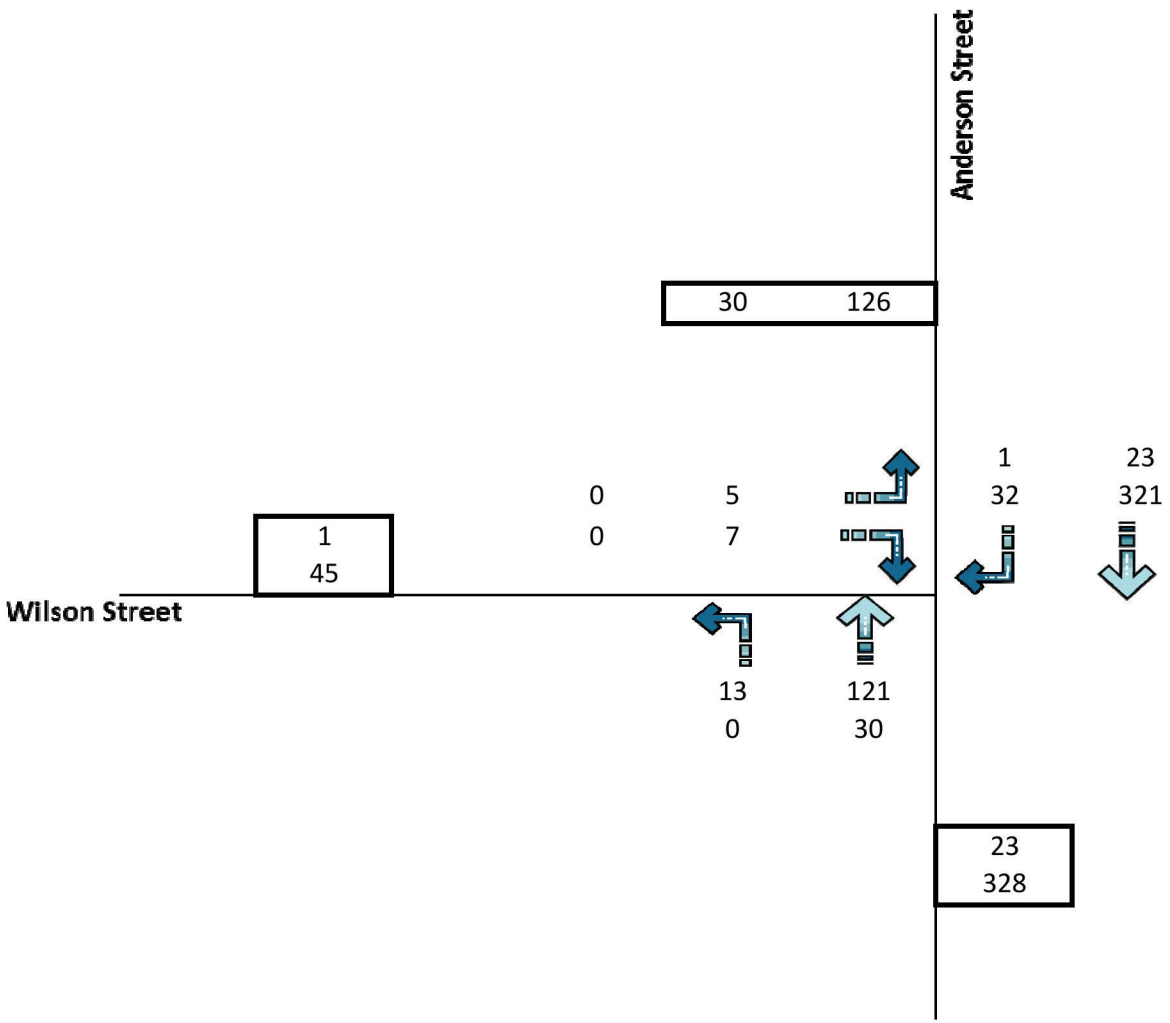
Trip Generation Rates

AM	0.14	trips per unit
PM	0.12	trips per unit
Commercial		
AM	1.03	trips per 100 m²
PM	0.84	trips per 100 m²
Retail		
	46	trips per 1000 m²
	4.6	trips per 100 m²

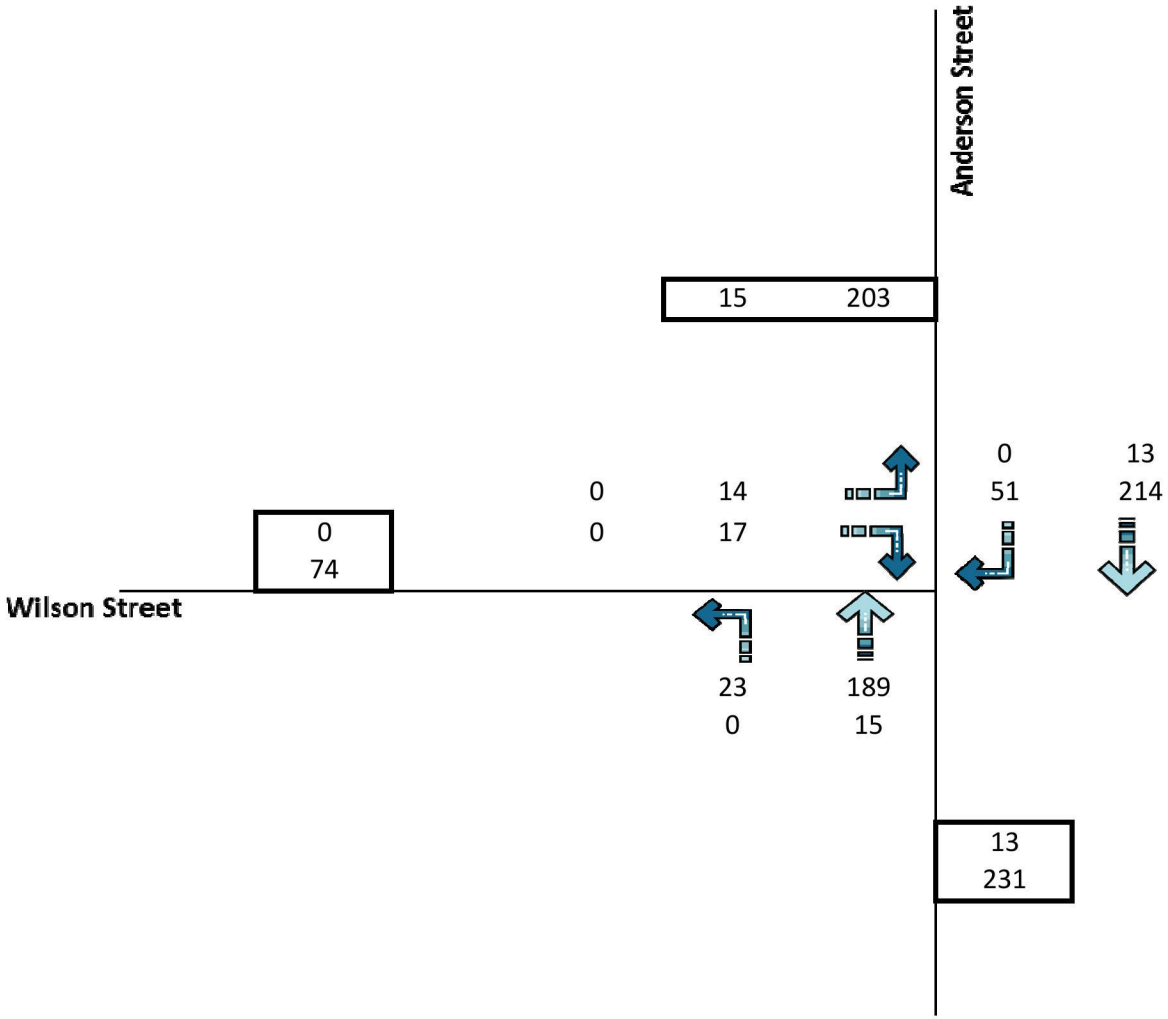
Split	In	Out
AM	20%	80%
PM	70%	30%
Commercial	50%	50%
retail	50%	50%

