

Annex 5

Replacement Pages of Traffic Impact Assessment



2. THE PROPOSED DEVELOPMENT

2.1 Site Location

2.1.1 The proposed development is located at Nos. 200-210 Lai King Hill Road as shown in **Figure 1.1**. The site is the existing three 4-storey main blocks and it is proposed to redevelop into two 7-storey buildings (excluding LG/F).

2.2 Proposed Development

2.1.2 The development schedule for the proposed development is summarized in **Table 2.1**.

Table 2.1 Development Parameters of the Proposed Development

Type of Facilities	Existing Capacity	Proposed Capacity upon Redevelopment
Day Activity Centre (“DAC”) Additional Extended Care Programme (“ECP”)	100 ⁽¹⁾ 20	178 ⁽²⁾ 20
Hostel for Severely Mentally Handicapped Persons “HSMH” • Residential Respite Service (“RSS”)	100 2 ⁽³⁾	178 2 ⁽⁴⁾
Integrated Vocational Rehabilitation Services Centre (“IVRSC”)	0	120
Hostel for Moderately Mentally Handicapped Persons “HMMH”)	0	80
Care & Attention Home for Severely Disabled Persons (“C&A/SD”)	0	70

Note:

(1) Includes 20 places of converted ECP.

(2) **Includes reprovisioning of 100 places of DAC (including 20 places of converted ECP).**

(3) Refers to 2 places (casual vacancies) of RRS.

(4) Refers to 2 places (designated places) of RRS.

2.2.1 It is anticipated that the proposed development will be completed by 2029 tentatively. Therefore, design year 2032 (i.e. 3 years after the planned commencement year of the proposed development) is adopted for the Traffic Impact Assessment.



Table 3.2 Operational Performance of Identified Critical Junctions in 2023

Ref.	Junction	Method of Control	Year 2023 RC/DFC ⁽¹⁾	
			AM Peak	PM Peak
A1-1	Lai King Hill Road / Joint Street	Priority	0.34	0.38
A1-2	Lai King Hill Road / Bus Terminal Exit	Priority	0.06	0.10
A2	Joint Street / Lai Cho Road	Priority	0.45	0.35
B	Lai King Hill Road / King Cho Road (Near Lai King Estate)	Priority	0.67	0.72
C	Lai King Hill Road / King Cho Road (Near Lai King Ventilation Building)	Priority	0.58	0.41
D	Lai King Hill Road / Kwai Chung Hospital Road	Priority	0.54	0.30
E	Lai King Hill Road / Kwai Chung Interchange	Signal	43%	63%
F	Kwai Fuk Road / Kwai Yi Road / Container Port Road	Roundabout	0.58	0.56

Notes: (1) RC = Reserve Capacity
DFC = Design Flow/Capacity ratio for Priority Junction

3.1.5 The assessment results in **Table 3.2** indicate that all critical junctions are at present operating within their capacities during peak hours.

Table 3.3 Volume to Capacity (V/C) Ratio Assessment of Identified Road Links in 2023

Road Link	Direction	Capacity (pcu/hr) ₍₁₎₍₂₎	Year 2023 Observed Traffic Flow			
			AM Peak Hour		PM Peak Hour	
			Flow (pcu/hr)	V/C	Flow (pcu/hr)	V/C
Lai King Hill Road (Between Joint Street and King Cho Road)	Northeast bound	1,450	540	0.37	490	0.34
	Southwest bound	1,450	610	0.42	550	0.38
Lai King Hill Road (Between King Cho Road near OUHK - Cita Lai King Learning Centre and Proposed Site)	Northeast bound	1,450	460	0.32	370	0.26
	Southwest bound	1,450	610	0.42	560	0.39
Lai King Hill Road (Between Proposed Site and King Cho Road near Cho Yiu Chuen)	Northeast bound	1,450	460	0.32	390	0.27
	Southwest bound	1,450	650	0.45	580	0.40
Lai King Hill Road (Between King Cho Road near Cho Yiu Chuen and Kwai Chung Hospital Road)	Northeast bound	1,450	570	0.39	560	0.39
	Southwest bound	1,450	810	0.56	670	0.46
Lai King Hill Road	Northeast	1,450	710	0.49	540	0.37



5. TRAFFIC IMPACT ASSESSMENT

5.1 Operational Assessment

5.1.1 To assess the potential traffic impact due to the proposed development, capacity analysis of the identified critical junctions and road links for both reference and design scenarios in year 2032 were carried out. The results are summarized in **Table 5.1**, **Table 5.3**, **Table 5.4** and the junction calculation sheets are attached in **Appendix A**.

