

Appendix 4.4

Details of Emission Factors and Calculations of Looping Effects for Both Normal Condition and Congested Condition

Summary of Emission Factors:

Emission Factor for NOx in gm/mile-veh for normal condition (Peak Hour Flow Speed)

Vehicle Class	Motor Cycles	Petrol PC & LGV	Taxi	Non-franchised Buses <6.4t	Non-franchised Buses 6.4-15t	Non-franchised Buses >15t	Private Light Buses <3.5t	Private Light Buses >3.5t	Diesel PC&LGV <2.5t	Diesel LGV 2.5-3.5t	Diesel LGV >3.5t	HGV<15t	HGV>15t	Single Deck Franchised Buses *	Double Deck Franchised Buses	Public Light Buses
Emission Factor of Trunk Road	1.02	0.23	0.25	0.00	6.47	0.00	0.00	0.75	0.95	0.53	3.47	7.34	9.29	5.13	5.13	0.75
Emission Factor of Other Road	1.14	0.28	0.28	0.00	7.07	0.00	0.00	0.82	1.07	0.59	3.76	7.89	10.01	5.44	5.81	0.77

Emission Factor for NOx in gm/mile-veh for worse condition (Congested Condition, 10kph)

Vehicle Class	Motor Cycles	Petrol PC & LGV	Taxi	Non-franchised Buses <6.4t	Non-franchised Buses 6.4-15t	Non-franchised Buses >15t	Private Light Buses <3.5t	Private Light Buses >3.5t	Diesel PC&LGV <2.5t	Diesel LGV 2.5-3.5t	Diesel LGV >3.5t	HGV<15t	HGV>15t	Single Deck Franchised Buses *	Double Deck Franchised Buses	Public Light Buses
Emission Factor of Trunk Road	0.83	0.35	0.38	0.00	10.41	0.00	0.00	1.21	1.50	0.86	5.57	11.82	14.98	10.26	10.26	1.13
Emission Factor of Other Road	1.02	0.38	0.38	0.00	10.41	0.00	0.00	1.21	1.55	0.86	5.57	11.82	15.06	9.45	10.26	1.14

Emission Factors adopted for in-tunnel calculations:

Emission Factor for NOx in gm/mile-veh for normal condition

Vehicle Class	Motor Cycles	Petrol PC & LGV	Taxi	Non-franchised Buses <6.4t	Non-franchised Buses 6.4-15t	Non-franchised Buses >15t	Private Light Buses <3.5t	Private Light Buses >3.5t	Diesel PC&LGV <2.5t	Diesel LGV 2.5-3.5t	Diesel LGV >3.5t	HGV<15t	HGV>15t	Single Deck Franchised Buses *	Double Deck Franchised Buses	Public Light Buses
Emission Factor (Peak Hour Flow Speed - Other Road)	1.14	0.28	0.28	0.00	7.07	0.00	0.00	0.82	1.07	0.59	3.76	7.89	10.01	5.44	5.81	0.77

Emission Factor for NOx in gm/mile-veh for worse condition (Congested Condition)

Vehicle Class	Motor Cycles	Petrol PC & LGV	Taxi	Non-franchised Buses <6.4t	Non-franchised Buses 6.4-15t	Non-franchised Buses >15t	Private Light Buses <3.5t	Private Light Buses >3.5t	Diesel PC&LGV <2.5t	Diesel LGV 2.5-3.5t	Diesel LGV >3.5t	HGV<15t	HGV>15t	Single Deck Franchised Buses *	Double Deck Franchised Buses	Public Light Buses
Emission Factor (Congested Condition, 10kph - Other Road)	1.02	0.38	0.38	0.00	10.41	0.00	0.00	1.21	1.55	0.86	5.57	11.82	15.06	9.45	10.26	1.14

Note: The above emission factor for NOx are applied to all in-tunnel calculations (Appendix 4.4a to 4.4h).

* Since there is no single deck franchised buses travelled on trunk road within the study area of Widening of Tuen Mun Road at Tsing Tin Interchange, as a conservative approach, the calculated emission factor for double deck franchised buses would be adopted for single deck franchised buses.

