

Attachment V

Justification Note of Traffic Impact on Junction J1: Kwong Fuk Road / Nam Wan Road / Tai Po Road – Yuen Chau Tsai and Proposed Junction Improvement Measure

Planning Application No.: Y/TP/42

Justification of Traffic impact on Junction J1: Kwong Fuk Road / Nam Wan Road / Tai Po Road – Yuen Chau Tsai and Proposed Junction Improvement Measure

1 Background and Objectives

1.1 Background

- 1.1.1 **Junction J1:** *Kwong Fuk Road / Nam Wan Road / Tai Po Road – Yuen Chau Tsai* is one of the key junctions in the vicinity of the Proposed Development. According to the Traffic Impact Assessment (TIA) report for the subject application, the junction exhibits constrained capacity during peak periods in the 2033 design year due to cumulative background traffic demand.

1.2 Objectives

- 1.2.1 The objective of this paper is to demonstrate that the traffic impact of the Proposed Development on J1 would be minimal, and that the junction could accommodate the Proposed Development without adverse traffic impacts.
- 1.2.2 This paper also elaborates on the proposed junction improvement measure identified in the TIA and explains its operational benefits.

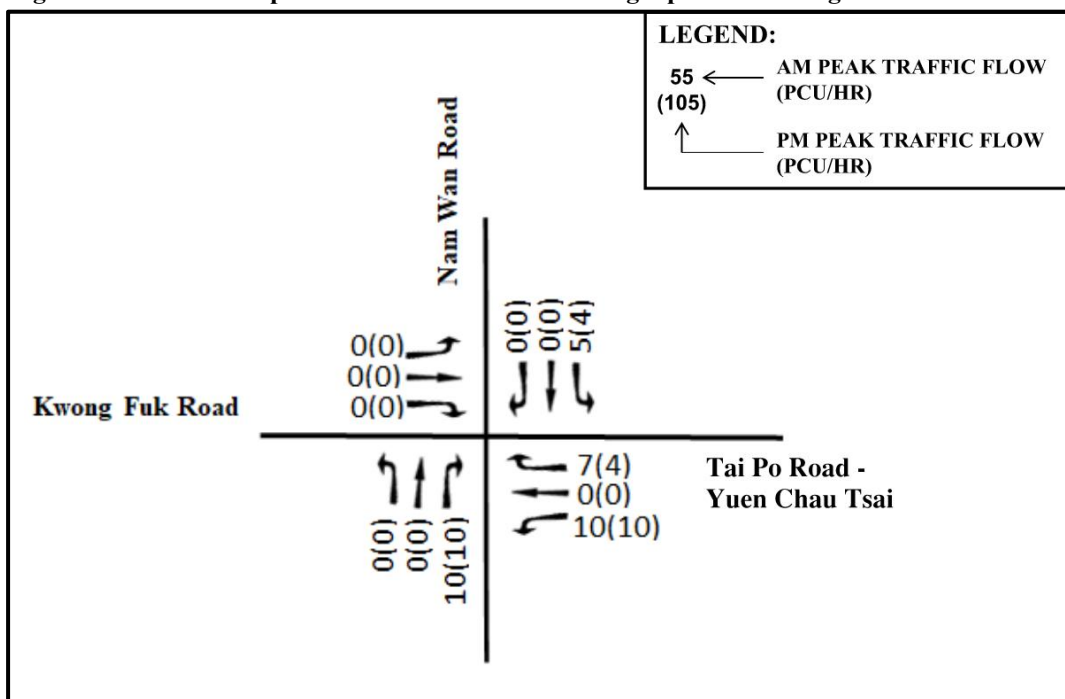
2 Traffic Impact on the Junction

2.1 Minimal Traffic Load to the Junction

2.1.1 Under the current application, the traffic contribution from the Proposed Development to J1 is minimal when compared with the background traffic flow. The additional traffic generated and attracted by the Proposed Development to J1 is limited to 32 pcu/hr (AM Peak) and 28 pcu/hr (PM Peak), representing less than **0.8%** of the total junction flow under the Year 2033 Design Scenario. This additional traffic load is therefore considered negligible.

2.1.2 For reference, the net development traffic flows at J1 during the operational stage are illustrated in **Figure 1**.

Figure 1 Net Development Traffic Flow at J1 During Operational Stage



2.1.3 The limited assignment of development-related traffic to J1 during peak periods is mainly due to the availability of Tolo Highway, which serves as the most direct strategic route for regional movements. As a result, the majority of trips associated with the Proposed Development are expected to bypass J1, further minimising its traffic impact.

2.2 Junction Capacity Assessment

2.2.1 Junction capacity assessment was carried out for J1 under the Year 2033 Reference and Design Scenarios. The relevant results extracted from the TIA are summarised in **Table 1**, and the detailed junction calculation sheets are enclosed in **Appendix A**.

Table 1 Year 2033 Future Junction Performance

Junction		Type	Reserve Capacity (RC) Performance			
			2033 Reference		2033 Design	
			AM	PM	AM	PM
J1	Kwong Fuk Road / Nam Wan Road / Tai Po Road – Yuen Chau Tsai	Signalized	-6%	5%	-6%	5%

2.2.2 As shown in **Table 1**, the reserve capacity (RC) values remain essentially unchanged between the Reference and Design Scenarios, indicating that the Proposed Development does not materially affect junction capacity. The negative RC observed during the AM peak represents an underlying condition arising from background traffic growth and cumulative traffic from other planned developments, rather than traffic generated by the Proposed Development.

