

Annex 3: Traffic Review Report

Reference number: CHK50836810/CHC/L2401945/sys

**SECTION 16 PLANNING APPLICATIONS FOR PROPOSED
UNDERGROUND VEHICULAR TUNNELS T1
(CONNECTING LEE GARDEN ONE AND LEE GARDEN
THREE) AND T2 (CONNECTING LEE GARDEN ONE AND
LEE GARDEN TWO)**

TRAFFIC REVIEW REPORT



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1. INTRODUCTION

1.1 Background

- 1.1.1 In order to enhance the traffic condition in the Causeway Bay south area, two vehicle tunnels, namely Tunnel T1 and Tunnel T2 were proposed beneath Hysan Avenue and Yun Ping Road respectively. Tunnel T1 would connect the basement car parks at Lee Garden One (LG One) and Lee Garden Three (LG Three), while Tunnel T2 would connect the basement car parks at Lee LG One and Lee Garden Two (LG Two). The locations of Tunnel T1 and Tunnel T2 are shown in **Drawing No. 1.1**.
- 1.1.2 Since the proposed Tunnels T1 and T2 would run across Hysan Avenue and Yun Ping Road respectively, where are zoned as 'Road' in the Causeway Bay Outline Zoning Plan (OZP), Section 16 Planning Applications (S16 Applications) for the proposed two tunnels with inclusion of Traffic Impact Assessments (TIAs) were submitted to the Town Planning Board (TPB) for obtaining permission. The S16 Applications for proposed two tunnels (application nos. A/H6/78 and A/H6/79) were approved by TPB in July 2016. Subsequently, the applications for extension of times for the two proposed tunnels were also approved by TPB in June 2020.
- 1.1.3 Given that the above permissions for the two proposed tunnels have been expired in June 2024, the subject applications are to obtain TPB's approvals for the Tunnels T1 and T2 to be implemented.
- 1.1.4 As per the comments on the subject applications received from Transport Department, a traffic review is required to verify whether the previous approved TIAs are still valid under the subject applications.
- 1.1.5 MVA Hong Kong Limited (MVA) is commissioned as a traffic consultant to conduct a traffic study and prepare a traffic review report in supporting the subject applications for the proposed Tunnels T1 and T2.

1.2 Study Objectives

- 1.2.1 The main objectives of the study are as follows:
- to present the latest scheme of the proposed Tunnels T1 and T2;
 - To discuss the key findings from the TIAs for the previous S16 applications of the proposed Tunnels T1 and T2 as approved in 2016;
 - to conduct a traffic review based on the latest traffic situation arrangement and project programme to re-assess if any adverse traffic impact due to the tunnels and to verify the conclusion as drawn from the previous; and
 - to present the proposed traffic arrangement and measures for the tunnel construction and review if any adverse traffic impact during the tunnel construction.

1.3 Structure of the Report

- 1.3.1 Following this introductory chapter, there are four further chapters.

- 1.3.2 Chapter 2 – Proposed Tunnels T1 and T2**, which describes the latest details of the proposed Tunnels T1 and T2.
- 1.3.3 Chapter 3 – Traffic Review**, which recaps the key findings from the previous TIAs, discusses the details of the traffic review based on the latest traffic situation and project programme, presents the re-assessment results, and summarizes the review findings.
- 1.3.4 Chapter 4 – Review on Traffic Arrangement and Impact during Construction**, which discusses the proposed traffic arrangement and the associated measures to facilitate the tunnel construction and review if any traffic impact during the tunnel construction.
- 1.3.5 Chapter 5 – Summary and Conclusion**, which summarizes the study findings and presents the conclusion for this traffic review report.

2. PROPOSED TUNNELS T1 AND T2

2.1 Tunnel Alignment

- 2.1.1 Except for the amendment to the connection level of Tunnel T1 at LG Three, i.e. changed from basement level 2 to level 3, there is no material change in the alignments of both the Tunnels T1 and T2 since the previous planning applications were approved in 2016.
- 2.1.2 Tunnel T1 will run across Hysan Avenue, and it will be connected from the northern side of the basement level 3 car park of LG Three to the southern side of the basement level 3 car park of LG One.
- 2.1.3 Tunnel T2 will run across Yun Ping Road, and it will be connected from the eastern side of the basement level 3 car park of LG One to the western side of the basement level 2 car park of LG Two.
- 2.1.4 The alignments of Tunnels T1 and T2 are shown in **Drawing No. 1.1**.

2.2 Traffic Arrangement

- 2.2.1 There is also no material change in traffic arrangement of both the Tunnels T1 and T2 since the previous planning applications were approved in 2016.
- 2.2.2 It was proposed that two-way traffic will be allowed at the tunnels for private cars use. To fulfil the minimum headroom requirement for private car as stipulated in HKPSG, a minimum clear headroom of 2.4m will be provided throughout the tunnel, and a minimum width of 3.5m will be provided at the driveways for each traffic direction. Apart from the driveways provided at the tunnels for 2-way traffic of private cars, a pedestrian passage will also be provided within each tunnel.
- 2.2.3 The latest layout and sectional designs of Tunnels T1 and T2 are presented in **Drawing Nos. 2.1, 2.2, 2.3 and 2.4**.

2.3 Tunnel Construction

- 2.3.1 As proposed in the previous approved applications in 2016, tunnelling method was proposed for the construction of both the Tunnels T1 and T2 which can avoid excavation works on public roads and hence minimizing disturbance to the at-grade vehicular and pedestrian traffic on Yun Ping Road.
- 2.3.2 The details of the proposed traffic arrangement during the construction stage of the tunnels are presented in **Chapter 4** of this report.

3. TRAFFIC REVIEW

3.1 Findings from the Previous TIAs

Re-routing of Traffic due to Tunnels T1 and T2

- 3.1.1 As reviewed in the previous TIAs, the proposed Tunnel T1 will enable an alternative ingress route for LG One via the existing vehicular entrance of LG Three on Hoi Ping Road, by which, vehicles come from Percival Street and Leighton Road eastbound can avoid entering the busy road sections of Yun Ping Road and Lan Fong Road to access LG One from Hoi Ping Road.
- 3.1.2 On the other hand, with Tunnel T2 connecting the basement car parks at LG One and LG Two, vehicles from the east (i.e. Leighton Road) and the south (i.e. Caroline Hill Road) will be able to access LG One via the ingress of LG Two at Pennington Street without passing through the busy road sections of Yun Ping Road and Lan Fong Road.
- 3.1.3 Furthermore, as enabled by the proposed Tunnel T2, the existing vehicular access of LG Two on Pennington Street will allow vehicles to leave LG One directly to the east without the need of circulation at Lan Fong Road, Lee Garden Road, Hysan Avenue and Sun Wui Road.
- 3.1.4 The above-mentioned re-routing of traffic with the proposed Tunnels T1 and T2 are shown in **Drawing Nos. 3.1, 3.2 and 3.3**.

No Adverse Traffic Impact

- 3.1.5 Since the Tunnels T1 and T2 will only be the linkages connecting the existing basement car parks, no additional traffic will be induced onto the road network. In contrast, the provision of Tunnels T1 and T2 will enable alternative and shorter routes for diverting the car park traffic from the at-grade roads to underground, and hence reducing traffic demand in the surrounding local roads in particular the traffic on Yun Ping Road and Lan Fong Road.
- 3.1.6 Notwithstanding the junction of Hysan Avenue/Hoi Ping Road would be slightly affected by the re-routing of traffic due to the proposed Tunnels T1 and T2, it was assessed in the previous TIAs that the effects on the junction operational performance were minimal, and all the assessed junctions were predicted to be operated within capacities in the Design Scenario.

Expected Benefits from Traffic Engineering Viewpoint

- 3.1.7 As concluded in the previous TIAs, the proposed Tunnels T1 and T2 were considered beneficial to the local area with the following expected benefits:
- Reduction in at-grade traffic on local roads would help to enhance the road traffic conditions, improve the air quality and pedestrian safety in the area;
 - Enhancement of the accessibility of car parks would help to efficiently use of available car parking spaces and allow the way-finding of vacant parking spaces can be taken place internally, and thus minimizing queuing at car park entrances and traffic circulation on public roads;

- Available of route choices for vehicles would help to achieve balanced use of roads/junctions' capacities under different road traffic situations; and
- Provision of flexibility in access and traffic management would allow the car park operators to manage the ingress and egress of vehicles to suit different traffic conditions in the area.

3.2 Traffic Review with Latest Traffic Situation and Project Programme

Anticipated No Change in Re-routing of Traffic due to Tunnels T1 and T2

- 3.2.1 As discussed in **Section 2.1**, there is no material change in the proposed alignment of Tunnels T1 and T2 since the previous planning applications were approved in 2016, and therefore no change to the re-routing of traffic due to the Tunnels T1 and T2 as identified in the previous TIAs.
- 3.2.2 In view of the Tunnels T1 and T2 will not induce any additional traffic onto the road network but only enabling alternative and shorter routes for diverting the car park traffic from the at-grade roads to underground, the conclusion of no adverse traffic impact due to the Tunnels T1 and T2 as drawn from the previous TIAs should be still valid.
- 3.2.3 To verify the above, the traffic impact due to the Tunnels T1 and T2 is re-assessed by taking into account the latest traffic situation as well as the updated project programme. The details of the re-assessment will be discussed in the following of this section.

Updating of Traffic Surveys

- 3.2.4 Updated traffic count surveys have been conducted at junctions with anticipated changes in traffic pattern due to the Tunnels T1 and T2 for this review. The surveys were carried out during hours of 08:00 – 10:00, 11:30 - 13:30 and 17:30 - 19:30 on a typical weekday and 11:30 - 13:30 on a weekend in November 2024. The surveyed road junctions are identified in **Drawing No. 3.4** and listed in below **Table 3.1**.

Table 3.1 Surveyed Junctions

Ref No.	Junctions	Method of Control	Drawing No.
J1	Leighton Road / Yun Ping Road / Pennington Street / Caroline Hill Road (East)	Signalised	3.5
J2	Leighton Road / Sunning Road	Priority	3.6
J3	Hysan Avenue / Hoi Ping Road	Priority	3.7
J4	Hysan Avenue / Sunning Road	Priority	3.7
J5	Hysan Avenue / Yun Ping Road	Priority	3.7

- 3.2.5 Observed traffic data indicated that the AM, Noon and PM peak hour flows occurred during hours of 08:45-09:45, 12:00-13:00 and 18:00-19:00 respectively on a typical weekday, and the weekend peak hour flows occurred during the hours of 12:15-13:15. The observed weekday and weekend peak hour traffic flows are shown in **Drawing No. 3.8**.

3.2.6 Apart from the traffic survey at junctions, vehicular Origin-Destination (O-D) surveys have also been conducted for the existing car park at LG One. The surveyed weekday and weekend peak hours O-D distributions of the car park related traffic of LG One are presented in **Drawing No. 3.9**.

Updating of Traffic Forecast

3.2.7 According to the latest project programme, the construction works for the tunnels are planned to be commenced in 2026 after the completion of the commercial development at Caroline Hill Road (the CHR Development), and the overall construction period would be about 35 months.

3.2.8 Taking into consideration the above latest project programme, a design year 2032 is adopted for this traffic review to cover any unexpected delays in the programme.

3.2.9 To derive the year 2032 traffic flows for Reference Scenario (i.e. without any proposed vehicle tunnel) in the local road network, an appropriate growth factor has to be identified for the area, which would be determined from historical growth trend and the planning data from Planning Department.

3.2.10 Transport Department has traffic count stations on the road sections in the vicinity of the subject site. The Average Annual Daily Traffic (A.A.D.T.) data from year 2017 to 2022 as reported in the Annual Traffic Census (ATC) are summarized in **Table 3.2**.

Table 3.2 Average Annual Daily Traffic (A.A.D.T.) Data from ATC

Stn. No.	Road	AADT (Vehicle/Day)						Annual Growth Rate (% p.a.)
		2017	2018	2019	2020	2021	2022	
1212	Irving Street and Pennington Street (Leighton Rd – Yee Wo St)	13,800	11,320	12,290	11,730	12,250	11,690	-3.26%
1436	Percival Street (Hennessy Rd – Leighton Rd)	12,830	12,860	12,180	12,170	12,410	11,760	-1.73%
1819	Hennessy Road and Yee Wo Street (Percival St – Pennington St)	20,840	20,830	18,530	16,700	17,240	16,980	-4.01%
2016	Yee Wo Street (Pennington St – Tung Lo Wan Rd)	20,980	18,420	16,390	14,770	15,240	14,820	-6.72%
2035	Leighton Road (Wong Nai Chung Rd – Percival St)	27,110	28,080	27,830	26,470	27,000	21,830	-4.24%
2036	Leighton Road (Irving St – Percival St)	14,910	15,080	14,950	14,220	14,510	13,940	-1.34%
2608	Caroline Hill Road (Leighton Rd – Yun Ping Rd)	4,900	5,220	4,550	4,800	4,610	4,890	-0.04%
2623	Lee Garden Road (Hennessy Rd – Hysan Ave)	3,250	3,200	3,470	2,870	2,980	2,540	-4.81%
Total		118,620	115,010	110,190	103,730	106,240	98,450	-3.66%

Source: The Annual Traffic Census 2017 – 2022 as available on TD's website.

3.2.11 The A.A.D.T. flows in **Table 3.2** show that the overall average traffic growth on the road sections in the vicinity of the subject site decreased at the rate of -3.66% per annum for year 2017 to 2022.

3.2.12 Other than the historical trend, the population and employment estimates from Territorial Population and Employment Data Matrix (TPEDM) as available on Planning Department's website are also referred for the review on the background traffic growth. The population and employment estimates for Wan Chai in years 2026 and 2031 are presented in **Table 3.3**.

Table 3.3 Population and Employment Estimates from TPEDM

Planning Data for Wan Chai District	Year		Growth Rate (% p.a.)
	2026	2031	2031/2026
Population	143,800	131,850	-1.72%
Employment	294,350	287,050	-0.50%
Population + Employment	438,150	418,900	-0.89%

Source: 2019-based Territorial Population and Employment Data Matrix as available on Planning Department's website.

3.2.13 As presented in **Table 3.3**, the growth rates as derived from TPEDM estimates for Wan Chai District from year 2026 to 2031 are ranged from -1.72% to -0.50% p.a.

3.2.14 Although both the historical trend and planning data have reflected the negative growths for the area, a nominal traffic growth rate of +0.1% is adopted in this review to reflect the background traffic growth in the area from year 2024 to 2032 for a conservative approach.

3.2.15 Other than the background traffic growth, the potential traffic induced by the planned future developments in the vicinity of the tunnels are also taken into account in the traffic forecast. The planning parameters of the identified planned developments are shown in the below **Table 3.4**.

Table 3.4 Planning Parameter for Planned Future Developments

Site Ref. No.	Planned Future Developments ⁽¹⁾	Use	Details
1	Commercial Development at Caroline Hill Road ⁽²⁾	Commercial	Total GFA : 102,000 m ²
2	District Court site ⁽³⁾	District Court	Total GFA : 70,000 m ²
3	Commercial Development in 8 Leighton Road ⁽⁴⁾ (A/H7/172)	Commercial	Total GFA : 14,945 m ²
4	Redevelopment of Po Leung Kuk Headquarters ⁽⁵⁾	Social Services	The service quotas for social services will be increased by about 140 upon the completion of the redevelopment

Notes: (1) Locations are indicated in **Drawing No. 3.10**

(2) Refer to information on the approved application no. A/H7/181 as available from the Statutory Planning Portal 2 by Town Planning Board

(3) Refer to MPC Paper No.5/19 as available on Town Planning Board's website

(4) Refer to information on the approved application no. A/H7/172 as available from the Statutory Planning Portal 2 by Town Planning Board

(5) Refer to information in Po Leung Kuk Annual Report 2023 – 2024 as available from Po Leung Kuk's website

3.2.16 The trip generations from the future developments as listed in **Table 3.4** are referred to the previous traffic study or to be estimated by the corresponding parameters and the trip rates as made reference to / derived from the mean trip rates as stipulated in TPDM as well as the consultant’s in-house trip rates as obtained from various traffic surveys. The adopted trip rates and estimated traffic generations of these future developments are summarized in **Table 3.5**.

Table 3.5 Adopted Trip Rates and Estimated Traffic Generation of Planned Future Developments

	Weekday						Weekend	
	AM Peak		Noon Peak		PM Peak		Noon Peak	
	GEN	ATT	GEN	ATT	GEN	ATT	GEN	ATT
1. Commercial Development at Caroline Hill Road – 102,000 m² GFA								
Estimated Trips (pcu/hr) ⁽¹⁾	272	398	309	326	308	239	304	303
2. District Court Site – 70,000 m² GFA								
Adopted Trip Rates ⁽²⁾ (pcu/hr/100 m ²)	0.0606	0.0918	0.0483	0.0450	0.0466	0.0437	N/A	N/A
Estimated Trips (pcu/hr)	42	64	34	31	33	31	5 ⁽²⁾	5 ⁽²⁾
3. Commercial Development in 8 Leighton Road – 14,945 m² GFA								
Adopted Trip Rates ^{(3) (4)} (pcu/hr/100 m ²)	0.1703	0.2452	0.1835	0.1748	0.1573	0.1175	0.1431	0.1589
Estimated Trips (pcu/hr)	25	37	27	26	24	18	21	24
4. Redevelopment of Po Leung Kuk Headquarters – Additional 140 Service Quotas								
Adopted Trip Rates ⁽⁵⁾ (pcu/hr/quota)	0.0487	0.0200	0.0200	0.0243	0.0177	0.0222	0.0155	0.0200
Estimated Trips (pcu/hr)	7	3	3	3	2	3	2	3

- Notes: (1) Estimated trips refer to the Traffic Review Report in the approved application no. A/H7/181.
(2) Trip rates derived from the consultant’s surveyed trip rates from Wanchai Tower and Lands Tribunal
(3) TPDM mean trip rates for office adopted for Weekday AM and PM Peaks
(4) Trip rates for weekday and weekend noon peaks are derived from the surveyed variance to the weekday PM peak trips of office development and applied onto the TPDM trip rates for office
(5) Trip rates derived from the consultant’s surveyed trip rates from the existing Po Leung Kuk

3.2.17 The 2032 reference traffic flows are derived by applying a growth rate of 0.1% p.a. on the 2024 observed flows upto the design year 2032 and superimposing the potential additional traffic as induced by the planned future developments in the vicinity of the subject site (**Table 3.5**) onto the road network.

3.2.18 The anticipated year 2032 reference traffic flows are presented in **Drawing No. 3.11**.

3.2.19 To derive the year 2032 traffic flows for Design Scenario (i.e. with Tunnels T1 and T2), the changes in traffic flows in the local road network due to the Tunnels T1 and T2 are quantified with reference to the anticipated re-routing of traffic as discussed in **Section 3.1** and the surveyed demands and distributions of the car park-related traffic as presented in **Drawing No. 3.9**. The estimated net differences of traffic flows in the local road network with Tunnels T1 and T2 during weekday and weekend peak hours are shown in **Drawing No. 3.12**.

3.2.20 Having estimated the potential re-routing of traffic due to Tunnels T1 and T2, the year 2032 future traffic flows for Design Scenario can be derived by superimposing the estimated net differences of traffic (**Drawing No. 3.12**) onto the year 2032 reference traffic flows (**Drawing No. 3.11**). The year 2032 weekday and weekend peak hour traffic forecasts in Design Scenario are presented in **Drawing No. 3.13**.

Re-assessment for Year 2032 Reference Scenario and Design Scenario

3.2.21 The operational performances of the junctions identified in **Table 3.1** are assessed with the latest forecasted year 2032 future traffic flows in Reference Scenario and Design Scenario. The assessment results for weekday and weekend peak hour traffic flows are summarised in **Table 3.6**, and the details of junction assessments are attached in **Appendix A**.

Table 3.6 Year 2032 Operational Performance of Identified Junctions

Ref No.	Junctions	Method of Control	Year 2032 RC/RFC ⁽¹⁾							
			Reference Scenario (Without any tunnels)				Design Scenario (With Tunnels T1 and T2)			
			Weekday			Weekend	Weekday			Weekend
			AM Peak	Noon Peak	PM Peak	Noon Peak	AM Peak	Noon Peak	PM Peak	Noon Peak
J1	Leighton Road / Yun Ping Road / Pennington Street / Caroline Hill Road (East)	Signal	37%	34%	34%	31%	37%	34%	34%	31%
J2	Leighton Road / Sunning Road	Priority	0.44	0.52	0.60	0.55	0.44	0.52	0.57	0.52
J3	Hysan Avenue / Hoi Ping Road	Priority	0.65	0.60	0.58	0.57	0.68	0.65	0.63	0.62
J4	Hysan Avenue / Sunning Road	Priority	0.16	0.20	0.16	0.16	0.16	0.19	0.15	0.15
J5	Hysan Avenue / Yun Ping Road	Priority	0.30	0.61	0.37	0.39	0.28	0.56	0.32	0.34

3.2.22 The updated assessment results in **Table 3.6** verify that Tunnels T1 and T2 linking the basement car parks of the LG One, LG Two and LG Three will not cause adverse impact to the local road network, and all the assessed junctions are predicted to be operated within capacities during all peak hours on both weekday and weekend in Design Scenario of year 2032.