	AM		**PM**	
	In	Out	In	Out
Residential	0.4	1.7	1.3	0.5
Commercial	2.60075	2.60075	2.1	2.1
Retail			1.0	1.0

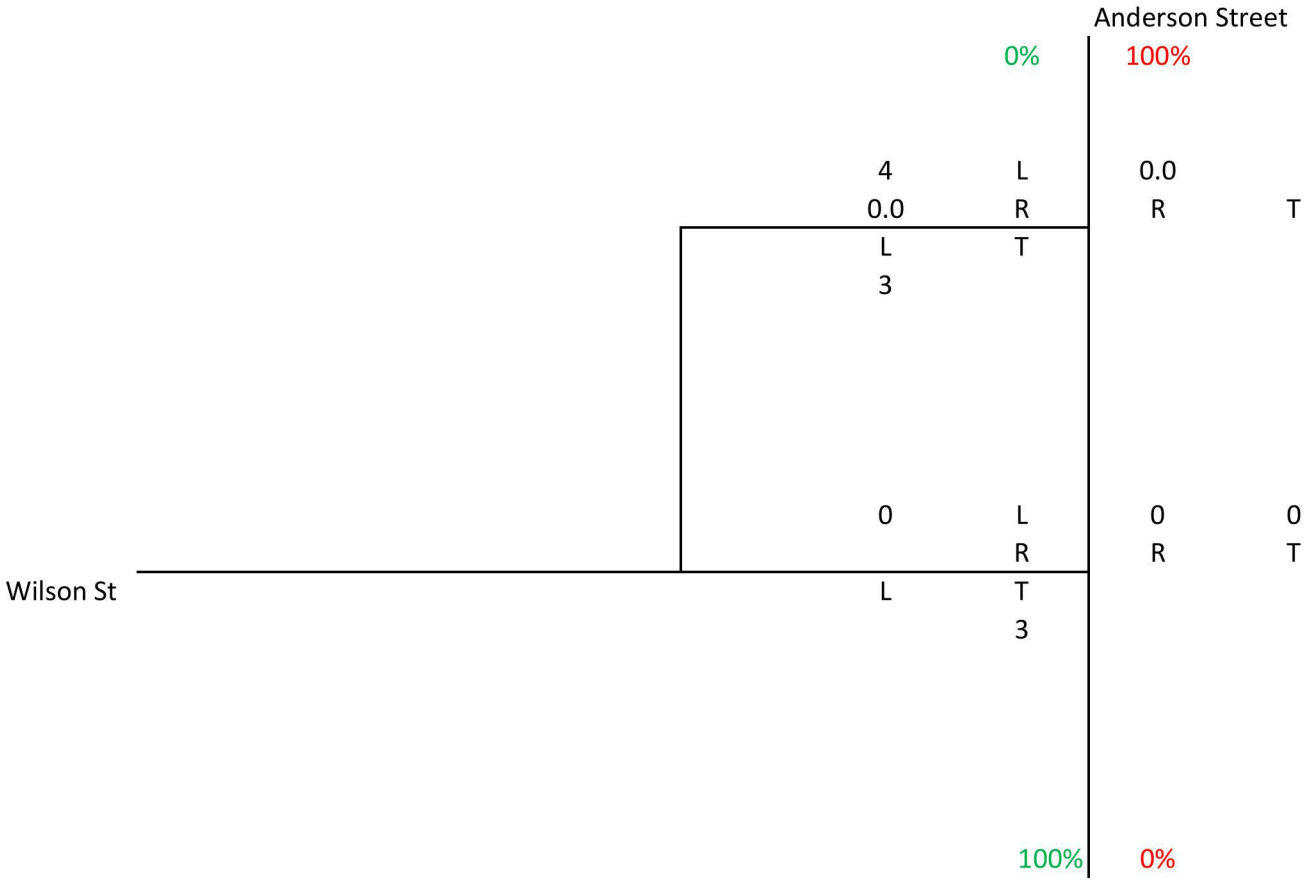
BASE AM PEAK


Anderson Street
30
126
1
23
0
5
32
321
1
0
7
45
Wilson Street
