
Appendix E
Traffic Review Report



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**SECTION 16 PLANNING APPLICATION FOR
PROPOSED AMENDMENTS TO APPROVED
MASTER LAYOUT PLAN OF MA WAN PARK
DEVELOPMENT**

Traffic Review Report

(Draft – Issue 1)

DECEMBER 2024

REVISION HISTORY

Rev.	Description of Revision	Date
-	Draft – Issue 1	December 2024

Author Various Various

Checker Lin LIN

Lin Lin

Reviewer Charis WONG

Charis Wong

Approver Steven HO

Steven Ho

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1 MA WAN PARK

1.1 Ma Wan Park is a park on Ma Wan Island, New Territories in Hong Kong, operated by Ma Wan Park Limited (MWPL) with investment from the Hong Kong Government. For Ma Wan Park Phase 1 (MWPP1), it primarily consists of Noah's Ark and Nature Garden including Solar Tower. For Ma Wan Park Phase 2 (MWPP2), it is a re-styled Ma Wan Village with existing buildings of Ma Wan Village preserved, restored and renovated. It primarily consists of restaurants, retail, workshop, gallery, event place and market. The site location is shown in **Figure 1.1**.

1.2 Under the Approved MLP, various uses have already been allowed in the Restyled Ma Wan Village to enrich visitors' experience, including 'Eating Place', 'Shop and Services', 'Place of Recreation, Sports or Culture', 'Open Space', 'Amenity Planting' and 'Holiday Camp'. These cover various facilities, such as antique shops, shops, artists' village, forest retreat, food & beverage, museum & craft workshops, fine dining & specialty, and the traditional village, etc, as originated from earlier approved schemes. Various technical assessments have already been conducted under earlier approved schemes to demonstrate the technical feasibility of the Restyled Ma Wan Village. The Restyled Ma Wan Village is already under implementation for phased opening in December 2024.

2 DEVELOPMENT PROPOSAL

2.1 Under this planning application, short term accommodation in the restyle Ma Wan Village in MWPP2 is proposed to be included in the current scheme. A total of not more than 30 guest houses would be provided in the existing buildings of Ma Wan Village. There are no changes to all the GFA as compared to the Approved Scheme.

Table 2.1 Comparison between the Approved Scheme and Proposed Scheme

Facilities	GFA Distribution (m ²) (about)		Difference (b) – (a)
	Approved Scheme (A/I-MWI/45) (a)	Proposed Scheme (b)	
Phase 1			
Noah's Ark	13,200	13,200	nil
Park Entrance Plaza and Information Centre	650	650	nil
Hilltop Garden / Café	700	700	nil
Landscaping Pavilions Inside Nature Garden	200	200	nil
Fire Safety Education Centre & Museum	390	390	nil
Event Centre / Landscape Pavilion	2,250	2,250	nil
Butterfly Sanctuary			nil
Existing	70	70	
New	50	50	
Pottery House			nil
Existing	70	70	
New	50	50	

Facilities	GFA Distribution (m ²) (about)		Difference (b) – (a)
	Approved Scheme (A/I-MWI/45) (a)	Proposed Scheme (b)	
Multi-purpose Performance Venue	790	790	nil
Heritage Museum	Existing	112	112
	New	100	100
Solar Tower and Exhibition Centre	1,500	1,500	nil
Bicycle Storage Shed	200	200	nil
Public Toilets (near coach parking area)	100	100	nil
GFA under Lantau Link	600	600	nil
Phase 2			
Restyled Ma Wan Village	Existing	9,532	9,532
	New	1,000	1,000
Total	31,564	31,564	nil

2.2 The Master Layout Plan of MWPP2 is shown in **Figure 2.1**.

3 EXISTING ROAD NETWORK AND ACCESSIBILITY

Existing Road Network

3.1 The whole Ma Wan Island (including MWPP2) is connected to the external road network via the Slip Road of Lantau Link only. The adjacent road network of MWPP2 as presented in **Figure 3.1**, includes Ma Wan Road, Pak Lam Road, Pak Lai Road, Pak Yan Road, Fong Yuen Road and Ma Wan Rural Committee Road.

3.2 Four key junctions were identified for capacity assessment purpose as shown in **Figure 3.1** and listed in **Table 3.1**.

Table 3.1 Key Junctions

No.	Junction	Type	Figure No.
J1	Ma Wan Road / Pak Lam Road	Roundabout	3.2
J2	Pak Lam Road / Fong Yuen Road / Pak Lai Road	Priority	3.3
J3	Pak Yan Road / Access Road to Hotel	Priority	3.4
J4	Fong Yuen Road / Ma Wan Rural Committee Road	Priority	3.5

3.3 Manual classified traffic counts surveys were carried out during 7:00am – 10:00am and 6:00pm – 9:00pm on a weekend and a weekday in June 2024 respectively. For both weekend and weekday, the AM peak period is 9:00am – 10:00am and PM peak period is 6:00pm – 7:00pm. The observed peak hour traffic

flows on weekend and weekday are shown in **Figure 3.6** and **Figure 3.7** respectively.

- 3.4 Based on the 2024 observed traffic flows, the critical junctions in Ma Wan were assessed and the results are shown in **Table 3.2** and **Table 3.3**. Detailed junction calculation sheets are attached in **Appendix A**.

Table 3.2 Existing Junction Performance – Weekend

No.	Junction	Type	2024 Observed DFC ⁽¹⁾	
			AM	PM
J1	Ma Wan Road / Pak Lam Road	Roundabout	0.07	0.10
J2	Pak Lam Road / Fong Yuen Road / Pak Lai Road	Priority	0.16	0.22
J3	Pak Yan Road / Access Road to Hotel	Priority	0.02	0.02
J4	Fong Yuen Road / Ma Wan Rural Committee Road	Priority	0.06	0.11

Note:

(1) DFC = Design Flow / Capacity ratio for priority junction or roundabout

Table 3.3 Existing Junction Performance – Weekday

No.	Junction	Type	2024 Observed DFC ⁽¹⁾	
			AM	PM
J1	Ma Wan Road / Pak Lam Road	Roundabout	0.15	0.10
J2	Pak Lam Road / Fong Yuen Road / Pak Lai Road	Priority	0.31	0.18
J3	Pak Yan Road / Access Road to Hotel	Priority	0.02	0.02
J4	Fong Yuen Road / Ma Wan Rural Committee Road	Priority	0.10	0.08

Note:

(1) DFC = Design Flow / Capacity ratio for priority junction or roundabout

Public Transport Accessibility

- 3.5 Ma Wan Park is served by urban taxi, tour coach, recreational franchised bus service 230R, resident's services and public ferry services.
- 3.6 To facilitate relaxation of restrictions for taxi access and operation of franchised bus service, provision of taxi and franchised bus laybys at Pak Yan Road have been recently completed as illustrated in **Figure 3.8**. Furthermore, additional 10 nos. of spaces for coach parking & pick-up/drop-off will be provided at Pak Yan Road so that a total of 40 coach parking spaces will be available in Ma Wan Park.
- 3.7 As shown in **Figure 3.9**, additional taxi pick-up/drop-off point would be provided within the MWPP2 to facilitate the opening of the MWPP2.

4 TRAFFIC REVIEW

- 4.1 In accordance with the Approved Planning Application No A/I-MWI/27 for the development of Ma Wan Park, the estimated total number of visitors for MWPP2 would be about 9,000 visitors/day on weekends and 3,900 visitors/day on weekdays.
- 4.2 By adopting 30 guest houses, a total of 90-120 visitors/day would be generated / attracted to the proposed guest houses. Some existing buildings would be used as guest houses, the available area originally planned as restaurants / retail / workshop / gallery / event place / market would be reduced. In general, the number of visitors accommodated in restaurant / workshop / retail / gallery / event place / market would be much higher than that in guest houses, and hence the original anticipated visitors (i.e. 3,900 visitors/day on weekdays and 9,000 visitors/day on weekends) for the MWPP2 would be decreased or in worst case maintained the same. Hence the traffic impact due to the proposed guest houses is nil or negligible.
- 4.3 Given that there are no changes to the proposed GFA and other development parameters under the current planning application, but only to broaden the uses allowed in the Restyled Ma Wan Village (i.e. 'Hotel (Holiday House)' for guesthouse / short-term accommodation purpose and 'Place of Entertainment' for more innovative types of arts operation), it is anticipated that there would not be any insurmountable problems for the proposed amendments to the Approved MLP to allow greater flexibility in future operation of the Restyled Ma Wan Village.
- 4.4 To appraise the traffic condition at nearby road junctions after the completion of MWPP2, reference was made to historical data on the arrival profile provided by the operator as listed in **Table 4.1** and the previous adopted modal split of visitors as given in **Table 4.2**, the hourly patronage taking coach and taxi during the AM and PM peak are listed in **Table 4.3**.

Table 4.1 Hourly Arrival Profile of Visitors

Hour	Hourly Distribution Average Daily
08:00 – 09:00	0.5%
09:00 – 10:00	5.1%
10:00 – 11:00	34.9%
11:00 – 12:00	11.6%
12:00 – 13:00	6.7%
13:00 – 14:00	7.3%
14:00 – 15:00	14.5%
15:00 – 16:00	3.6%
16:00 – 17:00	1.0%
17:00 – 18:00	1.5%
18:00 – 19:00	13.4%
Total	100.0%

Table 4.2 Modal Split of Visitors to/from Ma Wan Park Phase 1

Transport Mode	Percentage
Tour Coach	35%
Urban Taxi	4%
Others (Residents' Services, Public Ferry Services)	61%
Total	100%

Table 4.3 Patronage Split in Transport Modes (Visitors / Hour)

Transport Mode ⁽¹⁾	Percentage	Weekend		Weekday	
		9,000 visitors/day		3,900 visitors/day	
		AM Peak (34.9% ⁽¹⁾ of Daily Patronage)	PM Peak (13.4% of Daily Patronage)	AM Peak (34.9% ⁽¹⁾ of Daily Patronage)	PM Peak (13.4% of Daily Patronage)
Tour Coach	35%	1,100	423	477	183
Taxi	4%	126	49	55	21

Note:

- (1) As a conservative approach, 34.9% (instead of 5.1%) of the visitor volume of the MWPP2 is adopted for AM Peak assessment.

4.5

Referring to the patronage split as given in **Table 4.3**, the additional coach/taxi trip generation / attraction during the AM and PM peak hours was derived as presented in **Table 4.4**. The additional coach/ taxi trips as given in **Table 4.4** are assigned to the 2024 observed traffic flows as given in **Figure 3.6** and **Figure 3.7** to produce the 2024 design traffic flows. The 2024 design traffic flows (with MWPP2) on weekend and weekday are illustrated in **Figure 4.1** and **Figure 4.2** respectively.

Table 4.4 Traffic Generation / Attraction of MWPP2

Transport Mode	Visitor Volume				Vehicular Trip (pcu) ⁽²⁾			
	Weekend		Weekday		Weekend		Weekday	
	AM ⁽¹⁾ (9:00am – 10:00am)	PM (6:00pm – 7:00pm)	AM ⁽¹⁾ (9:00am – 10:00am)	PM (6:00pm – 7:00pm)	AM (9:00am – 10:00am)	PM (6:00pm – 7:00pm)	AM (9:00am – 10:00am)	PM (6:00pm – 7:00pm)
Tour Coach	1,100	423	477	183	38	16	16	8
Taxi	126	49	55	21	51	20	22	9

Notes:

- (1) As a conservative approach, 34.9% (instead of 5.1%) of the visitor volume of the MWPP2 is adopted for AM Peak assessment.
- (2) The occupancy of tour coach and taxi is assumed to be 60 passengers/coach and 2.5 passengers/taxi respectively. PCU factor of 2 pcu/veh and 1 pcu/veh is adopted for tour coach and taxi respectively.

4.6 Based on the 2024 design traffic flows, the critical junctions in Ma Wan were assessed and the results are shown in **Table 4.5** and **Table 4.6**. Detailed junction calculation sheets are attached in **Appendix A**.

Table 4.5 Junction Performance – Weekend for Operation of MWPP2

No.	Junction	Type	2024 Design Case DFC ⁽¹⁾	
			AM	PM
J1	Ma Wan Road / Pak Lam Road	Roundabout	0.14	0.14
J2	Pak Lam Road / Fong Yuen Road / Pak Lai Road	Priority	0.34	0.28
J3	Pak Yan Road / Access Road to Hotel	Priority	0.02	0.02
J4	Fong Yuen Road / Ma Wan Rural Committee Road	Priority	0.06	0.11

Note:

(2) DFC = Design Flow / Capacity ratio for priority junction or roundabout

Table 4.6 Junction Performance – Weekday for Operation of MWPP2

No.	Junction	Type	2024 Design Case DFC ⁽¹⁾	
			AM	PM
J1	Ma Wan Road / Pak Lam Road	Roundabout	0.18	0.12
J2	Pak Lam Road / Fong Yuen Road / Pak Lai Road	Priority	0.40	0.22
J3	Pak Yan Road / Access Road to Hotel	Priority	0.02	0.02
J4	Fong Yuen Road / Ma Wan Rural Committee Road	Priority	0.10	0.08

Note:

(2) DFC = Design Flow / Capacity ratio for priority junction or roundabout

4.7 As shown in **Table 4.5** and **Table 4.6**, all the junctions would operate with ample capacity with the operation of MWPP2.

5 CONCLUSION

5.1 Given that there are no changes to the proposed GFA and other development parameters under the current planning application, but only to broaden the uses allowed in the Restyled Ma Wan Village (i.e. 'Hotel (Holiday House)' for guesthouse / short-term accommodation purpose and 'Place of Entertainment' for more innovative types of arts operation), it is anticipated that there would not be any insurmountable problems for the proposed amendments to the Approved MLP to allow greater flexibility in future operation of the Restyled Ma Wan Village.

5.2 The traffic impact due to the development proposal is nil or negligible. Therefore, the current development proposal is considered feasible from the traffic point of view.

