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Education Bureau
Government Secretariat, The Government of the Hong Kong Special Administrative Region
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9 February 2021

Clerk to Panel on Education
Legislative Council
Legislative Council Complex
1 Legislative Council Road
Central, Hong Kong
(Attn.: Ms Angel WONG)

Dear Ms WONG,

Panel on Education
Follow-ups to the meeting on 8 January 2021

8021EM - Development of the Vocational Training Council Aviation and Maritime Education Centre at Tsing Yi

I refer to your letter of 8 January 2021 to the Secretary for Education on the captioned subject. The supplementary information regarding the proposed development of the Aviation and Maritime Education Centre (AMEC) by the Vocational Training Council (VTC) at Tsing Yi is set out in the ensuing paragraphs for Members' reference.

Supplementary information regarding the VTC's aviation and maritime-related programmes

2. At present, the VTC offers a total of 20 aviation and maritime-related programmes. The practical training sessions of the relevant programmes have to be carried out on different campuses of the VTC due to the lack of dedicated training facilities, which include the Hong Kong Institute of Vocational Education (IVE), Youth College and Maritime Services Training Institute. In response to the manpower needs of the aviation and maritime industries, as well as the shortage of practical training facilities for students, the VTC proposes to develop the AMEC to provide quality and authentic training experiences for students, with a view to supporting the long term manpower needs of the two industries. The proposed AMEC will provide state-of-the-art facilities, such as training workshops for aero engine and aircraft system repairing, and maritime engineering laboratories, with a view to preparing graduates for obtaining the Aircraft Maintenance Basic Licence issued by the Civil Aviation Department, or the Local Vessel Engine Operator Certificate issued by the Marine Department, for joining the relevant industries.

3. Upon the commissioning of the proposed AMEC, students of the relevant programmes will be able to undergo the required practical training in the AMEC, which will be located within the IVE(Tsing Yi) campus, utilising the state-of-the-art training facilities. In the long run, the VTC will consider launching suitable new programmes, having regard to the manpower needs of the industries[1]. Nevertheless, through programme and class reshuffling, the VTC will ensure that the planned student intake figures of the IVE(Tsing Yi) campus will remain at the 2020 level, i.e. 7 500 students. Details about the relevant aviation and maritime-related programmes are at **Annex 1**.

Manpower needs of the aviation and maritime industries and prospects of the graduates of the relevant programmes

4. As regards the future manpower demand of the aviation industry, the Airport Authority of Hong Kong estimated that, upon the commissioning of the

[1] According to the VTC's preliminary plan, subject to the actual prevailing situation, including the development of relevant industries and their manpower needs, the VTC will consider launching six new programmes. Under this preliminary plan, the long-term planned intake of the relevant programmes will increase from 786 in the 2020/21 AY to about 1,500 in the 2025/26 AY.

Three-runway System by 2030, the number of direct employment created in the airport area would increase to 141 000, more than double the existing level. Furthermore, as pointed out in the 2020 Manpower Update Report which was published by the VTC after conducting the relevant manpower surveys, the aircraft maintenance engineering industry had strong demand for technicians and professionals. The VTC's Manpower Update Report for Electrical and Mechanical Service Industry also pointed out that there were over 100 vacancies in the aircraft maintenance engineering industry from the second half of 2018 to the first half of 2019, reflecting that there was a considerable demand for additional manpower in the industry.

5. While the aviation industry has been affected by the unexpected pandemic situation, and that the adverse impact brought about by pandemic is expected to last for a certain period of time, the VTC anticipated that the industry would gradually return to normal after the pandemic is under control. According to the report published by the International Air Transport Association in July 2020, passenger traffic is expected to return to a level similar to that of 2019 in late 2024. In fact, the air cargo volume in 2020 only dropped by about 10% as compared with that for the same period in 2019 and the sector may recover earlier. The VTC anticipates that as the development of the AMEC takes about 3.5 years, it will tie in with the recovery of the global and local aviation industry upon its commissioning, and address the pressing manpower and associated training needs foreseen by the industry.

6. As regards the manpower needs of the maritime industry, both the 2016 Manpower Survey Report and 2020 Manpower Update Report which were published by the VTC after conducting the relevant manpower surveys indicated that the maritime industry had been facing a serious aging problem in its workforce, and the sector had a high demand for licenced marine engineering technicians and engineers working ashore. Following the retirement of serving maritime engineering technicians in the coming five to ten years, about 1 000 vacancies are expected to emerge. In fact, marine engineers and ship superintendents have been included in the Talent List under the Quality Migrant Admission Scheme, demonstrating that there exists a huge demand for the relevant professions in Hong Kong.

7. As regards the prospects of the graduates of the aviation and maritime-related programmes, the VTC's statistics show that their articulation and employment situations are satisfactory, reflecting that the quality of both the

relevant programmes and students is generally recognised by the industries and other post-secondary institutions. Specifically, over the past five years, 55% of the graduates of the aviation-related programmes pursued further studies, and 86% of them were admitted to relevant degree programmes of local institutions such as The Technological and Higher Education Institute of Hong Kong, The Hong Kong Polytechnic University and The Hong Kong University of Science and Technology. For the remaining graduates who pursued direct employment, over 95% were employed in the aviation industry. As regards the maritime-related programmes, over 95% of the graduates pursued direct employment and the average employment rate was about 83%. For the rest who pursued further studies, they were admitted to relevant maritime degree programmes in local and overseas universities such as The Hong Kong Polytechnic University and University of Plymouth in the United Kingdom.

8. To support students for employment, the VTC has launched the Career Booster Programme for over 10 years to encourage students to participate in company visits and group discussion with company representatives, as well as providing appropriate career advisory services, with a view to facilitating students in exploring their career aspirations and targets. During the pandemic, the VTC also stepped up its support, including arranging online career talks to enable students to better understand their career prospects. The VTC will continue these efforts and take necessary follow-up action, having regard to the latest pandemic and workplace situation.

Exchanges, internships and job opportunities outside Hong Kong

9. In addition to teaching in Hong Kong, the VTC has organised various types of student exchanges and internship programmes, such as the exchange programmes in and visits to the Greater Bay Area (GBA), which broaden students' horizons and provide them with employment opportunities through enabling them to establish contacts with different organisations in the region. For instance, the VTC assisted and encouraged students to participate in events including the annual aircraft maintenance engineering skills competitions co-organised with the Guangzhou Civil Aviation College, training programmes offered by Dalian Maritime University, and visits to the Guangzhou Aircraft Maintenance and Engineering Company, to enrich their knowledge on the workplaces outside Hong Kong. While some of these activities outside Hong Kong were affected by the pandemic, the VTC has been proactively planning for

further activities of a similar nature, such as the potential student visits to educational institutions and companies in Macau, which are being worked out, with a view to deepening their understanding of the development of the relevant industries in different cities within the GBA.

Potential traffic impact of the proposed AMEC

10. The VTC engaged a traffic specialist consultant in 2020 to conduct a traffic impact assessment (TIA) for the project. Although the AMEC will provide state-of-the-art training facilities for the provision of practical training for students that was not possible in the past, the VTC would ensure that the planned student intake figures of the IVE (Tsing Yi) campus would remain similar to the existing level through arrangements such as programme and class reshuffling. As such, the project will not result in any increase in the number of students travelling to the campus, nor will it generate any additional traffic for the relevant district. The demand for public transport services will also be maintained at the existing level. The traffic specialist consultant has also assessed the impact of the commissioning of the AMEC on the junction capacity and pedestrian, and the assessment is that all key junctions and footpaths in the vicinity would operate satisfactorily during the peak hours, and the overall TIA concluded that the proposed development would not create adverse impacts on the traffic, pedestrian networks, and public transport services. The detailed TIA is at **Annex 2**.

Yours sincerely,

(Kasper NG)
for Secretary for Education

Annex 1

The existing and planned aviation and maritime-related programmes of the VTC

Existing programmes	Programme Nature	Planned intake in 2020/21 AY	Actual enrolment in 2020/21 AY	Planned intake in 2025/26 AY
Aviation				
B.Eng (Hon) in Aircraft Engineering (Note 1)	Pre-employ subvented	56	38	60
Higher Diploma in Aircraft Maintenance Engineering (Note 1)	Pre-employ subvented	120	112	125
Higher Diploma in Aircraft Maintenance Engineering	In-service self-financed	56	N/A (Note 2)	60
Diploma of Vocational Education (Aircraft Maintenance) (Note 1)	Pre-employ subvented	50	62	90
Diploma of Vocational Education (Aircraft Maintenance)	In-service self-financed	28	N/A (Note 2)	30
Higher Diploma in Aviation (Note 1)	Pre-employ subvented	60	44	90
Higher Diploma in Aviation and e-Logistics	Pre-employ subvented	30	24	80
Higher Diploma in Aviation Services and Passenger Transport (Note 1)	Pre-employ subvented	30	57	100
Diploma of Foundation Studies (Aviation)	In-service self-financed	30	4	50
Total		**460**	**341**	**685**
Maritime				
Higher Diploma in Mechanical Engineering (Maritime Elective)	Pre-employ subvented	N/A	8	30
Higher Diploma in Maritime Studies (Note 1)	Pre-employ subvented	60	43	45
Certificate for Junior General Purpose Ratings	Pre-employ subvented	80	28 (Note 2)	80
Upgrading Courses for Class 3 (Sea-going) (Deck) Certificate of Competency (Note 1)	In-service self-financed	22	19 (Note 2)	110

Existing programmes	**Programme Nature**	**Planned intake in 2020/21 AY**	**Actual enrolment in 2020/21 AY**	**Planned intake in 2025/26 AY**
Upgrading Courses for Class 2/1 (Sea-going) (Deck) Certificate of Competency (Note 1)	In-service self-financed	18	6 (Note 2)	100
High Voltage Technology for Maritime Industry (Note 1)	In-service self-financed	5	2	10
Maritime Resources Management Course	In-service self-financed	43	17 (Note 2)	50
Local Vessel Engine Operator Grade 3 (Note 1)	In-service self-financed	14	N/A (Note 2)	90
Local Vessel Engine Operator Grade 2 (Note 1)	In-service self-financed	12	N/A (Note 2)	10
Local Coxswain Grade 3 (Note 1)	In-service self-financed	58	21 (Note 2)	180
Local Coxswain Grade 2 (Note 1)	In-service self-financed	14	N/A (Note 2)	15
Total		**326**	**144**	**720**

Note 1: Practical training will be conducted in the AMEC

Note 2: Student admission will go on later in the 2020/21 AY

Planned programmes	Programme Nature	Planned intake in 2025/26 AY
Aviation		
Certificate in Aircraft Maintenance Skills and Practices (Note)	Pre-employ subvented	28
Certificate in Aircraft Maintenance Skills and Practices	In-service self-financed	28
Professional Diploma in Aviation Operations	In-service self-financed	27
Professional Diploma in Aviation Management	In-service self-financed	27
Total		**110**
Maritime		
Higher Diploma in Maritime and Yacht Technology (Note)	Pre-employ subvented	30
Diploma of Vocational Education (Maritime)	Pre-employ subvented	20
Total		**50**

Note: Practical training will be conducted in the AMEC

Annex 2

Vocational Training Council Proposed Aviation and Maritime Education Centre Tsing Yi

Traffic Impact Assessment Study
Final Report

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CONTENT

			Page
1	**INTRODUCTION**		**1**
	1.1	Background	1
	1.2	Study Objectives	1
	1.3	Report Structure	2
2	**THE PROPOSED AMEC**		**3**
	2.1	Site Location and Study Area	3
	2.2	The Proposed Development Schedule	3
	2.3	Access Arrangements	4
	2.4	Internal Transport Facilities	4
3	**EXISTING TRAFFIC CONDITIONS**		**5**
	3.1	Existing Road Network	5
	3.2	Existing Public Transport Services	5
	3.3	Existing Peak Hour Traffic Flows	6
4	**FUTURE TRAFFIC SITUATION**		**9**
	4.1	Design Year	9
	4.2	Methodology	9
	4.3	2028 Background Traffic Flows	10
	4.4	2028 Reference / Design Traffic Flows	10
	4.5	2028 Junction Capacity Assessments	12
5	**PEDESTRIAN IMPACT ASSESSMENT AND PUBLIC TRANSPORT REVIEW**		**13**
	5.1	Pedestrian Impact Assessment	13
	5.2	Public Transport Review	16
6	**SUMMARY AND CONCLUSIONS**		**17**
	6.1	Summary	17
	6.2	Conclusions	18

LIST OF TABLES

		Page
Table 2-1	Numbers of Student and Staff Places at Existing and Future VTC Campus	3
Table 3-1	Existing Public Transport Services in the Study Area	5
Table 3-2	Average Annual Daily Traffic from Annual Traffic Census	7
Table 3-3	Peak Hour Junction Performances based on Derived 2020 Traffic Flows	8
Table 4-1	2016-Based TPEDM in Kwai Tsing District	10
Table 4-2	Peak Hour Trip Rates for Planned/ Committed Developments	11
Table 4-3	Estimated Peak Hour Trip Generations by Planned/ Committed Developments	11
Table 4-4	2028 Peak Hour Performance at Key Junctions	12
Table 5-1	Observed Peak-15 Minute Pedestrian Trips at VTC TY Campus	13
Table 5-2	Description of Level-of-Service (LOS) on Footpaths	14
Table 5-3	Description of Level-of-Service (LOS) for Stairs	15
Table 5-4	Level of Services (LOS) Assessment Results	16

LIST OF FIGURES

Figure 2-1 Site Location and Study Area
Figure 2-2 Existing Vehicular and Pedestrian Access Arrangements
Figure 3-1 Existing Public Transport Inventory
Figure 3-2 Locations of Surveyed Junctions
Figure 3-3 2017 Observed Peak Hour Traffic Flows
Figure 3-4 2020 Derived Peak Hour Traffic Flows
Figure 4-1 2028 Background Peak Hour Traffic Flows
Figure 4-2 Locations of Planned / Committed Developments
Figure 4-3 2028 Design Peak Hour Traffic Flows

APPENDICES

Appendix A 2020 Junction Calculation Sheets
Appendix B 2028 Junction Calculation Sheets

1 INTRODUCTION

1.1 Background

1.1.1 The Vocational Training Council (VTC) intend to redevelop the northern portion of the existing VTC Campus in Tsing Yi ("the VTC TY Campus") for an Aviation and Maritime Education Centre ("the Proposed AMEC") which will provide workshops, laboratories, teaching facilities, staff offices and associated facilities to support the training and manpower development of the aircraft and marine industries.

1.1.2 A Traffic Impact Assessment (TIA) Study had been undertaken in 2017 to assess the potential traffic impact to be induced by the Proposed AMEC and the findings reported in "Technical Study for Aircraft and Marine Engineering Centre at Tsing Yi Campus Traffic Impact Study (November 2017)" concluded that the local road network would be able to cope with the additional AMEC traffic.

1.1.3 Ozzo Technology (HK) Limited have been commissioned to review and update the Traffic Impact Assessment (TIA) Study based on the latest development parameters and taking into account the latest developments in the Study Area.

1.2 Study Objectives

1.2.1 The objectives of the TIA study are as follows:

- To review the existing traffic situation of the surrounding road network;
- To estimate the potential traffic generations/attractions to be induced by the Proposed AMEC;
- To assess the future traffic situation of the surrounding road network;
- To appraise the potential traffic impact of the Proposed AMEC on the surrounding road and pedestrian networks and to recommend improvement proposals, if required.

1.3 Report Structure

1.3.1 Following this introductory chapter, this report is arranged as follow:

- Chapter 2 describes the Proposed AMEC;
- Chapter 3 summarizes the existing traffic condition in the vicinity of the Proposed AMEC;
- Chapter 4 provides traffic forecast in the future design year and presents the traffic assessment results;
- Chapter 5 discusses the results of the pedestrian impact assessment and public transport review; and
- Chapter 6 summarizes the findings and conclusion of this study.

2 THE PROPOSED AMEC

2.1 Site Location and Study Area

2.1.1 **Figure 2-1** shows the location of the Proposed AMEC within the existing VTC Campus. At present, the VTC TY Campus comprises mainly of Hong Kong Institute of Vocational Education (Tsing Yi), Technological and Higher Education Institute of Hong Kong and Hall of Residence. As shown in the figure, the Proposed AMEC will be situated at the existing tennis courts situated at the northern portion of the VTC TY Campus.

2.1.2 **Figure 2-1** also shows the proposed Study Area for this TIA Study and which includes the key junctions in the vicinity of the Project Site.