Appendix 4.4 Details of Emission Factors and Calculations of Looping Effects for Both Normal Condition and Congested Condition

Calculation of portal emission (NOx) in Worse Condition (Congested Condition) for Looping Effect

Year 2025																	Emission Factor for NO _x in gm/mile-veh (Trunk Roads)																NO _x E.F.							
						Total	Traffic Breakdown																																	
Enclosure Group	Underdeck/ Enclosure No.	Road Name	Road Link No.	Road Speed	Q	Q	Motor Cycles	Petrol PC	Taxi	Non-franchised	Non-franchised	Non-franchised	Private Light	Private Light	Diesel	Diesel LGV	Diesel LGV	HGV<15t	HGV>15t	Single Deck	Double Deck	Public Light																		
								&LGV		Buses <6.4t	Buses 6.4-15t	Buses >15t	Buses <3.5t	Buses >3.5t	PC&LGV <2.5t	2.5-3.5t	3.5t			Franchised Buses	Franchised Buses	Buses																		
Emission Factor for NO _x in gm/mile-veh (Other Roads)																																								
Motor Cycles	Petrol PC &LGV	Taxi	Non-franchised Buses <6.4t	Non-franchised Buses 6.4-15t	Non-franchised Buses >15t	Private Light Buses <3.5t	Private Light Buses >3.5t	Diesel PC&LGV <2.5t	Diesel LGV 2.5-3.5t	Diesel LGV >3.5t	HGV<15t	HGV>15t	Single Deck Franchised Buses	Double Deck Franchised Buses	Public Light Buses																									
0.835	0.351	0.383	0.000	10.410	0.000	0.000	1.205	1.499	0.857	5.573	11.820	14.985	10.262	10.262	1.128																									
Motor Cycles	Petrol PC &LGV	Taxi	Non-franchised Buses <6.4t	Non-franchised Buses 6.4-15t	Non-franchised Buses >15t	Private Light Buses <3.5t	Private Light Buses >3.5t	Diesel PC&LGV <2.5t	Diesel LGV 2.5-3.5t	Diesel LGV >3.5t	HGV<15t	HGV>15t	Single Deck Franchised Buses	Double Deck Franchised Buses	Public Light Buses																									
1.023	0.381	0.384	0.000	10.410	0.000	0.000	1.206	1.549	0.859	5.570	11.818	15.059	9.445	10.263	1.142																									
Motor Cycles	Petrol PC &LGV	Taxi	Non-franchised Buses <6.4t	Non-franchised Buses 6.4-15t	Non-franchised Buses >15t	Private Light Buses <3.5t	Private Light Buses >3.5t	Diesel PC&LGV <2.5t	Diesel LGV 2.5-3.5t	Diesel LGV >3.5t	HGV<15t	HGV>15t	Single Deck Franchised Buses	Double Deck Franchised Buses	Public Light Buses																									
1.023	0.381	0.384	0.000	10.410	0.000	0.000	1.206	1.549	0.859	5.570	11.818	15.059	9.445	10.263	1.142																									
D	5a	Tuen Mun Road (Kowloon Bound)	88	5495	5495	0.04	0.43	0.07	0.00	0.03	0.00	0.00	0.01	0.02	0.11	0.09	0.17	0.01	0.00	0.01	0.00	0.01	0.01	183.5	829.6	147.1	0.0	1716.0	0.0	0.0	66.2	164.7	518.2	2371.9	8829.7	675.8	0.0	462.8	39.8	3.435
		Near Yan Oi Tong Circuit																																						
	5b	Tuen Mun Road (Kowloon Bound)	88-90	70	4510	4510	0.04	0.44	0.05	0.00	0.03	0.00	0.00	0.01	0.02	0.11	0.09	0.17	0.01	0.00	0.01	0.01	167.1	698.2	86.9	0.0	1408.4	0.0	0.0	54.4	149.9	442.2	2371.9	8829.7	675.8	0.0	462.8	39.8	3.412	
		Near Yan Oi Tong Circuit																																						