Drawings



SHEK TSAI WAN

MA WAN PARK PHASE II

MA WAN PARK PHASE I

TUNG WAN

KUNG TSAI WAN

SHELTERED ANCHORAGE

NURSERY

AREA FOR COACH PARKING, PICK-UP/DROP-OFF

EXISTING MA WAN SOCCER PITCH

PIER

LEGEND:

MA WAN PARK BOUNDARY

PHASE I & II BOUNDARY

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DEVELOPER



PROJECT
SECTION 16 PLANNING APPLICATION FOR PROPOSED AMENDMENTS TO APPROVED MASTER LAYOUT PLAN OF MA WAN PARK DEVELOPMENT

DRAWING TITLE
SITE LOCATION PLAN

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SCALE AT A3
1:3500

Drawing No.
FIGURE 1.1

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FOOTPATH TO THE RESTYLED VILLAGE/
4.5 m WIDE EVA/ACCESS
小徑通往重修舊村/4.5米緊急車輛通道/通道

STONE TABLE BEARING AN INSCRIPTION
九龍關(KOWLOON CUSTOMS), MA WAN 馬灣「九龍關」石碑
CAMP SITE WITH LANDSCAPE COURTYARD 營地與園林庭院

TRANSFORMER ROOM 變壓站

SEWAGE PUMPING STATION 污水 泵

MA WAN ROCK INSCRIPTION 馬灣刻石

SUNSET POINT 夕陽瞭望台

NEW BUILDING IN RESTYLED MA WAN VILLAGE
「重修馬灣舊村」內的新建築物

COMMEMORATIVE TABLE 紀念碑

EXISTING FERRY PIER 現有街渡碼頭

RESTYLED MA WAN VILLAGE INCLUDING SHORT TERM ACCOMMODATION
重修馬灣舊村包括短期出租住宿設施

TIN HAU TEMPLE 天后古廟

COASTAL WALK 岸邊小徑

SOLAR TOWER & EXHIBITION CENTRE 太陽館及展覽中心

RETAINED VILLAGE HOUSES FOR SHORT-TERM ACCOMMODATION 保留原來村屋作短期住宿用途

KUNG TSAI WAN 公仔灣

BUTTERFLY SANCTUARY 蝴蝶館

FUNG SHUI ROCK 風水石

POTTERY HOUSE 陶器館

ROUND THE ISLAND TRAIL 環島小徑

EVENT CENTRE 活動中心

GUARD HOUSES

TOTAL PARK SITE AREA:
公園整體面積

17.61 Ha 公頃

SHEK TSAI WAN 石仔灣

HERITAGE MUSEUM 古蹟博物館
MULTI-PURPOSE PERFORMANCE VENUE 多用途表演場地

LOADING / UNLOADING BAY 上落客貨區
RELOCATED KILNS (2 NOS.) 重置的磚窯(兩個)

TOILET 洗手間

SHeltered ANCHORAGE 避風塘

PCCW'S SITE (NOT PART OF APPLICATION SITE)
電訊盈科用地(非申請範圍)

NURSERY 苗圃

AREA FOR COACH PARKING, PICK-UP/DROP-OFF 教練泊位及上落客區

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TRANSFORMER/SWITCH/E&M FACILITIES ROOM
變壓站/電掣房/機電設備房

HILLTOP GARDEN / CAFE
山頂花園/咖啡座

MA WAN NATURE GARDEN
馬灣自然公園

EXISTING TOLL PLAZA ABOVE
上層為現有收費廣場

PARK ENTRANCE PLAZA AND INFORMATION CENTRE
馬灣公園入口廣場及資訊中心

BUS TERMINUS 巴士總站

GENERAL PICK-UP/DROP-OFF BAY 上落客區

COVERED WALKWAYS 有蓋行人通道

LANDSCAPE FORECOURT 園藝花園

EXISTING CONNECTION TO LANTAU LINK 現有連接通往青洲幹線之道路

FIRE SAFETY EDUCATION CENTRE & MUSEUM 消防教育中心及博物館

NOAH'S ARK 挪亞方舟

TOILET 洗手間

EXISTING MA WAN SOCCER PITCH 馬灣足球場

BASKETBALL COURT AND MULTI-PURPOSE ACTIVITIES AREA
籃球場及多用途活動場地

TOILETS / ANCILLARY FACILITIES UNDER SPECTATOR STAND
看台下方之洗手間/輔助設施

CYCLING TRACK 單車徑

BICYCLE STORAGE SHEDS 單車儲存倉

HIGH ADVENTURE PLAY AREA 戶外訓練營

TUNG WAN 東灣

LEGEND:

MA WAN PARK BOUNDARY

PHASE I & II BOUNDARY

Rev.	Date	Drawn	Description	Checked	Approved

DEVELOPER

CONSULTANT



PROJECT

SECTION 16 PLANNING APPLICATION FOR PROPOSED AMENDMENTS TO APPROVED MASTER LAYOUT PLAN OF MA WAN PARK DEVELOPMENT

DRAWING TITLE

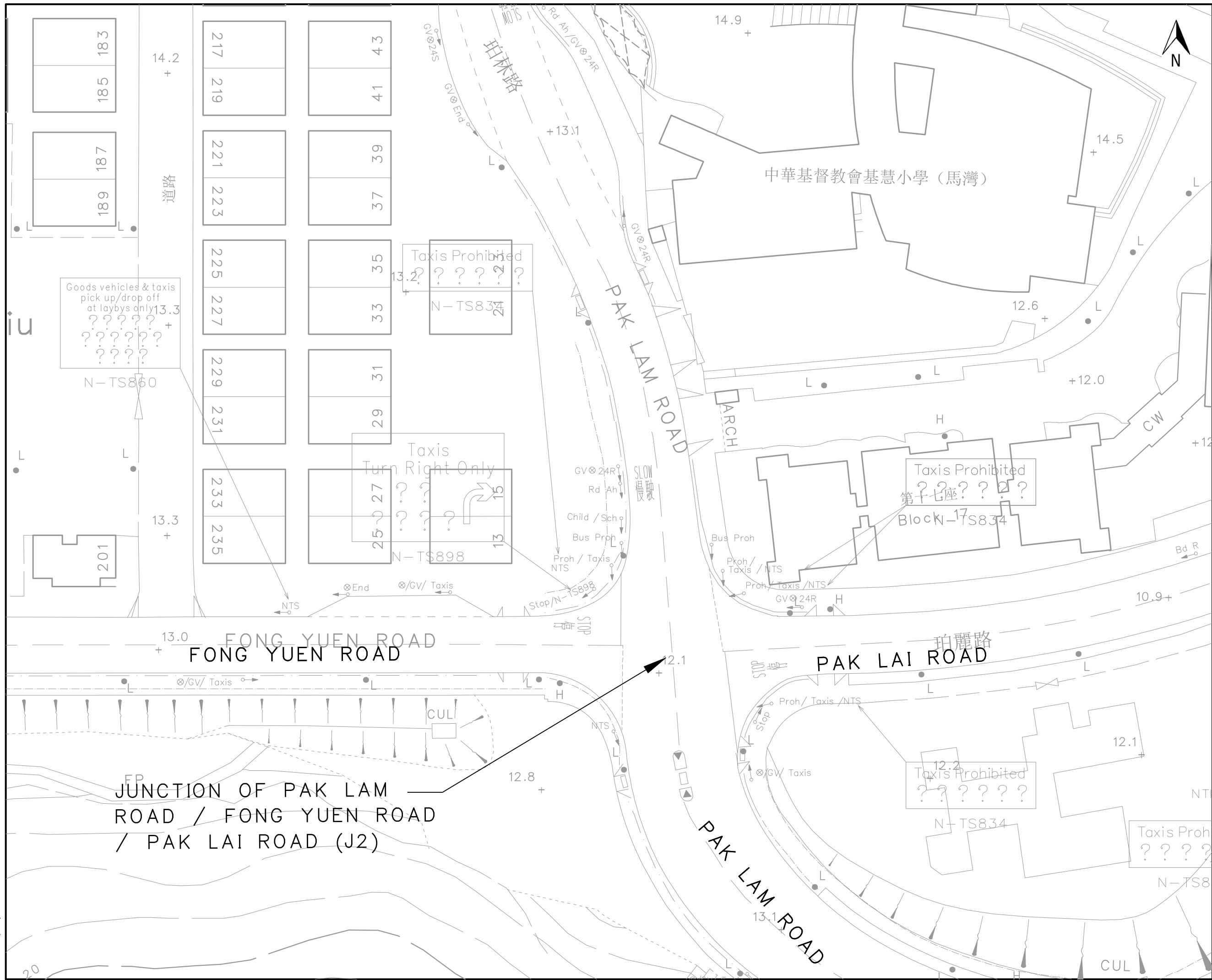
MASTER LAYOUT PLAN

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DRAWN	APPROVED


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Drawing No.
FIGURE 2.1

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JUNCTION OF PAK LAM ROAD / FONG YUEN ROAD / PAK LAI ROAD (J2)

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PROJECT					
SECTION 16 PLANNING APPLICATION FOR PROPOSED AMENDMENTS TO APPROVED MASTER LAYOUT PLAN OF MA WAN PARK DEVELOPMENT					
DRAWING TITLE					
JUNCTION LAYOUT OF PAK LAM ROAD / FONG YUEN ROAD / PAK LAI ROAD (J2)					
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FIGURE 3.3					
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馬灣大街村南 160 號
160 MA WAN MAIN STREET VILLAGE SOUTH

馬灣鄉事會路
MA WAN RURAL COMMITTEE ROAD

田寮
Tin Liu

FONG YUEN ROAD
芳園路

JUNCTION OF FONG YUEN ROAD / MA WAN RURAL COMMITTEE ROAD (J4)

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PROJECT
SECTION 16 PLANNING APPLICATION FOR PROPOSED AMENDMENTS TO APPROVED MASTER LAYOUT PLAN OF MA WAN PARK DEVELOPMENT

DRAWING TITLE
JUNCTION LAYOUT OF FONG YUEN ROAD / MA WAN RURAL COMMITTEE ROAD (J4)

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FIGURE 3.5

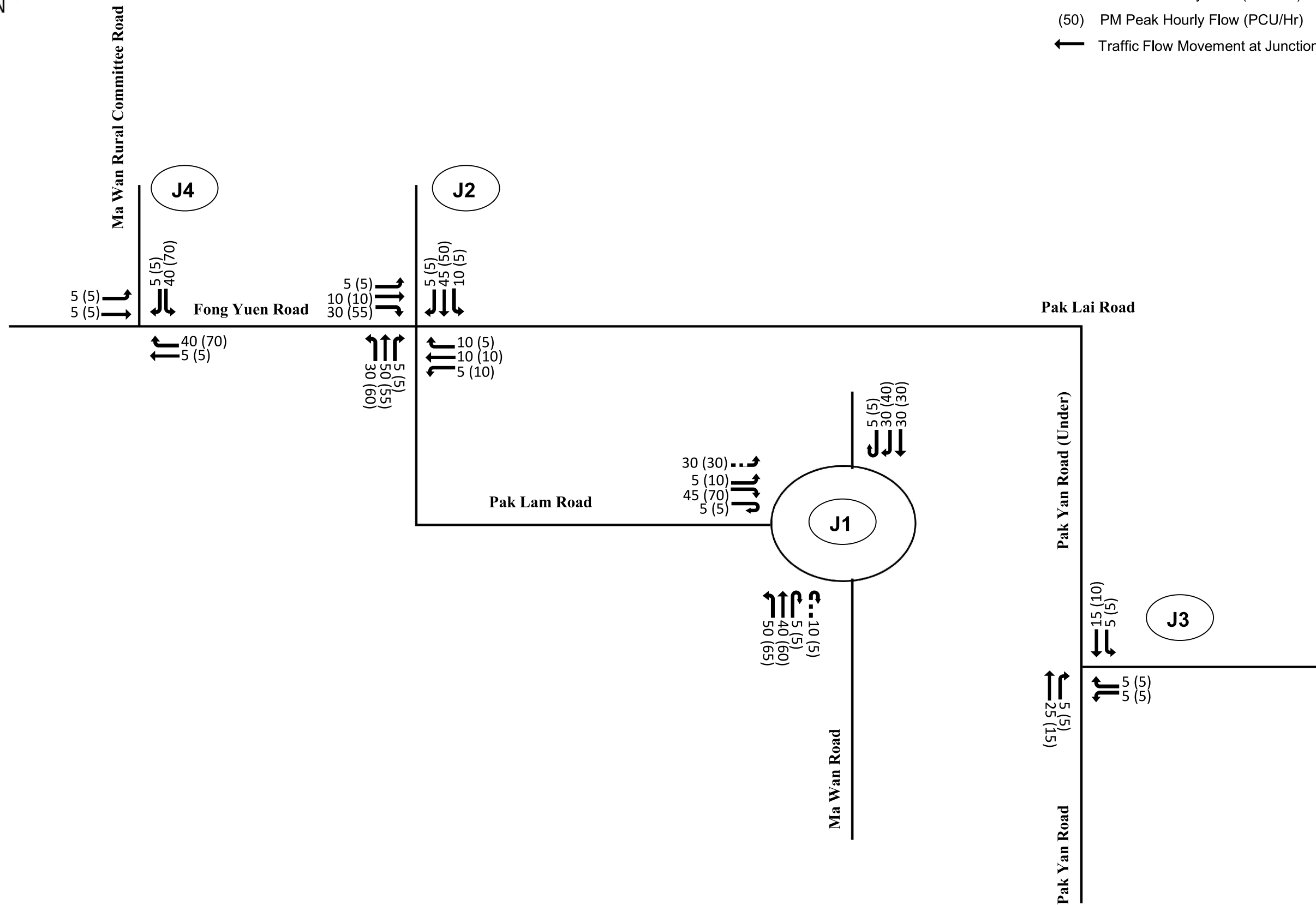
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Legend

- J1 Junction Number
- 50 AM Peak Hourly Flow (PCU/Hr)
- (50) PM Peak Hourly Flow (PCU/Hr)
- ← Traffic Flow Movement at Junction



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SECTION 16 PLANNING APPLICATION FOR PROPOSED AMENDMENTS TO APPROVED MASTER LAYOUT PLAN OF MA WAN PARK DEVELOPMENT

DRAWING TITLE
2024 OBSERVED TRAFFIC FLOWS (WEEKEND)

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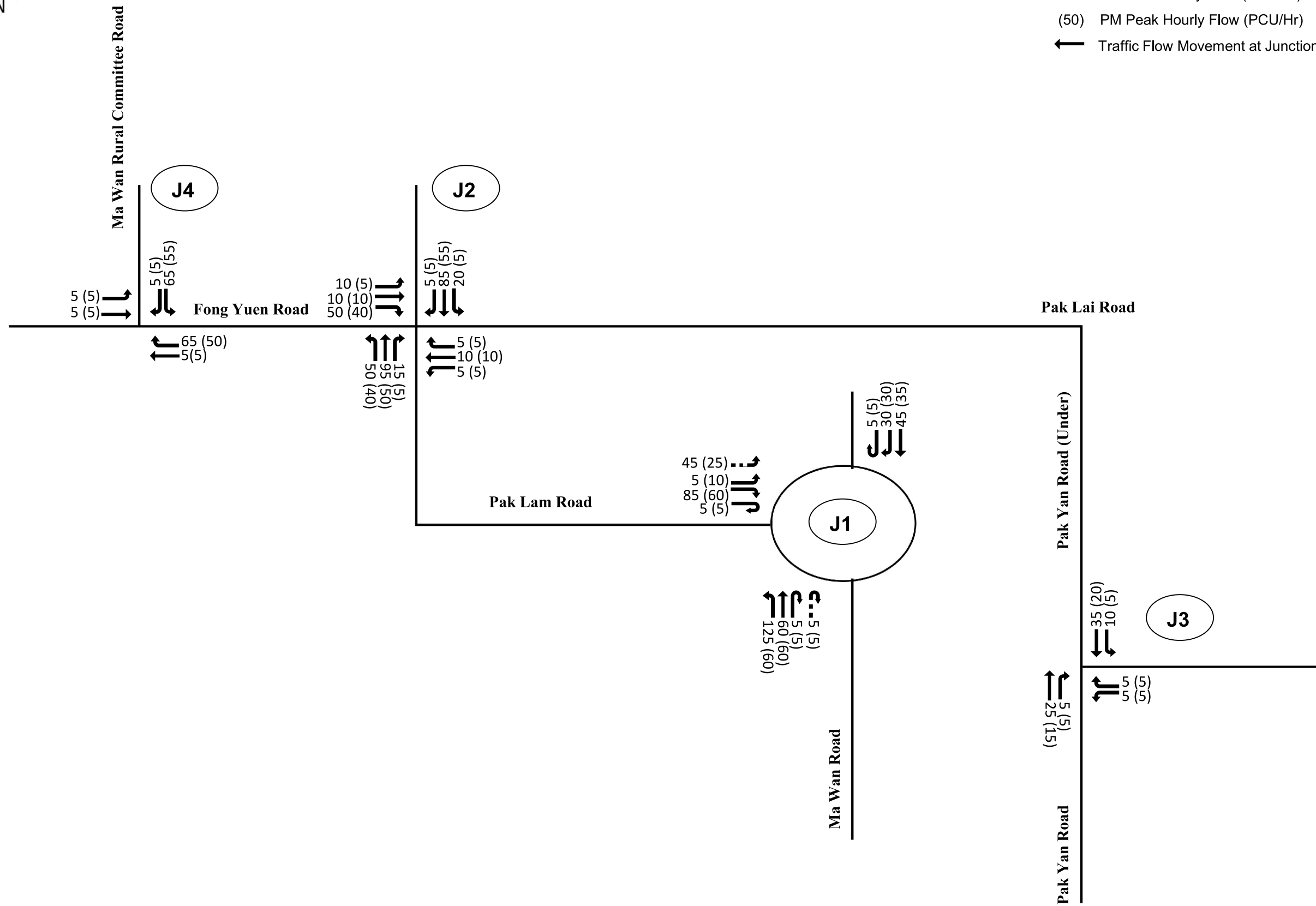
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FIGURE 3.6

