

For discussion on
25 April 2014

Legislative Council
Panel on Home Affairs and Panel on Development
Joint Subcommittee to Monitor the Implementation of the
West Kowloon Cultural District Project

Further Discussion on the Traffic Impact Assessment of the
Planning Application for Minor Relaxation of Development
Intensity of the West Kowloon Cultural District Site

PURPOSE

This paper serves to provide further information to Members on the traffic impact assessment (TIA) results of the planning application for minor relaxation of development intensity of the West Kowloon Cultural District (WKCD) site.

BACKGROUND

2. At the last Joint Subcommittee meeting on 28 March 2014, the West Kowloon Cultural District Authority (WKCDA) briefed Members on the technical assessment results of the planning application. Members requested more details of the TIA results including (i) the traffic impact on the adjacent road networks as a result of the proposal and the proposed traffic improvement measures to cope with the increasing traffic demand in the West Kowloon Area arising from the proposal; and (ii) the impact of the proposal on the pedestrian forecasts in the WKCD and the crowd dispersal arrangements for major events held on the site.

TRAFFIC IMPACT AND IMPROVEMENT MEASURES

3. A TIA in support of the proposed minor relaxation of maximum gross floor area (GFA) and building height restrictions of the WKCD site was submitted to Town Planning Board together with the planning application on 21 March 2014. The assessment results demonstrate that the planned road network for the WKCD presented in the approved Development Plan (DP) could

accommodate the induced traffic to be generated by the additional GFA. The construction-related traffic generated during the construction of the WKCD can also be accommodated on the adjacent road network.

4. The proposed minor relaxation of maximum GFA would primarily focus on the optimisation of the development potential of the WKCD site. Hence, the original concept of keeping the WKCD as vehicle-free and pedestrian friendly, with vehicular traffic and ancillary parking as well as loading/unloading facilities in the basement levels, will remain unchanged. The vehicular access points and drop-off lay-bys planned for the WKCD also remain the same as those proposed in the approved DP. Key findings of the TIA are summarised in **Annex A**.

PEDESTRIAN FORECASTS AND CROWD DISPERSAL

5. Pedestrians are primarily connected to the areas outside the WKCD through grade-separated pedestrian deck, footbridges and subways. **Annex B** shows the pedestrian connections with the adjoining developments and major public transport nodes.

6. Pedestrian forecasts and crowd dispersal analysis for year 2031 (upon full development scenario) indicate that planned pedestrian and vehicular facilities can accommodate surged demand during major events in the WKCD and visitors can be dispersed within 30 minutes. Analysis results are summarised in **Annex C**.

CONCLUSION

7. In summary, the assessment results demonstrate that the traffic impact on the adjacent road networks arising from the minor relaxation of development intensity of the WKCD site would be manageable. The planned road and pedestrian networks for the WKCD in the approved DP could also cater for the potential traffic to be generated by the additional GFA and the dispersal of visitors after major events in the WKCD.

RECOMMENDATION

8. Members are invited to note the TIA results of the planning application for minor relaxation of development intensity of the WKCD site.

