76-80 Great South Road, Remuera

Residential Development

Transportation Assessment Report

21 June 2022

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1 INTRODUCTION

1.1 GENERAL

Commute Transportation Consultants (Commute) has been engaged by Dilworth Trust Board to prepare a Transport Assessment (TA) for a residential development at 76-80 Great South Road, Remuera. The development features:

- Approximately 200 units;
- Commercial GFA of 355sqm;
- Retail GFA of 129sqm;
- Food and beverage GFA of 211sqm;
- 83 parking spaces; and
- 206 bicycle spaces.

This report assesses the transport-related effects of the proposal, including:

- a description of the site and its surrounding traffic environment;
- a description of the key transportation-related aspects of the proposal;
- the traffic anticipated to be generated by the proposal;
- the proposed form of access and egress;
- the proposed form of vehicle and bicycle parking; and
- the proposed servicing arrangements.

These and other matters are addressed in detail in this report. This report concludes that the establishment of the proposed residential development can be undertaken in a way so that its effect on the function, capacity and safety of the surrounding road network will be minimal.

2 EXISTING ENVIRONMENT

2.1 SITE LOCATION

The site is zoned 'Business – Mixed Use Zone' within the Auckland Unitary Plan (Unitary Plan). The site features frontage to Great South Road and Mauranui Avenue. Great South Road is classified as an arterial road; Mauranui Avenue is not classified as an arterial road. Both roads feature a posted speed limit of 50 km/h. The site is subject to an Auckland Transport (AT) road widening designation – (1618) in the Unitary Plan. In the vicinity of the site, Great South Road has one general vehicle lane in and peak hour bus lanes in either direction, which convert to kerbside parking outside commuter peak periods.

Figure 1 below details the existing site environment. The Auckland Transport designation is shown in red.

Figure 1: Existing Environment

2.2 TRAFFIC VOLUMES

2.2.1 AT TRAFFIC VOLUMES

Existing traffic volumes on this section of Great South Road were sourced from AT traffic counts. The most recent count in August 2019 recorded the following volumes:

- 5-day ADT of 14,100 vehicles per day (vpd);
- AM peak hour volume of 1,400 vehicles per hour (vph); and
- PM peak hour volume of 1,200 vph.

The volumes detailed above are considered typical of an arterial road within Auckland. From on-site observations, Great South Road in this location operates well, outside of commuter and afternoon school peak periods, with minimal delays and good Levels of Service. Within the peak periods, traffic

volumes are much larger as detailed above, with moderate delays, however Levels of Service are still considered satisfactory for an arterial road within a town centre. Traffic counts are not available on Mauranui Avenue, however are considered to be low, with satisfactory operation throughout the day. As will be detailed below, traffic volume increases generated by the proposal are anticipated to be minimal.

2.2.2 TRAFFIC SURVEYS

Traffic surveys at the at the Great South Road / Mauranui Avenue intersection and the Mauranui Avenue / St Marks Road intersection were undertaken on Tuesday 12 April 2022. The peak hour survey results are detailed in Table 1 and Table 2 below.

Table 1: Traffic Survey - Great South Road / Mauranui Avenue

	AM					PM				
	Cars	Trucks	Buses	Cyclists	AM Total	Cars	Trucks	Buses	Cyclists	PM Total
Mauranui Rd	**95**	**0**	**0**	**0**	**95**	**106**	**3**	**0**	**3**	**112**
Left into Great South Rd (S/E)	53	0	0	0	53	83	3	0	3	89
Right into Great South Rd (N/W	42	0	0	0	42	23	0	0	0	23
Great South Rd (S/E)	**887**	**25**	**13**	**14**	**939**	**638**	**7**	**7**	**0**	**652**
Thru to Great South Rd (N/W)	674	16	13	11	714	580	6	7	0	593
Right into Mauranui Rd	213	9	0	3	225	58	1	0	0	59
Great South Rd (N/W)	**390**	**4**	**7**	**4**	**405**	**462**	**4**	**9**	**12**	**487**
Left into Mauranui Rd	57	0	0	0	57	34	0	0	0	34
Thru to Great South Rd (S/E)	333	4	7	4	348	428	4	9	12	453
Grand Total	1372	29	20	18	1439	1206	14	16	15	1251

Table 2: Traffic Survey - Mauranui Avenue / St Marks Road

	AM					PM				
	Cars	Trucks	Buses	Cyclists	AM Total	Cars	Trucks	Buses	Cyclists	PM Total
St Marks Rd (East)	**656**	**7**	**4**	**3**	**670**	**453**	**6**	**2**	**0**	**461**
Left into Mauranui Rd	71	1	0	0	72	17	1	0	0	18
Thru to St Marks Rd (West)	585	6	4	3	598	436	5	2	0	443
Mauranui Rd	**247**	**10**	**0**	**4**	**261**	**187**	**8**	**0**	**0**	**195**
Left into St Marks Rd (West	148	5	0	3	156	109	4	0	0	113
Right into St Marks Rd (East	99	5	0	1	105	78	4	0	0	82
St Marks Rd (West)	**445**	**6**	**3**	**1**	**455**	**596**	**11**	**3**	**1**	**611**
Thru to St Marks Rd (East)	408	6	3	1	418	564	10	3	1	578
Right into Mauranui Rd	37	0	0	0	37	32	1	0	0	33
Grand Total	1348	23	7	8	1386	1236	25	5	1	1267

As detailed above, traffic volumes on Great South Road are typical of an arterial road in Auckland.

2.3 PUBLIC TRANSPORT

The site is considered to be well connected to the public transport network. Route 70 provides a connection between Botany and the city. Route 70 is a frequent service with a bus provided at least

every 15 minutes, from 7.00am to 7.00pm, 7 days a week. Remuera Train Station is also located approximately 700m away.

A pair of bus stops are provided near the site on Great South Road. Figure 2 shows the public transport services in the area.

Figure 2: Public Transport

2.4 ROAD SAFETY

A search of the New Zealand Transport Agency's (NZTA) Crash Analysis System (CAS) has been carried out to identify all reported crashes in the vicinity of the site during the five-year period 2017 - 2021 as well as any available 2021 data. The study area includes the site frontages to Great South Road and Mauranui Avenue, as well as a 50m radii around the Great South Road / Mauranui Avenue and the Great South Road / Erin Street intersections. A total of five crashes were recorded within the search area:

- Two crashes occurred at the Great South Road / Mauranui Avenue intersection and resulted in minor injury;
- One crash occurred midblock on Great South Road and did not result in injury; and
- Two crashes occurred midblock on Mauranui Avenue and did not result in injury.

The number of crashes within the crash search are considered typical of an arterial road in a centre. The proposal is not considered to detrimentally effect the good existing crash record, with the development designed to ensure safe movements into and out of the site.

3 PROPOSAL

The proposal is for a residential development at 76-80 Great South Road, Remuera. The development features:

- Approximately 200 units;
- Commercial GFA of 355sqm;
- Retail GFA of 129sqm;
- Food and beverage GFA of 211sqm;
- 83 parking spaces; and
- 206 bicycle spaces.

Access to the site will be provided via a new vehicle crossing to Mauranui Avenue, connecting to the lower ground carpark. A second exit-only vehicle crossing to Great South Road is also provided, allowing exit manoeuvres for service vehicles. The existing accesses to the site will be removed. The existing Motel 80 will be demolished.

Figure 3 and Figure 4 below show the proposed development layout.

Figure 3: Proposed Development Layout – Level B1

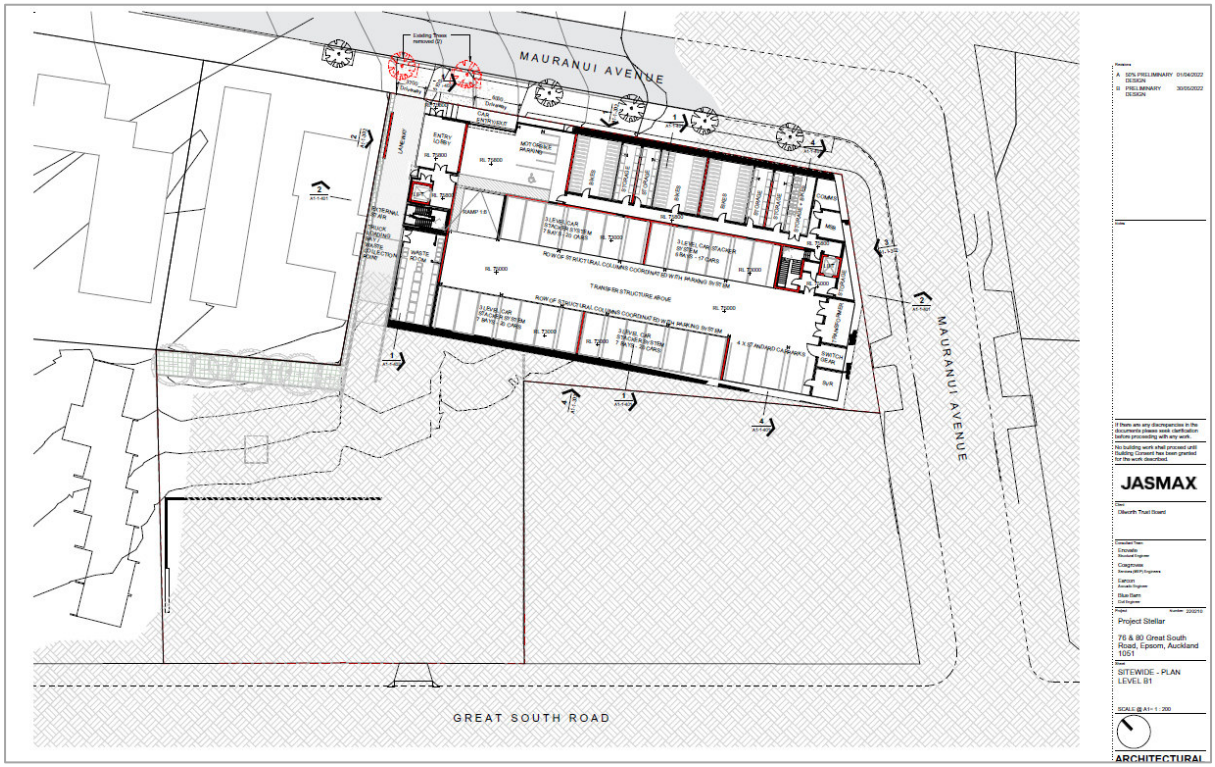


Figure 4: Proposed Development Layout – Level B0

4 TRIP GENERATION

4.1 EXISTING TRIP GENERATION

The peak hour trip generation of visitor accommodation is typically estimated using the predictive models within the RTA Guide[1]. For Motels, the RTA Guide details a trip rate of 0.4 trips / unit within the peak hour. Motel 80 features approximately 35 units.