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Legend

- J1 Junction Number
- 50 AM Peak Hourly Flow (PCU/Hr)
- (50) PM Peak Hourly Flow (PCU/Hr)
- ← Traffic Flow Movement at Junction



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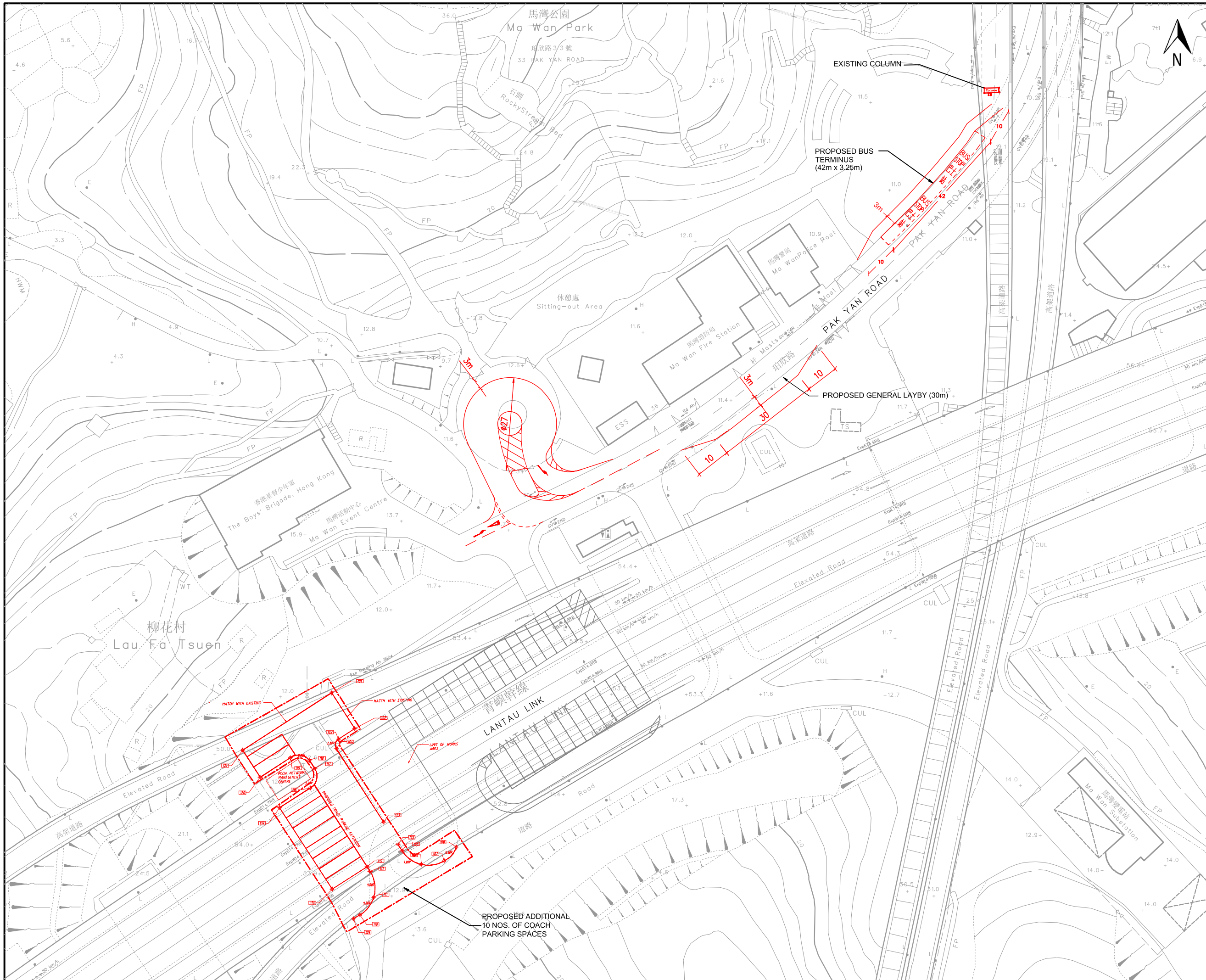
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SECTION 16 PLANNING APPLICATION FOR PROPOSED AMENDMENTS TO APPROVED MASTER LAYOUT PLAN OF MA WAN PARK DEVELOPMENT

DRAWING TITLE
2024 OBSERVED TRAFFIC FLOWS (WEEKDAY)

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NTS			

Drawing No.
FIGURE 3.7

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SECTION 16 PLANNING APPLICATION FOR PROPOSED AMENDMENTS TO APPROVED MASTER LAYOUT PLAN OF MA WAN PARK DEVELOPMENT

DRAWING TITLE
LAYOUT OF TAXI, FRANCHISED BUS LAYBYS AND COACH PARKING SPACES

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Drawing No.
FIGURE 3.8

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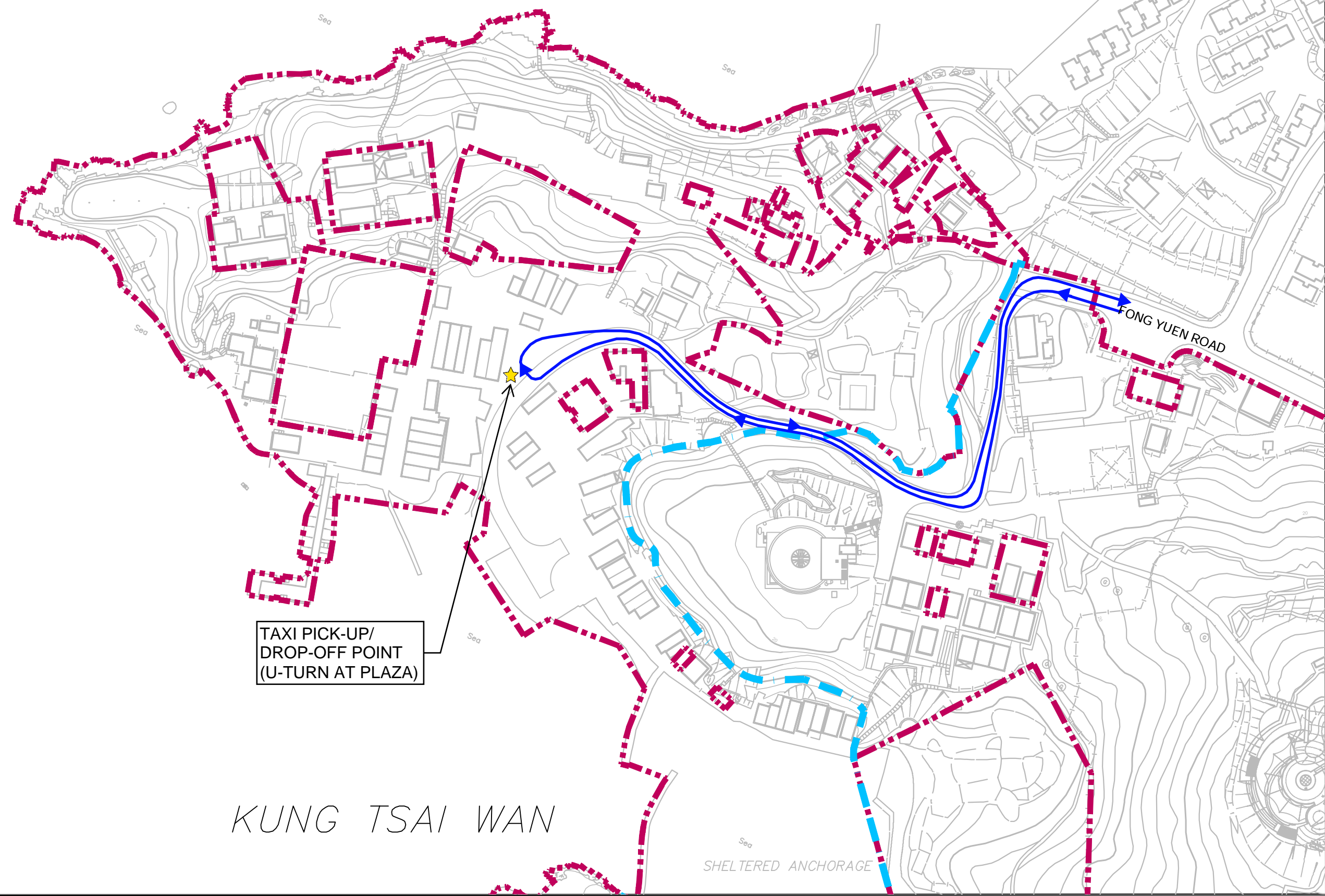
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SHEK TSAI WAN



- LEGEND:
- - - MA WAN PARK BOUNDARY
 - - - PHASE I & II BOUNDARY
 - TAXI ROUTING
 - ★ TAXI PICKUP/DROPOFF POINT




TAXI PICK-UP/
DROP-OFF POINT
(U-TURN AT PLAZA)

FONG YUEN ROAD

KUNG TSAI WAN

SHELTERED ANCHORAGE

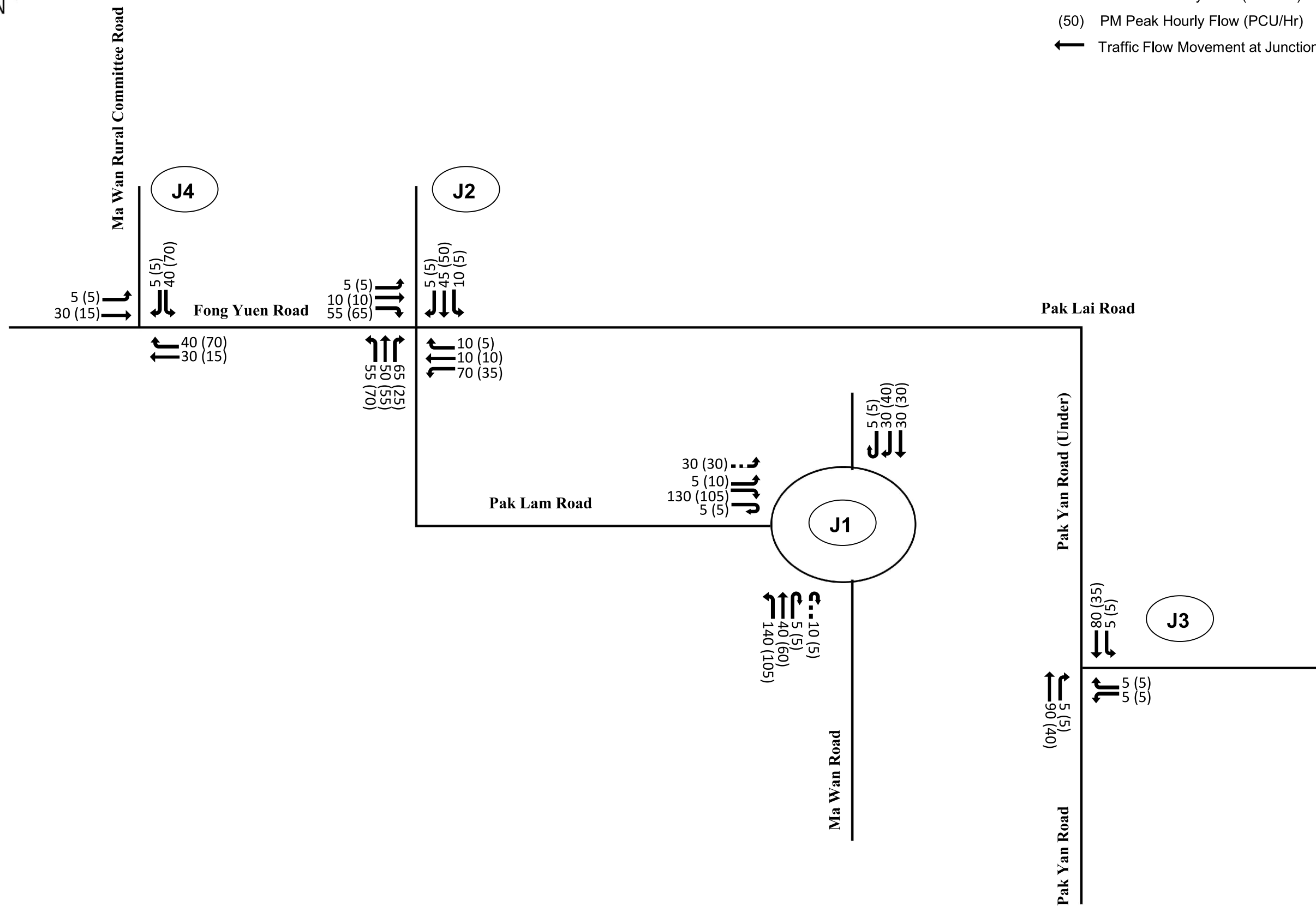
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SECTION 16 PLANNING APPLICATION FOR PROPOSED AMENDMENTS TO APPROVED MASTER LAYOUT PLAN OF MA WAN PARK DEVELOPMENT					
DRAWING TITLE					
TAXI PICK-UP/DROP-OFF POINT FOR THE MWPP2					
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FIGURE 3.9					
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Legend

- J1 Junction Number
- 50 AM Peak Hourly Flow (PCU/Hr)
- (50) PM Peak Hourly Flow (PCU/Hr)
- ← Traffic Flow Movement at Junction



Rev.	Date	Drawn	Description	Checked	Approved

DEVELOPER



CONSULTANT

PROJECT
SECTION 16 PLANNING APPLICATION FOR PROPOSED AMENDMENTS TO APPROVED MASTER LAYOUT PLAN OF MA WAN PARK DEVELOPMENT

