Information Note
Legislative Council Panel on Transport

Rationalisation of Traffic Distribution Among Six Tunnels

INTRODUCTION

This note informs Members of the following –

(a) the Government's toll adjustment proposals formulated with the findings of the study on reasonable redistribution of traffic among three road harbour crossings ("RHCs") (*viz.* Cross Harbour Tunnel ("CHT"), Eastern Harbour Crossing ("EHC") and Western Harbour Crossing ("WHC")) and three land tunnels between Kowloon and Sha Tin ("three land tunnels") (*viz.* Lion Rock Tunnel ("LRT"), Tate's Cairn Tunnel ("TCT") and Eagle's Nest and Sha Tin Heights Tunnel ("Route 8K"));

(b) a proposed toll compensation scheme ("WHC Toll Compensation Scheme") as agreed in principle between the Government and the franchisee of WHC, namely, Western Harbour Tunnel Company Limited ("WHTCL") as part of the toll adjustment proposal in (a) above to reasonably redistribute cross-harbour traffic; and

(c) the arrangement for the Government to pay WHTCL the tolls of franchised buses using WHC as agreed in principle between the Government and WHTCL, such that the resulting savings, together with similar savings arising from toll waivers to be introduced at government tolled-tunnels as well as the Tsing Ma and Tsing Sha Control Areas, can ease the fare burden of franchised bus passengers.

JUSTIFICATIONS

Worsening Tunnel Traffic Conditions

2. Traffic congestion at RHCs needs to be tackled immediately. With the large number of commuters and large volume of goods transported on a daily basis, the social and economic impacts of traffic congestion in Hong Kong are far-reaching.

3. The weekday morning peak-hour traffic demands for CHT and EHC have already significantly exceeded their respective design capacities by 77% and 38% respectively, causing long traffic queues on their connecting roads, affecting non-cross-harbour traffic. For example, the traffic queue along Gascoigne Road Flyover approaching CHT southbound during the morning peak-hour is 2.9km, obstructing non-cross-harbour traffic at the junction of Ferry Street / Waterloo Road as well as the eastbound traffic towards East Kowloon via Gascoigne Road Flyover. The average time for crossing CHT from the end of the traffic queue is about 30 minutes.

4. Regarding the three land tunnels, the weekday peak-hour traffic demands for TCT and LRT exceeded their respective design capacities by 38% and 35% respectively. About 15% of the cross-harbour road traffic also uses one of the three land tunnels and owing to the geographical locations of the tunnels, there is a natural "pairing effect" on the use of the three RHCs and the three land tunnels[1]. The map showing the critical traffic situations reflected by the average queue lengths (southbound at morning peak hours and northbound at evening peak hours) is in **Annex A**.

Opportunity for Utilising WHC Spare Design Capacity

5. WHC is a Build-Operate-Transfer tunnel which is currently owned and operated by WHTCL, a private company, until the end of the franchise period on 1 August 2023. Currently, the week-day morning (southbound) and evening (northbound) traffic of WHC are 10% and 14% below its design capacity of 118,000 vehicles per day. However, the spare capacity of WHC is constrained by congestion on its connecting roads in Central and Sheung Wan. With the upcoming commissioning of Central - Wan Chai Bypass and Island Eastern Corridor Link ("CWB") by late 2018/early 2019, the traffic conditions on these connecting roads of WHC will improve, allowing WHC to absorb traffic diverted from CHT and EHC. Against this background and noting the "pairing effect", the Transport Department ("TD") commissioned a study on the rationalisation of traffic distribution among the three RHCs and three land tunnels in a holistic manner ("the Study").

[1] The majority of the cross-harbour road traffic coming through LRT prefers CHT over EHC or WHC. Similar tendencies are also observed in the eastern areas (pairing TCT and EHC), and in the western areas (pairing Route 8K and WHC).

6. The objective of the Study is to formulate toll adjustment proposals to influence the motorists' choice of tunnels such that (a) the overall tunnel traffic could be more optimally distributed; and (b) the impact of the tunnel traffic on non-tunnel traffic could be minimised. We have consulted the Legislative Council ("LegCo") Panel on Transport and other stakeholders on the preliminary findings of the Study (see paragraph 30 below).

Toll Adjustment Proposal for Three RHCs

7. At present, private cars, taxis and motorcycles constitute about 75% of cross-harbour traffic volume. These vehicles are not efficient road users, given the average number of passengers they carry[2]. To encourage more efficient use of road space, toll adjustments should focus on these vehicle types ("Targeted Vehicles"). For the rationalisation of traffic among the three RHCs, the key findings of the Study are :

(a) in order to achieve a noticeable traffic diversion, a substantial increase in CHT and EHC tolls, coupled with a reduction in WHC tolls, on Targeted Vehicles is needed;

(b) unifying the tolls of the three RHCs is not a feasible option as traffic queues on the connecting roads of WHC on both sides of the harbour will lengthen and adversely affect the non-tunnel traffic;

(c) further lowering the tolls of the three RHCs will induce additional traffic demand and aggravate the impact on non-tunnel traffic and hence not feasible; and

(d) there is scope to align the tolls for taxis without passenger among the RHCs in order to rationalise traffic generated by the non-hired trips.