2.3 Queue Length Assessment

2.3.1 Queue Length Assessment was carried out to determine whether the vehicle queues at J1 would extend to adjacent junctions or critical access points.

2.3.2 The anticipated queue lengths under the Year 2033 Reference and Design Scenarios based on the calculation sheets are presented in **Figures 2** and **3** below.

Figure 2 Anticipated Queue Lengths for J1 under Year 2033 Reference Scenario

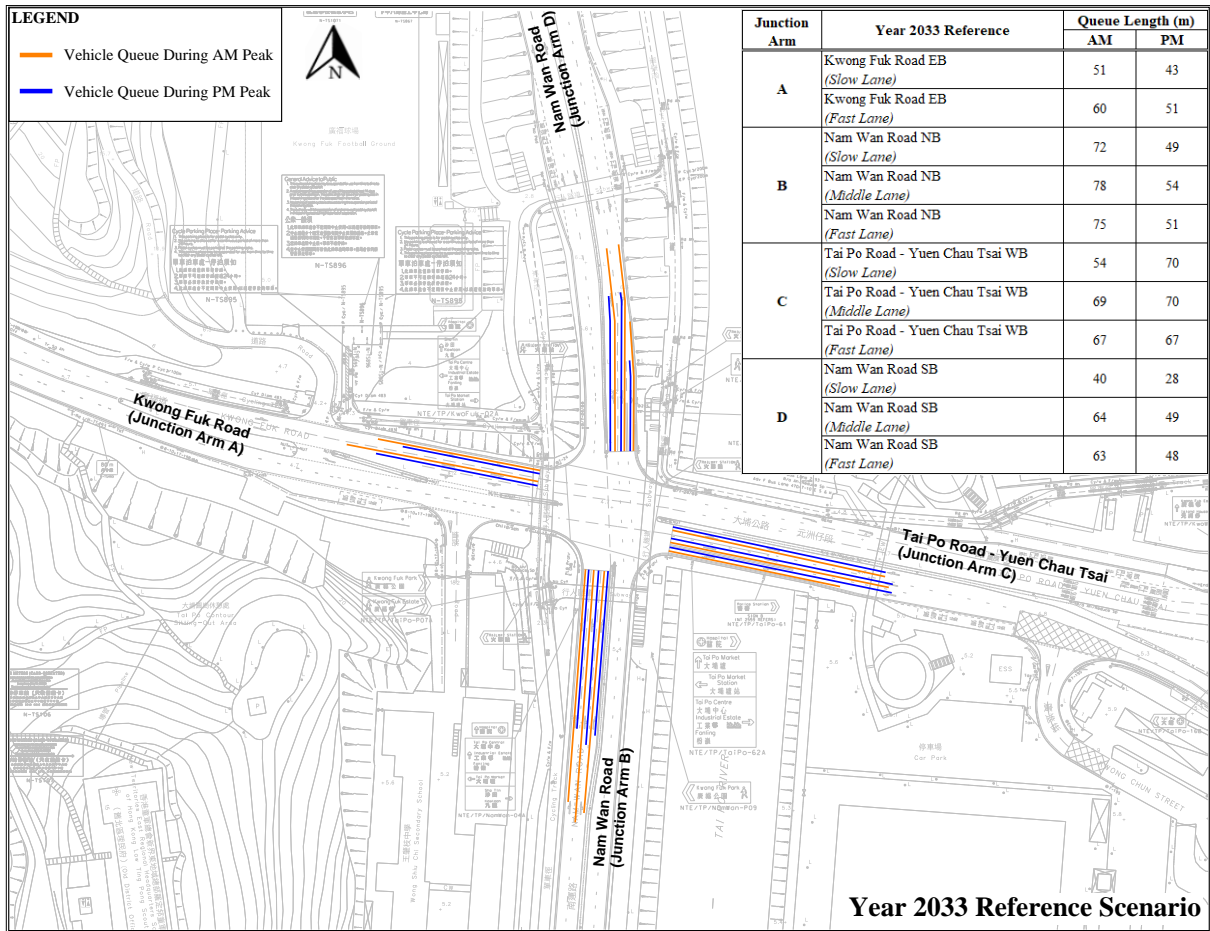
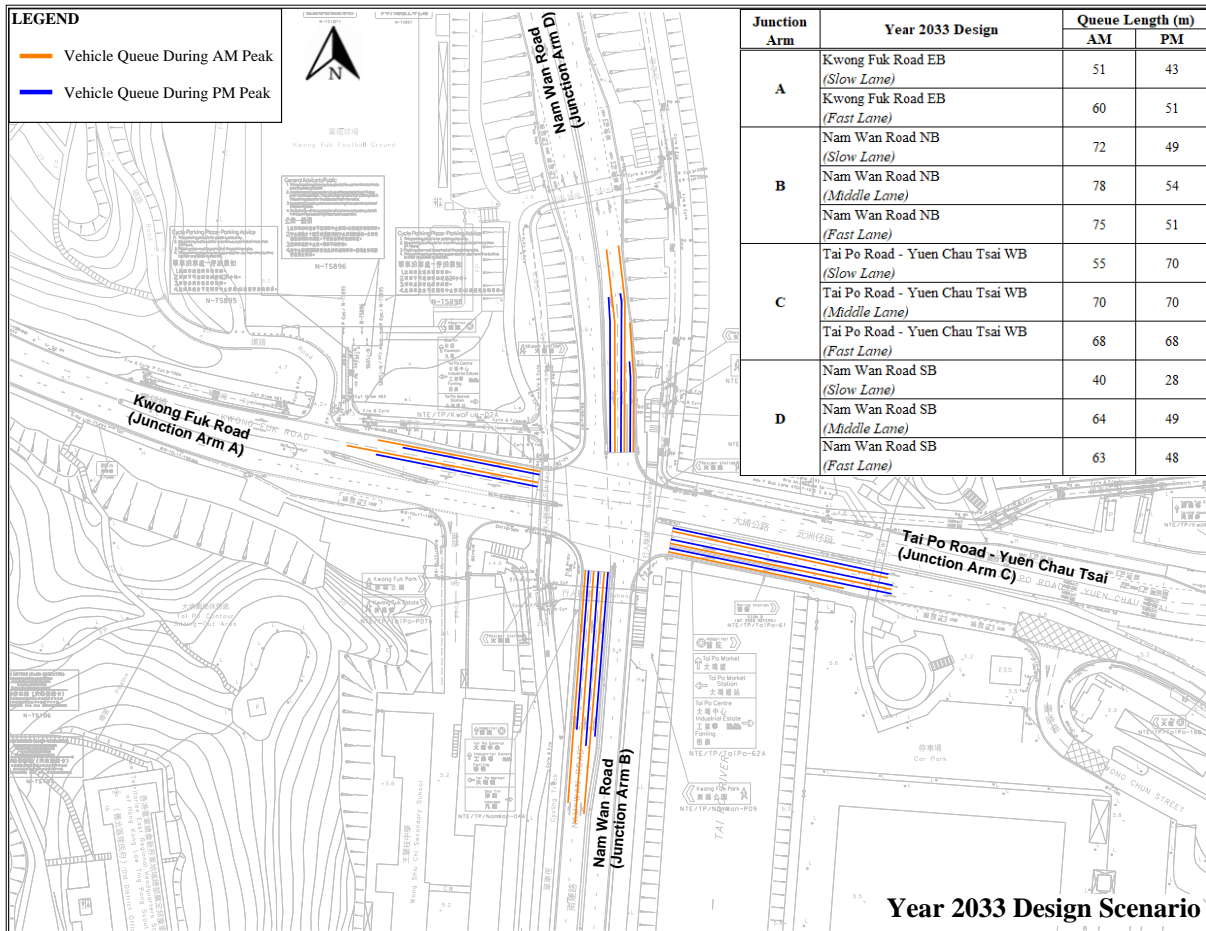