2.2 The Proposed Development Schedule

2.2.1 Similar to the existing facilities in the VTC TY Campus, the proposed AMEC will provide workshops, laboratories, teaching facilities and associated facilities to support the training and manpower development of the aircraft and marine industries.

2.2.2 **Table 2-1** summarizes the number of student places and staff in the existing VTC Campus and with the new provisions upon completion of the Proposed AMEC.

Table 2-1 Numbers of Student and Staff Places at Existing and Future VTC Campus

	2020 VTC TY Campus(1)	VTC TY Campus with new AMEC
Full-Time Student Places	5,087	No change
Part-Time Student Places	2,567	No change
Full-Time Staff	629	No change
Part-Time Staff	318	No change
Overall Total	8,601	8,601

2.2.3 In 2020, there are a total of 7,654 student places (5,087 full-time and 2,567 part-time) and 947 staff members (629 full-time and 318 part-time) in the existing VTC TY Campus. The new AMEC can provide practical training to 1,000 students in each academic year. The numbers of these 1,000 students have been included in the overall total of 8,601 as indicated above because they come from the related programmes offered at the existing TY Campus.

2.3 Access Arrangements

2.3.1 **Figure 2-2** shows the vehicular and pedestrian access arrangements at the VTC TY Campus after the completion of the Proposed AMEC. In general, all the existing vehicular and pedestrian accesses at VTC TY Campus will be maintained.

2.4 Internal Transport Facilities

2.4.1 As the Proposed AMEC consists mainly of workshops and laboratories, the demand for car parking and loading/ unloading will be very small and can be shared with the existing facilities available in the existing VTC TY Campus. Hence, no parking and loading/unloading facility will be provided within the Proposed AMEC.

3 EXISTING TRAFFIC CONDITIONS

3.1 Existing Road Network

3.1.1 **Figure 2-1** shows the existing road network in the Study Area.

3.1.2 The Proposed AMEC can be accessed via Sai Shan Road which is a local road, in single-2 lane carriageway standards, providing accesses to nearby developments along the road. Sai Shan Road connects with Tsing Yi Road, a District Distributor road in dual-2 lane carriageway standards, which is a major north-south corridor in Tsing Yi Island.

3.1.3 The section of Tsing Yi Road in the vicinity of VTC TY Campus connects with Ching Hong Road, a Local Distributor road, to provide access to/from the west. Tsing Yi Road also links with Tsing Yi Bridge/ Kwai Tsing Road connecting Tsing Yi Island with Kwai Chung district and urban Kowloon.

3.2 Existing Public Transport Services

3.2.1 The area is well served by public transport services with both franchised bus and Green Minibus services. **Table 3-1** summarized the public transport services in the area and **Figure 3-1** shows the locations of the bus/GMB stops serving the area.

3.2.2 In addition, shuttle bus services providing connecting services between VTC TY Campus and MTR Kwai Fong Station and Tai Wai Station are available for VTC students and staff.

Table 3-1 Existing Public Transport Services in the Study Area

Route No.	Termination Points		Frequency (Mins)
Franchised Bus Services			
KMB 41	Tsing Yi (Cheung Ching Estate)	Kowloon City Ferry	Daily service every 25-35 mins
KMB 42	Tsing Yi (Cheung Hong Estate)	Shun Lee	Daily service every 15-25 mins
KMB 42A	Tsing Yi (Cheung Hang Estate)	Jordan (West Kowloon Station)	Daily service every 4-15 mins
KMB 43	Tsing Yi (Cheung Hong Estate)	Tsuen Wan West Station	Daily service every 8-20 mins
KMB 43A	Tsing Yi (Cheung Wang Estate)	Shek Lei (Tai Loong Street)	Daily service every 6-15 min
KMB 43C	Tsing Yi (Cheung Hong Estate)	Island Harbourview	Daily service every 12- 15 mins during AM and PM peak periods
KMB 43D	Tsing Yi (Cheung Wang Estate)	Kwai Shing	Two departures daily during AM peak hour
KMB 43M	Kwai Fong Station	Cheung Ching Circular)	Daily service every 12-20 mins

Route No.	Termination Points		Frequency (Mins)
KMB 241X	Tsing Yi (Cheung Ching Estate)	Ho Man Tin (Oi Man Estate)	One departure daily during AM peak hour
KMB 242X	Tsing Yi (Cheung Hang Estate)	Tsim Sha Tsui	Two departures daily during AM peak hour
KMB 243M	Tsing Yi (Mayfair Garden)	Tsuen Wan (Discovery Park)	Daily service every 10-15 mins
KMB 243P	Tsing Yi (Mayfair Garden)	Tsuen Wan (Discovery Park)	Two departures daily during AM peak hour
KMB 249M	Tsing Yi Station	Mayfair Garden (Circular)	Daily service every 7-15 mins
KMB 249X	Tsing Yi Station	Pok Hong	Daily service every 20-30 mins
XHT 948	Causeway Bay(Tin Hau)	Tsing Yi (Cheung On Estate)	Daily service every 8-30 mins
XHT 948A	Tsing Yi (Cheung On Estate)	Causeway Bay (Tin Hau)	Daily service every 5-20 mins during AM peak period
XHT 948B	Greenfield Garden	Causeway Bay (Tin Hau)	Two departures daily during AM peak hour
XHT 948X	Tsing Yi (Cheung Wang Estate)	Causeway Bay (Tin Hau)	Four departures daily during AM peak hour
LW A32	Kwai Chung Estate	Airport (Ground Transportation Centre)	Daily service every 20-30 mins
LW E32	Kwai Fong (South)	Asiaworld Expo	Daily service every 10-20 mins
GMB Services			
GMB 88C	Mayfair Gardens	Kwai Fong Station	Daily service every 6-12 mins
GMB 88D	Tivoli Garden	Kwai Fong Station	Daily service every 4-6 mins
GMB 88F	Rambler Crest	Tsing Yi Station	Daily service every 6-18 mins
GMB 88G	Rambler Crest	Kwai Fong Station	Daily service every 6-15 mins
GMB 88M	HK Untied Dockyards	Kwai Fong Station	Daily service every 6-15 mins
GMB 405	Cheung Hang Estate	Cho Yiu Chuen	Daily service every 10-20 mins during AM and PM peak periods
VTC Shuttle Bus Service			
-	VTC Tsing Yi Campus	MTR Kwai Fong Station	10 – 15 min
-	VTC Tsing Yi Campus	MTR Tai Wai Station	30 – 60 min

3.3 Existing Peak Hour Traffic Flows

3.3.1 Due to the outbreak of COVID-19 disease in 2020, the traffic conditions in the HKSAR territories are significantly affected as a result of the government preventive and control measures such as school break, suspension of school activities, home office practice, restriction or compulsory quarantine for people entering Hong Kong etc. Hence, reference is made to the traffic count data obtained in 2017[1], which were observed under normal traffic conditions and school activities, for subsequent analysis.

[1] "Technical Study for Aircraft and Marine Engineering Centre at Tsing Yi Campus Traffic Impact Study (November 2017)"

3.3.2 The traffic count surveys were undertaken at the key links and junctions in the Study Area of the Project Site during the AM and PM peak periods on a typical weekday in September 2017. **Figure 3-2** shows the locations of the surveyed key links and junctions. The AM and PM peak hours are identified to occur at 08:30 - 09:30 and 17:30 - 18:30 respectively and the 2017 observed peak hour traffic flows on the road network in the vicinity of the Project Site are shown in **Figure 3-3**.

3.3.3 The 2017 peak hour traffic flows are then adjusted to derive the 2020 traffic flows taking into account the historical traffic data in the vicinity of the Site as indicated in **Table 3-2**.

Table 3-2 Average Annual Daily Traffic from Annual Traffic Census

Station	Road	Between		2013	2014	2015	2016	2017	2018	Average Growth Rate p.a.
5653	Ching Hong Rd	Chung Mei Rd	Tsing Yi Rd	11,290	11,390	13,200	11,560	11,770	11,950	1.14%
				--	0.89%	15.89%	-12.42%	1.82%	1.53%	
6219	Kwai Tsing Rd & Tsing Yi S Bridge	Tsing Yi Rd	Kwai Tai Rd Interchange	47,000	44,770	46,950	41,880	40,920	42,080	-2.19%
				--	-4.74%	4.87%	-10.80%	-2.29%	2.83%	
5232	Tsing Yi Rd	Tsing Yi Heung Sze Wui Rd	Ching Hong Rd	18,980	20,560	20,950	21,530	21,920	19,550	0.59%
				--	8.32%	1.90%	2.77%	1.81%	-10.81%	
5852	Tsing Yi Heung Sze Wui Rd	Fung Shue Wo Rd Roundabout	Tsing Yi Rd	31,770	32,040	32,640	33,300	32,890	33,380	0.99%
				--	0.85%	1.87%	2.02%	-1.23%	1.49%	
5439	Tsing Yi Rd	Ching Hong Rd	Tsing Nam St	6,890	7,080	7,170	7,370	7,500	7,620	2.03%
				--	2.76%	1.27%	2.79%	1.76%	1.60%	
6113	Tsing Yi Rd	Tsing Yi Rd near Dow Chemical	Tsing Yi Hong Wan Rd	10,920	11,020	11,220	11,540	12,870	11,720	1.42%
				--%	0.92%	1.81%	2.85%	11.53%	-8.94%	
6112	Tsing Yi Hong Wan Rd	Tsing Yi Rd	Tsing Sheung Rd	18,770	18,930	19,280	19,820	20,750	25,970	6.71%
				--	0.85%	1.85%	2.80%	4.69%	25.16%	
Total				**145,620**	**145,790**	**151,410**	**147,000**	**148,620**	**152,270**	**0.90%**
				--	**0.12%**	**3.85%**	**-2.91%**	**1.10%**	**2.46%**	

Source: 2013-2018 Annual Traffic Census (ATC) Reports published by Transport Department

3.3.4 As indicated in the **Table 3-2**, an overall traffic growth of 0.9% per annum was recorded over the period of 2013-2018. However, to provide conservative estimates, it is proposed to apply the higher growth rate of +2.46% p.a. (i.e. the growth rate from 2017 to 2018) for deriving the 2020 peak hour Flows. By applying the annual growth rate (+2.46%) to the 2017 observed peak hour flows, the derived 2020 Peak Hour Traffic Flows are shown in **Figure 3-4**.

3.3.5 For reference, the peak hour performance of the key junctions based on the Derived 2020 peak hour flows are calculated and presented in **Table 3-3** with detailed calculation sheets presented in **Appendix A**.

Table 3-3 Peak Hour Junction Performances based on Derived 2020 Traffic Flows

Jn. ID.	Location	Type	Capacity Index(1)	AM Peak	PM Peak
J1	Tsing Yi Road / Sai Shan Road	Priority	DFC	0.57	0.49
J2	Tsing Yi Road / Ching Hong Road	Roundabout	DFC	0.47	0.43
J3	Tsing Yi Road / Kwai Tsing Road Tsing Yi Bridge	Roundabout	DFC	0.56	0.50
J4	Tsing Yi Interchange	Roundabout	DFC	0.67	0.61
J5	Tsing Sha Highway / Tsing Yi Road / Tsing Yi Hong Wan Road	Roundabout	DFC	0.45	0.45

Notes: (1) The Capacity Index for Priority Junction and roundabout is Design Flow to Capacity Ratio (DFC)
- A DFC value less than 0.85 indicates that the junction is operating within acceptable level and a DFC greater than 1.0 indicates that the junction is overloaded.

4 FUTURE TRAFFIC SITUATION

4.1 Design Year

4.1.1 The planned operation year of the Proposed AMEC is 2025, hence, the "Design Year" for this TIA study is set as 2028, i.e. 3 years after the operation year.

4.2 Methodology

4.2.1 In forecasting the future traffic flows on the road network in the Study Area, references are made to the following sources of information which include:

- The forecast population and employment from the 2016-based Territorial Population and Employment Data Matrices (TPEDM) planning data published by Planning Department; and
- Planned and committed developments in the Study Area.

4.2.2 The following steps are undertaken to derive the 2028 Peak Hour Reference Flows (i.e. without the Proposed AMEC) and Design Flows (i.e. with the Proposed AMEC):

2028 Background Flows =	2020 Traffic Flows x annual growth factors
2028 Reference Flows =	2028 Background Flows + additional traffic generated by planned/committed developments
2028 Design Flows =	2028 Reference Flows

4.2.3 As mentioned in Section 2.2 and Table 2-1, it is noted that the Proposed AMEC will not increase the total number of students / staff in the VTC TY Campus and hence would not induce additional traffic and pedestrian flows upon operation of the Proposed AMEC development. As a result, the 2028 Design Flows (i.e. with the AMEC) would be the same as the 2028 Reference Flows (without the AMEC development) as the latter scenario has already included the traffic flows generated by the existing VTC TY Campus.

4.2.4 The traffic impact of the VTC TY Campus with the Proposed AMEC is then assessed based on the 2028 Peak Hour Design Traffic Flows.

4.3 2028 Background Traffic Flows

4.3.1 To estimate the 2028 Background Traffic Flows, reference is made to the 2016-based Territorial Population and Employment Data Matrices (TPEDM) planning data published by Planning Department. **Table 4-1** presents the population and employment data in Kwai Tsing District for 2016, 2021 and 2026.

Table 4-1 2016-Based TPEDM in Kwai Tsing District

Category	2016	2021	2026	Annual Growth Rate	
				2016-2021	2021-2026
Population	184,150	181,350	186,700	-0.31%	0.58%
Employment Places	37,500	39,150	39,250	0.86%	0.05%

Source: 2016, 2021 & 2026 population and employment places are extracted from 2016-based TPEDM published by Planning Department (Dec 2019).

4.3.2 As shown in the table, the predicted population and employment growth in Kwai Tsing District is approximately +0.58% and +0.05% per annum respectively from 2021 to 2026. To provide conservative estimates, it is proposed to adopt the higher annual growth rate of +0.58% for estimating the 2028 Background Traffic Flows. By applying the proposed growth rate (+0.58% p.a.) to the 2020 peak hour flows, the forecast 2028 Background Traffic Flows are calculated and presented in **Figure 4-1**.

4.4 2028 Reference / Design Traffic Flows

4.4.1 According to the published information from Town Planning Board, there are three planned/committed developments in the vicinity of the Project Site and these are:

- Hong Kong Housing Authority – Public Housing Development at Ching Hong Road North, Tsing Yi [Planned Completion Year: 2023-2028 by phases]
- Hong Kong Housing Authority – Public Housing Development at Tsing Hung Road, Tsing Yi [Planned Completion Year: 2022/23]
- Proposed Residential Development at Tsing Yi Town Lot No. 190 [Planned Completion Year: 2022].

4.4.2 The locations of the above developments are shown in **Figure 4-2**.

4.4.3 The additional peak hour traffic to be generated by the new developments are estimated based on the respective trip rates in TPDM as indicated in **Table 4-2** and the resulting peak hour trip generations are shown in **Table 4-3**.

Table 4-2 Peak Hour Trip Rates for Planned/ Committed Developments

Development Density / OZP Zoning	unit	AM Peak Hour		PM Peak Hour	
		Out	In	Out	In
Subsidised Housing: Public Rental Average Flat Size 40m²	pcu/hr/flat	0.0432	0.0326	0.0237	0.0301
Retail / Shopping Complex (Office + Retail)	pcu/hr/100m²	0.2296	0.2434	0.3100	0.3563
Private Housing: High-Density / R(A) Average Flat Size 60m²	pcu/hr/flat	0.0718	0.0425	0.0286	0.0370

Source: TPDM Vol.1 Chapter 3, Annex D, Table 1 and Table 2

Table 4-3 Estimated Peak Hour Trip Generations by Planned/ Committed Developments

Location	Land Use	AM Peak Hour		PM Peak Hour	
		Out	In	Out	In
Public Housing Development at Ching Hong Road North, Tsing Yi(1)	Public Rental Housing (3,200 flats)	138	104	76	96
	Retail (2,000 m² GFA)	5	5	6	7
Public Housing Development at Tsing Hung Road, Tsing Yi(1)	Public Rental Housing (2,868 flats)	124	93	68	86
	Retail (1,600m² GFA)	4	4	5	6
Proposed Residential Development at Tsing Yi Town Lot No. 190(2)	Private Housing (766 flats)	56	33	22	29
	Total	**327**	**239**	**177**	**224**

Source: (1) Development parameters from Housing Department Planning Brief published by Planning Department (Jan 2020)
(2) Development parameter published by Lands Department (Apr 2019)

4.4.4 The additional development flows in **Table 4-4** are then added to the 2028 Peak Hour Background Traffic (**Figure 4-1**) to derive the 2028 Peak Hour Reference Traffic Flows.