As such, the 35 units on site are anticipated to generate 14 trips in the peak hour.

4.2 DEVELOPMENT TRIP GENERATION

The peak hour trip generation of dwelling houses is typically estimated using the predictive models within the RTA Guide.

- All dwellings have been assessed as ‘Medium Density Residential Flat Buildings’;
- The commercial GFA has been assessed as ‘office’; and
- The retail and food and beverage GFA has been assessed as ‘retail - specialty shops’.

Table 3 below details the peak hour trip generation for the development. The residential component of the trip generation calculation has been based on a scheme plan of the development showing 183x 2-bedroom units and 8x 3-bedroom units.

[1] Roads and Traffic Authority of NSW, Guide to Traffic Generating Developments, Version 2.2, October 2002

Table 3: RTA Guide Traffic Generation

Activity	Notes	No. units / GFA	Rate (peak hour)	Generated Trips (vph)
Residential	2 bedrooms or less	183 units	0.4 trips / dwelling	73
	3 bedrooms or more	8 units	0.5 trips / dwelling	4
Commercial	Office	355sqm	2 trips / 100sqm	7
Retail	Retail	129sqm	4.6 trips / 100 sqm	6
	Food and beverage	211sqm	4.6 trips / 100 sqm	10
TOTAL	**-**	**-**	**-**	**100**

Based on the above, the overall trip generation for the site is 100vph. This represents an increase in peak hour vehicle trips of 86vph. It is noted that the development only features 83 parking spaces, and therefore the trip generation calculation above is considered a conservative estimate. Further, the retail and food and beverage activities are likely to be predominantly used by people already on-site, and as such unlikely to generate any external traffic.

Rule E27.6.1 'Trip generation' of the Unitary Plan sets out trip generation limits as to when resource consent for a restricted discretionary activity is required. For residential dwellings, this limit is 100 dwellings, and therefore additional assessment is required.

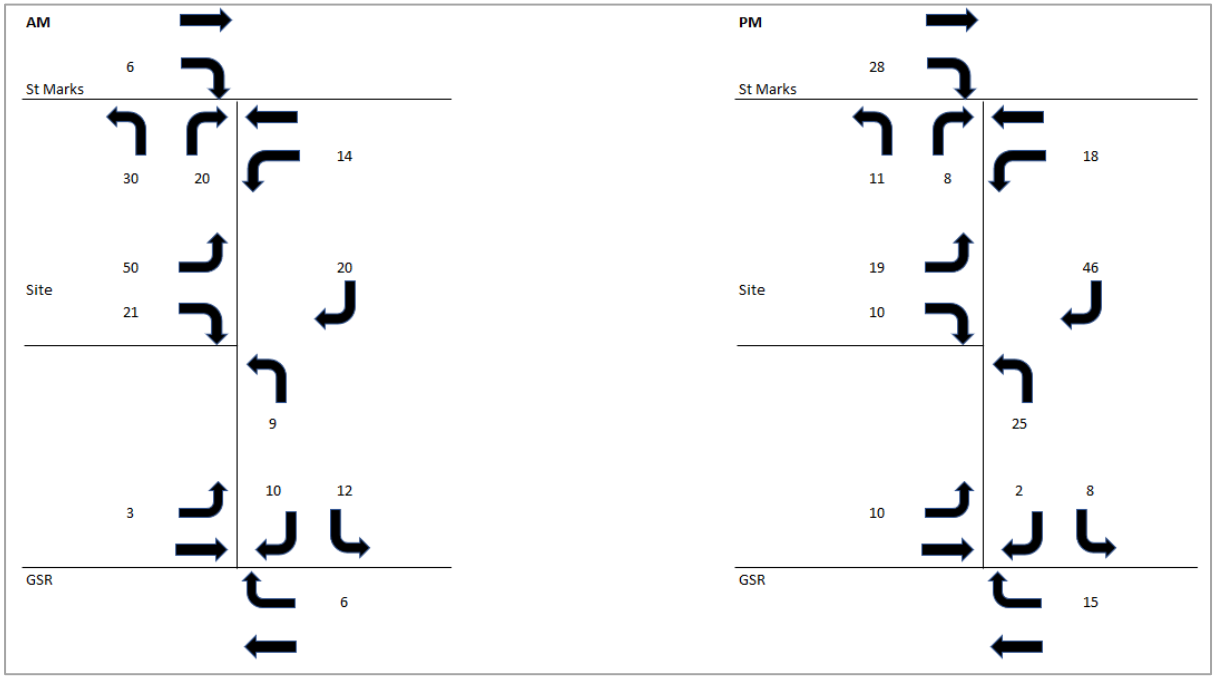
4.3 TRIP DISTRIBUTION

The key intersections for assessment are the Great South Road / Mauranui Avenue and the Mauranui Avenue / St Marks Road intersections. The additional trips generated by the development have been distributed based generally on the existing traffic volumes on Mauranui Avenue. Inbound and outbound splits were used for analysis as follows:

- Residential (inbound / outbound)
  - AM Peak – 20% / 80%
  - PM Peak – 80% / 20%
- Commercial (inbound / outbound)
  - AM Peak – 80% / 20%
  - PM Peak – 20% / 80%
- Retail (inbound / outbound)
  - AM Peak – 50% / 50%
  - PM Peak – 50% / 50%

The traffic generated by the proposal and the trip distribution is shown in Figure 5 below.

Figure 5: Trip Generation and Distribution



5 ASSESSMENT OF EFFECTS

5.1 TRAFFIC MODELLING

The traffic effects of the proposal have been assessed using the traffic modelling software SIDRA. The results presented in this report include the Degree of Saturation, which is a measure of available capacity and the Level of Service ("LOS"), which is a generalised function of delay. For priority-controlled intersections, a Degree of Saturation of less than 0.80 is considered to be acceptable. LOS A and B are very good and indicative of free-flow conditions; C is good; D is acceptable; and E and F are indicative of congestion and unstable conditions.

5.2 EXISTING INTERSECTION PERFORMANCE

5.2.1 GREAT SOUTH ROAD / MAURANUI AVENUE

The existing Great South Road / Mauranui Avenue intersection performance in the AM and PM peak hours is detailed in Table 4 and Table 5 below.

Table 4: Existing Intersection Performance – AM Peak Hour

MOVEMENT SUMMARY

Site: 101 [GSR / Mauranui - AM Existing (Site Folder: GSR / Mauranui)]

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

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que
East: GSR E											
5	T1	703	5.0	740	5.0	0.395	0.1	LOS A	0.0	0.0	0.00
6	R2	222	5.0	234	5.0	0.198	7.4	LOS A	1.0	7.3	0.49
Approach		925	5.0	974	5.0	0.395	1.9	NA	1.0	7.3	0.12
North: Mauranui											
7	L2	53	5.0	56	5.0	0.291	11.2	LOS B	1.1	8.3	0.63
9	R2	42	5.0	44	5.0	0.291	29.0	LOS D	1.1	8.3	0.63
Approach		95	5.0	100	5.0	0.291	19.1	LOS C	1.1	8.3	0.63
West: GSR W											
10	L2	57	5.0	60	5.0	0.225	5.7	LOS A	0.0	0.0	0.00
11	T1	344	5.0	362	5.0	0.225	0.1	LOS A	0.0	0.0	0.00
Approach		401	5.0	422	5.0	0.225	0.9	NA	0.0	0.0	0.00
All Vehicles		1421	5.0	1496	5.0	0.395	2.7	NA	1.1	8.3	0.12

Table 5: Existing Intersection Performance – PM Peak Hour

MOVEMENT SUMMARY

Site: 101 [GSR / Mauranui - PM Existing (Site Folder: GSR / Mauranui)]

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

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que
East: GSR E											
5	T1	593	5.0	624	5.0	0.333	0.1	LOS A	0.0	0.0	0.00
6	R2	59	5.0	62	5.0	0.057	7.6	LOS A	0.3	1.9	0.49
Approach		652	5.0	686	5.0	0.333	0.8	NA	0.3	1.9	0.04
North: Mauranui											
7	L2	86	5.0	91	5.0	0.194	10.8	LOS B	0.8	5.6	0.57
9	R2	23	5.0	24	5.0	0.194	21.3	LOS C	0.8	5.6	0.57
Approach		109	5.0	115	5.0	0.194	13.0	LOS B	0.8	5.6	0.57
West: GSR W											
10	L2	34	5.0	36	5.0	0.266	5.7	LOS A	0.0	0.0	0.00
11	T1	441	5.0	464	5.0	0.266	0.1	LOS A	0.0	0.0	0.00
Approach		475	5.0	500	5.0	0.266	0.5	NA	0.0	0.0	0.00
All Vehicles		1236	5.0	1301	5.0	0.333	1.7	NA	0.8	5.6	0.07

As shown above, the intersection operates satisfactorily in both peak hours, with reasonable queues on the major approaches. Overall, the intersection generally operates with an LOS of between A and C, with the exception of the right turn out from Mauranui Avenue in the AM peak hour. This movement operates at LOS D, which is considered acceptable for a stop controlled intersection in a peak hour.