Figure 3 Anticipated Queue Lengths for J1 under Year 2033 Design Scenario



2.3.3 The results indicate that vehicle queues do not extend to adjacent junctions or critical access points under either scenario. In the Design Scenario, the maximum increase in cumulative queue length (aggregated across the slow, middle and fast lanes) is limited to $\leq 3\text{m}$ on the Tai Po Road – Yuen Chau Tsai westbound approach per signal cycle.

2.3.4 The increases are equivalent to less than one passenger car length and are therefore considered operationally negligible.

2.4 Queue Clearance Assessment

- 2.4.1 To further assess junction operability, queue clearance assessment was carried out to verify whether queues on each approach could be fully discharged within the available green time during each signal cycle under the Year 2033 Design Scenario.
- 2.4.2 The maximum estimated queue lengths were converted into equivalent Passenger Car Units (PCU) by assuming an average stationary spacing of 6m per PCU.
- 2.4.3 At the start of the green phase, the first PCU is assumed to require about 2 seconds to react and accelerate, with subsequent PCUs discharging at a rate based on the saturation flow of the corresponding lanes. The required green time for full queue clearance is therefore calculated as follows:

$$\text{Required Green Time} = 2s + (\text{No. of PCUs in queue}) \times (\text{Discharge Rate})$$

- 2.4.4 The required green times were compared against the provided green times during the AM and PM peak periods, as summarised in **Tables 2** and **3**.

Table 2 Queue Clearance Assessment during AM Peak under Year 2033 Design Scenario

Junction Arm		Estimated Maximum Queue Length (m) [A]	No. of PCUs in Queue (PCU) [B] = [A] ÷ 6	Saturation Flow ⁽¹⁾ (PCU/hr) [C]	Discharge Rate (s/PCU) [D] = 3600 ÷ [C]	Required Green Time (s) 2 + [B] x [D]	Provided Green Time ⁽²⁾ (s)
A	Kwong Fuk Road EB	60	10	2264	1.6	18	19
B	Nam Wan Road NB	78	13	2000	1.8	25	32
C	Tai Po Road - Yuen Chau Tsai WB	70	12	2075	1.7	23	28
D	Nam Wan Road SB	64	11	2055	1.8	21	24

Notes:

- (1) Refer to the Revised Saturation Flow of the corresponding lane as shown in the calculation sheets.
 (2) Refer to the input green time (g) as shown in the calculation sheets.

