APPENDIX A :Total Annual GMR Emissions of all Substances from On-Road Mobile Sources

Table A1: Total annual GMR emissions for all substances (kg/year)

Substance	Passenger Vehicle Petrol - Exhaust	Light Duty Diesel - Exhaust	Light Duty Commercial Petrol - Exhaust	Heavy Duty Commercial Diesel - Exhaust	Other Vehicles - Exhaust	All Vehicles - Evaporative	All Vehicles - Non-Exhaust PM	On-Road Mobile Total
1-(1,1-DIMETHYLETHYL)-3,5-DIMETHYLBENZENE	0	436	0	2,517	0	0	0	2,953
1,1,2-TRIMETHYLCYCLOHEXANE	0	271	0	1,563	0	0	0	1,833
1,1,2-TRIMETHYLCYCLOPENTANE	0	214	0	1,233	0	0	0	1,447
1,1,4-TRIMETHYLCYCLOHEXANE	0	177	0	1,019	0	0	0	1,196
1,1-METHYLETHYLCYCLOPENTANE	0	57.1	0	330	0	0	0	387
1,2,3,4-TETRAMETHYLBENZENE	0	538	0	1,631	0	0	0	2,169
1,2,3,5-TETRAMETHYLBENZENE	0	1,180	0	3,499	0	0	0	4,678
1,2,3-TRIMETHYLBENZENE	46,185	1,305	15,945	3,851	2,483	8,014	0	77,783
1,2,4,5-TETRAMETHYLBENZENE	0	643	0	1,908	0	0	0	2,551
1,2,4-TRIMETHYLBENZENE	157,337	1,859	54,319	5,636	8,428	28,870	0	256,449
1,2-BUTADIENE {METHYLALLENE}	0	106	0	612	0	0	0	717
1,2-DIETHYLBENZENE (ORTHO)	0	514	0	1,504	0	0	0	2,019
1,2-DIHYDRONAPHTHALENE	0	102	0	305	0	0	0	406
1,2-DIMETHYL-4-ETHYLBENZENE	0	703	0	2,130	0	0	0	2,833
1,2-DIMETHYLNAPHTHALENE	0	146	0	457	0	0	0	603
1,2-ISODIPROPYLBENZENE	0	15.5	0	45.1	0	0	0	60.5
1,3,5-TRIETHYLBENZENE	0	410	0	2,368	0	0	0	2,778
1,3,5-TRIMETHYLBENZENE	50,382	1,016	17,394	3,074	2,705	8,922	0	83,493
1,3-BUTADIENE	121,364	819	41,900	4,725	6,549	0	0	175,357
1,3-DICHLOROBENZENE {M-DICHLOROBENZENE}	0	88.1	0	263	0	0	0	352
1,3-DIETHYLBENZENE (META)	8,172	455	2,821	1,493	440	945	0	14,327
1,3-DIMETHYL-2-ETHYLBENZENE	0	914	0	5,272	0	0	0	6,186
1,3-DIMETHYL-4-ETHYLBENZENE	0	325	0	1,877	0	0	0	2,202
1,3-DIMETHYL-4-ISOPROPYLBENZENE	0	66.2	0	197	0	0	0	263
1,3-DIMETHYL-5-ETHYLBENZENE	0	564	0	1,707	0	0	0	2,272
1,3-DIMETHYLCYCLOPENTANE	0	47.6	0	275	0	0	0	322
1,3-HEXADIENE	0	71.2	0	411	0	0	0	482
1,4-DIETHYLBENZENE (PARA)	29,217	319	10,087	1,839	1,557	4,201	0	47,221

Substance	Passenger Vehicle Petrol - Exhaust	Light Duty Diesel - Exhaust	Light Duty Commercial Petrol - Exhaust	Heavy Duty Commercial Diesel - Exhaust	Other Vehicles - Exhaust	All Vehicles - Evaporative	All Vehicles - Non-Exhaust PM	On-Road Mobile Total
1,4-DIMETHYL-2-ETHYLBENZENE	0	499	0	1,505	0	0	0	2,004
1,4-DIMETHYLNAPHTHALENE	0	220	0	675	0	0	0	894
1,4-PENTADIENE	0	296	0	1,709	0	0	0	2,005
2,2,3-TRIMETHYLPENTANE	0	47.8	0	276	0	0	0	324
2,2,4-TRIMETHYLHEXANE	0	57.1	0	330	0	0	0	387
2,2,4-TRIMETHYLPENTANE	24,092	113	8,318	652	1,310	21,184	0	55,669
2,2,5-TRIMETHYLHEXANE	0	36.1	0	208	0	0	0	244
2,2-DIMETHYLBUTANE	187,464	109	64,721	630	10,121	482,436	0	745,481
2,2-DIMETHYLHEPTANE	0	133	0	767	0	0	0	900
2,2-DIMETHYLHEXANE	0	44.7	0	258	0	0	0	303
2,2-DIMETHYLOCTANE	0	79.4	0	458	0	0	0	538
2,2-DIMETHYLPROPANAL (PIVALDEHYDE)	0	237	0	1,368	0	0	0	1,606
2,2-DIMETHYLPROPANE	0	216	0	1,249	0	0	0	1,466
2,3,3-TRIMETHYLPENTANE	0	1,123	0	6,479	0	0	0	7,602
2,3,4-TRIMETHYLPENTANE	10,491	44.2	3,622	255	571	12,337	0	27,320
2,3,5-TRIMETHYLNAPHTHALENE	128	0	54.8	0	8.28	0	0	191
2,3-DIMETHYL-2-PENTENE	0	44.5	0	257	0	0	0	301
2,3-DIMETHYLBUTANE	74,101	203	25,583	1,169	4,014	177,769	0	282,838
2,3-DIMETHYLHEPTANE	0	594	0	3,427	0	0	0	4,021
2,3-DIMETHYLHEXANE	14,260	67.3	4,923	388	774	9,626	0	30,039
2,3-DIMETHYLNAPHTHALENE	0	113	0	362	0	0	0	475
2,3-DIMETHYLPENTANE	39,161	72.3	13,520	417	2,120	41,065	0	96,355
2,4,4-TRIMETHYL-1-PENTENE	0	45.2	0	261	0	0	0	306
2,4,4-TRIMETHYLHEXANE	0	44.6	0	258	0	0	0	302
2,4-DIMETHYLHEPTANE	0	124	0	715	0	0	0	839
2,4-DIMETHYLHEXANE	0	59.6	0	344	0	0	0	403
2,4-DIMETHYLOCTANE	0	88.4	0	510	0	0	0	598
2,4-DIMETHYLPENTANE	23,079	140	7,968	805	1,251	39,867	0	73,109
2,5-DIMETHYLHEPTANE	0	314	0	1,812	0	0	0	2,126
2,5-DIMETHYLHEXANE	0	16.9	0	97.5	0	0	0	114
2,6,10-TRIMETHYL UNDECANE	0	779	0	2,800	0	0	0	3,578
2,6-DIMETHYLNAPHTHALENE	0	716	0	2,227	0	0	0	2,943
3,3-DIETHYLPENTANE	0	428	0	2,468	0	0	0	2,896
3,3-DIMETHYL-1-BUTENE	0	90.3	0	521	0	0	0	612

Substance	Passenger Vehicle Petrol - Exhaust	Light Duty Diesel - Exhaust	Light Duty Commercial Petrol - Exhaust	Heavy Duty Commercial Diesel - Exhaust	Other Vehicles - Exhaust	All Vehicles - Evaporative	All Vehicles - Non-Exhaust PM	On-Road Mobile Total
3,3-DIMETHYL-1-PENTENE	8,506	0	2,937	0	450	54,927	0	66,819
3,3-DIMETHYLHEPTANE	0	669	0	3,862	0	0	0	4,532
3,3-DIMETHYLHEXANE	0	66.5	0	384	0	0	0	450
3,3-DIMETHYLOCTANE	0	1,804	0	10,410	0	0	0	12,214
3,3-DIMETHYLPENTANE	11,531	0	3,981	0	631	13,567	0	29,710
3,4-DIMETHYLBENZOIC ACID	0	184	0	548	0	0	0	733
3,4-DIMETHYLHEPTANE	0	1,378	0	7,952	0	0	0	9,330
3,5-DIMETHYLHEPTANE	0	84.9	0	490	0	0	0	575
4,4-DIMETHYLHEPTANE	0	133	0	767	0	0	0	900
9,10-ANTHRAQUINONE	62.8	16.5	26.9	65.5	4.05	0	0	176
BENZO(G,H,I)PERYLENE	85.9	3.91	36.8	12.7	5.55	0	0	145
CIS,CIS,TRANS-1,2,4-TRIMETHYL CYCLOHEXANE	0	8,412	0	48,539	0	0	0	56,951
CIS,TRANS,CIS-1,2,3-TRIMETHYL CYCLOPENTANE	0	87.4	0	504	0	0	0	592
CIS,TRANS,CIS-1,2,4-TRIMETHYL CYCLOHEXANE	0	323	0	1,866	0	0	0	2,189
CIS-1,3-DIMETHYLCYCLOHEXANE	0	182	0	1,052	0	0	0	1,235
CIS-1,3-DIMETHYLCYCLOPENTANE	0	49.7	0	287	0	0	0	337
CIS-1,CIS-2,3-TRIMETHYLCYCLOPENTANE	0	218	0	1,258	0	0	0	1,476
CIS-1,CIS-3,5-TRIMETHYLCYCLOHEXANE	0	230	0	1,326	0	0	0	1,556
CIS-1,TRANS-2,TRANS-4-TRIMETHYLCYCLOHEXANE	0	128	0	741	0	0	0	870
DIBENZO(A,H)ANTHRACENE	0	0.066	0	0.227	0	0	0	0.293
DIBENZO(A,L)PYRENE	0	0.766	0	2.58	0	0	0	3.34
DIBENZO[A,H]PYRENE	0	1.02	0	3.43	0	0	0	4.45
INDENO(1,2,3-CD)PYRENE	29.4	2.37	12.6	7.87	1.9	0	0	54.1
TRANS-1,2-CIS-4-TRIMETHYLCYCLOPENTANE	0	93.2	0	538	0	0	0	631
TRANS-1,2-DIMETHYLCYCLOHEXANE	0	1,519	0	8,764	0	0	0	10,283
TRANS-1,3-DICHLOROPROPENE	0	80.6	0	465	0	0	0	545
TRANS-1,3-DIMETHYLCYCLOHEXANE	0	8.73	0	50.4	0	0	0	59.1
TRANS-1,3-DIMETHYLCYCLOPENTANE	0	51.0	0	294	0	0	0	345

Substance	Passenger Vehicle Petrol - Exhaust	Light Duty Diesel - Exhaust	Light Duty Commercial Petrol - Exhaust	Heavy Duty Commercial Diesel - Exhaust	Other Vehicles - Exhaust	All Vehicles - Evaporative	All Vehicles - Non-Exhaust PM	On-Road Mobile Total
TRANS-1,4-DIMETHYLCYCLOHEXANE	0	130	0	751	0	0	0	881
(1-METHYLPROPYL)BENZENE (SEC-BUTYL BENZENE)	0	344	0	1,006	0	0	0	1,350
(2-METHYLPROPYL)BENZENE	0	69.5	0	212	0	0	0	282
1-BUTENE	100,576	799	34,723	4,612	5,420	212,763	0	358,893
1-BUTYNE (ETHYLACETYLENE)	0	48.8	0	282	0	0	0	331
1-DECENE	0	713	0	2,149	0	0	0	2,861
1-DODECENE	0	783	0	4,519	0	0	0	5,302
1-HEPTENE	0	441	0	2,544	0	0	0	2,985
1-HEXENE	8,359	243	2,886	1,402	447	27,690	0	41,028
1-METHYL INDAN	0	1,280	0	4,078	0	0	0	5,358
1-METHYL-2-ISOPROPYLBENZENE	0	58.7	0	172	0	0	0	230
1-METHYL-2-N-BUTYLBENZENE	0	1,125	0	6,494	0	0	0	7,619
1-METHYL-2N-PROPYLBENZENE	0	545	0	1,638	0	0	0	2,183
1-METHYL-2-TERT-BUTYLBENZENE	0	691	0	3,985	0	0	0	4,676
1-METHYL-3-ISOPROPYLBENZENE	0	314	0	920	0	0	0	1,234
1-METHYL-3N-PROPYLBENZENE	0	923	0	5,326	0	0	0	6,249
1-METHYL-4-ISOPROPYLBENZENE	0	148	0	432	0	0	0	580
1-METHYL-4N-PROPYLBENZENE	0	501	0	1,526	0	0	0	2,027
1-METHYL-4-T-BUTYLBENZENE	0	2.93	0	8.16	0	0	0	11.1
1-METHYL-9H-FLUORENE	62.7	88.8	26.8	313	4.05	0	0	495
1-METHYLCYCLOPENTENE	0	89.2	0	515	0	0	0	604
1-METHYLNAPHTHALENE	4,543	1,155	1,944	3,602	293	0	0	11,537
1-METHYLPHENANTHRENE	41.0	56.5	17.6	201	2.65	0	0	319
1-NITROPYRENE	0	1.2	0	4.2	0	0	0	5.39
1-NONENE	0	903	0	5,213	0	0	0	6,116
1-OCTENE	0	80.6	0	465	0	0	0	546
1-PENTENE	26,032	549	8,987	3,169	1,399	116,714	0	156,850
1-PHENYLNAPHTHALENE	0	13.3	0	47.7	0	0	0	61.0
1-PROPYNE	31,306	311	10,808	1,795	1,683	0	0	45,903
1-UNDECENE	0	1,417	0	4,259	0	0	0	5,676
2-BUTYNE	0	694	0	4,002	0	0	0	4,696
2-DECANONE	0	114	0	346	0	0	0	461
2-ETHYLNAPHTHALENE	0	397	0	1,276	0	0	0	1,673
2-METHYL-1-BUTENE	16,075	288	5,550	1,659	866	267,711	0	292,149