5.2.2 MAURANUI AVENUE / ST MARKS ROAD

The existing Mauranui Avenue / St Marks Road intersection performance in the AM and PM peak hours is detailed in Table 6 and Table 7 below.

Table 6: Existing Intersection Performance – AM Peak Hour

MOVEMENT SUMMARY

Site: 101 [St Marks / Mauranui AM Existing (Site Folder: St Marks / Mauranui)]

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

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que
South: Mauranui											
1	L2	153	5.0	161	5.0	0.236	12.6	LOS B	1.0	7.3	0.61
3	R2	104	5.0	109	5.0	0.377	22.7	LOS C	1.5	11.2	0.83
Approach		257	5.0	271	5.0	0.377	16.7	LOS C	1.5	11.2	0.70
East: St Marks E											
4	L2	72	5.0	76	5.0	0.374	5.7	LOS A	0.0	0.0	0.00
5	T1	595	5.0	626	5.0	0.374	0.1	LOS A	0.0	0.0	0.00
Approach		667	5.0	702	5.0	0.374	0.7	NA	0.0	0.0	0.00
West: St Marks W											
11	T1	417	5.0	439	5.0	0.234	0.1	LOS A	0.0	0.0	0.00
12	R2	37	5.0	39	5.0	0.048	9.1	LOS A	0.2	1.3	0.55
Approach		454	5.0	478	5.0	0.234	0.8	NA	0.2	1.3	0.04
All Vehicles		1378	5.0	1451	5.0	0.377	3.7	NA	1.5	11.2	0.15

Table 7: Existing Intersection Performance – PM Peak Hour

MOVEMENT SUMMARY

Site: 101 [St Marks / Mauranui PM Existing (Site Folder: St Marks / Mauranui)]

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

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que
South: Mauranui											
1	L2	113	5.0	119	5.0	0.139	10.9	LOS B	0.6	4.3	0.51
3	R2	82	5.0	86	5.0	0.281	20.3	LOS C	1.1	7.8	0.80
Approach		195	5.0	205	5.0	0.281	14.8	LOS B	1.1	7.8	0.63
East: St Marks E											
4	L2	18	5.0	19	5.0	0.257	5.7	LOS A	0.0	0.0	0.00
5	T1	443	5.0	466	5.0	0.257	0.1	LOS A	0.0	0.0	0.00
Approach		461	5.0	485	5.0	0.257	0.3	NA	0.0	0.0	0.00
West: St Marks W											
11	T1	577	5.0	607	5.0	0.324	0.1	LOS A	0.0	0.0	0.00
12	R2	33	5.0	35	5.0	0.032	7.5	LOS A	0.1	0.9	0.42
Approach		610	5.0	642	5.0	0.324	0.5	NA	0.1	0.9	0.02
All Vehicles		1266	5.0	1333	5.0	0.324	2.6	NA	1.1	7.8	0.11

As shown above, the intersection operates satisfactorily in both peak hours, with reasonable queues on the major approaches. Overall, the intersection generally operates with an LOS of between A and C, which is considered acceptable for a stop controlled intersection in a peak hour.

5.3 ANTICIPATED INTERSECTION PERFORMANCE

5.3.1 GREAT SOUTH ROAD / MAURANUI AVENUE

The anticipated Great South Road / Mauranui Avenue intersection performance with the additional development traffic is summarised in Table 8 and Table 9 below.

Table 8: Anticipated Intersection Performance – AM Peak Hour

MOVEMENT SUMMARY

Site: 101 [GSR / Mauranui - AM Dev (Site Folder: GSR / Mauranui)]

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

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que
East: GSR E											
5	T1	703	5.0	740	5.0	0.395	0.1	LOS A	0.0	0.0	0.00
6	R2	228	5.0	240	5.0	0.204	7.5	LOS A	1.0	7.5	0.49
Approach		931	5.0	980	5.0	0.395	1.9	NA	1.0	7.5	0.12
North: Mauranui											
7	L2	65	5.0	68	5.0	0.363	12.3	LOS B	1.5	11.3	0.65
9	R2	52	5.0	55	5.0	0.363	30.8	LOS D	1.5	11.3	0.65
Approach		117	5.0	123	5.0	0.363	20.6	LOS C	1.5	11.3	0.65
West: GSR W											
10	L2	60	5.0	63	5.0	0.227	5.7	LOS A	0.0	0.0	0.00
11	T1	344	5.0	362	5.0	0.227	0.1	LOS A	0.0	0.0	0.00
Approach		404	5.0	425	5.0	0.227	0.9	NA	0.0	0.0	0.00
All Vehicles		1452	5.0	1528	5.0	0.395	3.1	NA	1.5	11.3	0.13

Table 9: Anticipated Intersection Performance – PM Peak Hour

MOVEMENT SUMMARY

Site: 101 [GSR / Mauranui - PM Dev (Site Folder: GSR / Mauranui)]

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

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que
East: GSR E											
5	T1	593	5.0	624	5.0	0.334	0.1	LOS A	0.0	0.0	0.00
6	R2	74	5.0	78	5.0	0.073	7.7	LOS A	0.3	2.4	0.50
Approach		667	5.0	702	5.0	0.334	0.9	NA	0.3	2.4	0.06
North: Mauranui											
7	L2	94	5.0	99	5.0	0.214	10.8	LOS B	0.8	6.2	0.58
9	R2	25	5.0	26	5.0	0.214	21.9	LOS C	0.8	6.2	0.58
Approach		119	5.0	125	5.0	0.214	13.2	LOS B	0.8	6.2	0.58
West: GSR W											
10	L2	44	5.0	46	5.0	0.272	5.7	LOS A	0.0	0.0	0.00
11	T1	441	5.0	464	5.0	0.272	0.1	LOS A	0.0	0.0	0.00
Approach		485	5.0	511	5.0	0.272	0.6	NA	0.0	0.0	0.00
All Vehicles		1271	5.0	1338	5.0	0.334	2.0	NA	0.8	6.2	0.08

As shown above, the intersection operates satisfactorily in both peak hours, with reasonable queues on the major approaches. Overall, the intersection generally operates with an LOS of between A and C, with the exception of the right turn out from Mauranui Avenue in the AM peak hour. This movement continues to operate at LOS D, which is considered acceptable for a stop controlled intersection in a peak hour. The overall average delay for the intersection increases by less than one second in both peak hours, and therefore the effects of the development on the operation of this intersection are considered minimal.

5.3.2 MAURANUI AVENUE / ST MARKS ROAD

The anticipated Mauranui Avenue / St Marks Road intersection performance with the additional development traffic is summarised in Table 10 and Table 11 below.

Table 10: Anticipated Intersection Performance – AM Peak Hour

MOVEMENT SUMMARY

Site: 101 [St Marks / Mauranui AM Dev (Site Folder: St Marks / Mauranui)]

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

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que
South: Mauranui											
1	L2	183	5.0	193	5.0	0.282	13.0	LOS B	1.3	9.6	0.63
3	R2	124	5.0	131	5.0	0.458	24.5	LOS C	2.0	14.5	0.85
Approach		307	5.0	323	5.0	0.458	17.7	LOS C	2.0	14.5	0.72
East: St Marks E											
4	L2	86	5.0	91	5.0	0.382	5.7	LOS A	0.0	0.0	0.00
5	T1	595	5.0	626	5.0	0.382	0.1	LOS A	0.0	0.0	0.00
Approach		681	5.0	717	5.0	0.382	0.8	NA	0.0	0.0	0.00
West: St Marks W											
11	T1	417	5.0	439	5.0	0.234	0.1	LOS A	0.0	0.0	0.00
12	R2	43	5.0	45	5.0	0.057	9.2	LOS A	0.2	1.5	0.56
Approach		460	5.0	484	5.0	0.234	0.9	NA	0.2	1.5	0.05
All Vehicles		1448	5.0	1524	5.0	0.458	4.4	NA	2.0	14.5	0.17

Table 11: Anticipated Intersection Performance – PM Peak Hour

MOVEMENT SUMMARY

Site: 101 [St Marks / Mauranui PM Dev (Site Folder: St Marks / Mauranui)]

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

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que
South: Mauranui											
1	L2	124	5.0	131	5.0	0.153	10.9	LOS B	0.6	4.7	0.52
3	R2	90	5.0	95	5.0	0.323	21.6	LOS C	1.3	9.2	0.82
Approach		214	5.0	225	5.0	0.323	15.4	LOS C	1.3	9.2	0.64
East: St Marks E											
4	L2	36	5.0	38	5.0	0.268	5.7	LOS A	0.0	0.0	0.00
5	T1	443	5.0	466	5.0	0.268	0.1	LOS A	0.0	0.0	0.00
Approach		479	5.0	504	5.0	0.268	0.5	NA	0.0	0.0	0.00
West: St Marks W											
11	T1	577	5.0	607	5.0	0.324	0.1	LOS A	0.0	0.0	0.00
12	R2	61	5.0	64	5.0	0.061	7.7	LOS A	0.2	1.8	0.44
Approach		638	5.0	672	5.0	0.324	0.8	NA	0.2	1.8	0.04
All Vehicles		1331	5.0	1401	5.0	0.324	3.1	NA	1.3	9.2	0.12

As shown above, the intersection operates satisfactorily in both peak hours, with reasonable queues on the major approaches. Overall, the intersection generally operates with an LOS of between A and C, which is considered acceptable for a stop controlled intersection in a peak hour. The overall average delay for the intersection increases by less than one second in both peak hours, and therefore the effects of the development on the operation of this intersection are considered minimal.