**Table 5.1 Junction Performance of Identified Critical Junction in Year 2032
(With and Without Proposed Site)**

Ref.	Junction	Method of Control		Year 2032 RC/DFC ⁽¹⁾			
				Reference Scenario (Without Proposed Site)		Design Scenario (With Proposed Site)	
				AM Peak	PM Peak	AM Peak	PM Peak
A1-1	Lai King Hill Road / Joint Street	Priority	With A/KC/489	0.59	0.47	0.60	0.48
A1-2	Lai King Hill Road / Bus Terminal Exit	Priority	With A/KC/489	0.07	0.10	0.07	0.10
A2	Joint Street / Lai Cho Road	Priority	With A/KC/489	0.54	0.40	0.54	0.40
B	Lai King Hill Road / King Cho Road (Near Lai King Estate)	Priority	With A/KC/489	0.82	0.79	0.82	0.80
			Without A/KC/489	0.79	0.78	0.80	0.79
C	Lai King Hill Road / King Cho Road (Near Lai King Ventilation Building)	Priority	With A/KC/489	0.77	0.48	0.78	0.49
D	Lai King Hill Road / Kwai Chung Hospital Road	Priority	With A/KC/489	0.74	0.33	0.75	0.37
E	Lai King Hill Road / Kwai Chung Interchange (Without improvement)	Signal	With A/KC/489	0%	25%	-1%	23%
			Without A/KC/489	37%	58%	35%	56%
F	Kwai Fuk Road / Kwai Yi Road / Container Port Road	Roundabout	With A/KC/489	0.73	0.62	0.73	0.63

Notes: (1) RC = Reserve Capacity
DFC = Design Flow/Capacity ratio for Priority Junction



5.1.2 The assessment results in **Table 5.1** revealed that all critical junctions would still operate within their capacities in both reference and design year 2032 during the peak hours, except Junction Lai King Hill Road / Kwai Chung Interchange (E).

5.1.3 Without junction modification, it is anticipated that Junction E will have negative reserve capacity during AM peak hour in Year 2032 without and with the proposed development. According to approved TIA report of A/KC/489, junction modification work is intended to be carried out before year 2028, i.e. before the completion of the proposed development in year 2029. Capacity analysis of Junction E with junction modification was carried out for both reference and design scenarios. The results are summarized in **Table 5.2** and the junction calculation sheets are also attached in **Appendix A**.

**Table 5.2 Junction Performance of Modified Junction E in Year 2032
(With and Without Proposed Site)**

Ref.	Junction	Method of Control	Year 2032 RC/DFC ⁽¹⁾			
			Reference Scenario (Without Proposed Site)		Design Scenario (With Proposed Site)	
			AM Peak	PM Peak	AM Peak	PM Peak
E	Lai King Hill Road / Kwai Chung Interchange (With Junction Modification)	Signal	16%	46%	15%	45%

Notes: (1) RC = Reserve Capacity
DFC = Design Flow/Capacity ratio for Priority Junction

5.1.4 The assessment results in **Table 5.2** revealed that Junction E would operate within its capacities during the peak hours in both reference and design year with junction modification.



7. SUMMARY AND CONCLUSION

7.1 Summary

7.1.1 CTA Consultants Limited (CTA) is commissioned as the traffic consultant to prepare the Traffic Impact Assessment (TIA) and provide technical justifications in supporting the planning application from traffic engineering point of view.

7.1.2 To appraise the existing traffic condition, manual-classified counting surveys were conducted at critical junctions in 2023. Current operational performance of the critical junctions has been assessed. The results reveal that all critical junctions are at present operating within its capacities.

7.1.3 Assessment of operational performance of the critical junctions revealed that all critical junctions would still operate within their capacities in both reference scenario (without proposed development) and design scenario (with proposed development) in 2032 during the peak hours, except Junction Lai King Hill Road / Kwai Chung Interchange (E).

7.1.4 Without junction modification, it is anticipated that Junction E will have negative reserve capacity during AM peak hour in Year 2032 without and with the proposed development. According to approved TIA report of A/KC/489, junction modification work is intended to be carried out before year 2028, i.e. before the completion of the proposed development in year 2029. The assessment results revealed that Junction E would operate within its capacities during the peak hours in both reference and design year with junction modification.

7.2 Conclusion

7.2.1 In conclusion, this TIA has demonstrated that the related traffic trips related to the proposed development can be absorbed by the nearby road network and no insurmountable traffic impact will be induced.