3.2.23 In contrast, Tunnels T1 and T2 allows alternative route for vehicles accessing LG One which help on reducing the at-grade vehicular traffic on Yun Ping Road and Lan Fong Road upto 43 pcus and 49 pcus (about 6% and 9% of the existing traffic flows on Yun Ping Road) during the peak hour on weekdays and weekends respectively as demonstrated in **Drawing No. 3.12**. The traffic benefits due to the Tunnels T1 and T2 as listed in **paragraph 3.1.7** remain unchanged.

4. REVIEW ON TRAFFIC ARRANGEMENT AND IMPACT DURING CONSTRUCTION STAGE

4.1 No Excavation Work on Public Road for Tunnel Construction

4.1.1 Tunnelling method is proposed for the construction of both the Tunnel T1 and Tunnel T2 in order to avoid any excavation work on the at-grade public road and hence minimizing disturbance to the at-grade vehicular and pedestrian traffic. The works areas for the tunnel construction will be situated at the basements of LG One, LG Two and LG Three.

4.2 Suspension of Parking Spaces during and after the Construction

4.2.1 With the proposed tunnelling construction method to avoid any work to be carried out on the public roads, it is unavoidable that some of the existing car parking spaces have to be temporarily suspended to facilitate tunnel construction works at the basement levels. Nevertheless, the extents of the works areas at the carparks will be well planned to ensure the daily operation of the carparks can be maintained throughout the construction period and to minimize the impact to parking provision.

4.2.2 Currently, there is a total of some 560 car parking spaces being provided at LG One, LG Two and LG Three. It was initially reviewed that it would be still a total of about 450 car parking spaces (approximately 80% of existing total provision at LG One, LG Two and LG Three) can be maintained to serve the ancillary use of the three affected buildings during the tunnel construction.

4.2.3 Besides, a commercial development at Caroline Hill Road (the CHR Development) with provision of about 600 car parking spaces is being constructed, and it was targeted to be completed by 2026. Since the construction of the tunnels is planned to be commenced after the completion of the CHR Development, the parking demand during the tunnel construction can be well absorbed by the remaining 80% of the existing car parking space at LG One, LG Two and LG Three together with the extra provision of 600 parking spaces at the CHR Development.

4.2.4 After the completion of tunnel construction, the temporarily suspended car parking spaces will be reinstated except for 12 spaces in LG One, 4 spaces in LG Two and 6 spaces in LG Three which are considered necessary to be permanently suspended for the opening of accesses for the tunnels.

4.2.5 Since the extra provision of 600 parking spaces at the CHR Development will be available before the completion of tunnels while the amount of parking spaces to be suspended permanently is minimal with only about 4% of the existing total car parking provision at LG One, LG Two and LG Three, the traffic impact due to the suspension of parking spaces should be negligible.

4.2.6 On the other hand, the available car parking spaces within the LG One, LG Two and LG Three can be shared used for the vehicles upon the car parks to be linked by the tunnel, and the accessibility of the car parks will also be improved without the need of any additional car park ingress and egress points. As a result, the utilizations of available car parking spaces can be maximised while the way-finding of vacant spaces can be taken place internally, therefore minimizing queuing at car park entrances.

4.3 Access Arrangement and Management for Construction Traffic

- 4.3.1 Given that the works areas required for the tunnel construction are all within the existing car parks of LG One, LG Two and LG Three, it is proposed that the accesses of construction traffic to the works areas will be via the existing vehicular accesses of LG One, LG Two and LG Three which can avoid any new opening of construction access on the public roads. The access routes of construction traffic would be similar to the those of the existing carpark traffic. The proposed access arrangement for construction traffic is shown in **Drawing No. 4.1**.
- 4.3.2 To minimize traffic impact, the overall construction traffic (including dump trucks) demand of the two tunnels will be kept minimal and limited to 14 vehicles per day only. Taking into consideration the necessity of maintaining the daily operation of the car parks as well as the headroom constraints at the carpark floors, it is planned that only small-sized trucks will be adopted for the tunnel construction.
- 4.3.3 Besides, time management for construction traffic will be implemented, by which the access of construction traffic will only be arranged outside the communal weekday's peak periods of 08:00-10:00, 12:00-14:00 and 16:00-20:00 except General Holidays in order to further minimize traffic impact to the surrounding road network during the communal peak periods.
- 4.3.4 With the above proposed time management for accesses of construction traffic, the hourly construction traffic demand will be kept at 3-4 vehicles per hour only. Therefore, the traffic impact to the surrounding roads caused by the construction traffic of the two tunnels would be very minimal.
- 4.3.5 To avoid traffic queueing for car park at public road, car park vacancy information signs will be erected at the car park entrances of LG One, LG Two and LG Three to guide the drivers to use the adjacent car park (i.e. the CHR Development) with vacant parking spaces.
- 4.3.6 Furthermore, to prevent any obstruction at the car park entrances leading to adverse impact to the operation of public transportation and the traffic on public roads, the car park operators would dedicate staffs for patrolling traffic at the car park entrance and guiding the motorists to park their cars at other car parks in the vicinity with vacant spaces (e.g. the CHR development) when necessary. Besides, the loading/unloading activities for the buildings would be well coordinated and managed by the car park operators to avoid such activities to be carried out during the peaks of the car parks and/or during the access periods of construction traffic.

4.4 Construction Traffic Management Scheme

- 4.4.1 To ensure no adverse traffic impact on the surrounding road network, a Construction Traffic Management Scheme (CTMS) which to be reviewed and approved by Transport Department will be implemented during the tunnel construction.
- 4.4.2 The CTMS shall include but not limited to:
- The tunnel construction works shall only be carried out underground without at-grade excavation works leading to any closure of public road;

- The overall construction traffic demand shall be kept minimal and limited to 14 vehicles per day. The construction vehicles shall access to/from the underground construction site via the existing vehicular access of LG One, LG Two and LG Three;
- The access of construction traffic shall only be arranged outside peak period of 08:00-10:00, 12:00-14:00 and 16:00-20:00 during weekdays except General Holidays;
- The car park operators of LG One, LG Two and LG Three shall deploy staff for patrolling traffic at the car park entrance and guiding the motorists to park their cars at other car parks in the vicinity with vacant spaces when necessary;
- The suspension of car parking spaces at LG One, LG Two and LG Three shall be minimised as far as possible and maintain at least 80% of provision at all time;
- Loading/unloading activities of LG One, LG Two and LG Three shall be well coordinated and managed by the car park operators to avoid carry out during access period of construction traffic;
- Adequate car park vacancy information signs shall be erected at the car park entrance to alert motorists;
- The tunnel construction works shall not commence earlier than the construction of covered walkway and footbridge at the area and full provision of private car parking spaces under the CHR Development; and
- Such other measures as stipulated in the approved CTMS.

5. SUMMARY AND CONCLUSION

5.1 Summary

- 5.1.1 In order to enhance the traffic condition in the Causeway Bay south area, Tunnel T1 and Tunnel T2 were proposed beneath Hysan Avenue and Yun Ping Road respectively. Tunnel T1 would connect the basement car parks at LG One and LG Three, while Tunnel T2 would connect the basement car parks at Lee LG One and LG Two.
- 5.1.2 Since the proposed Tunnels T1 and T2 would run across Hysan Avenue and Yun Ping Road respectively, where are zoned as 'Road' in the OZP, S16 Applications for the proposed two tunnels with inclusion of TIAs were submitted to the TPB for obtaining permission. The S16 Applications for proposed two tunnels were approved by TPB in July 2016. Subsequently, the applications for extension of times for the two proposed tunnels were also approved by TPB in June 2020.
- 5.1.3 Given that the above permissions for the two proposed tunnels have been expired in June 2024, the subject applications were to obtain TPB's approvals for the Tunnels T1 and T2 to be implemented.
- 5.1.4 As per the comments on the subject applications received from Transport Department, a traffic review was required to verify whether the previous approved TIAs were still valid under the subject applications.
- 5.1.5 MVA was commissioned as a traffic consultant to conduct a traffic study and prepare a traffic review report in supporting the subject applications for the proposed Tunnels T1 and T2.
- 5.1.6 Tunnel T1 would run across Hysan Avenue, and it would be connected from the northern side of the basement level 3 car park of LG Three to the southern side of the basement level 3 car park of LG One. Tunnel T2 would run across Yun Ping Road, and it would be connected from the eastern side of the basement level 3 car park of LG One to the western side of the basement level 2 car park of LG Two.
- 5.1.7 Except for the amendment to the connection level of Tunnel T1 at LG Three was changed from basement level 2 to level 3, there was no material change in the alignments of both the Tunnels T1 and T2 since the previous planning applications were approved in 2016.
- 5.1.8 As reviewed in the previous TIAs, the proposed Tunnel T1 would enable an alternative ingress route for LG One via the existing vehicular entrance of LG Three on Hoi Ping Road without the need of circulating at Hysan Avenue, Yun Ping Road and Lan Fong Road. On the other hand, Tunnel T2 would allow vehicles to access LG One via the ingress of LG Two at Pennington Street without passing through the busy road sections of Yun Ping Road and Lan Fong Road from the east and the south. Furthermore, Tunnel T2 would also enable a more direct route for the vehicles to leave LG One via the egress of LG Two at Pennington Street leading to the east.
- 5.1.9 In view of there was no material change in the proposed alignment of Tunnels T1 and T2 since the previous planning applications were approved in 2016, while the Tunnels T1 and T2 would not induce any additional traffic onto the road network but only enabling alternative and shorter routes for diverting the car park traffic from the at-grade roads to underground,

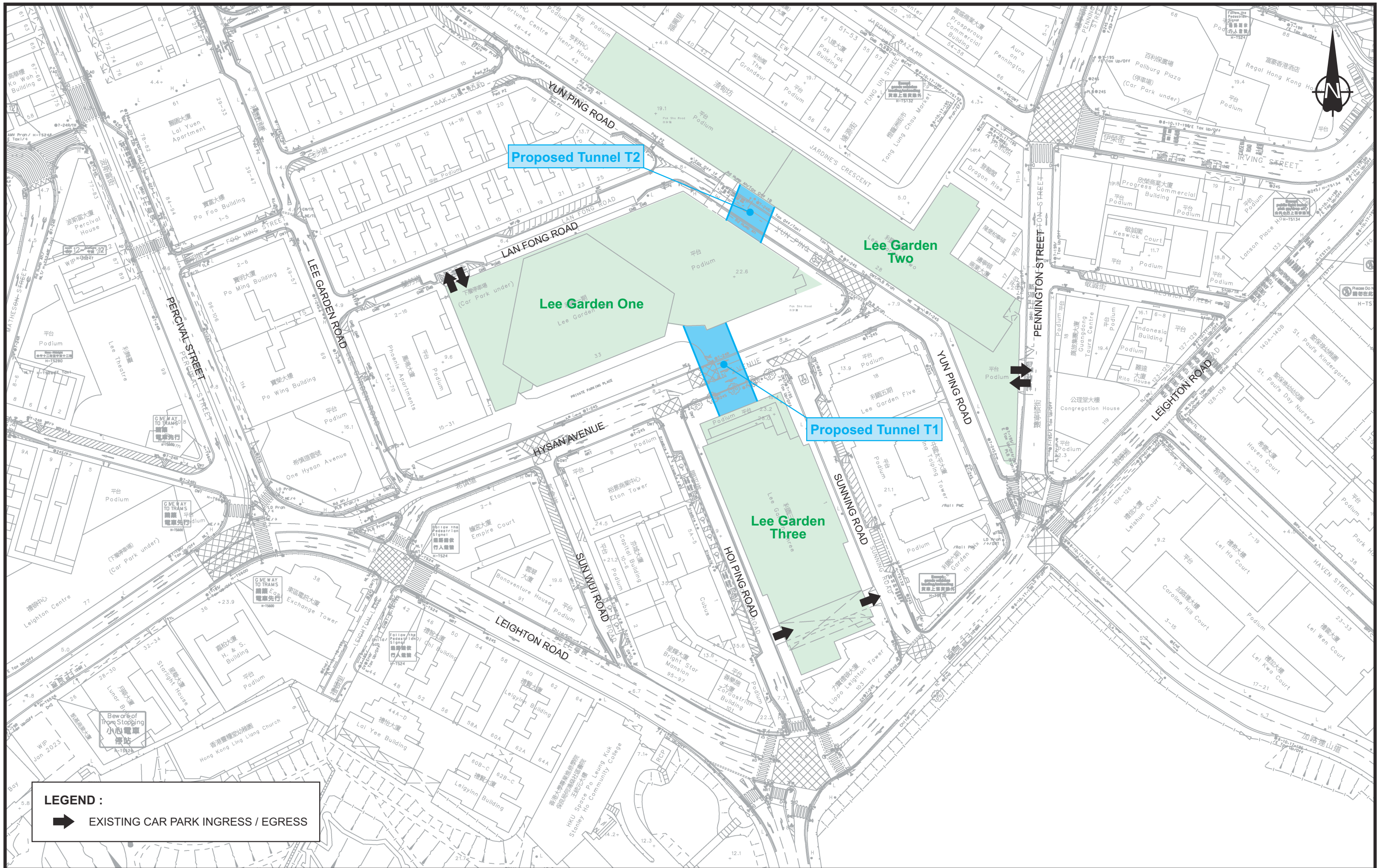
the conclusion of no adverse traffic impact due to the Tunnels T1 and T2 as drawn from the previous TIAs should be still valid.

- 5.1.10 For verification purpose, the traffic impact due to the Tunnels T1 and T2 was re-assessed by taking into account the latest traffic situation as well as the updated project programme.
- 5.1.11 The updated assessment results that Tunnels T1 and T2 linking the basement car parks of the LG One, LG Two and LG Three would not cause adverse impact to the local road network, and all the assessed junctions were predicted to be operated within capacities during all peak hours on both weekday and weekend in the design year 2032.
- 5.1.12 In contrast, Tunnels T1 and T2 would allow alternative route for vehicles accessing LG One which help on reducing the at-grade vehicular traffic on Yun Ping Road and Lan Fong Road. The traffic benefits due to the Tunnels T1 and T2 as identified from the previous TIAs remained unchanged.
- 5.1.13 Apart from the operational assessment, the traffic arrangement and impact during the construction stage of the tunnels were also reviewed. To avoid any excavation work on the at-grade public road and hence minimizing disturbance to the at-grade vehicular and pedestrian traffic, tunnelling method was proposed for the construction of both the Tunnel T1 and Tunnel T2. The works areas for the tunnel construction would be situated at the basements of LG One, LG Two and LG Three.
- 5.1.14 It would be unavoidable that some of the existing car parking spaces would be temporarily suspended to facilitate tunnel construction works at the basement levels; however, the extents of the works areas at the carparks would be well planned to maintain 80% of the existing total parking provision at LG One, LG Two and LG Three for the daily operation throughout the construction period. Besides, the construction of the tunnels was planned to be commenced after the completion of the CHR Development so that the parking demand during the tunnel construction would be well absorbed by the remaining existing car parking space at LG One, LG Two and LG Three together with the extra provision of 600 parking spaces at the CHR Development.
- 5.1.15 To avoid any new opening of construction access on the public roads it was proposed that the accesses of construction traffic to the works areas would be via the existing vehicular accesses of LG One, LG Two and LG Three.
- 5.1.16 Besides, the overall construction traffic demand of the two tunnels would be kept minimal, and time management for construction traffic would be implemented, by which the access of construction traffic would only be arranged outside the communal weekday's peak periods of 08:00-10:00, 12:00-14:00 and 16:00-20:00 except General Holidays. With the proposed time management, the hourly construction traffic demand would be kept at 3-4 vehicles per hour only. Therefore, the traffic impact to the surrounding roads caused by the construction traffic of the two tunnels would be very minimal.
- 5.1.17 Furthermore, a Construction Traffic Management Scheme (CTMS) which to be reviewed and approved by Transport Department would be implemented during the tunnel construction to ensure no adverse traffic impact on the surrounding road network.

5.2 Conclusion

5.2.1 In conclusion, the proposed Tunnels T1 and T2 are supported from a traffic engineering point of view as it is considered to be beneficial to the local area with the following expected benefits:

- Reduction in at-grade traffic on local roads would help to enhance the road traffic conditions, improve the air quality and pedestrian safety in the area;
- Enhancement of the accessibility of car parks would help to efficiently use of available car parking spaces and allow the way-finding of vacant parking spaces can be taken place internally, and thus minimizing queuing at car park entrances and traffic circulation on public roads;
- Available of route choices for vehicles would help to achieve balanced use of roads/junctions' capacities under different road traffic situations; and
- Provision of flexibility in access and traffic management would allow the car park operators to manage the ingress and egress of vehicles to suit different traffic conditions in the area.



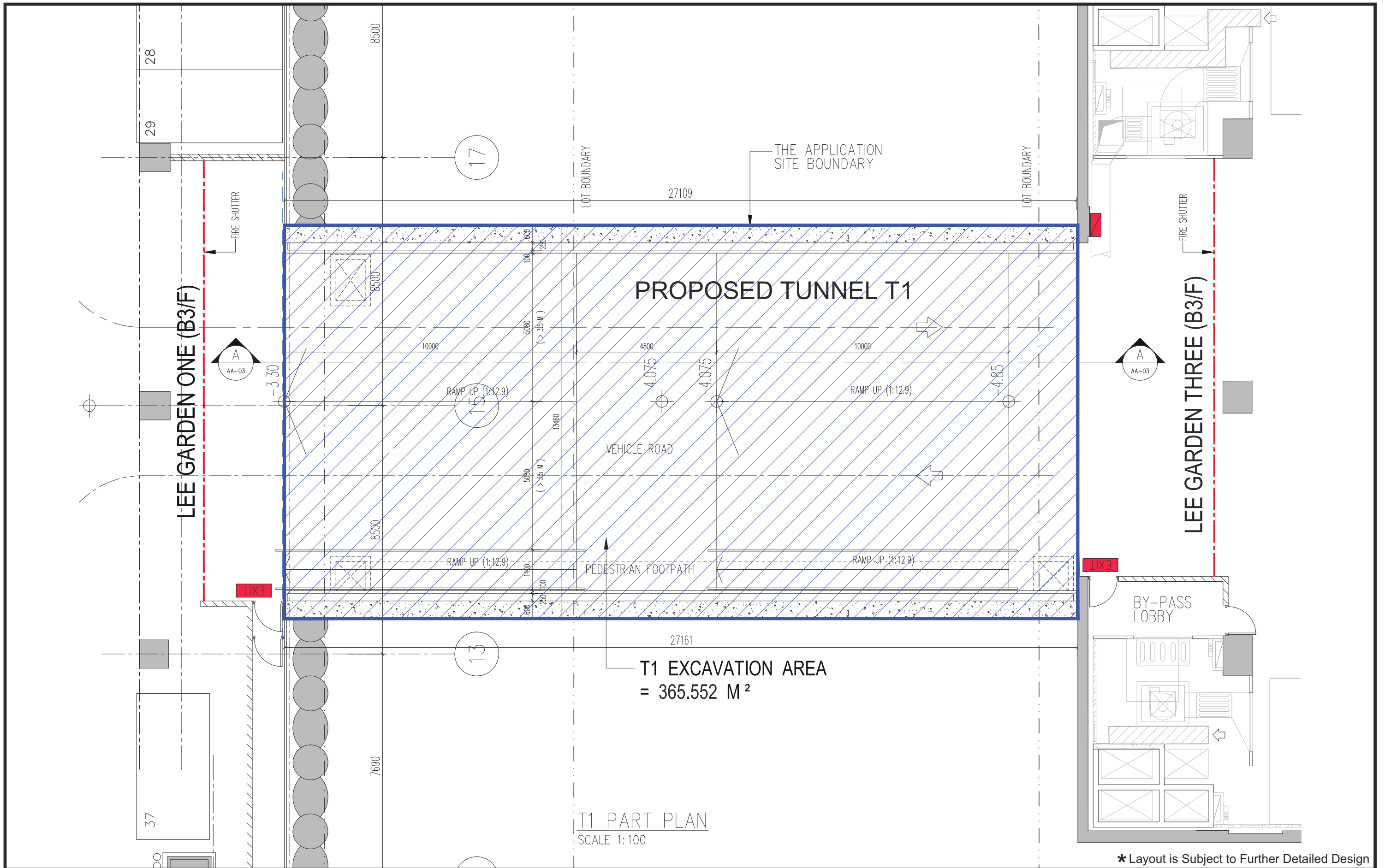
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 ➔ EXISTING CAR PARK INGRESS / EGRESS

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Rev.	Description	Checked Date

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SECTION 16 PLANNING APPLICATIONS FOR PROPOSED UNDERGROUND VEHICULAR TUNNEL T1 (CONNECTING LEE GARDEN ONE AND LEE GARDEN THREE) AND T2 (CONNECTING LEE GARDEN ONE AND LEE GARDEN TWO) TRAFFIC REVIEW REPORT

Drawing Title LOCATION PLAN OF PROPOSED TUNNELS T1 AND T2	
Designed CNM	Checked CHC
Scale NTS	Date NOV 2024
Drawing No. 1.1	Rev. -