West Kowloon Cultural District Authority
April 2014

Junction Analysis for Year 2031

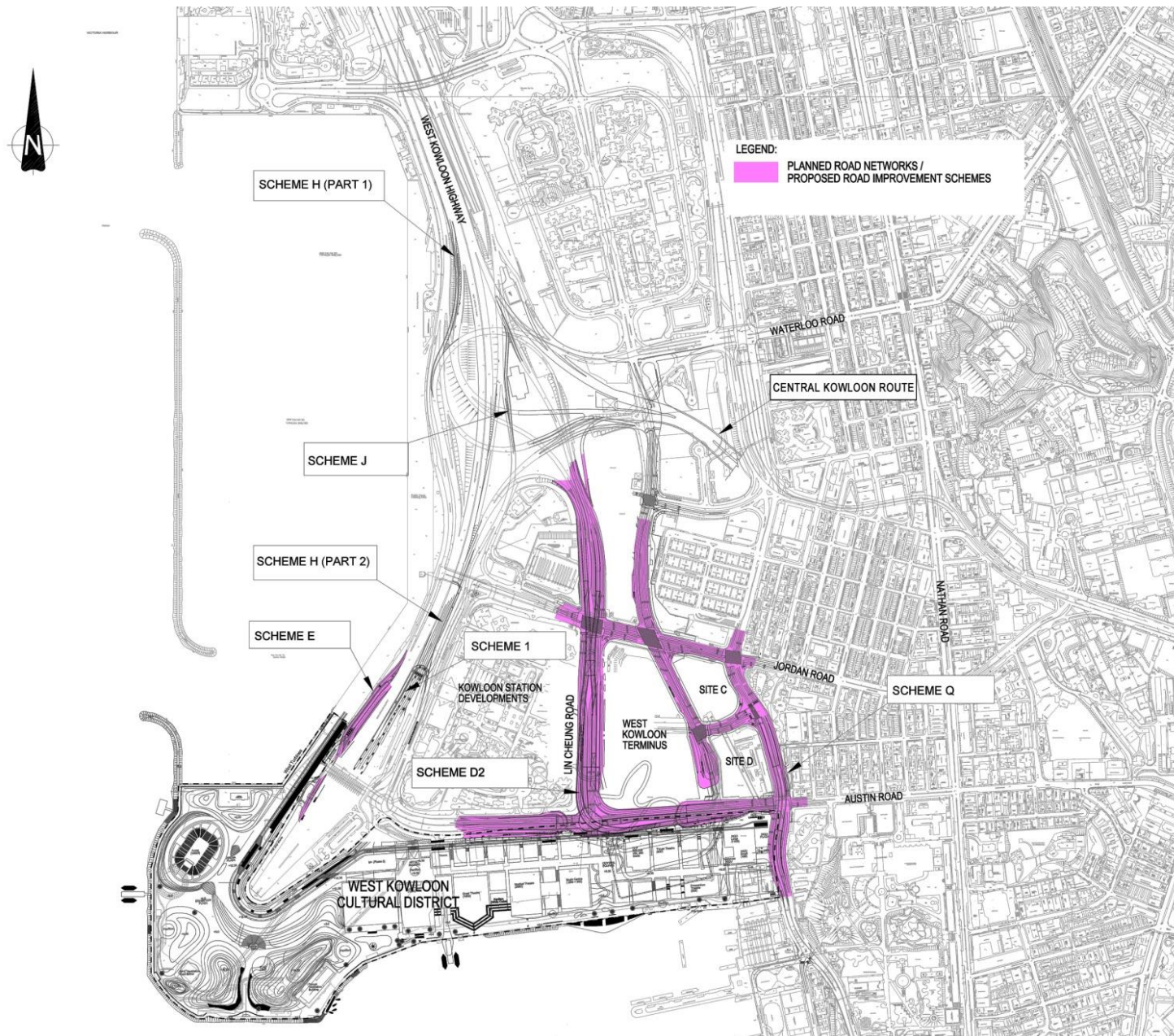
- (a) To cater for the traffic need generated by the progressive completion of the developments in the West Kowloon Reclamation Development (WKRD) area (including the West Kowloon Cultural District (WKCD), West Kowloon Terminus of the Guangzhou-Shenzhen-Hong Kong Express Rail Link (Hong Kong Section) and its topside development, as well as the development above Austin Station), a detailed traffic study was completed by the Transport Department (TD) in 2009. To strengthen the road network of the area, the study recommended a series of road improvement projects as shown in **Table A-1**. **Figure A-2** shows the planned/committed traffic schemes in WKRD area. Most of the improvement schemes are either completed or being implemented by the Highways Department to match the commissioning of the WKCD and new developments in the vicinity.