Table 3 Queue Clearance Assessment during PM Peak under Year 2033 Design Scenario

Junction Arm		Estimated Maximum Queue Length (m) [A]	No. of PCUs in Queue (PCU) [B] = [A] ÷ 6	Saturation Flow ⁽¹⁾ (PCU/hr) [C]	Discharge Rate (s/PCU) [D] = 3600 ÷ [C]	Required Green Time (s) 2 + [B] x [D]	Provided Green Time ⁽²⁾ (s)
A	Kwong Fuk Road EB	51	9	2280	1.6	16	19
B	Nam Wan Road NB	54	9	2006	1.8	18	24
C	Tai Po Road - Yuen Chau Tsai WB	70	12	2075	1.7	23	33
D	Nam Wan Road SB	49	9	2055	1.8	18	20

Notes:

(1) Refer to the Revised Saturation Flow of the corresponding lane as shown in the calculation sheets.

(2) Refer to the input green time (g) as shown in the calculation sheets.

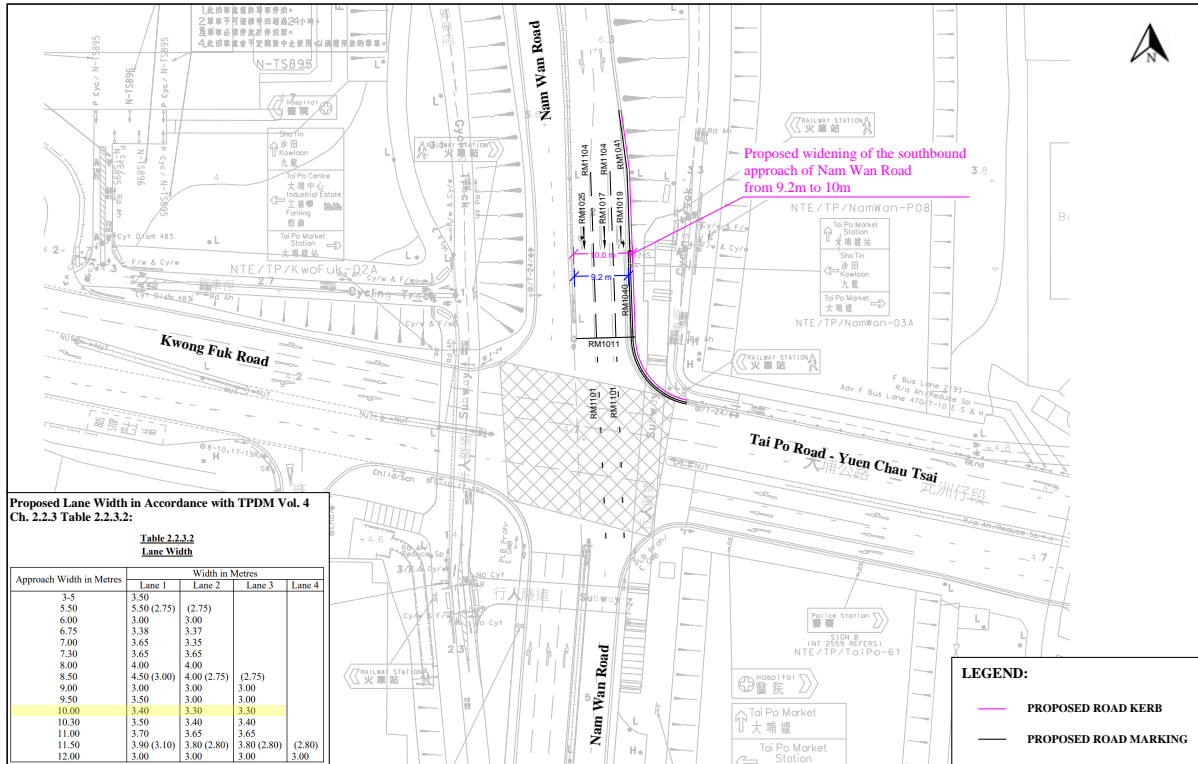
2.4.5 The results show that the provided green times exceed the required green times for all approaches during both peak periods. It is therefore concluded that all queues could be fully cleared within each signal cycle, and no residual queue accumulation or junction gridlock is expected under the Year 2033 Design Scenario.

3 Proposed Junction Improvement Measure

3.1.1 Although the traffic impact of the Proposed Development on J1 is expected to be minimal, potential enhancement measures were explored as a prudent and proactive improvement to the junction performance.

3.1.2 The proposed improvement involves widening the southbound approach of Nam Wan Road from 9.2m to 10m, taking into account the constraints posed by existing infrastructure near the junction, including subways, cycle tracks, slope structures, lift systems, and the bridge deck along Tai Po Road – Yuen Chau Tsai. The schematic layout is shown in **Figure 4**.

Figure 4 Proposed Junction Improvement Works at J1



3.1.3 The proposed improvement is expected to deliver the following benefits:

- **Improved Accommodation of Large/Heavy Vehicles:** Survey findings indicate a relatively high proportion of heavy vehicles on this approach (i.e. AM Peak: 26%, PM Peak: 22%), including frequent bus movements exceeding 1 veh/min during peak periods. The additional carriageway width would improve lateral clearance, and facilitate smoother and safer manoeuvring for larger vehicles.
- **Lane Realignment and Operational Efficiency:** The revised lane configuration would provide a straighter alignment for southbound traffic, reducing vehicle weaving and improving forward movement efficiency.
- **Capacity Enhancement:** The widened approach would increase saturation flow and improve the RC of the junction. The resulting junction performance is summarised in **Table 4**.