DRAWING TITLE
2024 DESIGN TRAFFIC FLOWS (WITH MWPP2) ON WEEKEND

DESIGNED		CHECKED	
DRAWN		APPROVED	
SCALE AT A3	STATUS	REV	
NTS			

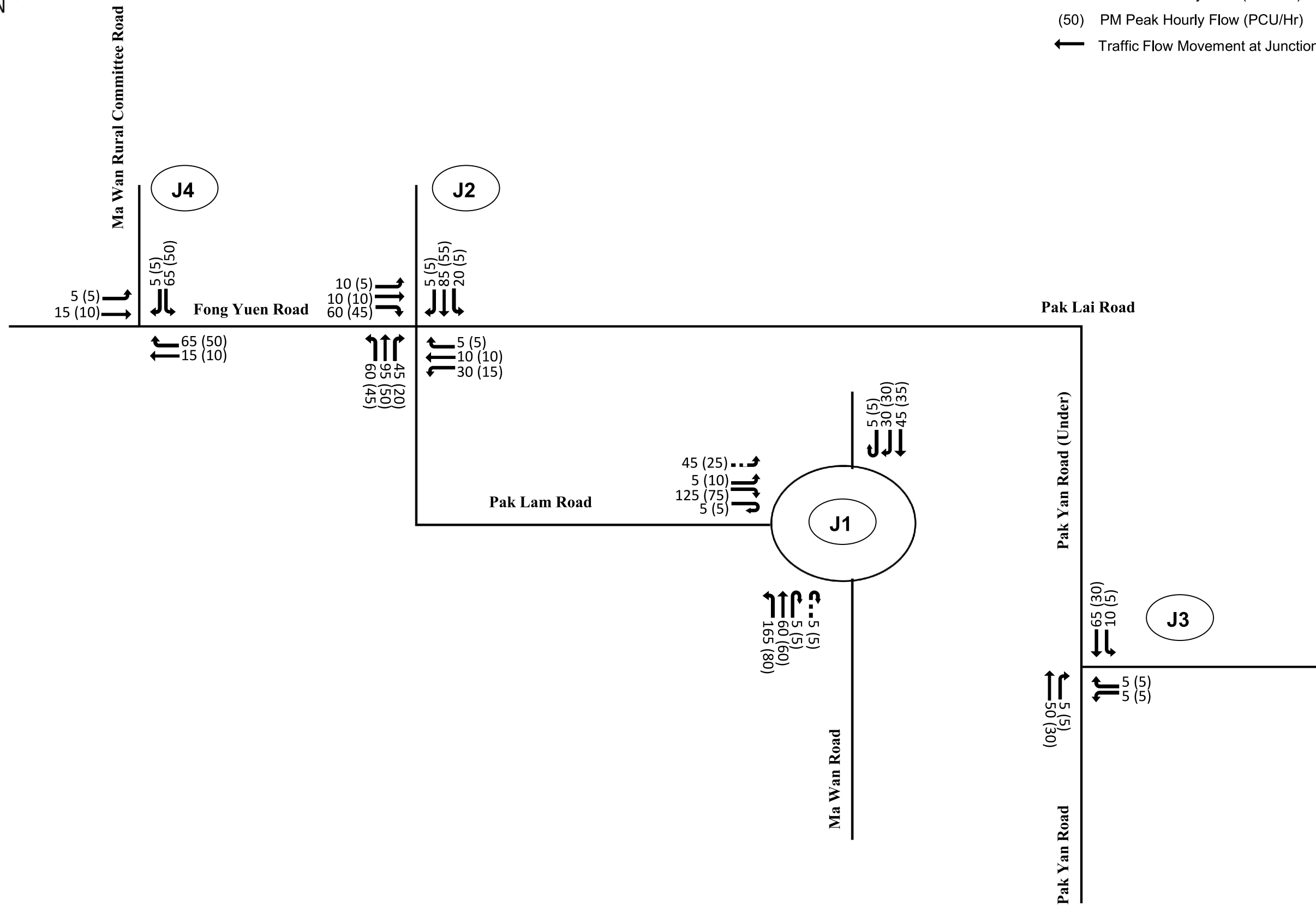
Drawing No.
FIGURE 4.1

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Legend

- J1 Junction Number
- 50 AM Peak Hourly Flow (PCU/Hr)
- (50) PM Peak Hourly Flow (PCU/Hr)
- ← Traffic Flow Movement at Junction



Rev.	Date	Drawn	Description	Checked	Approved

DEVELOPER



CONSULTANT

PROJECT
SECTION 16 PLANNING APPLICATION FOR PROPOSED AMENDMENTS TO APPROVED MASTER LAYOUT PLAN OF MA WAN PARK DEVELOPMENT

DRAWING TITLE
2024 DESIGN TRAFFIC FLOWS (WITH MWPP2) ON WEEKDAY

DESIGNED		CHECKED	
DRAWN		APPROVED	
SCALE AT A3	STATUS	REV	
NTS			

Drawing No.
FIGURE 4.2

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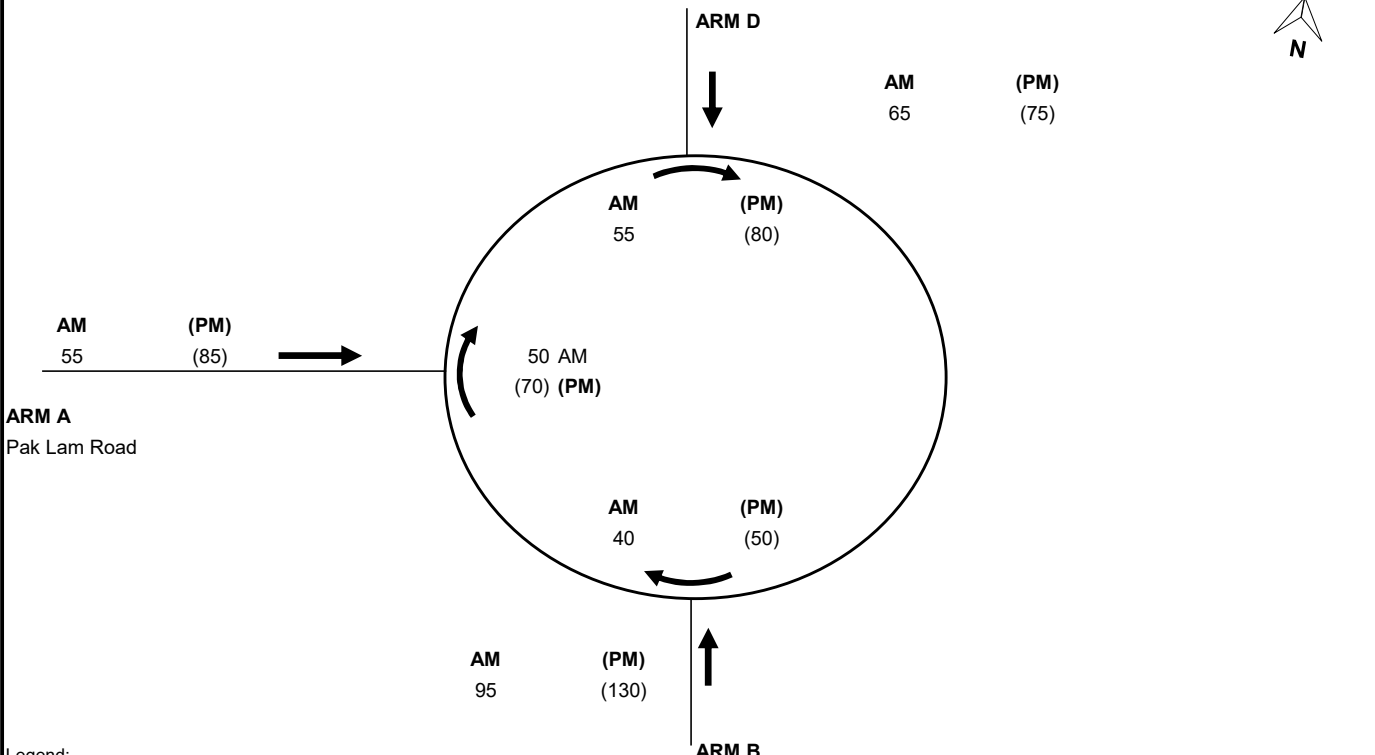
Appendix A Junction Calculation Sheets

Roundabout Capacity Calculation



Junction: Pak Lam Road / Ma Wan Road
 Scenario: 2024 Observed Case (Weekend)

Junction No.: J1
 Design Year: 2024



Legend:
 100 (200) AM (PM) Traffic Flows in pcu/hr

GEOMETRY		Arm A	Arm B	Arm D
Approach half width (m)	<i>v</i>	4.5	3.0	4.0
Entry width (m)	<i>e</i>	5.0	5.2	15.0
Effective length of flare (m)	<i>L</i>	5.0	5.0	20.0
Entry radius (m)	<i>r</i>	40	25	25
Inscribed circle diameter (m)	<i>D</i>	42	42	42
Entry angle (degree)	ϕ			

CALCULATION		Arm A	Arm B	Arm D
Sharpness of flare = $1.6(E-V)/L$	<i>S</i>	0.16	0.70	0.88
$1-0.00347(A-30)-0.978(1/R-0.05)$	<i>K</i>	1.13	1.11	1.11
$V + ((E-V)/(1+2S))$	<i>x₂</i>	4.88	3.91	7.99
$\exp((D-60)/10)$	<i>M</i>	0.17	0.17	0.17
$303x_2$	<i>F</i>	1478.27	1185.83	2419.61
$1+(0.5/(1+M))$	<i>t_D</i>	1.43	1.43	1.43
$0.21t_D(1+0.2x_2)$	<i>f_c</i>	0.59	0.54	0.78

	Q_c = Circulating flow across entry (pcu/h)		Q_e = Entry Capacity K(F-F_c*Q_c)		Q = Entry flow (pcu/h)		DFC	
	AM	PM	AM	PM	AM	PM	AM	PM
Arm A	50	(70)	1635	1621	55	(85)	0.03	0.05
Arm B	40	(130)	1297	1243	95	(130)	0.07	0.10
Arm C	0	(0)	0	0	0	(0)	0.00	0.00
Arm D	55	(80)	2647	2626	65	(75)	0.02	0.03

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 Appendix 2

	AM	PM
Critical Arm:	Arm B	Arm B
Critical DFC:	0.07	0.10

Priority Junction Capacity Calculation

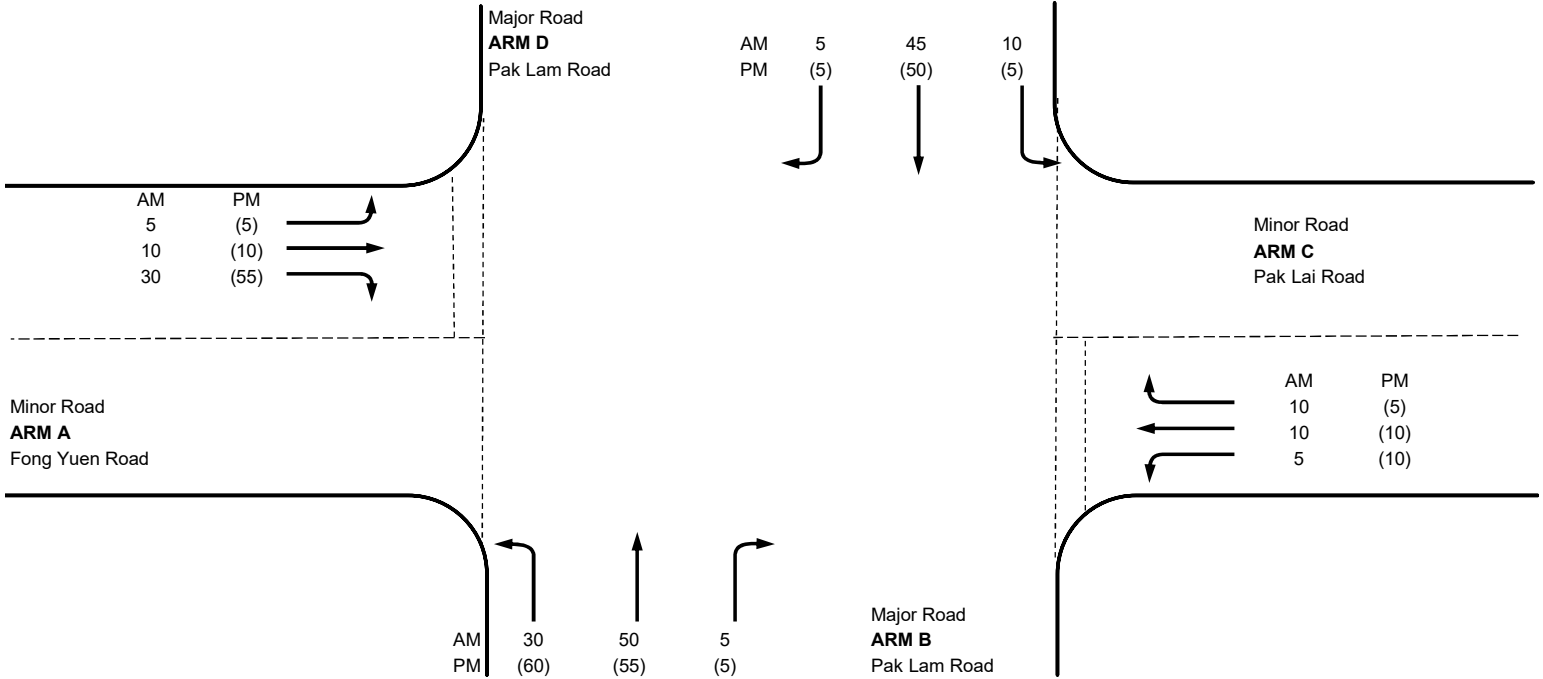
Junction : Fong Yuen Road / Pak Lam Road / Pak Lai Road

Junction No. : J2

Scenario : 2024 Observed Case (Weekend)

Design Year : 2024

ARM A	Fong Yuen Road
ARM B	Pak Lam Road
ARM C	Pak Lai Road
ARM D	Pak Lam Road



GEOMETRY		Arm A		Arm C	
Major road width	W = 8.5 m	Lane widths	W _{A-B} = 2.2 m	Lane widths	W _{C-B} = 3.7 m
Central Reserve width	W _{cr} = 0 m		W _{A-D} = 2.9 m		W _{C-D} = 2.2 m
			W _{D-A} = 2.2 m		W _{B-C} = 3 m
Visibilities	V _{B-C} = 50 m	Visibilities	V _{right A} = 30 m		V _{right C} = 30 m
	V _{D-A} = 55 m		V _{left A} = 30 m		V _{left C} = 30 m
General Terms		X _A = 0.880	Y = 0.707	X _A = 0.813	Y = 0.707
		X _B = 0.737	Z _B = 0.854	X _B = 0.737	Z _B = 0.923
		X _C = 0.813	Z _D = 0.923	X _C = 0.880	Z _D = 0.854
		X _D = 0.737		X _D = 0.737	

ANALYSIS											
Arm A		Arm B				Arm C		Arm D			
		Left-turn?	1	Right-turn?	1			Left-turn?	1	Right-turn?	1
Traffic	q _{A-B} = 5	AM	5	PM	5	Traffic	10	10	q _{D-A} = 10	AM	5
Flows	q _{A-C} = 10		q _{B-A} = 5		5	Flows	10	5	q _{D-B} = 45		50
(pcu/hr)	q _{A-D} = 30		q _{B-C} = 30		60	(pcu/hr)	5	10	q _{D-C} = 5		5
			q _{B-D} = 50		55				M = 0.857		
			M = 0.793				594	586			
Capacities	μ _{A-D} = 649		μ _{B-A} = 439		436				μ _{D-A} = 685		685
			μ _{B-C} = 634		634				μ _{D-B} = 521		420
			μ _{B-D} = 484		479				μ _{D-C} = 433		514
			μ _{B-AC} = 596		613				μ _{D-AC} = 574		587
DFC	A-D 0.05 0.08		B-A 0.01 0.01		0.02 0.01				D-A 0.01 0.01		0.01
			B-C 0.05 0.09						D-B 0.09 0.12		0.12
			B-D 0.1 0.11						D-C 0.01 0.01		0.01
			B-AC 0.06 0.11						D-AC 0.03 0.02		0.02
			B-ACD 0.16 0.22						D-ABC 0.11 0.14		0.14
DFC	0.05 0.08		0.16 0.22		DFC 0.02 0.01			DFC	0.11 0.14		