8. The Study ***recommends*** the following toll adjustments for the three RHCs –

[2] According to the Annual Traffic Census 2017, the average occupancy (including both driver and passengers) of private cars and motorcycles using the RHCs are 1.4 and 1.1 respectively, whereas the relevant figure for taxis ranges between 2.1 and 2.4.

Table 1 – Proposed Prescribed Toll Levels

Vehicle Type	WHC			CHT		EHC	
	Current Statutory Toll	Current Concessionary Toll	Proposed Prescribed Toll	Current Toll	Proposed Prescribed Toll	Current Toll	Proposed Prescribed Toll
Private cars	$240	$70	$50	$20	$40	$25	$40
Motorcycles	$140	$25	$20	$8	$16	$13	$16
Taxis (with passengers)	$240	$65	$36	$10	$20	$25	$20
Taxis (without passengers)	$240	$65 (with late night concession)	$15	$10	$15	$15	$15

9. With the above toll adjustment, it is estimated that by 2021, the length of traffic queues on the connecting roads to CHT and EHC would be reduced by 34% and 10% during the morning peak hours and by 42% and 29% respectively during the evening peak hours. The shortening of traffic queues at CHT and EHC will not only reduce the journey time of tunnel traffic, but also alleviate the existing obstruction to the non-tunnel peak-hour traffic at a number of junctions (mainly at CHT) along the connecting roads. The expected effect of the toll adjustment proposal is shown in the map at **Annex B**.

10. Implementation of the toll adjustment proposal will significantly alleviate traffic congestion at tunnels and at certain connecting roads, hence contributing to savings in journey time and travel distance. The commuting time of many members of the public will be saved, and the efficiency of many business operations enhanced. We estimate that the toll adjustment proposal will bring about over $800 million of social cost savings[3] per year.

11. The overall reduction in traffic congestion will also bring about significant environmental benefits by reducing vehicle emission, making Hong Kong a more sustainable and liveable city for future generations. By implementing the toll adjustment proposal, it is estimated that carbon dioxide from vehicle emission will be reduced by about 3,800 tonnes[4] per year, equivalent to planting over 160,000 trees.

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[3] Social cost savings = savings in travel distance x vehicle operating costs + savings in journey time x value of time.

[4] Reduction of carbon dioxide from vehicle emission = vehicular emission factor of carbon dioxide x savings in travel distance.

Proposed WHC Toll Compensation Scheme to Encourage More Use of WHC

12. In order to encourage motorists of Targeted Vehicles to switch from using CHC or EHC to WHC so as to make more use of the capacity of WHC, we have been in discussion with WHTCL since late 2017 on an arrangement such that the actual tolls payable by motorists of Targeted Vehicles using WHC can be lowered to the Proposed Prescribed Toll levels for WHC (i.e. Table 1 above) until the franchise expiry. The Government and WHTCL have agreed in principle to the following proposed WHC Toll Compensation Scheme –

(a) the actual tolls payable by motorists for Targeted Vehicles using WHC will be fixed at $50 for private cars, $20 for motorcycles, $36 for taxis (with passengers) and $15 for taxis (without passengers) (i.e. the Proposed Prescribed Toll for WHC in Table 1 above) from 1 January 2020 until the franchise expiry on 1 August 2023;

(b) for each single journey made by a Targeted Vehicle using WHC, the Government will compensate WHTCL the difference between the Proposed Prescribed Toll and the anticipated future toll levels of WHTCL as set out in **Annex C**; and

(c) the total compensation payable by the Government in respect of Targeted Vehicles during the entire compensation period will be capped at $1,800 million.

13. The amount of compensation to WHTCL will be determined based on actual trips made by Targeted Vehicles (i.e. on a "per-vehicle" basis), subject to the cap in paragraph 12(c) above. We will discuss with WHTCL putting in place an independent checking and auditing mechanism in relation to the proposed Scheme.

14. The proposed WHC Toll Compensation Scheme is subject to LegCo's passage of legislative amendments to adjust, and the simultaneous implementation of, CHT and EHC tolls for Targeted Vehicles to the level of Proposed Prescribed Tolls of CHT and EHC set out in Table 1. This is because without a corresponding substantial increase in CHT and EHC tolls, the expected rationalisation of traffic distribution among the three RHCs will not materialise simply by setting lower Proposed Prescribed Tolls for Targeted Vehicles using WHC. In

fact, merely reducing WHC toll would likely induce more demand for cross-harbour traffic, aggravating the current congestion at the RHCs.

15. The total compensation payable under the proposed WHC Toll Compensation Scheme is subject to a cap of $1,800 million (paragraph 12(c) above), which is a negotiated outcome having regard to WHTCL's loss of revenue as a result of charging the Proposed Prescribed Toll and reduced flexibility to adjust concessionary tolls for Targeted Vehicles from 1 January 2020 to the end of the franchise expiry. By way of background, pursuant to WHC Ordinance (Cap. 436), WHTCL is entitled to increases in statutory tolls for a maximum of six more times from now until the franchise expiry once the conditions stipulated in the Ordinance are met[5]. WHTCL has full discretion to increase concessionary tolls up to the statutory toll levels any time having regard to business considerations. The Government does not have any legal power to disapprove or defer such increase in concessionary tolls. With the proposed WHC Compensation Scheme, WHTCL would be compensated based on the anticipated future toll levels as set out in **Annex C**, which are far below the current statutory toll levels, as the basis for calculating the Government's compensation.