Substance	Passenger Vehicle Petrol - Exhaust	Light Duty Diesel - Exhaust	Light Duty Commercial Petrol - Exhaust	Heavy Duty Commercial Diesel - Exhaust	Other Vehicles - Exhaust	All Vehicles - Evaporative	All Vehicles - Non-Exhaust PM	On-Road Mobile Total
2-METHYL-1-PENTENE	8,359	1,015	2,886	5,855	447	27,690	0	46,252
2-METHYL-2-BUTENE	32,097	98.4	11,081	568	1,726	359,936	0	405,507
2-METHYL-2-PENTENE	10,776	35.1	3,720	203	588	67,654	0	82,976
2-METHYL-2-PROPENAL (METHACROLEIN)	3,838	160	1,325	921	199	0	0	6,442
2-METHYL-3-ETHYLPENTANE	0	214	0	1,233	0	0	0	1,447
2-METHYL-BUTANE	448,584	765	154,871	4,412	24,304	4,032,850	0	4,665,786
2-METHYLHEPTANE	33,988	156	11,734	902	1,838	16,906	0	65,524
2-METHYLHEXANE	102,476	373	35,379	2,153	5,552	111,391	0	257,324
2-METHYLINDAN	0	49.0	0	282	0	0	0	331
2-METHYLNAPHTHALENE	10,252	1,574	4,387	4,969	662	0	0	21,845
2-METHYLNONANE	0	1,702	0	9,820	0	0	0	11,522
2-METHYLOCTANE	0	552	0	3,187	0	0	0	3,739
2-METHYLPENTANE	272,216	198	93,981	1,145	14,723	645,608	0	1,027,872
2-METHYLPHENANTHRENE	97.8	57.5	41.9	202	6.32	0	0	405
2-METHYLPROPANE; ISOBUTANE	24,406	100	8,426	577	1,311	862,937	0	897,758
2-METHYLPROPENE (ISOBUTENE)	100,576	799	34,723	4,612	5,420	212,763	0	358,893
2-NITROFLUORENE	0	0.143	0	0.482	0	0	0	0.625
3-ETHYL-2-PENTENE	0	90.3	0	521	0	0	0	612
3-ETHYLHEPTANE	0	428	0	2,468	0	0	0	2,896
3-ETHYLHEXANE	0	93.2	0	538	0	0	0	631
3-ETHYLOCTANE	0	567	0	3,271	0	0	0	3,838
3-ETHYLPENTANE	0	51.0	0	294	0	0	0	345
3-METHYL-1-BUTENE	11,977	120	4,135	695	641	53,883	0	71,451
3-METHYL-1-HEXENE	0	185	0	1,066	0	0	0	1,251
3-METHYL-1-PENTENE	2,573	68.6	888	396	138	11,247	0	15,310
3-METHYL-3-ETHYLPENTANE	0	18.6	0	107	0	0	0	126
3-METHYLBIPHENYL	108	492	46.0	1,543	6.95	0	0	2,196
3-METHYL-CIS-2-PENTENE	6,666	17.9	2,301	103	362	37,751	0	47,201
3-METHYLHEPTANE	64,090	117	22,127	675	3,465	32,161	0	122,634
3-METHYLHEXANE	123,770	120	42,731	693	6,704	126,889	0	300,907
3-METHYLNONANE	0	1,605	0	9,262	0	0	0	10,867
3-METHYLOCTANE	0	351	0	2,025	0	0	0	2,376
3-METHYLPENTANE	175,010	149	60,421	857	9,461	356,682	0	602,579
3-METHYL-TRANS-2-PENTENE	0	27.9	0	161	0	0	0	189

Substance	Passenger Vehicle Petrol - Exhaust	Light Duty Diesel - Exhaust	Light Duty Commercial Petrol - Exhaust	Heavy Duty Commercial Diesel - Exhaust	Other Vehicles - Exhaust	All Vehicles - Evaporative	All Vehicles - Non-Exhaust PM	On-Road Mobile Total
4-METHYL-1-PENTENE	2,573	68.6	888	396	138	11,247	0	15,310
4-METHYL-CIS-2-PENTENE	0	8.93	0	51.6	0	0	0	60.5
4-METHYLHEPTANE	33,988	73.0	11,734	421	1,838	16,906	0	64,961
4-METHYLOCTANE	0	407	0	2,346	0	0	0	2,752
4-METHYL-TRANS-2-PENTENE	0	8.93	0	51.6	0	0	0	60.5
4-NITROBIPHENYL	0	0.239	0	0.802	0	0	0	1.04
4-NITROPYRENE	0	0.029	0	0.096	0	0	0	0.125
5-METHYLCHRYSENE	0.502	0.426	0.215	1.55	0.032	0	0	2.73
6-METHYLCHRYSENE	0	0.426	0	1.55	0	0	0	1.98
6-NITROCHRYSENE	0	0.048	0	0.16	0	0	0	0.208
9-METHYLANTHRACENE	1.87	1.25	0.801	4.4	0.121	0	0	8.45
ACENAPHTHENE	163	48.1	69.9	178	10.6	0	0	470
ACENAPHTHYLENE	1,730	192	740	637	112	0	0	3,411
ACETALDEHYDE	54,227	7,751	18,722	44,729	2,462	0	0	127,892
ACETONE	23,594	3,377	8,146	19,487	1,268	0	0	55,871
ACETYLENE	303,070	3,721	104,633	21,474	16,172	0	0	449,071
ACROLEIN (2-PROPENAL)	23,338	732	8,057	4,223	1,262	0	0	37,611
ADIPIC ACID	0	35.6	0	149	0	0	0	184
AMMONIA (TOTAL)	1,762,602	2,395	276,210	7,552	599	0	0	2,049,358
ANTHRACENE	182	22.5	78.0	79.0	11.8	0	0	373
ANTIMONY & COMPOUNDS	53.3	128	28.1	350	4.15	0	5,369	5,932
A-PINENE	0	44.0	0	254	0	0	0	298
ARSENIC & COMPOUNDS	0.136	14.5	0.071	39.6	0.011	0	38.8	93.2
BENZALDEHYDE	33,720	386	11,642	2,229	1,781	0	0	49,757
BENZENE	473,600	2,168	163,507	12,513	25,641	94,317	0	771,746
BENZO(A)ANTHRACENE	7.92	26.8	3.39	101	0.512	0	0	139
BENZO(A)PYRENE	24.6	19.2	10.5	65.1	1.59	0	3.07	124
BENZO(B)FLUORANTHENE	12.1	0.431	5.2	1.59	0.784	0	0.225	20.4
BENZO(C)PHENANTHRENE	2.42	4.38	1.04	16.9	0.156	0	0	24.9
BENZO(E)PYRENE	24.2	11.9	10.4	42.3	1.56	0	0	90.3
BENZO(J)FLUORANTHENE	12.1	0	5.2	0	0.784	0	0	18.1
BENZO(K)FLUORANTHENE	12.1	0.65	5.2	2.36	0.784	0	0.333	21.5
BENZO[GHI]FLUORANTHENE	0	19.7	0	66.2	0	0	0	85.8
BENZOIC ACID	0	1,464	0	5,182	0	0	0	6,645
BIPHENYL {PHENYL BENZENE}	595	768	255	2,343	38.5	0	0	3,999

Substance	Passenger Vehicle Petrol - Exhaust	Light Duty Diesel - Exhaust	Light Duty Commercial Petrol - Exhaust	Heavy Duty Commercial Diesel - Exhaust	Other Vehicles - Exhaust	All Vehicles - Evaporative	All Vehicles - Non-Exhaust PM	On-Road Mobile Total
B-PINENE	0	6.36	0	36.7	0	0	0	43.1
BRANCHED C10 ALKANES	12,139	0	4,191	0	639	1,801	0	18,769
BRANCHED C11 ALKANES	33,240	0	11,476	0	1,830	1,085	0	47,630
BRANCHED C7 ALKANES	62,786	0	21,676	0	3,420	66,417	0	154,299
BRANCHED C8 ALKANES	34,835	0	12,027	0	1,891	23,597	0	72,349
BRANCHED C9 ALKANES	45,627	0	15,752	0	2,470	12,508	0	76,357
BROMINE AND COMPOUNDS	27.9	31.3	14.7	85.6	2.17	0	35.2	197
BUTYLBENZENE ISOMERS	0	1,984	0	11,449	0	0	0	13,433
BUTYLCYCLOHEXANE	0	999	0	5,766	0	0	0	6,765
BUTYRALDEHYDE	9,186	877	3,171	5,061	497	0	0	18,791
C10 AROMATIC	46,751	0	16,140	0	2,522	5,804	0	71,217
C7 INTERNAL ALKENES	2,034	0	702	0	110	21.3	0	2,868
C7 TERMINAL ALKENES	2,034	0	702	0	110	21.3	0	2,868
CADMIUM & COMPOUNDS	10.3	137	5.43	373	0.8	0	15.2	542
CARBON DIOXIDE	5,756,227,366	591,103,366	1,268,748,088	2,367,056,316	39,581,895	0	0	10,022,717,031
CARBON MONOXIDE	93,437,069	1,176,223	48,731,195	5,705,049	4,762,042	0	0	153,811,578
CHLORINE	259	259	136	706	20.1	0	1,161	2,541
CHROMIUM (III) COMPOUNDS	19.0	36.6	10.0	100	1.47	0	1,257	1,424
CHRYSENE	7.03	16.1	3.01	62.3	0.454	0	0	88.9
CIS-1-2-DIMETHYLCYCLOPENTANE	0	101	0	583	0	0	0	685
CIS-1-METHYL-3-ETHYLCYCLOPENTANE	0	264	0	1,526	0	0	0	1,791
CIS-2-BUTENE	31,382	176	10,834	1,015	1,676	407,124	0	452,207
CIS-2-HEPTENE	0	409	0	2,360	0	0	0	2,769
CIS-2-HEXENE	6,021	62.9	2,079	363	327	25,252	0	34,104
CIS-2-NONENE	0	228	0	1,317	0	0	0	1,545
CIS-2-OCTENE	0	704	0	4,061	0	0	0	4,765
CIS-2-PENTENE	19,638	100	6,780	579	1,056	137,296	0	165,450
CIS-3-HEXENE	2,830	0	977	0	153	16,245	0	20,204
COBALT & COMPOUNDS	3.19	17.1	1.68	46.7	0.248	0	12.2	81.1
COPPER & COMPOUNDS	71.9	47.7	37.9	130	5.59	0	27,553	27,847
CORONENE	77.4	1.85	33.1	6.37	5	0	0	124
CRESOLS	0	99.3	0	573	0	0	0	672
CROTONALDEHYDE	5,249	687	1,812	3,962	284	0	0	11,994
CUMENE (1-METHYLETHYLBENZENE)	9,597	102	3,313	590	516	2,096	0	16,215

Substance	Passenger Vehicle Petrol - Exhaust	Light Duty Diesel - Exhaust	Light Duty Commercial Petrol - Exhaust	Heavy Duty Commercial Diesel - Exhaust	Other Vehicles - Exhaust	All Vehicles - Evaporative	All Vehicles - Non-Exhaust PM	On-Road Mobile Total
CYCLOHEXANE	102,812	121	35,495	700	5,589	140,475	0	285,192
CYCLOHEXENE	0	111	0	642	0	0	0	753
CYCLOPENTA[CD]PYRENE	0	20.4	0	68.5	0	0	0	88.9
CYCLOPENTANE	23,138	51.9	7,988	299	1,265	68,482	0	101,224
CYCLOPENTENE	11,043	299	3,812	1,727	591	29,527	0	47,000
DECYL CYCLOHEXANE	0	135	0	439	0	0	0	574
DI(2-ETHYLHEXYL)PHTHALATE	0	0.888	0	5.13	0	0	0	6.01
DIBENZANTHRACENES	0.891	0	0.381	0	0.058	0	0	1.33
DIBENZOFURAN	191	112	81.7	371	12.3	0	0	768
DIETHYLBENZENES	0	178	0	1,027	0	0	0	1,205
DIMETHYL INDAN	0	832	0	2,556	0	0	0	3,388
DIMETHYL NAPHTHALENES	3,041	0	1,301	0	196	0	0	4,538
DIMETHYLBENZALDEHYDE	0	159	0	918	0	0	0	1,077
DIMETHYLCYCLOHEXANES	0	107	0	617	0	0	0	724
DIMETHYLCYCLOPENTANE	0	1.55	0	8.95	0	0	0	10.5
DIMETHYLHEPTANES	0	45.2	0	261	0	0	0	306
DIMETHYLOCTANES	0	594	0	1,874	0	0	0	2,468
DIPHENYL ETHANE {BIBENZYL}	330	628	141	2,371	21.3	0	0	3,491
DL-LIMONENE {DIPENTENE}	0	38.8	0	224	0	0	0	263
DOCOSANE	0	254	0	924	0	0	0	1,178
EICOSANE	0	378	0	1,488	0	0	0	1,866
ETHANE	310,024	671	107,033	3,872	16,653	0	0	438,253
ETHYL ALCOHOL	21,917	0	7,567	0	0	51,323	0	80,807
ETHYL T-BUTYL ETHER	0	177	0	1,020	0	0	0	1,197
ETHYLBENZENE	158,715	364	54,795	2,098	8,527	40,601	0	265,101
ETHYLCYCLOHEXANE	0	230	0	1,326	0	0	0	1,556
ETHYLCYCLOPENTANE	0	16.9	0	97.5	0	0	0	114
ETHYLENE	998,098	14,523	344,586	83,804	53,465	0	0	1,494,476
ETHYLNAPHTHALENES	755	0	323	0	48.8	0	0	1,127
FLUORANTHENE	263	99.2	112	413	17.0	0	0	904
FLUORENE	542	147	232	501	35.0	0	0	1,457
FORMALDEHYDE	144,852	20,037	50,009	115,622	7,580	0	0	338,101
GLYCEROL	0	485	0	2,040	0	0	0	2,526
GLYOXAL	0	2,131	0	12,295	0	0	0	14,426
HENEICOSANE	0	243	0	954	0	0	0	1,197

Substance	Passenger Vehicle Petrol - Exhaust	Light Duty Diesel - Exhaust	Light Duty Commercial Petrol - Exhaust	Heavy Duty Commercial Diesel - Exhaust	Other Vehicles - Exhaust	All Vehicles - Evaporative	All Vehicles - Non-Exhaust PM	On-Road Mobile Total
HEPTANAL	0	186	0	546	0	0	0	732
HEPTYL CYCLOHEXANE	0	603	0	1,918	0	0	0	2,521
HEXADECANE	0	1,560	0	5,106	0	0	0	6,666
HEXANAL (HEXANALADEHYDE)	0	139	0	802	0	0	0	940
INDAN	0	1,249	0	3,636	0	0	0	4,885
INDANE	15,672	0	5,411	0	839	3,607	0	25,528
INDENE	0	216	0	637	0	0	0	854
ISOBUTYLCYCLOPENTANE (2-METHYLPROPYL CYCLOPENTANE)	0	77.9	0	449	0	0	0	527
ISOBUTYRALDEHYDE	0	203	0	1,171	0	0	0	1,373
ISOPRENE	3,638	174	1,256	1,004	199	4,741	0	11,012
ISOPROPYLCYCLOHEXANE (2-METHYLETHYL CYCLOHEXANE)	0	552	0	3,186	0	0	0	3,738
ISOPROPYLCYCLOPENTANE	0	44.6	0	258	0	0	0	302
ISOVALERALDEHYDE (3-METHYLBUTANAL)	0	472	0	2,727	0	0	0	3,199
LEAD & COMPOUNDS	42.7	55.0	22.5	150	3.32	0	3,380	3,653
MANGANESE & COMPOUNDS	6.47	26.9	3.41	73.6	0.503	0	1,355	1,466
MERCURY & COMPOUNDS	5.15	28.1	2.72	76.8	0.4	0	0	113
METHANE	987,892	33,577	341,063	193,752	53,011	0	0	1,609,295
METHYL ALCOHOL	16,007	2,613	5,526	15,076	746	0	0	39,968
METHYL BIPHENYL (MIXED) {PHENYLTOLUENE}	158	0	67.7	0	10.2	0	0	236
METHYL ETHYL KETONE (MEK) (2-BUTANONE)	0	638	0	3,681	0	0	0	4,319
METHYL ISOBUTYL KETONE	0	216	0	1,245	0	0	0	1,461
METHYL T-BUTYL ETHER (MTBE)	0	340	0	1,961	0	0	0	2,300
METHYL T-BUTYL KETONE (PINACOLIN)	0	609	0	3,512	0	0	0	4,121
METHYLBENZALDEHYDE ISOMERS	0	210	0	1,213	0	0	0	1,424
METHYLBENZANTHRACENES	1.1	0	0.469	0	0.071	0	0	1.64
METHYLBUTADIENE	0	141	0	816	0	0	0	958
METHYLCYCLOHEXANE	47,227	183	16,305	1,059	2,562	37,421	0	104,756
METHYLCYCLOPENTANE	123,280	721	42,561	4,163	6,698	207,758	0	385,181
METHYLPHENANTHRENES	149	0	63.7	0	9.62	0	0	222