4.4.5 As mentioned in Paragraph 4.2.2 and 4.2.3, the 2028 Design Flows would be the same as the Reference Flows since no additional traffic would be generated by the Proposed AMEC. The resulting 2028 Design Flows are shown in **Figure 4-3**.

4.5 2028 Junction Capacity Assessments

4.5.1 Based on the 2028 Design Flows, junction capacity assessments are undertaken and the results are presented in **Table 4-4** with detailed calculation sheets provided in **Appendix B**.

Table 4-4 2028 Peak Hour Performance at Key Junctions

Jn. ID.	Location	Type	Capacity Index(1)	AM Peak	PM Peak
J1	Tsing Yi Road / Sai Shan Road	Priority	DFC	0.67	0.56
J2	Tsing Yi Road / Ching Hong Road	Roundabout	DFC	0.54	0.49
J3	Tsing Yi Road / Kwai Tsing Road Tsing Yi Bridge	Roundabout	DFC	0.69	0.56
J4	Tsing Yi Interchange	Roundabout	DFC	0.76	0.67
J5	Tsing Sha Highway / Tsing Yi Road / Tsing Yi Hong Wan Road	Roundabout	DFC	0.49	0.49

Notes: (1) The Capacity Index for Priority Junction and roundabout is Design Flow to Capacity Ratio (DFC)
- A DFC value less than 0.85 indicates that the junction is operating within acceptable level and a DFC greater than 1.0 indicates that the junction is overloaded.

4.5.2 The results show that the key junctions in the Study Area would operate within capacity during both the AM and PM peak hours in 2028 for the Design scenario (i.e. with Proposed AMEC). The proposed AMEC development would not create adverse traffic impact because the proposed development would not induce additional traffic.

5 PEDESTRIAN IMPACT ASSESSMENT AND PUBLIC TRANSPORT REVIEW

5.1 Pedestrian Impact Assessment

5.1.1 Similar to vehicular traffic, as the overall nos. of students/ staff will not be increased, the peak hour pedestrian trips observed at the existing VTC TY campus in 2017 are adopted for assessing the level of services (LOS) of various pedestrian facilities within the campus with the Proposed AMEC. **Table 5-1** shows the observed peak-15 minutes pedestrian flows at the main pedestrian links near the Proposed AMEC and the locations of the concerned pedestrian links are shown in **Figure 2-2**.

Table 5-1 Observed Peak-15 Minute Pedestrian Trips at VTC TY Campus

ID	Location	AM Peak 15-min Flows			PM Peak 15-min Flows		
		Out	In	Total	Out	In	Total
P1	Covered Staircase	1	206	207	512	34	546
P2	Main Access to VTC Campus	0	104	104	83	33	116
P3	Access to Indoor Carpark	1	25	26	23	5	28
P4	Access to Internal Access Road	6	8	14	22	4	26
Total		**8**	**343**	**351**	**640**	**76**	**716**

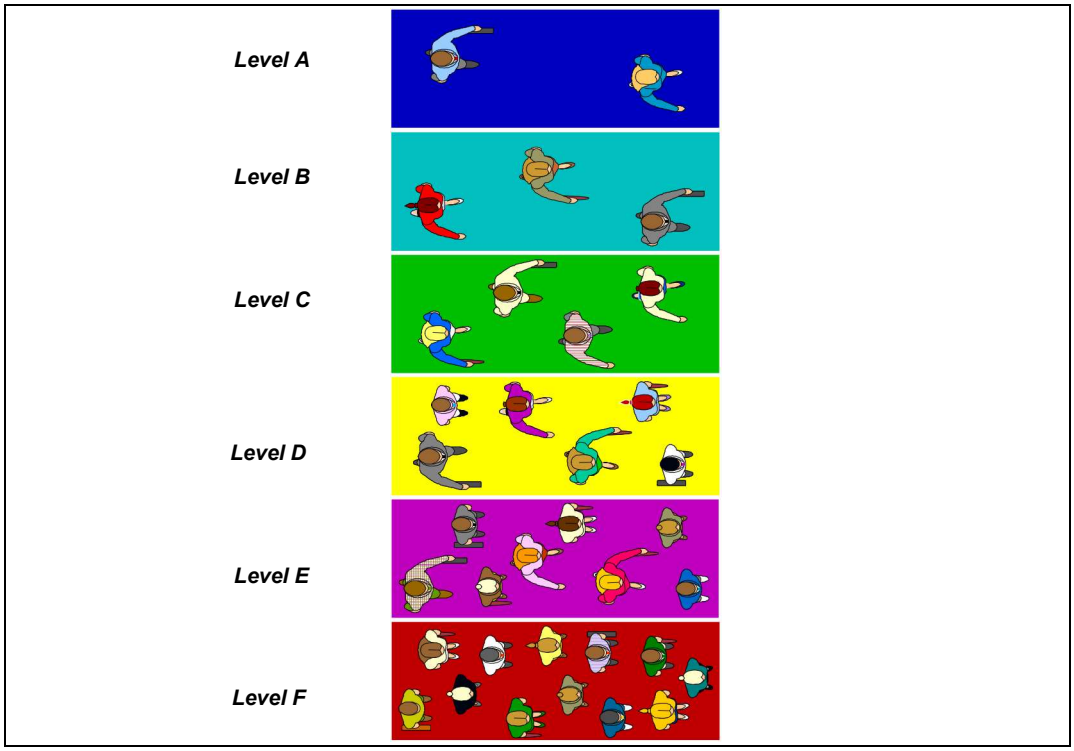
Source: Technical Study for Aircraft and Marine Engineering Centre at Tsing Yi Campus Traffic Impact Study (November 2017), Table 6.1
Notes: (1) refer to Figure 2-2 for locations of pedestrian links.

5.1.2 The performances of footpaths P2, P3 and P4 are assessed based on the Level of Service (LOS) method in accordance with the Transport Planning and Design Manual (Chapter 10.4.2, Volume 6). The definitions of different level of LOS on footpaths are described in **Table 5-2** and shown graphically in **Exihit-1**.

Table 5-2 Description of Level-of-Service (LOS) on Footpaths

LOS	Flow Rate (ped/min/m)	Description
A	≤ 16	Pedestrians basically move in desired paths without altering their movements in response to other pedestrians. Walking speeds are freely selected, and conflicts between pedestrians are unlikely.
B	16 - 23	Sufficient space is provided for pedestrians to freely select their walking speeds, to bypass other pedestrians and to avoid crossing conflicts with others. At this level, pedestrians begin to be aware of other pedestrians and to respond to their presence in the selection of walking paths.
C	23 - 33	Sufficient space is available to select normal walking speeds and to bypass other pedestrians primarily in unidirectional stream. Where reverse direction or crossing movement exists, minor conflicts will occur, and speed and volume will be somewhat lower.
D	33 - 49	Freedom to select individual walking speeds and bypass other pedestrians is restricted. Where crossing or reverse-flow movements exist, the probability of conflicts is high and its avoidance requires changes of speeds and position. The LOS provides reasonable fluid flow; however considerable friction and interactions between pedestrians are likely to occur.
E	49 - 75	Virtually, all pedestrians would have their normal walking speeds restricted. At the lower range of this LOS, forward movement is possible only by shuffling. Space is insufficient to pass over slower pedestrians. Cross- and reverse-movement are possible only with extreme difficulties. Design volumes approach the limit of walking capacity with resulting stoppages and interruptions to flow.
F	> 75	Walking speeds are severely restricted. Forward progress is made only by shuffling. There are frequent and unavoidable conflicts with other pedestrians. Cross- and reverse-movements are virtually impossible. Flow is sporadic and unstable. Space is more characteristics of queued pedestrians than of moving pedestrian streams.

Exhibit-1 Graphical Presentation of Level of Service (LOS)



5.1.3 The performance of stairs P1 is assessed with reference to the guidelines in Highway Capacity Manual 2010 and as described in **Table 5-3**.

Table 5-3 Description of Level-of-Service (LOS) for Stairs

LOS	Flow Rate (ped/min/m)	Description
A	≤ 16	Sufficient area is provided to freely select locomotion speed, and to bypass other slower-moving pedestrians. No serious difficulties would be experienced with reverse traffic flows.
B	16 – 20	Lower range of area occupancy, some difficulties would be experienced in passing slower pedestrians. Reverse flows would cause minor traffic conflicts.
C	20 – 26	Locomotion speeds would be restricted slightly, due to an inability to pass slower-moving pedestrians. Minor reverse traffic flows would encounter some difficulties.
D	26 – 36	Locomotion speeds are restricted for the majority of persons, due to the limited open tread space and an inability to bypass slower-moving pedestrians. Reverse flows would encounter significant difficulties and traffic conflict.
E	36 – 49	Virtually all persons would have their normal locomotion speeds reduced, because of the minimum tread length, space and inability to bypass others, intermittent stoppages are likely to occur. Reverse traffic flows would experience serious conflict.
F	> 49	Completed breakdown in traffic flow, with many stoppages.

5.1.4 The LOS of P1, P2, P3 and P4 for the future VTC Campus with the Proposed AMEC are assessed and the results are indicated in **Table 5-4**.

Table 5-4 Level of Services (LOS) Assessment Results

Location[2]	Effective Width[1]	AM Peak Hour			PM Peak hour		
		Peak 15-min 2-way Flow	Flow Rate (ped/min/m)	LOS	Peak 15-min 2-way Flow	Flow Rate (ped/min/m)	LOS
P1	4.3	207	3.2	A	546	8.5	A
P2	3.3	104	2.1	A	116	2.3	A
P3	3.0	26	0.6	A	28	0.6	A
P4	0.6	14	1.6	A	26	2.9	A

Notes: (1) Effective width = Actual width minus 1.0m shy zone
(2) Refer to Figure 2-2 for location of pedestrian link

5.1.5 The results indicate that LOS A could be achieved at all the concerned footpaths for both the AM and PM peak hours, i.e. indicating that the pedestrian links have sufficient capacity to accommodate the pedestrian flows with the Proposed AMEC.

5.2 Public Transport Review

5.2.1 At present, around 65% of the students adopt public transport services, including franchised bus and minibus services, to access the VTC TY Campus. Since the Proposed AMEC will not generate additional students, the demand for public transport services after the operation of the Proposed AMEC would be similar to the existing situation, i.e. no additional public transport services would be required.

6 SUMMARY AND CONCLUSIONS

6.1 Summary

6.1.1 The Vocational Training Council (VTC) intend to redevelop the northern portion of the existing VTC campus in Tsing Yi for an Aviation and Maritime Education Centre (AMEC) which will provide workshops, laboratories, teaching facilities, staff offices and associated facilities to provide practical training for 1000 nos. of students who come from the related programmes offered at the TY Campus in each academic year, i.e. the Proposed AMEC will not generate additional students/ staff.

6.1.2 Ozzo Technology (HK) Limited are commissioned to undertake this Traffic Impact Assessment (TIA) Study to assess the traffic impact on the nearby road network after the completion of the Proposed AMEC in 2025.

6.1.3 The Project Site is well served by public transport, including franchised bus, GMB services and VTC shuttle bus services. Due to the abnormal traffic conditions in the territory as a result of the outbreak of coronavirus diseases, reference is made to traffic and pedestrian data obtained in 2017, in which school activities are normal, as the basis for estimating the future traffic.

6.1.4 The planned completion for the Proposed Development is 2025 and hence the “Design Year” for this study is set as 2028, i.e. 3 years after the completion year. The 2028 Background Traffic Flows are estimated taking into account the historical trend of traffic growth in the area and the forecast development intensity in the area.

6.1.5 The peak hour trips to be generated by the planned and committed developments are added to the 2028 Peak Hour Background Flows to derive the 2028 Peak Hour Reference Flows (i.e. without the Proposed Development). Since the Proposed AMEC will not increase the no. of students/staff in the VTC TY Campus, no additional traffic would therefore be generated by the Proposed AMEC, the 2028 Peak Hour Design Flows (i.e. with the Proposed Development) will be the same as the 2028 Reference Flows.

6.1.6 Junction Capacity assessments are undertaken based on the 2028 Peak Hour Design Flows (i.e. with the Proposed AMEC). The assessment results indicate that all the key junctions in the vicinity of the proposed development would perform satisfactorily during the AM and PM peak periods.

6.1.7 Pedestrian impact assessments are also undertaken to assess the performance of the stairs and footpaths at the accesses to VTC campus. The results of the assessments indicate that the concerned stairs and footpaths would perform satisfactorily with sufficient spare capacity during the peak hour with the operation of the Proposed AMEC.

6.1.8 Since the Proposed AMEC will not generate additional students, the demand for public transport services after the operation of the Proposed AMEC would be similar to the existing situation, i.e. no additional public transport services would be required.

6.2 Conclusions

6.2.1 In view of the traffic impact assessment results, it is concluded that the Proposed AMEC Development would not create adverse impact on the surrounding road network and public transport services.

Figures

OZZO TECHNOLOGY

Scale 1:5000

Traffic Impact Assessment Study for Aviation and Maritime Education Centre at VTC Campus (Tsing Yi)

Site Location and Study Area

VTC

Project No. 81882

Dwg No. Figure 2-1

Rev. -

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P4
P3
P1
P2
Tsing Sha Highway
TSING SHA HIGHWAY
Tsing Yi Road
TSING YI ROAD
Sai Sham Road
TSING HUNG ROAD
Hong Kong Institute of Vocational Education (Tsing Yi)
Technological and Higher Education Institute of Hong Kong
VTC Ching Yi Halls of Residence
Assembly Hall
Basketball Court
Tennis Court
Mayfair Gardens
SAI SHAN
WIP Jan 2019
WIP Mar 2019
0 15 30 45 60

Legend:

- VTC Campus
- Proposed Aviation and Maritime Education Centre (AMEC)
- Vehicular Access
- Pedestrian Access

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Traffic Impact Assessment Study for Aviation and Maritime Education Centre at VTC Campus (Tsing Yi)

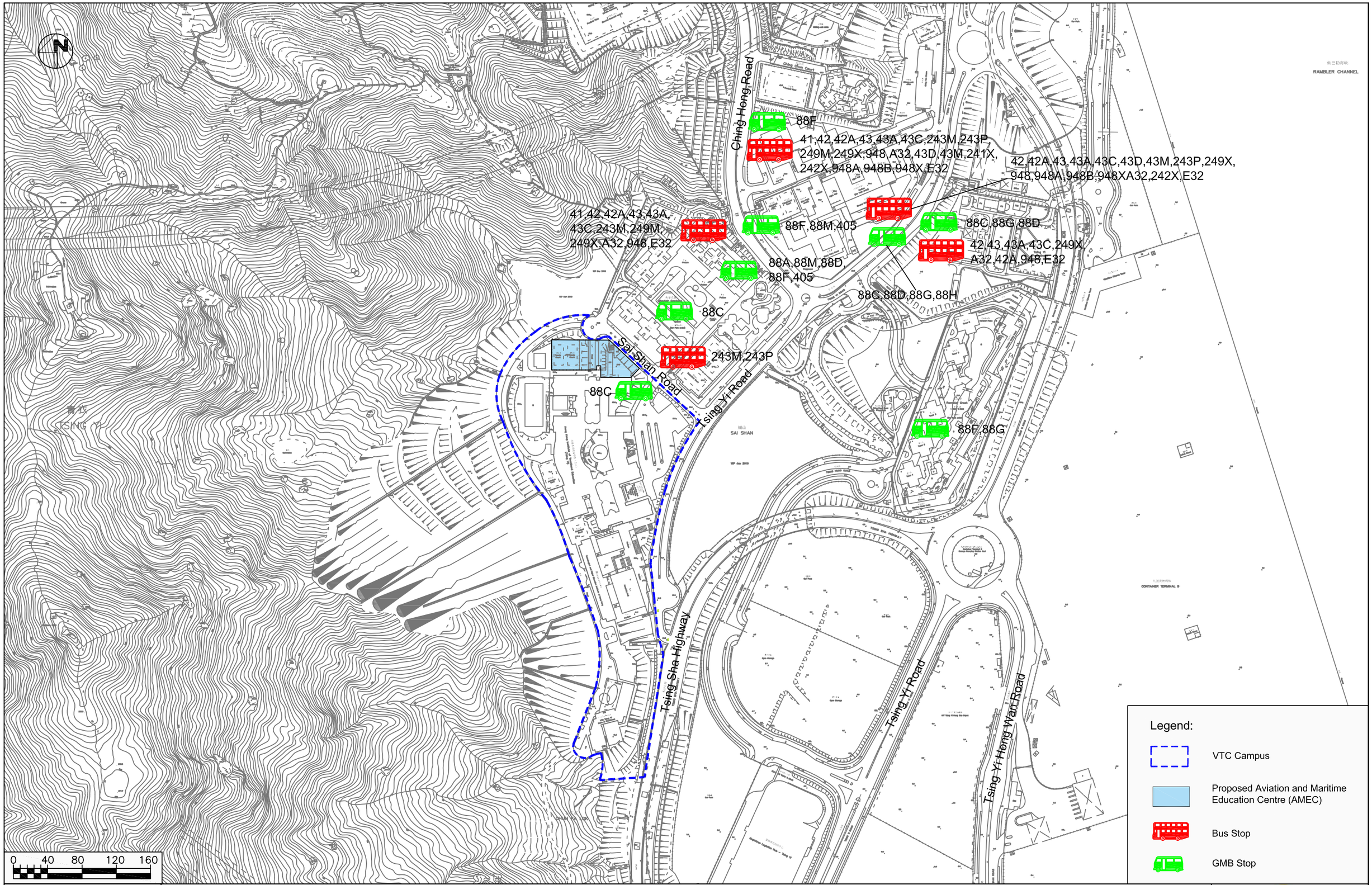
Existing Vehicular and Pedestrian Access Arrangement