Table A-1: Road Improvement Projects Recommended under TD's Traffic Study

Improvement Scheme		Purpose of Improvement Scheme
D2	Lin Cheung Road-Austin Road West Underpass	Construction of an underpass to relieve traffic along Lin Cheung Road and Austin Road West
E	New link road and widening of existing bus-only ramp from Western Harbour Crossing northbound to elevated Jordan Road eastbound	Improve accessibility from Western Harbour Crossing to Kowloon Station topside development and the WKCD
H (Part 1)	New connection from Hoi Po Road to West Kowloon Highway northbound	Relieve traffic along Lin Cheung Road northbound
H (Part 2)	Upgrading Nga Cheung Road	Improve junction capacity
I	New link road from elevated Nga Cheung Road to Western Harbour Crossing	Improve accessibility from Kowloon Station topside development and the WKCD to Western Harbour Crossing
J	West Kowloon Highway southbound link to at-grade Nga Cheung Road	Relieve traffic along Lin Cheung Road southbound

Q	Canton Road Underpass (Ultimate)	Improve junction capacity
Q	Canton Road /Austin Road /Austin Road West Road Widening Scheme (Interim)	Improve junction capacity
Junction Improvement Scheme		Purpose of Improvement Scheme
J8	Jordan Road/Nga Cheung Road (Elevated)	Improve junction capacity
J11	Lin Cheung Road/Jordan Road (Part of Scheme D2)	Improve junction capacity
J12	Canton Road/Jordan Road/Ferry Street	Improve junction capacity
J15	Canton Road/Wui Cheung Road	Improve junction capacity
J17	Lin Cheung Road/Austin Road West (Part of Scheme D2)	Improve junction capacity
J18	Canton Road/Austin Road/Austin Road West (Widening Scheme)	Improve junction capacity
J18	Canton Road/Austin Road/Austin Road West (Scheme Q)	Improve junction capacity
J39	Road D1A(N)/Yan Cheung Road/Hoi Wang Road	Improve junction capacity
J40	Road D1A(N)/Jordan Road/Road D1A(S)	Improve junction capacity

Figure A-2: Planned/Committed Traffic Schemes in WKRD Area



- (b) The road network, with improvement schemes in place, has been tested with induced traffic demand as a result of gross floor area increase. The results reveal that key junctions of the adjacent road network can be operated within capacity. **Table A-3** compares the estimated trip generation to/from the WKCD under the approved Development Plan (DP) and the scheme with minor relaxation. **Table A-4** shows the junction performances at peak hours under the approved DP and the scheme with minor relaxation. **Figure A-5** shows the location of the key junctions.

Table A-3: WKCD Traffic Generation

Scheme	Traffic Generation (passenger car units/hour)					
	AM Peak			PM Peak		
	Out	In	Total	Out	In	Total
Scheme under Approved DP (A)	944	1,068	2,012	1,853	2,262	4,115
Current Scheme with Minor Relaxation (B)	1,136	1,332	2,468	2,074	2,470	4,544
Difference (B) – (A)	+192	+264	+456	+221	+208	+429