E1	6	Tuen Mun Road (Kowloon Bound)	90	50	985	985	0.02	0.38	0.16	0.00	0.03	0.00	0.00	0.01	0.01	0.09	0.07	0.19	0.01	0.00	0.01	0.02	20.1	142.7	60.5	0.0	307.6	0.0	0.0	11.9	15.3	76.1	384.0	2211.8	148.3	0.0	101.1	22.5	3.555	
		Slip Road to Pui To Road																																						
	7+8	Tuen Mun Road (Kowloon Bound)	88-90	70	4510	4510	0.04	0.44	0.05	0.00	0.03	0.00	0.00	0.01	0.02	0.11	0.09	0.17	0.01	0.00	0.01	0.01	167.1	698.2	86.9	0.0	1408.4	0.0	0.0	54.4	149.9	442.2	2371.9	8829.7	675.8	0.0	462.8	39.8	3.412	
		Near Pui To Road Flyover																																						
E2	9+10	Tuen Mun Road (Kowloon Bound)	109	3218	2828	0.01	0.38	0.07	0.00	0.02	0.00	0.00	0.00	0.01	0.01	0.05	0.04	0.36	0.02	0.00	0.01	0.02	26.9	418.4	101.1	0.0	832.4	0.0	0.0	43.5	54.1	151.3	804.3	12633.2	906.0	40.0	450.3	90.2	5.143	
		Near Pui To Road Flyover																																						
	7a	Tuen Fat Road (Kowloon Bound)	149	50	903	903	0.01	0.30	0.22	0.00	0.03	0.00	0.00	0.01	0.01	0.07	0.05	0.05	0.01	0.01	0.09	0.14	9.2	103.3	76.3	0.0	282.0	0.0	0.0	10.9	14.0	54.3	251.5	533.6	136.0	85.3	834.0	144.4	2.807	
		Near Pui To Road Flyover																																						
E2	8a	Tuen Mun Road (Kowloon Bound)	110	70	3485	3485	0.01	0.42	0.03	0.00	0.01	0.00	0.00	0.00	0.01	0.07	0.05	0.36	0.02	0.00	0.01	0.01	29.1	513.9	40.0	0.0	362.8	0.0	0.0	0.0	52.2	209.2	971.1	14829.7	1044.4	0.0	357.6	39.3	5.294	
		Near Pui To Road Flyover																																						
	9a	Tuen Mun Road (Yuen Long Bound)	109	70	2828	2828	0.01	0.38	0.07	0.00	0.02	0.00	0.00	0.01	0.01	0.05	0.04	0.36	0.02	0.00	0.01	0.02	23.6	377.3	75.7	0.0	588.8	0.0	0.0	34.1	42.4	121.2	630.4	12033.9	847.5	0.0	290.2	63.8	5.350	
		Near Pui To Road Flyover																																						
F	10a	Tuen Hi Road (Yuen Long Bound)	108	50	390	390	0.01	0.30	0.17	0.00	0.06	0.00	0.00	0.02	0.02	0.09	0.08	0.13	0.01	0.01	0.04	0.06	4.0	44.6	25.5	0.0	243.6	0.0	0.0	9.4	12.1	30.2	173.8	599.2	58.7	36.8	160.1	26.7	3.653	
		Near Pui To Road Flyover																																						
	11	Tuen Hi Road (Yuen Long Bound)	126-125	50	878	325	0.02	0.31	0.24	0.00	0.05	0.00	0.00	0.01	0.01	0.07	0.05	0.09	0.01	0.01	0.05	0.08	12.3	118.5	249.8	0.0	284.3	0.0	0.0	10.6	13.6	43.3	213.7	2698.5	215.5	30.7	223.5	42.3	4.501	
		Under Tuen Mun Town Plaza																																						
F	12	Tuen Mun Road (Two-way)	179	70	6313	2828	0.01	0.38	0.07	0.00	0.02	0.00	0.00	0.01	0.01	0.05	0.04	0.36	0.02	0.00	0.01	0.02	52.7	891.2	115.7	0.0	951.6	0.0	0.0	34.1	94.6	330.4	1601.5	26863.6	1892.0	0.0	647.8	103.2	5.319	
		Under Tuen Mun Town Plaza																																						
	13	Tuen Fat Road (Kowloon Bound)	149	50	903	903	0.01	0.30	0.22	0.00	0.03	0.00	0.00	0.01	0.01	0.07	0.05	0.36	0.02	0.00	0.01	0.01	9.2	103.3	76.3	0.0	282.0	0.0	0.0	10.9	14.0	54.3	251.5	533.6	136.0	85.3	834.0	144.4	2.807	
		Under Tuen Mun Town Plaza																																						