6 ACCESS

6.1 GENERAL

Access to the development will be provided via a new vehicle crossing to Mauranui Avenue, connecting to the lower ground carpark serving residents. An entry-only access from Mauranui Avenue and an exit-only access to Great South Road are also provided, only accommodating service vehicles, which operate in a one-way direction through the site.

6.2 SIGHT DISTANCE

6.2.1 GREAT SOUTH ROAD ACCESS

The RTS 6 Guide details sight distance requirements for vehicle accesses. RTS 6 details a sight distance requirement of 90m for an arterial road with 50km/h posted speed limit.

Photographs 1 and 2 below detail the sight distance to the north and south respectively from the proposed access location on Great South Road.

Photograph 1: Sight Distance to the North

Photograph 2: Sight Distance to the South

As detailed above, sight distance is generally more than 200m to the north and more than 200m to the south and therefore satisfies requirements.

6.2.2 MAURANUI AVENUE ACCESS

The RTS 6 Guide details sight distance requirements for vehicle accesses. RTS 6 details a sight distance requirement of 40m for a local road with 50km/h posted speed limit.

Photographs 3 and 4 below detail the sight distance to the north and south respectively from the proposed access location on Mauranui Avenue.

Photograph 3: Sight Distance to the North

Photograph 4: Sight Distance to the South

As detailed above, sight distance is generally more than 150m to the north and more than 65m to the south and therefore satisfies requirements.

6.3 UNITARY PLAN REQUIREMENT – E27 TRANSPORTATION

6.3.1 VEHICLE ACCESS RESTRICTIONS

Unitary Plan Rule E27.6.4.1 (3) requires that vehicle crossings should not be provided if they are located within 10m of an intersection, are subject to a Vehicle Access Restriction, located with frontage to an arterial road or if they are located within 30m of a railway crossing. The site features an access to an arterial road and therefore consent is required for a restricted discretionary activity.

The matters of discretion relevant to the infringement of the access standards include relevantly:

(a) effects on the safe and efficient operation of the adjacent transport network having regard to:

(i) the effect of the modification on visibility and safe sight distances;

(ii) existing and future traffic conditions including speed, volume, type, current accident rate and the need for safe manoeuvring;

(iii) existing pedestrian numbers, and estimated future pedestrian numbers having regard to the level of development provided for in this Plan; or

(iv) existing community or public infrastructure located in the adjoining road, such as bus stops, bus lanes, footpaths, and cycleways.

(b) effects on pedestrian amenity or the amenity of the streetscape,

(c) the practicality and adequacy of parking, loading and access arrangements having regard to:

(i) site limitations, configuration of buildings and activities, user requirements and operational requirements;

(ii) the ability of the access to accommodate the nature and volume of traffic and vehicle types expected to use the access.

An assessment against the relevant assessment criteria is set out in Table 12 below.

Table 12: Assessment Criteria

Assessment Criteria	Comment
(11) construction or use of a vehicle crossing where a Vehicle Access Restriction applies under Standard E27.6.4.1(3):	
E27.8.2 (11) (a)	
i) effects of the location and design of the access on the safe and efficient operation of the adjacent transport network having regard to:	
• **visibility and safe sight distances;**	Sight distances from the proposed vehicle crossing satisfy relevant requirements.
• **existing and future traffic conditions including speed, volume, type, current accident rate, and the need for safe manoeuvring.**	There is no evidence of existing safety issues associated with vehicle movements in and out of driveways within the vicinity of the site. Vehicle volumes and speeds are not expected to change in the vicinity of the site as a result of the proposed development, as the area is already well developed. All vehicles will exit the site in a forwards direction.
• **proximity to and operation of intersections**	The nearest intersection is located 25m to the north and therefore complies with relevant requirements.

Assessment Criteria	Comment
• **existing pedestrian numbers, and estimated future pedestrian numbers having regard to the level of development provided for in this Plan;**	The volume of pedestrians travelling along the frontage of the site is not expected to change as a result of the proposed development.
• **existing community or public infrastructure located in the adjoining road, such as bus stops, bus lanes and cycleway;**	No existing community or public infrastructure will be affected by the development.
ii) the effects on the continuity of activities and pedestrian movement at street level in the Business – City Centre Zone, Business – Metropolitan Centre Zone, Business – Town Centre Zone and Business – Local Centre Zone;	
	Not applicable.
iii) the practicability and adequacy of the access arrangements considering site limitations, arrangement of buildings and activities, user requirements and operational requirements, proximity to and operation of intersections, having regard to:	
• **the extent to which the site can reasonably be served by different access arrangements including:** ○ **access from another road;** ○ **shared or amalgamated access with another site or sites;** ○ **via a frontage road, such as a slip lane or service road;**	The proposal features all residential movements to/from Mauranui Avenue. The access to Great South Road has been restricted to exit-only movements, and will only be used infrequently by service vehicles. The proposal will result in a net reduction of one access on Great South Road and therefore is considered to have positive safety effects for pedestrians.
• **the extent to which the need for access can reasonably be avoided by entering into a shared parking and/or loading arrangement with another site or sites in the immediate vicinity.**	There are no other sites in the vicinity of the site by which a shared parking arrangement could be entered, as all sites in the immediate vicinity of the site are residential dwellings or retail buildings with private parking.

As detailed above, the proposal aligns well with the assessment criteria. The access to Great South Road has been restricted to exit-only movements, and will only be used infrequently by service vehicles. The proposal will result in a net reduction of one access on Great South Road and therefore is considered to have positive safety effects for pedestrians. As such, the proposed access is considered acceptable.

6.3.2 SEPARATION AND NUMBER OF VEHICLE CROSSINGS

Rule E27.6.4.2.1 specifies that a minimum separation distance of 6m for vehicle crossings serving the same site be provided. A minimum separation for crossings serving adjacent sites of 2m is also required. Two crossings on adjacent sites can be combined where they do not exceed a total width of 6m at the property boundary.

The development provides one vehicle crossing on Great South Road, separated by more than 2m to adjacent crossings and therefore satisfies Unitary Plan requirements. The development provides two

vehicle crossings on Mauranui Avenue, separated from each other by 6m and by more than 2m to adjacent crossings to the east and therefore satisfy Unitary Plan requirements. To the west, the driveway is separated by 0.9m and therefore does not fully satisfy requirements. The service access will only feature infrequent rubbish collection activities, and will only feature entry movements, and therefore the possibility of conflicts is minimal. In any case, visibility between vehicles and pedestrians is excellent, and therefore the proposed design is considered acceptable.

Table E27.6.4.2.1 specifies that one driveway per 50m of frontage (or part thereof) can be provided for residential sites on arterial roads. The site features 48m of site frontage to Great South Road and one vehicle crossing is proposed, therefore satisfying Unitary Plan requirements.

Table E27.6.4.2.1 specifies that one driveway per 25m of frontage (or part thereof) can be provided for residential sites on non-arterial roads. The site features 90m of site frontage to Mauranui Avenue and two vehicle crossings are proposed, therefore satisfying Unitary Plan requirements.

6.3.3 WIDTH OF VEHICLE ACCESS

Table E27.6.4.3.2 of the Unitary Plan outlines rules regarding vehicle crossing and vehicle access widths.

For Mixed Use zones (serving 9 or less parking spaces), the Unitary Plan requires the following:

- '*A minimum width of 3.0m (one-way) at the site boundary'; and*
- '*A maximum width of 3.5m (one-way) at the site boundary*'.

For Mixed Use zones (serving 10 or more parking spaces), the Unitary Plan requires the following:

- '*A minimum width of 5.5m (two-way) at the site boundary'; and*
- '*A maximum width of 6.0m (two-way) at the site boundary*'.

The Mauranui Avenue entry-only vehicle crossing serves 2 loading spaces and one maintenance parking space and measures 3.7m wide at the site boundary and therefore exceeds the Unitary Plan requirements by 0.2m. This minor additional width is required to accommodate the vehicle tracking of the service vehicle, and is therefore considered acceptable. The vehicle tracking is further detailed in Section 7.5.

The Great South Road exit-only vehicle crossing serves 2 loading spaces and one maintenance parking space and measures 3.5m wide at the site boundary and therefore satisfies Unitary Plan requirements.

The Mauranui Avenue carpark vehicle crossing serves 83 parking spaces and measures 6.0m wide at the site boundary and therefore satisfies Unitary Plan requirements.

6.3.4 GRADIENT OF VEHICLE ACCESS

Rule E27.6.4.4.1 of the Unitary Plan outlines the requirements for vehicle access gradients. The requirements are detailed below:

- Maximum gradient of 1 in 5 (20%) for residential activities;
- Maximum gradient of 1 in 8 (12.5%) for heavy vehicles;
- Gradient changes exceeding 1 in 8 (12.5%) at the summit or 1 in 6.7 (15%) at a sag must include transition sections. Transition sections are typically a minimum of 2m long; and
- A 4m long platform with maximum gradient of 1 in 20 (5%) is required adjacent to and within the property boundary.