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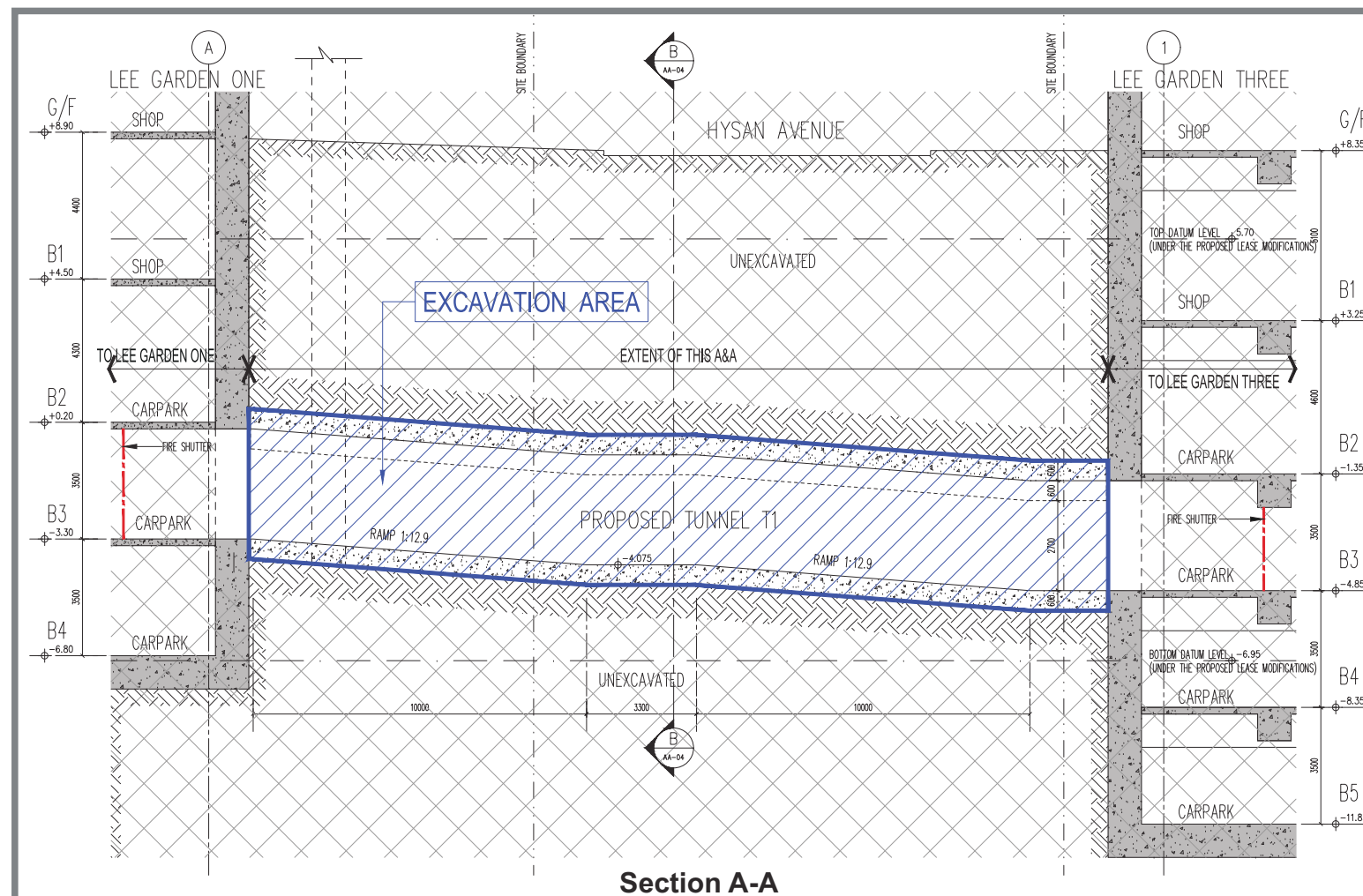
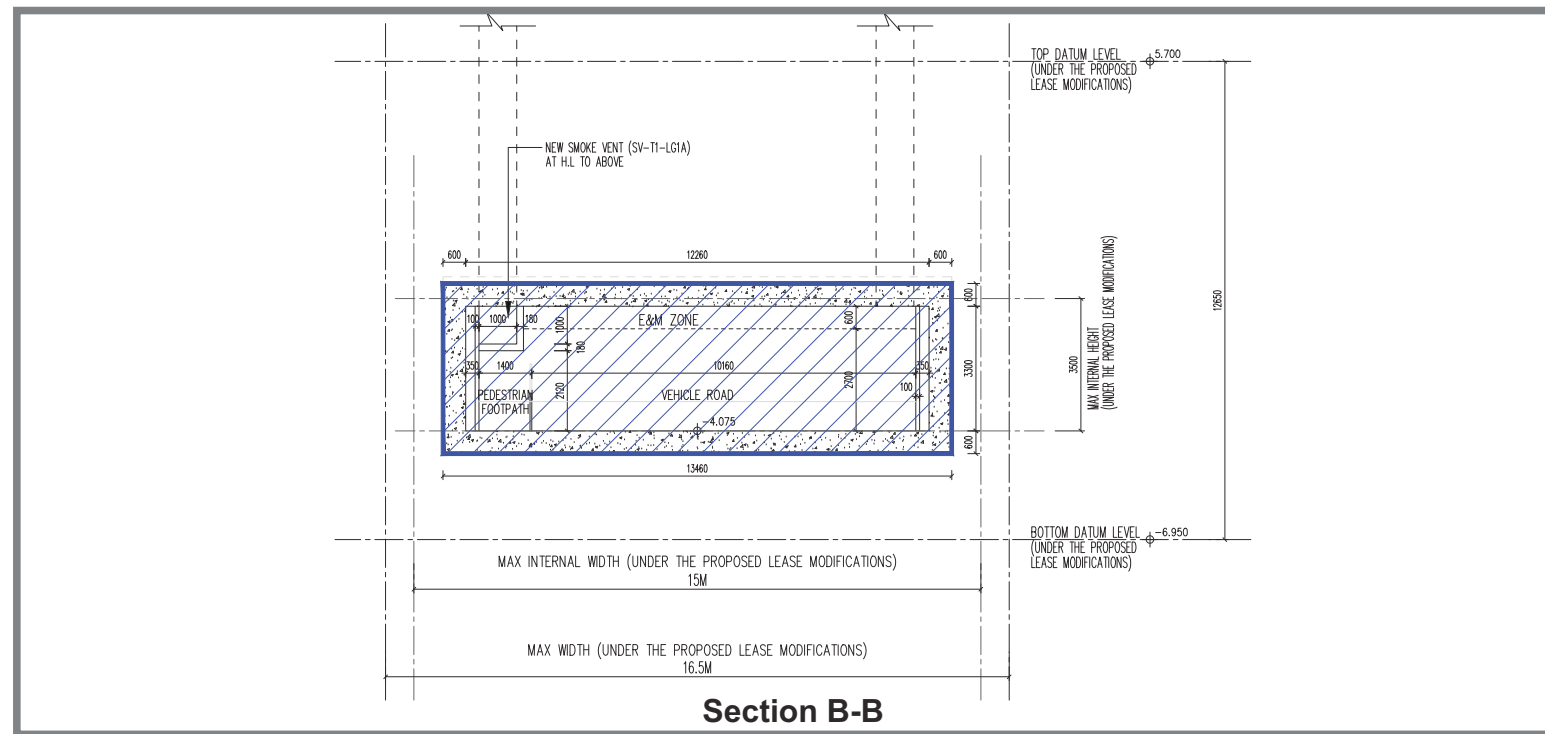
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CNM	CHC	NTS	NOV 2024	2.1	-	-	-

Drawing Title

LAYOUT OF TUNNEL T1



* Layout is Subject to Further Detailed Design

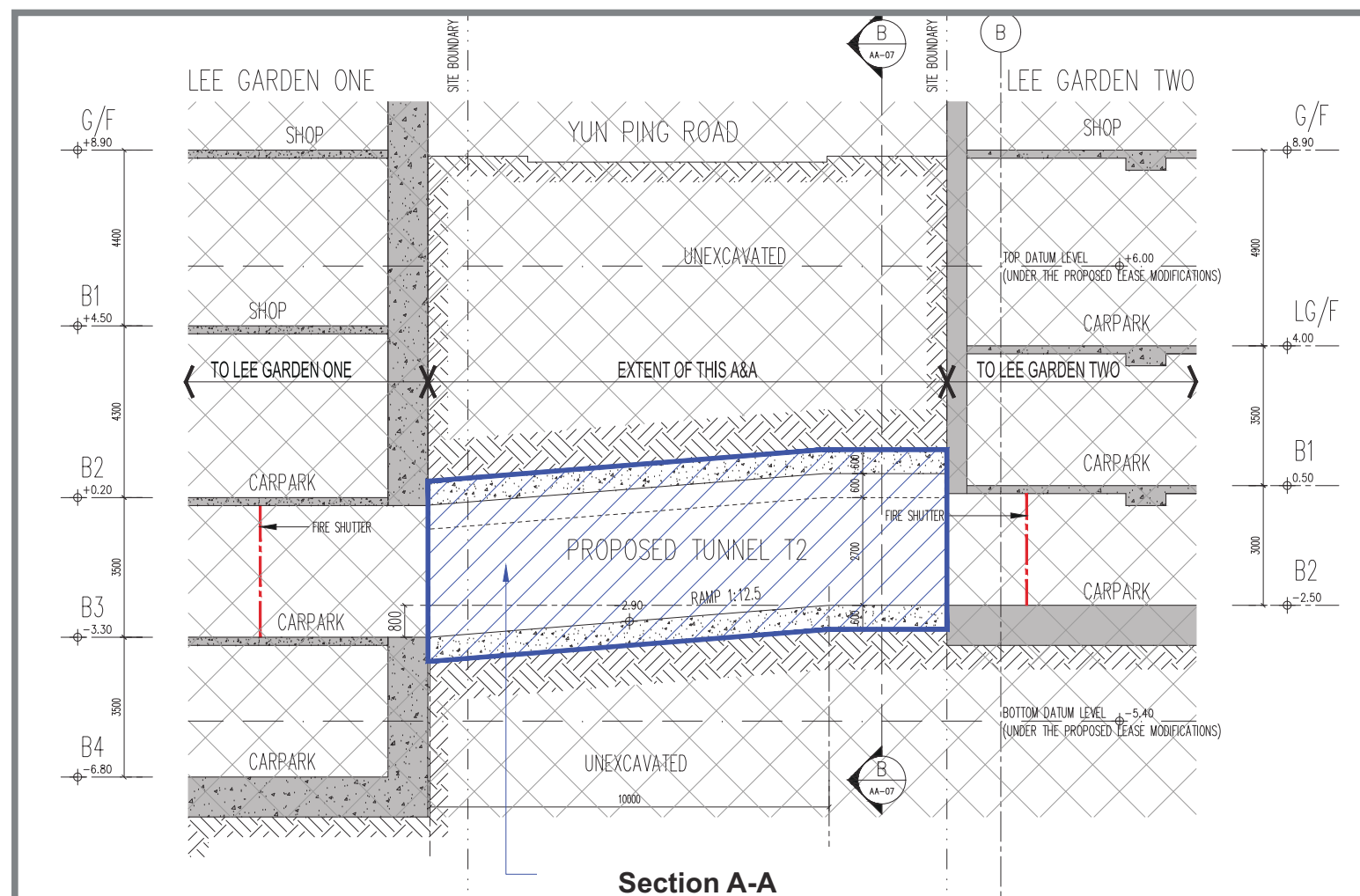
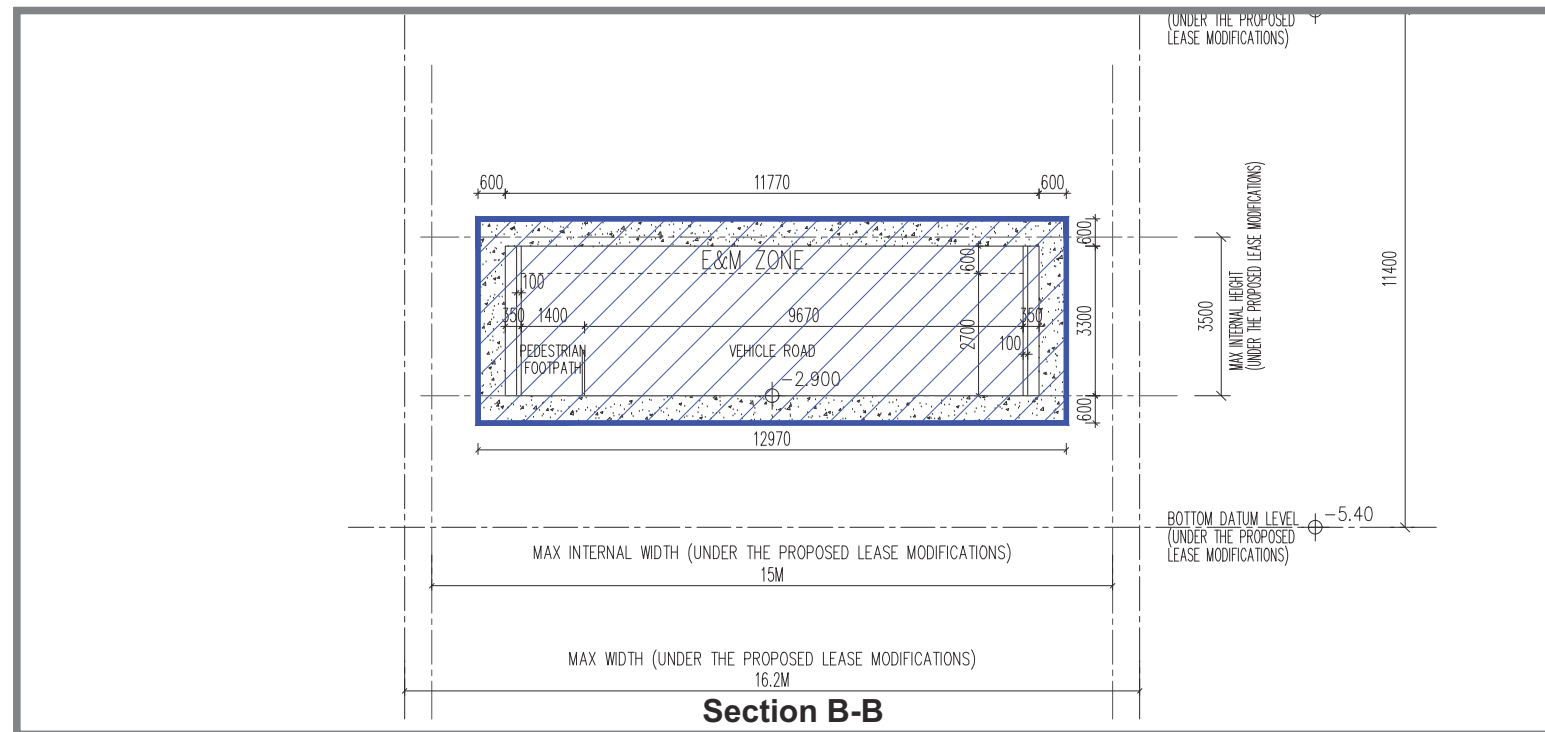
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Project Title

SECTION 16 PLANNING APPLICATIONS FOR PROPOSED UNDERGROUND VEHICULAR TUNNEL T1 (CONNECTING LEE GARDEN ONE AND LEE GARDEN THREE) AND T2 (CONNECTING LEE GARDEN ONE AND LEE GARDEN TWO) TRAFFIC REVIEW REPORT

Drawing Title		SECTIONAL PLANS OF TUNNEL T1	
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Scale	NTS	Date	NOV 2024
Drawing No.	2.2	Rev.	-





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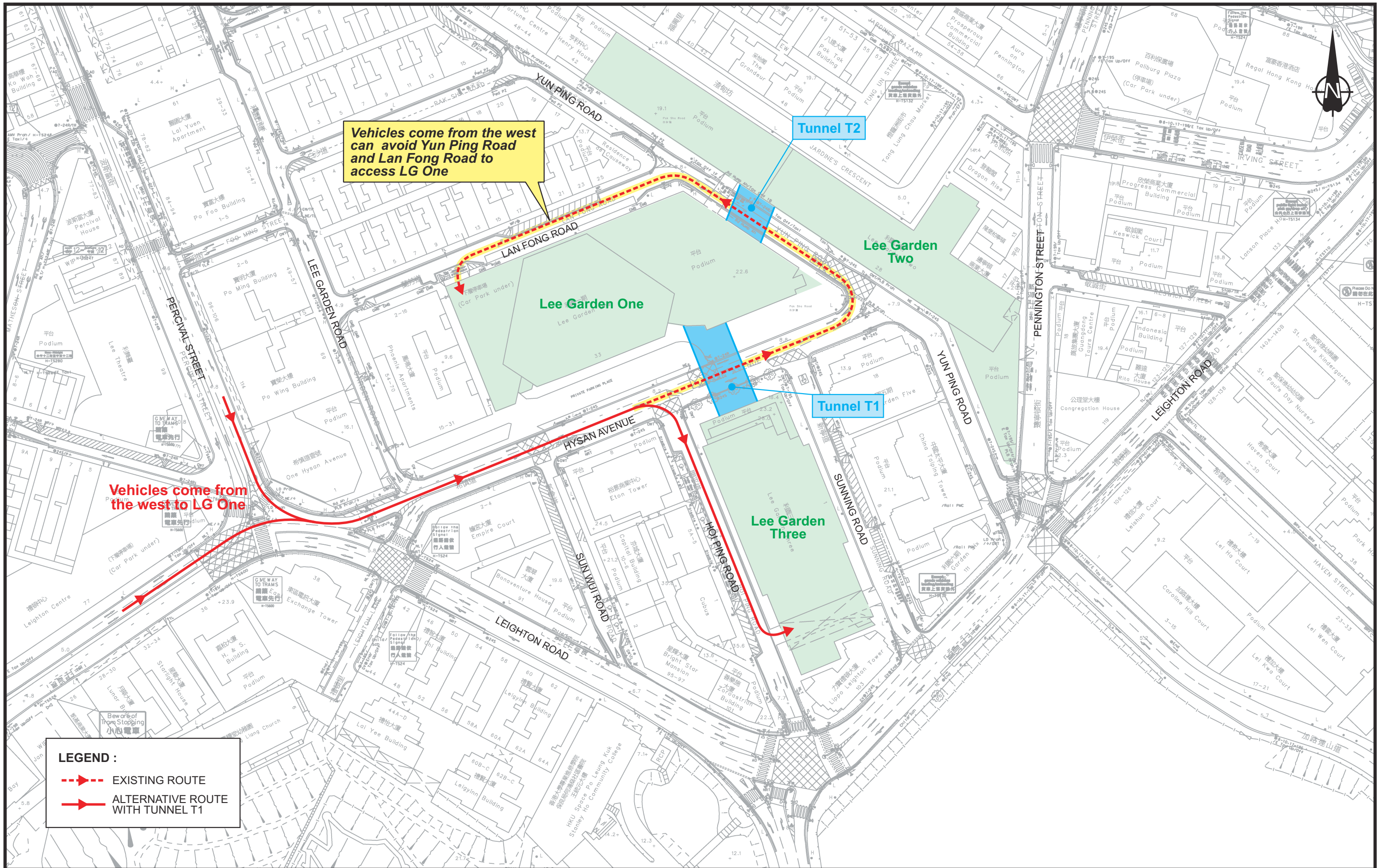
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Project Title

SECTION 16 PLANNING APPLICATIONS FOR PROPOSED UNDERGROUND VEHICULAR TUNNEL T1 (CONNECTING LEE GARDEN ONE AND LEE GARDEN THREE) AND T2 (CONNECTING LEE GARDEN ONE AND LEE GARDEN TWO) TRAFFIC REVIEW REPORT

Drawing Title		Scale		Date	Drawing No.	Rev.
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Project Title

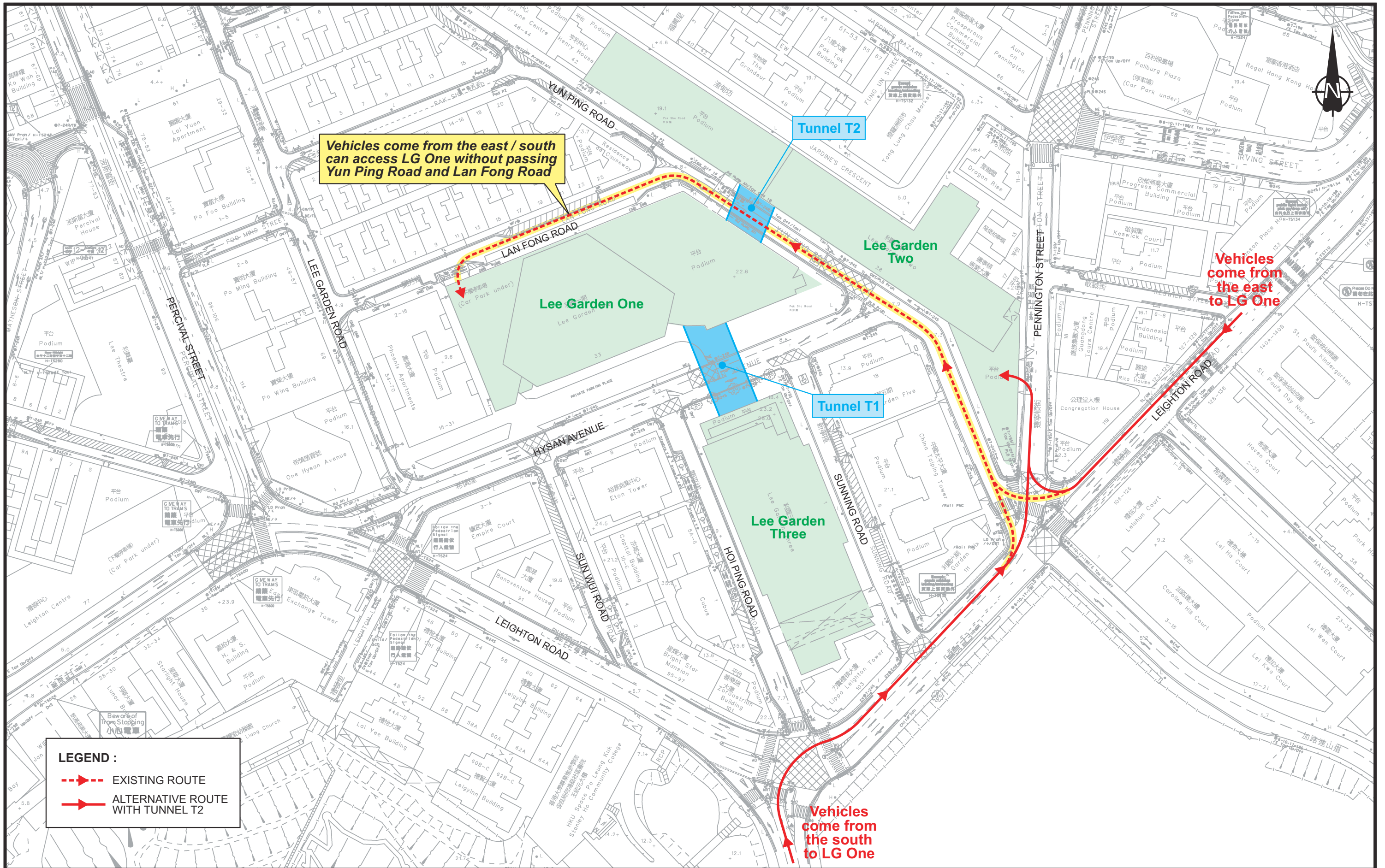
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Drawing Title