Substance	Passenger Vehicle Petrol - Exhaust	Light Duty Diesel - Exhaust	Light Duty Commercial Petrol - Exhaust	Heavy Duty Commercial Diesel - Exhaust	Other Vehicles - Exhaust	All Vehicles - Evaporative	All Vehicles - Non-Exhaust PM	On-Road Mobile Total
M-ETHYLTOLUENE	106,876	1,823	36,898	5,386	5,745	17,372	0	174,101
MOLYBDENUM	11.6	26.5	6.12	72.4	0.903	0	5,369	5,487
M-TOLUALDEHYDE	11,899	1,531	4,108	4,463	627	0	0	22,628
M-XYLENE	262,641	275	90,675	1,586	14,174	68,602	0	437,953
NAPHTHALENE	23,975	2,153	10,259	6,796	1,549	0	0	44,732
N-BUTANE	117,341	435	40,511	2,509	6,297	2,205,549	0	2,372,641
N-BUTYLBENZENE	0	351	0	1,103	0	0	0	1,453
N-BUTYLCYCLOPENTANE	0	782	0	4,514	0	0	0	5,296
N-DECANE	9,649	2,259	3,331	8,402	517	1,695	0	25,854
N-DECANOIC ACID	0	319	0	1,188	0	0	0	1,507
N-DODECANE	2,507	2,652	865	10,032	139	73.2	0	16,268
N-DODEDANOIC ACID	0	416	0	1,567	0	0	0	1,983
N-HEPTADECANE	0	1,587	0	4,989	0	0	0	6,576
N-HEPTANE	87,048	323	30,053	1,862	4,714	76,113	0	200,113
N-HEPTANOIC ACID	0	545	0	1,675	0	0	0	2,221
N-HEXANE	97,408	6,694	33,629	38,626	5,292	195,886	0	377,536
N-HEXANOIC ACID	0	573	0	1,963	0	0	0	2,535
N-HEXYLBENZENE	0	2,690	0	15,521	0	0	0	18,210
NICKEL & COMPOUNDS	11.6	13.3	6.13	36.2	0.904	0	196	264
NITRIC OXIDE	17,240,794	1,560,432	5,438,259	12,230,514	162,041	0	0	36,632,041
NITROGEN DIOXIDE	1,081,355	667,744	341,092	2,666,639	10,163	0	0	4,766,994
NITROUS OXIDE	1,039,252	12,364	158,062	22,589	1,405	0	0	1,233,672
N-NONADECANOIC ACID	0	38.5	0	178	0	0	0	216
N-NONANE	14,429	1,338	4,981	5,023	777	3,065	0	29,613
N-NONANOIC ACID	0	850	0	2,715	0	0	0	3,565
N-OCTANE	40,645	236	14,032	1,361	2,197	17,211	0	75,683
N-OCTANOIC ACID	0	456	0	1,419	0	0	0	1,875
NONADECANE	0	537	0	1,900	0	0	0	2,437
NONYL CYCLOHEXANE	0	393	0	1,353	0	0	0	1,746
N-PENTADECANE	0	1,397	0	4,868	0	0	0	6,265
N-PENTADECANOIC ACID	0	38.8	0	136	0	0	0	175
N-PENTANAL (N-VALERALDEHYDE)	0	259	0	1,493	0	0	0	1,752
N-PENTANE	158,886	385	54,854	2,222	8,615	823,145	0	1,048,107
N-PENTYLBENZENE	0	681	0	2,089	0	0	0	2,770
N-PROPYLBENZENE	24,912	743	8,601	2,251	1,341	5,671	0	43,520

Substance	Passenger Vehicle Petrol - Exhaust	Light Duty Diesel - Exhaust	Light Duty Commercial Petrol - Exhaust	Heavy Duty Commercial Diesel - Exhaust	Other Vehicles - Exhaust	All Vehicles - Evaporative	All Vehicles - Non-Exhaust PM	On-Road Mobile Total
N-TETRADECANE	0	1,649	0	5,721	0	0	0	7,370
N-TETRADECANOIC ACID	0	171	0	618	0	0	0	789
N-TRIDECANE	4,355	2,474	1,504	8,574	238	9.93	0	17,155
N-TRIDECANOIC ACID	0	30.7	0	124	0	0	0	154
N-UNDECANE	5,133	5,444	1,772	24,949	277	408	0	37,983
N-UNDECANOIC ACID	0	93.0	0	298	0	0	0	391
O-CRESOL (2-METHYL-BENZENOL)	0	117	0	348	0	0	0	465
OCTADECANE	0	791	0	2,712	0	0	0	3,502
OCTANAL	0	1,142	0	3,389	0	0	0	4,530
OCTYL CYCLOHEXANE	0	332	0	1,112	0	0	0	1,444
O-DICHLOROBENZENE	0	75.4	0	244	0	0	0	319
O-ETHYLTOLUENE	52,649	1,127	18,177	3,435	2,829	8,607	0	86,824
O-TOLUALDEHYDE	0	295	0	1,700	0	0	0	1,995
OXIDES OF NITROGEN	27,515,401	3,060,240	8,679,176	21,418,790	258,610	0	0	60,932,217
O-XYLENE	203,735	230	70,338	1,326	10,979	47,971	0	334,579
PALMITIC ACID {N-HEXADECANOIC ACID}	0	149	0	566	0	0	0	715
PARTICULATE MATTER ≤ 10 µm	120,836	308,061	63,714	841,289	9,395	0	1,449,904	2,793,199
PARTICULATE MATTER ≤ 2.5 µm	115,157	298,819	60,719	816,051	8,953	0	771,349	2,071,048
PENTAMETHYLBENZENE	0	101	0	303	0	0	0	404
PERYLENE	4.08	0.879	1.75	3	0.264	0	0	9.97
P-ETHYLTOLUENE	48,277	941	16,667	2,860	2,593	8,458	0	79,796
PHENANTHRENE	772	204	330	712	49.8	0	0	2,069
PHENOL (CARBOLIC ACID)	0	1,404	0	4,555	0	0	0	5,960
PHENYLACETIC ACID	0	88.9	0	349	0	0	0	438
PHOSPHORUS	547	620	288	1,694	42.5	0	0	3,192
POLYCHLORINATED DIOXINS AND FURANS	0.000068	0.000067	0.000015	0.00027	0.00000047	0	0	0.00042
POLYCYCLIC AROMATIC HYDROCARBONS	49,513	10,077	21,187	32,625	3,199	0	0	116,601
PROPANE	15,535	1,581	5,363	9,121	829	0	0	32,430
PROPIONALDEHYDE	5,747	1,067	1,984	6,156	304	0	0	15,258
PROPYLCYCLOPENTANE	0	15.8	0	91.2	0	0	0	107
PROPYLENE	411,962	4,389	142,227	25,324	22,160	0	0	606,061
P-TOLUALDEHYDE {4-	11,899	210	4,108	1,213	627	0	0	18,058

Substance	Passenger Vehicle Petrol - Exhaust	Light Duty Diesel - Exhaust	Light Duty Commercial Petrol - Exhaust	Heavy Duty Commercial Diesel - Exhaust	Other Vehicles - Exhaust	All Vehicles - Evaporative	All Vehicles - Non-Exhaust PM	On-Road Mobile Total
METHYLBENZALDEHYDE}								
P-XYLENE	262,641	275	90,675	1,586	14,174	68,602	0	437,953
PYRENE	290	133	124	545	18.7	0	0	1,111
RETENE	2.71	2.18	1.16	8.28	0.175	0	0	14.5
SELENIUM & COMPOUNDS	0.875	15.8	0.462	43.0	0.068	0	24.4	84.6
STEARIC ACID (N-OCTADECANOIC ACID)	0	255	0	909	0	0	0	1,164
STYRENE (ETHENYLBENZENE)	8,353	300	2,884	1,732	450	429	0	14,148
SULFATES	5,355	8,781	2,824	23,981	416	0	19,639	60,997
SULFUR DIOXIDE	180,829	9,010	41,181	36,162	1,492	0	0	268,673
T-BUTYLBENZENE	0	461	0	1,341	0	0	0	1,802
TETRALIN	0	713	0	2,256	0	0	0	2,969
TIN & COMPOUNDS	13.7	62.7	7.22	171	1.06	0	4,792	5,048
TOLUENE	881,492	954	304,329	5,502	47,517	391,933	0	1,631,726
TOTAL SUSPENDED PARTICULATE	120,836	311,142	63,714	849,702	9,395	0	2,248,656	3,603,444
TOTAL VOLATILE ORGANIC COMPOUNDS	9,647,383	203,266	3,330,690	1,172,939	517,690	14,631,534	0	29,503,501
TRANS-1-2-DIMETHYLCYCLOPENTANE	0	3,341	0	19,278	0	0	0	22,618
TRANS-1-BUTYL-4-ETHYLBENZENE	0	1,026	0	5,918	0	0	0	6,944
TRANS-2-BUTENE	39,418	208	13,609	1,198	2,108	474,586	0	531,126
TRANS-2-HEPTENE	0	111	0	638	0	0	0	748
TRANS-2-HEXENE	11,042	59.7	3,812	345	594	44,343	0	60,195
TRANS-2-NONENE	0	127	0	736	0	0	0	863
TRANS-2-OCTENE	0	54.3	0	313	0	0	0	367
TRANS-2-PENTENE	36,216	108	12,503	622	1,948	253,561	0	304,957
TRANS-3-HEXENE	2,830	0	977	0	153	16,245	0	20,204
TRANS-3-NONENE	0	195	0	1,127	0	0	0	1,322
TRIMETHYLBENZENES	0	5,672	0	32,731	0	0	0	38,403
TRIMETHYLCYCLOPENTANE	0	101	0	583	0	0	0	685
TRIMETHYLNAPHTHALENE	775	287	332	953	50.1	0	0	2,397
TRIMETHYLPENTANE	0	136	0	782	0	0	0	917
VANADIUM & COMPOUNDS	2.58	28.1	1.36	76.8	0.201	0	355	464
VINYLACETYLENE	12,943	0	4,468	0	689	0	0	18,100
ZINC & COMPOUNDS	685	808	361	2,208	53.2	0	9,746	13,861

APPENDIX B :Emission Projections

Future year emission projections are made using the same methodology as the estimates for the 2008 base year. Assumptions are made regarding the emissions performance of the fleet based on promulgated and proposed future emission standards relative to the emission data for the current fleet. VKT projections are provided by the Bureau of Transport Statistics. The level of uncertainty of the future year emission projections is likely to be considerably higher than those for the 2008 base year estimates.

The major assumptions and data upon which the projections are based are presented below followed by the projected emission data for years from 2011 to 2036 in five year increments.

B.1 :Major Assumptions for Projections

1. ADR 80/02 (adopting Euro IV) applies to all new heavy duty diesel vehicles from 2008.
2. ADR 80/03 (adopting Euro V) applies to all new heavy duty diesel vehicles from 2011. No future new emission standards for heavy duty vehicles beyond ADR 80/03 have been promulgated, and all future vehicles beyond 2011 are assumed to operate at Euro V level.
3. Euro IV heavy duty diesels emissions are estimated by applying the ratio of Euro IV to Euro III emissions predicted by the ARTEMIS model, to the Australian Euro III (ADR80/00) data. This results in reductions of 32 to 44% for NO_x, 72 to 92% in CO, 95% in HC, and 70 to 80% in PM. Note that the ARTEMIS model assumes Euro IV heavy diesels to all use exhaust aftertreatment to reduce PM (primarily oxidation catalysts or partial traps), and this results in associated large reductions in CO and HC.
4. Euro V heavy duty diesel emissions are estimated by applying the ratio of Euro V to Euro IV emissions predicted by the ARTEMIS model to the Euro IV emission factors derived as described above. The ARTEMIS model assumes that all Euro V heavy duty diesels will use SCR technology to reduce NO_x. Reductions from Euro IV of approximately 40% in NO_x are predicted. No further reduction in CO, HC, or PM is applied from the Euro IV levels.
5. ADR79/02 (adopting Euro 4) applied to all new light duty petrol vehicles from 2010. The 2006-2007 NISE2 ADR79/01 fleet included approximately 37% of vehicles that were certified to Euro 4‡.. To estimate Euro 4 emission factors the NISE2 ADR fleet was split into Euro 3, and Euro 4 and higher portions The Euro 4 vehicles were determined to have emissions approximately 30-35% lower for HC for both hot and cold running, 30% lower for cold running for CO, but no different for hot running, and 74 to 77% lower for NOx for cold and hot running respectively. All differences are statistically significant at the 90% level.
6. ADR79/02 for light duty diesel vehicles makes no further changes to the emission limits from ADR79/01 which requires Euro 4 certification.
7. Emission factors for the ADR79/02 petrol light duty fleet from 2010 to 2013 were estimated on the following assumptions:
   - The ADR79/02 fleet is made up of 63% of vehicle certified to Euro 4 and 37% certified to Euro 5 or Euro 6
   - The 2010-2013 Euro 4 vehicles are 10% lower emitting than the 2006-07 Euro 4 vehicles from the NISE2 fleet
   - The 2010-2013 Euro 5 vehicles are 10% lower emitting than the Euro 4 vehicles for CO and HC, and 25% lower emitting for NO_x, and have 20% lower deterioration rates for all pollutants in order to meet the 160,000 km durability requirement of Euro 5
   - PM_{10} emission factors do not change from the ADR79/01 fleet.

‡ Vehicle certification estimated from the Commonwealth Government's Green Vehicle Guide

8. ADR79/03/04 phases in Euro 5 standards for both light duty petrol and diesel vehicles over the period 2014 to 2016. Euro 5 requires a 25% reduction in NO_x for petrol vehicles, and reductions of 28%, 22% and 80% for NO_x, HC and PM respectively for light duty diesel vehicles.
9. ADR79/05 which has not yet been promulgated but is timetabled for phase in from 2017-2018 requires both petrol and diesel to be certified to Euro 6 limits. The emission projections assume that ADR79/05 will be introduced according to this planned timetable. Euro 6 imposes no new limits for petrol vehicles other than applying the same PM limit as for diesels to gasoline direct injection vehicles.
10. ADR79/03/04 petrol vehicle emission factors for 2014 to 2016 were estimated on the following assumptions:
    - In 2014 the fleet is assumed to be comprised of 65% Euro 4 certified vehicles and 35% Euro 5 or Euro 6 certified vehicles[§]
    - By the end of 2016 all vehicles are Euro 5 or Euro 6.
    - In 2014 Euro 4 and Euro 5 emission factors for NO_x, HC, CO and PM are assumed to be the same as Euro 4 and Euro 5 vehicles in 2010-2013 as described in 7. above.
11. ADR79/05 petrol vehicle emission factors from 2017 onwards are assumed to be 90% of those estimated for Euro 5 for ADR79/03/04 for NO_x, HC and CO. Pm emission factors are assumed the same as for ADR79/01 to ADR79/04.
12. ADR79/03/04 diesel vehicle emission factors for 2014 to 2016 were estimated on the following assumptions.
    - NO_x emission factors are assumed to reduce linearly from the Euro 4 to the Euro 5 limits, a total reduction of 28%.
    - HC and CO emission factors are assumed to reduce by 10% from the Euro 4 levels of 2010.
    - PM_{10} emission factors are assumed to reduce linearly from the Euro 4 to the Euro 5 limits, a total reduction of 80%.
13. E10 fuel use of 37% of total petrol is applied to 2011 year emission estimations, from the Department of Resources, Energy and Tourism data. From 2016 on, E10 usage is assumed to be 60% in order to meet the NSW requirement for ethanol to comprise 6% of total petrol sales from 2012.
14. The petrol-diesel new vehicle proportions are estimated by applying the sales trends given in Figure 3-3. This has diesel passenger cars and diesel 4WD vehicles comprising 20% and 40% of the respective new vehicle sales in 2015, levelling off at 25% and 42% in 2026. Diesel LCV's are assumed to comprise 62% of new LCV sales in 2015, levelling off at 70% by 2026.