Table A-4: Junction Assessments for Year 2031

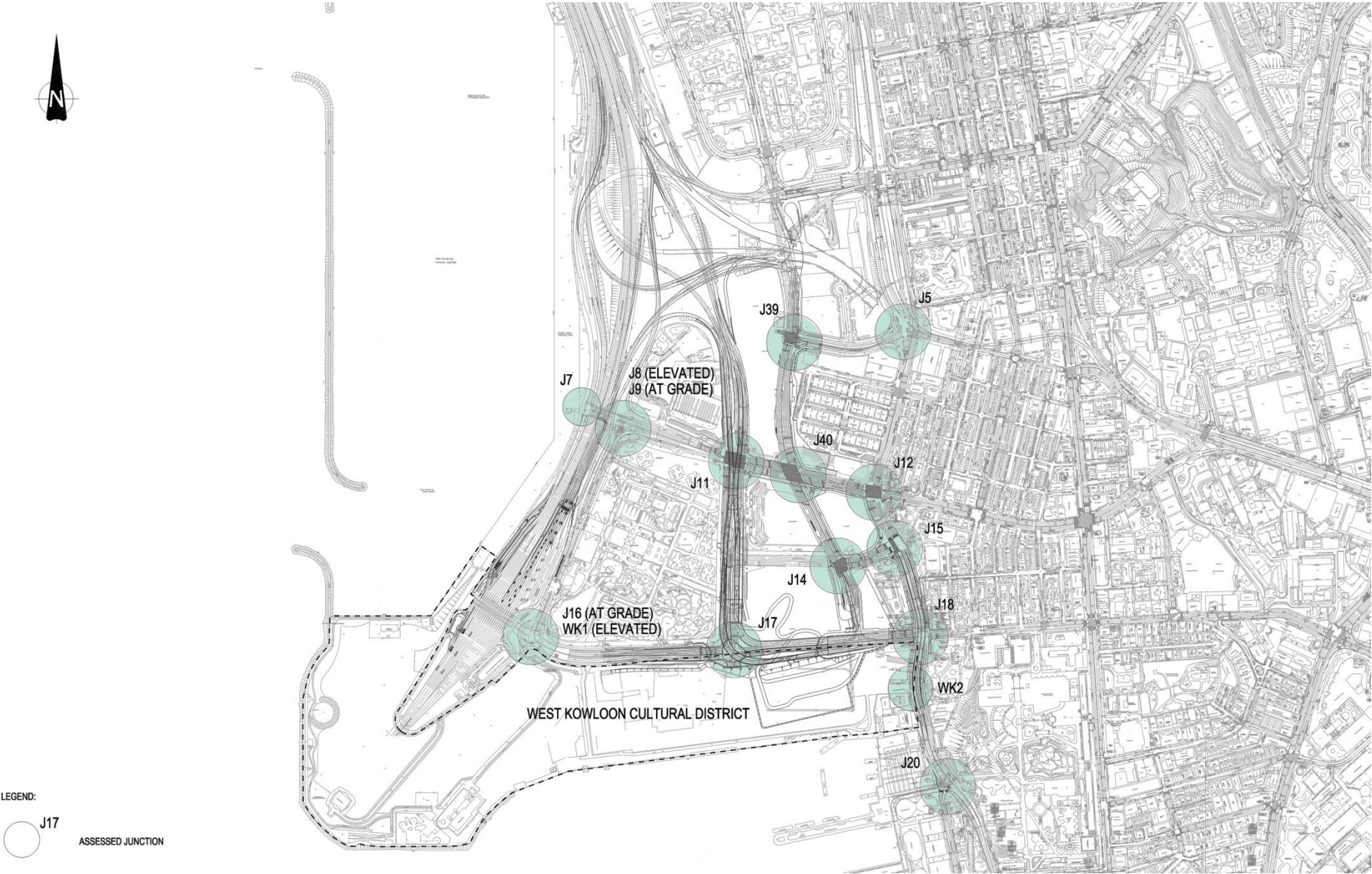
Junction		Junction Type ²	Reserve Capacity (in decimal or Ratio of Flow to Capacity (in percentage) ¹			
			Scheme under Approved DP		Scheme with Minor Relaxation	
			AM	PM	AM	PM
J5	Yan Cheung Road/Ferry Street/Kansu Street	S	2%	5%	1%	2%
J7	Jordan Road/Hoi Po Road	S	8%	10%	10%	11%
J8	Jordan Road/Nga Cheung Road (Elevated)	S	10%	37%	22%	38%
J9	Jordan Road/Nga Cheung Road (At-Grade)	R	0.73	0.64	0.89	0.83
J11	Lin Cheung Road/Jordan Road	S	11%	26%	10%	23%
J12	Jordan Road/Ferry Street	S	29%	32%	28%	31%
J14	Wui Cheung Road/Wui Man Road	S	59%	77%	59%	77%
J15	Canton Road/Wui Cheung Road (Without underpass)	S	27%	21%	26%	20%
J15	Canton Road/Wui Cheung Road (With underpass)	S	27%	15%	25%	12%
J16	Austin Road West/Nga Cheung Road (At-Grade)	R	0.28	0.33	0.31	0.39
J17	Lin Cheung Road/Austin Road West	S	23%	15%	15%	10%
J18	Canton Road/Austin Road/Austin Road West (Without underpass)	S	17%	20%	16%	17%
J18	Canton Road/Austin Road/Austin Road West (With underpass)	S	37%	30%	35%	29%
J20	Canton Road/Kowloon Park Drive	S	18%	27%	18%	21%
J39	Yan Cheung Road/Road D1A(N)/Hoi Wang Rd	S	14%	25%	11%	23%
J40	Jordan Road/Road D1A(S)/Road D1A(N)	S	14%	11%	13%	10%