7.2.2 Therefore, the proposed development is considered feasible from traffic engineering point of view.



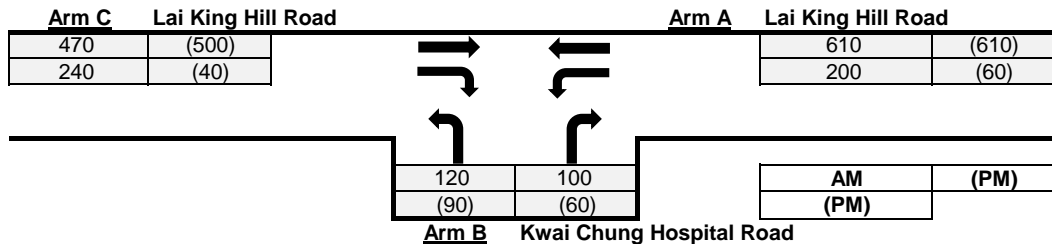
APPENDIX A

JUNCTION CALCULATION SHEETS

Priority Junction Calculation

Junction : Lai King Hill Road / Kwai Chung Hospital Road(Jn D) Job No.: 21149HK

Scenario : 2023 Observed Traffic Flows



The predictive equations of capacity of movement are:

$$Q-BA = D(627 + 14W-CR - Y(0.364q-AC + 0.144q-AB + 0.229q-CA + 0.52q-CB))$$

$$Q-BC = E(745 - Y(0.364q-AC + 0.144q-AB))$$

$$Q-CB = F(745 - 0.364Y(q-AC + q-AB))$$

The geometric parameters represented by D, E, F are:

$$D = (1 + 0.094(w-BA - 3.65))(1 + 0.0009(V-rBA - 120))(1 + 0.0006(V-IBA - 150))$$

$$E = (1 + 0.094(w-BC - 3.65))(1 + 0.0009(V-rBC - 120))$$

$$F = (1 + 0.094(w-CB - 3.65))(1 + 0.0009(V-rCB - 120))$$

where

$$Y = 1 - 0.0345W$$

q-AB, etc = the design flow of movement AB, etc

W = major road width

W-CR = central reserve width

w-BA, etc = lane width to vehicle

v-rBA, etc = visibility to the right for waiting vehicles in stream BA, etc

v-IBA = visibility to the left for waiting vehicles in stream BA, etc

Geometry :	Input				Calculated			
	W	10	V-rBA	50	w-BA	5	D	0.993
	W-CR	0	V-IBA	50	w-BC	5	E	1.056
C-B blocked C-A, residual width <2.5m? (Yes: 1, No: 0)		0	V-rBC	50	w-CB	2.1	F	0.800
Minor Road Share LT&RT? (Yes: 1, No: 0)		1	V-rCB	50			Y	0.655

Analysis :	Traffic Flow	AM	PM	Capacity	AM	PM	
	pcu/hr			pcu/hr			
	q-CA	470	500	Q-BA	308	384	
	q-CB	240	40	Q-BC	613	627	
	q-AB	200	60	Q-CB	442	468	
	q-AC	610	610	Q-CA	N/A	N/A	(If C-B blocked C-A)
	q-BA	100	60	Q-BAC	423	501	(If Minor Road Share LT&RT)
	q-BC	120	90				
	f	0.545	0.600				

Results :	Ratio of Flow-to-Capacity	AM	PM
	B-A	N/A	N/A
	B-C	N/A	N/A
	C-B	0.54	0.09
	C-A	N/A	N/A
	B-AC	0.52	0.30

Critical DFC

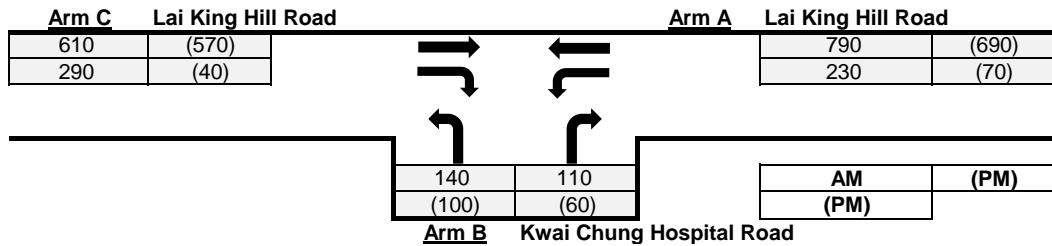
0.54

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Priority Junction Calculation

Junction : Lai King Hill Road / Kwai Chung Hospital Road(Jn D) Job No.: 21149HK

Scenario : 2032 Reference Traffic Flows



The predictive equations of capacity of movement are:

$$Q-BA = D(627 + 14W-CR - Y(0.364q-AC + 0.144q-AB + 0.229q-CA + 0.52q-CB))$$

$$Q-BC = E(745 - Y(0.364q-AC + 0.144q-AB))$$

$$Q-CB = F(745 - 0.364Y(q-AC + q-AB))$$

The geometric parameters represented by D, E, F are:

$$D = (1 + 0.094(w-BA - 3.65))(1 + 0.0009(V-rBA - 120))(1 + 0.0006(V-IBA - 150))$$

$$E = (1 + 0.094(w-BC - 3.65))(1 + 0.0009(V-rBC - 120))$$

$$F = (1 + 0.094(w-CB - 3.65))(1 + 0.0009(V-rCB - 120))$$

where

$$Y = 1 - 0.0345W$$

q-AB, etc = the design flow of movement AB, etc

W = major road width

W-CR = central reserve width

w-BA, etc = lane width to vehicle

v-rBA, etc = visibility to the right for waiting vehicles in stream BA, etc

v-IBA = visibility to the left for waiting vehicles in stream BA, etc

Geometry :	Input				Calculated			
	W	10	V-rBA	50	w-BA	5	D	0.993
	W-CR	0	V-IBA	50	w-BC	5	E	1.056
C-B blocked C-A, residual width <2.5m? (Yes: 1, No: 0)		0	V-rBC	50	w-CB	2.1	F	0.800
Minor Road Share LT&RT? (Yes: 1, No: 0)		1	V-rCB	50			Y	0.655

Analysis :	Traffic Flow	AM	PM	Capacity	AM	PM	
	pcu/hr			pcu/hr			
	q-CA	610	570	Q-BA	225	354	
	q-CB	290	40	Q-BC	565	606	
	q-AB	230	70	Q-CB	402	451	
	q-AC	790	690	Q-CA	N/A	N/A	(If C-B blocked C-A)
	q-BA	110	60	Q-BAC	339	478	(If Minor Road Share LT&RT)
	q-BC	140	100				
	f	0.560	0.625				

Results :	Ratio of Flow-to-Capacity	AM	PM
	B-A	N/A	N/A
	B-C	N/A	N/A
	C-B	0.72	0.09
	C-A	N/A	N/A
	B-AC	0.74	0.33

Critical DFC

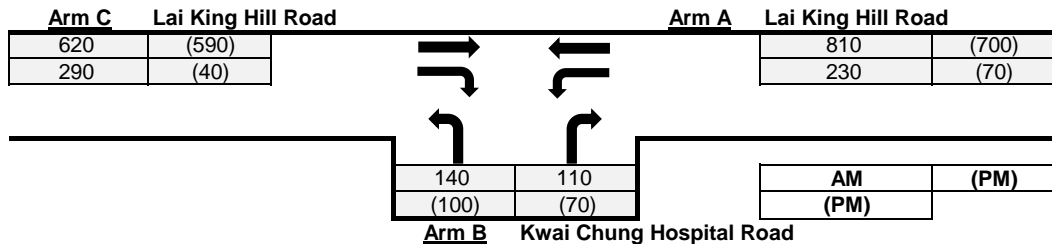
0.74

0.33

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Priority Junction Calculation

Junction : Lai King Hill Road / Kwai Chung Hospital Road(Jn D) Job No.: 21149HK
 Scenario : 2032 Design Traffic Flows



The predictive equations of capacity of movement are:

$$Q-BA = D(627 + 14W-CR - Y(0.364q-AC + 0.144q-AB + 0.229q-CA + 0.52q-CB))$$

$$Q-BC = E(745 - Y(0.364q-AC + 0.144q-AB))$$

$$Q-CB = F(745 - 0.364Y(q-AC + q-AB))$$

The geometric parameters represented by D, E, F are:

$$D = (1 + 0.094(w-BA - 3.65))(1 + 0.0009(V-rBA - 120))(1 + 0.0006(V-IBA - 150))$$

$$E = (1 + 0.094(w-BC - 3.65))(1 + 0.0009(V-rBC - 120))$$

$$F = (1 + 0.094(w-CB - 3.65))(1 + 0.0009(V-rCB - 120))$$

where

- Y = 1 - 0.0345W
- q-AB, etc = the design flow of movement AB, etc
- W = major road width
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- v-IBA = visibility to the left for waiting vehicles in stream BA, etc

Geometry :	Input				Calculated		
	W	10	V-rBA	50	w-BA	D	0.993
	W-CR	0	V-IBA	50	w-BC	E	1.056
C-B blocked C-A, residual width <2.5m? (Yes: 1, No: 0)		0	V-rBC	50	w-CB	F	0.800
Minor Road Share LT&RT? (Yes: 1, No: 0)		1	V-rCB	50		Y	0.655

Analysis :	Traffic Flow	AM	PM	Capacity	AM	PM	
	pcu/hr			pcu/hr			
	q-CA	620	590	Q-BA	219	349	
	q-CB	290	40	Q-BC	560	603	
	q-AB	230	70	Q-CB	398	449	
	q-AC	810	700	Q-CA	N/A	N/A	(If C-B blocked C-A)
	q-BA	110	70	Q-BAC	332	464	(If Minor Road Share LT&RT)
	q-BC	140	100				
	f	0.560	0.588				

Results :	Ratio of Flow-to-Capacity	AM	PM
	B-A	N/A	N/A
	B-C	N/A	N/A
	C-B	0.73	0.09
	C-A	N/A	N/A
	B-AC	0.75	0.37

Critical DFC **0.75** **0.37**