B.2 :VKT Data

The total VKT by vehicle type from 2008 to 2036 used for the emission projections is given in Table B1. This data was estimated by the Bureau of Transport Statistics using the Strategic Transport Mode and the Freight Movement Model (see Section 3.4).

§

Table B1: Projected GMR VKT 2008 to 2036 by vehicle type

Year	Petrol Passenger Vehicles	Diesel Passenger Vehicles	Petrol LCV	Diesel LCV	Heavy Duty Petrol	Rigid Truck	Articulated Truck	Heavy Diesel Bus	Motorcycles	Total VKT
2008	82,681,551	14,562,974	2,355,527	4,906,243	191,445	5,540,447	2,509,297	489,196	556,802	113,793,482
2011	82,020,109	13,639,099	5,077,809	6,359,580	172,316	5,981,824	2,676,309	502,618	570,333	116,999,996
2016	78,050,255	11,740,994	11,487,722	9,225,067	169,644	7,049,256	3,240,825	527,919	586,196	122,077,879
2021	74,676,549	10,312,898	18,424,746	12,155,290	179,086	8,150,494	3,672,201	552,246	609,498	128,733,009
2026	73,534,908	9,107,865	24,813,237	14,487,640	187,967	8,936,657	4,017,608	577,568	643,847	136,307,297
2031	72,728,004	8,428,613	28,719,902	16,216,454	200,781	9,738,888	4,362,427	603,903	664,165	141,663,137
2036	74,173,638	8,327,251	31,321,509	17,614,341	219,395	10,695,786	4,792,800	631,879	690,521	148,467,119

B.3 :Projected Emission Estimates

Emission projections for VOC, NO_x, CO and PM_{10} are presented in Table B2, Table B3, Table B4 and Table B5. The contribution by source type is shown graphically in Figure B1, Figure B2, Figure B3 and Figure B4.

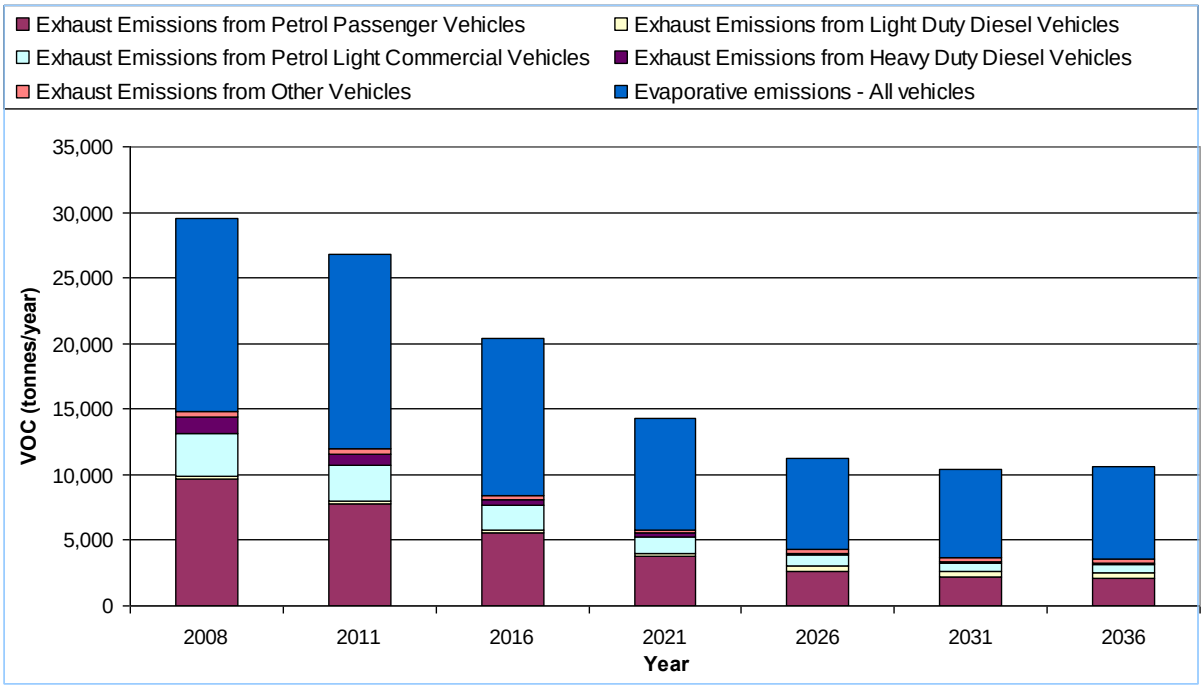

Figure B1: VOC GMR annual emission projections by source type

Table B2: VOC GMR emission projections (tonne/year)

Year	Passenger Vehicle Petrol - Exhaust	Light Duty Diesel – Exhaust	Light Duty Commercial Petrol - Exhaust	Heavy Duty Commercial Diesel - Exhaust	Other Vehicles - Exhaust	All Vehicles - Evaporative	Total
2008	9,647	203	3,331	1,173	518	14,632	29,504
2011	7,736	207	2,729	861	398	14,824	26,755
2016	5,555	241	1,883	432	309	11,982	20,403
2021	3,740	295	1,269	226	280	8,474	14,284
2026	2,670	346	854	125	274	6,957	11,227
2031	2,226	385	658	88.9	277	6,811	10,446
2036	2,117	416	646	80.8	289	7,110	10,658

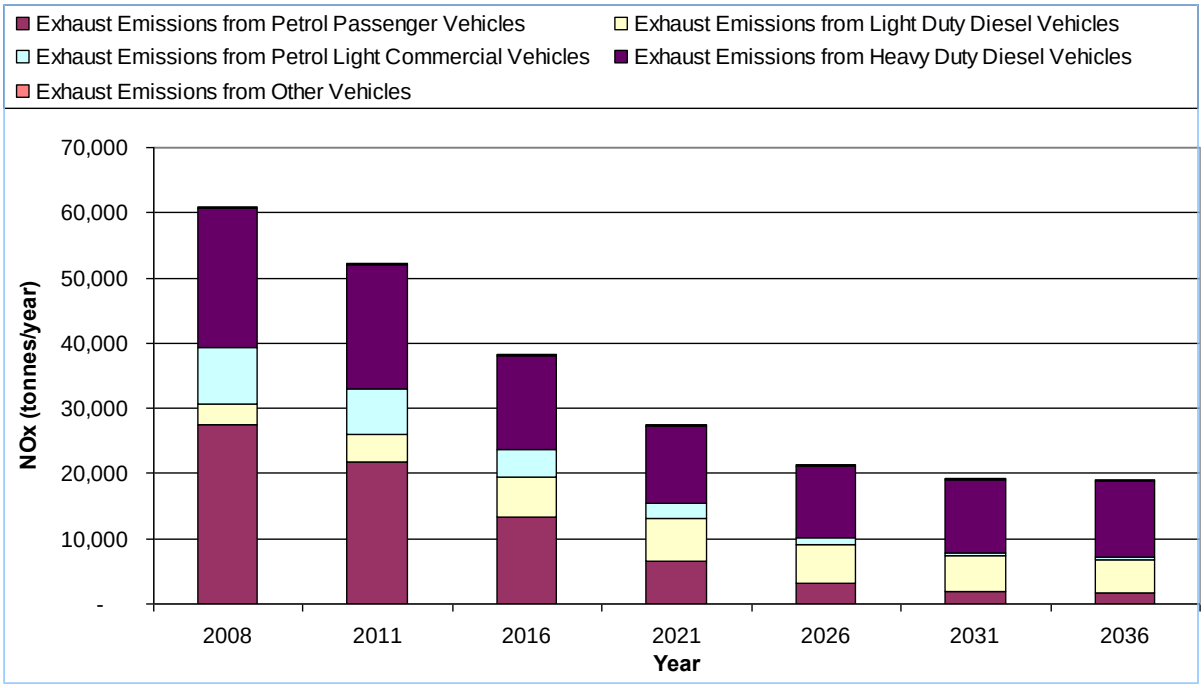

Figure B2: NO_x GMR Annual emission projections by source type

Table B3: NO_x GMR emission projections (tonne/year)

Year	Passenger Vehicle Petrol - Exhaust	Light Duty Diesel – Exhaust	Light Duty Commercial Petrol - Exhaust	Heavy Duty Commercial Diesel - Exhaust	Other Vehicles - Exhaust	Total
2008	27,515	3,060	8,679	21,419	259	60,932
2011	21,871	4,116	7,059	19,066	216	52,329
2016	13,246	6,231	4,304	14,262	189	38,231
2021	6,581	6,572	2,214	11,904	188	27,458
2026	3,158	6,011	996	10,992	192	21,349
2031	1,950	5,439	496	11,090	198	19,173
2036	1,657	5,086	342	11,817	211	19,114

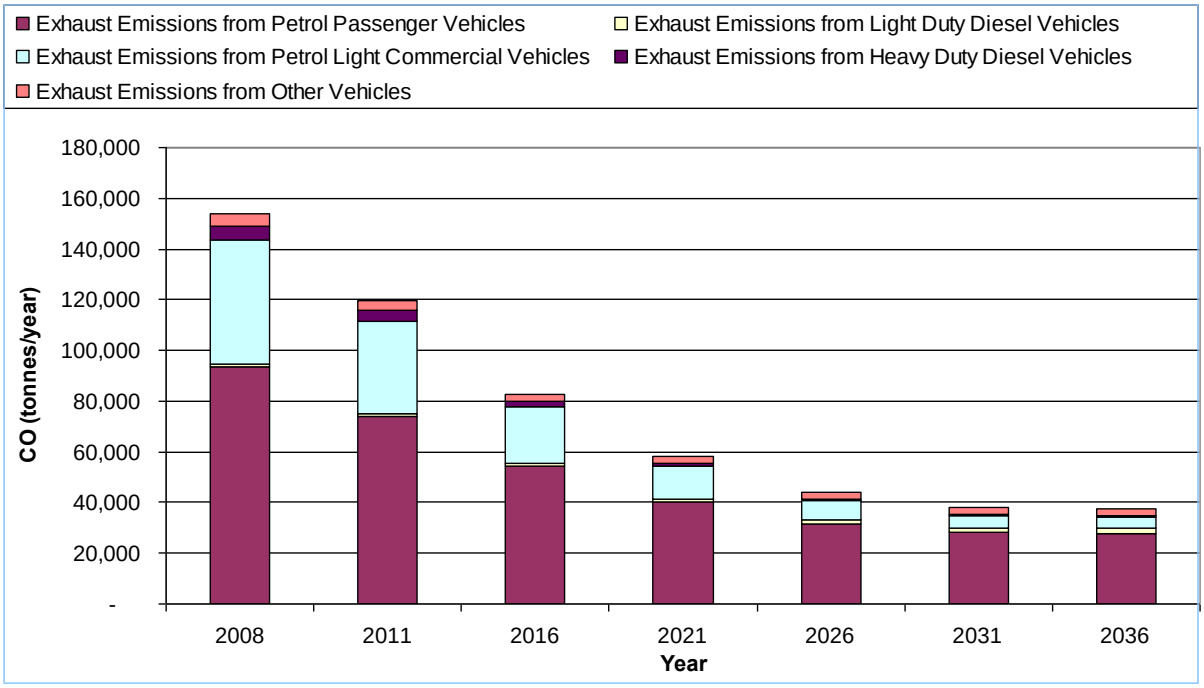

Figure B3: CO GMR Annual emission projections by source type

Table B4: CO emission projections (tonne/year)

Year	Passenger Vehicle Petrol - Exhaust	Light Duty Diesel – Exhaust	Light Duty Commercial Petrol - Exhaust	Heavy Duty Commercial Diesel - Exhaust	Other Vehicles - Exhaust	Total
2008	93,437	1,176	48,731	5,705	4,762	153,812
2011	73,891	1,139	36,660	4,158	3,615	119,463
2016	54,122	1,177	22,294	2,191	2,785	82,569
2021	40,211	1,371	12,770	1,184	2,528	58,065
2026	31,703	1,570	7,292	745	2,598	43,908
2031	28,088	1,735	5,070	602	2,714	38,209
2036	27,884	1,875	4,506	588	2,909	37,762

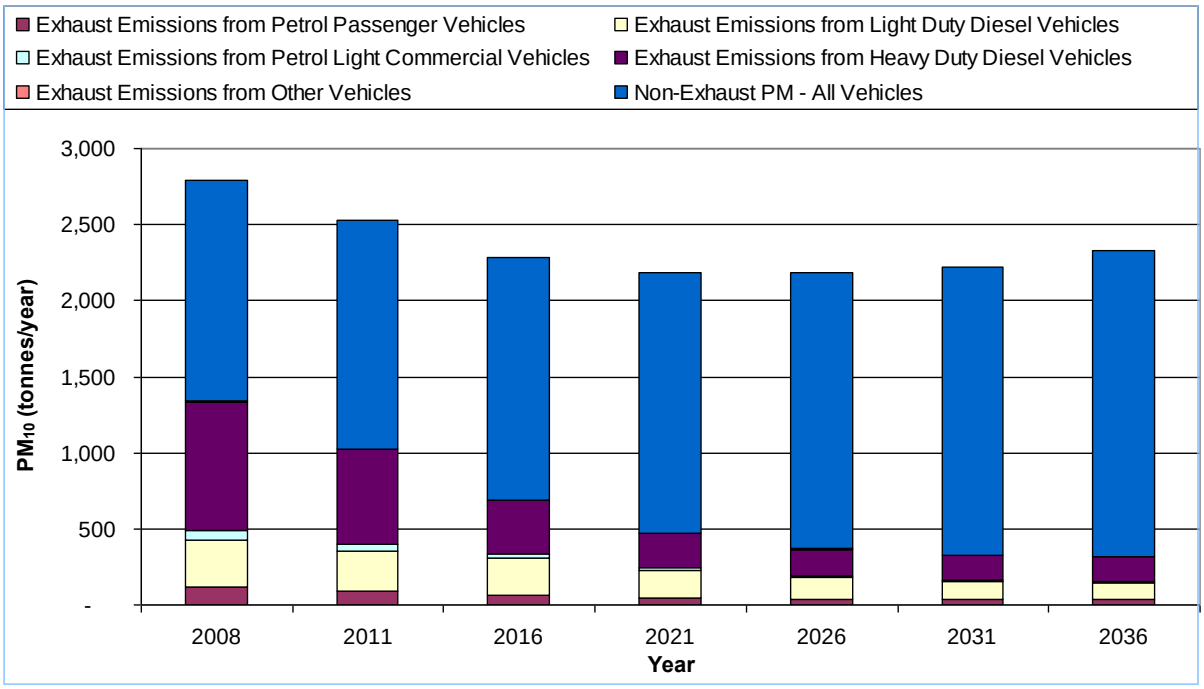

Figure B4: PM_{10} GMR annual emission projections by source type

Table B5: PM_{10} emission projections (tonne/year)

Year	Passenger Vehicle Petrol - Exhaust	Light Duty Diesel – Exhaust	Light Duty Commercial Petrol - Exhaust	Heavy Duty Commercial Diesel - Exhaust	Other Vehicles - Exhaust	All Vehicles - Non-Exhaust PM	Total
2008	121	308	63.7	841	9.39	1,450	2,793
2011	90.3	266	46.3	618	6.64	1,501	2,528
2016	62.2	245	28.6	352	4.56	1,593	2,286
2021	46.2	181	18.1	226	3.7	1,705	2,180
2026	40.0	142	12.4	172	3.54	1,810	2,180
2031	38.2	115	10.2	159	3.53	1,899	2,225
2036	38.4	104	9.21	165	3.64	2,007	2,327

APPENDIX C :Detailed Cold-Start Parameters

Details of cold-start parameters are listed in the tables on the following pages.