Critical DFC	AM	PM
	0.16	0.22

Priority Junction Capacity Calculation

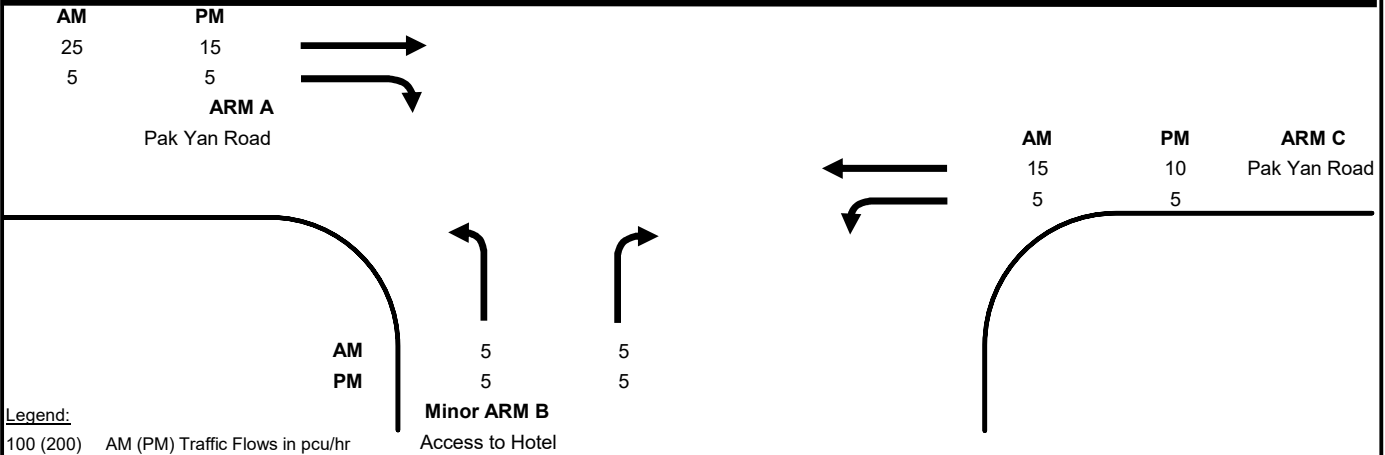


Junction: Pak Yan Road / Local Road (Access to Hotel)

Junction No.: J3

Scenario: 2024 Observed Case (Weekend)

Design Year: 2024



Legend:

100 (200) AM (PM) Traffic Flows in pcu/hr

Minor ARM B
Access to Hotel

GEOMETRY

Major road width	W	12.00 m	Lane widths	w(b-c)	2.30 m
Central Reserve width	W _{cr}	0.00 m		w(b-a)	2.30 m
2 Lane Minor Arm (Y/N)		N		w(a-b)	2.05 m
Visibilities	V _r (b-c)	100 m	Calculated	D	0.83
	V _l (b-c)	100 m		E	0.82
	V _r (b-a)	50 m		F	0.79
	V _r (a-b)	40 m		Y	0.59

ANALYSIS

		AM	PM
Traffic Flows	q(c-a)	25	15
	q(c-b)	5	5
	q(a-b)	5	5
	q(a-c)	15	10
	q(b-a)	5	5
	q(b-c)	5	5
	f	0.50	0.50
Capacities	Q(b-a)	514	516
	Q(b-c)	607	607
	Q(c-b)	584	585
	Q(b-ac)	556	558
Design Flow to Capacity (DFC)	b-a	0.01	0.01
	b-c	0.01	0.01
	c-b	0.01	0.01
	b-ac	0.02	0.02
Critical DFC	0.02	0.02	

Where V_l and V_r are visibility distances to the left or right of the respective streams

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

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

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

$$Y = 1-0.0345W$$

f = proportion of minor traffic turning left

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

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Appendix 1

Priority Junction Capacity Calculation

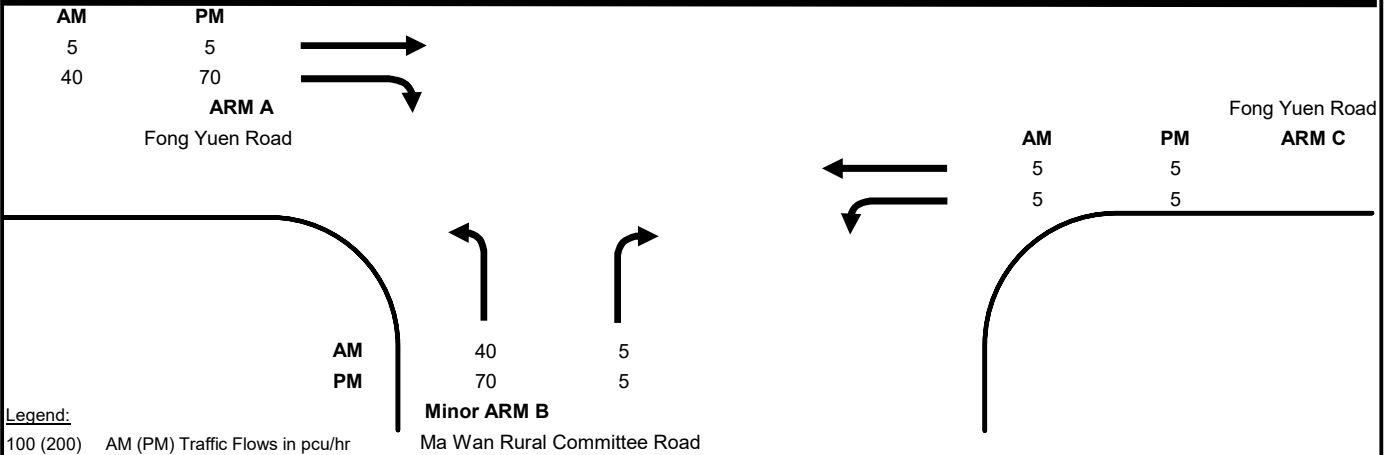


Junction: Fong Yuen Road / Ma Wan Rural Committee Road

Junction No.: J4

Scenario: 2024 Observed Case (Weekend)

Design Year: 2024



Legend:

100 (200) AM (PM) Traffic Flows in pcu/hr

Minor ARM B

Ma Wan Rural Committee Road

GEOMETRY

Major road width	W	7.85 m	Lane widths	w(b-c)	2.05 m
Central Reserve width	W _{cr}	0.00 m		w(b-a)	2.81 m
2 Lane Minor Arm (Y/N)		Y		w(a-b)	3.60 m
Visibilities	V _r (b-c)	80 m	Calculated	D	0.78
	V _l (b-c)	80 m		E	0.87
	V _r (b-a)	60 m		F	0.93
	V _r (a-b)	50 m		Y	0.73

ANALYSIS

		AM	PM
Traffic Flows	q(c-a)	5	5
	q(c-b)	40	70
	q(a-b)	5	5
	q(a-c)	5	5
	q(b-a)	5	5
	q(b-c)	40	70
	f	0.89	0.93
Capacities	Q(b-a)	478	469
	Q(b-c)	648	648
	Q(c-b)	692	692
	Q(b-ac)	623	631
Design Flow to Capacity (DFC)	b-a	0.01	0.01
	b-c	0.06	0.11
	c-b	0.06	0.10
	b-ac	0.00	0.00
Critical DFC	0.06	0.11	

Where V_l and V_r are visibility distances to the left or right of the respective streams

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

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

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

$$Y = 1-0.0345W$$

f = proportion of minor traffic turning left

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

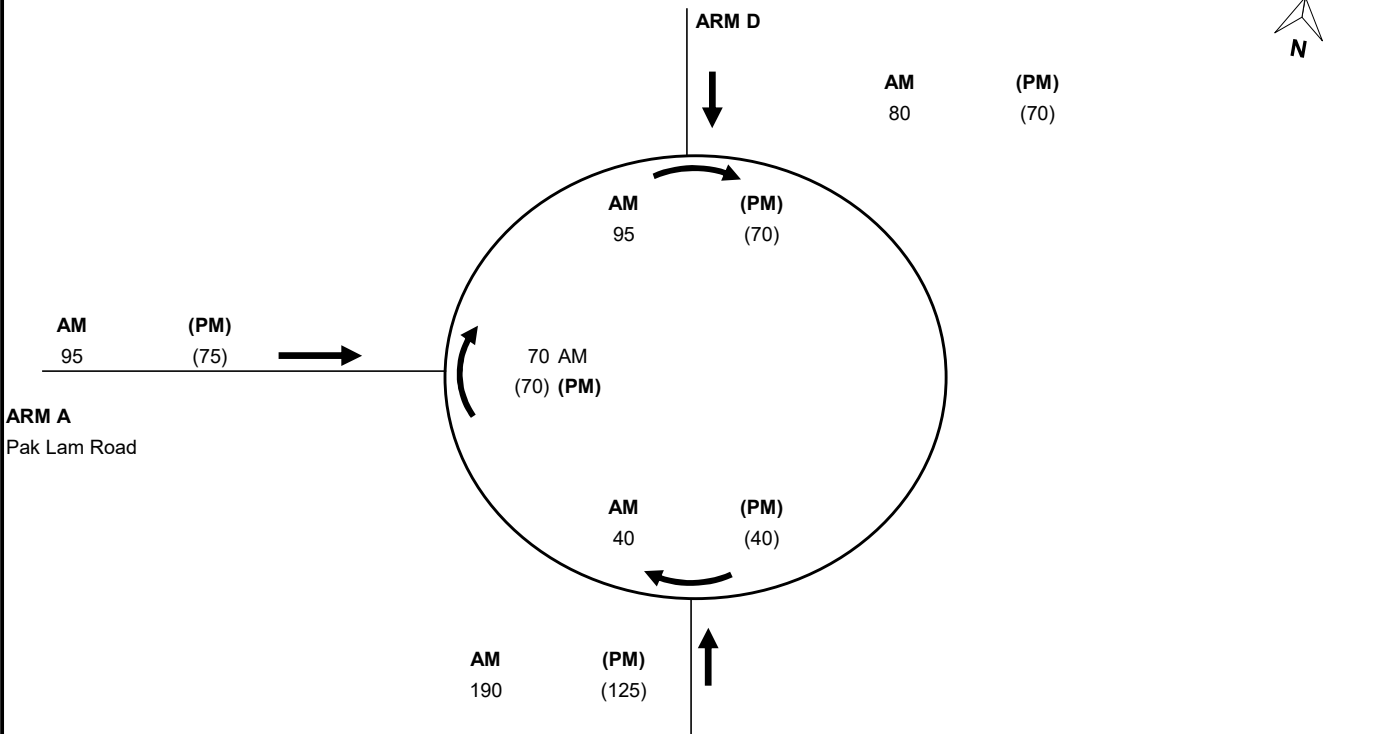
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Appendix 1

Roundabout Capacity Calculation



Junction: Pak Lam Road / Ma Wan Road
 Scenario: 2024 Observed Case (Weekday)

Junction No.: J1
 Design Year: 2024



Legend:

100 (200) AM (PM) Traffic Flows in pcu/hr

GEOMETRY		<i>Arm A</i>	<i>Arm B</i>	<i>Arm D</i>
Approach half width (m)	<i>v</i>	4.5	3.0	4.0
Entry width (m)	<i>e</i>	5.0	5.2	15.0
Effective length of flare (m)	<i>L</i>	5.0	5.0	20.0
Entry radius (m)	<i>r</i>	40	25	25
Inscribed circle diameter (m)	<i>D</i>	42	42	42
Entry angle (degree)	φ			

CALCULATION		<i>Arm A</i>	<i>Arm B</i>	<i>Arm D</i>
Sharpness of flare = $1.6(E-V)/L$	<i>S</i>	0.16	0.70	0.88
$1-0.00347(A-30)-0.978(1/R-0.05)$	<i>K</i>	1.13	1.11	1.11
$V + ((E-V)/(1+2S))$	x_2	4.88	3.91	7.99
$\exp((D-60)/10)$	<i>M</i>	0.17	0.17	0.17
$303x_2$	<i>F</i>	1478.27	1185.83	2419.61
$1+(0.5/(1+M))$	t_D	1.43	1.43	1.43
$0.21t_D(1+0.2x_2)$	f_c	0.59	0.54	0.78

	Q_c = Circulating flow across entry (pcu/h)		Q_e = Entry Capacity K(F-F_c*Q_c)		Q = Entry flow (pcu/h)		DFC	
	AM	PM	AM	PM	AM	PM	AM	PM
Arm A	70	(70)	1621	1621	95	(75)	0.06	0.05
Arm B	40	(125)	1297	1246	190	(125)	0.15	0.10
Arm C	0	(0)	0	0	0	(0)	0.00	0.00
Arm D	95	(70)	2613	2634	80	(70)	0.03	0.03

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 Appendix 2

	AM	PM
Critical Arm:	Arm B	Arm B
Critical DFC:	0.15	0.10

Priority Junction Capacity Calculation

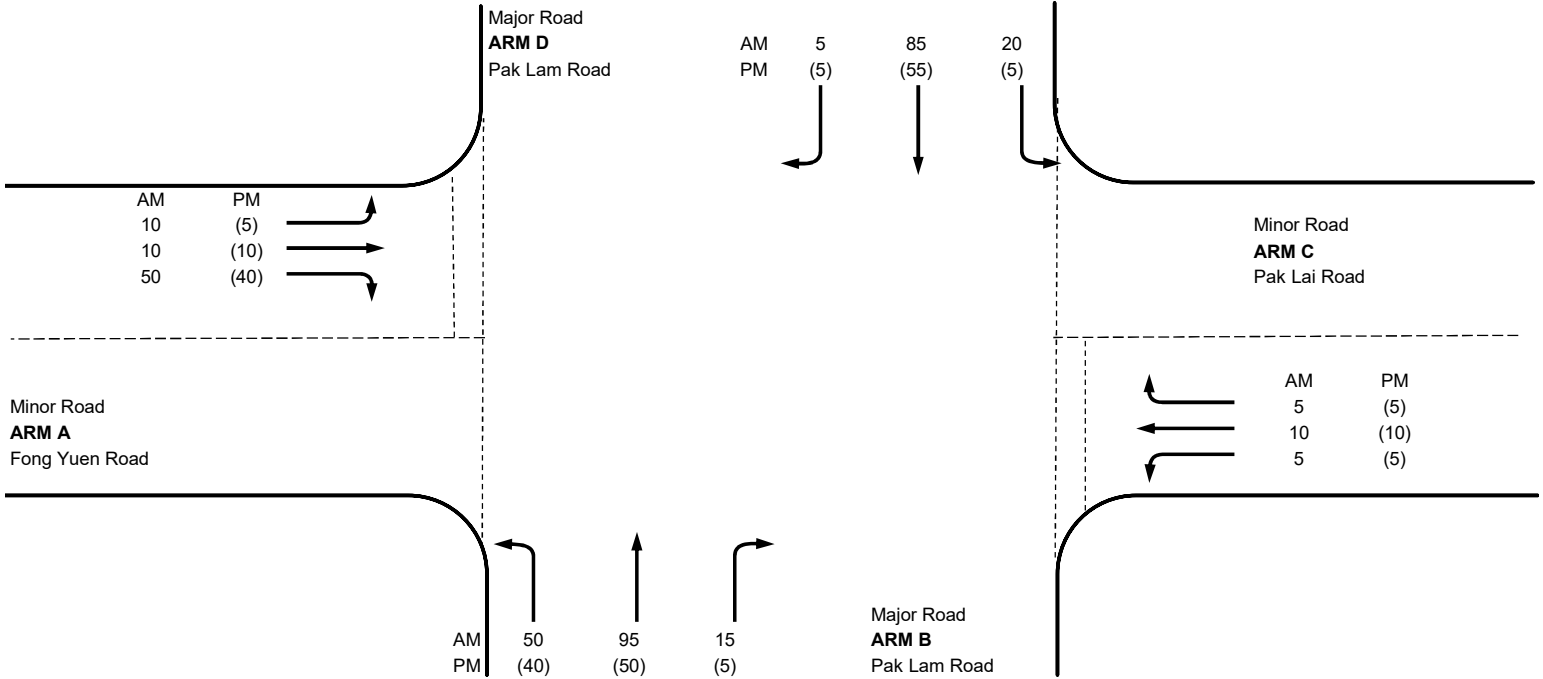
Junction : Fong Yuen Road / Pak Lam Road / Pak Lai Road

Junction No. : J2

Scenario : 2024 Observed Case (Weekday)