ANTICIPATED TRAFFIC RE-ROUTING DUE TO TUNNELS T1 AND T2 (1 OF 3)

Designed CNM Checked CHC Scale NTS Date NOV 2024 Drawing No. **3.1** Rev. -





LEGEND :

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- > ALTERNATIVE ROUTE WITH TUNNEL T2

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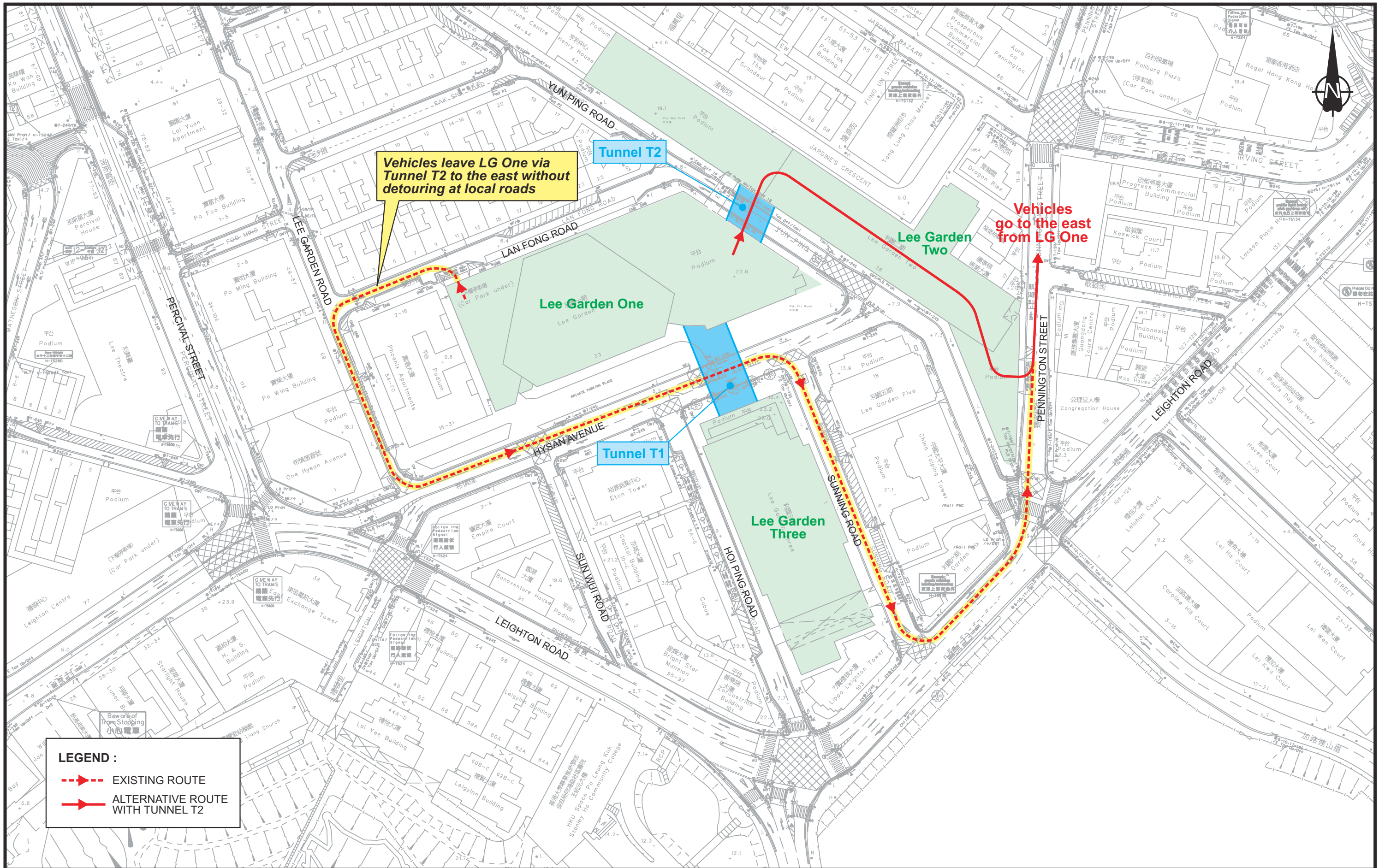
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Drawing Title

ANTICIPATED TRAFFIC RE-ROUTING DUE TO TUNNELS T1 AND T2 (2 OF 3)

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- **ALTERNATIVE ROUTE WITH TUNNEL T2**

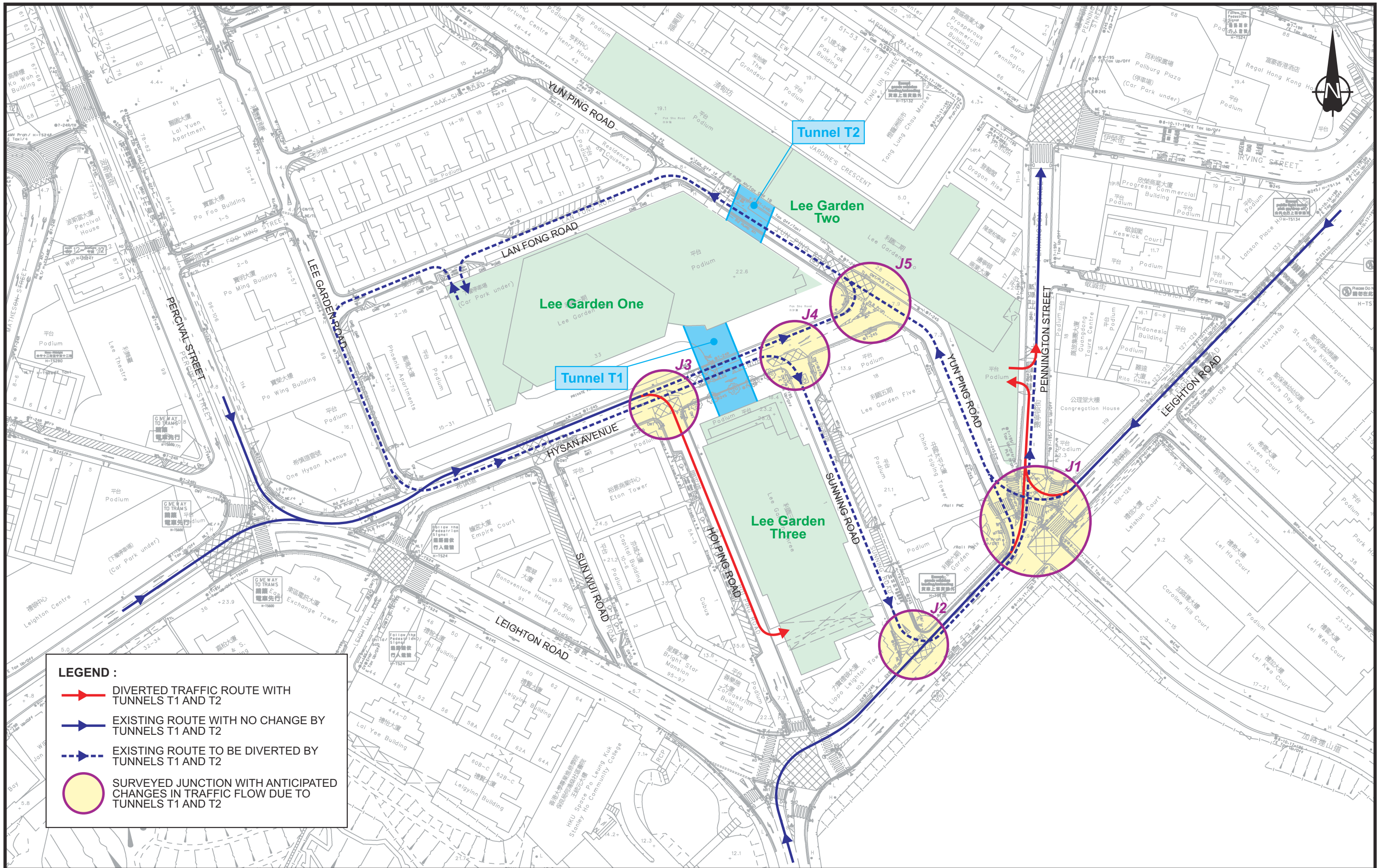
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Project Title





SECTION 16 PLANNING APPLICATIONS FOR PROPOSED UNDERGROUND VEHICULAR TUNNEL T1 (CONNECTING LEE GARDEN ONE AND LEE GARDEN THREE) AND T2 (CONNECTING LEE GARDEN ONE AND LEE GARDEN TWO) TRAFFIC REVIEW REPORT

Drawing Title		ANTICIPATED TRAFFIC RE-ROUTING DUE TO TUNNELS T1 AND T2 (3 OF 3)	
Designed	CNM	Checked	CHC
Scale	NTS	Date	NOV 2024
Drawing No.	3.3		Rev.
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LEGEND :

-  DIVERTED TRAFFIC ROUTE WITH TUNNELS T1 AND T2
-  EXISTING ROUTE WITH NO CHANGE BY TUNNELS T1 AND T2
-  EXISTING ROUTE TO BE DIVERTED BY TUNNELS T1 AND T2
-  SURVEYED JUNCTION WITH ANTICIPATED CHANGES IN TRAFFIC FLOW DUE TO TUNNELS T1 AND T2

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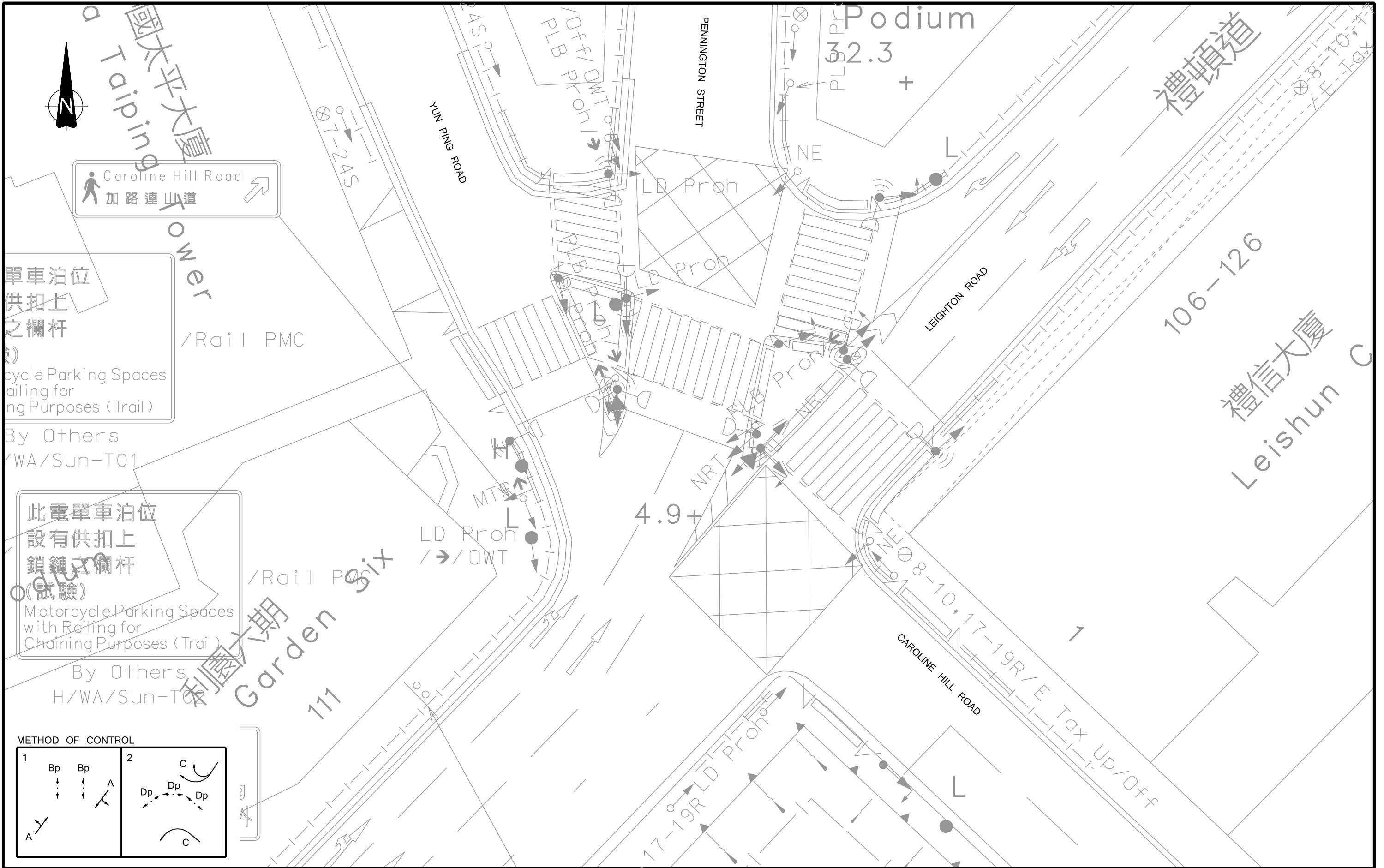
Project Title

SECTION 16 PLANNING APPLICATIONS FOR PROPOSED UNDERGROUND VEHICULAR TUNNEL T1 (CONNECTING LEE GARDEN ONE AND LEE GARDEN THREE) AND T2 (CONNECTING LEE GARDEN ONE AND LEE GARDEN TWO) TRAFFIC REVIEW REPORT

Drawing Title			
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Scale	NTS	Date	NOV 2024
Drawing No.	3.4		Rev.
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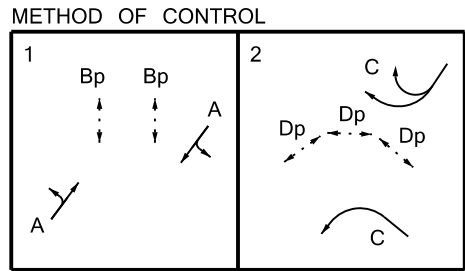


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單車泊位
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 Cycle Parking Spaces
 with Railing for
 Chaining Purposes (Trail)
 By Others
 H/WA/Sun-T01

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 (試驗)
 Motorcycle Parking Spaces
 with Railing for
 Chaining Purposes (Trail)
 By Others
 H/WA/Sun-T01



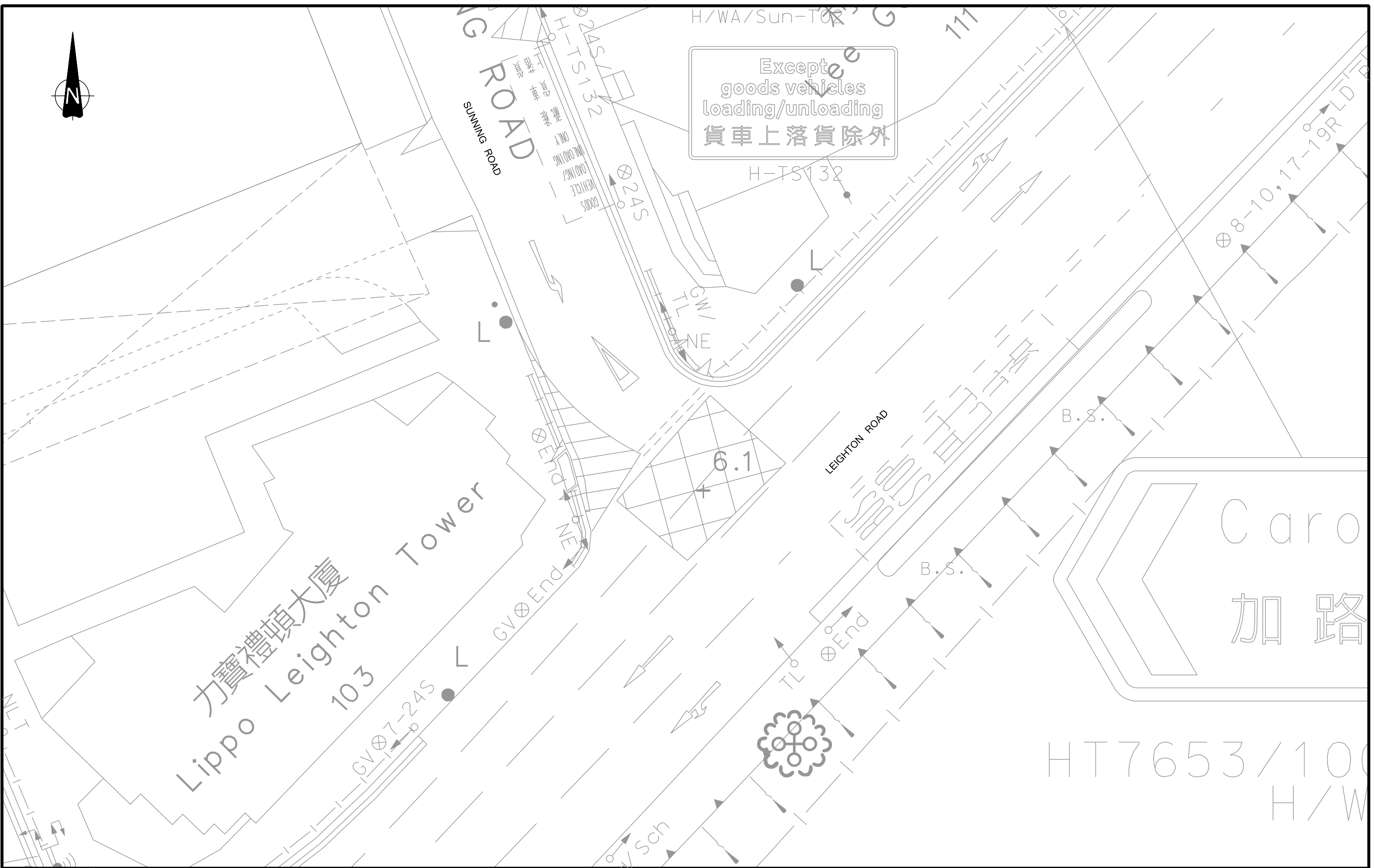
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Drawing Title
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Designed: CNM Checked: TCW Scale: 1:200(A3) Date: NOV 2024 Drawing No.: **3.5** Rev.: -