13
121
0
30
23
328

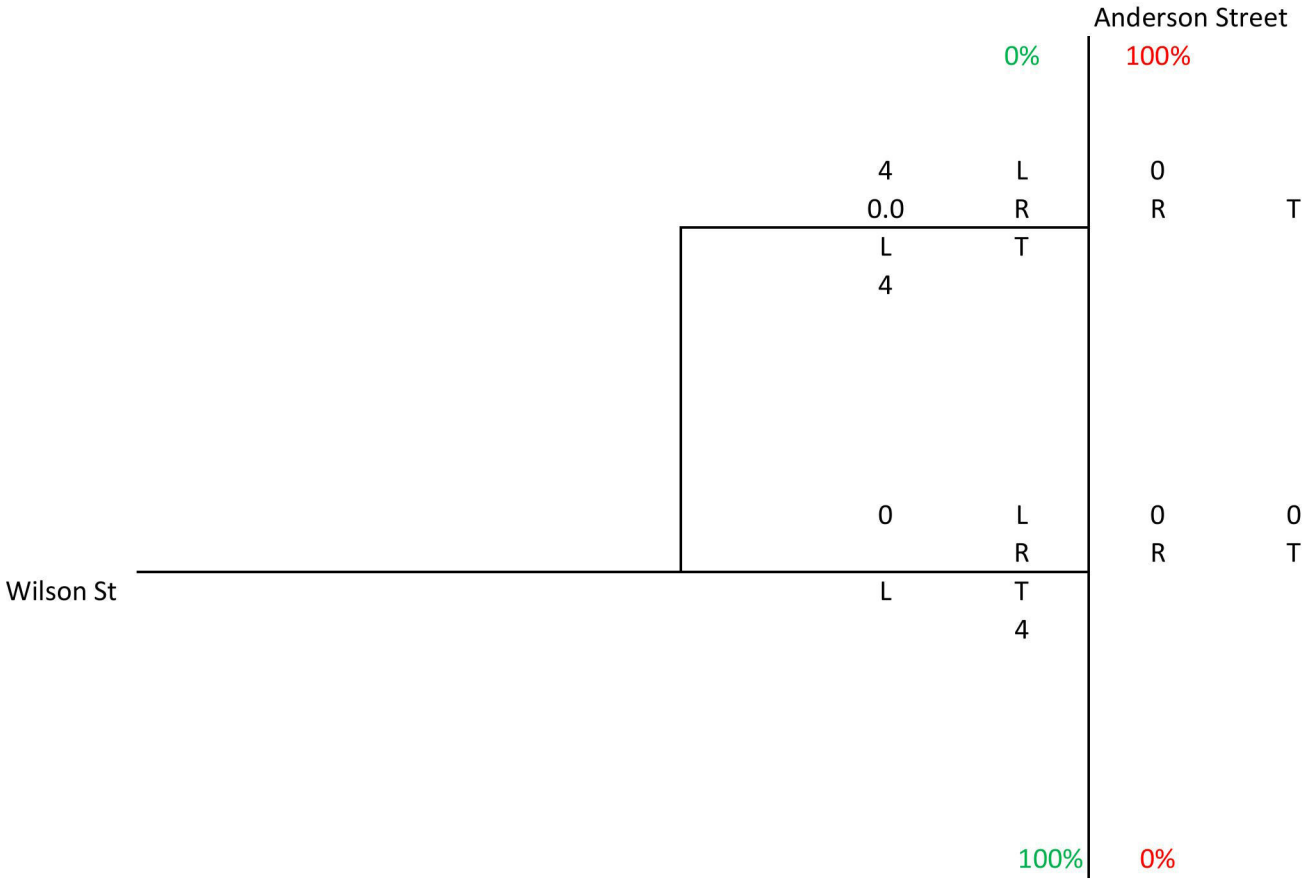
BASE PM PEAK


Anderson Street
15
203
0
13
0
14
51
214
0
17
0
74
Wilson Street
23
189
0
15
13
231

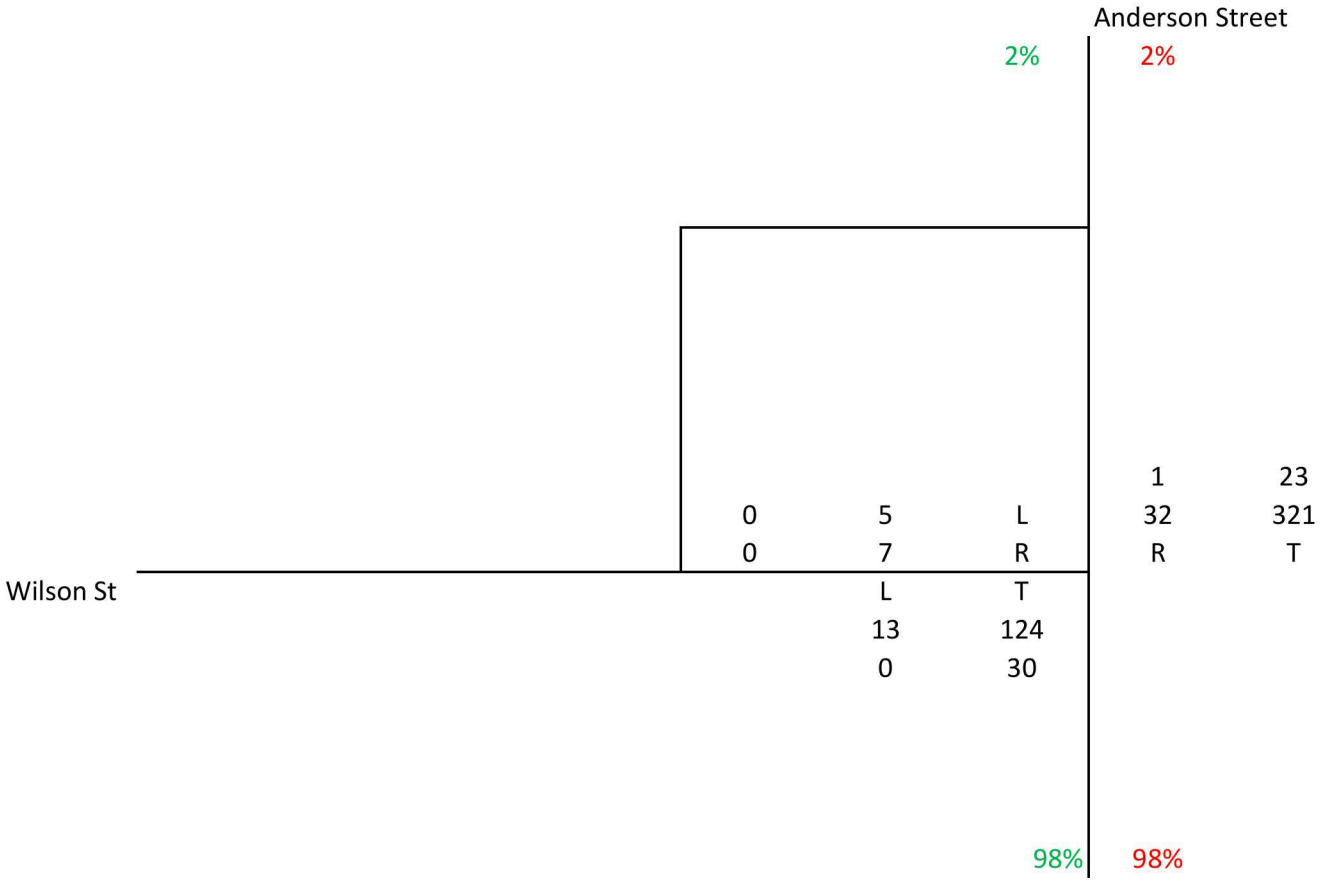
Development (AM)