Table C1: Age class base cold start emission factor ratios – petrol passenger vehicles – residential/local roads

Distance from Start	0 - 1.5 km							1.5 - 2.5 km							2.5 - 4.0 km						
Emission Class	THC	CO	NO_x	CO_2	FC	NH_3	N_2O	THC	CO	NO_x	CO_2	FC	NH_3	N_2O	THC	CO	NO_x	CO_2	FC	NH_3	N_2O
ADR27	1.88	2.16	1.00	1.39	1.39	1.00	1.0	1.20	1.28	1.00	1.19	1.19	1.00	1.0	1.05	1.08	1.00	1.14	1.14	1.00	1.00
ADR37/00	8.01	5.79	3.07	1.26	1.39	0.50	2.62	3.55	1.53	1.00	1.17	1.19	2.50	2.62	2.41	1.65	1.01	1.12	1.14	2.00	2.62
ADR37/01	16.78	9.97	5.48	1.30	1.39	0.70	1.64	3.78	1.07	1.00	1.19	1.19	2.50	1.64	2.44	1.26	1.00	1.13	1.13	1.75	1.64
ADR79/00	16.34	10.62	8.83	1.37	1.40	0.70	3.15	2.04	1.02	1.00	1.21	1.21	2.50	3.15	1.81	1.12	1.00	1.15	1.15	1.75	3.15
ADR79/01	21.59	11.60	4.40	1.34	1.37	1.00	3.15	1.85	1.00	1.00	1.19	1.19	2.50	3.15	1.33	1.00	1.22	1.13	1.13	1.50	3.15
ADR79/02+	21.59	7.58	3.77	1.22	1.25	2.50	3.15	1.85	1.32	1.00	1.11	1.11	4.50	3.15	1.33	1.19	1.17	1.09	1.09	2.00	3.15
Distance from Start	4.0 - 5.5 km							5.5 - 7.5 km													
Emission Class	THC	CO	NO_x	CO_2	FC	NH_3	N_2O	THC	CO	NO_x	CO_2	FC	NH_3	N_2O							
ADR27	1.01	1.02	1.00	1.05	1.05	1.0	1.00	1.00	1.00	1.00	1.02	1.02	1.00	1.00							
ADR37/00	1.23	1.52	1.00	1.04	1.05	1.2	1.10	1.00	1.23	1.00	1.02	1.02	1.00	1.10							
ADR37/01	1.77	1.56	1.00	1.04	1.05	1.0	1.00	1.05	1.00	1.00	1.02	1.02	1.00	1.00							
ADR79/00	1.09	1.00	1.00	1.05	1.05	1.0	1.00	1.00	1.00	1.00	1.03	1.02	1.00	1.00							
ADR79/01	1.00	1.00	1.27	1.04	1.03	1.0	1.00	1.00	1.00	1.00	1.02	1.01	1.00	1.00							
ADR79/02+	1.00	1.04	1.47	1.02	1.02	1.0	1.00	1.00	1.00	1.00	1.02	1.01	1.00	1.00							

Table C2: Age class base cold start emission factor ratios – petrol passenger vehicles – arterial roads

Distance from Start	0 - 1.5 km							1.5 - 2.5 km							2.5 - 4.0 km						
Emission Class	THC	CO	NO_x	CO_2	FC	NH_3	N_2O	THC	CO	NO_x	CO_2	FC	NH_3	N_2O	THC	CO	NO_x	CO_2	FC	NH_3	N_2O
ADR27	3.21	3.59	1.00	1.39	1.39	1.00	1.0	1.71	1.87	1.00	1.19	1.19	1.00	1.0	1.25	1.32	1.00	1.14	1.14	1.00	1.00
ADR37/00	9.11	8.17	4.50	1.26	1.39	0.20	2.62	4.01	2.15	1.27	1.17	1.19	3.00	2.62	2.73	2.33	1.30	1.12	1.14	2.25	2.62
ADR37/01	19.08	14.07	8.01	1.30	1.39	0.50	1.64	4.27	1.50	1.23	1.19	1.19	3.00	1.64	2.76	1.77	1.23	1.13	1.13	2.25	1.64
ADR79/00	18.58	14.99	12.91	1.37	1.40	0.50	3.15	2.30	1.43	1.00	1.21	1.21	3.00	3.15	2.05	1.57	1.16	1.15	1.15	2.25	3.15
ADR79/01	24.55	16.36	6.44	1.34	1.37	0.80	3.15	2.09	1.00	1.22	1.19	1.19	3.00	3.15	1.50	1.33	1.56	1.13	1.13	2.00	3.15
ADR79/02+	22.19	14.79	5.53	1.19	1.22	3.00	3.15	4.22	2.02	1.09	1.04	1.04	6.00	3.15	1.00	2.10	1.43	1.04	1.04	3.00	3.15
Distance from Start	4.0 - 5.5 km							5.5 - 7.5 km													
Emission Class	THC	CO	NO_x	CO_2	FC	NH_3	N_2O	THC	CO	NO_x	CO_2	FC	NH_3	N_2O							
ADR27	1.07	1.09	1.00	1.05	1.05	1.00	1.00	1.01	1.02	1.00	1.02	1.02	1.00	1.00							
ADR37/00	1.40	2.14	1.23	1.04	1.05	1.50	1.10	1.13	1.73	1.11	1.02	1.02	1.00	1.10							
ADR37/01	2.01	2.19	1.21	1.04	1.05	1.25	1.00	1.19	1.16	1.11	1.02	1.02	1.00	1.00							
ADR79/00	1.23	1.28	1.19	1.05	1.05	1.25	1.00	1.10	1.16	1.11	1.03	1.02	1.00	1.00							
ADR79/01	1.10	1.28	1.62	1.04	1.03	1.00	1.00	1.06	1.16	1.24	1.02	1.01	1.00	1.00							
ADR79/02+	1.00	1.45	1.19	1.00	1.00	1.00	1.00	1.05	1.16	1.24	1.00	1.00	1.00	1.00							

Table C3: Age class base cold start emission factor ratios – petrol passenger vehicles – commercial arterial roads

Distance from Start	0 - 1.5 km							1.5 - 2.5 km							2.5 - 4.0 km						
Emission Class	THC	CO	NO_x	CO_2	FC	NH_3	N_2O	THC	CO	NO_x	CO_2	FC	NH_3	N_2O	THC	CO	NO_x	CO_2	FC	NH_3	N_2O
ADR27	2.91	3.30	1.00	1.39	1.39	1.00	1.0	1.58	1.74	1.00	1.19	1.19	1.00	1.0	1.19	1.26	1.00	1.14	1.14	1.00	1.00
ADR37/00	8.90	7.71	4.31	1.26	1.39	0.20	2.62	3.92	2.03	1.22	1.17	1.19	3.00	2.62	2.67	2.20	1.24	1.12	1.14	2.25	2.62
ADR37/01	18.64	13.28	7.68	1.30	1.39	0.50	1.64	4.18	1.42	1.18	1.19	1.19	3.00	1.64	2.70	1.67	1.18	1.13	1.13	2.25	1.64
ADR79/00	18.15	14.14	12.37	1.37	1.40	0.50	3.15	2.25	1.35	1.00	1.21	1.21	3.00	3.15	2.01	1.49	1.11	1.15	1.15	2.25	3.15
ADR79/01	23.98	15.44	6.17	1.34	1.37	0.80	3.15	2.04	1.00	1.17	1.19	1.19	3.00	3.15	1.47	1.26	1.49	1.13	1.13	2.00	3.15
ADR79/02+	20.34	13.09	5.27	1.19	1.22	3.00	3.15	3.79	1.86	1.04	1.05	1.05	6.00	3.15	1.01	1.87	1.38	1.05	1.05	3.00	3.15

Distance from Start	4.0 - 5.5 km							5.5 - 7.5 km						
Emission Class	THC	CO	NO_x	CO_2	FC	NH_3	N_2O	THC	CO	NO_x	CO_2	FC	NH_3	N_2O
ADR27	1.05	1.07	1.00	1.05	1.05	1.00	1.00	1.00	1.01	1.00	1.02	1.02	1.00	1.00
ADR37/00	1.36	2.02	1.18	1.04	1.05	1.50	1.10	1.11	1.64	1.07	1.02	1.02	1.00	1.10
ADR37/01	1.96	2.07	1.16	1.04	1.05	1.25	1.00	1.17	1.09	1.07	1.02	1.02	1.00	1.00
ADR79/00	1.20	1.20	1.14	1.05	1.05	1.25	1.00	1.08	1.09	1.07	1.03	1.02	1.00	1.00
ADR79/01	1.07	1.20	1.56	1.04	1.03	1.00	1.00	1.03	1.09	1.19	1.02	1.01	1.00	1.00
ADR79/02+	1.02	1.34	1.23	1.00	1.00	1.00	1.00	1.03	1.09	1.19	1.00	1.00	1.00	1.00

Table C4: Age class base cold start emission factor ratios – petrol passenger vehicles – commercial highway roads

Distance from Start	0 - 1.5 km							1.5 - 2.5 km							2.5 - 4.0 km						
Emission Class	THC	CO	NO_x	CO_2	FC	NH_3	N_2O	THC	CO	NO_x	CO_2	FC	NH_3	N_2O	THC	CO	NO_x	CO_2	FC	NH_3	N_2O
ADR27	5.58	4.81	1.00	1.39	1.39	1.00	1.0	2.92	2.67	1.00	1.19	1.19	1.00	1.0	1.84	1.76	1.00	1.14	1.14	1.00	1.00
ADR37/00	9.65	9.37	4.98	1.26	1.39	0.00	2.62	4.24	2.46	1.40	1.17	1.19	2.00	2.62	2.89	2.67	1.44	1.12	1.14	2.00	2.62
ADR37/01	20.21	16.13	8.87	1.30	1.39	0.30	1.64	4.52	1.72	1.36	1.19	1.19	2.00	1.64	2.92	2.02	1.36	1.13	1.13	2.00	1.64
ADR79/00	19.68	17.18	14.29	1.37	1.40	0.30	3.15	2.44	1.63	1.00	1.21	1.21	2.00	3.15	2.17	1.80	1.29	1.15	1.15	2.00	3.15
ADR79/01	26.01	18.76	7.13	1.34	1.37	0.60	3.15	2.21	1.00	1.35	1.19	1.19	2.50	3.15	1.59	1.53	1.72	1.13	1.13	2.50	3.15
ADR79/02+	10.17	7.34	7.05	1.19	1.22	1.00	3.15	2.60	1.18	1.35	1.00	1.00	4.00	3.15	1.00	1.85	1.73	1.00	1.00	4.00	3.15
Distance from Start	4.0 - 5.5 km							5.5 - 7.5 km													
Emission Class	THC	CO	NO_x	CO_2	FC	NH_3	N_2O	THC	CO	NO_x	CO_2	FC	NH_3	N_2O							
ADR27	1.31	1.29	1.00	1.05	1.05	1.00	1.00	1.10	1.10	1.00	1.02	1.02	1.00	1.00							
ADR37/00	1.48	2.46	1.36	1.04	1.05	1.75	1.10	1.20	1.99	1.23	1.02	1.02	1.00	1.10							
ADR37/01	2.12	2.51	1.34	1.04	1.05	1.75	1.00	1.26	1.33	1.23	1.02	1.02	1.00	1.00							
ADR79/00	1.30	1.46	1.32	1.05	1.05	1.75	1.00	1.17	1.33	1.23	1.03	1.02	1.00	1.00							
ADR79/01	1.16	1.46	1.80	1.04	1.03	1.75	1.00	1.12	1.33	1.38	1.02	1.01	1.00	1.00							
ADR79/02+	1.00	1.55	1.23	1.00	1.00	1.75	1.00	1.00	1.33	1.00	1.00	1.00	1.00	1.00							

Table C5: Age class base cold start emission factor ratios –diesel passenger vehicles and LCV vehicles – residential/local roads

Distance from Start	0 - 1.5 km							1.5 - 2.5 km							2.5 - 4.0 km						
Emission Class	THC	CO	NO_x	CO_2	FC	NH_3	N_2O	THC	CO	NO_x	CO_2	FC	NH_3	N_2O	THC	CO	NO_x	CO_2	FC	NH_3	N_2O
ADR27	3.40	2.24	0.94	1.36	1.36	1.0	1.0	2.35	1.58	0.97	1.16	1.16	1.0	1.0	1.77	1.28	0.98	1.07	1.07	1.0	1.0
ADR37/00	2.97	1.99	1.52	1.29	1.29	1.0	1.0	2.24	1.63	1.26	1.14	1.14	1.0	1.0	1.79	1.40	1.08	1.07	1.07	1.0	1.0
ADR37/01	1.48	4.16	0.90	1.21	1.21	1.0	1.0	1.22	1.77	0.98	1.10	1.10	1.0	1.0	1.10	1.21	1.00	1.05	1.05	1.0	1.0
ADR79/00	3.63	6.00	1.02	1.27	1.27	1.0	1.0	1.45	1.79	1.01	1.15	1.15	1.0	1.0	1.09	1.15	1.01	1.09	1.09	1.0	1.0
ADR79/01	3.63	6.00	1.02	1.27	1.27	1.0	1.0	1.45	1.79	1.01	1.15	1.15	1.0	1.0	1.09	1.15	1.01	1.09	1.09	1.0	1.0
ADR79/02+	3.63	6.00	1.02	1.27	1.27	1.0	1.0	1.45	1.79	1.01	1.15	1.15	1.0	1.0	1.09	1.15	1.01	1.09	1.09	1.0	1.0

Distance from Start	4.0 - 5.5 km							5.5 - 7.5 km						
Emission Class	THC	CO	NO_x	CO_2	FC	NH_3	N_2O	THC	CO	NO_x	CO_2	FC	NH_3	N_2O
ADR27	1.39	1.10	0.99	1.03	1.03	1.0	1.0	1.17	1.00	1.00	1.00	1.00	1.0	1.0
ADR37/00	1.46	1.23	1.00	1.03	1.03	1.0	1.0	1.25	1.13	1.00	1.01	1.01	1.0	1.0
ADR37/01	1.04	1.04	1.00	1.02	1.02	1.0	1.0	1.01	1.00	1.00	1.00	1.00	1.0	1.0
ADR79/00	1.01	1.02	1.00	1.04	1.04	1.0	1.0	1.00	1.00	1.00	1.02	1.02	1.0	1.0
ADR79/01	1.01	1.02	1.00	1.04	1.04	1.0	1.0	1.00	1.00	1.00	1.02	1.02	1.0	1.0
ADR79/02+	1.01	1.02	1.00	1.04	1.04	1.0	1.0	1.00	1.00	1.00	1.02	1.02	1.0	1.0

Table C6: Age class base cold start emission factor ratios – diesel passenger vehicles and LCV vehicles – arterial roads

