Sensitivity Test on the Potential Air Quality Impact of a Lower Percentage of Light Goods Vehicle Travelling on SWC and the Section of DBL to the North of Ha Tsuen Interchange

As shown in **Table 2.9** of the EIA Report, the predicted 2021 peak hour traffic flow on SWC and the section of DBL to the north of Ha Tsuen Interchange are about 3800 vehicle per hour with 66% of goods vehicles for both northbound and southbound directions. Among the 66% of goods vehicles (GV), it was assumed in the EIA Report that 50% of the non-container truck portion of the goods vehicles would be light goods vehicle (LGV). The percentage of LGV among all the GV (including container truck) is about 22%.

The purpose of this sensitivity test is to determine the change in potential air quality impact for a lower percentage of LGV on SWC and the section of DBL to the north of Ha Tsuen Interchange. This sensitivity test assumed only 12% of all GV (including container truck) as LGV, and the other 88% of the GV would be heavy goods vehicles (HGV) and container trucks. In view of the higher tailpipe emissions from HGV and container truck compared with LGV, the lower percentage of LGV would in effect result in higher traffic emissions from SWC and the section of DBL to the north of Ha Tsuen Interchange.

The air sensitive receivers (ASRs) most susceptible to this change would be those ASRs in Ngau Hom Shek, namely assessment points 8101 to 8131. The predicted worst-case 1-hour and 24-hour average NO_2 concentration at these assessment points for the scenario with 22% LGV (the scenario presented in the EIA Report) and the 12% LGV scenario are shown in the following table.

Predicted Worst-case 1-hour and 24-hour Average NO_2 Concentration for the 12% and 22% LGV Scenarios

Assessment Point	Height (m)	12% LGV Scenario (Scenario tested in this appendix)		22% LGV Scenario (Scenario presented in the EIA Report)	
		Worst-case 1-hr Average NO_2 (μgm^{-3})	Worst-case 24-hr Average NO_2 (μgm^{-3})	Worst-case 1-hr Average NO_2 (μgm^{-3})	Worst-case 24-hr Average NO_2 (μgm^{-3})
8101	1.5	190.5	134.4	188.4	133.4
	10.0	188.5	133.5	188.1	132.6
8102	1.5	188.4	133.8	187.3	132.9
	10.0	187.5	132.9	187.1	132.1
8103	1.5	187.4	133.3	186.4	132.5
	10.0	186.6	132.5	186.1	131.6
8104	1.5	189.7	133.4	185.7	132.3
	10.0	185.7	132.3	185.3	131.4
8105	1.5	188.1	132.8	184.8	131.8
	10.0	184.9	131.8	184.4	130.9
8106	1.5	195.7	136.7	191.7	134.6
	10.0	191.2	134.2	189.5	132.2
8108	1.5	201.6	140.9	200.7	139.7
	10.0	199.2	139.0	194.7	136.7
8109	1.5	202.9	143.2	202.5	142.3
	10.0	202.3	142.0	201.8	140.7
8110	1.5	202.9	143.2	202.5	142.1
	10.0	203.8	143.6	203.3	142.7

Assessment Point	Height (m)	12% LGV Scenario (Scenario tested in this appendix)		22% LGV Scenario (Scenario presented in the EIA Report)	
		Worst-case 1-hr Average NO_2 (μgm^{-3})	Worst-case 24-hr Average NO_2 (μgm^{-3})	Worst-case 1-hr Average NO_2 (μgm^{-3})	Worst-case 24-hr Average NO_2 (μgm^{-3})
8116	1.5	252.9	132.6	245.4	130.9
	10.0	246.4	134.2	239.3	132.8
8117	1.5	249.3	132.9	242.2	131.4
	10.0	243.9	132.5	237.1	131.2
8118	1.5	168.1	127.2	166.5	126.4
	10.0	166.6	126.3	165.1	125.4
8119	1.5	176.1	126.9	174.8	126.1
	10.0	174.5	126.0	173.3	125.1
8120	1.5	171.9	125.8	170.7	124.6
	10.0	170.6	124.6	169.4	123.4
8121	1.5	166.3	125.7	164.9	124.4
	10.0	165.0	124.5	163.7	123.2
8122	1.5	159.1	126.4	156.4	125.1
	10.0	158.7	125.2	155.9	123.8
8123	1.5	162.8	124.6	161.5	123.3
	10.0	161.7	123.6	160.4	121.9
8124	1.5	156.8	124.7	155.3	123.2
	10.0	155.8	123.5	154.4	121.8
8125	1.5	156.2	126.0	154.1	124.5
	10.0	155.3	124.5	153.1	122.9
8126	1.5	155.8	124.1	154.4	122.5
	10.0	154.9	122.9	153.5	121.2
8127	1.5	161.5	123.3	160.2	121.7
	10.0	160.5	122.1	159.2	120.6
8128	1.5	164.9	122.6	164.6	121.8
	10.0	164.0	122.0	163.7	121.2
8129	1.5	163.6	122.9	162.4	121.4
	10.0	162.5	121.9	161.4	120.5
8130	1.5	158.1	122.6	156.8	121.1
	10.0	157.2	121.5	155.9	120.1
8131	1.5	168.3	122.4	167.3	121.1
	10.0	167.3	121.3	166.3	120.6
Highest		**252.9**	**143.6**	**245.4**	**142.7**
AQO		**300**	**150**	**300**	**150**
% of AQO		**84%**	**96%**	**82%**	**95%**

As shown by the above modeling results, the worst-case 1-hour average NO_2 level at the ASRs in Ngau Hom Shek would increase from 245.4 μgm^{-3} (82% of AQO) to 252.9 μgm^{-3} (84% of AQO) with a decrease of LGV% from 22% to 12%. The worst-case 24-hour average NO_2 level at the ASRs in Ngau

Hom Shek would increase from 142.7 µgm^{-3} (95% of AQO) to 143.6 µgm^{-3} (96% of AQO) with a decrease of LGV% from 22% to 12%. No exceedance of the respective AQO for NO_2 at the ASRs in Ngau Hom Shek is expected with a decrease of LGV% from 22% to 12%.

With reference to the results of the sensitivity test above for NO_2, the decrease of LGV% from 22% to 12% would only increase the predicted pollutant levels at ASRs by a few percents. For the other traffic air pollutants namely RSP, CO, and SO_2, the modeling results at those ASRs in Ngau Hom Shek, namely assessment points 8101 to 8131, under the 22% LGV scenario are all less than 60% of their respective AQO (see **Appendix 2C**). Exceedance of the AQO at the ASRs in Ngau Hom Shek for the other traffic air pollutants is thus not expected with a decrease of LGV% from 22% to 12%.

The concentration contours for the predicted worst-case 1-hour and 24-hour average NO_2 at 1.5m and 10m above ground level for the 12% LGV scenario are shown in **Figures A2D.1 to A2D.4**. As shown in **Figure A2D.3**, Area A and Area B are two small areas outside the works limit with predicted exceedance of the 24-hour average AQO for NO_2 at 1.5m above ground. These two areas are rather remote and no existing ASR is currently identified within these two areas. These two areas are currently zoned as “green belt” and future development of these two remote areas into air sensitive uses is not anticipated.