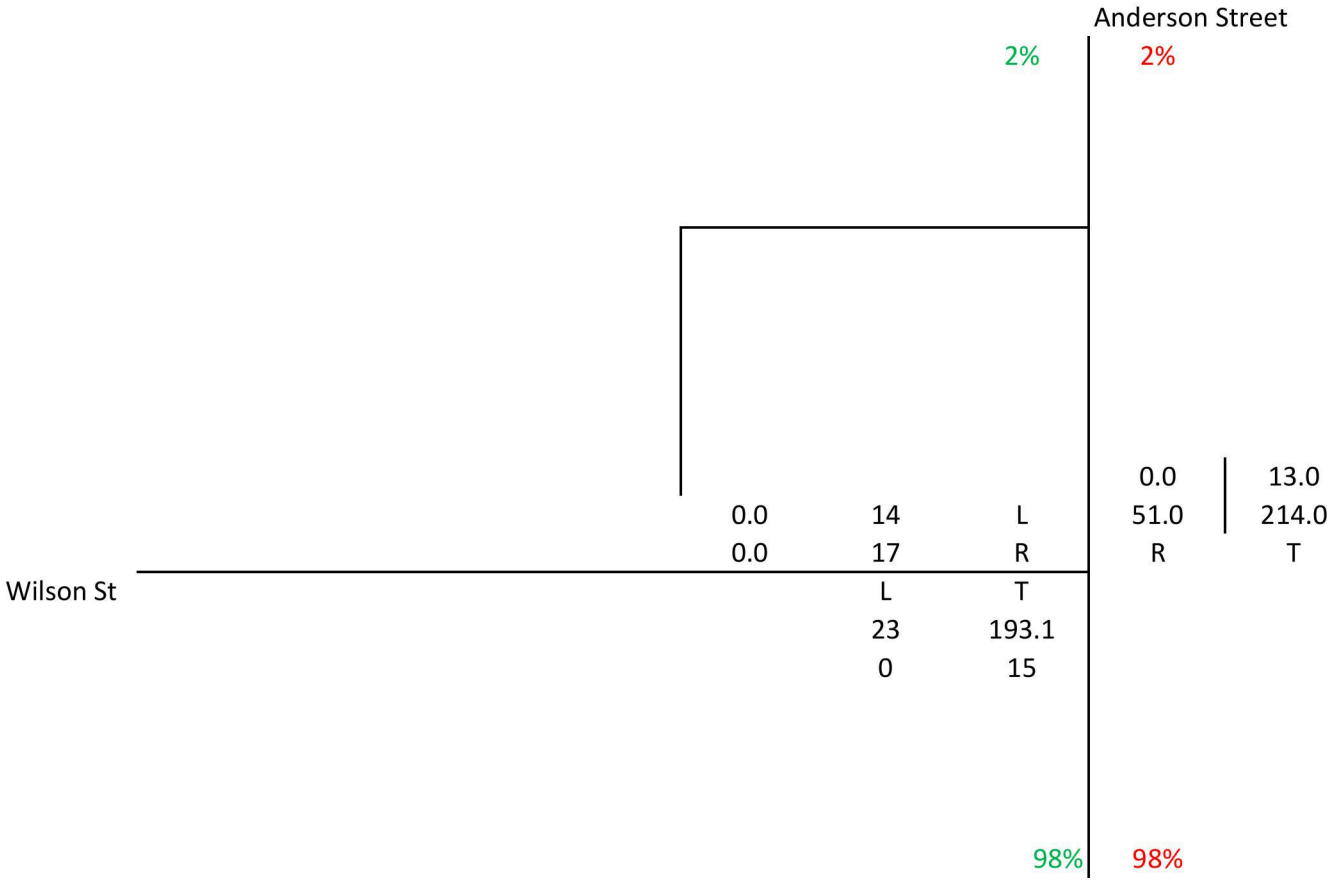
Development (PM)