Emissions from Portals							
Enclosure Group	Underdeck/ Enclosure No.	Description	Length (m)	Width (m)	Q (veh/hr)	Original E.F. NOX E.F. (g/mile-veh)	Original mass NO _x (g/s)
D	5a	Tuen Mun Road (Kowloon Bound) Near Yan Oi Tong Circuit	50	11	5495	3.4346	1.629E-01
	5b	Tuen Mun Road (Kowloon Bound) Near Yan Oi Tong Circuit	33	11	4510	3.4118	8.765E-02
	6	Tuen Mun Road (Kowloon Bound) Slip Road To Pui To Road	67	6	985	3.5553	4.050E-02
E1	7-8	Tuen Mun Road (Kowloon Bound) Near Pui To Road Flyover	82	14	4510	3.4118	2.178E-01
	9+10	Tuen Mun Road (Yuen Long Bound) Near Pui To Road Flyover	82	14	3218	5.1435	2.343E-01
E2	7a	Tuen Fat Road (Kowloon Bound) Near Pui To Road Flyover	73	6	3903	2.8070	3.194E-02
	8a	Tuen Mun Road (Kowloon Bound) Near Pui To Road Flyover	73	11	3485	5.2939	2.325E-01
	9a	Tuen Mun Road (Yuen Long Bound) Near Pui To Road Flyover	73	11	2828	5.3497	1.906E-01
	10a	Tuen Hi Road (Yuen Long Bound) Near Pui To Road Flyover	73	7	390	3.6529	1.795E-02
		Tuen Hi Road (Yuen Long Bound) Under Tuen Mun Town Plaza	96	8	878	4.5007	6.548E-02
F	12	Tuen Mun Road (Two-way) Under Tuen Mun Town Plaza	96	22	6313	5.3189	5.564E-01
		Tuen Fat Road (Kowloon Bound) Under Tuen Mun Town Plaza	96	7	903	2.8070	4.200E-02