The Mauranui Avenue entry-only and the Great South Road exit-only accesses are essentially flat, with a 1 in 8 ramp provided within the laneway and therefore satisfy Unitary Plan requirements.

The Mauranui Avenue carpark access features a maximum gradient of 1 in 8 and is essentially flat near the site boundary and therefore satisfies Unitary Plan requirements.

6.4 ACTIVE TRANSPORT

Pedestrian footpaths are provided along both sides of the Great South Road and Mauranui Avenue. The development provides direct pedestrian access to the local road network and future residents are considered to be well accommodated. A laneway is provided through the centre of the development, facilitating safe pedestrian movement. Pedestrians will not access the carpark directly, but through the main pedestrian entry to Mauranui Avenue.

Cyclists are provided for on Great South Road through the use of the bus lanes on both sides of the road. As will be discussed, sufficient bike spaces are provided on-site. Cyclists are able to gain direct access to the development from Great South Road and Mauranui Avenue.

7 PARKING

7.1 GENERAL

The development will feature a total of 83 parking spaces, including 77 spaces accessed via a stacker system, four regular spaces with EV chargers, one mobility space. An additional four motorcycle spaces are also provided in the carpark. A maintenance parking space and two loading bays are provided within the laneway.

7.2 UNITARY PLAN REQUIREMENTS

Table E27.6.2.3 of the Unitary Plan set out the parking requirement for various activities in the 'Business – Mixed Use Zone'. For residential and retail activities, no minimum or maximum parking rates apply.

As such, the 83 parking spaces satisfy Unitary Plan requirements.

7.3 UNITARY PLAN DIMENSIONS

Table E27.6.3.1.1 of the Unitary Plan sets out the minimum car parking space and manoeuvring dimensions.

For 90-degree (regular user) spaces, the following requirements are set out. For a 2.5m wide parking space, the Unitary Plan requires:

- '5.0m depth of parking space'; and
- '6.7m manoeuvring space'.

For a 2.6m wide parking space, the Unitary Plan requires:

- '5.0m depth of parking space'; and
- '6.3m manoeuvring space'.

The regular parking spaces measure 2.5m wide by 5.0m long and feature a minimum of 6.7m manoeuvring space and therefore satisfy Unitary Plan requirements.

The car stacker parking spaces measure 2.6m wide by 5.6m long and feature a minimum of 6.7m manoeuvring space and therefore satisfy Unitary Plan requirements. It is noted that the 2.6m wide car stacker parking spaces allow for a 2.4m wide clear platform width, as per the manufacturers width requirements.

The mobility parking spaces measures 3.5m wide (including the adjacent clear space) by 5.0m long and features a minimum of 7.3m manoeuvring space and therefore satisfies Unitary Plan requirements.

Vehicle tracking of the Unitary Plan 85th percentile design vehicle is provided in **Attachments A1 – A5**. As shown in the attachments, vehicles can safely and efficiently manoeuvre into and out of the parking spaces, and enter and exit the site in a forwards direction, and therefore is considered acceptable. It is noted that one to two spaces require a multi-point turn to exit, however this is considered acceptable as drivers will be residents, familiar with the manoeuvring requirements in the carpark. As such, the proposed parking arrangements are considered acceptable.

7.4 CYCLE PARKING

Table E27.6.2.5 of the Unitary Plan details bicycle parking requirements. Table 13 below details the Unitary Plan bicycle parking requirements for residential and retail developments.

Table 13: Unitary Plan Bicycle Parking Requirements

Activity	Short Stay Rate	Long Stay Rate	No. units / GFA	Short Stay Required	Long Stay Required
Residential (Developments of 20 or more dwellings)	1 per 20 dwellings	1 per dwelling without a dedicated garage	191 units	10	191
Office (Greater than 200sqm up to 10,000sqm)	1 space plus 1 space per 1,000sqm above 1,000sqm	1 per 300sqm of office	355sqm	1	1
Retail (all other retail, less than 500sqm)	Nil required	1 per 300sqm of office	129sqm	0	0
Retail (food and beverage, less than 350sqm)	Nil required	1 per 300sqm GFA	211sqm	0	1
TOTAL	**-**	**-**	**-**	**11**	**193**

As detailed above, the development requires 11 short stay and 193 secure bicycle spaces. The development provides 11 short stay and 195 secure bicycle spaces and therefore satisfies Unitary Plan requirements.

7.5 LOADING

For all activities other than retail and industrial use, developments with GFA between 5,000sqm and 20,000sqm require one loading space. The development features a total residential GFA of approximately 13,400sqm and therefore requires one loading space. The development provides two loading spaces and one maintenance parking space within the laneway and therefore satisfies Unitary Plan requirements.

For all activities other than retail and industrial use, developments with less than 5,000sqm GFA do not require any loading spaces, and therefore the development does not require any commercial loading spaces.

Retail activities with less than 300sqm GFA do not require any loading spaces, and therefore the development does not require any retail loading spaces.

As detailed previously, the loading bays and maintenance parking space are considered to provide for sufficient service vehicle parking to satisfy anticipated demands, and therefore the proposal is considered acceptable.

Private rubbish collection will occur from a communal rubbish area. The Waste Management Plan provided for the development details a 8.0m truck will service the site. The truck will stop briefly in the laneway to collect rubbish. It is noted that no public vehicles will use the laneway. The vehicle tracking of this truck is shown in **Attachments B1 and B2**. As shown, the truck can safely and efficiently access and egress the rubbish area and exit the site in a forwards direction.

7.6 VERTICAL CLEARANCE

Rule E27.6.3.5 of the Unitary Plan details vertical clearance requirements for vehicle access. To ensure vehicles can pass safely under overhead structures to access any parking and loading spaces, the minimum clearance between the formed surface and the structure must be 3.8m where loading is required.

The laneway entry features vertical clearance of 3.5m, and therefore does not fully satisfy Unitary Plan requirements. It is noted that the laneway will only accommodate service and maintenance vehicles. The Waste Management Plan provided as part of this application details a truck height of 2.4m, and information received from the Waste Management providers details a minimum vertical clearance requirement of 2.7m. As such, the largest anticipated vehicle can safely manoeuvre through the laneway, and therefore this minor non-compliance is considered acceptable.

8 CONSTRUCTION TRAFFIC

The development site is currently occupied, and demolition works followed by earthworks can be undertaken immediately. The anticipated earthworks volumes are provided within the civil engineering documents forming part of this application. The construction vehicle volumes are not expected to have any significant impact on the operation of the local network. To facilitate construction, it is proposed to utilise access to the site via the existing driveway to Mauranui Avenue. This can operate as the primary construction access for the duration of the project. This is considered appropriate given the road is classified as a non-arterial road within the Unitary Plan.

As is typical with a development of this scale, it is recommended that should consent be approved, a Construction Traffic Management Plan (CTMP) should be required as a condition of consent. It is considered that this Construction Traffic Management Plan should include:

- Construction dates and hours of operation including any specific non-working hours for traffic congestion/noise etc, aligned with normally accepted construction hours in the Auckland Region;
- Truck route diagrams between the site and external road network.
- Temporary traffic management signage/details for both pedestrians and vehicles, to manage the interaction of these road users with heavy construction traffic; and
- Details of site access/egress over the entire construction period and any limitations on truck movements. All egress points should be positioned to achieve appropriate sight distances.

Based on experience of constructing similar projects, and bearing in mind capacity within the existing road network, with the appropriate Construction Traffic Management Plan in place and the above measures implemented, it is considered that construction activities can be managed to ensure any generated traffic effects are mitigated.