Design Year : 2024

ARM A	Fong Yuen Road
ARM B	Pak Lam Road
ARM C	Pak Lai Road
ARM D	Pak Lam Road



GEOMETRY		Arm A				Arm C			
Major road width	W = 8.5 m	Lane widths		W _{A-B} = 2.2 m	Lane widths		W _{C-B} = 3.7 m		
Central Reserve width	W _{cr} = 0 m			W _{A-D} = 2.9 m			W _{C-D} = 2.2 m		
				W _{D-A} = 2.2 m			W _{B-C} = 3 m		
Visibilities	V _{B-C} = 50 m	Visibilities		V _{right A} = 30 m	Visibilities		V _{right C} = 30 m		
	V _{D-A} = 55 m			V _{left A} = 30 m			V _{left C} = 30 m		
General Terms				X _A = 0.880	Y = 0.707			X _A = 0.813	Y = 0.707
				X _B = 0.737	Z _B = 0.854			X _B = 0.737	Z _B = 0.923
				X _C = 0.813	Z _D = 0.923			X _C = 0.880	Z _D = 0.854
				X _D = 0.737				X _D = 0.737	

ANALYSIS														
Arm A			Arm B				Arm C			Arm D				
			Left-turn?	1	Right-turn?	1				Left-turn?	1	Right-turn?	1	
			AM	PM	AM	PM	AM			PM	AM	PM	PM	
Traffic	q _{A-B} =	10	5	q _{B-A} =	15	5	Traffic	10	10	q _{D-A} =	20	5		
Flows	q _{A-C} =	10	10	q _{B-C} =	50	40	Flows	5	5	q _{D-B} =	85	55		
(pcu/hr)	q _{A-D} =	50	40	q _{B-D} =	95	50	(pcu/hr)	5	5	q _{D-C} =	5	5		
				M =	0.793					M =	0.857			
Capacities	μ _{A-D} =	650	650	μ _{B-A} =	427	438		587	591	μ _{D-A} =	685	685		
				μ _{B-C} =	633	634				μ _{D-B} =	515	429		
				μ _{B-D} =	481	483				μ _{D-C} =	415	519		
				μ _{B-AC} =	570	604				μ _{D-AC} =	606	591		
DFC	A-D	0.08	0.06	B-A	0.04	0.01		0.01	0.01	D-A	0.03	0.01		
				B-C	0.08	0.06				D-B	0.17	0.13		
				B-D	0.2	0.1				D-C	0.01	0.01		
				B-AC	0.11	0.07				D-AC	0.04	0.02		
				B-ACD	0.31	0.18				D-ABC	0.21	0.15		
DFC		0.08	0.06				DFC	0.01	0.01	DFC		0.21	0.15	
											Critical DFC		AM	PM
													0.31	0.18

Priority Junction Capacity Calculation

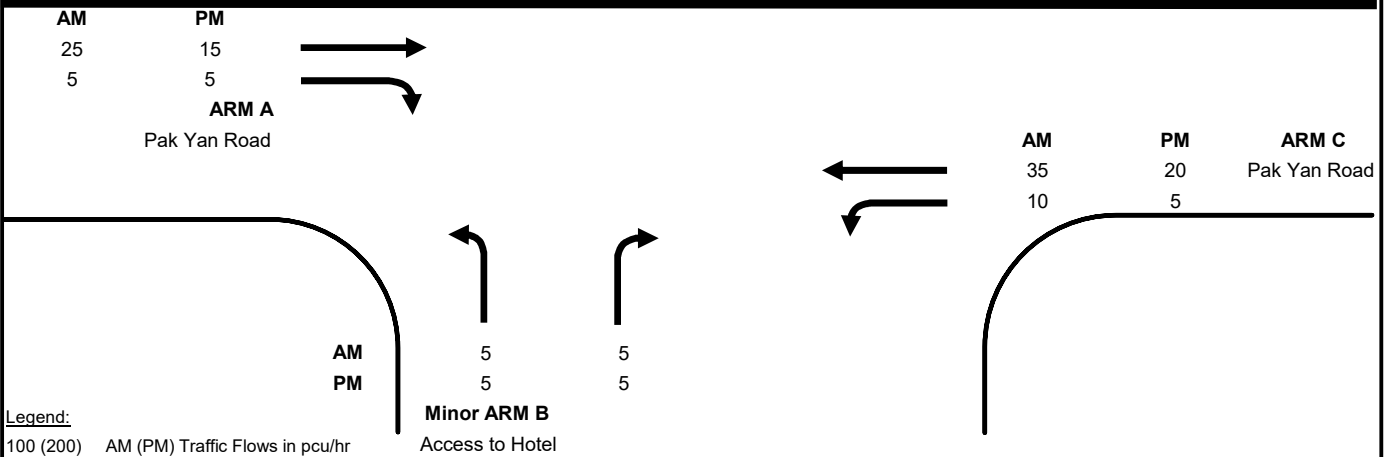


Junction: Pak Yan Road / Local Road (Access to Hotel)

Junction No.: J3

Scenario: 2024 Observed Case (Weekday)

Design Year: 2024



GEOMETRY

Major road width	W	12.00 m	Lane widths	w(b-c)	2.30 m
Central Reserve width	W _{cr}	0.00 m		w(b-a)	2.30 m
2 Lane Minor Arm (Y/N)		N		w(a-b)	2.05 m
Visibilities	V _r (b-c)	100 m	Calculated	D	0.83
	V _l (b-c)	100 m		E	0.82
	V _r (b-a)	50 m		F	0.79
	V _r (a-b)	40 m		Y	0.59

ANALYSIS

		AM	PM
Traffic Flows	q(c-a)	25	15
	q(c-b)	5	5
	q(a-b)	10	5
	q(a-c)	35	20
	q(b-a)	5	5
	q(b-c)	5	5
	f	0.50	0.50
Capacities	Q(b-a)	510	515
	Q(b-c)	603	606
	Q(c-b)	580	583
	Q(b-ac)	552	556
Design Flow to Capacity (DFC)	b-a	0.01	0.01
	b-c	0.01	0.01
	c-b	0.01	0.01
	b-ac	0.02	0.02
Critical DFC		0.02	0.02

Where V_l and V_r are visibility distances to the left or right of the respective streams

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

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

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

$$Y = 1-0.0345W$$

f = proportion of minor traffic turning left

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

Priority Junction Capacity Calculation

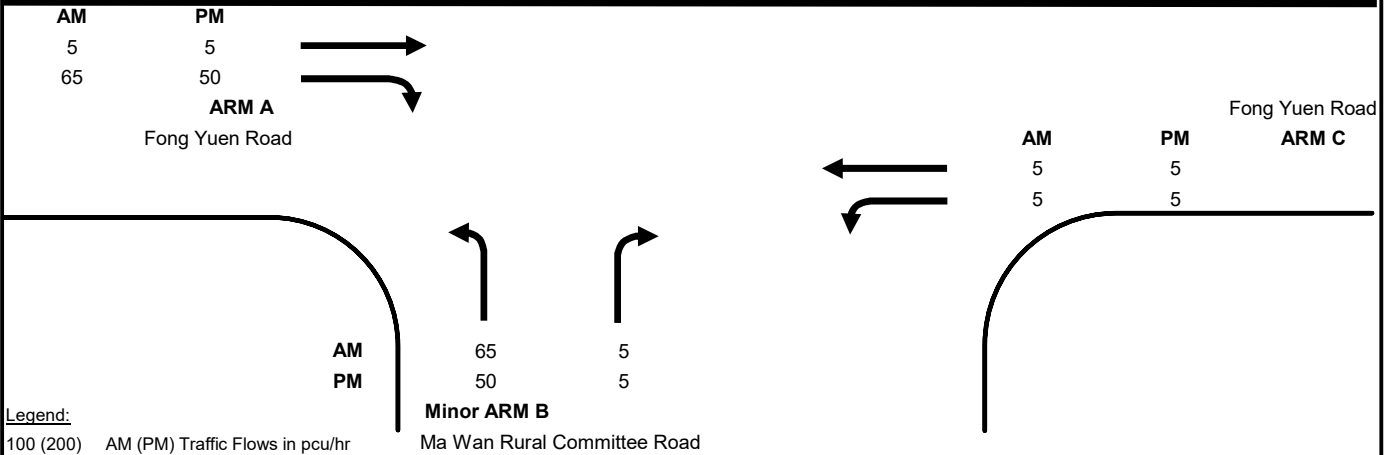


Junction: Fong Yuen Road / Ma Wan Rural Committee Road

Junction No.: J4

Scenario: 2024 Observed Case (Weekday)

Design Year: 2024



GEOMETRY

Major road width	W	7.85 m	Lane widths	w(b-c)	2.05 m
Central Reserve width	W _{cr}	0.00 m		w(b-a)	2.81 m
2 Lane Minor Arm (Y/N)		Y		w(a-b)	3.60 m
Visibilities	V _r (b-c)	80 m	Calculated	D	0.78
	V _l (b-c)	80 m		E	0.87
	V _r (b-a)	60 m		F	0.93
	V _r (a-b)	50 m		Y	0.73

ANALYSIS

		AM	PM
Traffic Flows	q(c-a)	5	5
	q(c-b)	65	50
	q(a-b)	5	5
	q(a-c)	5	5
	q(b-a)	5	5
	q(b-c)	65	50
	f	0.93	0.91
Capacities	Q(b-a)	471	475
	Q(b-c)	648	648
	Q(c-b)	692	692
	Q(b-ac)	631	627
Design Flow to Capacity (DFC)	b-a	0.01	0.01
	b-c	0.10	0.08
	c-b	0.09	0.07
	b-ac	0.00	0.00
Critical DFC	0.10	0.08	

Where V_l and V_r are visibility distances to the left or right of the respective streams

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

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

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

$$Y = 1-0.0345W$$

f = proportion of minor traffic turning left

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

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Appendix 1

Roundabout Capacity Calculation

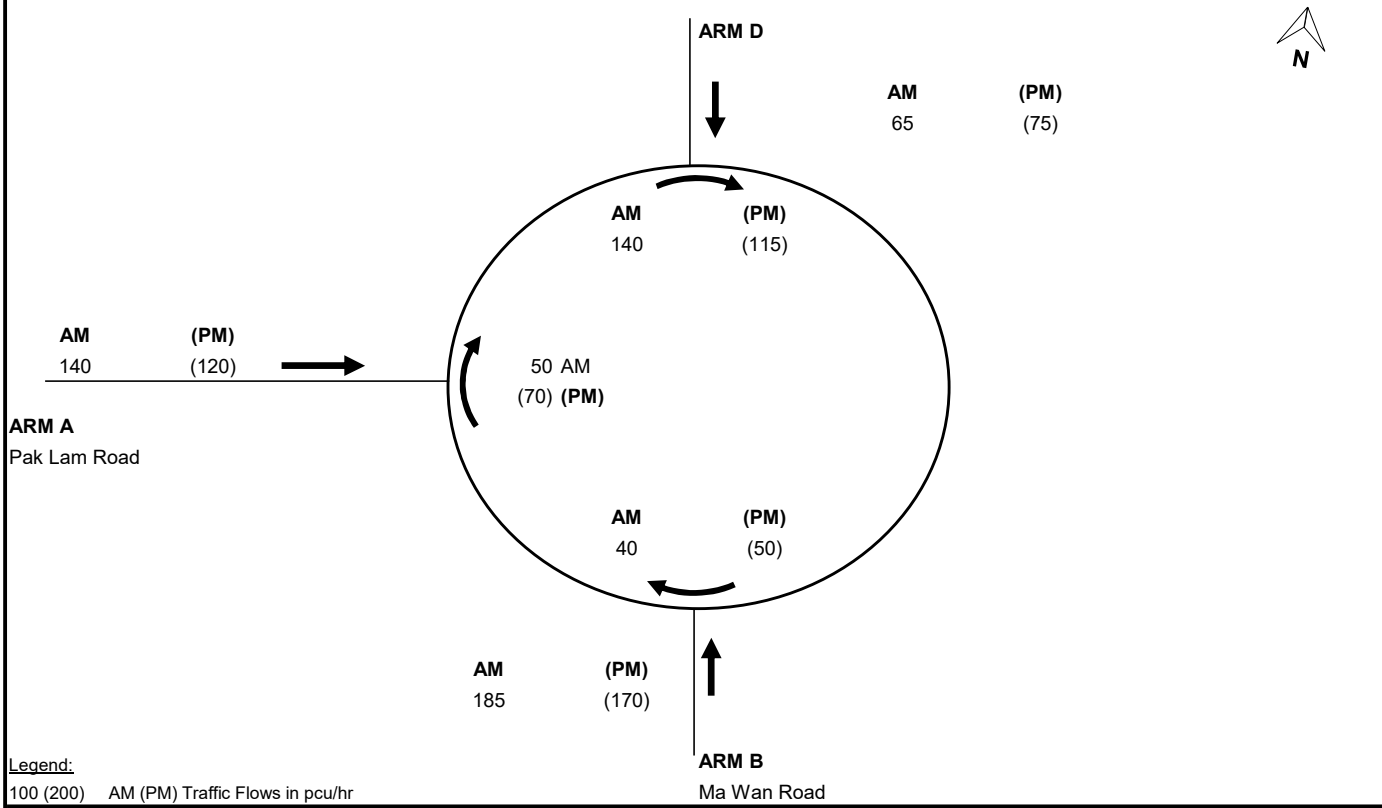


Junction: Pak Lam Road / Ma Wan Road

Junction No.: J1

Scenario: 2024 Design Case (Weekend)

Design Year: 2024



Legend:

100 (200) AM (PM) Traffic Flows in pcu/hr

GEOMETRY		<i>Arm A</i>	<i>Arm B</i>	<i>Arm D</i>
Approach half width (m)	<i>v</i>	4.5	3.0	4.0
Entry width (m)	<i>e</i>	5.0	5.2	15.0
Effective length of flare (m)	<i>L</i>	5.0	5.0	20.0
Entry radius (m)	<i>r</i>	40	25	25
Inscribed circle diameter (m)	<i>D</i>	42	42	42
Entry angle (degree)	φ			

CALCULATION		<i>Arm A</i>	<i>Arm B</i>	<i>Arm D</i>
Sharpness of flare = $1.6(E-V)/L$	<i>S</i>	0.16	0.70	0.88
$1-0.00347(A-30)-0.978(1/R-0.05)$	<i>K</i>	1.13	1.11	1.11
$V + ((E-V)/(1+2S))$	x_2	4.88	3.91	7.99
$\exp((D-60)/10)$	<i>M</i>	0.17	0.17	0.17
$303x_2$	<i>F</i>	1478.27	1185.83	2419.61
$1+(0.5/(1+M))$	t_D	1.43	1.43	1.43
$0.21t_D(1+0.2x_2)$	f_c	0.59	0.54	0.78

	Q_c = Circulating flow across entry (pcu/h)		Q_e = Entry Capacity $K(F-F_c \cdot Q_c)$		Q = Entry flow (pcu/h)		DFC	
	<u>AM</u>	<u>PM</u>	<u>AM</u>	<u>PM</u>	<u>AM</u>	<u>PM</u>	<u>AM</u>	<u>PM</u>
Arm A	50	(70)	1635	1621	140	(120)	0.09	0.07
Arm B	40	(170)	1297	1220	185	(170)	0.14	0.14
Arm C	0	(0)	0	0	0	(0)	0.00	0.00
Arm D	140	(115)	2574	2595	65	(75)	0.03	0.03