VTC

Project No. 81882

Rev. -

Dwg No. Figure 2-2



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Traffic Impact Assessment Study for Aviation and Maritime Education Centre at VTC Campus (Tsing Yi)

Existing Public Transport Inventory

VTC

Project No. 81882

Dwg No. Figure 3-1

Rev. -

Traffic Impact Assessment Study for Aviation and Maritime Education Centre at VTC Campus (Tsing Yi)

Locations of The Surveyed Junctions

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VTC

Project No. 81882

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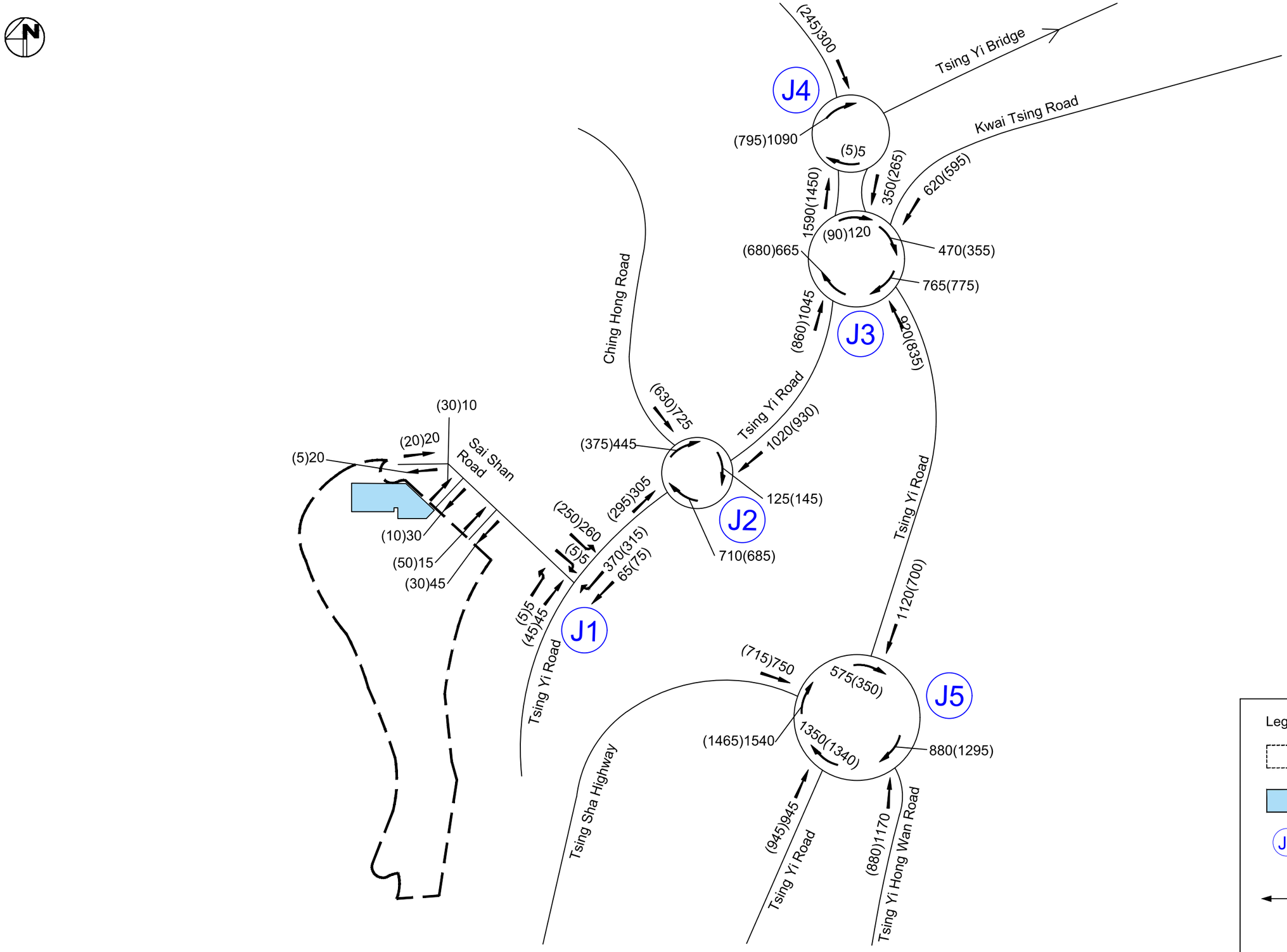

Legend:

- VTC Campus
- Proposed Aviation and Maritime Education Centre (AMEC)
- J1 — Surveyed Junction
- 123(123) — AM Peak Hour Traffic Flows / PM Peak Hour Traffic Flows

Note: Traffic Flows at Junction in PCU values
Minor Road not shown for Clarity

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Scale N.T.S

Traffic Impact Assessment Study for Aviation and Maritime Education Centre at VTC Campus (Tsing Yi)

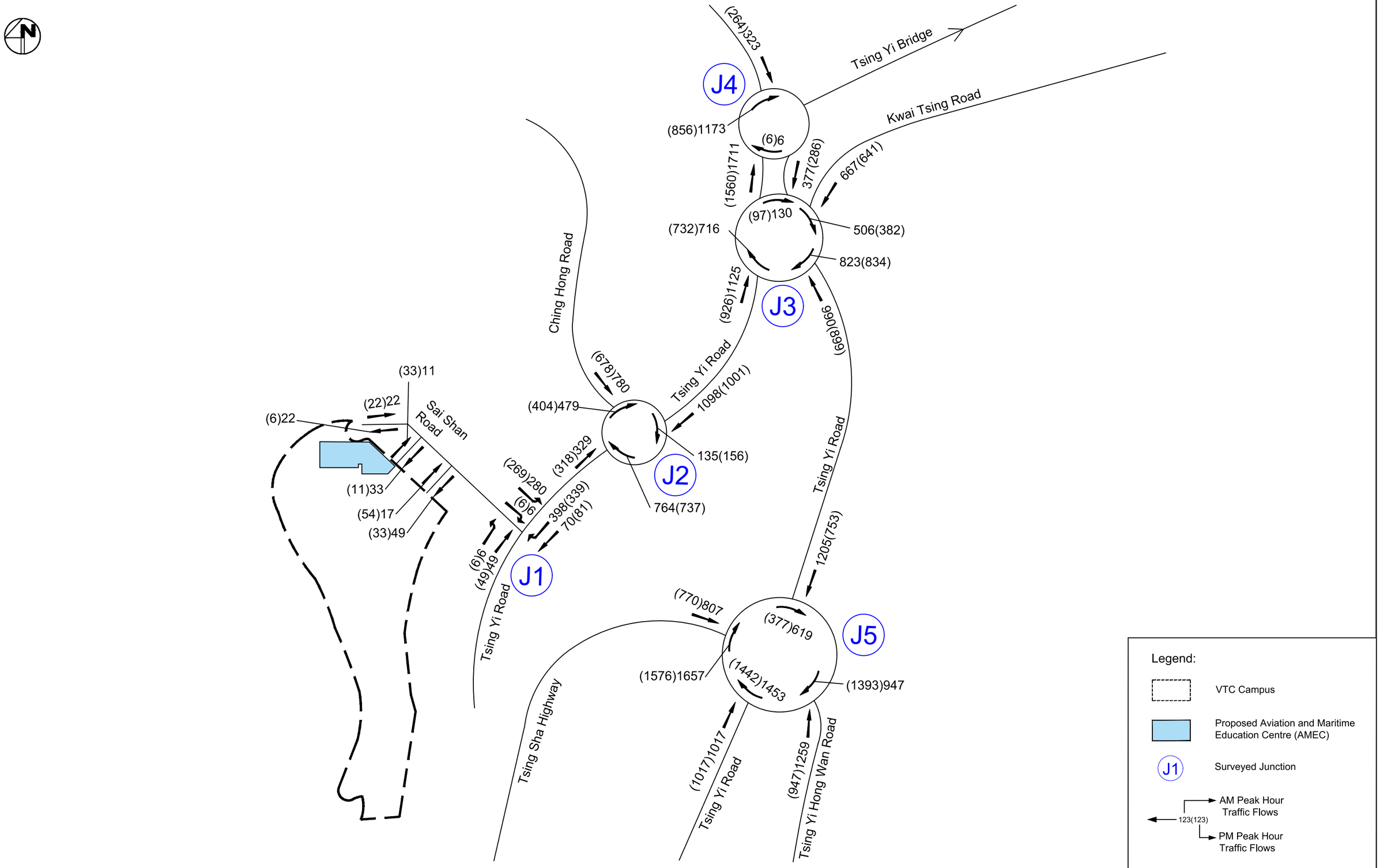
2017 Observed Peak Hour Traffic Flows

VTC

Project No. 81882

Rev. A

Dwg No. Figure 3-3



OZZO TECHNOLOGY

Scale N.T.S

Traffic Impact Assessment Study for Aviation and Maritime Education Centre at VTC Campus (Tsing Yi)

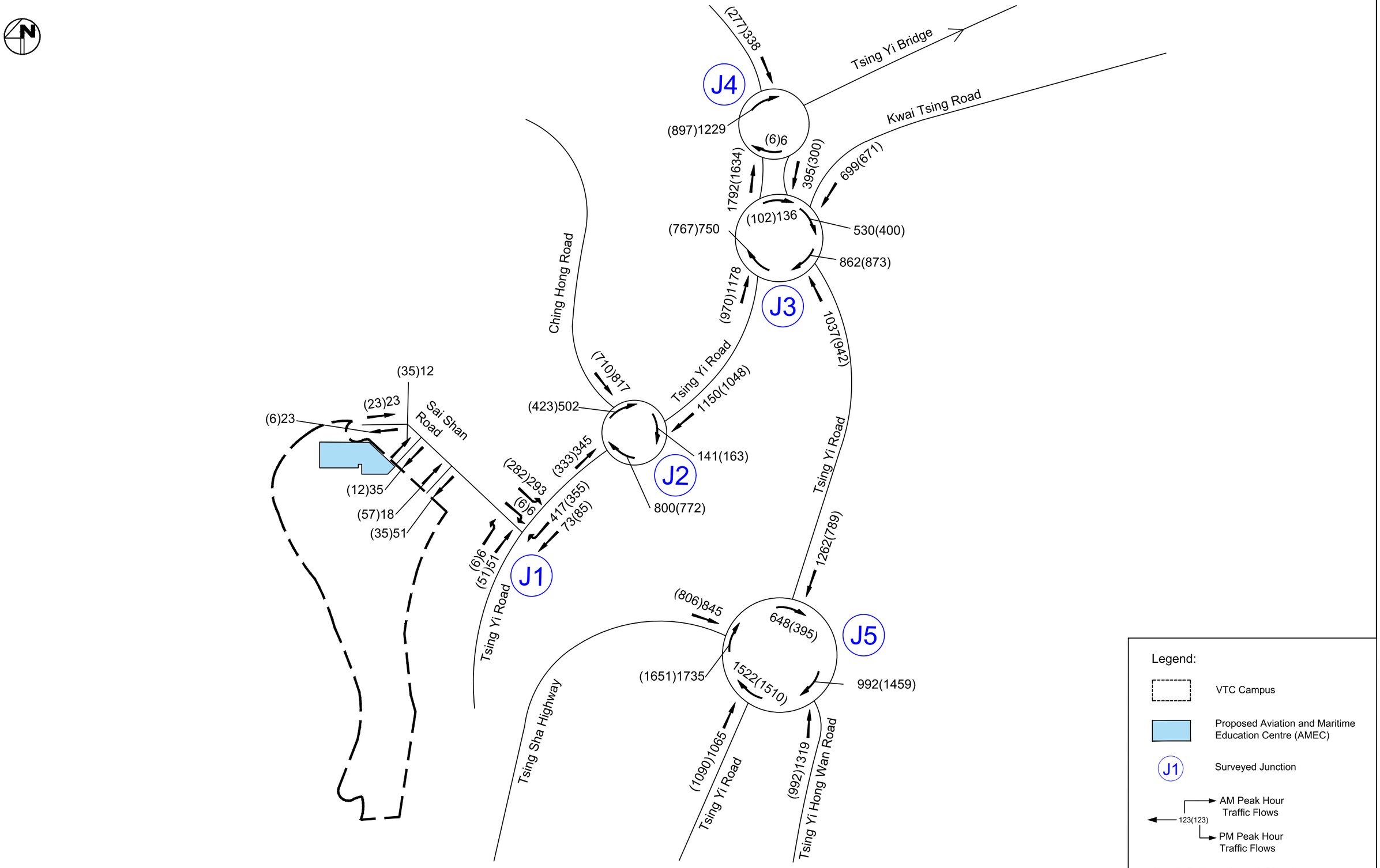
2020 Derived Peak Hour Traffic Flows

VTC

Project No. 81882

Rev. -

Dwg No. Figure 3-4



OZZO TECHNOLOGY

Scale N.T.S

Traffic Impact Assessment Study for Aviation and Maritime Education Centre at VTC Campus (Tsing Yi)

2028 Background Peak Hour Traffic Flows

VTC

Project No. 81882

Rev. A

Dwg No. Figure 4-1

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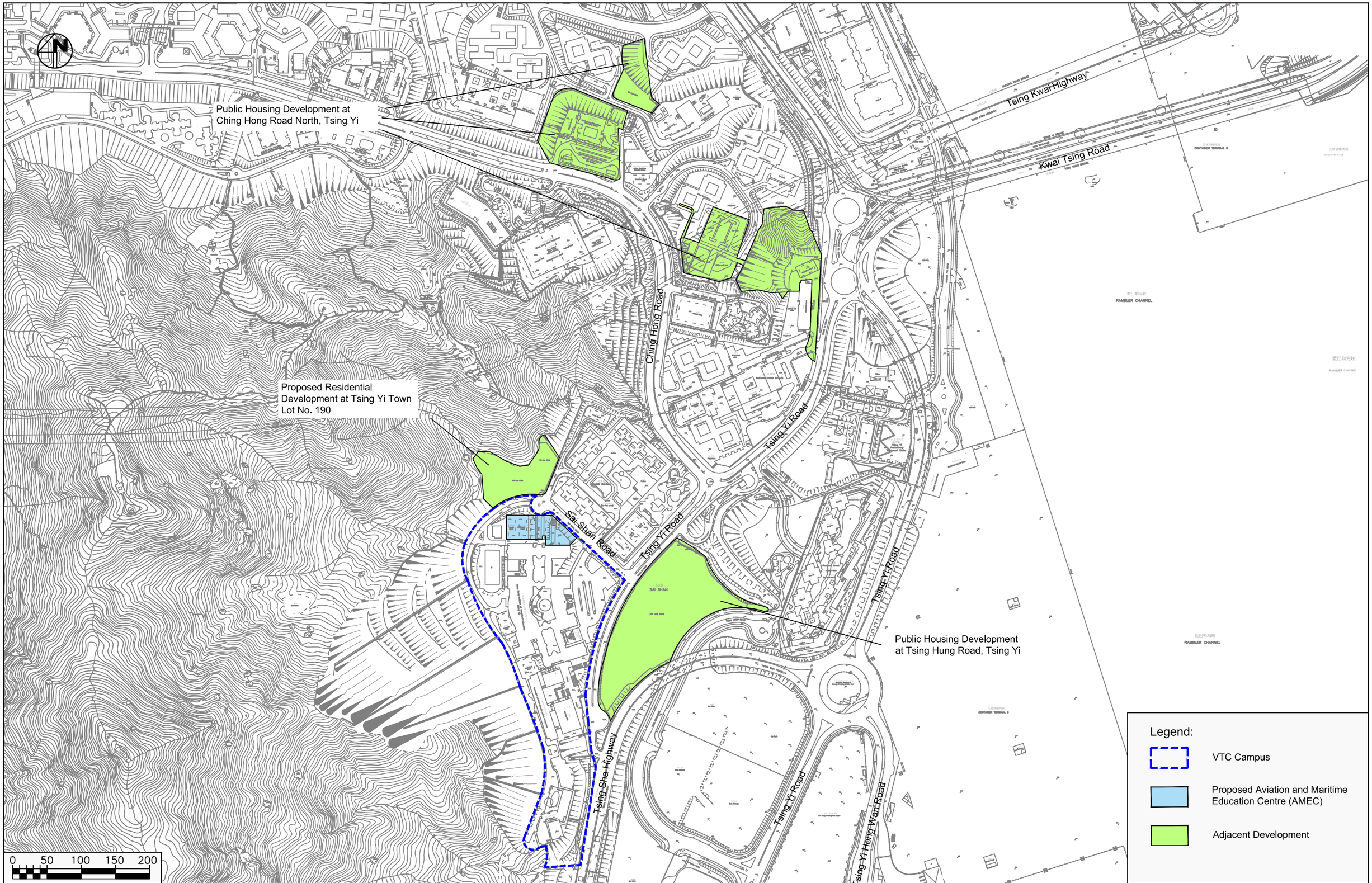