Distance from Start	0 - 1.5 km							1.5 - 2.5 km							2.5 - 4.0 km						
Emission Class	THC	CO	NO_x	CO_2	FC	NH_3	N_2O	THC	CO	NO_x	CO_2	FC	NH_3	N_2O	THC	CO	NO_x	CO_2	FC	NH_3	N_2O
ADR27	3.14	2.08	1.01	1.27	1.27	1.0	1.0	2.22	1.46	1.01	1.17	1.17	1.0	1.0	1.71	1.21	1.00	1.11	1.11	1.0	1.0
ADR37/00	2.62	1.70	1.02	1.25	1.25	1.0	1.0	2.13	1.43	1.02	1.14	1.14	1.0	1.0	1.80	1.27	1.01	1.08	1.08	1.0	1.0
ADR37/01	1.07	4.29	0.90	1.24	1.24	1.0	1.0	1.04	1.98	0.97	1.13	1.13	1.0	1.0	1.02	1.32	0.99	1.07	1.07	1.0	1.0
ADR79/00	5.04	7.48	1.23	1.37	1.37	1.0	1.0	1.80	2.27	1.14	1.19	1.19	1.0	1.0	1.18	1.29	1.09	1.11	1.11	1.0	1.0
ADR79/01	5.04	7.48	1.23	1.37	1.37	1.0	1.0	1.80	2.27	1.14	1.19	1.19	1.0	1.0	1.18	1.29	1.09	1.11	1.11	1.0	1.0
ADR79/02+	5.04	7.48	1.23	1.37	1.37	1.0	1.0	1.80	2.27	1.14	1.19	1.19	1.0	1.0	1.18	1.29	1.09	1.11	1.11	1.0	1.0

Distance from Start	4.0 - 5.5 km							5.5 - 7.5 km						
Emission Class	THC	CO	NO_x	CO_2	FC	NH_3	N_2O	THC	CO	NO_x	CO_2	FC	NH_3	N_2O
ADR27	1.37	1.04	1.00	1.06	1.06	1.0	1.0	1.17	1.00	1.00	1.03	1.03	1.0	1.0
ADR37/00	1.52	1.15	1.01	1.04	1.04	1.0	1.0	1.32	1.08	1.00	1.02	1.02	1.0	1.0
ADR37/01	1.01	1.08	1.00	1.04	1.04	1.0	1.0	1.00	1.02	1.00	1.02	1.02	1.0	1.0
ADR79/00	1.03	1.05	1.05	1.05	1.05	1.0	1.0	1.00	1.01	1.02	1.02	1.02	1.0	1.0
ADR79/01	1.03	1.05	1.05	1.05	1.05	1.0	1.0	1.00	1.01	1.02	1.02	1.02	1.0	1.0
ADR79/02+	1.03	1.05	1.05	1.05	1.05	1.0	1.0	1.00	1.01	1.02	1.02	1.02	1.0	1.0

Table C7: Age class base cold start emission factor ratios – diesel passenger vehicles and LCV vehicles – commercial arterial roads

Distance from Start	0 - 1.5 km							1.5 - 2.5 km							2.5 - 4.0 km						
Emission Class	THC	CO	NO_x	CO_2	FC	NH_3	N_2O	THC	CO	NO_x	CO_2	FC	NH_3	N_2O	THC	CO	NO_x	CO_2	FC	NH_3	N_2O
ADR27	3.03	2.04	1.01	1.27	1.27	1.0	1.0	2.16	1.45	1.01	1.16	1.16	1.0	1.0	1.68	1.20	1.00	1.10	1.10	1.0	1.0
ADR37/00	2.52	1.68	1.02	1.24	1.24	1.0	1.0	2.06	1.42	1.02	1.14	1.14	1.0	1.0	1.75	1.26	1.01	1.08	1.08	1.0	1.0
ADR37/01	1.07	4.06	0.90	1.23	1.23	1.0	1.0	1.04	1.91	0.97	1.13	1.13	1.0	1.0	1.02	1.30	0.99	1.07	1.07	1.0	1.0
ADR79/00	4.80	6.95	1.22	1.35	1.35	1.0	1.0	1.75	2.17	1.14	1.19	1.19	1.0	1.0	1.17	1.27	1.09	1.10	1.10	1.0	1.0
ADR79/01	4.80	6.95	1.22	1.35	1.35	1.0	1.0	1.75	2.17	1.14	1.19	1.19	1.0	1.0	1.17	1.27	1.09	1.10	1.10	1.0	1.0
ADR79/02+	4.80	6.95	1.22	1.35	1.35	1.0	1.0	1.75	2.17	1.14	1.19	1.19	1.0	1.0	1.17	1.27	1.09	1.10	1.10	1.0	1.0

Distance from Start	4.0 - 5.5 km							5.5 - 7.5 km						
Emission Class	THC	CO	NO_x	CO_2	FC	NH_3	N_2O	THC	CO	NO_x	CO_2	FC	NH_3	N_2O
ADR27	1.35	1.04	1.00	1.06	1.06	1.0	1.0	1.16	1.00	1.00	1.03	1.03	1.0	1.0
ADR37/00	1.49	1.15	1.01	1.04	1.04	1.0	1.0	1.30	1.08	1.00	1.02	1.02	1.0	1.0
ADR37/01	1.01	1.07	1.00	1.03	1.03	1.0	1.0	1.00	1.01	1.00	1.01	1.01	1.0	1.0
ADR79/00	1.03	1.04	1.05	1.05	1.05	1.0	1.0	1.00	1.01	1.01	1.02	1.02	1.0	1.0
ADR79/01	1.03	1.04	1.05	1.05	1.05	1.0	1.0	1.00	1.01	1.01	1.02	1.02	1.0	1.0
ADR79/02+	1.03	1.04	1.05	1.05	1.05	1.0	1.0	1.00	1.01	1.01	1.02	1.02	1.0	1.0

Table C8: Age class base cold start emission factor ratios – diesel passenger vehicles and LCV vehicles – commercial highway roads

Distance from Start	0 - 1.5 km							1.5 - 2.5 km							2.5 - 4.0 km						
Emission Class	THC	CO	NO_x	CO_2	FC	NH_3	N_2O	THC	CO	NO_x	CO_2	FC	NH_3	N_2O	THC	CO	NO_x	CO_2	FC	NH_3	N_2O
ADR27	3.83	2.33	1.01	1.28	1.28	1.0	1.0	2.62	1.57	1.01	1.17	1.17	1.0	1.0	1.94	1.25	1.00	1.11	1.11	1.0	1.0
ADR37/00	3.03	1.78	1.03	1.27	1.27	1.0	1.0	2.42	1.48	1.02	1.15	1.15	1.0	1.0	2.00	1.30	1.01	1.09	1.09	1.0	1.0
ADR37/01	1.10	5.84	0.89	1.26	1.26	1.0	1.0	1.05	2.45	0.96	1.14	1.14	1.0	1.0	1.03	1.47	0.99	1.08	1.08	1.0	1.0
ADR79/00	6.64	12.98	1.23	1.41	1.41	1.0	1.0	2.11	3.35	1.14	1.22	1.22	1.0	1.0	1.25	1.54	1.09	1.12	1.12	1.0	1.0
ADR79/01	6.64	12.98	1.23	1.41	1.41	1.0	1.0	2.11	3.35	1.14	1.22	1.22	1.0	1.0	1.25	1.54	1.09	1.12	1.12	1.0	1.0
ADR79/02+	6.64	12.98	1.23	1.41	1.41	1.0	1.0	2.11	3.35	1.14	1.22	1.22	1.0	1.0	1.25	1.54	1.09	1.12	1.12	1.0	1.0

Distance from Start	4.0 - 5.5 km							5.5 - 7.5 km						
Emission Class	THC	CO	NO_x	CO_2	FC	NH_3	N_2O	THC	CO	NO_x	CO_2	FC	NH_3	N_2O
ADR27	1.49	1.05	1.00	1.06	1.06	1.0	1.0	1.23	1.00	1.00	1.03	1.03	1.0	1.0
ADR37/00	1.65	1.17	1.01	1.05	1.05	1.0	1.0	1.40	1.09	1.00	1.02	1.02	1.0	1.0
ADR37/01	1.01	1.12	1.00	1.04	1.04	1.0	1.0	1.01	1.02	1.00	1.02	1.02	1.0	1.0
ADR79/00	1.04	1.08	1.05	1.06	1.06	1.0	1.0	1.01	1.01	1.02	1.02	1.02	1.0	1.0
ADR79/01	1.04	1.08	1.05	1.06	1.06	1.0	1.0	1.01	1.01	1.02	1.02	1.02	1.0	1.0
ADR79/02+	1.04	1.08	1.05	1.06	1.06	1.0	1.0	1.01	1.01	1.02	1.02	1.02	1.0	1.0

Table C9: Age class base cold start emission factor ratios – petrol LCV vehicles – residential/local roads

Distance from Start	0 - 1.5 km							1.5 - 2.5 km							2.5 - 4.0 km						
Emission Class	THC	CO	NO_x	CO_2	FC	NH_3	N_2O	THC	CO	NO_x	CO_2	FC	NH_3	N_2O	THC	CO	NO_x	CO_2	FC	NH_3	N_2O
ADR27	1.88	2.16	1.00	1.39	1.39	1.00	1.00	1.20	1.28	1.00	1.19	1.19	1.00	1.00	1.05	1.08	1.00	1.14	1.14	1.00	1.00
ADR37/00	2.09	1.93	1.35	1.32	1.35	0.50	1.47	1.27	1.00	1.00	1.14	1.06	2.50	1.47	1.28	1.00	1.00	1.11	1.06	2.00	1.47
ADR37/01	4.05	4.44	1.72	1.31	1.41	0.70	3.15	2.01	1.00	1.00	1.13	1.13	2.50	3.15	1.54	1.00	1.02	1.10	1.10	1.75	3.15
ADR79/00	16.76	18.00	2.95	1.37	1.43	0.70	3.15	1.94	1.01	1.10	1.11	1.11	2.50	3.15	1.76	1.00	1.35	1.10	1.10	1.75	3.15
ADR79/01	50.85	7.41	10.59	1.32	1.36	1.00	3.15	1.96	1.00	1.01	1.12	1.13	2.50	3.15	1.71	1.00	1.00	1.11	1.11	1.50	3.15
ADR79/02+	50.85	4.84	9.07	1.20	1.24	2.50	3.15	1.96	1.32	1.00	1.04	1.05	4.50	3.15	1.71	1.19	1.00	1.07	1.07	2.00	3.15
Distance from Start	4.0 - 5.5 km							5.5 - 7.5 km													
Emission Class	THC	CO	NO_x	CO_2	FC	NH_3	N_2O	THC	CO	NO_x	CO_2	FC	NH_3	N_2O							
ADR27	1.01	1.02	1.00	1.05	1.05	1.0	1.00	1.00	1.00	1.00	1.02	1.02	1.00	1.00							
ADR37/00	1.00	1.00	1.00	1.03	1.01	1.2	1.18	1.00	1.00	1.05	1.05	1.03	1.00	1.18							
ADR37/01	1.02	1.00	1.01	1.05	1.04	1.0	1.00	1.07	1.03	1.03	1.04	1.04	1.00	1.00							
ADR79/00	1.31	1.00	1.21	1.05	1.04	1.0	1.00	1.00	1.00	1.00	1.04	1.04	1.00	1.00							
ADR79/01	1.00	1.00	1.00	1.05	1.04	1.0	1.00	1.00	1.00	1.00	1.04	1.04	1.00	1.00							
ADR79/02+	1.00	1.04	1.16	1.03	1.03	1.0	1.00	1.00	1.00	1.00	1.04	1.04	1.00	1.00							

Table C10: Age class base cold start emission factor ratios – petrol LCV vehicles – arterial roads

Distance from Start	0 - 1.5 km							1.5 - 2.5 km							2.5 - 4.0 km						
Emission Class	THC	CO	NO_x	CO_2	FC	NH_3	N_2O	THC	CO	NO_x	CO_2	FC	NH_3	N_2O	THC	CO	NO_x	CO_2	FC	NH_3	N_2O
ADR27	3.21	3.59	1.00	1.39	1.39	1.00	1.00	1.71	1.87	1.00	1.19	1.19	1.00	1.00	1.25	1.32	1.00	1.14	1.14	1.00	1.00
ADR37/00	2.31	3.91	1.65	1.36	1.40	0.20	1.47	1.06	1.05	1.00	1.18	1.09	3.00	1.47	1.56	1.07	1.07	1.14	1.08	2.25	1.47
ADR37/01	4.50	8.98	2.11	1.35	1.46	0.50	3.15	1.68	1.11	1.12	1.16	1.16	3.00	3.15	1.87	1.07	1.14	1.13	1.12	2.25	3.15
ADR79/00	18.60	36.45	3.61	1.41	1.48	0.50	3.15	1.61	1.39	1.26	1.14	1.15	3.00	3.15	2.15	1.07	1.50	1.13	1.13	2.25	3.15
ADR79/01	56.43	15.00	12.93	1.36	1.41	0.80	3.15	1.63	1.05	1.16	1.16	1.16	3.00	3.15	2.08	1.07	1.07	1.14	1.14	2.00	3.15
ADR79/02+	51.02	13.56	11.11	1.21	1.25	3.00	3.15	3.30	2.11	1.03	1.02	1.02	6.00	3.15	1.21	1.69	1.00	1.04	1.04	3.00	3.15
Distance from Start	4.0 - 5.5 km							5.5 - 7.5 km													
Emission Class	THC	CO	NO_x	CO_2	FC	NH_3	N_2O	THC	CO	NO_x	CO_2	FC	NH_3	N_2O							
ADR27	1.07	1.09	1.00	1.05	1.05	1.00	1.00	1.01	1.02	1.00	1.02	1.02	1.00	1.00							
ADR37/00	1.03	1.00	1.18	1.05	1.03	1.50	1.18	1.00	1.00	1.06	1.06	1.04	1.00	1.18							
ADR37/01	1.06	1.00	1.20	1.07	1.06	1.25	1.00	1.07	1.03	1.04	1.05	1.05	1.00	1.00							
ADR79/00	1.35	1.01	1.44	1.07	1.07	1.25	1.00	1.00	1.00	1.01	1.05	1.05	1.00	1.00							
ADR79/01	1.03	1.00	1.15	1.07	1.06	1.00	1.00	1.00	1.00	1.01	1.05	1.05	1.00	1.00							
ADR79/02+	1.00	1.13	1.00	1.02	1.01	1.00	1.00	1.00	1.00	1.01	1.03	1.03	1.00	1.00							

Table C11: Age class base cold start emission factor ratios – petrol LCV vehicles – commercial arterial roads

Distance from Start	0 - 1.5 km							1.5 - 2.5 km							2.5 - 4.0 km						
Emission Class	THC	CO	NO_x	CO_2	FC	NH_3	N_2O	THC	CO	NO_x	CO_2	FC	NH_3	N_2O	THC	CO	NO_x	CO_2	FC	NH_3	N_2O
ADR27	2.91	3.30	1.00	1.39	1.39	1.00	1.00	1.58	1.74	1.00	1.19	1.19	1.00	1.00	1.19	1.26	1.00	1.14	1.14	1.00	1.00
ADR37/00	2.28	3.45	1.59	1.36	1.39	0.20	1.47	1.00	1.00	1.00	1.17	1.09	3.00	1.47	1.46	1.05	1.05	1.13	1.08	2.25	1.47
ADR37/01	4.43	7.92	2.03	1.35	1.45	0.50	3.15	1.59	1.05	1.09	1.15	1.16	3.00	3.15	1.76	1.05	1.11	1.13	1.12	2.25	3.15
ADR79/00	18.33	32.13	3.48	1.41	1.47	0.50	3.15	1.53	1.32	1.23	1.14	1.14	3.00	3.15	2.02	1.05	1.47	1.13	1.13	2.25	3.15
ADR79/01	55.62	13.22	12.48	1.35	1.40	0.80	3.15	1.55	1.00	1.13	1.15	1.16	3.00	3.15	1.95	1.05	1.05	1.13	1.13	2.00	3.15
ADR79/02+	47.17	11.21	10.66	1.21	1.25	3.00	3.15	2.88	1.86	1.01	1.02	1.03	6.00	3.15	1.35	1.56	1.00	1.05	1.05	3.00	3.15