Amount of Portal Emission at particular locations of Tuen Mun Road Section (For detailed locations of the Emission Locations ID, please refer to FIGURE A4.3 in Appendix 4.3)						
Original Enclosure Group	Emission Locations	Amount of Emission NOx (g/s) (First Order)	(Second Order)	(Third Order)	(Fourth Order)	Amount of NOx left
						Remarks
D	Original OUT A1 IN A2 B OUT B1 IN B2 C OUT C1 IN C2 OUT D E OUT E1 IN E2 F OUT F1 IN F2 OUT G	2.213E-01 1.623E-01 5.902E-02 2.951E-02 5.194E-03 2.432E-02 1.223E-02 1.0395E-02 1.8745E-03 9.377E-04 9.377E-04 7.939E-04 1.408E-04 1.223E-02 2.153E-03 1.008E-02 3.455E-02	5.039E-02 8.668E-04 4.152E-03 2.088E-03 1.768E-03 3.202E-04 1.601E-04 1.601E-04 1.356E-04 2.455E-05 2.088E-04 3.675E-04 1.721E-03 8.604E-04	8.604E-04 1.514E-04 7.089E-04 3.566E-04 3.019E-04 5.467E-05 2.734E-05 2.734E-05 2.315E-05 4.192E-06 3.566E-04 6.276E-05 2.938E-04 1.469E-04	1.469E-04 2.586E-05 1.211E-04 6.088E-05 5.155E-05 9.305E-06 4.668E-06 4.668E-06 3.952E-06 7.157E-07 6.089E-05 1.072E-05 5.017E-05 2.508E-05	2.508E-05 Original (First Order) = "Enclosure 5a" * "Ratio 3" + "Enclosure 5b"; Original (Second Order and up) = "IN F2" * 1/2 = "Original (First Order)" * (2/3 + 1/3 * 10/50) = "Original (First Order)" * 1/3 * 40/50 = "IN A2" * 1/2 First Order = "B" * (44/50/2/3*0.3; Second Order and up= Original (Second Order and up) * 44/50/2/3*0.3 = "B" * (44/50/2/3*0.7+6/50/2/3+1/3); Second Order and up= Original (Second Order and up) * (44/50/2/3*0.7+6/50/2/3+1/3) First Order = "IN B2" * 1/2; Second Order and up = ("IN B2" + "IN E2") * 1/2 = "C" * (2/3+27/50*1/3) = "C" * (2/3/50*1/3) = "IN C2" * 1/2 = "IN C2" * 1/2 = "E" * 1/2 * (2/3+27/50*1/3) = "E" * 1/2 * (2/3/50*1/3) = ("IN B2" + "IN E2") * 1/2 = "F" * 44/50/2/3*0.3 = "F" * (44/50/2/3*0.7+6/50/2/3+1/3) First Order = "IN A2" * 1/2 + "IN F2" * 1/2; Second Order and up= "IN F2" * 1/2
E1	Original OUT B1 IN B2 C OUT C1 IN C2 OUT D E OUT E1 IN E2 F OUT F1 IN F2 OUT G	4.521E-01 3.978E-02 1.862E-01 9.367E-02 7.931E-02 1.436E-02 7.182E-03 6.091E-03 1.101E-03 9.367E-02 1.649E-02 7.7149E-02 2.646E-01	3.859E-02 6.793E-03 1.380E-02 1.599E-02 1.354E-02 2.453E-03 1.226E-03 1.038E-03 1.880E-04 1.599E-02 2.815E-03 2.1318E-02 6.590E-03	6.590E-03 1.160E-03 5.430E-03 2.731E-03 2.315E-03 4.188E-04 2.094E-04 2.094E-04 3.027E-05 3.211E-05 2.731E-03 4.807E-04 3.846E-04 1.125E-03	1.125E-03 1.980E-04 9.272E-04 4.663E-04 3.946E-04 7.150E-05 3.575E-05 3.575E-05 3.027E-05 5.482E-06 4.663E-04 8.207E-05 3.846E-04 1.921E-04	1.921E-04 Original (First Order) = "sum of Enclosure 7a to 10"; Original (Second Order and up) = "IN F2" * 1/2 First Order = "Original (First Order)" * 1/2 * (2/3 * 44/50 * 0.3); Second Order and up = "Original (Second Order and