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Traffic Impact Assessment Study for Aviation and Maritime Education Centre at VTC Campus (Tsing Yi)

Location of Planned / Committed Developments

VTC

Project No. 81882

Dwg No. Figure 4-2

Rev. -

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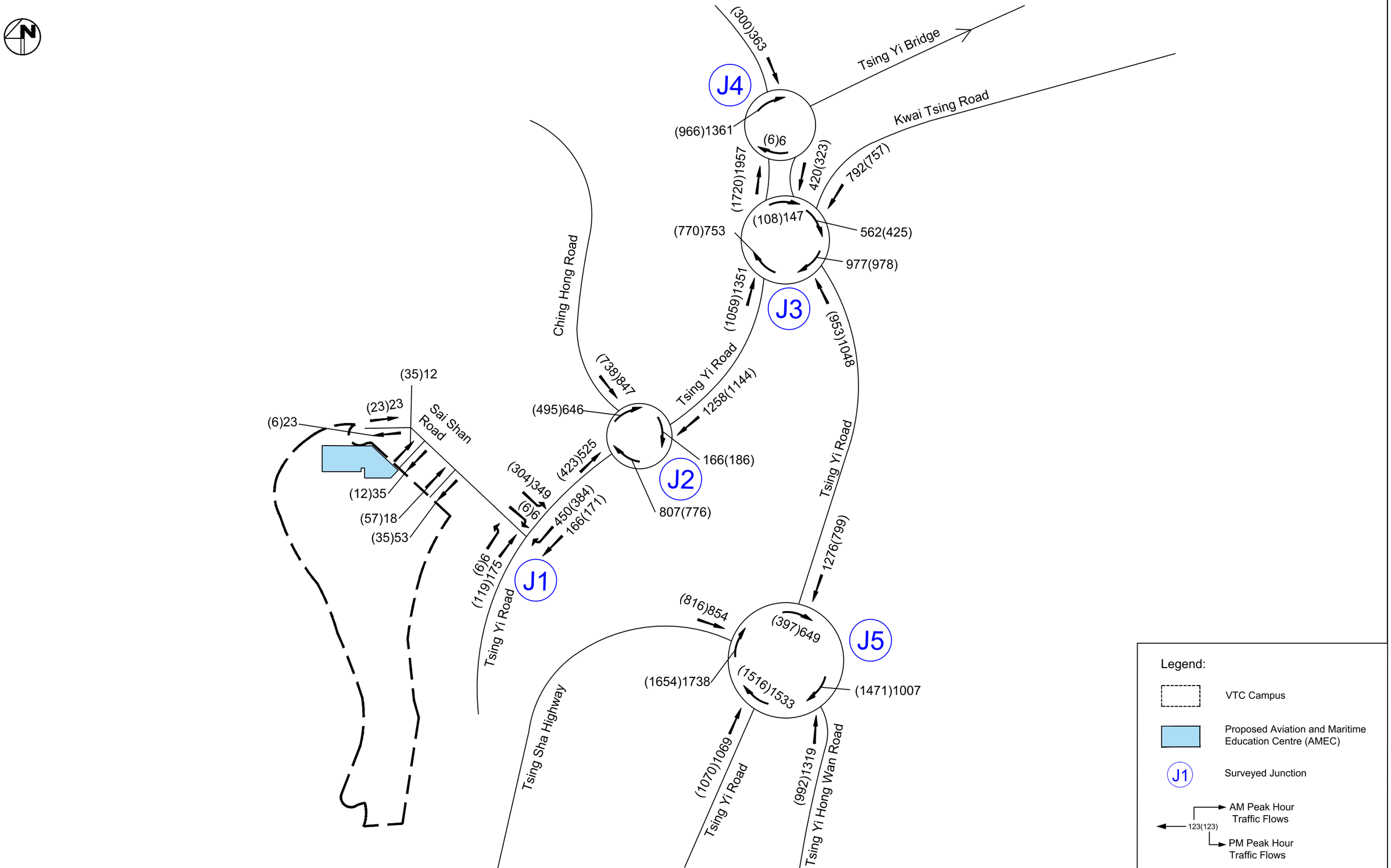

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Scale N.T.S

Traffic Impact Assessment Study for Aviation and Maritime Education Centre at VTC Campus (Tsing Yi)

2028 Design Peak Hour Traffic Flows

VTC

Project No. 81882

Dwg No. Figure 4-3

Rev. A

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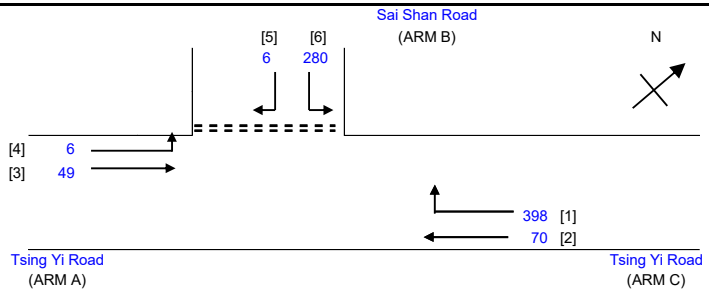
Appendix A

2020 Junction Calculation Sheets

OZZO TECHNOLOGY (HK) LIMITED	PRIORITY JUNCTION CALCULATION			INITIALS
VTC Proposed Aviation and Maritime Education Centre, Tsing Yi		PROJECT NO.: 81882	PREPARED BY:	LL
J1: Tsing Yi Road / Sai Shan Road	**2020AM**	FILENAME :	CHECKED BY:	MM
2020 Derived AM Peak Hour Traffic Flow		J1 TsingYiRd_SaiShaRd_P.xls	REVIEWED BY:	OC



NOTES : (GEOMETRIC INPUT DATA)

W	=	MAJOR ROAD WIDTH
W cr	=	CENTRAL RESERVE WIDTH
W b-a	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM b-a
W b-c	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM b-c
W c-b	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM c-b
Vl b-a	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM b-a
Vr b-a	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM b-a
Vr b-c	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM b-c
Vr c-b	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM c-b
D	=	STREAM-SPECIFIC B-A
E	=	STREAM-SPECIFIC B-C
F	=	STREAM-SPECIFIC C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS:

MAJOR ROAD (ARM A)

W	=	14.4	(metres)
W cr	=	2	(metres)
q a-b	=	6	(pcu/hr)
q a-c	=	49	(pcu/hr)

MAJOR ROAD (ARM C)

W c-b	=	3.7	(metres)
Vr c-b	=	53.5	(metres)
q c-a	=	70	(pcu/hr)
q c-b	=	398	(pcu/hr)

MINOR ROAD (ARM B)

W b-a	=	3.6	(metres)
W b-c	=	3.6	(metres)
Vl b-a	=	95.3	(metres)
Vr b-a	=	100	(metres)
Vr b-c	=	100	(metres)
q b-a	=	6	(pcu/hr)
q b-c	=	280	(pcu/hr)

GEOMETRIC FACTORS :

D	=	0.9449497
E	=	0.9770154
F	=	0.9423142
Y	=	0.502855
F for (Qb-ac)	=	0.979021

THE CAPACITY OF MOVEMENT :

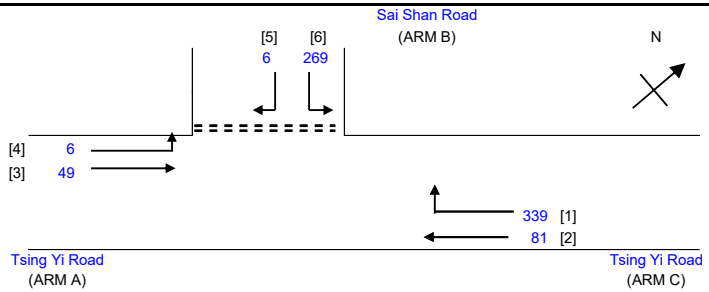
Q b-a	=	504	
Q b-c	=	719	
Q c-b	=	693	
Q b-ac	=	712.6	
TOTAL FLOW	=	803	(PCU/HR)

COMPARISION OF DESIGN FLOW TO CAPACITY:

DFC b-a	=	0.0119
DFC c-b	=	0.5743

CRITICAL DFC = 0.57

OZZO TECHNOLOGY (HK) LIMITED	PRIORITY JUNCTION CALCULATION		INITIALS
VTC Proposed Aviation and Maritime Education Centre, Tsing Yi	PROJECT NO.: 81882	PREPARED BY:	LL
J1: Tsing Yi Road / Sai Shan Road	**2020PM**	CHECKED BY:	MM
2020 Derived PM Peak Hour Traffic Flow	FILENAME : J1 TsingYiRd_SaiShaRd_P.xls	REVIEWED BY:	OC



NOTES : (GEOMETRIC INPUT DATA)

W	=	MAJOR ROAD WIDTH
W cr	=	CENTRAL RESERVE WIDTH
W b-a	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM b-a
W b-c	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM b-c
W c-b	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM c-b
Vl b-a	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM b-a
Vr b-a	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM b-a
Vr b-c	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM b-c
Vr c-b	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM c-b
D	=	STREAM-SPECIFIC B-A
E	=	STREAM-SPECIFIC B-C
F	=	STREAM-SPECIFIC C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS:

MAJOR ROAD (ARM A)

W	=	14.4	(metres)
W cr	=	2	(metres)
q a-b	=	6	(pcu/hr)
q a-c	=	49	(pcu/hr)

MAJOR ROAD (ARM C)

W c-b	=	3.7	(metres)
Vr c-b	=	53.5	(metres)
q c-a	=	81	(pcu/hr)
q c-b	=	339	(pcu/hr)

MINOR ROAD (ARM B)

W b-a	=	3.6	(metres)
W b-c	=	3.6	(metres)
Vl b-a	=	95.3	(metres)
Vr b-a	=	100	(metres)
Vr b-c	=	100	(metres)
q b-a	=	6	(pcu/hr)
q b-c	=	269	(pcu/hr)

GEOMETRIC FACTORS :

D	=	0.9449497
E	=	0.9770154
F	=	0.9423142
Y	=	0.502855
F for (Qb-ac)	=	0.9781818

THE CAPACITY OF MOVEMENT :

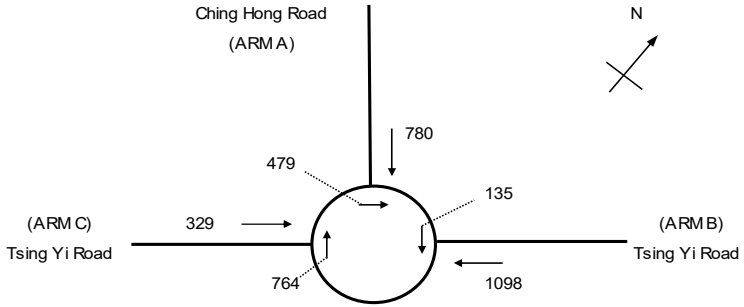
Q b-a	=	517	
Q b-c	=	719	
Q c-b	=	693	
Q b-ac	=	712.9	
TOTAL FLOW	=	744	(PCU/HR)

COMPARISION OF DESIGN FLOW TO CAPACITY:

DFC b-a	=	0.0116
DFC c-b	=	0.4892

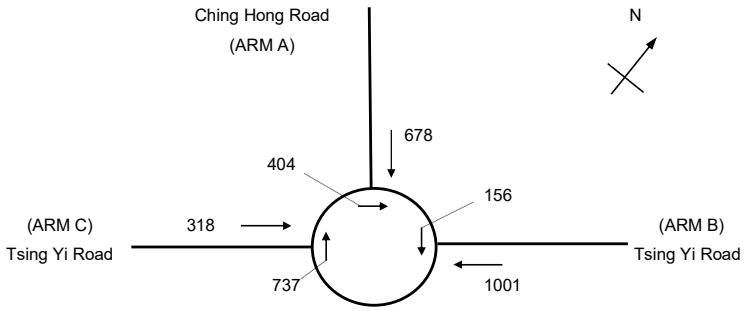
CRITICAL DFC = 0.49

OZZO TECHNOLOGY (HK) LIMITED	TRAFFIC SIGNAL CALCULATION			INITIALS
VTC Proposed Aviation and Maritime Education Centre, Tsing Yi		PROJECT NO.: 81882	PREPARED BY:	LL
J2: Tsing Yi Road / Ching Hong Road Roundabout	2020AM	FILENAME :	CHECKED BY:	MM
2020 Derived AM Peak Hour Traffic Flow		J2 TsingYiRd_ChingHongRd_R.xls	REVIEWED BY:	OC



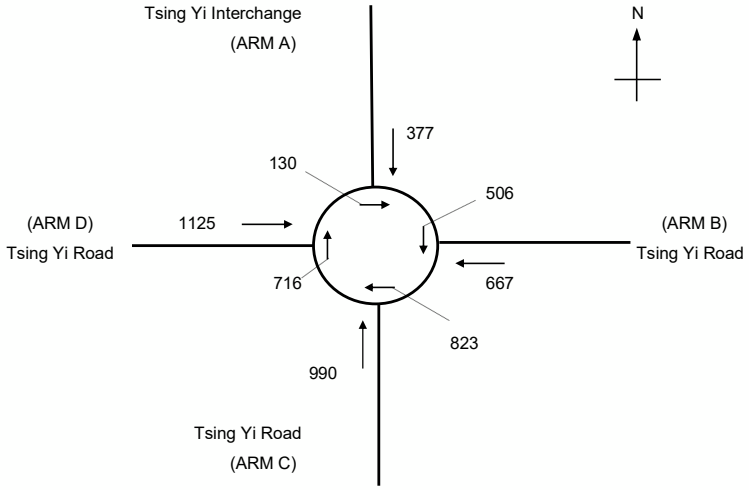
ARM			A	B	C	D			
INPUT PARAMETERS:									
V	=	Approach half width (m)	7.0	7.2	5.0	0.0			
E	=	Entry width (m)	7.6	8.7	9.2	0.0			
L	=	Effective length of flare (m)	3.4	5.8	14.7	0.0			
R	=	Entry radius (m)	23.1	24.3	24.1	0.0			
D	=	Inscribed circle diameter (m)	30.0	30.0	30.0	0.0			
A	=	Entry angle (degree)	10.0	28.0	20.0	0.0			
Q	=	Entry flow (pcu/h)	780	1098	329	0			
Qc	=	Circulating flow across entry (pcu/h)	479	135	764	0			
OUTPUT PARAMETERS:									
S	=	Sharpness of flare = 1.6(E-V)/L	0.29	0.42	0.45	0.00			
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.08	1.02	1.04	0.00			
X2	=	V + ((E-V)/(1+2S))	7.39	8.02	7.22	0.00			
M	=	EXP((D-60)/10)	0	0	0	0			
F	=	303*X2	2240	2429	2188	0			
Td	=	1+(0.5/(1+M))	1.48	1.48	1.48	0.00			
Fc	=	0.21*Td(1+0.2*X2)	0.77	0.81	0.76	0.00			
Qe	=	K(F-Fc*Qc)	2014	2357	1678	0	Total In Sum =	2207	PCU
DFC	=	Design flow/Capacity = Q/Qe	0.39	0.47	0.20	0.00	DFC of Critical Approach =	0.47	