Distance from Start	4.0 - 5.5 km							5.5 - 7.5 km						
Emission Class	THC	CO	NO_x	CO_2	FC	NH_3	N_2O	THC	CO	NO_x	CO_2	FC	NH_3	N_2O
ADR27	1.05	1.07	1.00	1.05	1.05	1.00	1.00	1.00	1.01	1.00	1.02	1.02	1.00	1.00
ADR37/00	1.02	1.00	1.14	1.05	1.03	1.50	1.18	1.00	1.00	1.06	1.06	1.04	1.00	1.18
ADR37/01	1.04	1.00	1.16	1.07	1.06	1.25	1.00	1.07	1.03	1.03	1.05	1.05	1.00	1.00
ADR79/00	1.33	1.00	1.39	1.06	1.06	1.25	1.00	1.00	1.00	1.00	1.05	1.05	1.00	1.00
ADR79/01	1.02	1.00	1.11	1.06	1.06	1.00	1.00	1.00	1.00	1.00	1.05	1.05	1.00	1.00
ADR79/02+	1.00	1.11	1.00	1.02	1.02	1.00	1.00	1.00	1.00	1.00	1.03	1.03	1.00	1.00

Table C12: Age class base cold start emission factor ratios – petrol LCV vehicles – commercial highway roads

Distance from Start	0 - 1.5 km							1.5 - 2.5 km							2.5 - 4.0 km						
Emission Class	THC	CO	NO_x	CO_2	FC	NH_3	N_2O	THC	CO	NO_x	CO_2	FC	NH_3	N_2O	THC	CO	NO_x	CO_2	FC	NH_3	N_2O
ADR27	5.58	4.81	1.00	1.39	1.39	1.00	1.00	2.92	2.67	1.00	1.19	1.19	1.00	1.00	1.84	1.76	1.00	1.14	1.14	1.00	1.00
ADR37/00	2.14	4.83	2.00	1.37	1.41	0.00	1.47	1.35	1.00	1.06	1.19	1.11	2.00	1.47	2.61	1.00	1.23	1.16	1.10	2.00	1.47
ADR37/01	4.16	11.09	2.55	1.36	1.47	0.30	3.15	2.13	1.00	1.28	1.18	1.18	2.00	3.15	3.15	1.00	1.30	1.15	1.14	2.00	3.15
ADR79/00	17.20	44.99	4.36	1.42	1.49	0.30	3.15	2.05	1.11	1.44	1.16	1.16	2.00	3.15	3.62	1.00	1.72	1.15	1.15	2.00	3.15
ADR79/01	52.19	18.51	15.64	1.37	1.41	0.60	3.15	2.08	1.00	1.33	1.17	1.18	2.50	3.15	3.50	1.00	1.23	1.16	1.16	2.50	3.15
ADR79/02+	20.40	7.24	15.46	1.22	1.26	1.00	3.15	2.45	1.18	1.32	1.00	1.00	4.00	3.15	1.75	1.21	1.23	1.01	1.01	4.00	3.15
Distance from Start	4.0 - 5.5 km							5.5 - 7.5 km													
Emission Class	THC	CO	NO_x	CO_2	FC	NH_3	N_2O	THC	CO	NO_x	CO_2	FC	NH_3	N_2O							
ADR27	1.31	1.29	1.00	1.05	1.05	1.00	1.00	1.10	1.10	1.00	1.02	1.02	1.00	1.00							
ADR37/00	1.26	1.00	1.34	1.07	1.05	1.75	1.18	1.05	1.00	1.29	1.08	1.06	1.00	1.18							
ADR37/01	1.29	1.00	1.36	1.09	1.08	1.75	1.00	1.13	1.03	1.26	1.07	1.07	1.00	1.00							
ADR79/00	1.65	1.00	1.62	1.08	1.08	1.75	1.00	1.05	1.00	1.22	1.07	1.07	1.00	1.00							
ADR79/01	1.26	1.00	1.30	1.08	1.08	1.75	1.00	1.05	1.00	1.22	1.07	1.07	1.00	1.00							
ADR79/02+	1.00	1.06	1.00	1.00	1.00	1.75	1.00	1.00	1.00	1.00	1.02	1.01	1.00	1.00							

Table C13: Passenger vehicles – distribution of parking time prior to start of trip – week days

Hour of Day	Distribution of Parking Time Prior to Trip Start										
	≤ 5 min	6 – 15 min	16 – 30 min	31 – 60 min	61 – 120 min	121 – 240 min	241-360 min	361 – 480 min	481 – 600 min	> 600 min	First Trip of Day
00:01-04:00	7%	2%	2%	2%	4%	8%	19%	11%	14%	14%	17%
04:01-07:00	4%	2%	1%	2%	1%	0%	0%	0%	0%	0%	90%
07:01-08:00	8%	4%	3%	4%	3%	1%	0%	0%	0%	0%	78%
08:01-09:00	14%	8%	5%	4%	4%	2%	0%	0%	0%	0%	64%
09:01-11:00	9%	12%	11%	14%	13%	5%	1%	0%	0%	0%	35%
11:01-13:00	7%	12%	12%	15%	18%	16%	6%	1%	0%	0%	14%
13:01-15:00	8%	10%	11%	13%	14%	15%	11%	5%	4%	0%	9%
15:01-16:00	12%	14%	13%	11%	8%	10%	6%	11%	11%	1%	4%
16:01-17:00	8%	12%	9%	12%	11%	9%	5%	8%	18%	3%	4%
17:01-18:00	9%	10%	9%	12%	13%	8%	5%	4%	20%	6%	4%
18:01-19:00	9%	9%	9%	12%	16%	12%	6%	3%	8%	12%	4%
19:01-21:00	9%	8%	7%	13%	23%	17%	6%	3%	3%	8%	5%
21:01-24:00	5%	5%	4%	6%	14%	35%	13%	5%	6%	6%	2%

Table C14: Passenger vehicles – distribution of parking time prior to start of trip – weekend days

Hour of Day	Distribution of Parking Time Prior to Trip Start										
	≤ 5 min	6 – 15 min	16 – 30 min	31 – 60 min	61 – 120 min	121 – 240 min	241-360 min	361 – 480 min	481 – 600 min	> 600 min	First Trip of Day
00:01-04:00	11%	2%	2%	3%	7%	14%	18%	20%	8%	9%	6%
04:01-07:00	6%	3%	1%	1%	2%	1%	0%	0%	0%	0%	86%
07:01-08:00	9%	5%	4%	3%	2%	1%	0%	0%	0%	0%	76%
08:01-09:00	8%	8%	6%	7%	4%	1%	0%	0%	0%	0%	66%
09:01-11:00	8%	10%	9%	11%	11%	4%	0%	0%	0%	0%	46%
11:01-13:00	7%	10%	13%	15%	18%	11%	3%	1%	0%	0%	24%
13:01-15:00	6%	10%	10%	15%	19%	15%	5%	2%	1%	0%	16%
15:01-16:00	6%	9%	10%	13%	16%	22%	7%	3%	2%	0%	12%
16:01-17:00	6%	5%	9%	13%	15%	22%	11%	5%	4%	1%	8%
17:01-18:00	8%	8%	8%	12%	14%	17%	11%	5%	4%	2%	9%
18:01-19:00	9%	13%	8%	10%	18%	16%	7%	6%	2%	3%	9%
19:01-21:00	8%	8%	5%	9%	19%	24%	9%	5%	3%	4%	6%
21:01-24:00	7%	6%	4%	4%	8%	32%	21%	7%	6%	3%	2%

Table C15: LCV vehicles – distribution of parking time prior to start of trip – week days

Hour of Day	Distribution of Parking Time Prior to Trip Start										
	≤ 5 min	6 – 15 min	16 – 30 min	31 – 60 min	61 – 120 min	121 – 240 min	241-360 min	361 – 480 min	481 – 600 min	> 600 min	First Trip of Day
00:01-04:00	15%	3%	1%	3%	4%	7%	17%	9%	12%	13%	16%
04:01-07:00	8%	2%	2%	1%	1%	0%	0%	0%	0%	0%	85%
07:01-08:00	15%	15%	13%	11%	12.0%	5.0%	2%	3%	2%	2%	20%
08:01-09:00	15%	15%	12%	12%	12.0%	7.0%	4%	3%	3%	2%	15%
09:01-11:00	15%	15%	12%	18%	18.0%	8.0%	4%	2%	2%	1%	5%
11:01-13:00	15%	15%	13%	20%	18.0%	8.0%	4%	2%	1%	1%	3%
13:01-15:00	15%	15%	17%	19%	16.0%	10.0%	3%	1%	1%	1%	2%
15:01-16:00	12%	10%	12%	15%	16.0%	16.0%	11%	5%	1%	0%	2%
16:01-17:00	11%	10%	8%	11%	14%	19%	13%	8%	4%	0%	2%
17:01-18:00	12%	10%	9%	10%	12%	16%	15%	5%	8%	2%	1%
18:01-19:00	11%	9%	9%	12%	14%	12%	15%	7%	6%	3%	2%
19:01-21:00	11%	7%	7%	13%	16%	15%	16%	6%	3%	4%	2%
21:01-24:00	11%	6%	10%	6%	12%	21%	18%	5%	4%	5%	2%

Table C16: LCV vehicles – distribution of parking time prior to start of trip – weekend days

Hour of Day	Distribution of Parking Time Prior to Trip Start										
	≤ 5 min	6 – 15 min	16 – 30 min	31 – 60 min	61 – 120 min	121 – 240 min	241-360 min	361 – 480 min	481 – 600 min	> 600 min	First Trip of Day
00:01-04:00	11%	2%	2%	3%	7%	14%	18%	20%	8%	9%	6%
04:01-07:00	6%	3%	1%	1%	2%	1%	0%	0%	0%	0%	86%
07:01-08:00	9%	5%	4%	3%	1.6%	0.9%	0%	0%	0%	0%	76%
08:01-09:00	8%	8%	6%	7%	3.9%	1.4%	0%	0%	0%	0%	66%
09:01-11:00	8%	10%	9%	11%	10.9%	3.9%	0%	0%	0%	0%	46%
11:01-13:00	7%	10%	13%	15%	17.7%	10.9%	3%	1%	0%	0%	24%
13:01-15:00	6%	10%	10%	15%	19.3%	15.5%	5%	2%	1%	0%	16%
15:01-16:00	6%	9%	10%	13%	16.1%	21.6%	7%	3%	2%	0%	12%
16:01-17:00	6%	5%	9%	13%	15%	22%	11%	5%	4%	1%	8%
17:01-18:00	8%	8%	8%	12%	14%	17%	11%	5%	4%	2%	9%
18:01-19:00	9%	13%	8%	10%	18%	16%	7%	6%	2%	3%	9%
19:01-21:00	8%	8%	5%	9%	19%	24%	9%	5%	3%	4%	6%
21:01-24:00	7%	6%	4%	4%	8%	32%	21%	7%	6%	3%	2%

APPENDIX D: Full Speciation Profiles

The full speciation profiles for the various source types are given here. Where a speciation against both VOC and PM is listed for a substance, the average substance concentration is taken.

Table D1: Petrol vehicle exhaust organics speciation profile

ID	SUBSTANCE	Petrol no ethanol (E0)		Petrol E10	
		%VOC	%PM_{10}	%VOC	%PM_{10}
36	POLYCHLORINATED DIOXINS AND FURANS	1.17558×10^{-12}(1)	N/A	1.17558×10^{-12}(1)	N/A
37	POLYCYCLIC AROMATIC HYDROCARBONS	0.560292	37.217998	0.560292	37.217998
47	METHANE	10.240000	N/A	10.240000	N/A
49	FORMALDEHYDE	1.464200	N/A	1.815354	N/A
51	METHYL ALCOHOL	0.144082	N/A	0.349832	N/A
83	ACETYLENE	3.123955	N/A	3.289051	N/A
84	ETHYLENE	10.327534	N/A	10.499527	N/A
85	ETHANE	3.216754	N/A	3.186573	N/A
88	ACETALDEHYDE	0.475506	N/A	1.291372	N/A
91	ETHYL ALCOHOL	0.000000	N/A	2.140576	N/A
141	1-PROPYNE	0.325061	N/A	0.319785	N/A
144	PROPYLENE	4.280648	N/A	4.182106	N/A
145	PROPANE	0.160195	N/A	0.168056	N/A
147	ACROLEIN (2-PROPENAL)	0.243693	N/A	0.226866	N/A
148	ACETONE	0.244875	N/A	0.241934	N/A
151	PROPIONALDEHYDE	0.058679	N/A	0.067109	N/A
200	VINYLACETYLENE	0.133090	N/A	0.143165	N/A
201	1,3-BUTADIENE	1.265047	N/A	1.198678	N/A
207	1-BUTENE	1.046985	N/A	1.004889	N/A
208	2-METHYLPROPENE (ISOBUTENE)	1.046985	N/A	1.004889	N/A
209	CIS-2-BUTENE	0.323787	N/A	0.337953	N/A
210	TRANS-2-BUTENE	0.407222	N/A	0.420057	N/A
211	N-BUTANE	1.216310	N/A	1.216185	N/A
212	2-METHYLPROPANE; ISOBUTANE	0.253279	N/A	0.250508	N/A
218	2-METHYL-2-PROPENAL (METHACROLEIN)	0.038402	N/A	0.051382	N/A
219	CROTONALDEHYDE	0.054809	N/A	0.051025	N/A
224	BUTYRALDEHYDE	0.095916	N/A	0.089293	N/A
287	ISOPRENE	0.038408	N/A	0.031823	N/A
288	CYCLOPENTENE	0.114123	N/A	0.117348	N/A
292	CYCLOPENTANE	0.244342	N/A	0.201880	N/A
293	1-PENTENE	0.270312	N/A	0.265789	N/A
294	3-METHYL-1-BUTENE	0.123755	N/A	0.127462	N/A
295	2-METHYL-2-BUTENE	0.333464	N/A	0.326305	N/A
296	2-METHYL-1-BUTENE	0.167190	N/A	0.161916	N/A
297	CIS-2-PENTENE	0.204061	N/A	0.199324	N/A
298	TRANS-2-PENTENE	0.376224	N/A	0.368437	N/A
300	N-PENTANE	1.664072	N/A	1.502557	N/A
301	2-METHYL-BUTANE	4.694629	N/A	4.272275	N/A
356	BENZENE	4.952975	N/A	4.539592	N/A
368	METHYLCYCLOPENTANE	1.293863	N/A	1.143058	N/A
369	CYCLOHEXANE	1.079605	N/A	0.948540	N/A