up)" * 1/2 * (2/3 * 44/50 * 0.3) First Order = "Original (First Order)" * 1/2 * (44/50/2/3*0.7+6/50/2/3+1/3); Second Order = "Original (Second Order and up)" * 1/2 * (44/50/2/3*0.7+6/50/2/3+1/3) First Order = "IN B2" * 1/2; Second Order and up = ("IN B2" + "IN E2") * 1/2 = "C" * (2/3+27/50*1/3) = "C" * (2/3/50*1/3) = "IN C2" * 1/2 = "IN C2" * 1/2 = "E" * 1/2 * (2/3+27/50*1/3) = "E" * 1/2 * (2/3/50*1/3) = ("IN B2" + "IN E2") * 1/2 = "F" * 44/50/2/3*0.3 = "F" * (44/50/2/3*0.7+6/50/2/3+1/3) First Order = "Original" * 1/2 + "IN F2" * 1/2; Second Order and up = "IN F2" * 1/2
E2	Original OUT C1 IN C2 OUT D OUT E1 IN E2 OUT F1 IN F2 OUT G OUT B1 IN B2	4.730E-01 2.002E-01 3.626E-02 1.813E-02 1.535E-02 2.780E-03 1.047E-02 1.949E-01 9.744E-02 1.715E-02 8.029E-02	8.307E-02 3.517E-02 6.368E-03 3.184E-03 2.696E-03 4.883E-04 1.310E-03 3.422E-02 1.711E-02 3.012E-03 1.410E-02	1.459E-02 6.176E-03 1.119E-03 5.592E-04 4.735E-04 8.575E-05 1.284E-03 6.010E-03 3.005E-03 5.289E-04 2.476E-03	2.562E-03 1.085E-03 1.984E-04 9.821E-05 8.315E-05 1.506E-05 2.265E-04 1.056E-03 5.278E-04 9.289E-05 4.349E-04	4.500E-04 Original (First Order) = "sum of Enclosure 7a to 10a"; Original (Second - Fourth Order) = "IN B2 + IN E2" = "Original" * 1/2 * (2/3+27/50*1/3) = "Original" * 1/2 * (2/3/50*1/3) = "IN C2" * 1/2 = "IN C2" * 1/2 * (2/3+27/50*1/3) = "IN C2" * 1/2 * (2/3/50*1/3) = "Original" * 1/2 * (2/3 * 44/50 * 0.3) = "Original" * 1/2 * (44/50/2/3*0.7+6/50/2/3+1/3) = "IN F2" * 1/2 = "IN F2" * 1/2 * (2/3 * 44/50 * 0.3) = "IN F2" * 1/2 * (44/50/2/3*0.7+6/50/2/3+1/3)
F	Original OUT E1 IN E2 F OUT F1 IN F2 OUT G B OUT B1 IN B2 C OUT C1 IN C2 OUT D	6.639E-01 2.810E-01 5.590E-02 3.065E-02 5.395E-03 2.526E-02 1.263E-02 1.263E-02 2.222E-03 1.041E-02 3.065E-02 2.595E-02 4.700E-03 3.343E-01	2.350E-03 1.990E-03 3.803E-04 2.170E-04 8.819E-05 1.788E-04 8.940E-05 8.940E-05 1.574E-05 7.367E-05 2.170E-04 1.837E-04 3.327E-05 1.664E-05	1.966E-05 1.574E-05 7.367E-05 2.170E-04 1.837E-04 3.327E-05 1.664E-05	1.664E-05 Original (First Order) = "sum of Enclosure 11 to 13"; Original (Second Order) = "IN C2" * 1/2 First Order = "Original (First Order)" * 1/2 * (2/3+27/50*1/3); Second Order = "Original (Second Order)" * (2/3+27/50*1/3) First Order = "Original (First Order)" * 1/2 * (2/3/50*1/3); Second Order = "Original (Second Order)" * (2/3/50*1/3) First Order = "IN E2" * 1/2; Second Order = ("IN B2" + "IN E2") * 1/2 = "F" * 44/50/2/3*0.3 = "F" * (44/50/2/3*0.7+6/50/2/3+1/3) = "IN F2" * 1/2 = "IN F2" * 1/2 = "B" * 1/2 * (2/3 * 44/50 * 0.3) = "B" * 1/2 * (44/50/2/3*0.7+6/50/2/3+1/3) = ("IN B2" + "IN E2") * 1/2 = "C" * (2/3+27/50*1/3) = "C" * (2/3/50*1/3) First Order = "Original" * 1/2 + "IN C2" * 1/2; Second Order = "IN C2" * 1/2	