OZZO TECHNOLOGY (HK) LIMITED	TRAFFIC SIGNAL CALCULATION			INITIALS
VTC Proposed Aviation and Maritime Education Centre, Tsing Yi		PROJECT NO.: 81882	PREPARED BY:	LL
J2: Tsing Yi Road / Ching Hong Road Roundabout	2020PM	FILENAME :	CHECKED BY:	MM
2020 Derived PM Peak Hour Traffic Flow		J2 TsingYiRd_ChingHongRd_R.xls	REVIEWED BY:	OC



ARM			A	B	C	D			
INPUT PARAMETERS:									
V	=	Approach half width (m)	7.0	7.2	5.0	0.0			
E	=	Entry width (m)	7.6	8.7	9.2	0.0			
L	=	Effective length of flare (m)	3.4	5.8	14.7	0.0			
R	=	Entry radius (m)	23.1	24.3	24.1	0.0			
D	=	Inscribed circle diameter (m)	30.0	30.0	30.0	0.0			
A	=	Entry angle (degree)	10.0	28.0	20.0	0.0			
Q	=	Entry flow (pcu/h)	678	1001	318	0			
Qc	=	Circulating flow across entry (pcu/h)	404	156	737	0			
OUTPUT PARAMETERS:									
S	=	Sharpness of flare = 1.6(E-V)/L	0.29	0.42	0.45	0.00			
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.08	1.02	1.04	0.00			
X2	=	V + ((E-V)/(1+2S))	7.39	8.02	7.22	0.00			
M	=	EXP((D-60)/10)	0	0	0	0			
F	=	303*X2	2240	2429	2188	0			
Td	=	1+(0.5/(1+M))	1.48	1.48	1.48	0.00			
Fc	=	0.21*Td(1+0.2*X2)	0.77	0.81	0.76	0.00			
Qe	=	K(F-Fc*Qc)	2076	2340	1699	0	Total In Sum =	1997	PCU
DFC	=	Design flow/Capacity = Q/Qe	0.33	0.43	0.19	0.00	DFC of Critical Approach =	0.43	

OZZO TECHNOLOGY (HK) LIMITED	TRAFFIC SIGNAL CALCULATION			INITIALS
VTC Proposed Aviation and Maritime Education Centre, Tsing Yi		PROJECT NO.: 81882	PREPARED BY:	LL
J3: Tsing Yi Road / Kwai Tsing Road Tsing Yi Bridge	**2020AM**	FILENAME :	CHECKED BY:	MM
2020 Derived AM Peak Hour Traffic Flow		J3 TsingYiRd_TsingYi INT_R.xls	REVIEWED BY:	OC

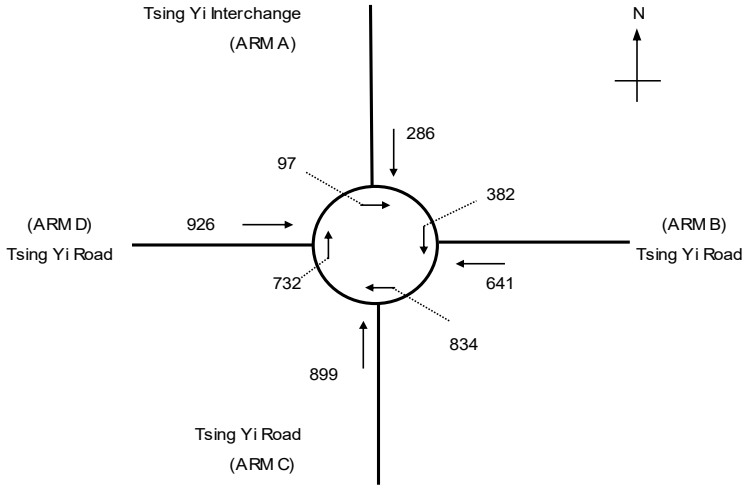


ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.5	7.2	7.8	7.5
E	=	Entry width (m)	10.3	10.1	11.4	9.3
L	=	Effective length of flare (m)	5.9	5.0	6.2	3.2
R	=	Entry radius (m)	21.5	43.4	10.2	33.7
D	=	Inscribed circle diameter (m)	60.0	60.0	60.0	60.0
A	=	Entry angle (degree)	34.0	32.0	60.0	33.0
Q	=	Entry flow (pcu/h)	377	667	990	1125
Qc	=	Circulating flow across entry (pcu/h)	130	506	823	716
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.77	0.93	0.93	0.92
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	0.99	1.02	0.85	1.01
X2	=	V + ((E-V)/(1+2S))	8.58	8.23	9.02	8.15
M	=	EXP((D-60)/10)	1	1	1	1
F	=	303*X2	2600	2494	2733	2469
Td	=	1+(0.5/(1+M))	1.25	1.25	1.25	1.25
Fc	=	0.21*Td(1+0.2*X2)	0.71	0.69	0.74	0.69
Qe	=	K(F-Fc*Qc)	2481	2184	1807	1994
DFC	=	Design flow/Capacity = Q/Qe	0.15	0.31	0.55	0.56

Total In Sum = 3159 PCU

DFC of Critical Approach = 0.56

OZZO TECHNOLOGY (HK) LIMITED	TRAFFIC SIGNAL CALCULATION			INITIALS
VTC Proposed Aviation and Maritime Education Centre, Tsing Yi		PROJECT NO.: 81882	PREPARED BY:	LL
J3: Tsing Yi Road / Kwai Tsing Road Tsing Yi Bridge	**2020PM**	FILENAME :	CHECKED BY:	MM
2020 Derived PM Peak Hour Traffic Flow		J3 TsingYiRd_TsingYi INT_R.xls	REVIEWED BY:	OC

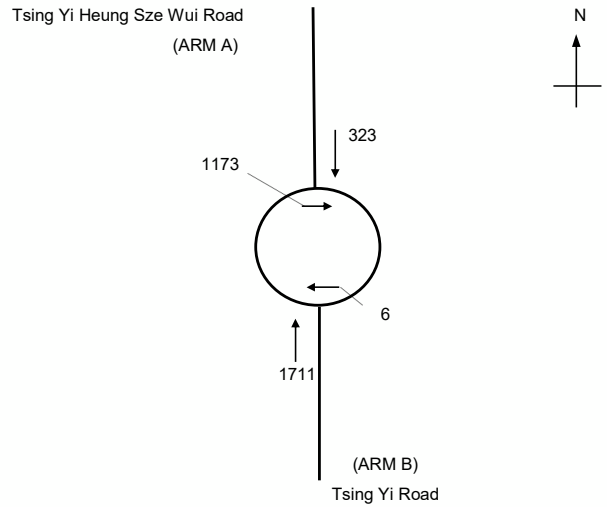


ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.5	7.2	7.8	7.5
E	=	Entry width (m)	10.3	10.1	11.4	9.3
L	=	Effective length of flare (m)	5.9	5.0	6.2	3.2
R	=	Entry radius (m)	21.5	43.4	10.2	33.7
D	=	Inscribed circle diameter (m)	60.0	60.0	60.0	60.0
A	=	Entry angle (degree)	34.0	32.0	60.0	33.0
Q	=	Entry flow (pcu/h)	286	641	899	926
Qc	=	Circulating flow across entry (pcu/h)	97	382	834	732
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.77	0.93	0.93	0.92
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	0.99	1.02	0.85	1.01
X2	=	V + ((E-V)/(1+2S))	8.58	8.23	9.02	8.15
M	=	EXP((D-60)/10)	1	1	1	1
F	=	303*X2	2600	2494	2733	2469
Td	=	1+(0.5/(1+M))	1.25	1.25	1.25	1.25
Fc	=	0.21*Td(1+0.2*X2)	0.71	0.69	0.74	0.69
Qe	=	K(F-Fc*Qc)	2504	2272	1800	1983
DFC	=	Design flow/Capacity = Q/Qe	0.11	0.28	0.50	0.47

Total In Sum = 2752 PCU

DFC of Critical Approach = 0.50

OZZO TECHNOLOGY (HK) LIMITED	TRAFFIC SIGNAL CALCULATION			INITIALS
VTC Proposed Aviation and Maritime Education Centre, Tsing Yi		PROJECT NO.: 81882	PREPARED BY:	LL
J4: Tsing Yi Interchange	**2020AM**	FILENAME :	CHECKED BY:	MM
2020 Derived AM Peak Hour Traffic Flow		TsingYiRd_TsingYiHeungSzeWuiRd_R.xls	REVIEWED BY:	OC

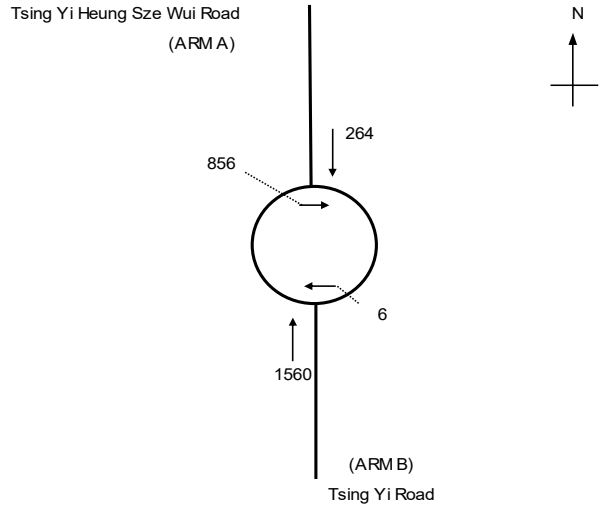


ARM			A	B
INPUT PARAMETERS:				
V	=	Approach half width (m)	5.8	7.4
E	=	Entry width (m)	9.2	8.7
L	=	Effective length of flare (m)	4.8	7.1
R	=	Entry radius (m)	18.1	44.5
D	=	Inscribed circle diameter (m)	60.0	60.0
A	=	Entry angle (degree)	45.0	29.0
Q	=	Entry flow (pcu/h)	323	1711
Qc	=	Circulating flow across entry (pcu/h)	1173	6
OUTPUT PARAMETERS:				
S	=	Sharpness of flare = 1.6(E-V)/L	1.14	0.30
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	0.94	1.03
X2	=	V + ((E-V)/(1+2S))	6.87	8.23
M	=	EXP((D-60)/10)	1	1
F	=	303*X2	2081	2494
Td	=	1+(0.5/(1+M))	1.25	1.25
Fc	=	0.21*Td(1+0.2*X2)	0.62	0.69
Qe	=	K(F-Fc*Qc)	1273	2565
DFC	=	Design flow/Capacity = Q/Qe	0.25	0.67

Total In Sum = 2034 PCU

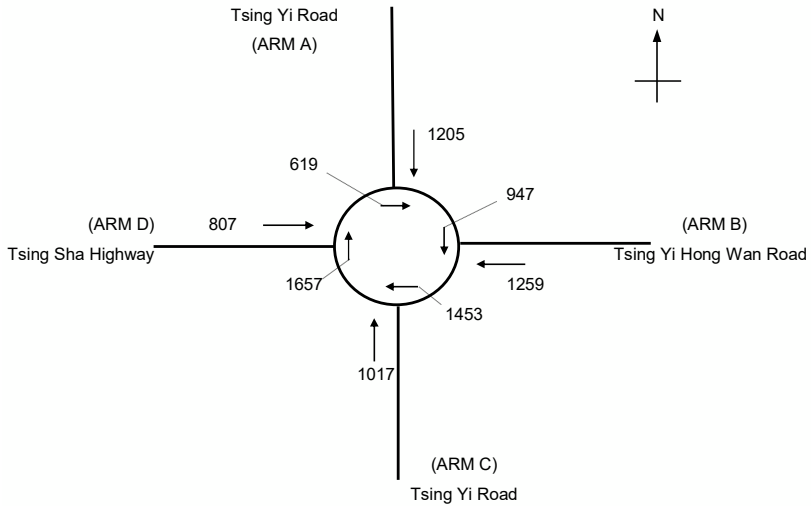
DFC of Critical Approach = 0.67

OZZO TECHNOLOGY (HK) LIMITED	TRAFFIC SIGNAL CALCULATION			INITIALS
VTC Proposed Aviation and Maritime Education Centre, Tsing Yi		PROJECT NO.: 81882	PREPARED BY:	LL
J4: Tsing Yi Interchange	**2020PM**	FILENAME :	CHECKED BY:	MM
2020 Derived PM Peak Hour Traffic Flow		TsingYiRd_TsingYiHeungSzeWuiRd_R.xls	REVIEWED BY:	OC



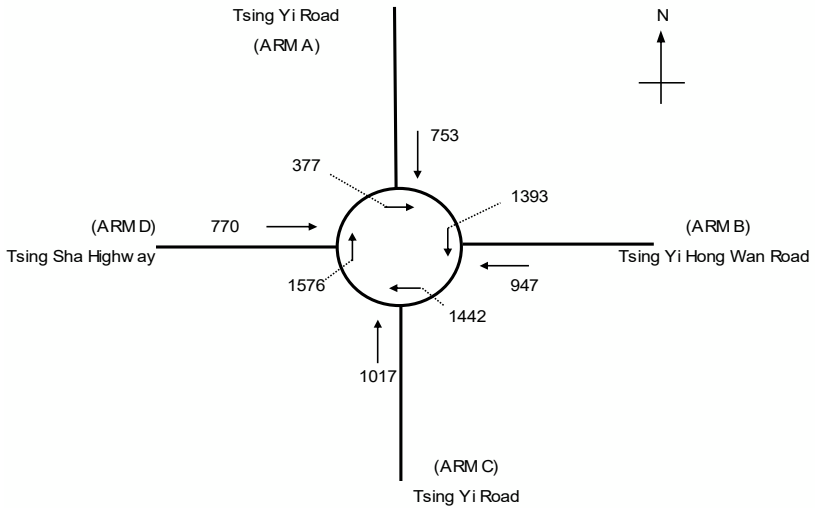
ARM			A	B			
INPUT PARAMETERS:							
V	=	Approach half width (m)	5.8	7.4			
E	=	Entry width (m)	9.2	8.7			
L	=	Effective length of flare (m)	4.8	7.1			
R	=	Entry radius (m)	18.1	44.5			
D	=	Inscribed circle diameter (m)	60.0	60.0			
A	=	Entry angle (degree)	45.0	29.0			
Q	=	Entry flow (pcu/h)	264	1560			
Qc	=	Circulating flow across entry (pcu/h)	856	6			
OUTPUT PARAMETERS:							
S	=	Sharpness of flare = 1.6(E-V)/L	1.14	0.30			
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	0.94	1.03			
X2	=	V + ((E-V)/(1+2S))	6.87	8.23			
M	=	EXP((D-60)/10)	1	1			
F	=	303*X2	2081	2494			
Td	=	1+(0.5/(1+M))	1.25	1.25			
Fc	=	0.21*Td(1+0.2*X2)	0.62	0.69			
Qe	=	K(F-Fc*Qc)	1460	2565	Total In Sum =	1824	PCU
DFC	=	Design flow/Capacity = Q/Qe	0.18	0.61	DFC of Critical Approach =	0.61	

OZZO TECHNOLOGY (HK) LIMITED	TRAFFIC SIGNAL CALCULATION			INITIALS
VTC Proposed Aviation and Maritime Education Centre, Tsing Yi		PROJECT NO.: 81882	PREPARED BY:	LL
J5: Tsing Sha Highway / Tsing Yi Road / Tsing Yi Hong Wan Road	**2020AM**	FILENAME :	CHECKED BY:	MM
2020 Derived AM Peak Hour Traffic Flow		/ay_TsingYiRd_TsingYiHongWanRd_R.xls	REVIEWED BY:	OC



ARM			A	B	C	D			
INPUT PARAMETERS:									
V	=	Approach half width (m)	11.1	9.1	8.0	11.4			
E	=	Entry width (m)	15.1	13.9	13.2	12.4			
L	=	Effective length of flare (m)	27.6	9.9	9.3	9.8			
R	=	Entry radius (m)	45.9	29.5	77.1	73.4			
D	=	Inscribed circle diameter (m)	100.0	100.0	100.0	100.0			
A	=	Entry angle (degree)	18.0	14.0	16.0	12.0			
Q	=	Entry flow (pcu/h)	1205	1259	1017	807			
Qc	=	Circulating flow across entry (pcu/h)	619	947	1453	1657			
OUTPUT PARAMETERS:									
S	=	Sharpness of flare = 1.6(E-V)/L	0.23	0.78	0.91	0.16			
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.07	1.07	1.08	1.10			
X2	=	V + ((E-V)/(1+2S))	13.82	10.94	9.82	12.18			
M	=	EXP((D-60)/10)	55	55	55	55			
F	=	303*X2	4188	3314	2976	3692			
Td	=	1+(0.5/(1+M))	1.01	1.01	1.01	1.01			
Fc	=	0.21*Td(1+0.2*X2)	0.80	0.68	0.63	0.73			
Qe	=	K(F-Fc*Qc)	3950	2865	2239	2729	Total In Sum =	4288	PCU
DFC	=	Design flow/Capacity = Q/Qe	0.31	0.44	0.45	0.30	DFC of Critical Approach =	0.45	