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Project Title

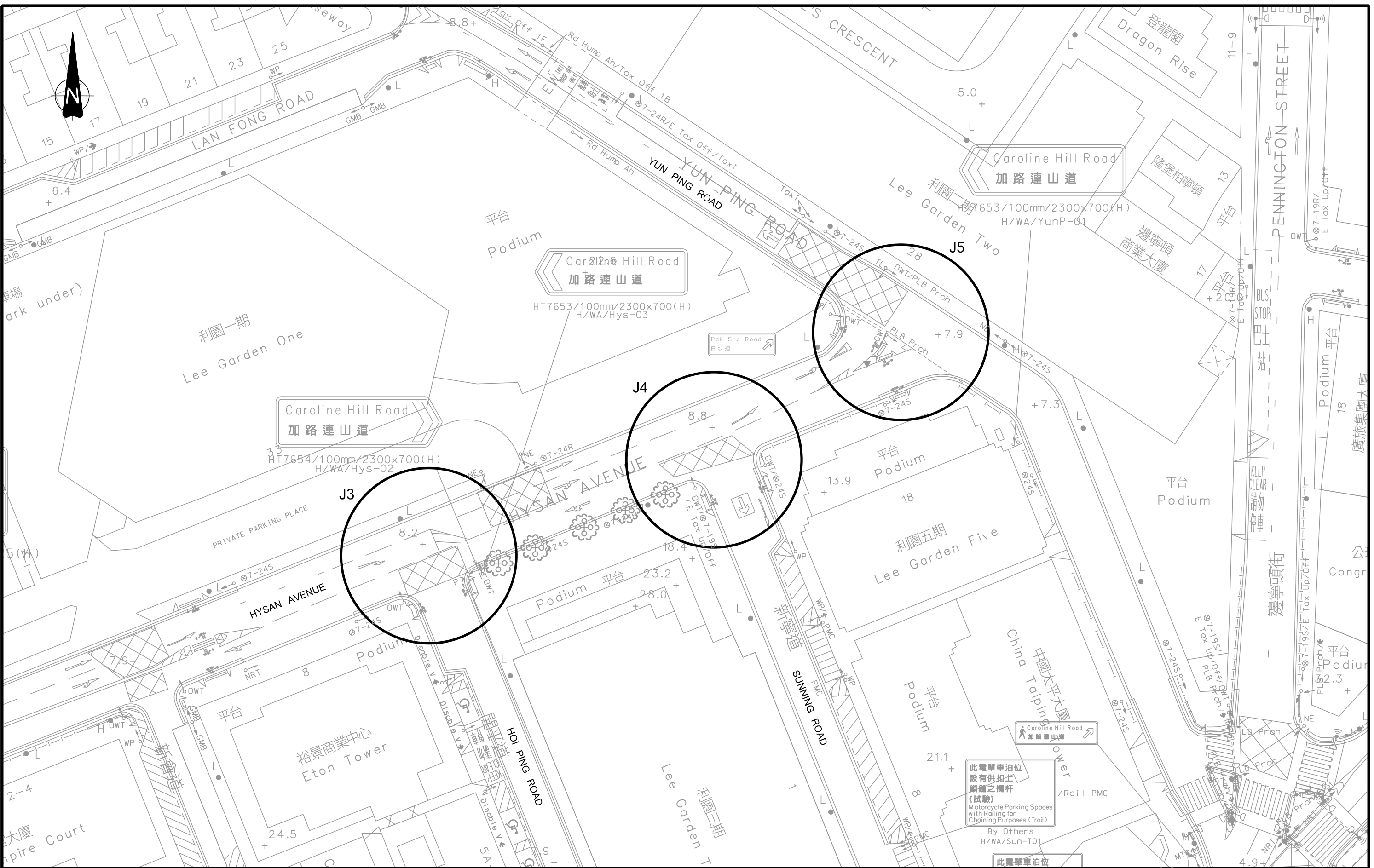
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Drawing Title

EXISTING JUNCTION LAYOUT OF LEIGHTON ROAD / SUNNING ROAD (J2)

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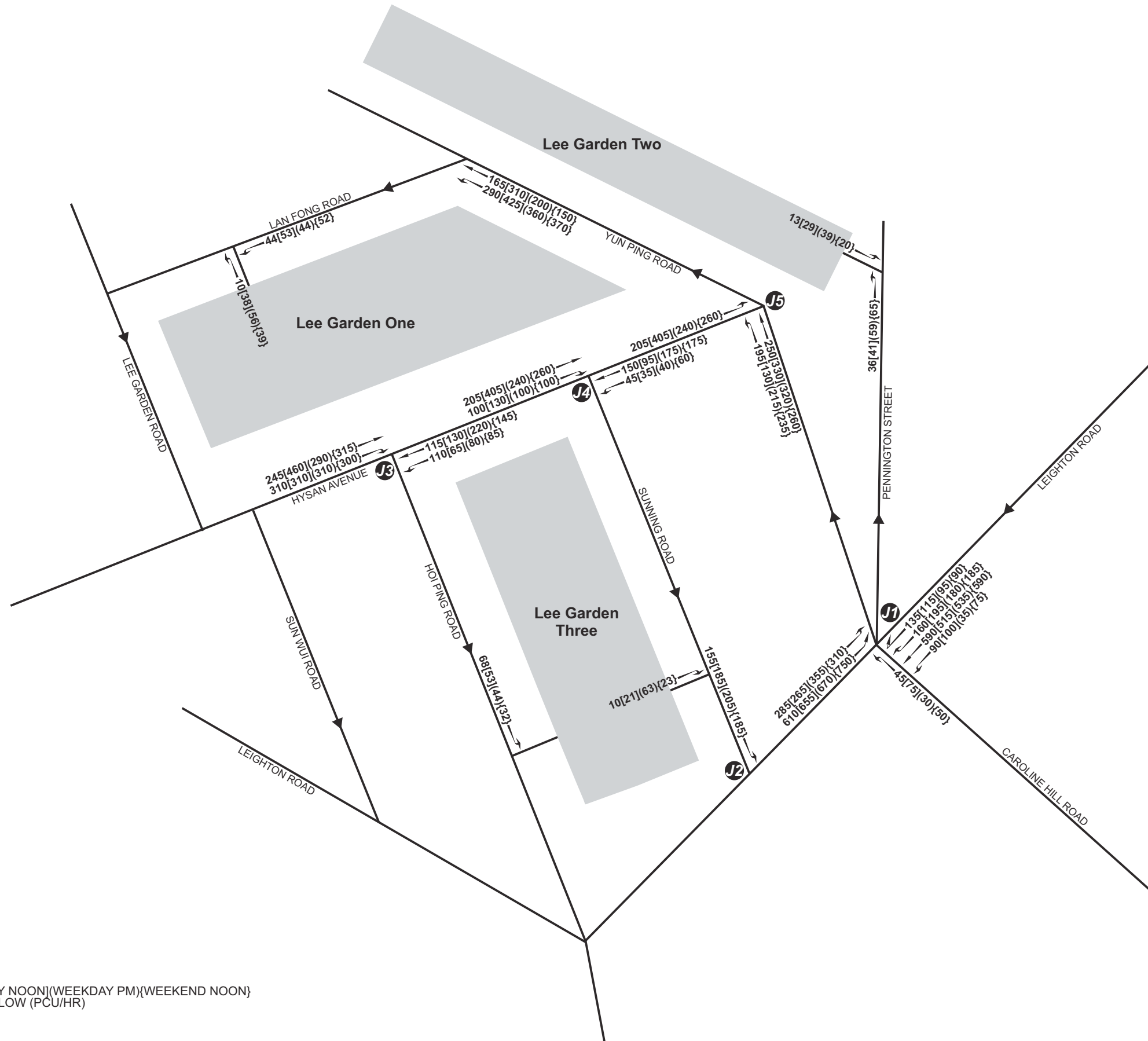
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Drawing Title
EXISTING JUNCTION LAYOUT OF HYSAN AVENUE / HOI PING ROAD (J3), HYSAN AVENUE / SUNNING ROAD (J4) AND HYSAN AVENUE / YUN PING ROAD (J5)

Designed CNM Checked TCW Scale 1:500(A3) Date NOV 2024 Drawing No. **3.7** Rev. -





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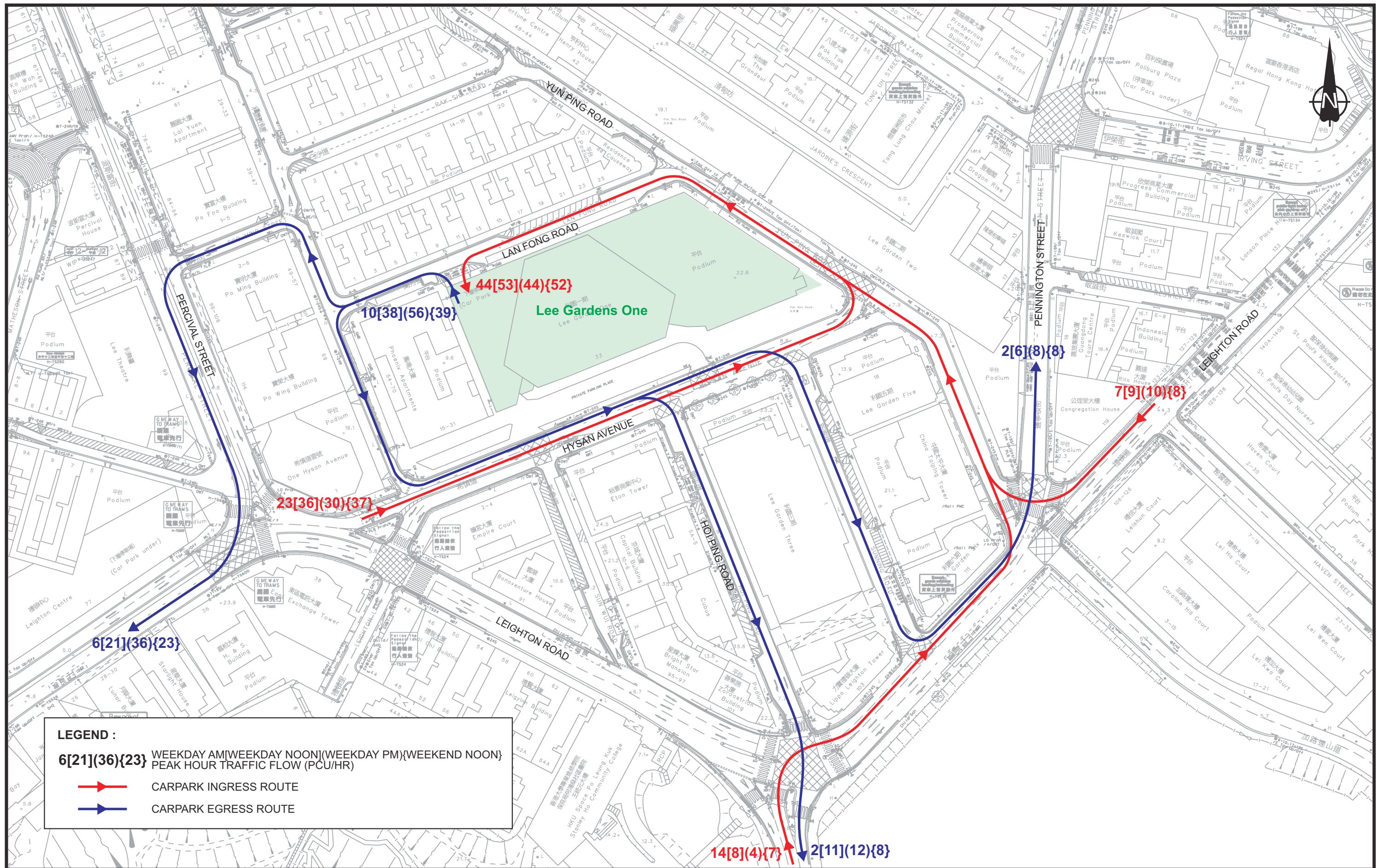
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Project Title

**SECTION 16 PLANNING APPLICATIONS FOR
 PROPOSED UNDERGROUND VEHICULAR TUNNEL T1
 (CONNECTING LEE GARDEN ONE AND LEE GARDEN THREE) AND
 T2 (CONNECTING LEE GARDEN ONE AND LEE GARDEN TWO)
 TRAFFIC REVIEW REPORT**

Drawing Title							
YEAR 2024 OBSERVED TRAFFIC FLOWS							
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						Drawing No.	3.8
						Rev.	-





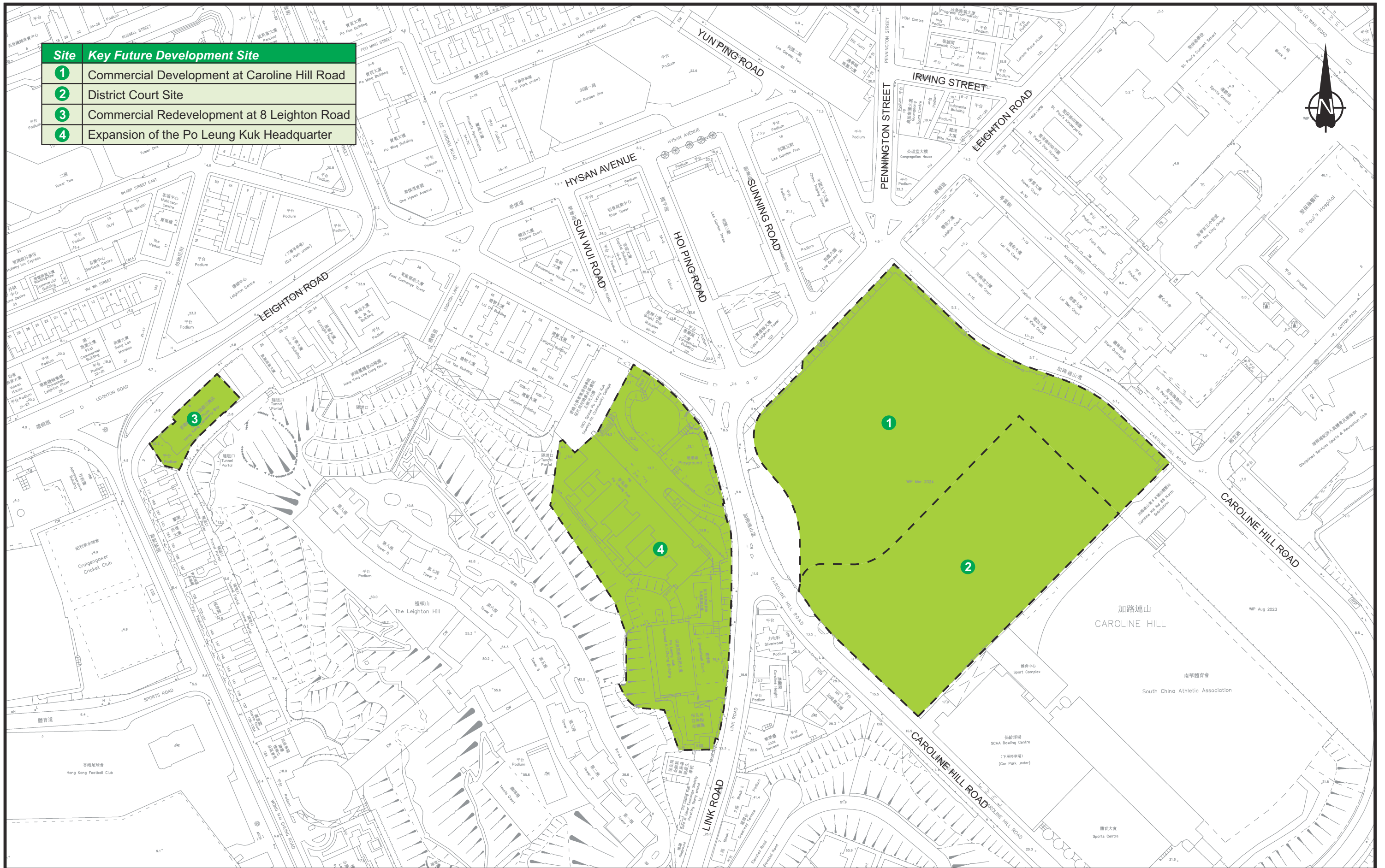
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Project Title

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Drawing Title			
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Designed	Checked	Scale	Date
CNM	CHC	NTS	NOV 2024
Drawing No.		Rev.	
3.9		-	





Site	Key Future Development Site
1	Commercial Development at Caroline Hill Road
2	District Court Site
3	Commercial Redevelopment at 8 Leighton Road
4	Expansion of the Po Leung Kuk Headquarter



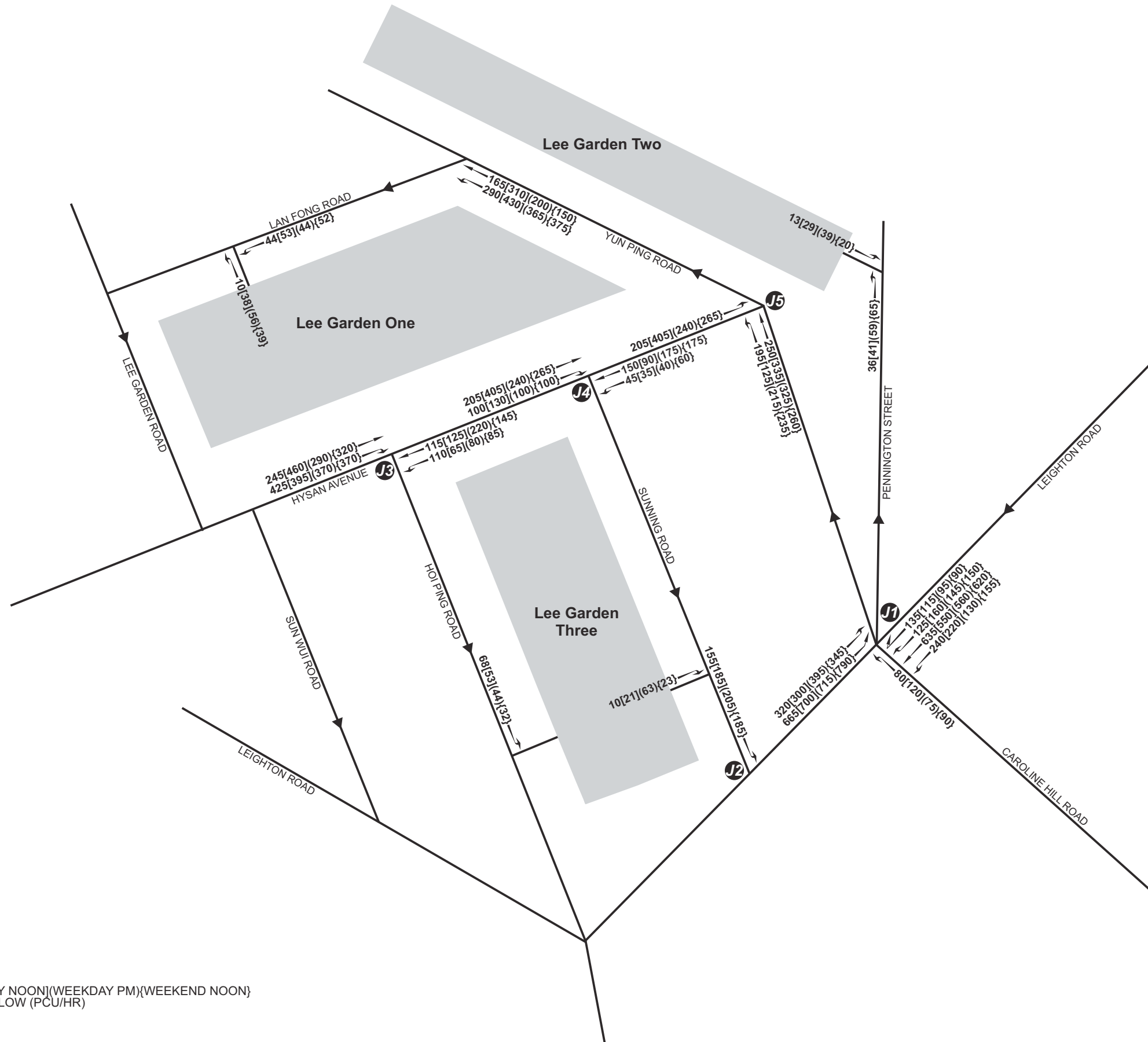
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Project Title

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Drawing Title	
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Date	NOV 2024
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Rev.	-





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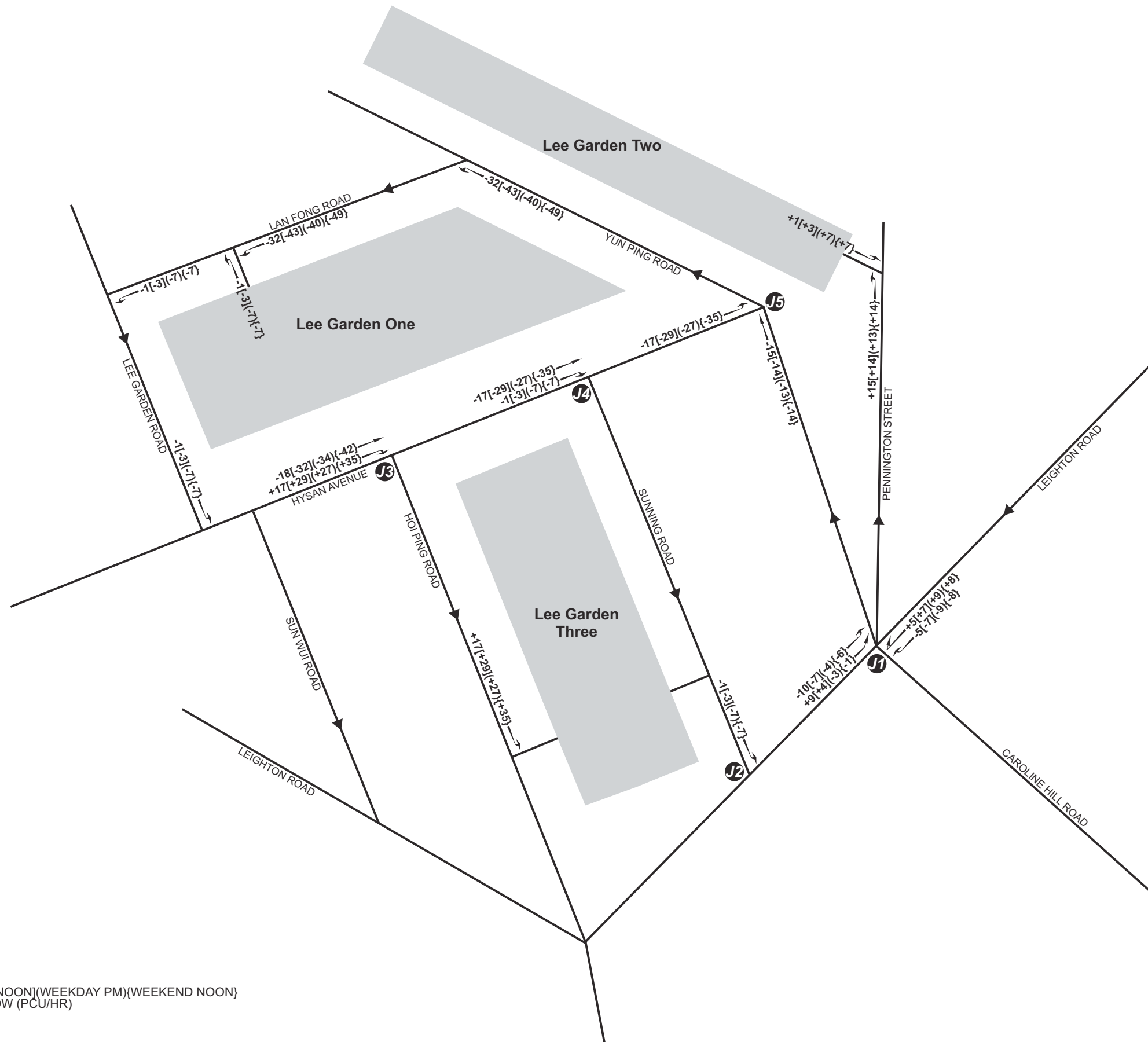
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 PEAK HOUR TRAFFIC FLOW (PCU/HR)