Toll Adjustment Proposal for Three Land Tunnels

16. Regarding the three land tunnels, the Study looked into how traffic may be better distributed among them, and examined whether the traffic of the RHCs may be further optimised given the pairing effect. The key findings of the Study are –

(a) LRT is over-utilised with morning peak-hour traffic demand exceeding its design capacity by 35%. However, traffic diversion from LRT to TCT through reduction of TCT tolls is not advisable, since TCT is also already over-utilised during weekday peak hours with queue length comparable to that at LRT. Reducing the tolls of TCT will result in additional traffic queues, seriously affecting non-tunnel traffic to Shek Mun Roundabout, an important interchange for accessing various parts in Sha Tin, during weekday morning peak hours;

(b) Route 8K is the only tunnel among the three land tunnels with spare capacity. However, there is a bottleneck at Tai Po Road (Sha Tin Section), restraining the traffic flow from Tolo

[5] WHTCL can only give effect to one statutory toll increase each year.

Highway and Ma On Shan to Route 8K during the morning peak hours. Encouraging southbound traffic to use Route 8K will lengthen the traffic queue along Tai Po Road (Sha Tin Section), potentially extending to Tolo Highway; and

(c) the traffic volume of TCT does not exceed its design capacity throughout the day on Sundays and public holidays.

17. In the light of paragraph 16(a) and (b) above, rationalisation of traffic distribution among the three land tunnels by toll adjustment will not be practicable for the time being. We therefore ***recommend*** not implementing adjustments to the tolls of the three land tunnels, pending the expected completion of the widening works of Tai Po Road (Sha Tin Section) in 2023 after which the bottleneck leading to Route 8K will be removed.

18. Given that TCT is not congested throughout the day on Sundays and public holidays, as a pilot scheme to explore the effect of traffic rationalisation by implementing differential toll levels on different days, we ***recommend*** charging a flat toll of $8 for all vehicle types using TCT (i.e. the same tolls for the three land tunnels) on Sundays and public holidays, which will be subject to LegCo's passage of legislative amendments. However, given that traffic congestion at CHT and EHC occurs at certain peak hours[6] on Sundays and public holidays, we do not propose implementing similar arrangements for RHCs.

Waiving Tolls on Franchised Buses

19. As mass carriers which make more efficient use of road space, franchised buses assume a pivotal role in the public transport system. The operating costs of franchised buses are on the rise and franchised bus operators are facing different degrees of fare increase pressure. In fact, five out of six bus franchisees have already submitted fare increase applications[7]. On average, tunnel tolls account for about 7% of

[6] Charging different toll levels at different time periods on the same day may cause some motorists to speed up or slow down on purpose near the time of change of toll levels to avoid paying higher tolls. This may result in operational issues at the tunnels and may even have an adverse impact on the safety of other tunnel users. In the longer term, we may consider introducing incremental changes to toll levels within a period between peak and non-peak hours when automatic toll collection with the use of in-vehicle units is fully implemented.

[7] These five franchisees include Citybus Limited (Franchised for Hong Kong Island and cross-harbour bus network), New World First Bus Services Limited, Kowloon Motor Bus Company (1933) Limited, Long Win Bus Company Limited and New Lantao Bus Company (1973). TD is now processing the fare increase applications in accordance with established procedures.

franchised buses' operating cost. From the point of view of road space management, efficient mass carriers such as franchised buses should not be made to pay hefty tunnel tolls. A relevant, additional, factor is that the routings of franchised buses are not determined by the operators, but by the Government based on transport planning considerations. Against the above background, the Government proposes to waive or pay the toll for franchised buses using all tunnels (including both government and Build-Operate-Transfer ones) as well as Tsing Ma and Tsing Sha Control Areas with a view to relieving the fare increase pressure. Under the proposal, the toll savings will be set aside, by accounting arrangements, in a dedicated fund under each of the bus franchisees ("Franchised Bus Toll Waiver Funds"). The toll saved under the Franchised Bus Toll Waiver Funds will be used for relieving the fare increase pressure of the corresponding bus franchisees in future, or reducing the magnitude of required fare increase. As some franchised bus operators may not face pressure for fare increase in near future, a cap would be set on the Franchised Bus Toll Waiver Funds, so that toll savings of these franchised bus operators exceeding the cap would be distributed to their passengers through fare concession.