Total Amount of Portal Emission at particular locations of Tuen Mun Road Section	
Emission Locations ID	Total Amount of Emission NO _x (Congested Condition) (g/s)
IN A2	5.902E-02
IN B2	3.615E-01
IN C2	6.824E-02
IN E2	5.613E-02
IN F2	3.667E-01

Calculation of portal emission (NOx) in Normal Condition for Looping Effect

Emissions from Portals							
Enclosure Group	Underdeck/ Enclosure No.	Description	Length (m)	Width (m)	Q (veh/hr)	Original E.F. NOX E.F. (g/mile-veh)	Original mass NO _x (g/s)
D	5a	Tuen Mun Road (Kowloon Bound) Near Yan Oi Tong Circuit	50	11	5495	2.1472	1.018E-01
	5b	Tuen Mun Road (Kowloon Bound) Near Yan Oi Tong Circuit	33	11	4510	2.1351	5.485E-02
	6	Tuen Mun Road (Kowloon Bound) Slip Road To Pui To Road	67	6	985	2.3944	2.728E-02
E1	7+8	Tuen Mun Road (Kowloon Bound) Near Pui To Road Flyover	82	14	4510	2.1351	1.363E-01
	9+10	Tuen Mun Road (Yuen Long Bound) Near Pui To Road Flyover	82	14	3218	3.1877	1.452E-01
E2	7a	Tuen Fat Road (Kowloon Bound) Near Pui To Road Flyover	73	6	903	1.7973	2.045E-02
	8a	Tuen Mun Road (Kowloon Bound) Near Pui To Road Flyover	73	11	3485	3.2862	1.443E-01
	9a	Tuen Mun Road (Yuen Long Bound) Near Pui To Road Flyover	73	11	2828	3.3215	1.184E-01
	10a	Tuen Hi Road (Yuen Long Bound) Near Pui To Road Flyover	73	7	390	2.4182	1.188E-02
F		Tuen Hi Road (Yuen Long Bound) Under Tuen Mun Town Plaza	96	8	878	3.0008	3.466E-02
	12	Tuen Mun Road (Two-way) Under Tuen Mun Town Plaza	96	22	6313	3.3020	4.354E-01
		Tuen Fat Road (Kowloon Bound) Under Tuen Mun Town Plaza	96	7	903	1.7973	2.689E-02

Total Amount of Portal Emission at particular locations of Tuen Mun Road Section	
Emission Locations ID	Total Amount of Emission NO _x (Normal Condition) (g/s)
IN A2	3.691E-02
IN B2	2.283E-01
IN C2	4.256E-02
IN E2	3.515E-02
IN F2	2.287E-01

Appendix 4.4-2.xls(12Aug08_normal)

Appendix 4.4 Detailed Calculations of Emission Transfers from Enclosure I to Enclosure J

Calculation of portal emission transfers (NOx) from Enclosure I to Enclosure J for Normal Condition

Year 2025																							Emission Factor for NO _x in gm/mile-veh (Trunk Roads)															NO _x E.F.	
																							Motor Cycles	Petrol PC &LGV	Taxi	Non-franchised Buses <6.4t	Non-franchised Buses 6.4-15t	Non-franchised Buses >15t	Private Light Buses <3.5t	Private Light Buses >3.5t	Diesel PC&LGV <2.5t	Diesel LGV 2.5-3.5t	Diesel LGV >3.5t	HGV<15t	HGV>15t	Single Deck Franchised Buses	Double Deck Franchised Buses	Public Light Buses	(g/mile-veh)
																							1.023	0.227	0.251	0.000	6.466	0.000	0.000	0.747	0.950	0.532	3.466	7.344	9.287	5.132	5.132	0.752	
Enclosure Group	Underdeck/Enclosure No.	Road Name	Road Link No.	Road Speed	Total Q	Traffic Breakdown															Motor Cycles	Petrol PC &LGV	Taxi	Non-franchised Buses <6.4t	Non-franchised Buses 6.4-15t	Non-franchised Buses >15t	Private Light Buses <3.5t	Private Light Buses >3.5t	Diesel PC&LGV <2.5t	Diesel LGV 2.5-3.5t	Diesel LGV >3.5t	HGV<15t	HGV>15t	Single Deck Franchised Buses	Double Deck Franchised Buses	Public Light Buses			
	21	Tuen Mun Road (Kowloon Bound) Near Tsing Sin Playground	135 137	70	4716	3538 1178	0.02 0.02	0.45 0.25	0.06 0.02	0.00 0.00	0.03 0.03	0.00 0.00	0.00 0.00	0.01 0.01	0.01 0.01	0.09 0.05	0.07 0.04	0.19 0.39	0.01 0.02	0.00 0.01	0.02 0.06	0.04 0.09	96.5	428.6	59.3	0.0	914.9	0.0	0.0	35.2	44.8	200.6	1021.7	8310.3	547.4	60.5	725.9	186.2	2.679