Table 4 Year 2033 Future Junction Performance – With Junction Improvement

Junction	Type	Reserve Capacity (RC) Performance				
		2033 Reference		2033 Design (With Junction Improvement)		
		AM	PM	AM	PM	
J1	Kwong Fuk Road / Nam Wan Road / Tai Po Road – Yuen Chau Tsai	Signalized	-6%	5%	-5%	5%

4 Conclusion

- 4.1.1 In conclusion, the Proposed Development is expected to generate only a minimal increase in traffic at J1, accounting for less than 0.8% of the total junction flow. The negative RC observed during the AM peak reflects background conditions unrelated to the Proposed Development.
- 4.1.2 Detailed junction capacity, queue length and queue clearance assessments confirms that vehicle queues remain contained and fully cleared within each signal cycle. J1 can therefore accommodate the Proposed Development without adverse traffic or operational impacts.
- 4.1.3 The proposed junction improvement measure provides meaningful operational and safety benefits, particularly for buses and heavy vehicles, and represent a prudent enhancement to support long-term junction performance and district-wide traffic efficiency.

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Flow pcu/h</th> <th rowspan="2">y</th> <th rowspan="2">Greater y</th> <th rowspan="2">L sec</th> <th rowspan="2">g (required) sec</th> <th rowspan="2">g (input) sec</th> <th rowspan="2">Degree of Saturation X</th> <th rowspan="2">Queuing Length m.</th> </tr> <tr> <th>Left pcu/h</th> <th>Straight pcu/h</th> <th>Right pcu/h</th> </tr> </thead> <tbody> <tr> <td>1,2</td> <td>A</td> <td>3.6</td> <td></td> <td>1</td> <td>13</td> <td></td> <td>N</td> <td>1975</td> <td>60</td> <td>218</td> <td></td> <td>278</td> <td>0.22</td> <td>1927</td> <td></td> <td></td> <td>0.144</td> <td>0.144</td> <td>25</td> <td>19</td> <td>19</td> <td>0.973</td> <td>51</td> </tr> <tr> <td>2,3</td> <td>A</td> <td>3.5</td> <td></td> <td>1</td> <td>25</td> <td></td> <td></td> <td>2105</td> <td></td> <td>252</td> <td>75</td> <td>327</td> <td>0.23</td> <td>2076</td> <td>188</td> <td></td> <td>0.144</td> <td></td> <td></td> <td>19</td> <td>19</td> <td>0.973</td> <td>60</td> </tr> <tr> <td>4,5</td> <td>B</td> <td>2.8</td> <td></td> <td>1</td> <td>15</td> <td></td> <td>N</td> <td>1895</td> <td>160</td> <td>280</td> <td></td> <td>440</td> <td>0.36</td> <td>1829</td> <td></td> <td></td> <td>0.241</td> <td>0.241</td> <td>31</td> <td>31</td> <td>0.994</td> <td>72</td> </tr> <tr> <td>5,6</td> <td>B</td> <td>3.0</td> <td></td> <td>1</td> <td>21</td> <td></td> <td></td> <td>2055</td> <td></td> <td>300</td> <td>182</td> <td>482</td> <td>0.38</td> <td>2001</td> <td></td> <td></td> <td>0.241</td> <td></td> <td>31</td> <td>31</td> <td>0.994</td> <td>78</td> </tr> <tr> <td>6</td> <td>B</td> <td>3.0</td> <td></td> <td>1</td> <td>19</td> <td></td> <td></td> <td>2055</td> <td></td> <td></td> <td>458</td> <td>458</td> <td>1.00</td> <td>1905</td> <td></td> <td></td> <td>0.241</td> <td></td> <td>31</td> <td>31</td> <td>0.994</td> <td>75</td> </tr> <tr> <td>7</td> <td>B,C</td> <td>3.2</td> <td></td> <td>1</td> <td>11</td> <td></td> <td>N</td> <td>1935</td> <td>460</td> <td></td> <td></td> <td>460</td> <td>1.00</td> <td>1703</td> <td></td> <td></td> <td>0.270</td> <td></td> <td>36</td> <td>57</td> <td>0.607</td> <td>54</td> </tr> <tr> <td>8</td> <td>C</td> <td>3.2</td> <td></td> <td>1</td> <td></td> <td></td> <td></td> <td>2075</td> <td></td> <td>416</td> <td></td> <td>416</td> <td>0.00</td> <td>2075</td> <td></td> <td></td> <td>0.200</td> <td>0.200</td> <td>28</td> <td>28</td> <td>0.916</td> <td>69</td> </tr> <tr> <td>8,9</td> <td>C</td> <td>3.2</td> <td></td> <td>1</td> <td>17</td> <td></td> <td></td> <td>2075</td> <td></td> <td>269</td> <td>135</td> <td>404</td> <td>0.33</td> <td>2016</td> <td></td> <td></td> <td>0.200</td> <td></td> <td>28</td> <td>28</td> <td>0.916</td> <td>67</td> </tr> <tr> <td>11</td> <td>D</td> <td>3.0</td> <td></td> <td>1</td> <td></td> <td></td> <td></td> <td>2055</td> <td></td> <td>367</td> <td></td> <td>367</td> <td>0.00</td> <td>2055</td> <td></td> <td></td> <td>0.179</td> <td>0.179</td> <td>24</td> <td>24</td> <td>0.952</td> <td>64</td> </tr> <tr> <td>11,12</td> <td>D</td> <td>3.1</td> <td></td> <td>1</td> <td>19</td> <td></td> <td></td> <td>2065</td> <td></td> <td>223</td> <td>135</td> <td>358</td> <td>0.38</td> <td>2005</td> <td></td> <td></td> <td>0.179</td> <td></td> <td>24</td> <td>24</td> <td>0.952</td> <td>63</td> </tr> <tr> <td>10</td> <td>C,D</td> <td>3.1</td> <td></td> <td>1</td> <td>17</td> <td></td> <td>N</td> <td>1925</td> <td>335</td> <td></td> <td></td> <td>335</td> <td>1.00</td> <td>1769</td> <td></td> <td></td> <td>0.379</td> <td></td> <td>51</td> <td>57</td> <td>0.851</td> <td>40</td> </tr> </tbody> </table>															Movement	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Flow			Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Uphill Gradient %	Short lane Effect pcu/h	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queuing Length m.	Left pcu/h	Straight pcu/h	Right pcu/h	1,2	A	3.6		1	13		N	1975	60	218		278	0.22	1927			0.144	0.144	25	19	19	0.973	51	2,3	A	3.5		1	25			2105		252	75	327	0.23	2076	188		0.144			19	19	0.973	60	4,5	B	2.8		1	15		N	1895	160	280		440	0.36	1829			0.241	0.241	31	31	0.994	72	5,6	B	3.0		1	21			2055		300	182	482	0.38	2001			0.241		31	31	0.994	78	6	B	3.0		1	19			2055			458	458	1.00	1905			0.241		31	31	0.994	75	7	B,C	3.2		1	11		N	1935	460			460	1.00	1703			0.270		36	57	0.607	54	8	C	3.2		1				2075		416		416	0.00	2075			0.200	0.200	28	28	0.916	69	8,9	C	3.2		1	17			2075		269	135	404	0.33	2016			0.200		28	28	0.916	67	11	D	3.0		1				2055		367		367	0.00	2055			0.179	0.179	24	24	0.952	64	11,12	D	3.1		1	19			2065		223	135	358	0.38	2005			0.179		24	24	0.952	63	10	C,D	3.1		1	17		N	1925	335			335	1.00	1769			0.379		51	57	0.851	40
Movement	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Flow			Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h										Uphill Gradient %	Short lane Effect pcu/h	Revised Sat. Flow pcu/h														y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queuing Length m.																																																																																																																																																																																																																																																											
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11	D	3.0		1				2055		367		367	0.00	2055			0.179	0.179	24	24	0.952	64																																																																																																																																																																																																																																																																																			
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<p>NOTE : 'O' - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRIAN WALKING SPEED = 0.9m/s QUEUING LENGTH = AVERAGE QUEUE * 6m</p>																																																																																																																																																																																																																																																																																																									