20. As part of the above proposal, we have agreed in principle with WHTCL on a proposed arrangement under which the Government will pay the toll for franchised buses using WHC. Under the proposed arrangement, starting from 1 January 2020 until franchise expiry, franchised buses using WHC are expected to be charged a toll of $0. The Government will pay WHTCL the revenue forgone, on the basis of the anticipated future toll levels for franchised buses (as set out in **Annex C**) on a "per vehicle" basis, subject to an independent checking and auditing mechanism. The Government payment for the revenue forgone will not be subject to a cap because the number of franchised bus routes using WHC as well as the service frequencies are determined by the Government based on transport needs. The Government and WHTCL agreed in principle that the proposed WHC Compensation Scheme and the proposed payment for franchised buses using WHC are two integral components of the overall understanding between the two parties.

21. We are also exploring with the franchisee of Tai Lam Tunnel ("TLT"), the other remaining Build-Operate-Transfer ("BOT") tunnel, on similar arrangements for franchised buses using TLT.

Congestion Charging

22. With continued social and economic development, traffic demand will only increase with time. To address the congestion problem in the longer term, we need to ensure that the limited road space can be used efficiently to alleviate traffic congestion, facilitate the commuting public, and avoid hindering economic activities such as goods transportation, thereby benefiting everyone. To make efficient use of road space on congested roads, we propose to adopt the concept of "congestion charging" and principle of "efficiency first" in the longer term to determine the appropriate toll levels at tunnels and Tsing Ma and Tsing Sha Control Areas.

23. TD will commence a study in Q2 2019 to comprehensively review the hierarchy and level of tolls of all government tolled-tunnels and the two Control Areas. The concept of "congestion charging" and principle of "efficiency first" will not only enable effective use of road space, but also enable efficient people carriers and vehicles that support economic activities to enjoy lower tolls.

Other Options

24. The following options have been considered and the reasons for not pursuing them are set out below –

(a) Buying back WHC: While there have been occasional calls from the public and stakeholders that the Government should buy back WHC, Government's ownership of WHC is not a prerequisite of lowering tolls payable by motorists using WHC. Given the more complex issues involved (e.g. determining the asset value and the purchase process), we do not consider the buy back option a better alternative to entering into a compensation arrangement with WHTCL. Buying back WHC will also involve a much more significant financial outlay.

(b) Implementing toll adjustments only at CHT and EHC: As explained in paragraph 7(a) above, reduction in tolls at CHT and EHC will attract more tunnel traffic and aggravate the congestion problem. Hence, there is no room for lowering the tolls at these two tunnels. On the contrary, there is a need for the tolls at CHT and EHC to be raised substantially in order to divert the cross-harbour traffic to WHC. In parallel, to

achieve the best effect of traffic diversion, reduction in WHC tolls for Targeted Vehicles is required. Otherwise, the spare capacity of WHC will not be put to optimal use.

(c) Aligning the toll levels among the three RHCs and among the three land tunnels: As explained in paragraph 7(b) above, if WHC tolls are lowered to align with those of CHT and EHC, non-tunnel traffic on the connecting roads of WHC will be adversely affected by the lengthened queues. Similarly, for the three land tunnels, if the TCT tolls are lowered to align with that of LRT and Route 8K, the southbound traffic queue during the morning peak-hour would be lengthened and adversely affect non-tunnel traffic from North East New Territories to Sha Tin / Ma On Shan and areas further south.

(d) Waiving tolls for all of the six tunnels: As explained in paragraph 7(c) above, lowering the tolls of the three RHCs will induce significant additional traffic demand, thereby worsening the existing traffic congestion problem. The congestion will be even worse under the toll-free scenario. For instance, the southbound traffic for CHT during the morning peak-hour would be queued beyond the junction of Waterloo Road and Boundary Street and cause blockage of traffic to other areas in Kowloon. The queue of the northbound traffic for CHT in the evening peak-hour would also be stretched along Connaught Road Central and Rumsey Street Flyover, and would therefore block the approach road to CWB.

(e) Constructing a fourth RHC: Constructing a fourth RHC will obviously provide additional capacity for cross-harbour traffic. However, this will involve a lengthy planning and construction process which will not be conducive to alleviating the cross-harbour traffic congestion in the short to medium term. For planning the necessary strategic transport infrastructure for the long term, the Government will take forward the "Strategic Studies on Railways and Major Roads beyond 2030".

Timetable

25. The timetable for taking forward the proposals in paragraphs 7 to 21 above is as follows –

Consult LegCo Panel on Transport	November 2018
Table legislative amendments at LegCo for negative vetting	December 2018/ Q1 2019
Seek funding from LegCo Finance Committee (for the proposed WHC Toll Compensation Scheme and compensation for franchised bus tolls for WHC and TLT (if an agreement is reached with the TLT franchisee))	Q2 2019
Finalise detailed agreements with WHTCL and TLT franchisee (where applicable)	Q3 2019
Commence toll adjustment proposals and franchised bus toll waiver	1 January 2020

IMPLICATIONS OF THE PROPOSAL

26. The financial implications of the proposals in paragraphs 7 to 21 above are set out below –

(a) Proposed WHC Toll Compensation Scheme: The compensation payable by the Government will be determined based on actual trips made by Targeted Vehicles using WHC over the compensation period (from 1 January 2020 to 1 August 2023), subject to an aggregate cap of $1,800 million.