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Rev.	Description	Checked	Date

Project Title
**SECTION 16 PLANNING APPLICATIONS FOR
 PROPOSED UNDERGROUND VEHICULAR TUNNEL T1
 (CONNECTING LEE GARDEN ONE AND LEE GARDEN THREE) AND
 T2 (CONNECTING LEE GARDEN ONE AND LEE GARDEN TWO)
 TRAFFIC REVIEW REPORT**

Drawing Title			
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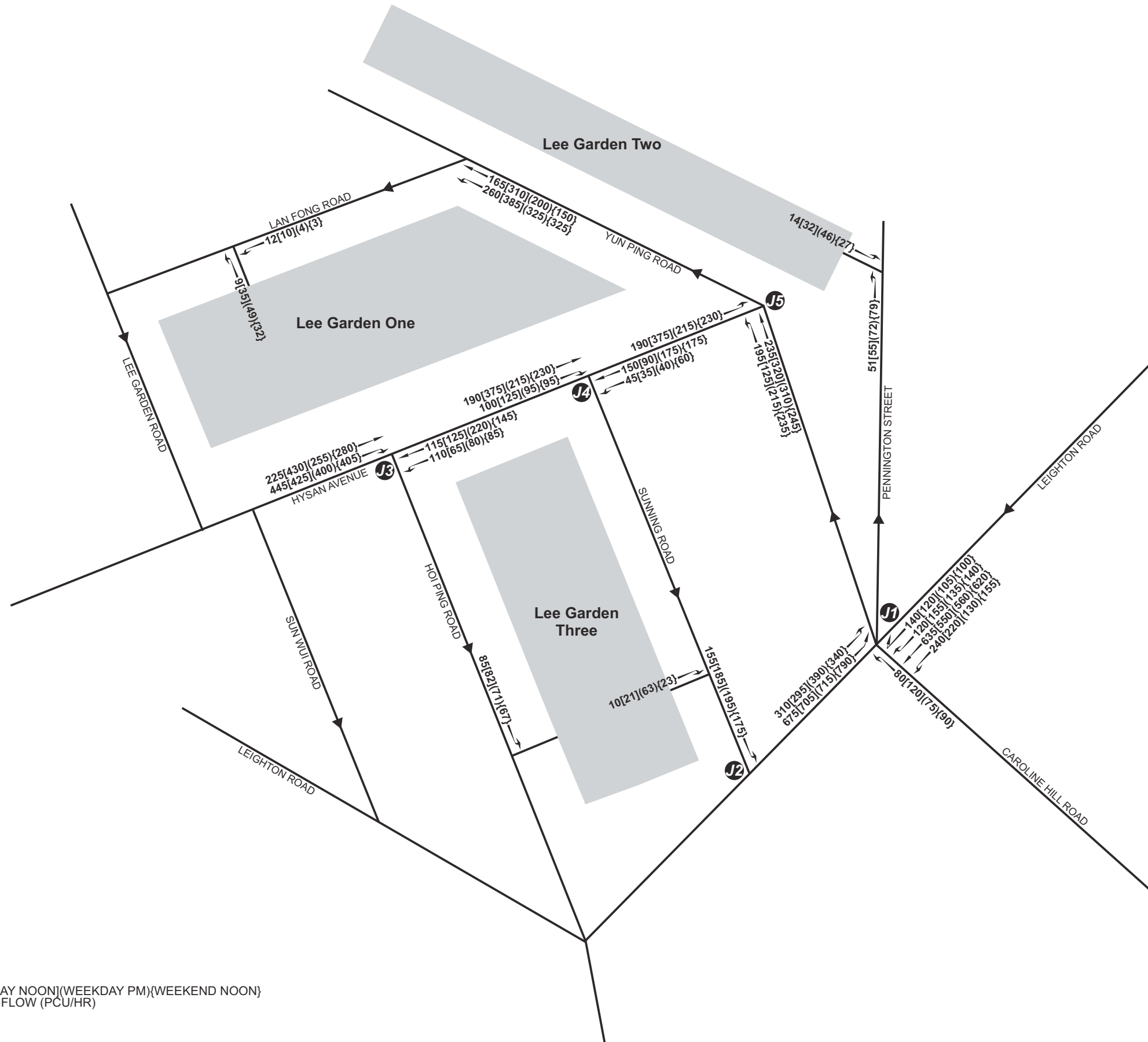
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Rev.	Description	Checked	Date

Project Title
**SECTION 16 PLANNING APPLICATIONS FOR
 PROPOSED UNDERGROUND VEHICULAR TUNNEL T1
 (CONNECTING LEE GARDEN ONE AND LEE GARDEN THREE) AND
 T2 (CONNECTING LEE GARDEN ONE AND LEE GARDEN TWO)
 TRAFFIC REVIEW REPORT**

Drawing Title		NET DIFFERENCES IN TRAFFIC FLOWS DUE TO TUNNELS T1 AND T2			
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Date	NOV 2024	Drawing No.	3.12	Rev.	-





LEGEND :

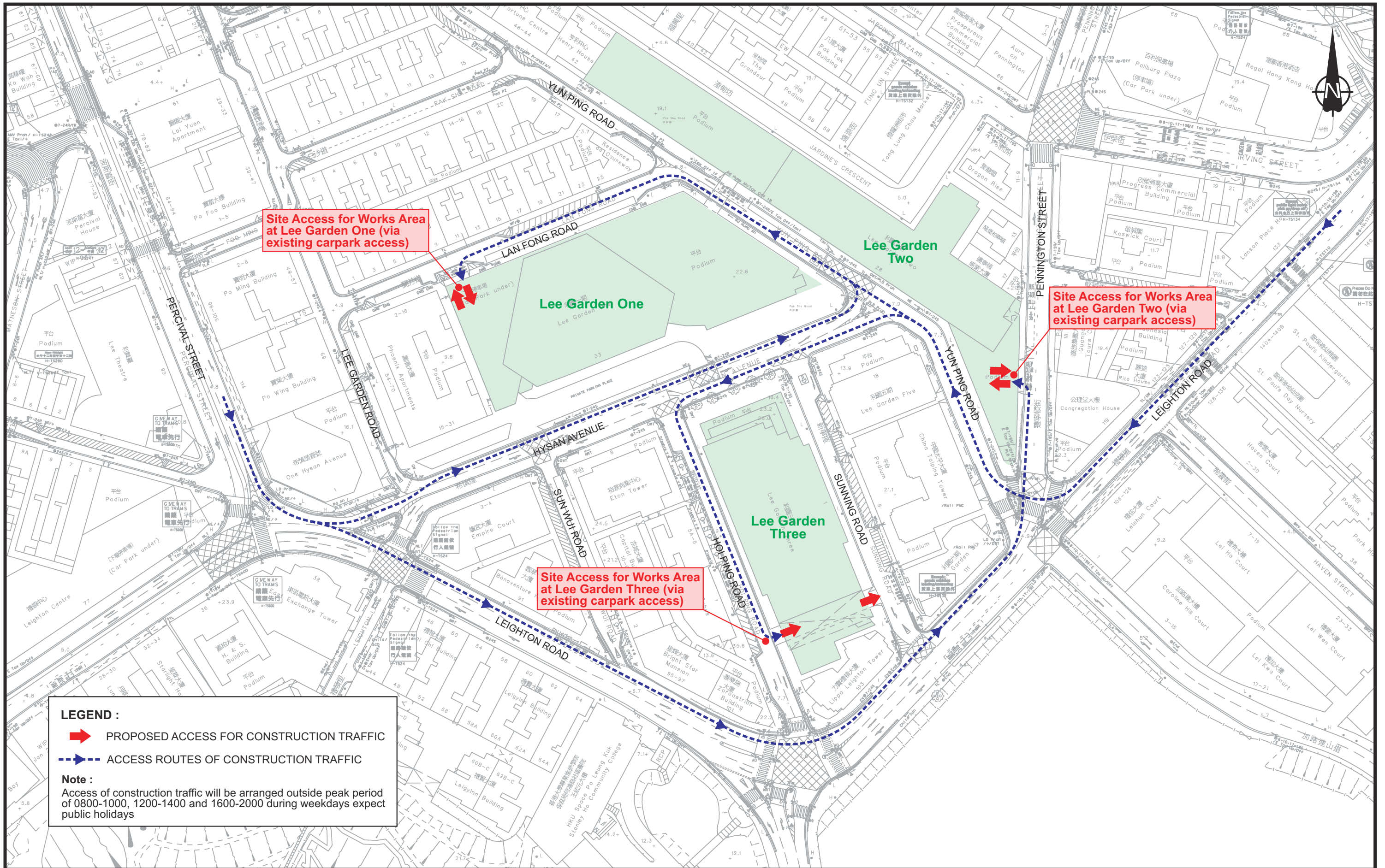
130[120](105){80} WEEKDAY AM{WEEKDAY NOON}{WEEKDAY PM}{WEEKEND NOON}
 PEAK HOUR TRAFFIC FLOW (PCU/HR)

-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
Rev.	Description	Checked	Date

Project Title
**SECTION 16 PLANNING APPLICATIONS FOR
 PROPOSED UNDERGROUND VEHICULAR TUNNEL T1
 (CONNECTING LEE GARDEN ONE AND LEE GARDEN THREE) AND
 T2 (CONNECTING LEE GARDEN ONE AND LEE GARDEN TWO)
 TRAFFIC REVIEW REPORT**

Drawing Title			
YEAR 2032 DESIGN TRAFFIC FLOWS			
Designed	Checked	Scale	Date
CNM	CHC	NTS	NOV 2024
Drawing No.		Rev.	
3.13		-	





-	-	-
-	-	-
-	-	-
-	-	-
Rev.	Description	Checked Date

Project Title

SECTION 16 PLANNING APPLICATIONS FOR PROPOSED UNDERGROUND VEHICULAR TUNNEL T1 (CONNECTING LEE GARDEN ONE AND LEE GARDEN THREE) AND T2 (CONNECTING LEE GARDEN ONE AND LEE GARDEN TWO) TRAFFIC REVIEW REPORT

Drawing Title		<p>ACCESS ARRANGEMENT OF CONSTRUCTION TRAFFIC</p>	
Designed	CNM	Checked	CHC
Scale	NTS	Date	NOV 2024
Drawing No.	4.1		Rev.



APPENDIX A – JUNCTION ASSESSMENTS

2032 Reference

TRAFFIC SIGNALS CALCULATION

Job No.: CHK50836810

MVA HONG KONG LIMITED

Junction: Leighton Road / Yun Ping Road / Pennington Street / Caroline Hill Road (East)

Design Year: 2032

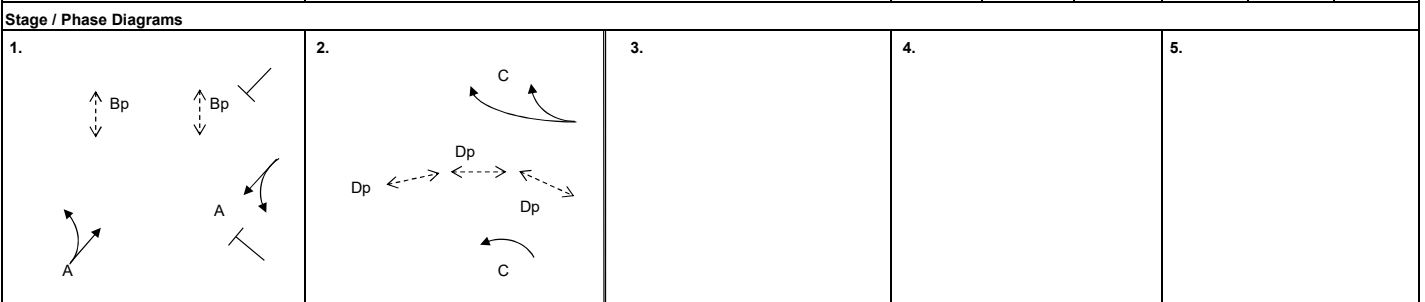
Description: 2032 Reference

Designed By: TCW

Checked By: CHC

Approach	Movements	Phase	Stage	Width (m)	Radius (m)		Gradient (%)	Pro. Turning (%)		Revised Saturation Flow (pcu/hr)		AM Peak			PM Peak		
					Left	Right		AM	PM	AM	PM	Flow (pcu/hr)	y Value	Critical y	Flow (pcu/hr)	y Value	Critical y
Leighton Road WB	↔*	A	1	3.000	7			84%	56%	975	1025	286	0.293		234	0.228	
	←	A	1	2.500													
Leighton Road WB	↔**	C	2	3.500						1180	1180	260	0.220	0.220	240	0.203	0.203
Caroline Hill Road NB	↔*	C	2	4.000						930	930	80	0.086		75	0.081	
Leighton Road EB	↔**	A	1	3.000	15			70%	77%	1255	1245	459	0.366	0.366	515	0.414	0.414
	→**	A	1	3.000													
Pedestrian Crossing		Bp	1	MIN GREEN + FLASH =		5	+	8	=	13							
		Dp	2	MIN GREEN + FLASH =		10	+	8	=	18							

Notes: TAC junction: Cycle time of 105s and 130s are adopted for AM and PM Peak * = Site factor of 0.6 adopted ** = Site factor of 0.7 adopted	Flow: (pcu/hr) 	Group	A,Dp	A,C	Group	A,Dp	A,C
		y	0.366	0.586	y	0.414	0.617
		L (sec)	27	11	L (sec)	27	11
		C (sec)	105	105	C (sec)	130	130
		y pract.	0.669	0.806	y pract.	0.713	0.824
		R.C. (%)	83%	37%	R.C. (%)	72%	34%



I/G= 7	I/G= 6	I/G=	I/G=	I/G=	I/G=
I/G= 7	I/G= 6	I/G=	I/G=	I/G=	I/G=

Date: NOV, 2024 Junction: Leighton Road / Yun Ping Road / Pennington Street / Caroline Hill (J1)

TRAFFIC SIGNALS CALCULATION

Job No.: CHK50836810

MVA HONG KONG LIMITED

Junction: Leighton Road / Yun Ping Road / Pennington Street / Caroline Hill Road (East)

Design Year: 2032

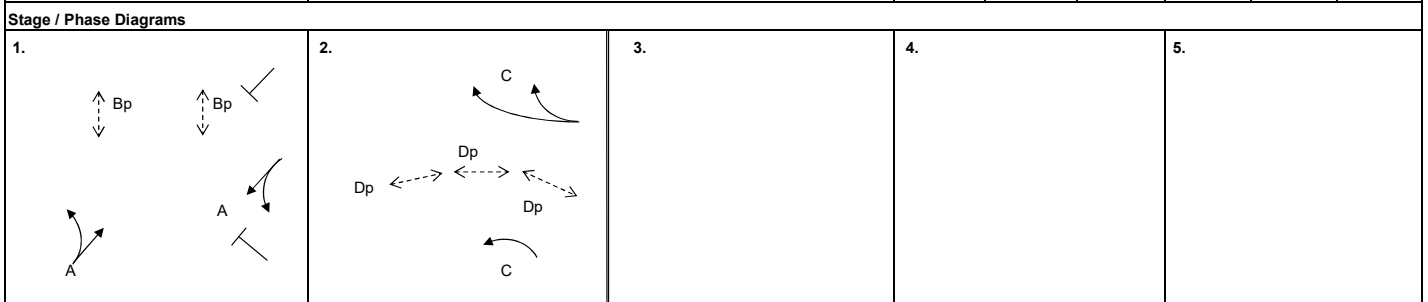
Description: 2032 Reference

Designed By: TCW

Checked By: CHC

Approach	Movements	Phase	Stage	Width (m)	Radius (m)		Gradient (%)	Pro. Turning (%)		Revised Saturation Flow (pcu/hr)		WD NOON			WE NOON		
					Left	Right		WD NOON	WE NOON	WD NOON	WE NOON	Flow (pcu/hr)	y Value	Critical y	Flow (pcu/hr)	y Value	Critical y
Leighton Road WB	↔*	A	1	3.000	7			88%	59%	965	1020	251	0.260		261	0.256	
	←	A	1	2.500						2005	2005	519	0.259		514	0.256	
Leighton Road WB	↔**	C	2	3.500		9				1180	1180	275	0.233	0.233	240	0.203	0.203
Caroline Hill Road NB	↔*	C	2	4.000		5				930	930	120	0.129		90	0.097	
Leighton Road EB	↔**	A	1	3.000	15			64%	65%	1260	1260	467	0.371	0.371	530	0.421	0.421
	→**	A	1	3.000						1440	1440	533	0.370		605	0.420	
Pedestrian Crossing		Bp	1	MIN GREEN + FLASH =		5	+	8	=	13							
		Dp	2	MIN GREEN + FLASH =		10	+	8	=	18							

Notes: TAC junction: Cycle time of 110s and 120s are adopted for weekday noon and * = Site factor of 0.6 adopted ** = Site factor of 0.7 adopted	Flow: (pcu/hr) 	Group	A,Dp	A,C	Group	A,Dp	A,C
		y	0.371	0.604	y	0.421	0.624
		L (sec)	27	11	L (sec)	27	11
		C (sec)	110	110	C (sec)	120	120
		y pract.	0.679	0.810	y pract.	0.698	0.818
		R.C. (%)	83%	34%	R.C. (%)	66%	31%



I/G= 7	I/G= 6	I/G=	I/G=	I/G=	I/G=
I/G= 7	I/G= 6	I/G=	I/G=	I/G=	I/G=
Date: NOV, 2024				Junction: Leighton Road / Yun Ping Road / Pennington Street / Caroline Hill	

Simplified Priority Junction Capacity Calculation

Job Title:					
Junction: Leighton Road - Sunning Road		Ref. No.:	J2		
Scheme: 2032 Reference		Ref. No.:			
Year: 2032	Job No.:	CHK50836810	Rev.: -		
ARM A: Leighton Road					
ARM B: Sunning Road					
ARM C: Leighton Road					
GEOMETRY					
Major road width	W	13.15	Lane widths	w(b-a)	5.50
Central Reserve width	Wcr	0.00		w(b-c)	0.00
2 Lane Minor Arm (Y/N)		N		w(c-b)	0.00
Visibilities	Vr(b-a)	40	Calculated	D	1.03
	VI(b-a)	55		E	0.61
	Vr(b-c)	40		F	0.63
	Vr(c-b)	70		Y	0.55
ANALYSIS					
			WD AM PEAK	(WD PM) PEAK	
TRAFFIC FLOWS	q(c-a)		715	635	
	q(c-b)		0	0	
	q(a-b)		0	0	
	q(a-c)		830	910	
	q(b-a)		0	0	
	q(b-c)		155	205	
	f		1.00	1.00	
CAPACITIES	Q(b-a)	Factor 1	383	377	
	Q(b-c)	1	354	344	
	Q(c-b)	1	364	354	
	Q(b-ac)	1	354	344	
RFC's	b-a		0.000	0.000	
	b-c		0.438	0.596	
	c-b		0.000	0.000	
	b-ac		0.438	0.596	
Worst RFC			0.438	0.596	
<p>Where VI and Vr are visibility distances to the left or right of the respective streams</p> $D = (1+0.094(w(b-a)-3.65))(1+0.0009(Vr(b-a)-120))(1+0.0006(VI(b-a)-150))$ $E = (1+0.094(w(b-c)-3.65))(1+0.0009(Vr(b-c)-120))$ $F = (1+0.094(w(c-b)-3.65))(1+0.0009(Vr(c-b)-120))$ $Y = 1-0.0345W$ <p>f = proportion of minor traffic turning left</p> $Q(b-ac) = Q(b-c)*Q(b-a)/((1-f)*Q(b-c)+f*Q(b-a))$ <p style="text-align: right;">Capacity of combined streams - in accordance with TPDM V2.4</p>					
T.P.D.M.V.2.4 Appendix 1					
Calculated by:	TCW	Date:	Nov-24	Checked by:	CHC