2033 Reference Scenario (PM Peak)

OVE ARUP & PARTNERS										TRAFFIC SIGNAL CALCULATION									
Junction No. J1										PROJECT NO: 292635-02									
Kwong Fuk Road / Nam Wan Road/ Tai Po Road - Yuen Chau Tsai										2033 Reference Flows (PM)									
DATE : 28-May-26										FILENAME :									

Nam Wan Road

Kwong Fuk Road

Tai Po Road - Yuen Chau Tsai

Nam Wan Road

No. of stages per cycle	N =	4
No. of stage using for calculation	N =	4
Cycle time	C =	120 sec
Sum(y)	Y =	0.674
Loss time	L =	25 sec
Total Flow	=	3693 pcu
Co	= (1.5*L+5)/(1-Y)	= 130.6 sec
Cm	= L/(1-Y)	= 76.8 sec
Yult	=	0.713
R.C.ult	= (Yult-Y)/Y*100%	= 5.6 %
Cp	= 0.9*L/(0.9-Y)	= 99.8 sec
Ymax	= 1-L/C	= 0.792
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	= 5 %

1	2	3	4
STAGE A	STAGE B	STAGE C	STAGE D
INT= 8	INT= 7	INT= 7	INT= 7

Pedestrian Phase	Width (m)	Green Time Required (s)		Green Time Provided (s)		Check
		SG	FG	SG	FG	

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Flow			Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Uphill Gradient %	Short lane Effect pcu/h	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queuing Length m.
									Left pcu/h	Straight pcu/h	Right pcu/h													
1,2	A	3.6		1	13		N	1975	55	202		257	0.21	1927			1927	0.133	0.133	25	19	19	0.841	43
2,3	A	3.5		1	25			2105		243	60	303	0.20	2080	200		2280	0.133			19	19	0.841	51
4,5	B	2.8		1	15		N	1895	85	221		306	0.28	1844			1844	0.166	0.166		23	23	0.866	49
5,6	B	3.0		1	21			2055		224	109	333	0.33	2008			2008	0.166			23	23	0.866	54
6	B	3.0		1	19			2055			316	1905	1.00	1905			1905	0.166			23	23	0.866	51
7	B,C	3.2		1	11		N	1935	635			635	1.00	1703			1703	0.373			53	54	0.829	70
8	C	3.2		1				2075		481		481	0.00	2075			2075	0.232	0.232		33	33	0.843	70
8,9	C	3.2		1	17			2075		274	190	464	0.41	2003			2003	0.232			33	33	0.843	67
11	D	3.0		1				2055		295		295	0.00	2055			2055	0.144	0.144		20	20	0.862	49
11,12	D	3.1		1	19			2065		200	90	290	0.31	2016			2016	0.144			20	20	0.862	48
10	C,D	3.1		1	17		N	1925	270			270	1.00	1769			884	0.305			43	58	0.632	28