Junction		Junction Type ²	Reserve Capacity (in decimal or Ratio of Flow to Capacity (in percentage) ¹			
			Scheme under Approved DP		Scheme with Minor Relaxation	
			AM	PM	AM	PM
WK1	Austin Road West/Nga Cheung Road (Elevated)	R	0.64	0.75	0.88	0.84
WK2	Canton Road Entrance	P	0.32	0.55	0.38	0.63

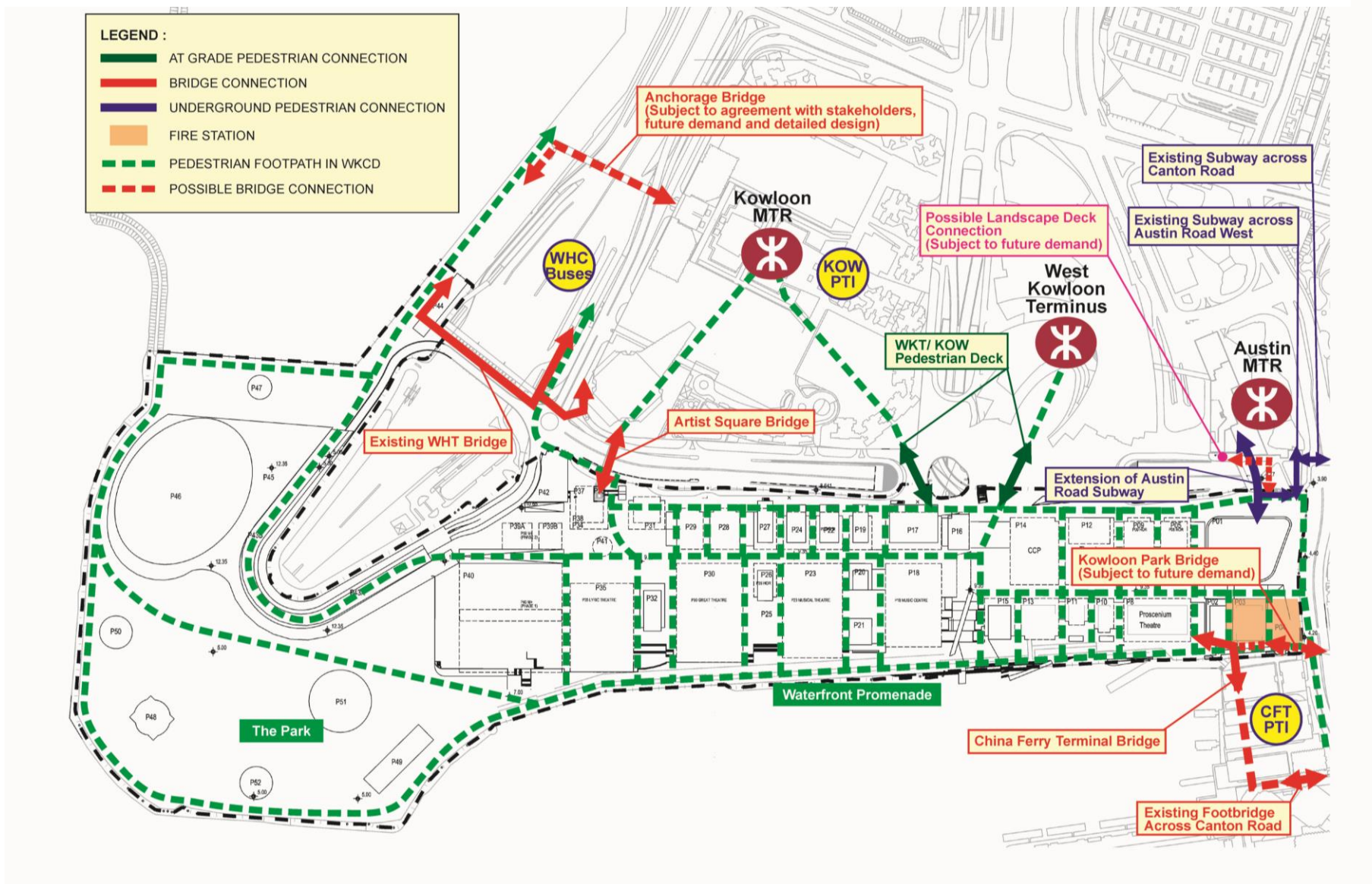
Remarks:

1. The traffic condition of a signal-controlled junction is indicated by its reserve capacity (RC). A positive RC figure indicates the junction is operating with spare capacity. A negative RC figure indicates the junction is overloaded, resulting in traffic queues and longer travel time. On the other hand, the performance of a priority junction or roundabout is measured in Ratio of Flow to Capacity (RFC). When the RFC is 100%, it means that the traffic flow in vehicles has reached 100% of the design capacity of the link or junction which is considered to be “saturated” and delays are then likely to occur.
2. S – Signal Controlled; R – Roundabout; P – Priority Junction

Figure A-5: Key Junctions in WKRD Area and Environs



Pedestrian Connections with the Adjoining Developments and Major Transport Nodes



Pedestrian Forecasts and Crowd Dispersal

- (a) The pedestrian network has been comprehensively designed in such a way that visitors can conveniently access the West Kowloon Cultural District (WKCD) by means of various transport modes. The pedestrian volumes will vary substantially throughout the WKCD from major surge in pedestrian volumes after performances at various WKCD venues to busy circulation in the Avenue, and to more modest flows at the waterfront promenade and in the Park.
- (b) For assessing the normal peak (i.e. on most weekends and possibly some public holiday periods) crowd dispersal scenario, the traffic impact assessment for the planning application assumes that all major arts and cultural venues will have 80% attendance at the same time. Together with the pedestrian volumes generated by the retail/dining/entertainment facilities, it is estimated that a total of about 33,000 pedestrians will be generated/attracted to/from the WKCD during end of the shows on weekends. The pedestrians will then disperse by various transport modes per the split shown in **Table C-1** which was generated from the territory-wide transport forecasting model.

Table C-1: Choice of Transport Modes during Dispersal

Private Car/Taxi /Coach	Kowloon Station/ Station PTI	Austin Station	West Kowloon Terminus	Western Harbour Crossing Bus Laybys	WKCD Bus Laybys	Walk to Tsim Sha Tsui/ Jordan District
27%	38%	10%	1%	11%	5%	8%

- (c) **Figure C-2** shows the 2031 forecast pedestrian flows on various pedestrian facilities during the dispersal situation. In determining the configurations of pedestrian facilities, it is assumed that the peak surges will be accommodated within 30 minutes. Level of Service (LOS)¹ C (i.e. 33 pedestrians/ metre/minute) was adopted as the design criteria for assessing

¹ A satisfactory LOS would provide adequate space for pedestrians to select normal walking speeds and free bypassing of other pedestrians in a primarily unidirectional stream within a footpath. LOS C is considered as an optimal level of service.

walkway. Based on the 2031 forecast pedestrian flows, the operational performance of existing/planned footbridges/subways were assessed and summarised in **Table C-3**. All the pedestrian facilities would have an acceptable LOS C or better.

- (d) In addition, the road junctions within the WKCD and the nearby junctions have been assessed during event dispersal situation and it is found that all the junctions can be operated at a satisfactory level.
- (e) During mega events such as fireworks display which will attract huge crowd of people to the WKCD, special crowd management and traffic arrangements will be implemented on need basis.