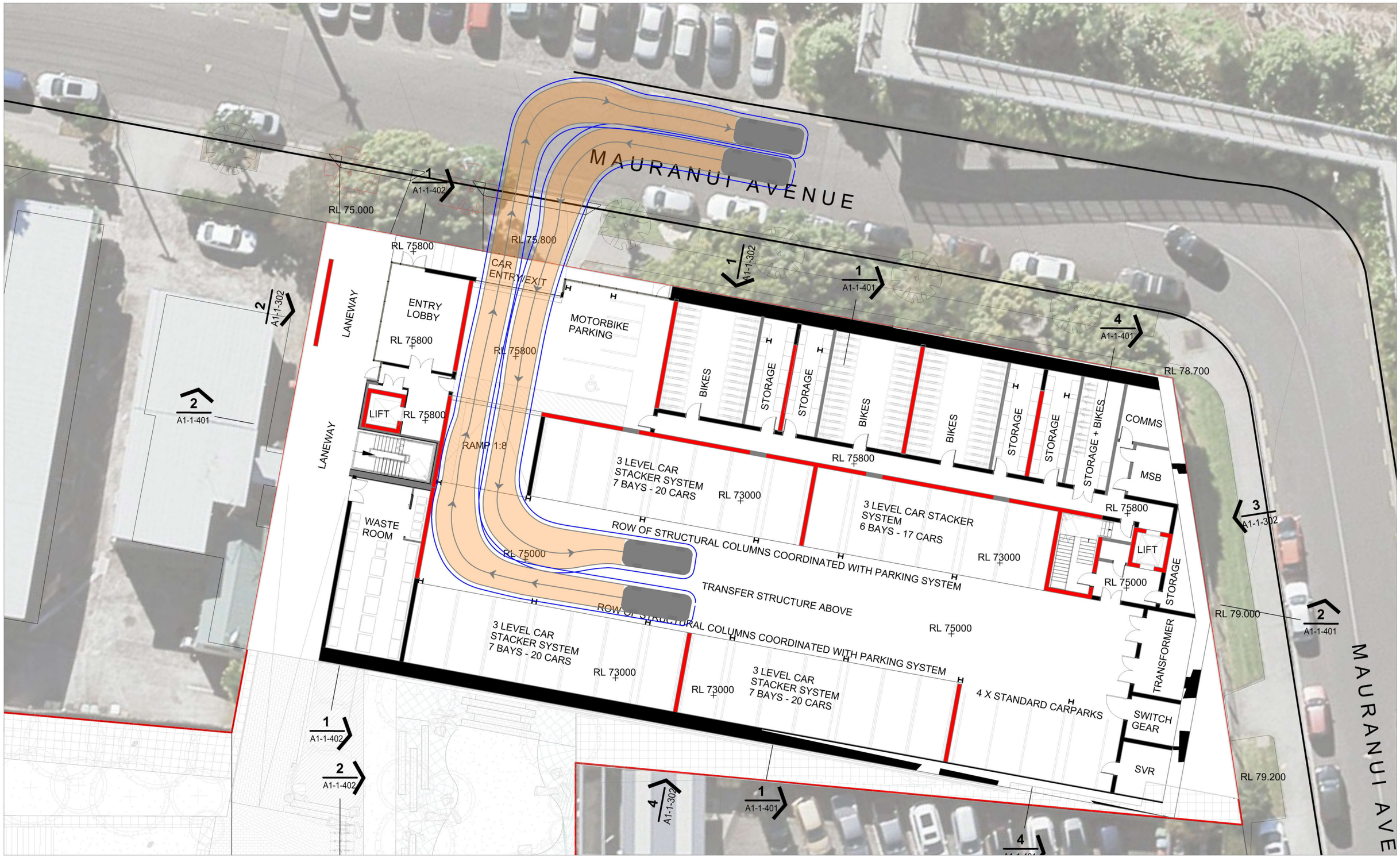
9 CONCLUSIONS

Following a review of the proposal for a residential development at 76-80 Great South Road, Remuera, the following can be concluded:

- The site location features excellent public transport connections;
- The development is not expected to detrimentally effect the existing good safety record in the vicinity of the site;
- The traffic expected to be generated by the proposed development can be accommodated within the existing road network;
- The development will feature a net reduction of one access on Great South Road, and therefore is considered to generate positive safety effects for pedestrians;
- The development satisfies relevant sight distance requirements;
- The development generally satisfies relevant Unitary Plan vehicle access requirements in terms of both form and location, with those exceptions detailed in Section 5.3 which are considered acceptable;
- The development satisfies relevant Unitary Plan parking requirements in terms of both provision and dimensions;
- The development features good connections for both pedestrians and cyclists; and
- The development satisfies loading and servicing requirements, with the exception of the vertical clearance in the laneway, as detailed in Section 7.6 above (which is considered acceptable).

Accordingly, subject to the recommendations detailed above, it is concluded that there are no traffic engineering or transportation planning reasons that would preclude the development of the subject site as proposed.

APPENDIX A: VEHICLE TRACKING – UNITARY PLAN CAR



Revision notes:		
Rev:	Date:	Notes:

Drawn by: JB
Project Stellar

Client:

Project: Great South Road, Remuera
Residential Development

Drawing Title: Vehicle Tracking - 85th Percentile Car

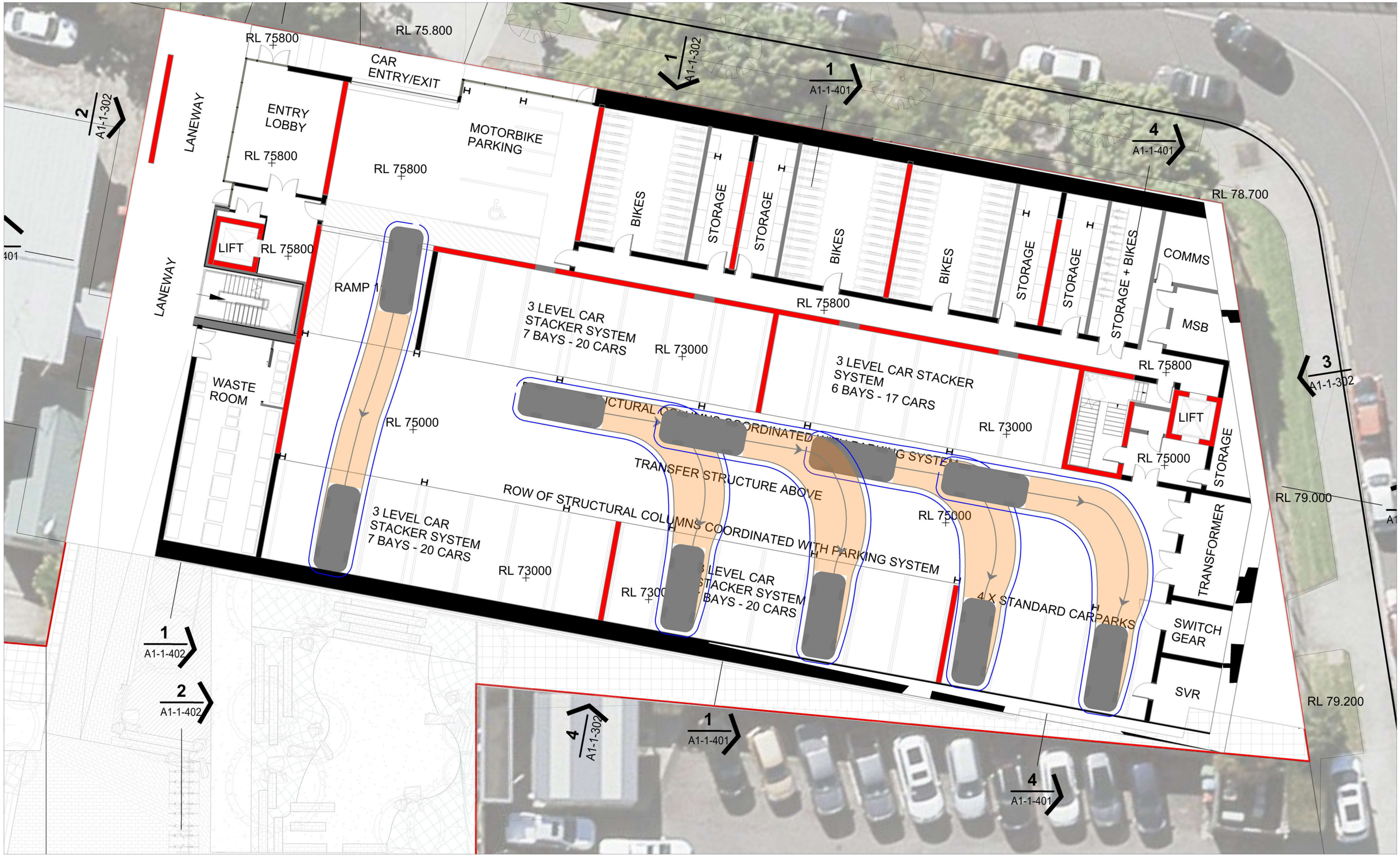
Date: 31/05/22

Scale @ A3: 1:250

Revision: A

commute TRANSPORTATION CONSULTANTS

Figure: A1



Revision notes:

Rev:	Date:	Notes:

Drawn by: JB
Project Stellar

Client:

Project: Great South Road, Remuera
Residential Development

Drawing Title: Vehicle Tracking - 85th Percentile Car

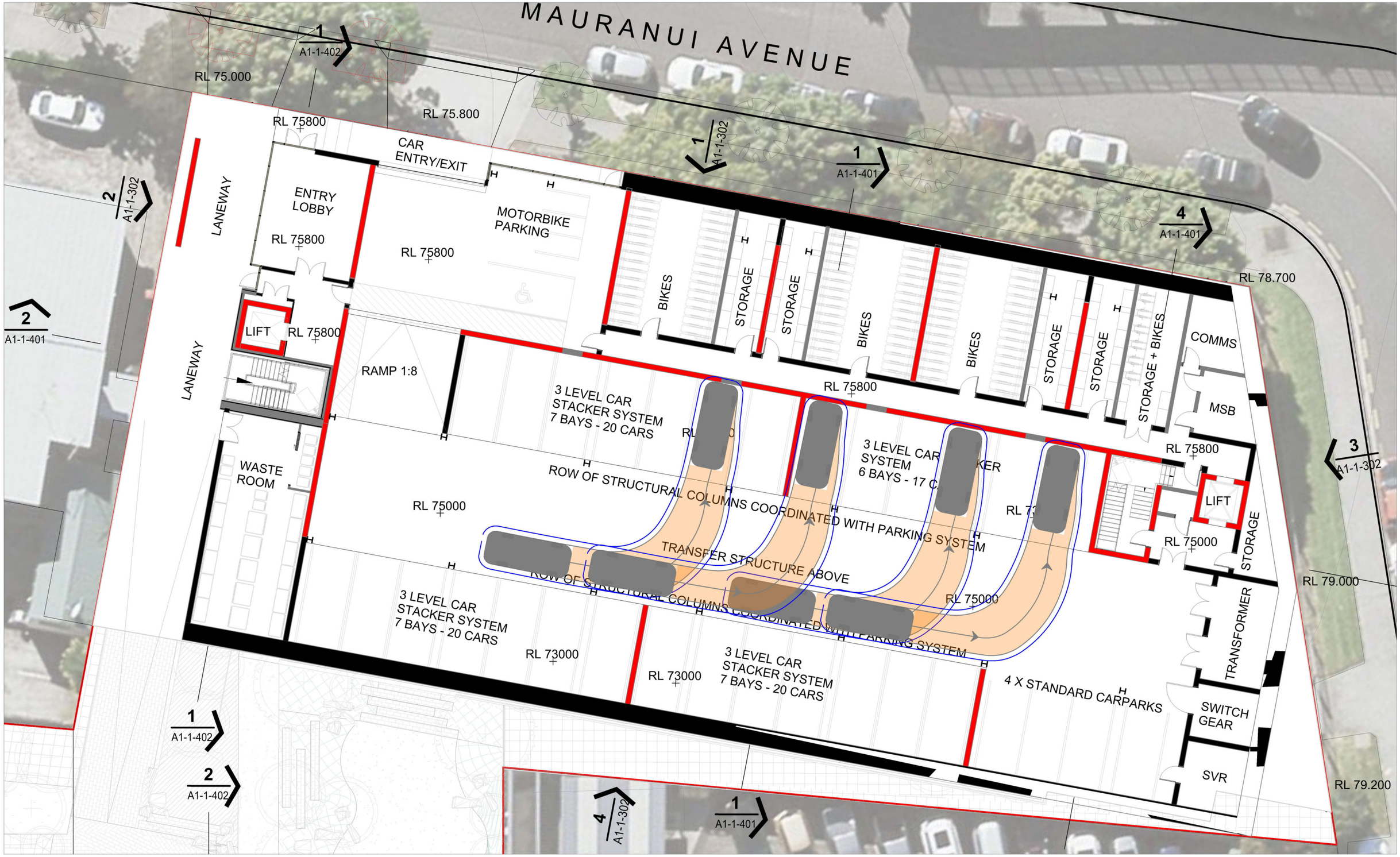
Date: 31/05/22

Scale @ A3: 1:200

Revision: A

commute TRANSPORTATION CONSULTANTS

Figure: A2



Revision notes:

Rev:	Date:	Notes:

Drawn by:
JB
Project Stellar

Client:

Project:
Great South Road, Remuera
Residential Development

Drawing Title:
Vehicle Tracking - 85th Percentile Car

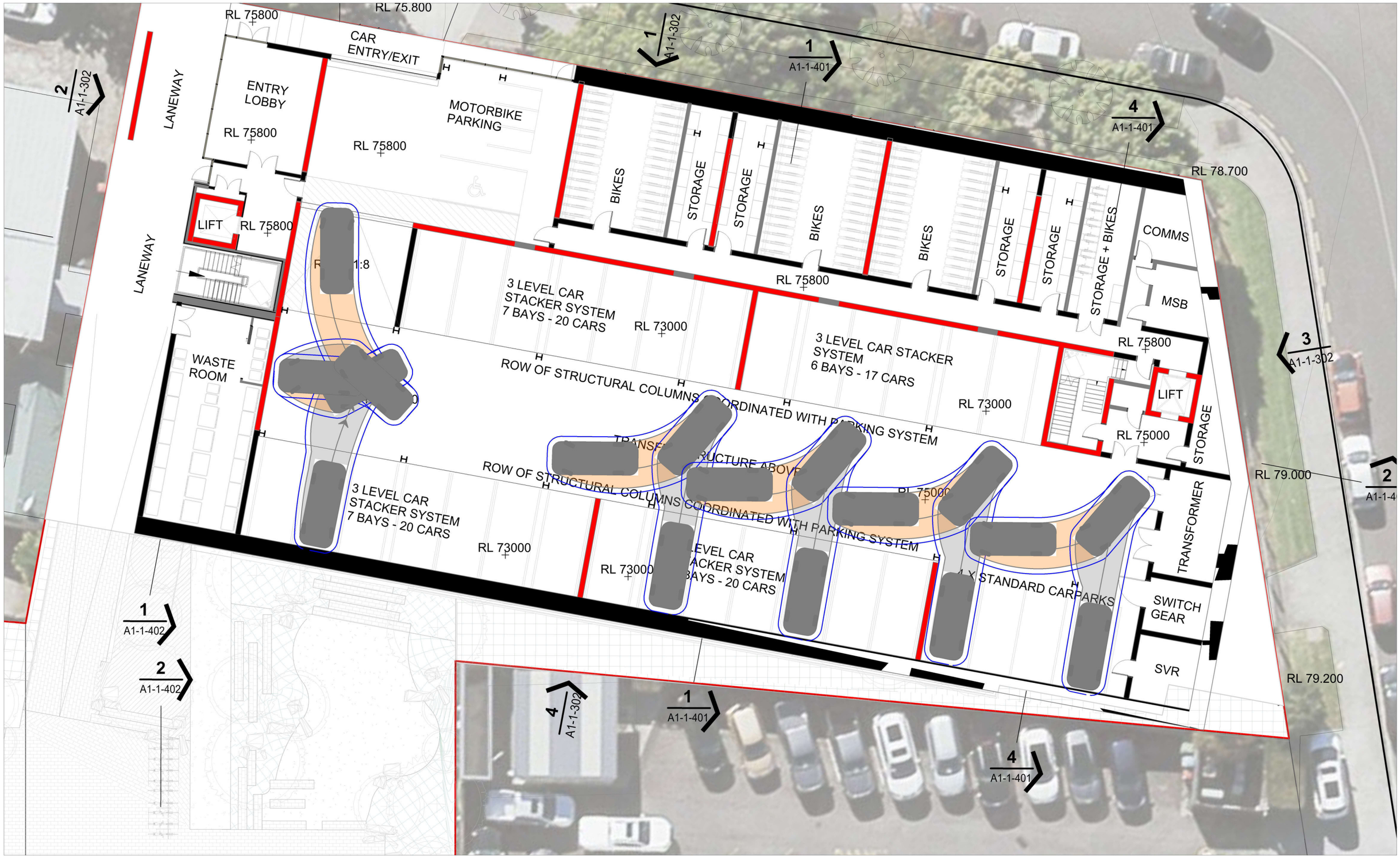
Date:
31/05/22

Scale @ A3:
1:200

Revision:
A

commute
TRANSPORTATION CONSULTANTS

Figure:
A3



Revision notes:

Rev:	Date:	Notes:

Drawn by:
JB
Project Stellar

Client:

Project:
Great South Road, Remuera
Residential Development

Drawing Title:
Vehicle Tracking - 85th Percentile Car

Date:
31/05/22

Scale @ A3:
1:200

Revision:
A

commute
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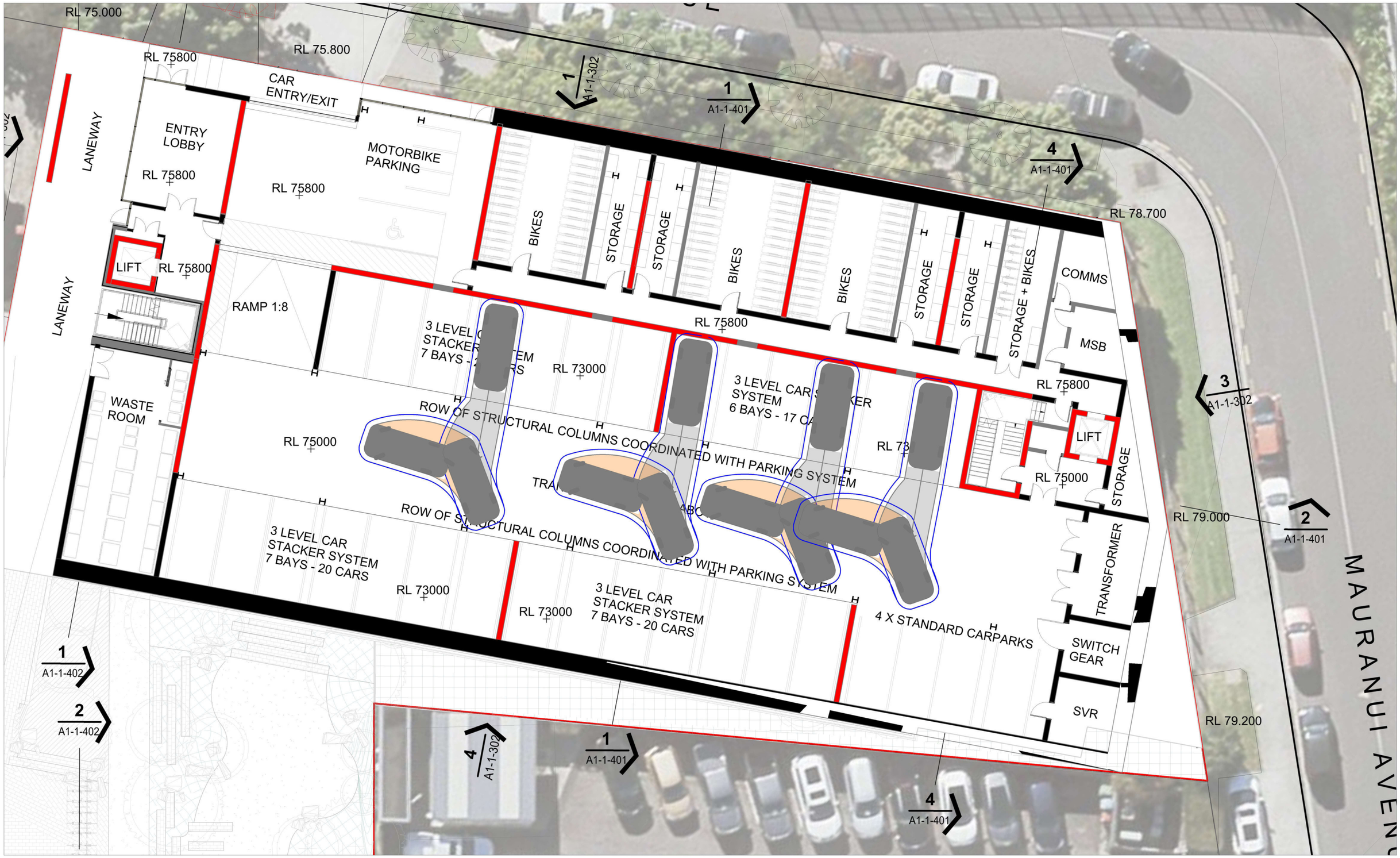
Figure:
A4