O:\cnm\Sigcal_2032 REF_AM&PM.xlsm]J2

Simplified Priority Junction Capacity Calculation

Job Title:					
Junction:	Leighton Road - Sunning Road	Ref. No.:	J2		
Scheme:	2032 Reference	Ref. No.:			
Year:	2032	Job No.:	CHK50836810		
		Rev.:	-		
ARM A:	Leighton Road				
ARM B:	Sunning Road				
ARM C:	Leighton Road				
GEOMETRY					
Major road width	W	13.15	Lane widths	w(b-a)	5.50
Central Reserve width	Wcr	0.00		w(b-c)	0.00
2 Lane Minor Arm (Y/N)		N		w(c-b)	0.00
Visibilities	Vr(b-a)	40	Calculated	D	1.03
	VI(b-a)	55		E	0.61
	Vr(b-c)	40		F	0.63
	Vr(c-b)	70		Y	0.55
ANALYSIS					
			WD NOON PEAK	(WE NOON) PEAK	
TRAFFIC FLOWS	q(c-a)		670	710	
	q(c-b)		0	0	
	q(a-b)		0	0	
	q(a-c)		815	950	
	q(b-a)		0	0	
	q(b-c)		185	185	
	f		1.00	1.00	
CAPACITIES	Q(b-a)	Factor	392	359	
	Q(b-c)	1	355	339	
	Q(c-b)	1	366	349	
	Q(b-ac)	1	355	339	
RFC's	b-a		0.000	0.000	
	b-c		0.521	0.546	
	c-b		0.000	0.000	
	b-ac		0.521	0.546	
Worst RFC			0.521	0.546	
<p>Where VI and Vr are visibility distances to the left or right of the respective streams</p> $D = (1+0.094(w(b-a)-3.65))(1+0.0009(Vr(b-a)-120))(1+0.0006(VI(b-a)-150))$ $E = (1+0.094(w(b-c)-3.65))(1+0.0009(Vr(b-c)-120))$ $F = (1+0.094(w(c-b)-3.65))(1+0.0009(Vr(c-b)-120))$ $Y = 1-0.0345W$ <p>f = proportion of minor traffic turning left</p> $Q(b-ac) = Q(b-c)*Q(b-a)/((1-f)*Q(b-c)+f*Q(b-a))$ <p style="text-align: right;">Capacity of combined streams - in accordance with TPDM V2.4</p>					
Calculated by:		TCW	Date:	Nov-24	
Checked by:		CHC			

O:\cnm\Sigcal_2032 REF_NOON&WE.xlsm]J2

Simplified Priority Junction Capacity Calculation

Job Title:					
Junction: Hysan Avenue - Hoi Ping Road		Ref. No.: J3			
Scheme: 2032 Reference		Ref. No.:			
Year: 2032	Job No.: CHK50836810	Rev.: -			
ARM A: Hysan Avenue					
ARM B: Hoi Ping Road					
ARM C: Hysan Avenue					
GEOMETRY					
Major road width	W	10.00	Lane widths	w(b-a)	0.00
Central Reserve width	Wcr	0.00		w(b-c)	0.00
2 Lane Minor Arm (Y/N)		N		w(c-b)	3.30
Visibilities	Vr(b-a)	75	Calculated	D	0.59
	VI(b-a)	55		E	0.63
	Vr(b-c)	75		F	0.94
	Vr(c-b)	90		Y	0.66
ANALYSIS					
			WD AM PEAK	(WD PM) PEAK	
TRAFFIC FLOWS	q(c-a)		245	290	
	q(c-b)		425	370	
	q(a-b)		110	80	
	q(a-c)		115	220	
	q(b-a)		0	0	
	q(b-c)		0	0	
	f		0.00	0.00	
CAPACITIES	Q(b-a)	Factor 1	242	236	
	Q(b-c)	1	446	432	
	Q(c-b)	1	651	634	
	Q(b-ac)	1	242	236	
RFC's	b-a		0.000	0.000	
	b-c		0.000	0.000	
	c-b		0.653	0.584	
	b-ac		0.000	0.000	
Worst RFC			0.653	0.584	
<p>Where VI and Vr are visibility distances to the left or right of the respective streams</p> $D = (1+0.094(w(b-a)-3.65))(1+0.0009(Vr(b-a)-120))(1+0.0006(VI(b-a)-150))$ $E = (1+0.094(w(b-c)-3.65))(1+0.0009(Vr(b-c)-120))$ $F = (1+0.094(w(c-b)-3.65))(1+0.0009(Vr(c-b)-120))$ $Y = 1-0.0345W$ <p>f = proportion of minor traffic turning left</p> $Q(b-ac) = Q(b-c)*Q(b-a)/((1-f)*Q(b-c)+f*Q(b-a))$ <p style="text-align: right;">Capacity of combined streams - in accordance with TPDM V2.4</p>					
Calculated by: TCW		Date: Nov-24	Checked by: CHC		

O:\cnm\Sigcal_2032 REF_AM&PM.xlsm]J3

Simplified Priority Junction Capacity Calculation

Job Title:					
Junction:	Hysan Avenue - Hoi Ping Road		Ref. No.: J3		
Scheme:	2032 Reference		Ref. No.:		
Year:	2032	Job No.:	CHK50836810		
Rev.:	-				
ARM A:	Hysan Avenue				
ARM B:	Hoi Ping Road				
ARM C:	Hysan Avenue				
GEOMETRY					
Major road width	W	10.00	Lane widths		
Central Reserve width	Wcr	0.00	w(b-a)	0.00	
2 Lane Minor Arm (Y/N)		N	w(b-c)	0.00	
			w(c-b)	3.30	
Visibilities	Vr(b-a)	75	Calculated	D	0.59
	VI(b-a)	55		E	0.63
	Vr(b-c)	75		F	0.94
	Vr(c-b)	90		Y	0.66
ANALYSIS					
			WD NOON PEAK	(WE NOON) PEAK	
TRAFFIC FLOWS	q(c-a)		460	320	
	q(c-b)		395	370	
	q(a-b)		65	85	
	q(a-c)		125	145	
	q(b-a)		0	0	
	q(b-c)		0	0	
	f		0.00	0.00	
CAPACITIES	Q(b-a)	Factor	230	244	
	Q(b-c)	1	447	443	
	Q(c-b)	1	658	649	
	Q(b-ac)	1	230	244	
RFC's	b-a		0.000	0.000	
	b-c		0.000	0.000	
	c-b		0.600	0.570	
	b-ac		0.000	0.000	
Worst RFC			0.600	0.570	
<p>Where VI and Vr are visibility distances to the left or right of the respective streams</p> $D = (1+0.094(w(b-a)-3.65))(1+0.0009(Vr(b-a)-120))(1+0.0006(VI(b-a)-150))$ $E = (1+0.094(w(b-c)-3.65))(1+0.0009(Vr(b-c)-120))$ $F = (1+0.094(w(c-b)-3.65))(1+0.0009(Vr(c-b)-120))$ $Y = 1-0.0345W$ <p>f = proportion of minor traffic turning left</p> $Q(b-ac) = Q(b-c)*Q(b-a)/((1-f)*Q(b-c)+f*Q(b-a))$ <p style="text-align: right;">Capacity of combined streams - in accordance with TPDM V2.4</p>					
Calculated by:	TCW	Date:	Nov-24	Checked by: CHC	

O:\cnm\Sigcal_2032 REF_NOON&WE.xlsm]J3

Simplified Priority Junction Capacity Calculation

Job Title:					
Junction:	Hysan Avenue - Sunning Road	Ref. No.:	J4		
Scheme:	2032 Reference	Ref. No.:			
Year:	2032	Job No.:	CHK50836810		
Rev.:		Rev.:	-		
ARM A:	Hysan Avenue				
ARM B:	Sunning Road				
ARM C:	Hysan Avenue				
GEOMETRY					
Major road width	W	10.00	Lane widths	w(b-a)	0.00
Central Reserve width	Wcr	0.00		w(b-c)	0.00
2 Lane Minor Arm (Y/N)		N		w(c-b)	3.30
Visibilities	Vr(b-a)	40	Calculated	D	0.59
	VI(b-a)	100		E	0.61
	Vr(b-c)	40		F	0.91
	Vr(c-b)	50		Y	0.66
ANALYSIS					
			WD AM PEAK	(WD PM) PEAK	
TRAFFIC FLOWS	q(c-a)		205	240	
	q(c-b)		100	100	
	q(a-b)		45	40	
	q(a-c)		150	175	
	q(b-a)		0	0	
	q(b-c)		0	0	
	f		0.00	0.00	
CAPACITIES	Q(b-a)	Factor	309	302	
	Q(b-c)	1	430	426	
	Q(c-b)	1	633	629	
	Q(b-ac)	1	309	302	
RFC's	b-a		0.000	0.000	
	b-c		0.000	0.000	
	c-b		0.158	0.159	
	b-ac		0.000	0.000	
Worst RFC			0.158	0.159	
<p>Where VI and Vr are visibility distances to the left or right of the respective streams</p> $D = (1+0.094(w(b-a)-3.65))(1+0.0009(Vr(b-a)-120))(1+0.0006(VI(b-a)-150))$ $E = (1+0.094(w(b-c)-3.65))(1+0.0009(Vr(b-c)-120))$ $F = (1+0.094(w(c-b)-3.65))(1+0.0009(Vr(c-b)-120))$ $Y = 1-0.0345W$ <p>f = proportion of minor traffic turning left</p> $Q(b-ac) = Q(b-c)*Q(b-a)/((1-f)*Q(b-c)+f*Q(b-a))$ <p style="text-align: right;">Capacity of combined streams - in accordance with TPDM V2.4</p>					
Calculated by:	TCW	Date:	Nov-24	Checked by:	CHC

O:\cnm\Sigcal_2032 REF_AM&PM.xlsm]J4

Simplified Priority Junction Capacity Calculation

Job Title:			
Junction:	Hysan Avenue - Sunning Road	Ref. No.:	J4
Scheme:	2032 Reference	Ref. No.:	
Year:	2032	Job No.:	CHK50836810
ARM A:	Hysan Avenue	Rev.:	-
ARM B:	Sunning Road		
ARM C:	Hysan Avenue		

ARM C

WD NOON	(WE NOON)
405	(265)
130	(100)

ARM A

WD NOON	(WE NOON)
90	(175)
35	(60)

WD NOON (WE NOON)

Minor ARM B

GEOMETRY					
Major road width	W	10.00	Lane widths	w(b-a)	0.00
Central Reserve width	Wcr	0.00		w(b-c)	0.00
2 Lane Minor Arm (Y/N)		N		w(c-b)	3.30
Visibilities	Vr(b-a)	40	Calculated	D	0.59
	VI(b-a)	100		E	0.61
	Vr(b-c)	40		F	0.91
	Vr(c-b)	50		Y	0.66

ANALYSIS		WD NOON PEAK	(WE NOON) PEAK
TRAFFIC FLOWS	q(c-a)	405	265
	q(c-b)	130	100
	q(a-b)	35	60
	q(a-c)	90	175
	q(b-a)	0	0
	q(b-c)	0	0
	f	0.00	0.00
CAPACITIES	Q(b-a)	294	299
	Q(b-c)	439	425
	Q(c-b)	648	624
	Q(b-ac)	294	299
RFC's	b-a	0.000	0.000
	b-c	0.000	0.000
	c-b	0.201	0.160
	b-ac	0.000	0.000
Worst RFC		0.201	0.160

Where VI and Vr are visibility distances to the left or right of the respective streams

$$D = (1+0.094(w(b-a)-3.65))(1+0.0009(Vr(b-a)-120))(1+0.0006(VI(b-a)-150))$$

$$E = (1+0.094(w(b-c)-3.65))(1+0.0009(Vr(b-c)-120))$$

$$F = (1+0.094(w(c-b)-3.65))(1+0.0009(Vr(c-b)-120))$$

$$Y = 1-0.0345W$$

f = proportion of minor traffic turning left

$$Q(b-ac) = Q(b-c)*Q(b-a)/((1-f)*Q(b-c)+f*Q(b-a))$$

Capacity of combined streams
- in accordance with TPDM V2.4

T.P.D.M.V.2.4
Appendix 1

Calculated by:	TCW	Date:	Nov-24	Checked by:	CHC
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O:\cnm\Sigcal_2032 REF_NOON&WE.xlsm]J4

Simplified Priority Junction Capacity Calculation

Job Title:					
Junction:	Hysan Avenue - Yun Ping Road	Ref. No.:	J5		
Scheme:	2032 Reference	Ref. No.:			
Year:	2032	Job No.:	CHK50836810		
		Rev.:	-		
ARM A:	Yun Ping Road				
ARM B:	Hysan Avenue				
ARM C:	Yun Ping Road				
GEOMETRY					
Major road width	W	7.00	Lane widths	w(b-a)	0.00
Central Reserve width	Wcr	0.00		w(b-c)	5.00
2 Lane Minor Arm (Y/N)		N		w(c-b)	0.00
Visibilities	Vr(b-a)	35	Calculated	D	0.57
	VI(b-a)	45		E	1.04
	Vr(b-c)	35		F	0.61
	Vr(c-b)	40		Y	0.76
ANALYSIS					
		WD AM PEAK	(WD PM) PEAK		
TRAFFIC FLOWS	q(c-a)	0	0		
	q(c-b)	0	0		
	q(a-b)	195	215		
	q(a-c)	250	325		
	q(b-a)	0	0		
	q(b-c)	205	240		
	f	1.00	1.00		
CAPACITIES	Q(b-a)	305	292		
	Q(b-c)	681	657		
	Q(c-b)	379	363		
	Q(b-ac)	681	657		
RFC's	b-a	0.000	0.000		
	b-c	0.301	0.365		
	c-b	0.000	0.000		
	b-ac	0.301	0.365		
Worst RFC		0.301	0.365		
<p>Where VI and Vr are visibility distances to the left or right of the respective streams</p> $D = (1+0.094(w(b-a)-3.65))(1+0.0009(Vr(b-a)-120))(1+0.0006(VI(b-a)-150))$ $E = (1+0.094(w(b-c)-3.65))(1+0.0009(Vr(b-c)-120))$ $F = (1+0.094(w(c-b)-3.65))(1+0.0009(Vr(c-b)-120))$ $Y = 1-0.0345W$ <p>f = proportion of minor traffic turning left</p> $Q(b-ac) = Q(b-c)*Q(b-a)/((1-f)*Q(b-c)+f*Q(b-a))$ <p style="text-align: right;">Capacity of combined streams - in accordance with TPDM V2.4</p>					
Calculated by:	TCW	Date:	Nov-24		
Checked by:	CHC				

O:\cnm\Sigcal_2032 REF_AM&PM.xlsm]J5

Simplified Priority Junction Capacity Calculation

Job Title:			
Junction:	Hysan Avenue - Yun Ping Road	Ref. No.:	J5
Scheme:	2032 Reference	Ref. No.:	
Year:	2032	Job No.:	CHK50836810
ARM A:	Yun Ping Road	Rev.:	-
ARM B:	Hysan Avenue		
ARM C:	Yun Ping Road		

ARM C

WD NOON (WE NOON)	
335	(260)
125	(235)

WD NOON (WE NOON)	405
(265)	Minor ARM B

GEOMETRY					
Major road width	W	7.00	Lane widths	w(b-a)	0.00
Central Reserve width	Wcr	0.00		w(b-c)	5.00
2 Lane Minor Arm (Y/N)		N		w(c-b)	0.00
Visibilities	Vr(b-a)	35	Calculated	D	0.57
	VI(b-a)	45		E	1.04
	Vr(b-c)	35		F	0.61
	Vr(c-b)	40		Y	0.76

ANALYSIS			WD NOON PEAK	(WE NOON) PEAK
TRAFFIC FLOWS	q(c-a)		0	0
	q(c-b)		0	0
	q(a-b)		125	235
	q(a-c)		335	260
	q(b-a)		0	0
	q(b-c)		405	265
	f		1.00	1.00
CAPACITIES	Q(b-a)	Factor 1	296	301
	Q(b-c)	1	665	674
	Q(c-b)	1	377	371
	Q(b-ac)	1	665	674
RFC's	b-a		0.000	0.000
	b-c		0.609	0.393
	c-b		0.000	0.000
	b-ac		0.609	0.393
Worst RFC			0.609	0.393

Where VI and Vr are visibility distances to the left or right of the respective streams

$$D = (1+0.094(w(b-a)-3.65))(1+0.0009(Vr(b-a)-120))(1+0.0006(VI(b-a)-150))$$

$$E = (1+0.094(w(b-c)-3.65))(1+0.0009(Vr(b-c)-120))$$

$$F = (1+0.094(w(c-b)-3.65))(1+0.0009(Vr(c-b)-120))$$

$$Y = 1-0.0345W$$

f = proportion of minor traffic turning left

$$Q(b-ac) = Q(b-c)*Q(b-a)/(1-f)*Q(b-c)+f*Q(b-a)$$

Capacity of combined streams
- in accordance with TPDM V2.4

T.P.D.M.V.2.4
Appendix 1

Calculated by:	TCW	Date:	Nov-24	Checked by:	CHC
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2032 Design

TRAFFIC SIGNALS CALCULATION

Job No.: CHK50836810

MVA HONG KONG LIMITED

Junction: Leighton Road / Yun Ping Road / Pennington Street / Caroline Hill Road (East)

Design Year: 2032

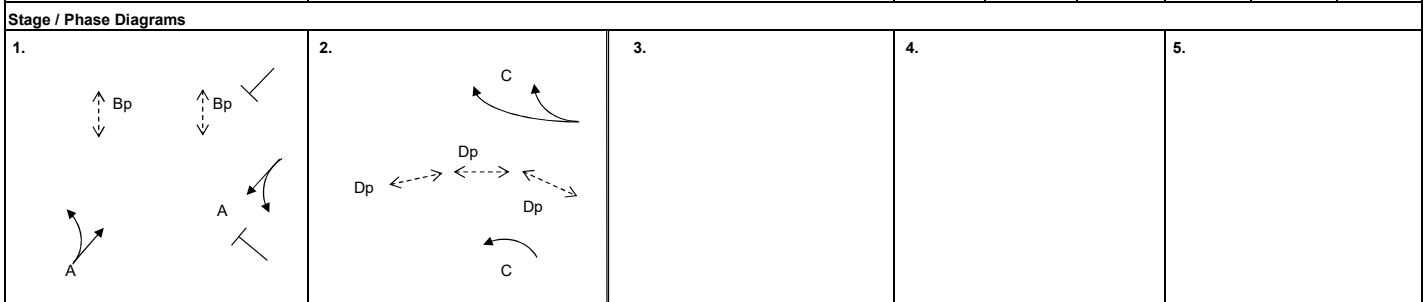
Description: 2032 Design

Designed By: TCW

Checked By: CHC

Approach	Movements	Phase	Stage	Width (m)	Radius (m)		Gradient (%)	Pro. Turning (%)		Revised Saturation Flow (pcu/hr)		AM Peak			PM Peak		
					Left	Right		AM	PM	AM	PM	Flow (pcu/hr)	y Value	Critical y	Flow (pcu/hr)	y Value	Critical y
Leighton Road WB	↔*	A	1	3.000	7			84%	56%	975	1025	286	0.293		234	0.228	
	←	A	1	2.500						2005	2005	589	0.294		456	0.227	
Leighton Road WB	↔**	C	2	3.500		9				1180	1180	260	0.220	0.220	240	0.203	0.203
Caroline Hill Road NB	↔*	C	2	4.000		5				930	930	80	0.086		75	0.081	
Leighton Road EB	↔**	A	1	3.000	15			68%	76%	1255	1245	459	0.366	0.366	513	0.412	0.412
	→**	A	1	3.000						1440	1440	526	0.365		592	0.411	
Pedestrian Crossing		Bp	1	MIN GREEN + FLASH =		5	+	8	=	13							
		Dp	2	MIN GREEN + FLASH =		10	+	8	=	18							

Notes: TAC junction: Cycle time of 105s and 130s are adopted for AM and PM Peak * = Site factor of 0.6 adopted ** = Site factor of 0.7 adopted	Flow: (pcu/hr) 	Group	A,Dp	A,C	Group	A,Dp	A,C
		y	0.366	0.586	y	0.412	0.615
		L (sec)	27	11	L (sec)	27	11
		C (sec)	105	105	C (sec)	130	130
		y pract.	0.669	0.806	y pract.	0.713	0.824
		R.C. (%)	83%	37%	R.C. (%)	73%	34%



I/G= 7	I/G= 6	I/G=	I/G=	I/G=	I/G=
I/G= 7	I/G= 6	I/G=	I/G=	I/G=	I/G=
Date: NOV, 2024				Junction: Leighton Road / Yun Ping Road / Pennington Street / Caroline Hill (J1)	

TRAFFIC SIGNALS CALCULATION

Job No.: CHK50836810

MVA HONG KONG LIMITED

Junction: Leighton Road / Yun Ping Road / Pennington Street / Caroline Hill Road (East)