(b) Proposed payment of tolls for franchised buses using WHC: The amount payable by the Government will be determined based on the actual trips made by franchised buses using WHC over the compensation period (from 1 January 2020 to 1 August 2023), estimated at a total of $956 million. Separately, estimated payment of tolls for franchised buses using TLT will be subject to discussion with TLT franchisee.

(c) Estimated additional toll revenue from CHT and EHC at Proposed Prescribed Tolls (from toll increases for Targeted Vehicles continuing to use CHT and EHC, offset by reduced traffic volume of vehicles using CHT and EHC and waiving of tolls for franchised buses using CHT and EHC) over the compensation period of WHC Toll Compensation Scheme: $546 million.

(d) Reduction of revenue from the proposed toll reduction at TCT on Sundays and public holidays: estimated at around $50 million per year.

27. On economic and productivity implications, as mentioned in paragraph 10 above, implementation of toll adjustment proposal for the three RHCs is expected to bring about social cost savings of more than $800 million per year, or $3.1 billion throughout the compensation period of the proposed WHC Toll Compensation Scheme.

28. On environmental implications, as mentioned in paragraph 11 above, implementing the toll adjustment proposal for the three RHCs is expected to reduce carbon dioxide from vehicle emission by 3,800 tonnes per year, equivalent to planting 160,000 trees.

29. The proposal is in conformity with the Basic Law, including the provisions concerning human rights.

PUBLIC CONSULTATION

30. We consulted the LegCo Panel on Transport on the preliminary findings of the Study in November 2017, and subsequently gauged views of other stakeholders including the Transport Advisory Committee, District Councils, the transport trade and professional institutes. One of the more prevalent views is that the difference between the toll levels among the three RHCs and those among the three land tunnels should be narrowed as much as possible, such that motorists may choose the most convenient route without considering the toll differentials. Another prevalent view is that the tolls on taxis (without passengers) for using the three RHCs should be unified. Many stakeholders also accept that the tolls of CHT should be increased to suppress its traffic demand, with a view to alleviating the serious traffic congestion at the tunnel and its connecting roads. There are also views that the tolls for public transport (e.g. franchised buses) should be reduced or waived such that the

operators could have scope to lower the fare with lower operating costs.

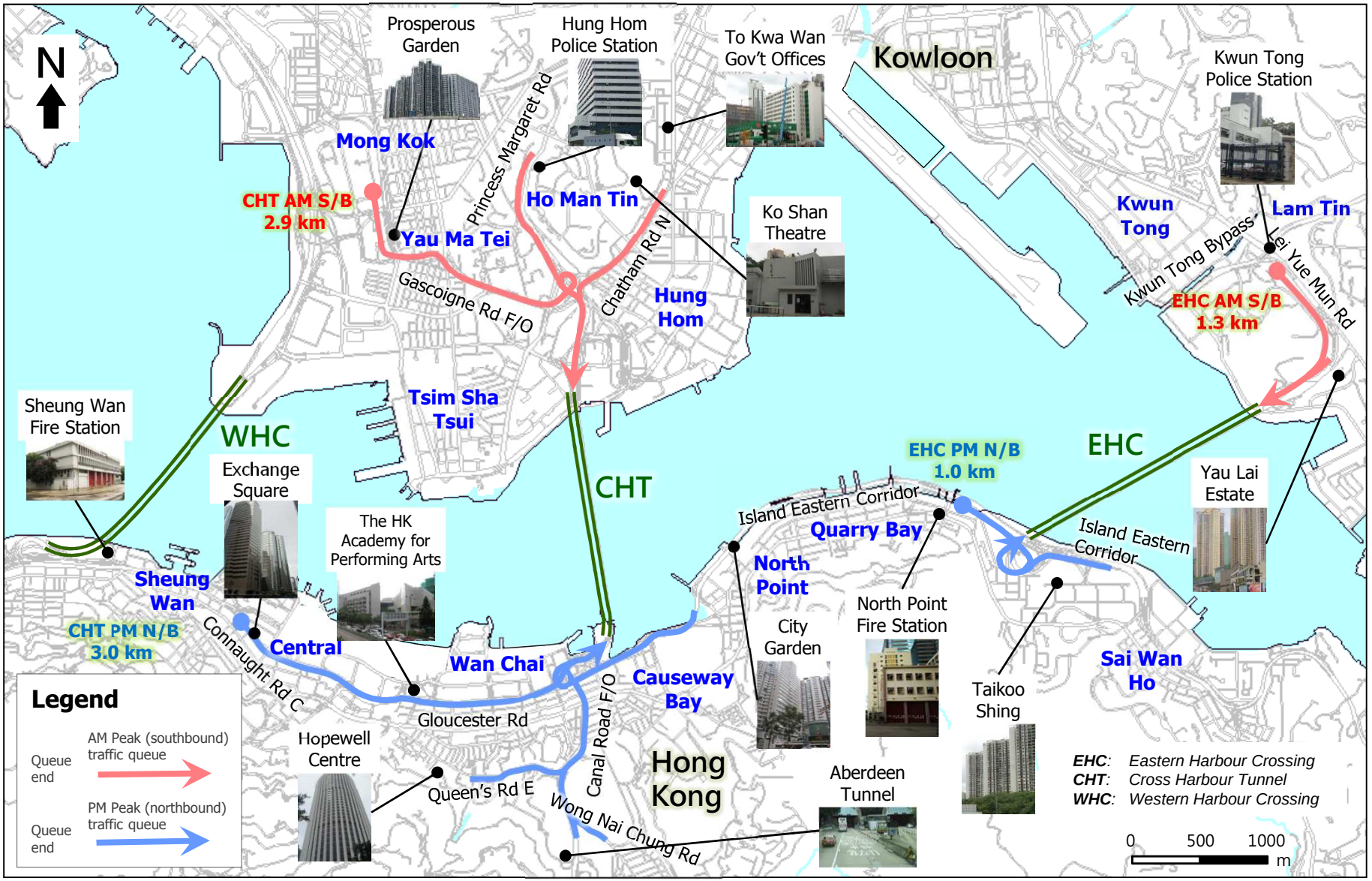
31. We will brief LegCo Panel on Transport on the toll adjustment proposals in paragraph 7 to 21 above in the context of the policy briefing for the 2018 Policy Address, and will formally consult the Panel at a Panel meeting in November 2018.