2017 Base + Development (AM)

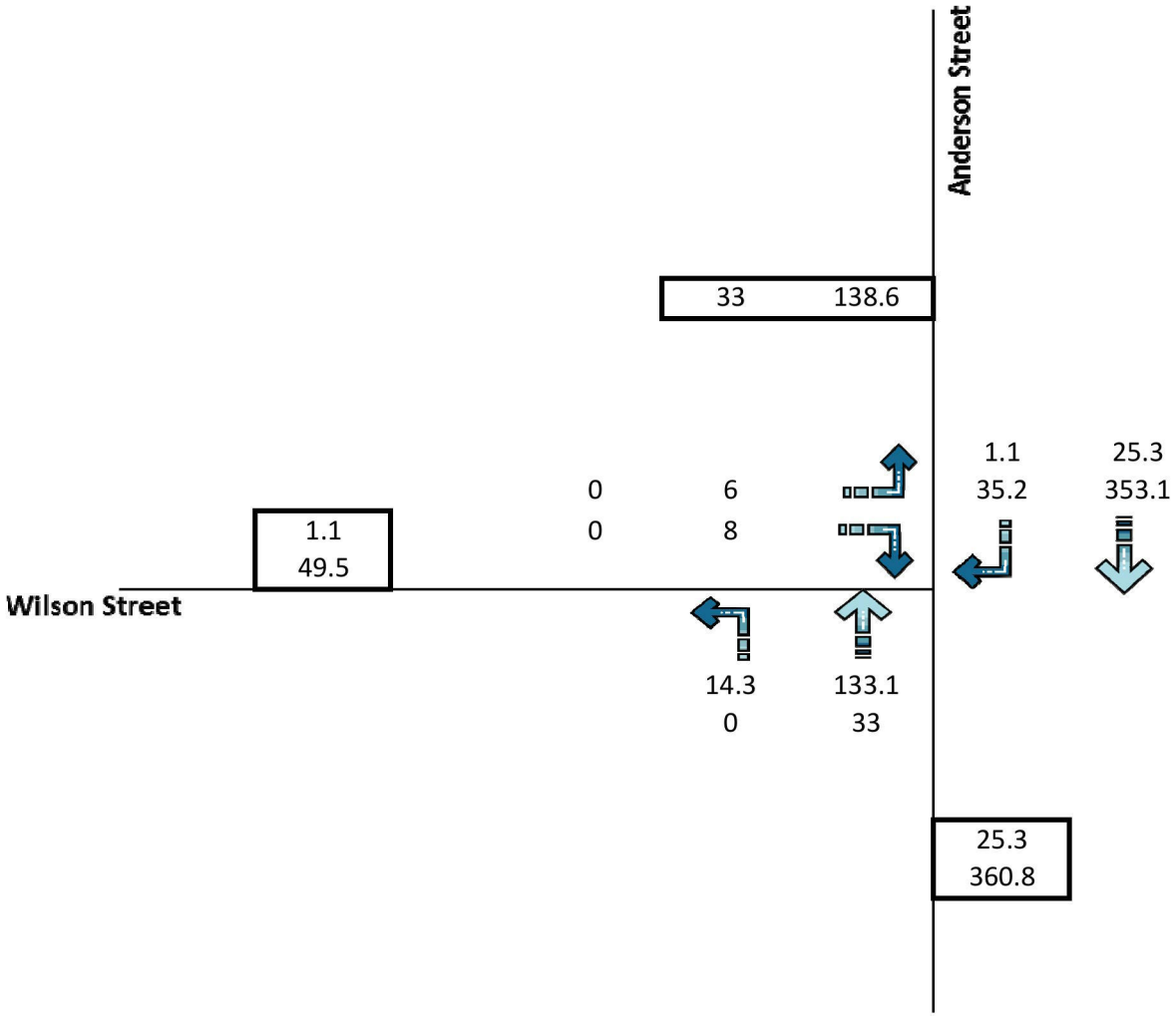


2017 Base + Development (PM)



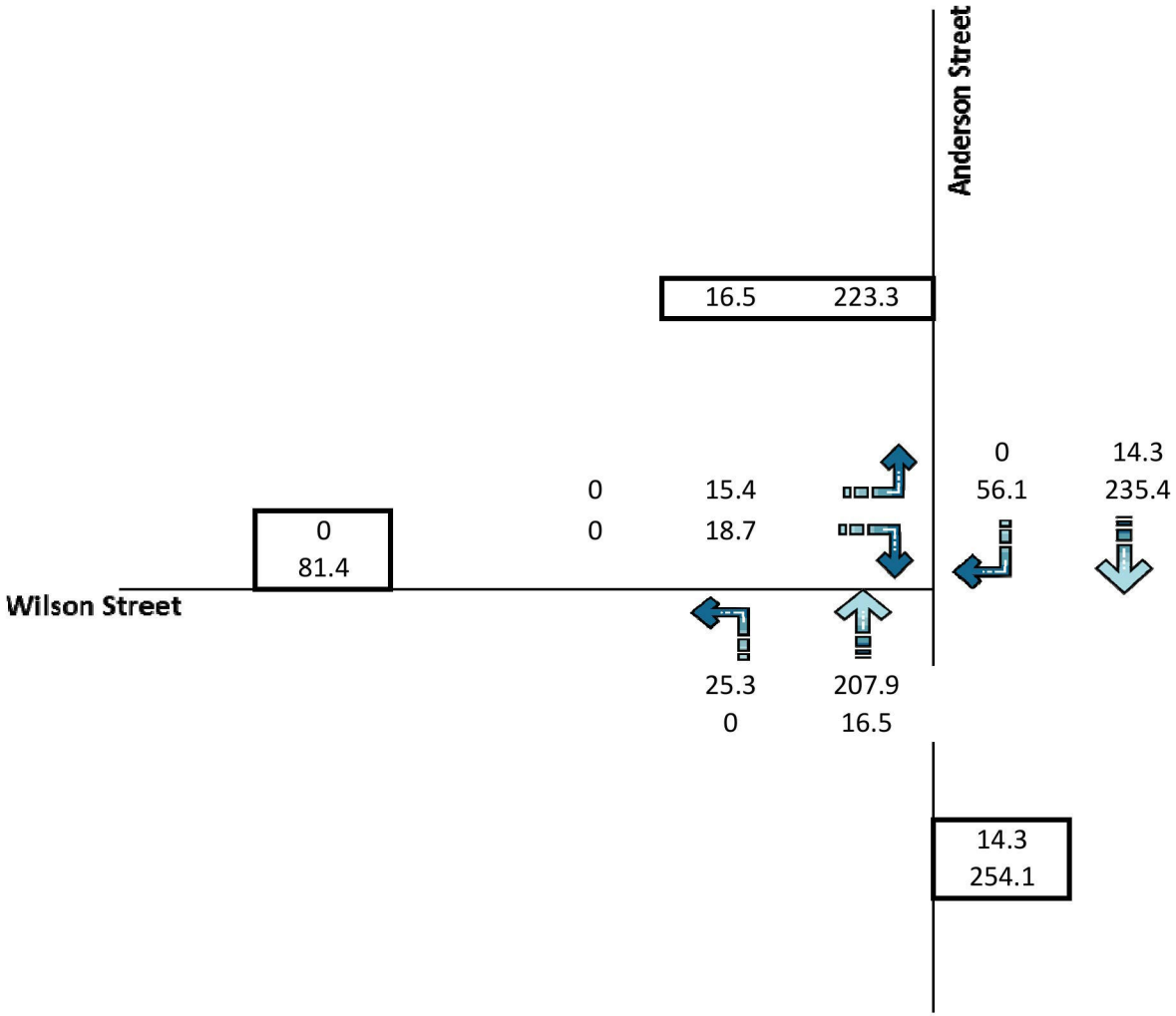
Growth	1%
Years	10

2027 Base (AM)



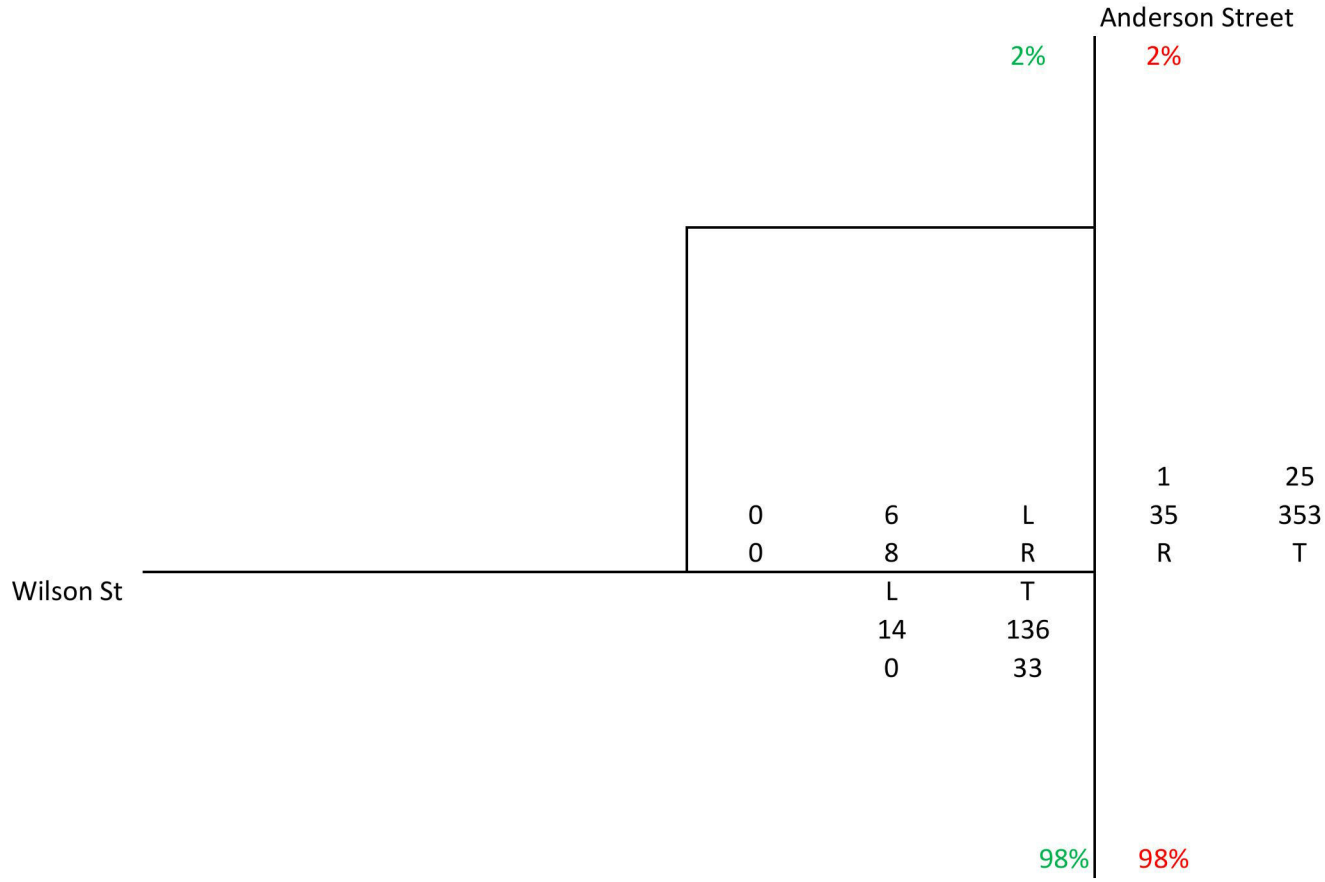
Growth	1%
Years	10

2027 Base (PM)



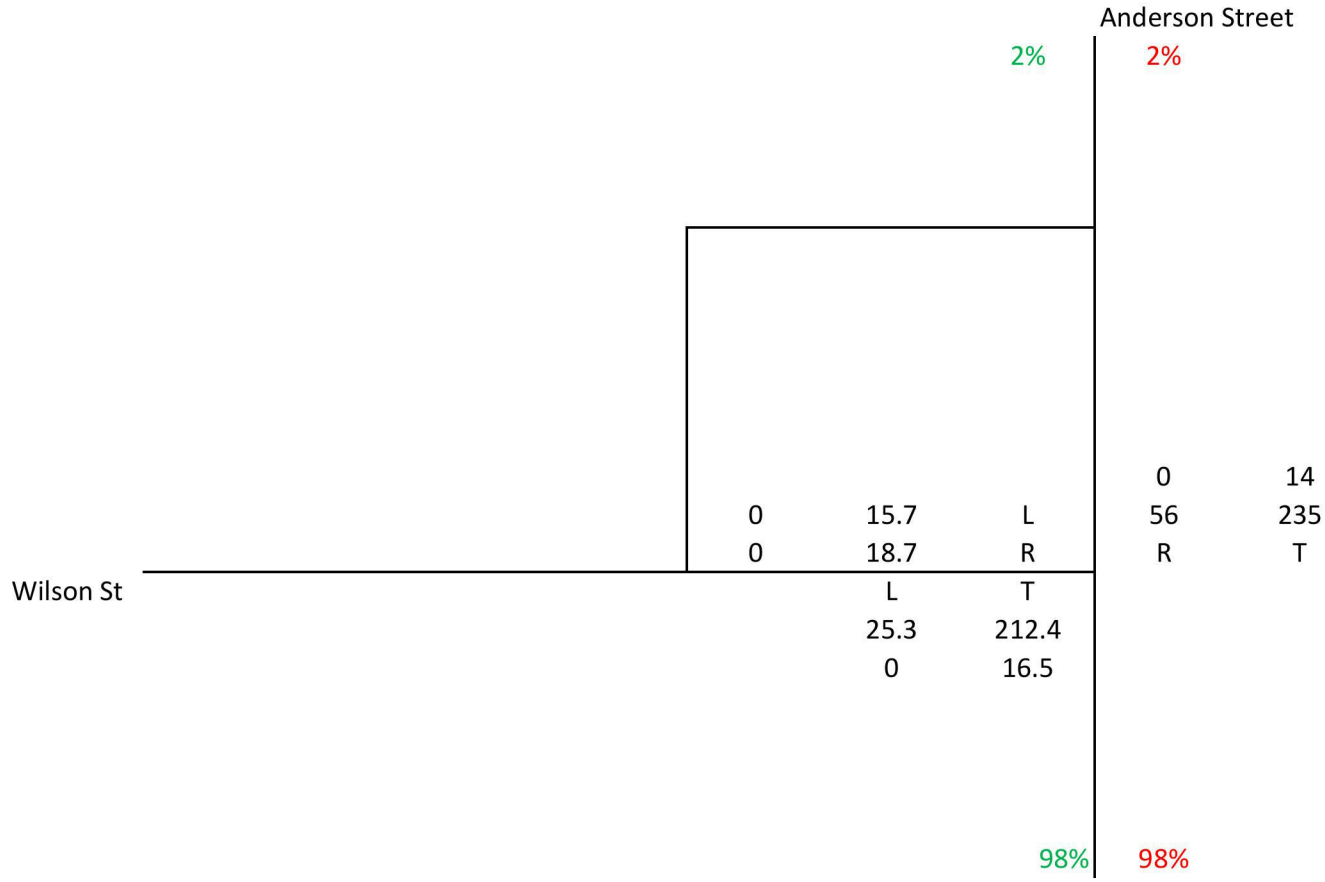
Growth	1%
Year	10

2027 Base + Development (AM)



Growth	1%
Year	10

2027 Base + Development (PM)



APPENDIX

E

SIDRA ANALYSIS

MOVEMENT SUMMARY

Site: 101 [2017 Base + Development AM]

Anderson St/Wilson St
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	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 per veh	Average Speed km/h
South: Anderson Street											
1	L2	14	0.0	0.101	3.4	LOS A	0.0	0.0	0.00	0.04	40.0
2	T1	162	19.5	0.101	0.0	LOS A	0.0	0.0	0.00	0.04	39.8
Approach		176	18.0	0.101	0.3	NA	0.0	0.0	0.00	0.04	39.8
North: Anderson Street											
8	T1	362	6.7	0.218	0.1	LOS A	0.3	2.1	0.07	0.04	39.6
9	R2	35	3.0	0.218	4.3	LOS A	0.3	2.1	0.07	0.04	38.4
Approach		397	6.4	0.218	0.5	NA	0.3	2.1	0.07	0.04	39.5
West: Wilson Street											