Revision notes:

Rev:	Date:	Notes:

Drawn by:
JB
Project Stellar

Client:

Project:
Great South Road, Remuera
Residential Development

Drawing Title:
Vehicle Tracking - 85th Percentile Car

Date:
31/05/22

Scale @ A3:
1:200

Revision:
A

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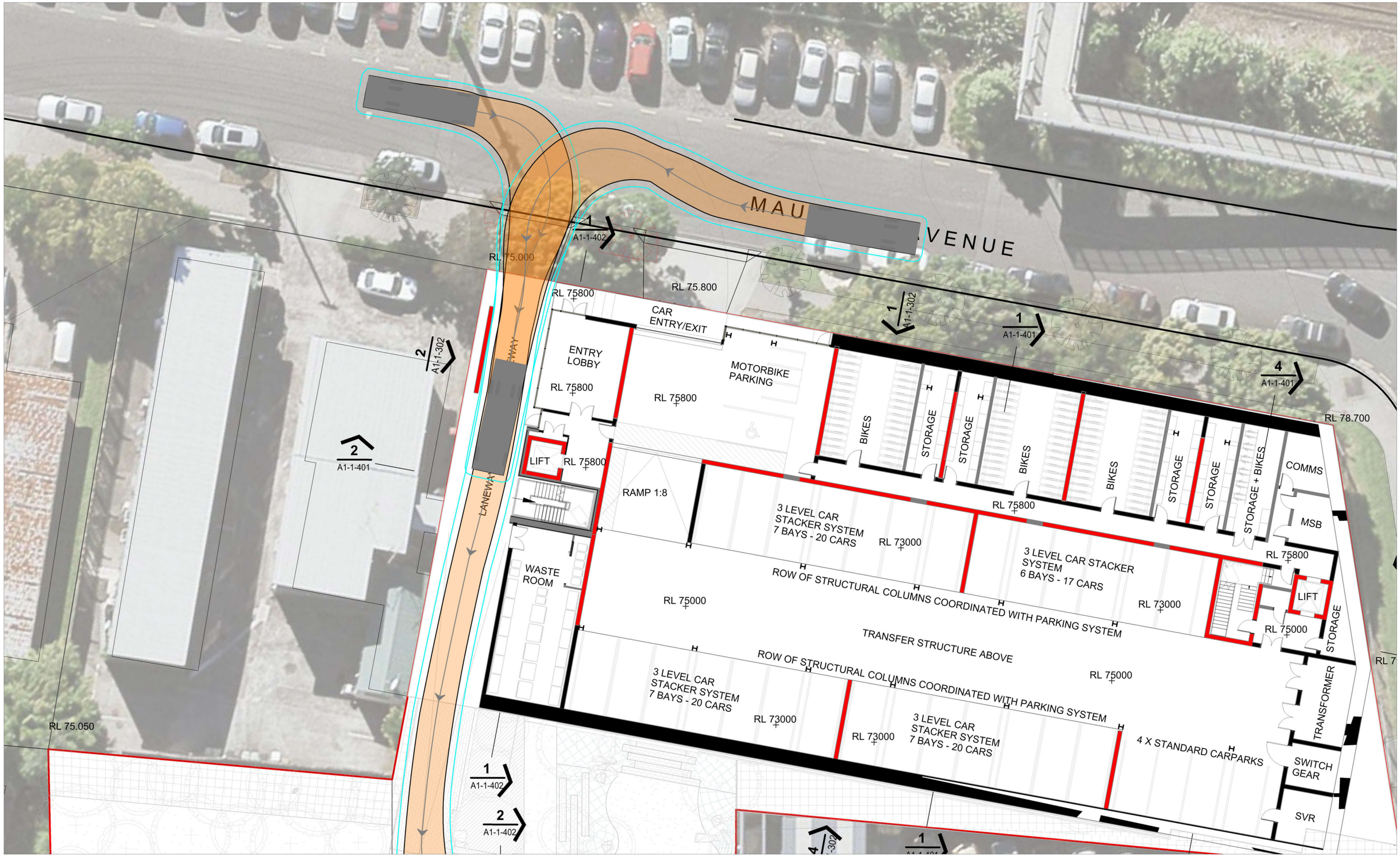
Figure:
A5

APPENDIX B: VEHICLE TRACKING – 8.0M TRUCK



Revision notes:		
Rev:	Date:	Notes:

Drawn by: JB
Project Stellar

Client:

Project: Great South Road, Remuera
Residential Development

Drawing Title: Vehicle Tracking - 8.0m Green Gorilla

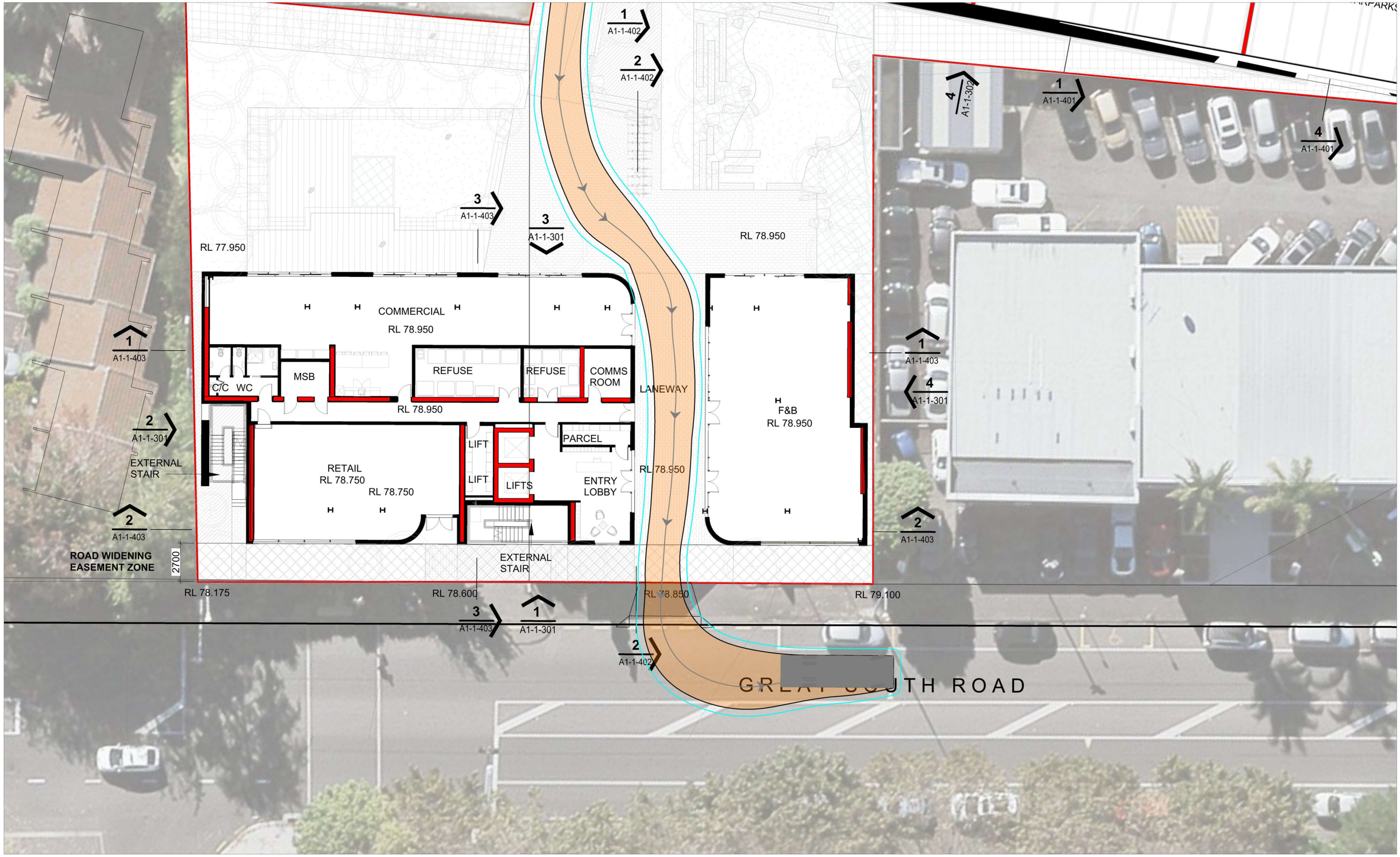
Date: 31/05/22

Scale @ A3: 1:250

Revision: A

commute TRANSPORTATION CONSULTANTS

Figure: B1



Revision notes:

Rev:	Date:	Notes:

Drawn by:
JB
Project Stellar

Client:

Project:
Great South Road, Remuera
Residential Development

Drawing Title:
Vehicle Tracking - 8.0m Green Gorilla

Date:
31/05/22

Scale @ A3:
1:250

Revision:
A

commute
TRANSPORTATION CONSULTANTS

Figure:
B2