NOTE : 'O' - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRIAN WALKING SPEED = 0.9m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

2033 Design Scenario (AM Peak)

OVE ARUP & PARTNERS										TRAFFIC SIGNAL CALCULATION																																																																																																																																																																																																																																																																																																																			
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Flow pcu/h</th> <th rowspan="2">y</th> <th rowspan="2">Greater y</th> <th rowspan="2">L sec</th> <th rowspan="2">g (required) sec</th> <th rowspan="2">g (input) sec</th> <th rowspan="2">Degree of Saturation X</th> <th rowspan="2">Queuing Length m.</th> </tr> <tr> <th>Left pcu/h</th> <th>Straight pcu/h</th> <th>Right pcu/h</th> </tr> </thead> <tbody> <tr> <td>1,2</td> <td>A</td> <td>3.6</td> <td></td> <td>1</td> <td>13</td> <td></td> <td>N</td> <td>1975</td> <td>60</td> <td>218</td> <td></td> <td>278</td> <td>0.22</td> <td>1927</td> <td></td> <td></td> <td>1927</td> <td>0.144</td> <td>0.144</td> <td>25</td> <td>19</td> <td>19</td> <td>0.973</td> <td>51</td> </tr> <tr> <td>2,3</td> <td>A</td> <td>3.5</td> <td></td> <td>1</td> <td>25</td> <td></td> <td></td> <td>2105</td> <td></td> <td>252</td> <td>75</td> <td>327</td> <td>0.23</td> <td>2076</td> <td>188</td> <td></td> <td>2264</td> <td>0.144</td> <td></td> <td></td> <td>19</td> <td>19</td> <td>0.973</td> <td>60</td> </tr> <tr> <td>4,5</td> <td>B</td> <td>2.8</td> <td></td> <td>1</td> <td>15</td> <td></td> <td>N</td> <td>1895</td> <td>160</td> <td>283</td> <td></td> <td>443</td> <td>0.36</td> <td>1829</td> <td></td> <td></td> <td>1829</td> <td>0.242</td> <td>0.242</td> <td></td> <td>32</td> <td>32</td> <td>0.970</td> <td>72</td> </tr> <tr> <td>5,6</td> <td>B</td> <td>3.0</td> <td></td> <td>1</td> <td>21</td> <td></td> <td></td> <td>2055</td> <td></td> <td>297</td> <td>188</td> <td>485</td> <td>0.39</td> <td>2000</td> <td></td> <td></td> <td>2000</td> <td>0.242</td> <td></td> <td></td> <td>32</td> <td>32</td> <td>0.970</td> <td>78</td> </tr> <tr> <td>6</td> <td>B</td> <td>3.0</td> <td></td> <td>1</td> <td>19</td> <td></td> <td></td> <td>2055</td> <td></td> <td></td> <td>462</td> <td>462</td> <td>1.00</td> <td>1905</td> <td></td> <td></td> <td>1905</td> <td>0.242</td> <td></td> <td></td> <td>32</td> <td>32</td> <td>0.970</td> <td>75</td> </tr> <tr> <td>7</td> <td>B,C</td> <td>3.2</td> <td></td> <td>1</td> <td>11</td> <td></td> <td>N</td> <td>1935</td> <td>470</td> <td></td> <td></td> <td>470</td> <td>1.00</td> <td>1703</td> <td></td> <td></td> <td>1703</td> <td>0.276</td> <td></td> <td></td> <td>37</td> <td>58</td> <td>0.609</td> <td>55</td> </tr> <tr> <td>8</td> <td>C</td> <td>3.2</td> <td></td> <td>1</td> <td></td> <td></td> <td></td> <td>2075</td> <td></td> <td>420</td> <td></td> <td>420</td> <td>0.00</td> <td>2075</td> <td></td> <td></td> <td>2075</td> <td>0.202</td> <td>0.202</td> <td></td> <td>28</td> <td>28</td> <td>0.925</td> <td>70</td> </tr> <tr> <td>8,9</td> <td>C</td> <td>3.2</td> <td></td> <td>1</td> <td>17</td> <td></td> <td></td> <td>2075</td> <td></td> <td>265</td> <td>142</td> <td>407</td> <td>0.35</td> <td>2013</td> <td></td> <td></td> <td>2013</td> <td>0.202</td> <td></td> <td></td> <td>28</td> <td>28</td> <td>0.925</td> <td>68</td> </tr> <tr> <td>11</td> <td>D</td> <td>3.0</td> <td></td> <td>1</td> <td></td> <td></td> <td></td> <td>2055</td> <td></td> <td>367</td> <td></td> <td>367</td> <td>0.00</td> <td>2055</td> <td></td> <td></td> <td>2055</td> <td>0.179</td> <td>0.179</td> <td></td> <td>24</td> <td>24</td> <td>0.952</td> <td>64</td> </tr> <tr> <td>11,12</td> <td>D</td> <td>3.1</td> <td></td> <td>1</td> <td>19</td> <td></td> <td></td> <td>2065</td> <td></td> <td>223</td> <td>135</td> <td>358</td> <td>0.38</td> <td>2005</td> <td></td> <td></td> <td>2005</td> <td>0.179</td> <td></td> <td></td> <td>24</td> <td>24</td> <td>0.952</td> <td>63</td> </tr> <tr> <td>10</td> <td>C,D</td> <td>3.1</td> <td></td> <td>1</td> <td>17</td> <td></td> <td>N</td> <td>1925</td> <td>340</td> <td></td> <td></td> <td>340</td> <td>1.00</td> <td>1769</td> <td></td> <td></td> <td>884</td> <td>0.384</td> <td></td> <td></td> <td>52</td> <td>57</td> <td>0.863</td> <td>40</td> </tr> </tbody> </table>															Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Flow			Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Uphill Gradient %	Short lane Effect pcu/h	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queuing Length m.	Left pcu/h	Straight pcu/h	Right pcu/h	1,2	A	3.6		1	13		N	1975	60	218		278	0.22	1927			1927	0.144	0.144	25	19	19	0.973	51	2,3	A	3.5		1	25			2105		252	75	327	0.23	2076	188		2264	0.144			19	19	0.973	60	4,5	B	2.8		1	15		N	1895	160	283		443	0.36	1829			1829	0.242	0.242		32	32	0.970	72	5,6	B	3.0		1	21			2055		297	188	485	0.39	2000			2000	0.242			32	32	0.970	78	6	B	3.0		1	19			2055			462	462	1.00	1905			1905	0.242			32	32	0.970	75	7	B,C	3.2		1	11		N	1935	470			470	1.00	1703			1703	0.276			37	58	0.609	55	8	C	3.2		1				2075		420		420	0.00	2075			2075	0.202	0.202		28	28	0.925	70	8,9	C	3.2		1	17			2075		265	142	407	0.35	2013			2013	0.202			28	28	0.925	68	11	D	3.0		1				2055		367		367	0.00	2055			2055	0.179	0.179		24	24	0.952	64	11,12	D	3.1		1	19			2065		223	135	358	0.38	2005			2005	0.179			24	24	0.952	63	10	C,D	3.1		1	17		N	1925	340			340	1.00	1769			884	0.384			52	57	0.863	40
Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Flow			Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h										Uphill Gradient %	Short lane Effect pcu/h	Revised Sat. Flow pcu/h														y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queuing Length m.																																																																																																																																																																																																																																																																															
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<p>NOTE : 'O' - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRIAN WALKING SPEED = 0.9m/s QUEUING LENGTH = AVERAGE QUEUE * 6m</p>																																																																																																																																																																																																																																																																																																																													