OZZO TECHNOLOGY (HK) LIMITED	TRAFFIC SIGNAL CALCULATION			INITIALS
VTC Proposed Aviation and Maritime Education Centre, Tsing Yi		PROJECT NO.: 81882	PREPARED BY:	LL
J5: Tsing Sha Highway / Tsing Yi Road / Tsing Yi Hong Wan Road	**2020PM**	FILENAME :	CHECKED BY:	MM
2020 Derived PM Peak Hour Traffic Flow		/ay_TsingYiRd_TsingYiHongWanRd_R.xls	REVIEWED BY:	OC

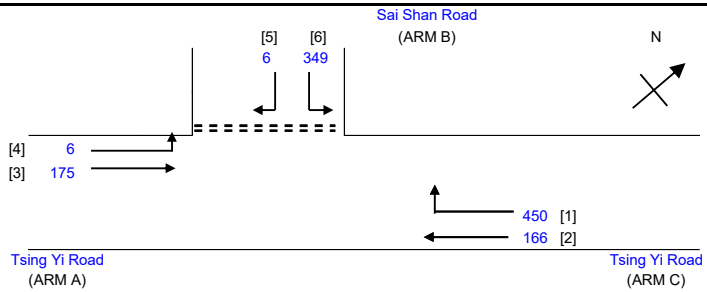


ARM			A	B	C	D			
INPUT PARAMETERS:									
V	=	Approach half width (m)	11.1	9.1	8.0	11.4			
E	=	Entry width (m)	15.1	13.9	13.2	12.4			
L	=	Effective length of flare (m)	27.6	9.9	9.3	9.8			
R	=	Entry radius (m)	45.9	29.5	77.1	73.4			
D	=	Inscribed circle diameter (m)	100.0	100.0	100.0	100.0			
A	=	Entry angle (degree)	18.0	14.0	16.0	12.0			
Q	=	Entry flow (pcu/h)	753	947	1017	770			
Qc	=	Circulating flow across entry (pcu/h)	377	1393	1442	1576			
OUTPUT PARAMETERS:									
S	=	Sharpness of flare = 1.6(E-V)/L	0.23	0.78	0.91	0.16			
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.07	1.07	1.08	1.10			
X2	=	V + ((E-V)/(1+2S))	13.82	10.94	9.82	12.18			
M	=	EXP((D-60)/10)	55	55	55	55			
F	=	303*X2	4188	3314	2976	3692			
Td	=	1+(0.5/(1+M))	1.01	1.01	1.01	1.01			
Fc	=	0.21*Td(1+0.2*X2)	0.80	0.68	0.63	0.73			
Qe	=	K(F-Fc*Qc)	4156	2542	2246	2793	Total In Sum =	3487	PCU
DFC	=	Design flow/Capacity = Q/Qe	0.18	0.37	0.45	0.28	DFC of Critical Approach =	0.45	

Appendix B

2028 Junction Calculation Sheets

OZZO TECHNOLOGY (HK) LIMITED	PRIORITY JUNCTION CALCULATION			INITIALS
VTC Proposed Aviation and Maritime Education Centre, Tsing Yi		PROJECT NO.: 81882	PREPARED BY:	LL
J1: Tsing Yi Road / Sai Shan Road	**2028 Des_AM**	FILENAME :	CHECKED BY:	MM
2028 Design AM Peak Hour Traffic Flow		J1 TsingYiRd_SaiShaRd_P.xls	REVIEWED BY:	OC



NOTES : (GEOMETRIC INPUT DATA)

W	=	MAJOR ROAD WIDTH
W cr	=	CENTRAL RESERVE WIDTH
W b-a	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM b-a
W b-c	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM b-c
W c-b	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM c-b
Vl b-a	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM b-a
Vr b-a	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM b-a
Vr b-c	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM b-c
Vr c-b	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM c-b
D	=	STREAM-SPECIFIC B-A
E	=	STREAM-SPECIFIC B-C
F	=	STREAM-SPECIFIC C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS:

MAJOR ROAD (ARM A)

W	=	14.4	(metres)
W cr	=	2	(metres)
q a-b	=	6.284	(pcu/hr)
q a-c	=	175.3	(pcu/hr)

MAJOR ROAD (ARM C)

W c-b	=	3.7	(metres)
Vr c-b	=	53.5	(metres)
q c-a	=	166.3	(pcu/hr)
q c-b	=	449.8	(pcu/hr)

MINOR ROAD (ARM B)

W b-a	=	3.6	(metres)
W b-c	=	3.6	(metres)
Vl b-a	=	95.3	(metres)
Vr b-a	=	100	(metres)
Vr b-c	=	100	(metres)
q b-a	=	6.284	(pcu/hr)
q b-c	=	349.3	(pcu/hr)

GEOMETRIC FACTORS :

D	=	0.9449497
E	=	0.9770154
F	=	0.9423142
Y	=	0.502855
F for (Qb-ac)	=	0.9823253

THE CAPACITY OF MOVEMENT :

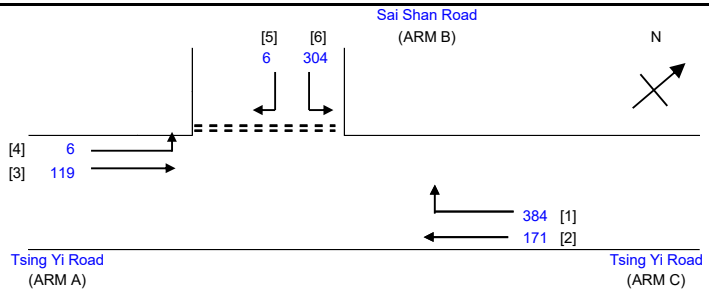
Q b-a	=	459
Q b-c	=	696
Q c-b	=	671
Q b-ac	=	689.7
TOTAL FLOW	=	1147.024399 (PCU/HR)

COMPARISION OF DESIGN FLOW TO CAPACITY:

DFC b-a	=	0.0137
DFC c-b	=	0.6704

CRITICAL DFC = 0.67

OZZO TECHNOLOGY (HK) LIMITED	PRIORITY JUNCTION CALCULATION		INITIALS
VTC Proposed Aviation and Maritime Education Centre, Tsing Yi	PROJECT NO.: 81882	PREPARED BY:	LL
J1: Tsing Yi Road / Sai Shan Road	**2028 Des_PM**	CHECKED BY:	MM
2028 Design PM Peak Hour Traffic Flow	FILENAME : J1 TsingYiRd_SaiShaRd_P.xls	REVIEWED BY:	OC



NOTES : (GEOMETRIC INPUT DATA)

W	=	MAJOR ROAD WIDTH
W cr	=	CENTRAL RESERVE WIDTH
W b-a	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM b-a
W b-c	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM b-c
W c-b	=	LANE WIDTH AVAILABLE TO VEHICLE WAITING IN STREAM c-b
Vl b-a	=	VISIBILITY TO THE LEFT FOR VEHICLES WAITING IN STREAM b-a
Vr b-a	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM b-a
Vr b-c	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM b-c
Vr c-b	=	VISIBILITY TO THE RIGHT FOR VEHICLES WAITING IN STREAM c-b
D	=	STREAM-SPECIFIC B-A
E	=	STREAM-SPECIFIC B-C
F	=	STREAM-SPECIFIC C-B
Y	=	(1-0.0345W)

GEOMETRIC DETAILS:

MAJOR ROAD (ARM A)

W	=	14.4	(metres)
W cr	=	2	(metres)
q a-b	=	6.284	(pcu/hr)
q a-c	=	119.3	(pcu/hr)

MAJOR ROAD (ARM C)

W c-b	=	3.7	(metres)
Vr c-b	=	53.5	(metres)
q c-a	=	170.8	(pcu/hr)
q c-b	=	384.1	(pcu/hr)

MINOR ROAD (ARM B)

W b-a	=	3.6	(metres)
W b-c	=	3.6	(metres)
Vl b-a	=	95.3	(metres)
Vr b-a	=	100	(metres)
Vr b-c	=	100	(metres)
q b-a	=	6.284	(pcu/hr)
q b-c	=	303.7	(pcu/hr)

GEOMETRIC FACTORS :

D	=	0.9449497
E	=	0.9770154
F	=	0.9423142
Y	=	0.502855
F for (Qb-ac)	=	0.9797301

THE CAPACITY OF MOVEMENT :

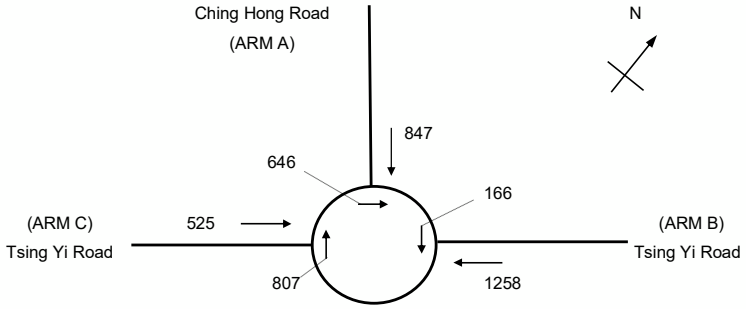
Q b-a	=	484
Q b-c	=	706
Q c-b	=	680
Q b-ac	=	699.5
TOTAL FLOW	=	984.2305768 (PCU/HR)

COMPARISION OF DESIGN FLOW TO CAPACITY:

DFC b-a	=	0.0130
DFC c-b	=	0.5648

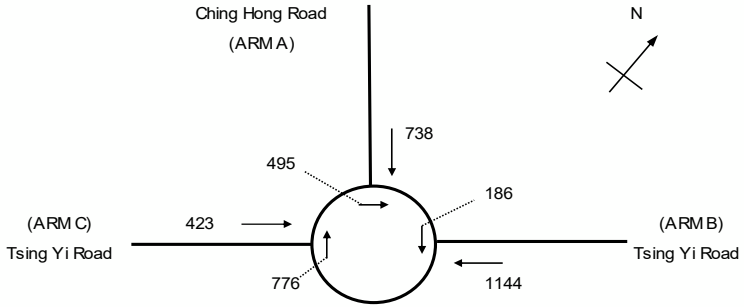
CRITICAL DFC = 0.56

OZZO TECHNOLOGY (HK) LIMITED	TRAFFIC SIGNAL CALCULATION			INITIALS
VTC Proposed Aviation and Maritime Education Centre, Tsing Yi		PROJECT NO.: 81882	PREPARED BY:	LL
J2: Tsing Yi Road / Ching Hong Road Roundabout	**2028 Des_AM**	FILENAME :	CHECKED BY:	MM
2028 Design AM Peak Hour Traffic Flow		J2 TsingYiRd_ChingHongRd_R.xls	REVIEWED BY:	OC



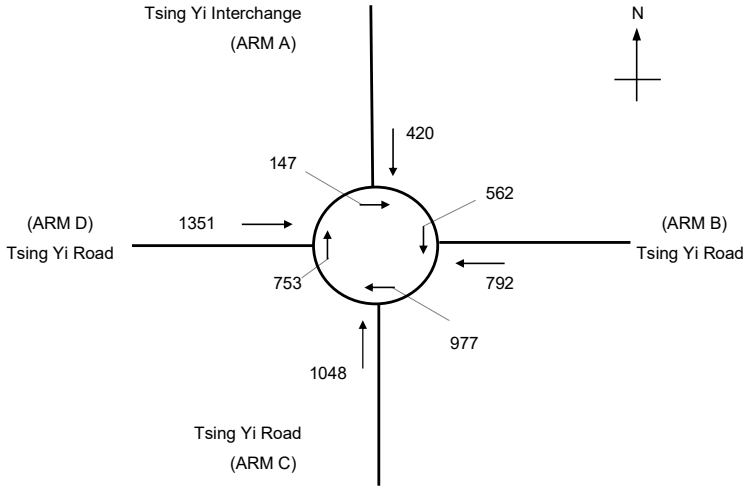
ARM			A	B	C	D			
INPUT PARAMETERS:									
V	=	Approach half width (m)	7.0	7.2	5.0	0.0			
E	=	Entry width (m)	7.6	8.7	9.2	0.0			
L	=	Effective length of flare (m)	3.4	5.8	14.7	0.0			
R	=	Entry radius (m)	23.1	24.3	24.1	0.0			
D	=	Inscribed circle diameter (m)	30.0	30.0	30.0	0.0			
A	=	Entry angle (degree)	10.0	28.0	20.0	0.0			
Q	=	Entry flow (pcu/h)	847	1258	525	0			
Qc	=	Circulating flow across entry (pcu/h)	646	166	807	0			
OUTPUT PARAMETERS:									
S	=	Sharpness of flare = 1.6(E-V)/L	0.29	0.42	0.45	0.00			
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.08	1.02	1.04	0.00			
X2	=	V + ((E-V)/(1+2S))	7.39	8.02	7.22	0.00			
M	=	EXP((D-60)/10)	0	0	0	0			
F	=	303*X2	2240	2429	2188	0			
Td	=	1+(0.5/(1+M))	1.48	1.48	1.48	0.00			
Fc	=	0.21*Td(1+0.2*X2)	0.77	0.81	0.76	0.00			
Qe	=	K(F-Fc*Qc)	1876	2331	1644	0	Total In Sum =	2630	PCU
DFC	=	Design flow/Capacity = Q/Qe	0.45	0.54	0.32	0.00	DFC of Critical Approach =	0.54	

OZZO TECHNOLOGY (HK) LIMITED	TRAFFIC SIGNAL CALCULATION			INITIALS
VTC Proposed Aviation and Maritime Education Centre, Tsing Yi		PROJECT NO.: 81882	PREPARED BY:	LL
J2: Tsing Yi Road / Ching Hong Road Roundabout	**2028 Des_PM**	FILENAME :	CHECKED BY:	MM
2028 Design PM Peak Hour Traffic Flow		J2 TsingYiRd_ChingHongRd_R.xls	REVIEWED BY:	OC



ARM			A	B	C	D			
INPUT PARAMETERS:									
V	=	Approach half width (m)	7.0	7.2	5.0	0.0			
E	=	Entry width (m)	7.6	8.7	9.2	0.0			
L	=	Effective length of flare (m)	3.4	5.8	14.7	0.0			
R	=	Entry radius (m)	23.1	24.3	24.1	0.0			
D	=	Inscribed circle diameter (m)	30.0	30.0	30.0	0.0			
A	=	Entry angle (degree)	10.0	28.0	20.0	0.0			
Q	=	Entry flow (pcu/h)	738	1144	423	0			
Qc	=	Circulating flow across entry (pcu/h)	495	186	776	0			
OUTPUT PARAMETERS:									
S	=	Sharpness of flare = 1.6(E-V)/L	0.29	0.42	0.45	0.00			
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.08	1.02	1.04	0.00			
X2	=	V + ((E-V)/(1+2S))	7.39	8.02	7.22	0.00			
M	=	EXP((D-60)/10)	0	0	0	0			
F	=	303*X2	2240	2429	2188	0			
Td	=	1+(0.5/(1+M))	1.48	1.48	1.48	0.00			
Fc	=	0.21*Td(1+0.2*X2)	0.77	0.81	0.76	0.00			
Qe	=	K(F-Fc*Qc)	2001	2315	1669	0	Total In Sum =	2306	PCU
DFC	=	Design flow/Capacity = Q/Qe	0.37	0.49	0.25	0.00	DFC of Critical Approach =	0.49	

OZZO TECHNOLOGY (HK) LIMITED	TRAFFIC SIGNAL CALCULATION			INITIALS
VTC Proposed Aviation and Maritime Education Centre, Tsing Yi		PROJECT NO.: 81882	PREPARED BY:	LL
J3: Tsing Yi Road / Kwai Tsing Road Tsing Yi Bridge	**2028 Des_AM**	FILENAME :	CHECKED BY:	MM
2028 Design AM Peak Hour Traffic Flow		J3 TsingYiRd_TsingYi INT_R.xls	REVIEWED BY:	OC