10	L2	5	0.0	0.017	7.3	LOS A	0.1	0.4	0.35	0.88	31.0
12	R2	7	0.0	0.017	9.7	LOS A	0.1	0.4	0.35	0.88	34.4
Approach		13	0.0	0.017	8.7	LOS A	0.1	0.4	0.35	0.88	33.4
All Vehicles		585	9.7	0.218	0.6	NA	0.3	2.1	0.06	0.06	39.5

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.
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.
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 SUMMARY

Site: 101 [2017 Base + Development PM]

Anderson St/Wilson St
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	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 per veh	Average Speed km/h
South: Anderson Street											
1	L2	24	0.0	0.131	3.4	LOS A	0.0	0.0	0.00	0.05	40.0
2	T1	219	7.2	0.131	0.0	LOS A	0.0	0.0	0.00	0.05	39.7
Approach		243	6.5	0.131	0.4	NA	0.0	0.0	0.00	0.05	39.8
North: Anderson Street											
8	T1	239	5.7	0.165	0.3	LOS A	0.4	3.0	0.16	0.10	39.1
9	R2	54	0.0	0.165	4.5	LOS A	0.4	3.0	0.16	0.10	37.5
Approach		293	4.7	0.165	1.0	NA	0.4	3.0	0.16	0.10	38.9
West: Wilson Street											
10	L2	15	0.0	0.040	7.6	LOS A	0.1	1.0	0.38	0.89	31.2
12	R2	18	0.0	0.040	9.3	LOS A	0.1	1.0	0.38	0.89	34.6