2033 Design Scenario (AM Peak) - With Proposed Improvement

OVE ARUP & PARTNERS										TRAFFIC SIGNAL CALCULATION									
Junction No. J1										PROJECT NO: 292635-02									
Kwong Fuk Road / Nam Wan Road/ Tai Po Road - Yuen Chau Tsai										2033 Design Flows (AM) - With Improvement									
DATE : 28-May-26										FILENAME :									

Nam Wan Road

Kwong Fuk Road

Tai Po Road - Yuen Chau Tsai

Nam Wan Road

No. of stages per cycle	N =	4
No. of stage using for calculation	N =	4
Cycle time	C =	128 sec
Sum(y)	Y =	0.765
Loss time	L =	25 sec
Total Flow	=	4357 pcu
Co	= (1.5*L+5)/(1-Y)	= 181.2 sec
Cm	= L/(1-Y)	= 106.6 sec
Yult	=	0.713
R.C.ult	= (Yult-Y)/Y*100%	= -6.9 %
Cp	= 0.9*L/(0.9-Y)	= 167.3 sec
Ymax	= 1-L/C	= 0.805
R.C.(C)	= (0.9*Ymax-Y)/Y*100%	= -5 %

STAGE A	INT=	8	STAGE B	INT=	7	STAGE C	INT=	7	STAGE D	INT=	7
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Pedestrian Phase	Width (m)	Green Time Required (s)		Green Time Provided (s)		Check
		SG	Delay	FG	Delay	

Move-ment	Stage	Lane Width m.	Phase	No. of lane	Radius m.	O	N	Straight-Ahead Sat. Flow	Flow			Total Flow pcu/h	Proportion of Turning Vehicles	Sat. Flow pcu/h	Uphill Gradient %	Short lane Effect pcu/h	Revised Sat. Flow pcu/h	y	Greater y	L sec	g (required) sec	g (input) sec	Degree of Saturation X	Queuing Length m.
									Left pcu/h	Straight pcu/h	Right pcu/h													
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8	C	3.2		1				2075		420		420	0.00	2075							28	28	0.925	70
8,9	C	3.2		1	17			2075		265	142	407	0.35	2013							28	28	0.925	68
11	D	3.3		1				2085		368		368	0.00	2085							25	25	0.903	63
11,12	D	3.3		1	19			2085		222	135	357	0.38	2025							25	25	0.903	61
10	C,D	3.4		1	15		N	1955	340			340	1.00	1777							51	58	0.844	40

NOTE : 'O' - OPPOSING TRAFFIC N - NEAR SIDE LANE SG - STEADY GREEN FG - FLASHING GREEN PEDESTRIAN WALKING SPEED = 0.9m/s QUEUING LENGTH = AVERAGE QUEUE * 6m