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Appendix 2

	<u>AM</u>	<u>PM</u>
Critical Arm:	Arm B	Arm B
Critical DFC:	0.14	0.14

Priority Junction Capacity Calculation

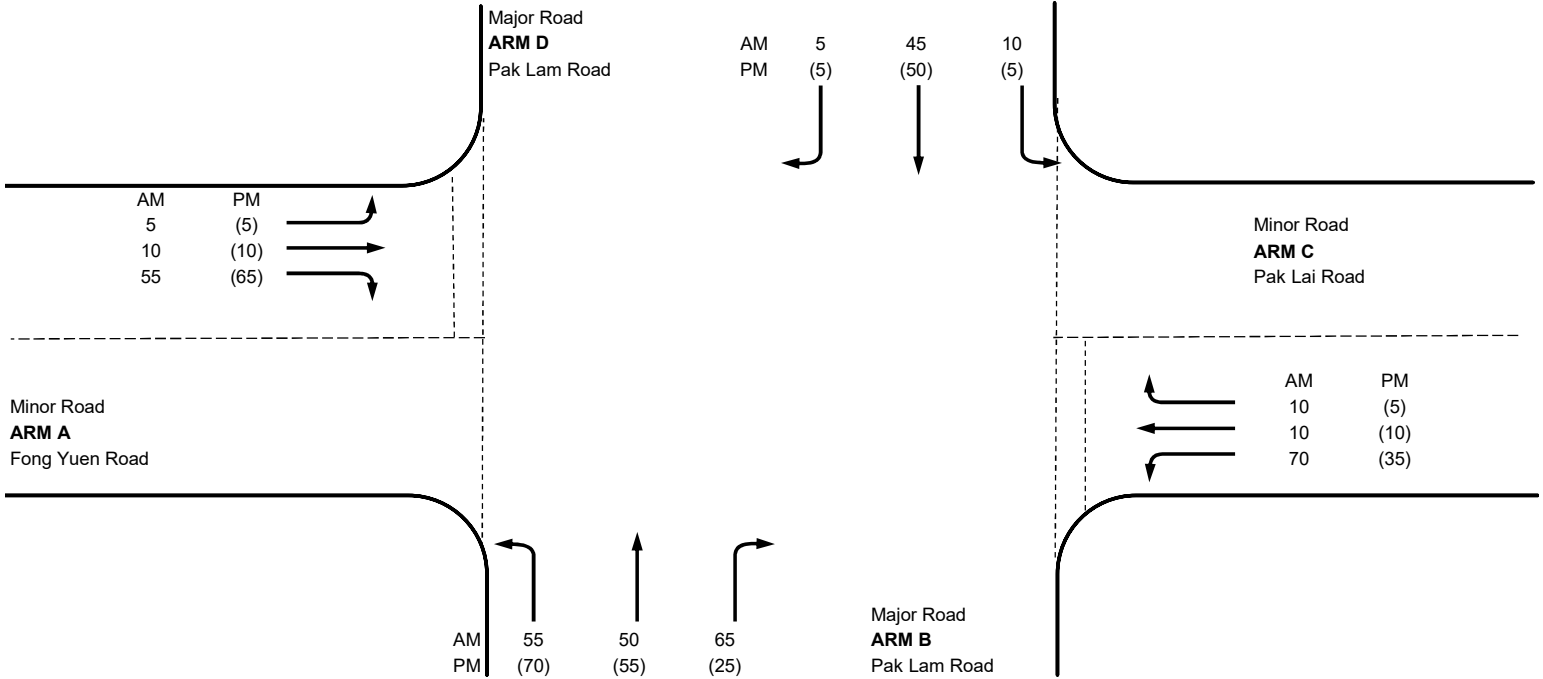
Junction : Fong Yuen Road / Pak Lam Road / Pak Lai Road

Junction No. : J2

Scenario : 2024 Design Case (Weekend)

Design Year : 2024

ARM A	Fong Yuen Road
ARM B	Pak Lam Road
ARM C	Pak Lai Road
ARM D	Pak Lam Road



GEOMETRY		Arm A		Arm C	
Major road width	W = 8.5 m	Lane widths	W _{A-B} = 2.2 m	Lane widths	W _{C-B} = 3.7 m
Central Reserve width	W _{cr} = 0 m		W _{A-D} = 2.9 m		W _{C-D} = 2.2 m
			W _{D-A} = 2.2 m		W _{B-C} = 3 m
Visibilities	V _{B-C} = 50 m	Visibilities	V _{right A} = 30 m	Visibilities	V _{right C} = 30 m
	V _{D-A} = 55 m		V _{left A} = 30 m		V _{left C} = 30 m
General Terms		X _A = 0.880	Y = 0.707	X _A = 0.813	Y = 0.707
		X _B = 0.737	Z _B = 0.854	X _B = 0.737	Z _B = 0.923
		X _C = 0.813	Z _D = 0.923	X _C = 0.880	Z _D = 0.854
		X _D = 0.737		X _D = 0.737	

ANALYSIS															
Arm A			Arm B				Arm C			Arm D					
			Left-turn?	1	Right-turn?	1				Left-turn?	1	Right-turn?	1		
Traffic	AM	PM		AM	PM	Traffic	AM	PM	Traffic	AM	PM		AM	PM	
Flows	q _{A-B} = 5	5		q _{B-A} = 65	25	Flows	10	10	Flows	q _{D-A} = 10	5		q _{D-B} = 45	50	
(pcu/hr)	q _{A-C} = 10	10		q _{B-C} = 55	70	(pcu/hr)	10	5	(pcu/hr)	q _{D-C} = 5	5		q _{D-C} = 5	5	
	q _{A-D} = 55	65		q _{B-D} = 50	55		70	35		M = 0.857					
				M = 0.793											
Capacities	μ _{A-D} = 634	644		μ _{B-A} = 434	434		586	583		μ _{D-A} = 679	682		μ _{D-B} = 507	412	
				μ _{B-C} = 634	634					μ _{D-C} = 411	508		μ _{D-C} = 411	508	
				μ _{B-D} = 470	474					μ _{D-AC} = 558	582				
				μ _{B-AC} = 507	565										
DFC	A-D	0.09	0.1	B-A	0.15	0.06		0.02	0.01	D-A	0.01	0.01	D-B	0.09	0.12
				B-C	0.09	0.11				D-C	0.01	0.01	D-AC	0.03	0.02
				B-D	0.11	0.12				D-ABC	0.12	0.14			
				B-AC	0.24	0.17									
				B-ACD	0.34	0.28									
DFC	0.09	0.1		0.34	0.28	DFC	0.02	0.01	DFC	0.12	0.14				



Critical DFC	AM	PM
	0.34	0.28

Priority Junction Capacity Calculation

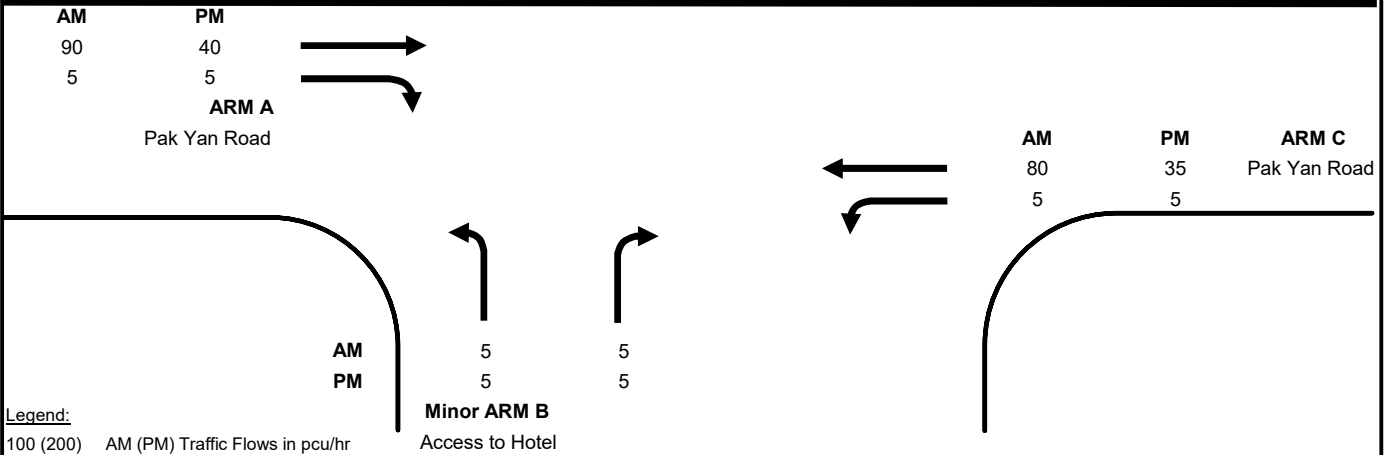


Junction: Pak Yan Road / Local Road (Access to Hotel)

Junction No.: J3

Scenario: 2024 Design Case (Weekend)

Design Year: 2024



GEOMETRY

Major road width	W	12.00 m	Lane widths	w(b-c)	2.30 m
Central Reserve width	W _{cr}	0.00 m		w(b-a)	2.30 m
2 Lane Minor Arm (Y/N)		N		w(a-b)	2.05 m
Visibilities	V _r (b-c)	100 m	Calculated	D	0.83
	V _l (b-c)	100 m		E	0.82
	V _r (b-a)	50 m		F	0.79
	V _r (a-b)	40 m		Y	0.59

ANALYSIS

		AM	PM
Traffic Flows	q(c-a)	90	40
	q(c-b)	5	5
	q(a-b)	5	5
	q(a-c)	80	35
	q(b-a)	5	5
	q(b-c)	5	5
	f	0.50	0.50
Capacities	Q(b-a)	496	509
	Q(b-c)	595	603
	Q(c-b)	573	581
	Q(b-ac)	541	552
Design Flow to Capacity (DFC)	b-a	0.01	0.01
	b-c	0.01	0.01
	c-b	0.01	0.01
	b-ac	0.02	0.02
Critical DFC		0.02	0.02

Where V_l and V_r are visibility distances to the left or right of the respective streams

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

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

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

$$Y = 1-0.0345W$$

f = proportion of minor traffic turning left

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

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Appendix 1

Priority Junction Capacity Calculation

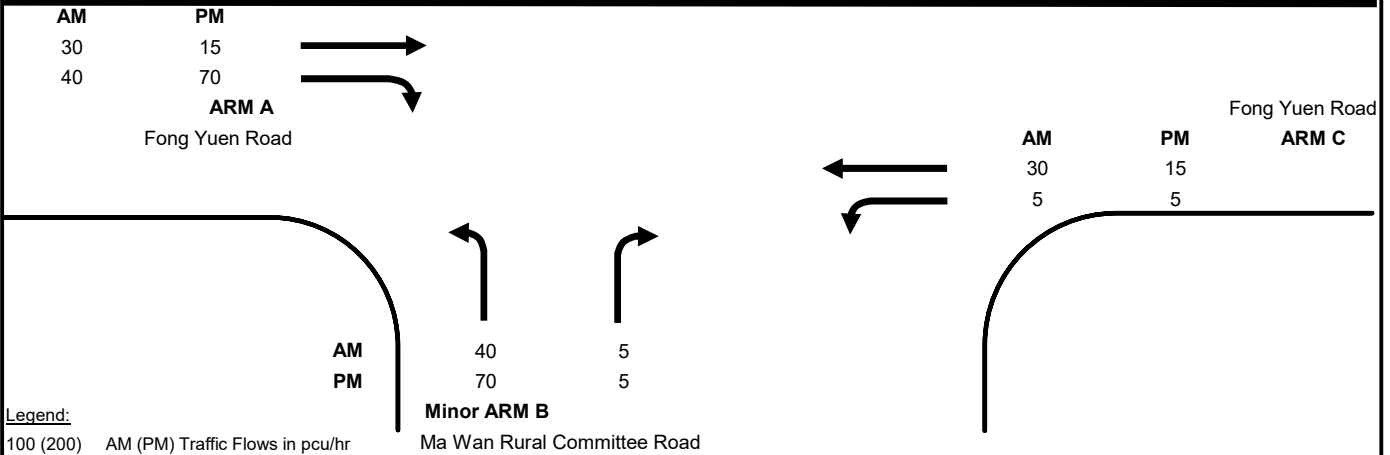


Junction: Fong Yuen Road / Ma Wan Rural Committee Road

Junction No.: J4

Scenario: 2024 Design Case (Weekend)

Design Year: 2024



GEOMETRY

Major road width	W	7.85 m	Lane widths	w(b-c)	2.05 m
Central Reserve width	Wcr	0.00 m		w(b-a)	2.81 m
2 Lane Minor Arm (Y/N)		Y		w(a-b)	3.60 m
Visibilities	Vr(b-c)	80 m	Calculated	D	0.78
	VI(b-c)	80 m		E	0.87
	Vr(b-a)	60 m		F	0.93
	Vr(a-b)	50 m		Y	0.73

ANALYSIS

		AM	PM
Traffic Flows	q(c-a)	30	15
	q(c-b)	40	70
	q(a-b)	5	5
	q(a-c)	30	15
	q(b-a)	5	5
	q(b-c)	40	70
	f	0.89	0.93
Capacities	Q(b-a)	469	466
	Q(b-c)	642	645
	Q(c-b)	686	690
	Q(b-ac)	616	629
Design Flow to Capacity (DFC)	b-a	0.01	0.01
	b-c	0.06	0.11
	c-b	0.06	0.10
	b-ac	0.00	0.00
Critical DFC	0.06	0.11	

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

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

TPDM Vol 2.4
Appendix 1

Roundabout Capacity Calculation

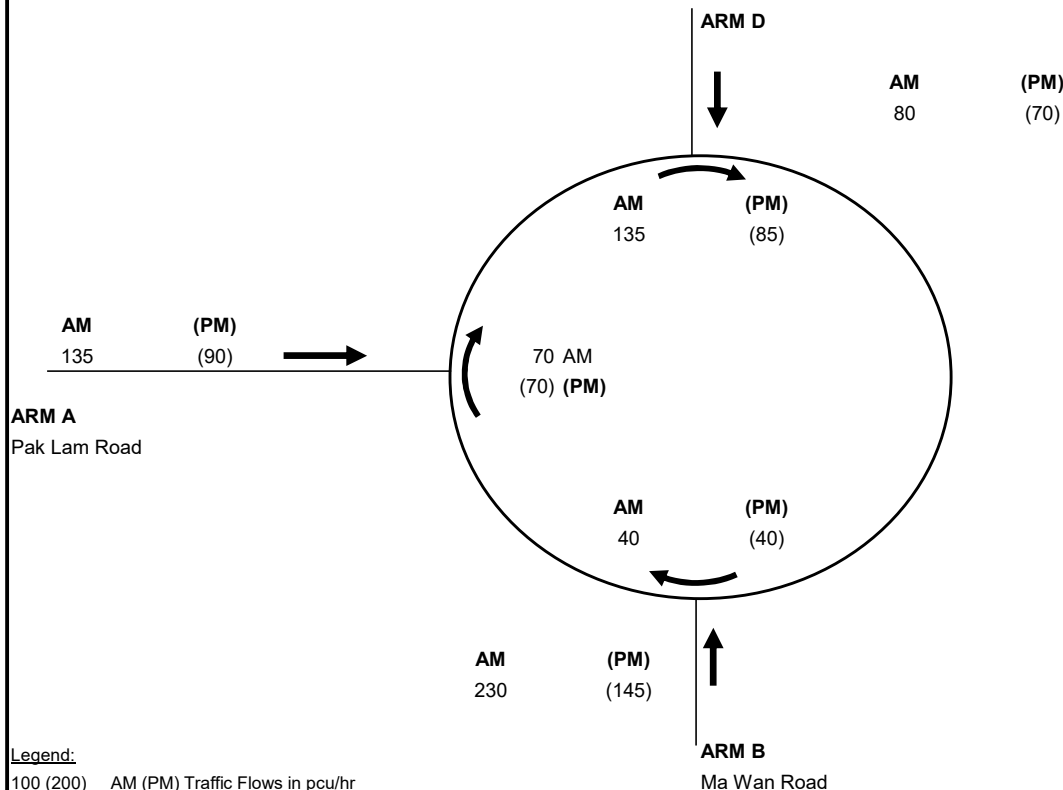


Junction: Pak Lam Road / Ma Wan Road

Junction No.: J1

Scenario: 2024 Design Case (Weekday)