BACKGROUND

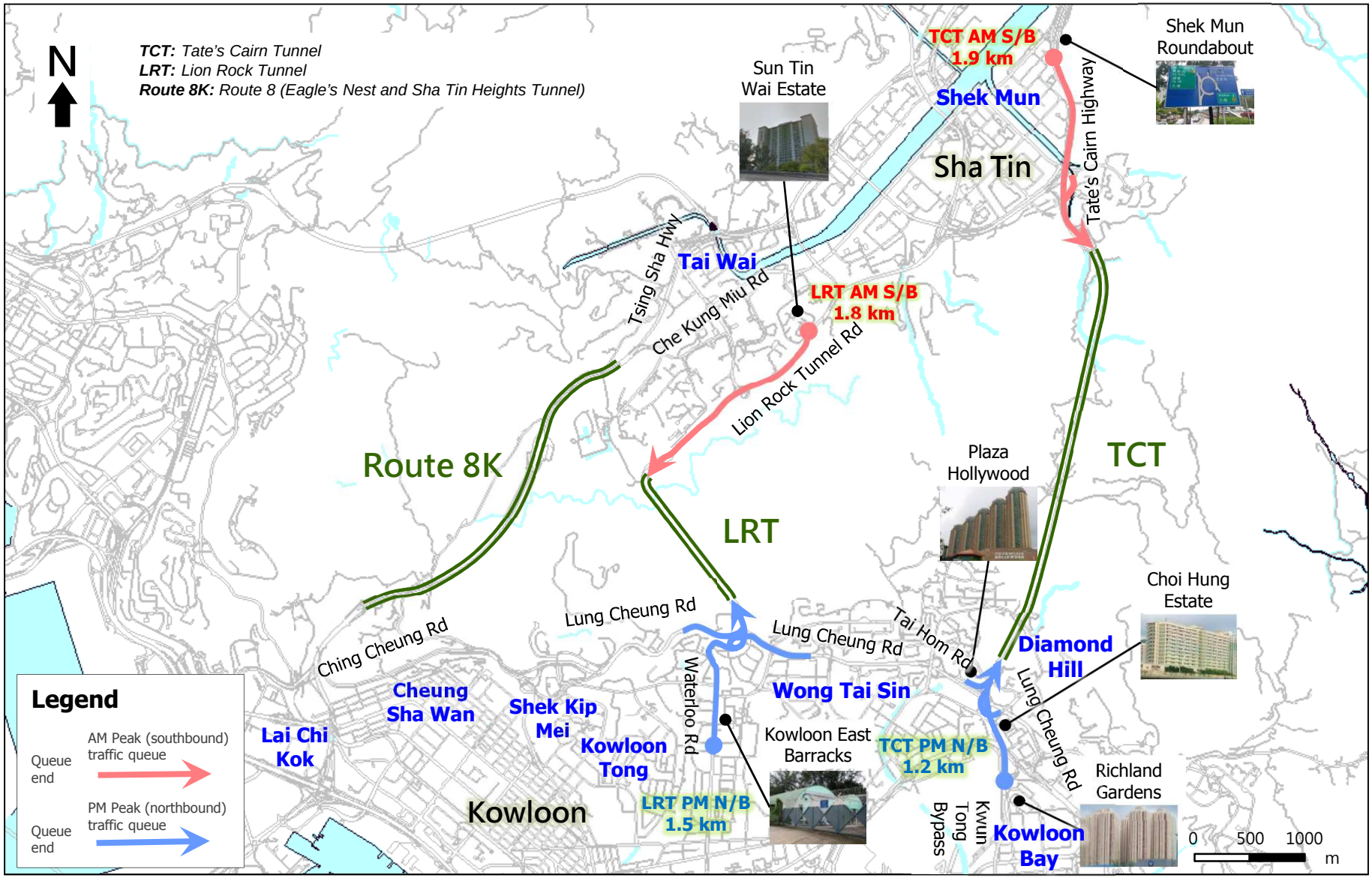
32. In May 2016, the Government undertook that after the take-over of EHC upon the expiry of its BOT franchise in August 2016, it would commence as soon as possible a study on the overall strategy and feasible options for the rationalisation of cross-harbour traffic. Noting the "pairing effect" between the usage of the three RHCs and the three land tunnels, TD commenced in early 2017 the Study which covers all of the six abovementioned tunnels in a holistic manner.