Approach		33	0.0	0.040	8.5	LOS A	0.1	1.0	0.38	0.89	33.5
All Vehicles		568	5.2	0.165	1.2	NA	0.4	3.0	0.10	0.12	39.0

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

Site: 101 [2027 Base + Development AM]

Anderson St/Wilson St
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	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 per veh	Average Speed km/h
South: Anderson Street											
1	L2	15	0.0	0.111	3.4	LOS A	0.0	0.0	0.00	0.04	40.0
2	T1	178	19.5	0.111	0.0	LOS A	0.0	0.0	0.00	0.04	39.8
Approach		193	18.0	0.111	0.3	NA	0.0	0.0	0.00	0.04	39.8
North: Anderson Street											
8	T1	398	6.6	0.239	0.1	LOS A	0.3	2.4	0.08	0.04	39.6
9	R2	38	2.8	0.239	4.4	LOS A	0.3	2.4	0.08	0.04	38.4
Approach		436	6.3	0.239	0.5	NA	0.3	2.4	0.08	0.04	39.5
West: Wilson Street											
10	L2	6	0.0	0.020	7.4	LOS A	0.1	0.5	0.38	0.89	30.7
12	R2	8	0.0	0.020	10.3	LOS A	0.1	0.5	0.38	0.89	34.3
Approach		15	0.0	0.020	9.0	LOS A	0.1	0.5	0.38	0.89	33.2
All Vehicles		643	9.7	0.239	0.6	NA	0.3	2.4	0.06	0.06	39.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2027 Base + Development PM]