Design Year: 2024



Legend:

100 (200) AM (PM) Traffic Flows in pcu/hr

GEOMETRY		<i>Arm A</i>	<i>Arm B</i>	<i>Arm D</i>
Approach half width (m)	<i>v</i>	4.5	3.0	4.0
Entry width (m)	<i>e</i>	5.0	5.2	15.0
Effective length of flare (m)	<i>L</i>	5.0	5.0	20.0
Entry radius (m)	<i>r</i>	40	25	25
Inscribed circle diameter (m)	<i>D</i>	42	42	42
Entry angle (degree)	φ			

CALCULATION

Sharpness of flare = $1.6(E-V)/L$	<i>S</i>	0.16	0.70	0.88
$1-0.00347(A-30)-0.978(1/R-0.05)$	<i>K</i>	1.13	1.11	1.11
$V + ((E-V)/(1+2S))$	<i>x₂</i>	4.88	3.91	7.99
$\exp((D-60)/10)$	<i>M</i>	0.17	0.17	0.17
$303x_2$	<i>F</i>	1478.27	1185.83	2419.61
$1+(0.5/(1+M))$	<i>t_D</i>	1.43	1.43	1.43
$0.21t_D(1+0.2x_2)$	<i>f_c</i>	0.59	0.54	0.78

FLOWS & DFC

	Q _c = Circulating flow across entry (pcu/h)		Q _e = Entry Capacity K(F-F _c *Q _c)		Q = Entry flow (pcu/h)		DFC	
	AM	PM	AM	PM	AM	PM	AM	PM
Arm A	70	(70)	1621	1621	135	(90)	0.08	0.06
Arm B	40	(145)	1297	1234	230	(145)	0.18	0.12
Arm C	0	(0)	0	0	0	(0)	0.00	0.00
Arm D	135	(85)	2578	2621	80	(70)	0.03	0.03

TPDM Vol 2.4
Appendix 2

Critical Arm:	AM	PM
Critical DFC:	0.18	0.12

Priority Junction Capacity Calculation

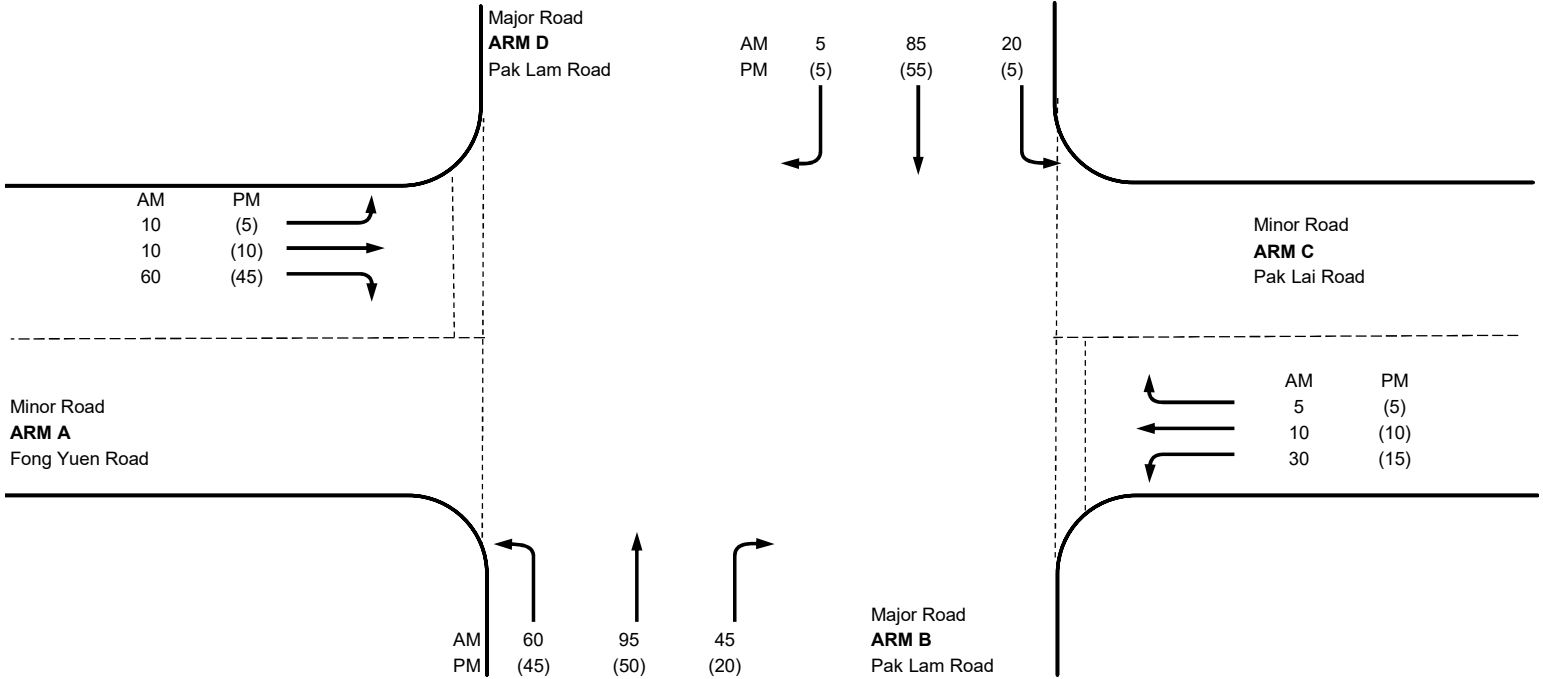
Junction : Fong Yuen Road / Pak Lam Road / Pak Lai Road

Junction No. : J2

Scenario : 2024 Design Case (Weekday)

Design Year : 2024

ARM A	Fong Yuen Road
ARM B	Pak Lam Road
ARM C	Pak Lai Road
ARM D	Pak Lam Road



GEOMETRY		Arm A				Arm C			
Major road width	W = 8.5 m	Lane widths		W _{A-B} = 2.2 m	Lane widths		W _{C-B} = 3.7 m		
Central Reserve width	W _{cr} = 0 m			W _{A-D} = 2.9 m			W _{C-D} = 2.2 m		
				W _{D-A} = 2.2 m			W _{B-C} = 3 m		
Visibilities	V _{B-C} = 50 m	Visibilities		V _{right A} = 30 m	Visibilities		V _{right C} = 30 m		
	V _{D-A} = 55 m			V _{left A} = 30 m			V _{left C} = 30 m		
General Terms		X _A = 0.880		Y = 0.707		X _A = 0.813		Y = 0.707	
		X _B = 0.737		Z _B = 0.854		X _B = 0.737		Z _B = 0.923	
		X _C = 0.813		Z _D = 0.923		X _C = 0.880		Z _D = 0.854	
		X _D = 0.737				X _D = 0.737			

ANALYSIS																																	
Arm A				Arm B				Arm C				Arm D																					
				Left-turn?	1	Right-turn?	1					Left-turn?	1	Right-turn?	1																		
Traffic	q _{A-B} = 10	q _{A-C} = 10	q _{A-D} = 60		q _{B-A} = 45	q _{B-C} = 60	q _{B-D} = 95	M = 0.793	Traffic	10	5	30		q _{D-A} = 20	q _{D-B} = 85	q _{D-C} = 5	M = 0.857																
Flows (pcu/hr)	AM	PM		AM	PM				AM	PM		AM	PM																				
Capacities	μ _{A-D} = 645	648		μ _{B-A} = 425	437	μ _{B-C} = 633	634	μ _{B-D} = 475	481	μ _{B-AC} = 523	557	584	589	μ _{D-A} = 683	684	μ _{D-B} = 510	425	μ _{D-C} = 406	516	μ _{D-AC} = 601	588												
DFC	A-D	0.09	0.07	B-A	0.11	0.05	B-C	0.09	0.07	B-D	0.2	0.1	B-AC	0.20	0.12	B-ACD	0.4	0.22	D-A	0.03	0.01	D-B	0.17	0.13	D-C	0.01	0.01	D-AC	0.04	0.02	D-ABC	0.21	0.15
DFC	0.09	0.07																															



Critical DFC	AM	PM
	0.40	0.22

Priority Junction Capacity Calculation

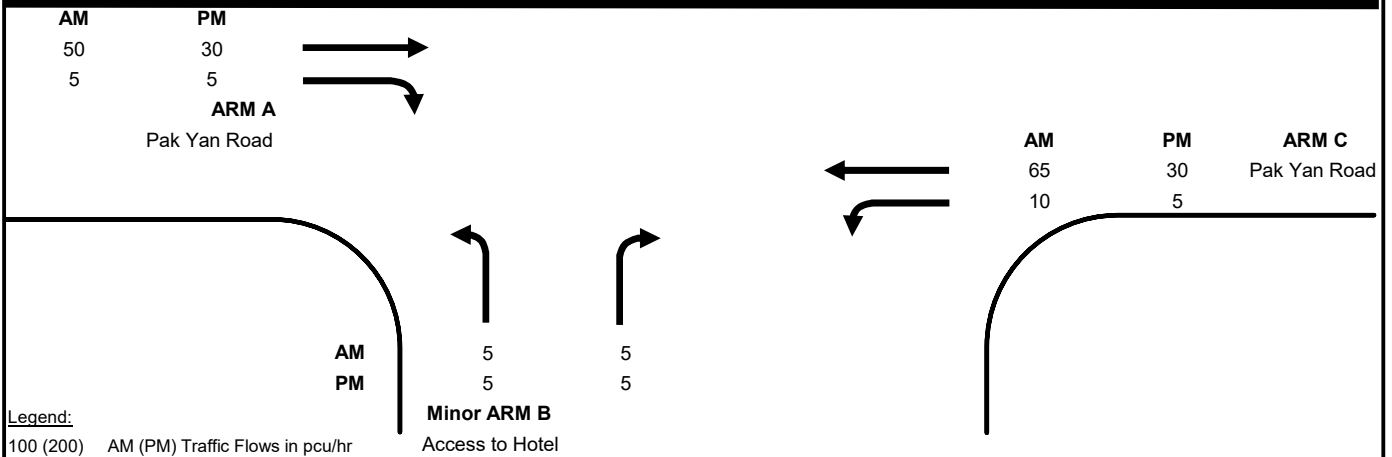


Junction: Pak Yan Road / Local Road (Access to Hotel)

Junction No.: J3

Scenario: 2024 Design Case (Weekday)

Design Year: 2024



GEOMETRY

Major road width	W	12.00 m	Lane widths	w(b-c)	2.30 m
Central Reserve width	W _{cr}	0.00 m		w(b-a)	2.30 m
2 Lane Minor Arm (Y/N)		N		w(a-b)	2.05 m
Visibilities	V _r (b-c)	100 m	Calculated	D	0.83
	V _l (b-c)	100 m		E	0.82
	V _r (b-a)	50 m		F	0.79
	V _r (a-b)	40 m		Y	0.59

ANALYSIS

		AM	PM
Traffic Flows	q(c-a)	50	30
	q(c-b)	5	5
	q(a-b)	10	5
	q(a-c)	65	30
	q(b-a)	5	5
	q(b-c)	5	5
	f	0.50	0.50
Capacities	Q(b-a)	502	511
	Q(b-c)	597	604
	Q(c-b)	575	581
	Q(b-ac)	546	554
Design Flow to Capacity (DFC)	b-a	0.01	0.01
	b-c	0.01	0.01
	c-b	0.01	0.01
	b-ac	0.02	0.02
Critical DFC		0.02	0.02

Where V_l and V_r are visibility distances to the left or right of the respective streams

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

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

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

$$Y = 1-0.0345W$$

f = proportion of minor traffic turning left

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

Priority Junction Capacity Calculation

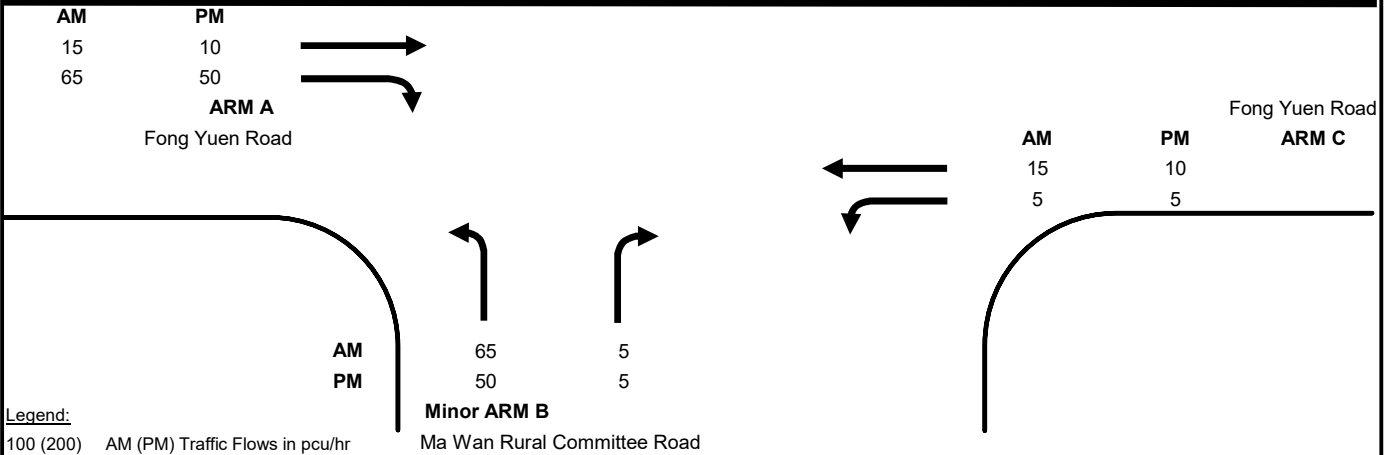


Junction: Fong Yuen Road / Ma Wan Rural Committee Road

Junction No.: J4

Scenario: 2024 Design Case (Weekday)

Design Year: 2024



Legend:

100 (200) AM (PM) Traffic Flows in pcu/hr

Minor ARM B

Ma Wan Rural Committee Road

GEOMETRY

Major road width	W	7.85 m	Lane widths	w(b-c)	2.05 m
Central Reserve width	W _{cr}	0.00 m		w(b-a)	2.81 m
2 Lane Minor Arm (Y/N)		Y		w(a-b)	3.60 m
Visibilities	V _r (b-c)	80 m	Calculated	D	0.78
	V _l (b-c)	80 m		E	0.87
	V _r (b-a)	60 m		F	0.93
	V _r (a-b)	50 m		Y	0.73

ANALYSIS

		AM	PM
Traffic Flows	q(c-a)	15	10
	q(c-b)	65	50
	q(a-b)	5	5
	q(a-c)	15	10
	q(b-a)	5	5
	q(b-c)	65	50
	f	0.93	0.91
Capacities	Q(b-a)	467	473
	Q(b-c)	645	646
	Q(c-b)	690	691
	Q(b-ac)	628	626
Design Flow to Capacity (DFC)	b-a	0.01	0.01
	b-c	0.10	0.08
	c-b	0.09	0.07
	b-ac	0.00	0.00
Critical DFC	0.10	0.08	

Where V_l and V_r are visibility distances to the left or right of the respective streams

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

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

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

$$Y = 1-0.0345W$$

f = proportion of minor traffic turning left

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

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Appendix 1