Figure C-2: 2031 Forecast Pedestrian Flows during Dispersal

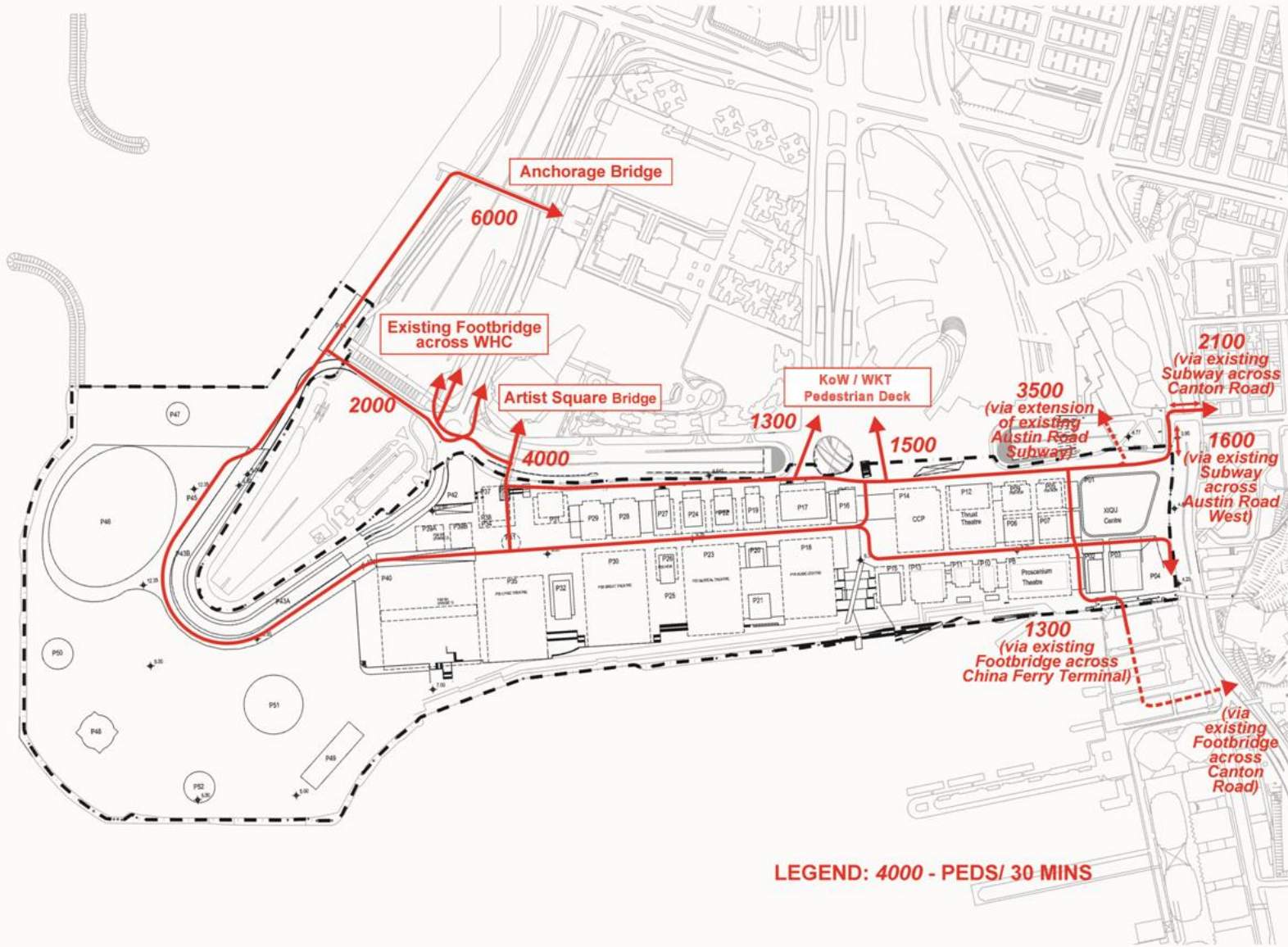


Table C-3: 2031 Operational Performance of Pedestrian Facilities

Existing/Planned Pedestrian Facilities	2031 Forecast Pedestrian Flows (pedestrians/30 minutes)	2031 Pedestrian Flow Rates (pedestrians/ metre/minute)	LOS
Existing Footbridge across Western Harbour Crossing	2,000	19	B
Planned Kowloon Station Pedestrian Deck	1,300	2.3	A
Planned West Kowloon Terminus Pedestrian Deck	1,500	2.6	A
Existing Subway across Canton Road	2,100	12.7	A
Existing Subway across Austin Road West	1,600	21.3	B
Existing Footbridge across Canton Road	1,300	14.4	A
Proposed Anchorage Bridge	6,000	32.8	C
Proposed Artist Square Bridge	4,000	20.5	B
Extension of Existing Austin Road Subway	3,500	32.4	C
Proposed China Ferry Terminal Bridge	1,300	17.3	A