10 October 2018
Transport and Housing Bureau

Existing traffic queues along connecting roads of the three Road Harbour Crossings

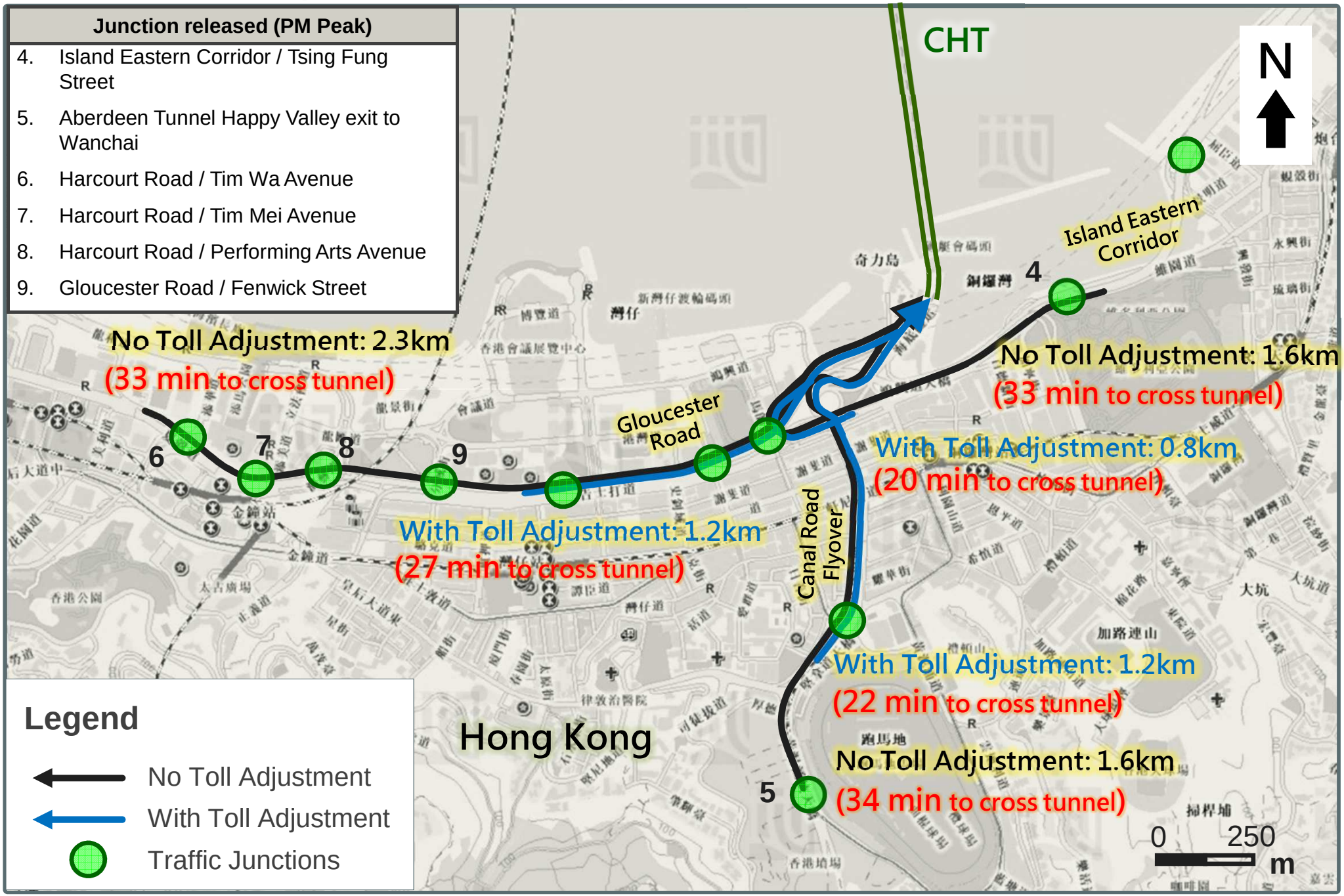


Existing traffic queues along connecting roads of the three Land Tunnels

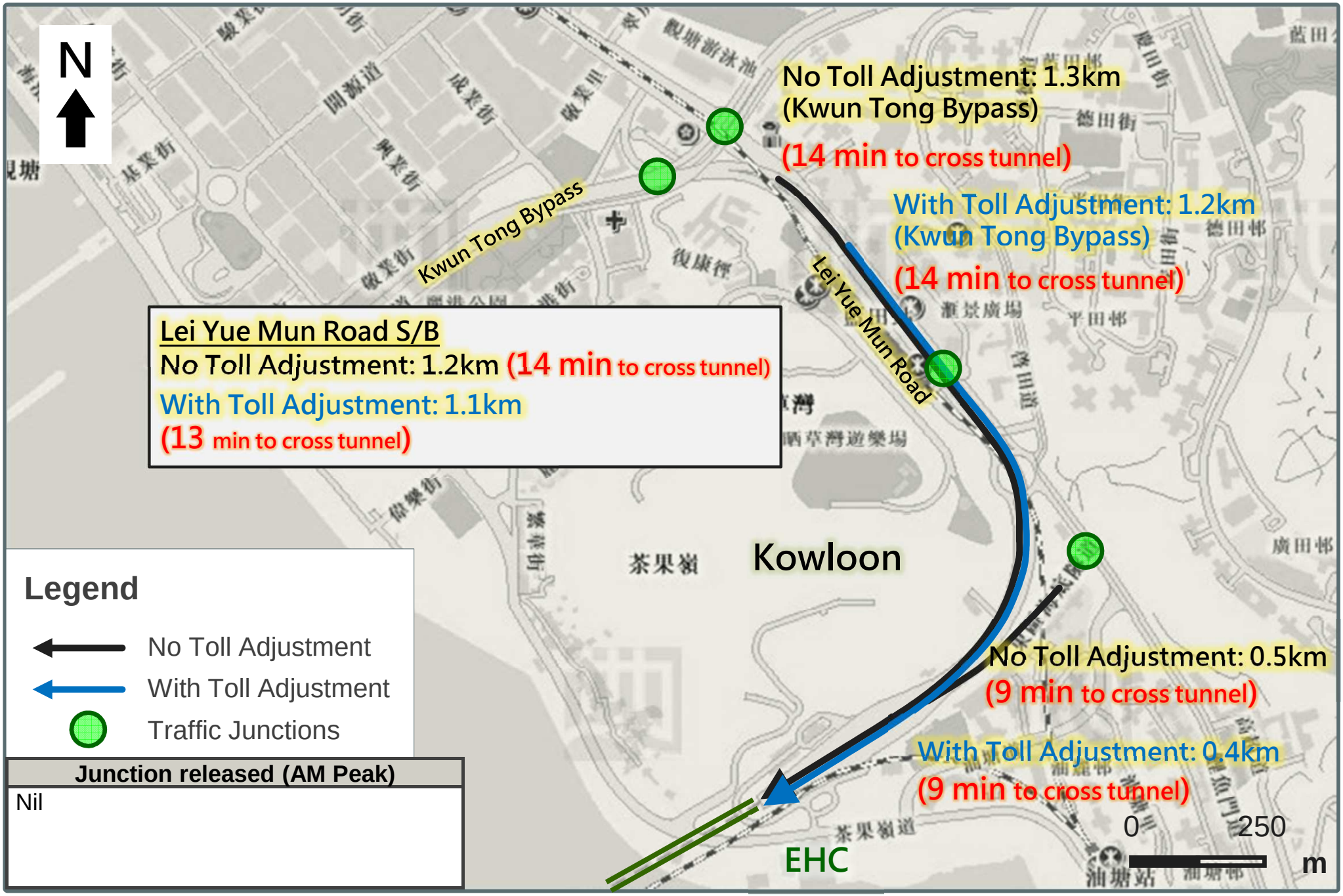


Forecast AM Peak (southbound) traffic queues along connecting roads of CHT in 2021

Forecast PM Peak (northbound) traffic queues along connecting roads of CHT in 2021



Forecast AM Peak (southbound) traffic queues along connecting roads of EHC in 2021



Forecast PM Peak (northbound) traffic queues along connecting roads of EHC in 2021

Junction released (PM Peak)
1. Island Eastern Corridor towards Chai Wan

Forecast AM Peak (southbound) traffic queues along connecting roads of WHC in 2021

Junction affected (AM Peak)
Nil

Forecast PM Peak (northbound) traffic queues along connecting roads of WHC in 2021

Annex C

Western Harbour Crossing Toll Compensation Scheme
Anticipated Future Toll Levels

The business plan of the franchisee of the Western Harbour Crossing anticipates, until the end of the franchise on 1 August 2023,

(a) starting at the current concessionary toll level (at HKD70 for private cars and electrically powered passenger vehicles and at HKD65 for taxis) and an annual increase (with the first increase on 1 June 2019 and subsequent increases effective from 1 June of each following year) of HKD5 per trip in toll for private cars, electrically powered passenger vehicles and taxis;

(b) no change to the current concessionary toll level (at HKD25) in the amount per trip in toll for motorcycles and motor tricycles;

(c) no change to the current promotional toll (at HKD10) at late night period from 0000 to 0700 hours for taxis (without passengers); and

(d) an increase to HKD140 per trip in concessionary toll for single-deck franchised buses and HKD200 per trip in toll for double-deck franchised buses on 1 June 2019, followed by an increase of HKD10 per trip in toll for single-deck franchised buses and HKD15 per trip in toll for double-deck franchised buses on 1 January 2022.