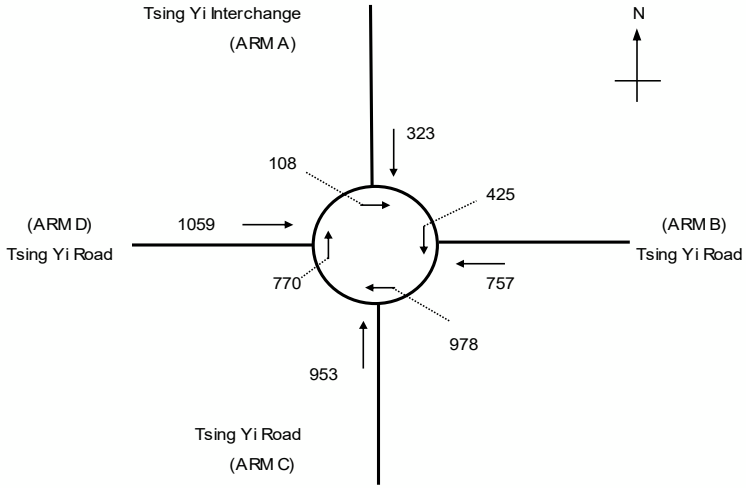


ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.5	7.2	7.8	7.5
E	=	Entry width (m)	10.3	10.1	11.4	9.3
L	=	Effective length of flare (m)	5.9	5.0	6.2	3.2
R	=	Entry radius (m)	21.5	43.4	10.2	33.7
D	=	Inscribed circle diameter (m)	60.0	60.0	60.0	60.0
A	=	Entry angle (degree)	34.0	32.0	60.0	33.0
Q	=	Entry flow (pcu/h)	420	792	1048	1351
Qc	=	Circulating flow across entry (pcu/h)	147	562	977	753
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.77	0.93	0.93	0.92
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	0.99	1.02	0.85	1.01
X2	=	V + ((E-V)/(1+2S))	8.58	8.23	9.02	8.15
M	=	EXP((D-60)/10)	1	1	1	1
F	=	303*X2	2600	2494	2733	2469
Td	=	1+(0.5/(1+M))	1.25	1.25	1.25	1.25
Fc	=	0.21*Td(1+0.2*X2)	0.71	0.69	0.74	0.69
Qe	=	K(F-Fc*Qc)	2469	2145	1711	1968
DFC	=	Design flow/Capacity = Q/Qe	0.17	0.37	0.61	0.69

Total In Sum = 3611 PCU

DFC of Critical Approach = 0.69

OZZO TECHNOLOGY (HK) LIMITED	TRAFFIC SIGNAL CALCULATION			INITIALS
VTC Proposed Aviation and Maritime Education Centre, Tsing Yi		PROJECT NO.: 81882	PREPARED BY:	LL
J3: Tsing Yi Road / Kwai Tsing Road Tsing Yi Bridge	**2028 Des_PM**	FILENAME :	CHECKED BY:	MM
2028 Design PM Peak Hour Traffic Flow		J3 TsingYiRd_TsingYi INT_R.xls	REVIEWED BY:	OC

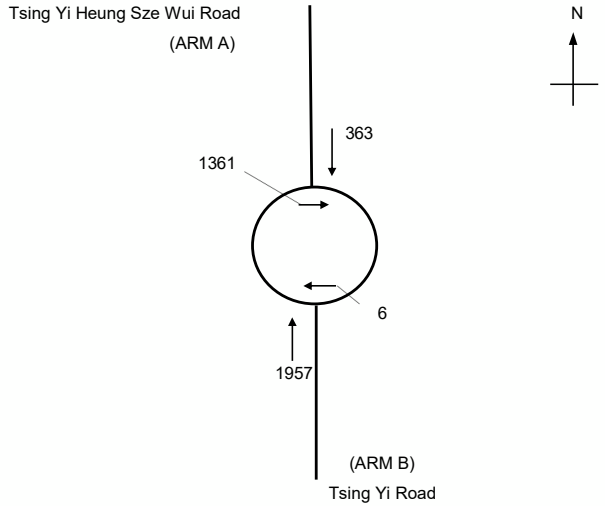


ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.5	7.2	7.8	7.5
E	=	Entry width (m)	10.3	10.1	11.4	9.3
L	=	Effective length of flare (m)	5.9	5.0	6.2	3.2
R	=	Entry radius (m)	21.5	43.4	10.2	33.7
D	=	Inscribed circle diameter (m)	60.0	60.0	60.0	60.0
A	=	Entry angle (degree)	34.0	32.0	60.0	33.0
Q	=	Entry flow (pcu/h)	323	757	953	1059
Qc	=	Circulating flow across entry (pcu/h)	108	425	978	770
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = 1.6(E-V)/L	0.77	0.93	0.93	0.92
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	0.99	1.02	0.85	1.01
X2	=	V + ((E-V)/(1+2S))	8.58	8.23	9.02	8.15
M	=	EXP((D-60)/10)	1	1	1	1
F	=	303*X2	2600	2494	2733	2469
Td	=	1+(0.5/(1+M))	1.25	1.25	1.25	1.25
Fc	=	0.21*Td(1+0.2*X2)	0.71	0.69	0.74	0.69
Qe	=	K(F-Fc*Qc)	2497	2242	1710	1956
DFC	=	Design flow/Capacity = Q/Qe	0.13	0.34	0.56	0.54

Total In Sum = 3091 PCU

DFC of Critical Approach = 0.56

OZZO TECHNOLOGY (HK) LIMITED	TRAFFIC SIGNAL CALCULATION			INITIALS
VTC Proposed Aviation and Maritime Education Centre, Tsing Yi		PROJECT NO.: 81882	PREPARED BY:	LL
J4: Tsing Yi Interchange	**2028 Des_AM**	FILENAME :	CHECKED BY:	MM
2028 Design AM Peak Hour Traffic Flow		TsingYiRd_TsingYiHeungSzeWuiRd_R.xls	REVIEWED BY:	OC

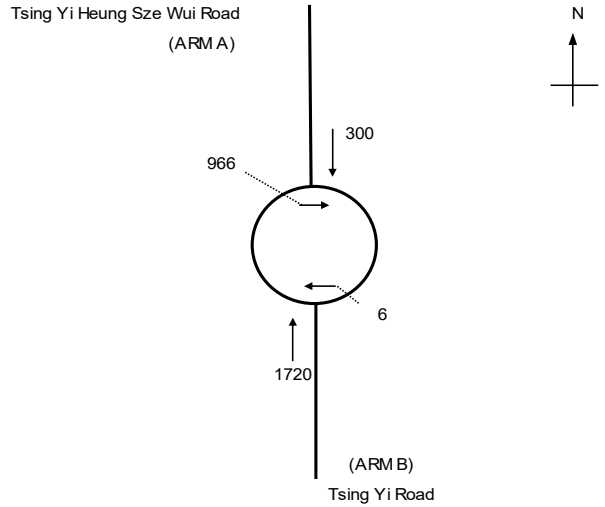


ARM			A	B
INPUT PARAMETERS:				
V	=	Approach half width (m)	5.8	7.4
E	=	Entry width (m)	9.2	8.7
L	=	Effective length of flare (m)	4.8	7.1
R	=	Entry radius (m)	18.1	44.5
D	=	Inscribed circle diameter (m)	60.0	60.0
A	=	Entry angle (degree)	45.0	29.0
Q	=	Entry flow (pcu/h)	363	1957
Qc	=	Circulating flow across entry (pcu/h)	1361	6
OUTPUT PARAMETERS:				
S	=	Sharpness of flare = 1.6(E-V)/L	1.14	0.30
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	0.94	1.03
X2	=	V + ((E-V)/(1+2S))	6.87	8.23
M	=	EXP((D-60)/10)	1	1
F	=	303*X2	2081	2494
Td	=	1+(0.5/(1+M))	1.25	1.25
Fc	=	0.21*Td(1+0.2*X2)	0.62	0.69
Qe	=	K(F-Fc*Qc)	1163	2565
DFC	=	Design flow/Capacity = Q/Qe	0.31	0.76

Total In Sum = 2320 PCU

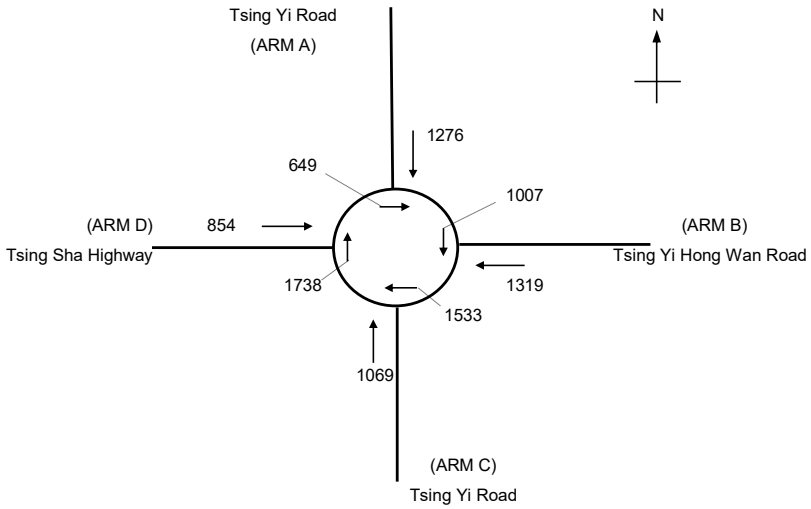
DFC of Critical Approach = 0.76

OZZO TECHNOLOGY (HK) LIMITED	TRAFFIC SIGNAL CALCULATION			INITIALS
VTC Proposed Aviation and Maritime Education Centre, Tsing Yi		PROJECT NO.: 81882	PREPARED BY:	LL
J4: Tsing Yi Interchange	**2028 Des_PM**	FILENAME :	CHECKED BY:	MM
2028 Design PM Peak Hour Traffic Flow		TsingYiRd_TsingYiHeungSzeWuiRd_R.xls	REVIEWED BY:	OC



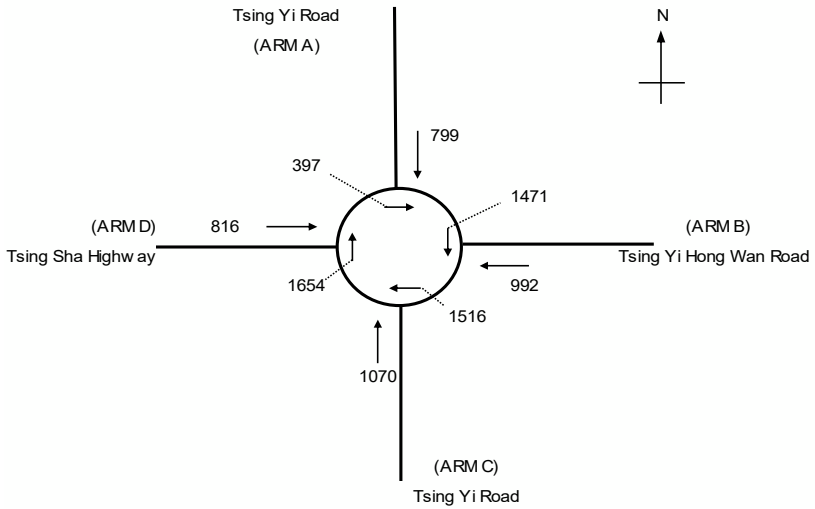
ARM			A	B			
INPUT PARAMETERS:							
V	=	Approach half width (m)	5.8	7.4			
E	=	Entry width (m)	9.2	8.7			
L	=	Effective length of flare (m)	4.8	7.1			
R	=	Entry radius (m)	18.1	44.5			
D	=	Inscribed circle diameter (m)	60.0	60.0			
A	=	Entry angle (degree)	45.0	29.0			
Q	=	Entry flow (pcu/h)	300	1720			
Qc	=	Circulating flow across entry (pcu/h)	966	6			
OUTPUT PARAMETERS:							
S	=	Sharpness of flare = 1.6(E-V)/L	1.14	0.30			
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	0.94	1.03			
X2	=	V + ((E-V)/(1+2S))	6.87	8.23			
M	=	EXP((D-60)/10)	1	1			
F	=	303*X2	2081	2494			
Td	=	1+(0.5/(1+M))	1.25	1.25			
Fc	=	0.21*Td(1+0.2*X2)	0.62	0.69			
Qe	=	K(F-Fc*Qc)	1395	2565	Total In Sum =	2019	PCU
DFC	=	Design flow/Capacity = Q/Qe	0.21	0.67	DFC of Critical Approach =	0.67	

OZZO TECHNOLOGY (HK) LIMITED	TRAFFIC SIGNAL CALCULATION			INITIALS
VTC Proposed Aviation and Maritime Education Centre, Tsing Yi		PROJECT NO.: 81882	PREPARED BY:	LL
J5: Tsing Sha Highway / Tsing Yi Road / Tsing Yi Hong Wan Road	**2028 Des_AM**	FILENAME :	CHECKED BY:	MM
2028 Design AM Peak Hour Traffic Flow		/ay_TsingYiRd_TsingYiHongWanRd_R.xls	REVIEWED BY:	OC



ARM			A	B	C	D			
INPUT PARAMETERS:									
V	=	Approach half width (m)	11.1	9.1	8.0	11.4			
E	=	Entry width (m)	15.1	13.9	13.2	12.4			
L	=	Effective length of flare (m)	27.6	9.9	9.3	9.8			
R	=	Entry radius (m)	45.9	29.5	77.1	73.4			
D	=	Inscribed circle diameter (m)	100.0	100.0	100.0	100.0			
A	=	Entry angle (degree)	18.0	14.0	16.0	12.0			
Q	=	Entry flow (pcu/h)	1276	1319	1069	854			
Qc	=	Circulating flow across entry (pcu/h)	649	1007	1533	1738			
OUTPUT PARAMETERS:									
S	=	Sharpness of flare = 1.6(E-V)/L	0.23	0.78	0.91	0.16			
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.07	1.07	1.08	1.10			
X2	=	V + ((E-V)/(1+2S))	13.82	10.94	9.82	12.18			
M	=	EXP((D-60)/10)	55	55	55	55			
F	=	303*X2	4188	3314	2976	3692			
Td	=	1+(0.5/(1+M))	1.01	1.01	1.01	1.01			
Fc	=	0.21*Td(1+0.2*X2)	0.80	0.68	0.63	0.73			
Qe	=	K(F-Fc*Qc)	3924	2821	2184	2664	Total In Sum =	4518	PCU
DFC	=	Design flow/Capacity = Q/Qe	0.33	0.47	0.49	0.32	DFC of Critical Approach =	0.49	

OZZO TECHNOLOGY (HK) LIMITED	TRAFFIC SIGNAL CALCULATION			INITIALS
VTC Proposed Aviation and Maritime Education Centre, Tsing Yi		PROJECT NO.: 81882	PREPARED BY:	LL
J5: Tsing Sha Highway / Tsing Yi Road / Tsing Yi Hong Wan Road	**2028 Des_PM**	FILENAME :	CHECKED BY:	MM
2028 Design PM Peak Hour Traffic Flow		/ay_TsingYiRd_TsingYiHongWanRd_R.xls	REVIEWED BY:	OC



ARM			A	B	C	D			
INPUT PARAMETERS:									
V	=	Approach half width (m)	11.1	9.1	8.0	11.4			
E	=	Entry width (m)	15.1	13.9	13.2	12.4			
L	=	Effective length of flare (m)	27.6	9.9	9.3	9.8			
R	=	Entry radius (m)	45.9	29.5	77.1	73.4			
D	=	Inscribed circle diameter (m)	100.0	100.0	100.0	100.0			
A	=	Entry angle (degree)	18.0	14.0	16.0	12.0			
Q	=	Entry flow (pcu/h)	799	992	1070	816			
Qc	=	Circulating flow across entry (pcu/h)	397	1471	1516	1654			
OUTPUT PARAMETERS:									
S	=	Sharpness of flare = 1.6(E-V)/L	0.23	0.78	0.91	0.16			
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.07	1.07	1.08	1.10			
X2	=	V + ((E-V)/(1+2S))	13.82	10.94	9.82	12.18			
M	=	EXP((D-60)/10)	55	55	55	55			
F	=	303*X2	4188	3314	2976	3692			
Td	=	1+(0.5/(1+M))	1.01	1.01	1.01	1.01			
Fc	=	0.21*Td(1+0.2*X2)	0.80	0.68	0.63	0.73			
Qe	=	K(F-Fc*Qc)	4139	2486	2196	2731	Total In Sum =	3677	PCU
DFC	=	Design flow/Capacity = Q/Qe	0.19	0.40	0.49	0.30	DFC of Critical Approach =	0.49	