Anderson St/Wilson St
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	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 per veh	Average Speed km/h
South: Anderson Street											
1	L2	26	0.0	0.144	3.4	LOS A	0.0	0.0	0.00	0.05	40.0
2	T1	241	7.4	0.144	0.0	LOS A	0.0	0.0	0.00	0.05	39.7
Approach		267	6.7	0.144	0.3	NA	0.0	0.0	0.00	0.05	39.8
North: Anderson Street											
8	T1	262	5.6	0.182	0.3	LOS A	0.5	3.4	0.17	0.10	39.1
9	R2	59	0.0	0.182	4.6	LOS A	0.5	3.4	0.17	0.10	37.4
Approach		321	4.6	0.182	1.1	NA	0.5	3.4	0.17	0.10	38.9
West: Wilson Street											
10	L2	17	0.0	0.048	7.7	LOS A	0.2	1.1	0.41	0.90	31.0
12	R2	20	0.0	0.048	9.7	LOS A	0.2	1.1	0.41	0.90	34.4
Approach		37	0.0	0.048	8.8	LOS A	0.2	1.1	0.41	0.90	33.3
All Vehicles		625	5.2	0.182	1.2	NA	0.5	3.4	0.11	0.12	39.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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MOVEMENT SUMMARY

Site: 101 [2027 Base AM]

Anderson St/Wilson St
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	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 per veh	Average Speed km/h
South: Anderson Street											
1	L2	15	0.0	0.109	3.4	LOS A	0.0	0.0	0.00	0.04	40.0
2	T1	175	19.9	0.109	0.0	LOS A	0.0	0.0	0.00	0.04	39.8
Approach		189	18.3	0.109	0.3	NA	0.0	0.0	0.00	0.04	39.8
North: Anderson Street											
8	T1	398	6.6	0.239	0.1	LOS A	0.3	2.4	0.08	0.04	39.6
9	R2	38	2.8	0.239	4.4	LOS A	0.3	2.4	0.08	0.04	38.4
Approach		436	6.3	0.239	0.5	NA	0.3	2.4	0.08	0.04	39.5
West: Wilson Street											
10	L2	6	0.0	0.020	7.4	LOS A	0.1	0.5	0.37	0.89	30.7
12	R2	8	0.0	0.020	10.2	LOS A	0.1	0.5	0.37	0.89	34.3
Approach		15	0.0	0.020	9.0	LOS A	0.1	0.5	0.37	0.89	33.2
All Vehicles		640	9.7	0.239	0.6	NA	0.3	2.4	0.06	0.06	39.5

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.
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.
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 SUMMARY

Site: 101 [2027 Base PM]

Anderson St/Wilson St
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	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 per veh	Average Speed km/h
South: Anderson Street											
1	L2	26	0.0	0.142	3.4	LOS A	0.0	0.0	0.00	0.05	40.0
2	T1	237	7.6	0.142	0.0	LOS A	0.0	0.0	0.00	0.05	39.7
Approach		263	6.8	0.142	0.4	NA	0.0	0.0	0.00	0.05	39.8
North: Anderson Street											
8	T1	262	5.6	0.182	0.3	LOS A	0.5	3.4	0.17	0.10	39.1
9	R2	59	0.0	0.182	4.6	LOS A	0.5	3.4	0.17	0.10	37.4
Approach		321	4.6	0.182	1.1	NA	0.5	3.4	0.17	0.10	38.9
West: Wilson Street											
10	L2	16	0.0	0.046	7.7	LOS A	0.2	1.1	0.40	0.90	31.0
12	R2	20	0.0	0.046	9.7	LOS A	0.2	1.1	0.40	0.90	34.4
Approach		36	0.0	0.046	8.8	LOS A	0.2	1.1	0.40	0.90	33.4
All Vehicles		620	5.3	0.182	1.2	NA	0.5	3.4	0.11	0.12	39.0

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.
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.
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 SUMMARY

Site: 101 [Base Model - AM Peak Hour]

Anderson St/Wilson St
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	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 per veh	Average Speed km/h
South: Anderson Street											
1	L2	14	0.0	0.099	3.4	LOS A	0.0	0.0	0.00	0.04	40.0
2	T1	159	19.9	0.099	0.0	LOS A	0.0	0.0	0.00	0.04	39.8
Approach		173	18.3	0.099	0.3	NA	0.0	0.0	0.00	0.04	39.8
North: Anderson Street											
8	T1	362	6.7	0.217	0.1	LOS A	0.3	2.1	0.07	0.04	39.6
9	R2	35	3.0	0.217	4.3	LOS A	0.3	2.1	0.07	0.04	38.4
Approach		397	6.4	0.217	0.5	NA	0.3	2.1	0.07	0.04	39.5
West: Wilson Street											
10	L2	5	0.0	0.017	7.3	LOS A	0.1	0.4	0.35	0.88	31.0
12	R2	7	0.0	0.017	9.7	LOS A	0.1	0.4	0.35	0.88	34.4
Approach		13	0.0	0.017	8.7	LOS A	0.1	0.4	0.35	0.88	33.4
All Vehicles		582	9.8	0.217	0.6	NA	0.3	2.1	0.06	0.06	39.5

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.
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.
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 SUMMARY

Site: 101 [Base Model - PM Peak Hour]

Anderson St/Wilson St
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	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 per veh	Average Speed km/h
South: Anderson Street											
1	L2	24	0.0	0.128	3.4	LOS A	0.0	0.0	0.00	0.05	40.0
2	T1	215	7.4	0.128	0.0	LOS A	0.0	0.0	0.00	0.05	39.7
Approach		239	6.6	0.128	0.4	NA	0.0	0.0	0.00	0.05	39.7
North: Anderson Street											
8	T1	239	5.7	0.165	0.3	LOS A	0.4	3.0	0.16	0.10	39.1
9	R2	54	0.0	0.165	4.5	LOS A	0.4	3.0	0.16	0.10	37.5
Approach		293	4.7	0.165	1.0	NA	0.4	3.0	0.16	0.10	38.9
West: Wilson Street											
10	L2	15	0.0	0.040	7.6	LOS A	0.1	1.0	0.38	0.89	31.2
12	R2	18	0.0	0.040	9.2	LOS A	0.1	1.0	0.38	0.89	34.6
Approach		33	0.0	0.040	8.5	LOS A	0.1	1.0	0.38	0.89	33.5
All Vehicles		564	5.2	0.165	1.2	NA	0.4	3.0	0.10	0.12	39.0

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.
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.
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.