Design Year: 2032

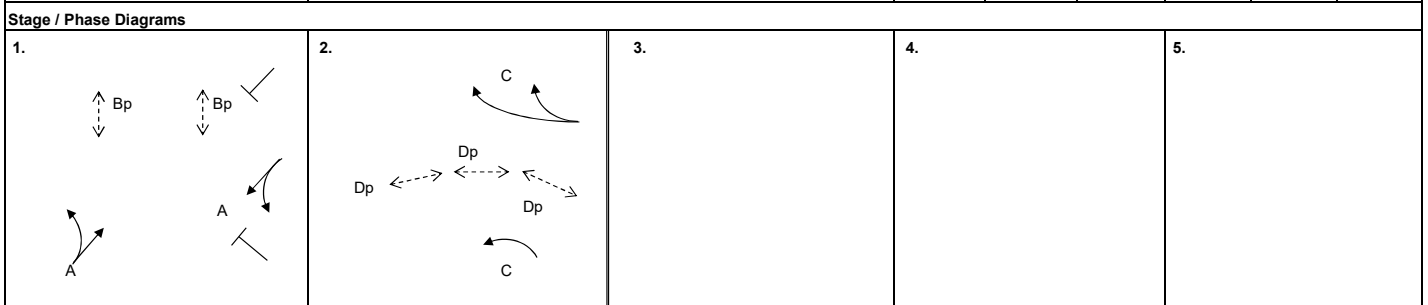
Description: 2032 Design

Designed By: TCW

Checked By: CHC

Approach	Movements	Phase	Stage	Width (m)	Radius (m)		Gradient (%)	Pro. Turning (%)		Revised Saturation Flow (pcu/hr)		WD NOON			WE NOON		
					Left	Right		WD NOON	WE NOON	WD NOON	WE NOON	Flow (pcu/hr)	y Value	Critical y	Flow (pcu/hr)	y Value	Critical y
Leighton Road WB	↔*	A	1	3.000	7			88%	59%	965	1020	251	0.260		261	0.256	
	←	A	1	2.500						2005	2005	519	0.259		514	0.256	
Leighton Road WB	↔**	C	2	3.500		9				1180	1180	275	0.233	0.233	240	0.203	0.203
Caroline Hill Road NB	↔*	C	2	4.000		5				930	930	120	0.129		90	0.097	
Leighton Road EB	↔**	A	1	3.000	15			63%	65%	1260	1260	467	0.371	0.371	527	0.418	
	→**	A	1	3.000						1440	1440	533	0.370		603	0.419	0.419
Pedestrian Crossing		Bp	1	MIN GREEN + FLASH =		5	+	8	=	13							
		Dp	2	MIN GREEN + FLASH =		10	+	8	=	18							

Notes: TAC junction: Cycle time of 110s and 120s are adopted for weekday noon and * = Site factor of 0.6 adopted ** = Site factor of 0.7 adopted	Flow: (pcu/hr) 	Group	A,Dp	A,C	Group	A,Dp	A,C
		y	0.371	0.604	y	0.419	0.622
		L (sec)	27	11	L (sec)	27	11
		C (sec)	110	110	C (sec)	120	120
		y pract.	0.679	0.810	y pract.	0.698	0.818
		R.C. (%)	83%	34%	R.C. (%)	67%	31%



I/G= 7		I/G= 6		I/G=		I/G=		I/G=	
I/G= 7		I/G= 6		I/G=		I/G=		I/G=	
Date: NOV, 2024						Junction: Leighton Road / Yun Ping Road / Pennington Street / Caroline Hill (J1)			

Simplified Priority Junction Capacity Calculation

Job Title:					
Junction: Leighton Road - Sunning Road		Ref. No.:	J2		
Scheme: 2032 Design		Ref. No.:			
Year: 2032	Job No.:	CHK50836810	Rev.: -		
ARM A: Leighton Road					
ARM B: Sunning Road					
ARM C: Leighton Road					
GEOMETRY					
Major road width	W	13.15	Lane widths	w(b-a)	5.50
Central Reserve width	Wcr	0.00		w(b-c)	0.00
2 Lane Minor Arm (Y/N)		N		w(c-b)	0.00
Visibilities	Vr(b-a)	40	Calculated	D	1.03
	VI(b-a)	55		E	0.61
	Vr(b-c)	40		F	0.63
	Vr(c-b)	70		Y	0.55
ANALYSIS					
			WD AM PEAK	(WD PM) PEAK	
TRAFFIC FLOWS	q(c-a)		715	635	
	q(c-b)		0	0	
	q(a-b)		0	0	
	q(a-c)		830	910	
	q(b-a)		0	0	
	q(b-c)		155	195	
	f		1.00	1.00	
CAPACITIES	Q(b-a)	Factor 1	383	377	
	Q(b-c)	1	354	344	
	Q(c-b)	1	364	354	
	Q(b-ac)	1	354	344	
RFC's	b-a		0.000	0.000	
	b-c		0.438	0.567	
	c-b		0.000	0.000	
	b-ac		0.438	0.567	
Worst RFC			0.438	0.567	
<p>Where VI and Vr are visibility distances to the left or right of the respective streams</p> $D = (1+0.094(w(b-a)-3.65))(1+0.0009(Vr(b-a)-120))(1+0.0006(VI(b-a)-150))$ $E = (1+0.094(w(b-c)-3.65))(1+0.0009(Vr(b-c)-120))$ $F = (1+0.094(w(c-b)-3.65))(1+0.0009(Vr(c-b)-120))$ $Y = 1-0.0345W$ <p>f = proportion of minor traffic turning left</p> $Q(b-ac) = Q(b-c)*Q(b-a)/((1-f)*Q(b-c)+f*Q(b-a))$ <p style="text-align: right;">Capacity of combined streams - in accordance with TPDM V2.4</p>					
T.P.D.M.V.2.4 Appendix 1					
Calculated by:	TCW	Date:	Nov-24	Checked by:	CHC

O:\cnm\Sigcal_2032 DES_AM&PM.xlsm]J2

Simplified Priority Junction Capacity Calculation

Job Title:					
Junction: Leighton Road - Sunning Road		Ref. No.:	J2		
Scheme: 2032 Design		Ref. No.:			
Year: 2032	Job No.:	CHK50836810	Rev.: -		
ARM A: Leighton Road					
ARM B: Sunning Road					
ARM C: Leighton Road					
GEOMETRY					
Major road width	W	13.15	Lane widths	w(b-a)	5.50
Central Reserve width	Wcr	0.00		w(b-c)	0.00
2 Lane Minor Arm (Y/N)		N		w(c-b)	0.00
Visibilities	Vr(b-a)	40	Calculated	D	1.03
	VI(b-a)	55		E	0.61
	Vr(b-c)	40		F	0.63
	Vr(c-b)	70		Y	0.55
ANALYSIS					
			WD NOON PEAK	(WE NOON) PEAK	
TRAFFIC FLOWS	q(c-a)		670	710	
	q(c-b)		0	0	
	q(a-b)		0	0	
	q(a-c)		815	950	
	q(b-a)		0	0	
	q(b-c)		185	175	
	f		1.00	1.00	
CAPACITIES	Q(b-a)	Factor 1	392	359	
	Q(b-c)	1	355	339	
	Q(c-b)	1	366	349	
	Q(b-ac)	1	355	339	
RFC's	b-a		0.000	0.000	
	b-c		0.521	0.516	
	c-b		0.000	0.000	
	b-ac		0.521	0.516	
Worst RFC			0.521	0.516	
<p>Where VI and Vr are visibility distances to the left or right of the respective streams</p> $D = (1+0.094(w(b-a)-3.65))(1+0.0009(Vr(b-a)-120))(1+0.0006(VI(b-a)-150))$ $E = (1+0.094(w(b-c)-3.65))(1+0.0009(Vr(b-c)-120))$ $F = (1+0.094(w(c-b)-3.65))(1+0.0009(Vr(c-b)-120))$ $Y = 1-0.0345W$ <p>f = proportion of minor traffic turning left</p> $Q(b-ac) = Q(b-c)*Q(b-a)/((1-f)*Q(b-c)+f*Q(b-a))$ <p style="text-align: right;">Capacity of combined streams - in accordance with TPDM V2.4</p>					
T.P.D.M.V.2.4 Appendix 1					
Calculated by:	TCW	Date:	Nov-24	Checked by:	CHC

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Simplified Priority Junction Capacity Calculation

Job Title:					
Junction: Hysan Avenue - Hoi Ping Road		Ref. No.: J3			
Scheme: 2032 Design		Ref. No.:			
Year: 2032	Job No.: CHK50836810	Rev.: -			
ARM A: Hysan Avenue					
ARM B: Hoi Ping Road					
ARM C: Hysan Avenue					
GEOMETRY					
Major road width	W	10.00	Lane widths	w(b-a)	0.00
Central Reserve width	Wcr	0.00		w(b-c)	0.00
2 Lane Minor Arm (Y/N)		N		w(c-b)	3.30
Visibilities	Vr(b-a)	75	Calculated	D	0.59
	VI(b-a)	55		E	0.63
	Vr(b-c)	75		F	0.94
	Vr(c-b)	90		Y	0.66
ANALYSIS					
			WD AM PEAK	(WD PM) PEAK	
TRAFFIC FLOWS	q(c-a)		225	255	
	q(c-b)		445	400	
	q(a-b)		110	80	
	q(a-c)		115	220	
	q(b-a)		0	0	
	q(b-c)		0	0	
	f		0.00	0.00	
CAPACITIES	Q(b-a)	Factor	240	233	
	Q(b-c)	1	446	432	
	Q(c-b)	1	651	634	
	Q(b-ac)	1	240	233	
RFC's	b-a		0.000	0.000	
	b-c		0.000	0.000	
	c-b		0.684	0.631	
	b-ac		0.000	0.000	
Worst RFC			0.684	0.631	
<p>Where VI and Vr are visibility distances to the left or right of the respective streams</p> $D = (1+0.094(w(b-a)-3.65))(1+0.0009(Vr(b-a)-120))(1+0.0006(VI(b-a)-150))$ $E = (1+0.094(w(b-c)-3.65))(1+0.0009(Vr(b-c)-120))$ $F = (1+0.094(w(c-b)-3.65))(1+0.0009(Vr(c-b)-120))$ $Y = 1-0.0345W$ <p>f = proportion of minor traffic turning left</p> $Q(b-ac) = Q(b-c)*Q(b-a)/((1-f)*Q(b-c)+f*Q(b-a))$ <p style="text-align: right;">Capacity of combined streams - in accordance with TPDM V2.4</p>					
Calculated by: TCW			Date: Nov-24	Checked by: CHC	

O:\cnm\Sigcal_2032 DES_AM&PM.xlsm]J3

Simplified Priority Junction Capacity Calculation

Job Title:					
Junction: Hysan Avenue - Hoi Ping Road		Ref. No.: J3			
Scheme: 2032 Design		Ref. No.:			
Year: 2032	Job No.: CHK50836810	Rev.: -			
ARM A: Hysan Avenue					
ARM B: Hoi Ping Road					
ARM C: Hysan Avenue					
GEOMETRY					
Major road width	W	10.00	Lane widths	w(b-a)	0.00
Central Reserve width	Wcr	0.00		w(b-c)	0.00
2 Lane Minor Arm (Y/N)		N		w(c-b)	3.30
Visibilities	Vr(b-a)	75	Calculated	D	0.59
	VI(b-a)	55		E	0.63
	Vr(b-c)	75		F	0.94
	Vr(c-b)	90		Y	0.66
ANALYSIS					
		WD NOON PEAK		(WE NOON) PEAK	
TRAFFIC FLOWS	q(c-a)		430		280
	q(c-b)		425		405
	q(a-b)		65		85
	q(a-c)		125		145
	q(b-a)		0		0
	q(b-c)		0		0
	f		0.00		0.00
CAPACITIES	Q(b-a)	Factor	227		240
	Q(b-c)	1	447		443
	Q(c-b)	1	658		649
	Q(b-ac)	1	227		240
RFC's	b-a		0.000		0.000
	b-c		0.000		0.000
	c-b		0.646		0.624
	b-ac		0.000		0.000
Worst RFC			0.646		0.624
<p>Where VI and Vr are visibility distances to the left or right of the respective streams</p> $D = (1+0.094(w(b-a)-3.65))(1+0.0009(Vr(b-a)-120))(1+0.0006(VI(b-a)-150))$ $E = (1+0.094(w(b-c)-3.65))(1+0.0009(Vr(b-c)-120))$ $F = (1+0.094(w(c-b)-3.65))(1+0.0009(Vr(c-b)-120))$ $Y = 1-0.0345W$ <p>f = proportion of minor traffic turning left</p> $Q(b-ac) = Q(b-c)*Q(b-a)/((1-f)*Q(b-c)+f*Q(b-a))$ <p style="text-align: right;">Capacity of combined streams - in accordance with TPDM V2.4</p>					
Calculated by: TCW		Date: Nov-24		Checked by: CHC	

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Simplified Priority Junction Capacity Calculation

Job Title:					
Junction: Hysan Avenue - Sunning Road		Ref. No.: J4			
Scheme: 2032 Design		Ref. No.:			
Year: 2032	Job No.: CHK50836810	Rev.: -			
ARM A: Hysan Avenue					
ARM B: Sunning Road					
ARM C: Hysan Avenue					
GEOMETRY					
Major road width	W	10.00	Lane widths	w(b-a)	0.00
Central Reserve width	Wcr	0.00		w(b-c)	0.00
2 Lane Minor Arm (Y/N)		N		w(c-b)	3.30
Visibilities	Vr(b-a)	40	Calculated	D	0.59
	VI(b-a)	100		E	0.61
	Vr(b-c)	40		F	0.91
	Vr(c-b)	50		Y	0.66
ANALYSIS					
			WD AM PEAK	(WD PM) PEAK	
TRAFFIC FLOWS	q(c-a)		190	215	
	q(c-b)		100	95	
	q(a-b)		45	40	
	q(a-c)		150	175	
	q(b-a)		0	0	
	q(b-c)		0	0	
	f		0.00	0.00	
CAPACITIES	Q(b-a)	Factor 1	310	306	
	Q(b-c)	1	430	426	
	Q(c-b)	1	633	629	
	Q(b-ac)	1	310	306	
RFC's	b-a		0.000	0.000	
	b-c		0.000	0.000	
	c-b		0.158	0.151	
	b-ac		0.000	0.000	
Worst RFC			0.158	0.151	
<p>Where VI and Vr are visibility distances to the left or right of the respective streams</p> $D = (1+0.094(w(b-a)-3.65))(1+0.0009(Vr(b-a)-120))(1+0.0006(VI(b-a)-150))$ $E = (1+0.094(w(b-c)-3.65))(1+0.0009(Vr(b-c)-120))$ $F = (1+0.094(w(c-b)-3.65))(1+0.0009(Vr(c-b)-120))$ $Y = 1-0.0345W$ <p>f = proportion of minor traffic turning left</p> $Q(b-ac) = Q(b-c)*Q(b-a)/((1-f)*Q(b-c)+f*Q(b-a))$ <p style="text-align: right;">Capacity of combined streams - in accordance with TPDM V2.4</p>					
Calculated by: TCW		Date: Nov-24	Checked by: CHC		

O:\cnm\Sigcal_2032 DES_AM&PM.xlsm]J4

Simplified Priority Junction Capacity Calculation

Job Title:					
Junction:	Hysan Avenue - Sunning Road		Ref. No.: J4		
Scheme:	2032 Design		Ref. No.:		
Year:	2032	Job No.:	CHK50836810		
ARM A:	Hysan Avenue		Rev.: -		
ARM B:	Sunning Road				
ARM C:	Hysan Avenue				
GEOMETRY					
Major road width	W	10.00	Lane widths		
Central Reserve width	Wcr	0.00	w(b-a)	0.00	
2 Lane Minor Arm (Y/N)		N	w(b-c)	0.00	
Visibilities	Vr(b-a)	40	Calculated	w(c-b)	3.30
	VI(b-a)	100		D	0.59
	Vr(b-c)	40		E	0.61
	Vr(c-b)	50		F	0.91
				Y	0.66
ANALYSIS					
			WD NOON PEAK	(WE NOON) PEAK	
TRAFFIC FLOWS	q(c-a)		375	230	
	q(c-b)		125	95	
	q(a-b)		35	60	
	q(a-c)		90	175	
	q(b-a)		0	0	
	q(b-c)		0	0	
	f		0.00	0.00	
CAPACITIES	Q(b-a)	Factor	298	303	
	Q(b-c)	1	439	425	
	Q(c-b)	1	648	624	
	Q(b-ac)	1	298	303	
RFC's	b-a		0.000	0.000	
	b-c		0.000	0.000	
	c-b		0.193	0.152	
	b-ac		0.000	0.000	
Worst RFC			0.193	0.152	
<p>Where VI and Vr are visibility distances to the left or right of the respective streams</p> $D = (1+0.094(w(b-a)-3.65))(1+0.0009(Vr(b-a)-120))(1+0.0006(VI(b-a)-150))$ $E = (1+0.094(w(b-c)-3.65))(1+0.0009(Vr(b-c)-120))$ $F = (1+0.094(w(c-b)-3.65))(1+0.0009(Vr(c-b)-120))$ $Y = 1-0.0345W$ <p>f = proportion of minor traffic turning left</p> $Q(b-ac) = Q(b-c)*Q(b-a)/((1-f)*Q(b-c)+f*Q(b-a))$ <p>Capacity of combined streams - in accordance with TPDM V2.4</p>					
Calculated by:	TCW	Date:	Nov-24	Checked by: CHC	

O:\cnm\Sigcal_2032 DES_NOON&WE.xlsm]J4

Simplified Priority Junction Capacity Calculation

Job Title:					
Junction: Hysan Avenue - Yun Ping Road		Ref. No.:	J5		
Scheme: 2032 Design		Ref. No.:			
Year: 2032	Job No.:	CHK50836810	Rev.: -		
ARM A: Yun Ping Road					
ARM B: Hysan Avenue					
ARM C: Yun Ping Road					
GEOMETRY					
Major road width	W	7.00	Lane widths	w(b-a)	0.00
Central Reserve width	Wcr	0.00		w(b-c)	5.00
2 Lane Minor Arm (Y/N)		N		w(c-b)	0.00
Visibilities	Vr(b-a)	35	Calculated	D	0.57
	VI(b-a)	45		E	1.04
	Vr(b-c)	35		F	0.61
	Vr(c-b)	40		Y	0.76
ANALYSIS					
			WD AM PEAK	(WD PM) PEAK	
TRAFFIC FLOWS	q(c-a)		0	0	
	q(c-b)		0	0	
	q(a-b)		195	215	
	q(a-c)		235	310	
	q(b-a)		0	0	
	q(b-c)		190	215	
	f		1.00	1.00	
CAPACITIES	Q(b-a)	Factor 1	307	294	
	Q(b-c)	1	686	662	
	Q(c-b)	1	382	366	
	Q(b-ac)	1	686	662	
RFC's	b-a		0.000	0.000	
	b-c		0.277	0.325	
	c-b		0.000	0.000	
	b-ac		0.277	0.325	
Worst RFC			0.277	0.325	
<p>Where VI and Vr are visibility distances to the left or right of the respective streams</p> $D = (1+0.094(w(b-a)-3.65))(1+0.0009(Vr(b-a)-120))(1+0.0006(VI(b-a)-150))$ $E = (1+0.094(w(b-c)-3.65))(1+0.0009(Vr(b-c)-120))$ $F = (1+0.094(w(c-b)-3.65))(1+0.0009(Vr(c-b)-120))$ $Y = 1-0.0345W$ <p>f = proportion of minor traffic turning left</p> $Q(b-ac) = Q(b-c)*Q(b-a)/((1-f)*Q(b-c)+f*Q(b-a))$ <p style="text-align: right;">Capacity of combined streams - in accordance with TPDM V2.4</p>					
T.P.D.M.V.2.4 Appendix 1					
Calculated by:	TCW	Date:	Nov-24	Checked by:	CHC

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Simplified Priority Junction Capacity Calculation

Job Title:						
Junction:	Hysan Avenue - Yun Ping Road	Ref. No.:	J5			
Scheme:	2032 Design	Ref. No.:				
Year:	2032	Job No.:	CHK50836810			
		Rev.:	-			
ARM A:	Yun Ping Road					
ARM B:	Hysan Avenue					
ARM C:	Yun Ping Road					
GEOMETRY						
Major road width	W	7.00	Lane widths	w(b-a)	0.00	
Central Reserve width	Wcr	0.00		w(b-c)	5.00	
2 Lane Minor Arm (Y/N)		N		w(c-b)	0.00	
Visibilities	Vr(b-a)	35	Calculated	D	0.57	
	VI(b-a)	45		E	1.04	
	Vr(b-c)	35		F	0.61	
	Vr(c-b)	40		Y	0.76	
ANALYSIS						
		WD NOON PEAK	(WE NOON) PEAK			
TRAFFIC FLOWS	q(c-a)	0	0			
	q(c-b)	0	0			
	q(a-b)	125	235			
	q(a-c)	320	245			
	q(b-a)	0	0			
	q(b-c)	375	230			
	f	1.00	1.00			
CAPACITIES	Q(b-a)	298	303			
	Q(b-c)	669	678			
	Q(c-b)	379	373			
	Q(b-ac)	669	678			
RFC's	b-a	0.000	0.000			
	b-c	0.561	0.339			
	c-b	0.000	0.000			
	b-ac	0.561	0.339			
Worst RFC		0.561	0.339			
<p>Where VI and Vr are visibility distances to the left or right of the respective streams</p> $D = (1+0.094(w(b-a)-3.65))(1+0.0009(Vr(b-a)-120))(1+0.0006(VI(b-a)-150))$ $E = (1+0.094(w(b-c)-3.65))(1+0.0009(Vr(b-c)-120))$ $F = (1+0.094(w(c-b)-3.65))(1+0.0009(Vr(c-b)-120))$ $Y = 1-0.0345W$ <p>f = proportion of minor traffic turning left</p> $Q(b-ac) = Q(b-c)*Q(b-a)/(1-f)*Q(b-c)+f*Q(b-a)$ <p style="text-align: right;">Capacity of combined streams - in accordance with TPDM V2.4</p>						
Calculated by:		TCW	Date:	Nov-24	Checked by:	CHC

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