Emissions from Portals							
Enclosure Group	Underdeck/Enclosure No.	Description	Length (m)	Width (m)	Q (veh/hr)	Original E.F. NO _x E.F. (g/mile-veh)	Original mass NO _x (g/s)
I	21	Tuen Mun Road (Kowloon Bound) Near Tsing Sin Playground	112	15	4716	2.6785	2.442E-01

Amount of Portal Emission Transfer from Enclosure I to J			
From Enclosure Group	To Enclosure Group	Name	Amount of Emission Transfer NO _x (g/s)
I	J	I-J	5.535E-02

= "Enclosure 21" * 1/3 * 34/50

Calculation of portal emission transfers (NOx) from Enclosure I to Enclosure J for Worse Condition (Congested Condition)

Year 2025																							Emission Factor for NO _x in gm/mile-veh (Trunk Roads)															NO _x E.F.	
																							Motor Cycles	Petrol PC & LGV	Taxi	Non-franchised Buses <6.4t	Non-franchised Buses 6.4-15t	Non-franchised Buses >15t	Private Light Buses <3.5t	Private Light Buses >3.5t	Diesel PC&LGV <2.5t	Diesel LGV 2.5-3.5t	Diesel LGV >3.5t	HGV<15t	HGV>15t	Single Deck Franchised Buses	Double Deck Franchised Buses	Public Light Buses	(g/mile-veh)
																							0.835	0.351	0.383	0.000	10.410	0.000	0.000	1.205	1.499	0.857	5.573	11.820	14.985	10.262	10.262	1.128	
Enclosure Group	Underdeck/Enclosure No.	Road Name	Road Link No.	Road Speed	Total Q	Traffic Breakdown												Motor Cycles	Petrol PC & LGV	Taxi	Non-franchised Buses <6.4t	Non-franchised Buses 6.4-15t	Non-franchised Buses >15t	Private Light Buses <3.5t	Private Light Buses >3.5t	Diesel PC&LGV <2.5t	Diesel LGV 2.5-3.5t	Diesel LGV >3.5t	HGV<15t	HGV>15t	Single Deck Franchised Buses	Double Deck Franchised Buses	Public Light Buses						
I	21	Tuen Mun Road (Kowloon Bound) Near Tsing Sin Playground	135 137	70	4716	3538 1178	0.02 0.02	0.45 0.25	0.06 0.02	0.00 0.00	0.03 0.03	0.00 0.00	0.00 0.00	0.01 0.01	0.01 0.01	0.09 0.05	0.07 0.04	0.19 0.39	0.01 0.02	0.00 0.01	0.02 0.06	0.04 0.09	78.8	662.4	90.2	0.0	1472.8	0.0	0.0	56.8	70.7	323.5	1642.8		13376.2	883.2	120.9	1451.5	279.3

Emissions from Portals							
Enclosure Group	Underdeck/Enclosure No.	Description	Length (m)	Width (m)	Q (veh/hr)	Original E.F. NO _x E.F. (g/mile-veh)	Original mass NO _x (g/s)
I	21	Tuen Mun Road (Kowloon Bound) Near Tsing Sin Playground	112	15	4716	4.3488	3.965E-01

Amount of Portal Emission Transfer from Enclosure I to J			
From Enclosure Group	To Enclosure Group	Name	Amount of Emission Transfer NO _x (g/s)
I	J	I-J	8.987E-02

= "Enclosure 21" * 1/3 * 34/50