ID	SUBSTANCE	Petrol no ethanol (E0)		Petrol E10	
		%VOC	%PM_{10}	%VOC	%PM_{10}
371	1-HEXENE	0.086425	N/A	0.088541	N/A
372	4-METHYL-1-PENTENE	0.026652	N/A	0.026782	N/A
373	3-METHYL-1-PENTENE	0.026652	N/A	0.026782	N/A
374	TRANS-3-HEXENE	0.029488	N/A	0.028018	N/A
375	TRANS-2-HEXENE	0.114691	N/A	0.112457	N/A
379	2-METHYL-2-PENTENE	0.113594	N/A	0.095695	N/A
383	2-METHYL-1-PENTENE	0.086425	N/A	0.088541	N/A
384	CIS-3-HEXENE	0.029488	N/A	0.028018	N/A
385	CIS-2-HEXENE	0.063218	N/A	0.055562	N/A
386	3-METHYL-CIS-2-PENTENE	0.070021	N/A	0.061291	N/A
387	2,2-DIMETHYLBUTANE	1.955008	N/A	1.843357	N/A
388	2-METHYLPENTANE	2.844011	N/A	2.633418	N/A
389	N-HEXANE	1.022282	N/A	0.903548	N/A
390	2,3-DIMETHYLBUTANE	0.775431	N/A	0.706291	N/A
391	3-METHYLPENTANE	1.827531	N/A	1.700645	N/A
482	TOLUENE	9.178649	N/A	8.787243	N/A
493	METHYLCYCLOHEXANE	0.494826	N/A	0.444892	N/A
505	3,3-DIMETHYL-1-PENTENE	0.086867	N/A	0.099162	N/A
535	3,3-DIMETHYLPENTANE	0.121845	N/A	0.099964	N/A
537	2,4-DIMETHYLPENTANE	0.241603	N/A	0.219168	N/A
540	N-HEPTANE	0.910608	N/A	0.832307	N/A
541	2,3-DIMETHYLPENTANE	0.409439	N/A	0.376297	N/A
542	3-METHYLHEXANE	1.295023	N/A	1.181159	N/A
543	2-METHYLHEXANE	1.072428	N/A	0.976184	N/A
544	BENZALDEHYDE	0.343983	N/A	0.396193	N/A
593	STYRENE (ETHENYLBENZENE)	0.086908	N/A	0.083871	N/A
594	ETHYLBENZENE	1.647158	N/A	1.628337	N/A
595	P-XYLENE	2.737836	N/A	2.592487	N/A
596	M-XYLENE	2.737836	N/A	2.592487	N/A
597	O-XYLENE	2.120748	N/A	2.036597	N/A
659	2,2,4-TRIMETHYLPENTANE	0.252962	N/A	0.222464	N/A
662	N-OCTANE	0.424325	N/A	0.395891	N/A
667	2,3,4-TRIMETHYLPENTANE	0.110352	N/A	0.095173	N/A
669	2,3-DIMETHYLHEXANE	0.149561	N/A	0.133081	N/A
671	4-METHYLHEPTANE	0.355083	N/A	0.328900	N/A
672	3-METHYLHEPTANE	0.669289	N/A	0.622544	N/A
674	2-METHYLHEPTANE	0.355083	N/A	0.328900	N/A
678	P-TOLUALDEHYDE {4-METHYLBENZALDEHYDE}	0.121158	N/A	0.141741	N/A
680	M-TOLUALDEHYDE	0.121158	N/A	0.141741	N/A
743	N-PROPYLBENZENE	0.259092	N/A	0.250967	N/A
744	CUMENE (1-METHYLETHYLBENZENE)	0.099698	N/A	0.097603	N/A
745	1,3,5-TRIMETHYLBENZENE	0.522519	N/A	0.519817	N/A
746	1,2,3-TRIMETHYLBENZENE	0.479586	N/A	0.471556	N/A

ID	SUBSTANCE	Petrol no ethanol (E0)		Petrol E10	
		%VOC	%PM_{10}	%VOC	%PM_{10}
747	O-ETHYLTOLUENE	0.546543	N/A	0.538881	N/A
748	M-ETHYLTOLUENE	1.109806	N/A	1.091146	N/A
749	P-ETHYLTOLUENE	0.500876	N/A	0.496523	N/A
750	1,2,4-TRIMETHYLBENZENE	1.628000	N/A	1.655101	N/A
817	N-NONANE	0.150032	N/A	0.145616	N/A
884	NAPTHALENE	0.271298	18.021277	0.271298	18.021277
903	1,4-DIETHYLBENZENE (PARA)	0.300774	N/A	0.320360	N/A
908	1,3-DIETHYLBENZENE (META)	0.085008	N/A	0.082145	N/A
983	N-DECANE	0.099959	N/A	0.100476	N/A
1067	1-METHYL NAPHTHALENE	0.051411	3.415010	0.051411	3.415010
1068	2-METHYLNAPHTHALENE	0.116016	7.706477	0.116016	7.706477
1129	N-UNDECANE	0.053575	N/A	0.050079	N/A
1168	ACENAPHTHYLENE	0.019573	1.300164	0.019573	1.300164
1169	BIPHENYL {PHENYL BENZENE}	0.006736	0.447433	0.006736	0.447433
1170	ACENAPHTHENE	0.001848	0.122782	0.001848	0.122782
1191	DIBENZOFURAN	0.002161	0.143574	0.002161	0.143574
1206	N-DODECANE	0.026824	N/A	0.018919	N/A
1257	FLUORENE	0.006138	0.407752	0.006138	0.407752
1258	3-METHYL BIPHENYL	0.001218	0.080888	0.001218	0.080888
1259	2,3,5-TRIMETHYLNAPHTHALENE	0.001450	0.096311	0.001450	0.096311
1282	N-TRIDECANE	0.045963	N/A	0.038219	N/A
1298	ANTHRACENE	0.002062	0.136952	0.002062	0.136952
1299	PHENANTHRENE	0.008732	0.580011	0.008732	0.580011
1301	1-METHYL-9H-FLUORENE	0.000710	0.047143	0.000710	0.047143
1302	DIPHENYL ETHANE {BIBENZYL}	0.003734	0.248051	0.003734	0.248051
1317	9,10-ANTHRAQUINONE	0.000710	0.047178	0.000710	0.047178
1327	2-METHYLPHENANTHRENE	0.001107	0.073546	0.001107	0.073546
1329	1-METHYLPHENANTHRENE	0.000464	0.030846	0.000464	0.030846
1356	PYRENE	0.003280	0.217892	0.003280	0.217892
1358	FLUORANTHENE	0.002972	0.197426	0.002972	0.197426
1387	BENZO(C)PHENANTHRENE	0.000027	0.001818	0.000027	0.001818
1388	CHRYSENE	0.000080	0.005284	0.000080	0.005284
1390	BENZO(A)ANTHRACENE	0.000090	0.005953	0.000090	0.005953
1404	BENZO(A)PYRENE	0.000278	0.018494	0.000278	0.018494
1405	BENZO(B)FLUORANTHENE	0.000137	0.009127	0.000137	0.009127
1406	BENZO(E)PYRENE	0.000274	0.018185	0.000274	0.018185
1407	PERYLENE	0.000046	0.003071	0.000046	0.003071
1408	BENZO(K)FLUORANTHENE	0.000137	0.009127	0.000137	0.009127
1418	INDENO(1,2,3-CD)PYRENE	0.000333	0.022113	0.000333	0.022113
1420	BENZO(G,H,I)PERYLENE	0.000972	0.064573	0.000972	0.064573
1427	CORONENE	0.000876	0.058157	0.000876	0.058157
1452	METHYL BIPHENYL (MIXED) {PHENYLTOLUENE}	0.001791	0.118973	0.001791	0.118973
1517	METHYLBENZANTHRACENES	0.000012	0.000823	0.000012	0.000823

ID	SUBSTANCE	Petrol no ethanol (E0)		Petrol E10	
		%VOC	%PM_{10}	%VOC	%PM_{10}
1524	DIBENZANTHRACENES	0.000010	0.000669	0.000010	0.000669
1547	ETHYLNAPHTHALENES	0.008544	0.567556	0.008544	0.567556
1591	C7 TERMINAL ALKENES	0.021309	N/A	0.019179	N/A
1592	C7 INTERNAL ALKENES	0.021309	N/A	0.019179	N/A
1618	TRIMETHYLNAPHTHALENE	0.008775	0.582910	0.008775	0.582910
1709	METHYLPHENANTHRENES	0.001685	0.111923	0.001685	0.111923
1717	BRANCHED C11 ALKANES	0.353454	N/A	0.269515	N/A
1720	BRANCHED C7 ALKANES	0.660657	N/A	0.567842	N/A
1721	BRANCHED C8 ALKANES	0.365250	N/A	0.325977	N/A
1722	BRANCHED C9 ALKANES	0.477027	N/A	0.438582	N/A
1733	DIMETHYL NAPTHALENES	0.034408	2.285577	0.034408	2.285577
1773	BRANCHED C10 ALKANES	0.123469	N/A	0.145675	N/A
1921	5-METHYLCHRYSENE	0.000006	0.000377	0.000006	0.000377
1993	BENZO(J)FLUORANTHENE	0.000137	0.009127	0.000137	0.009127
9027	C10 AROMATIC	0.487187	N/A	0.462752	N/A
9039	INDANE	0.162098	N/A	0.165394	N/A
9040	RETENE	0.000031	0.002042	0.000031	0.002042
9050	9-METHYLANTHRACENE	0.000021	0.001407	0.000021	0.001407

[1] – Dioxins are speciated as a proportion of CO_2 emissions as a proxy for fuel consumption

Table D2: Petrol vehicle exhaust PM speciation

ID	SUBSTANCE	Petrol E0	Petrol E10
		%PM	%PM_{10}
3	LEAD & COMPOUNDS	0.035375	0.035375
5	PARTICULATE MATTER 2.5µm	95.3	95.3
7	ANTIMONY & COMPOUNDS	0.044130	0.044130
8	ARSENIC & COMPOUNDS	0.000112	0.000112
12	CADMIUM & COMPOUNDS	0.008516	0.008516
13	CHLORINE	0.214068	0.214068
16	CHROMIUM (III) COMPOUNDS	0.015698	0.015698
18	COBALT & COMPOUNDS	0.002638	0.002638
19	COPPER & COMPOUNDS	0.059523	0.059523
27	MANGANESE & COMPOUNDS	0.005352	0.005352
28	MERCURY & COMPOUNDS	0.004261	0.004261
30	NICKEL & COMPOUNDS	0.009627	0.009627
38	SELENIUM & COMPOUNDS	0.000724	0.000724
41	ZINC & COMPOUNDS	0.566582	0.566582
44	TIN & COMPOUNDS	0.011334	0.011334
45	VANADIUM & COMPOUNDS	0.002134	0.002134
46	TOTAL SUSPENDED PARTICULATE	100	100
1865	PHOSPHORUS	0.452372	0.452372
1936	BROMINE AND COMPOUNDS	0.023086	0.023086
1997	SULFATES	4.432039	4.432039
9051	MOLYBDENUM	0.009610	0.009610

Table D3: Petrol vehicles evaporative VOC speciation

ID	SUBSTANCE	Petrol E0 (%VOC)	Petrol E10 (%VOC)
91	ETHYL ALCOHOL	0.000000	3.104152
207	1-BUTENE	1.452504	1.466968
208	2-METHYLPROPENE (ISOBUTENE)	1.452504	1.466968
209	CIS-2-BUTENE	2.763941	2.928249
210	TRANS-2-BUTENE	3.224849	3.390646
211	N-BUTANE	15.106027	14.822112
212	2-METHYLPROPANE; ISOBUTANE	5.873574	6.087877
287	ISOPRENE	0.032770	0.029529
288	CYCLOPENTENE	0.203500	0.188491
292	CYCLOPENTANE	0.471870	0.438001
293	1-PENTENE	0.794886	0.819681
294	3-METHYL-1-BUTENE	0.381957	0.260795
295	2-METHYL-2-BUTENE	2.448260	2.552163
296	2-METHYL-1-BUTENE	1.829746	1.829204
297	CIS-2-PENTENE	0.936579	0.952330
298	TRANS-2-PENTENE	1.728192	1.770515
300	N-PENTANE	5.639209	5.520785
301	2-METHYL-BUTANE	27.491204	28.124198
356	BENZENE	0.658176	0.538167
368	METHYLCYCLOPENTANE	1.433234	1.315510
369	CYCLOHEXANE	0.976490	0.831324
371	1-HEXENE	0.189710	0.185617
372	4-METHYL-1-PENTENE	0.076797	0.077440
373	3-METHYL-1-PENTENE	0.076797	0.077440
374	TRANS-3-HEXENE	0.111012	0.111131
375	TRANS-2-HEXENE	0.303779	0.297428
379	2-METHYL-2-PENTENE	0.465614	0.437064
383	2-METHYL-1-PENTENE	0.189710	0.185617
384	CIS-3-HEXENE	0.111012	0.111131
385	CIS-2-HEXENE	0.173557	0.164935
386	3-METHYL-CIS-2-PENTENE	0.260122	0.241412
387	2,2-DIMETHYLBUTANE	3.326949	3.064001
388	2-METHYLPENTANE	4.432799	4.252674
389	N-HEXANE	1.349626	1.253792
390	2,3-DIMETHYLBUTANE	1.222888	1.152829
391	3-METHYLPENTANE	2.445699	2.375441
482	TOLUENE	2.766556	1.988936
493	METHYLCYCLOHEXANE	0.263224	0.197110
505	3,3-DIMETHYL-1-PENTENE	0.378118	0.354060
535	3,3-DIMETHYLPENTANE	0.094939	0.075346
537	2,4-DIMETHYLPENTANE	0.274956	0.253000
540	N-HEPTANE	0.534254	0.409874
541	2,3-DIMETHYLPENTANE	0.283859	0.255549
542	3-METHYLHEXANE	0.886071	0.719308

ID	SUBSTANCE	Petrol E0 (%VOC)	Petrol E10 (%VOC)
543	2-METHYLHEXANE	0.778100	0.629500
593	STYRENE (ETHENYLBENZENE)	0.002979	0.002589
594	ETHYLBENZENE	0.289790	0.180962
595	P-XYLENE	0.489010	0.310729
596	M-XYLENE	0.489010	0.310729
597	O-XYLENE	0.343257	0.206978
659	2,2,4-TRIMETHYLPENTANE	0.148343	0.116852
662	N-OCTANE	0.122102	0.082542
667	2,3,4-TRIMETHYLPENTANE	0.086728	0.065379
669	2,3-DIMETHYLHEXANE	0.067854	0.049561
671	4-METHYLHEPTANE	0.119285	0.086186
672	3-METHYLHEPTANE	0.227065	0.162798
674	2-METHYLHEPTANE	0.119285	0.086186
743	N-PROPYLBENZENE	0.040886	0.022059
744	CUMENE (1-METHYLETHYLBENZENE)	0.015106	0.008222
745	1,3,5-TRIMETHYLBENZENE	0.064247	0.035335
746	1,2,3-TRIMETHYLBENZENE	0.057991	0.029480
747	O-ETHYLTOLUENE	0.062142	0.032806
748	M-ETHYLTOLUENE	0.124948	0.069923
749	P-ETHYLTOLUENE	0.060839	0.034000
750	1,2,4-TRIMETHYLBENZENE	0.208184	0.112000
817	N-NONANE	0.022020	0.012531
903	1,4-DIETHYLBENZENE (PARA)	0.030837	0.012033
908	1,3-DIETHYLBENZENE (META)	0.006981	0.002389
983	N-DECANE	0.012233	0.006484
1129	N-UNDECANE	0.002970	0.001336
1206	N-DODECANE	0.000535	0.000231
1282	N-TRIDECANE	0.000071	0.000045
1591	C7 TERMINAL ALKENES	0.000089	0.000596
1592	C7 INTERNAL ALKENES	0.000089	0.000596
1717	BRANCHED C11 ALKANES	0.007350	0.007902
1720	BRANCHED C7 ALKANES	0.463727	0.377042
1721	BRANCHED C8 ALKANES	0.165909	0.124868
1722	BRANCHED C9 ALKANES	0.089623	0.052995
1773	BRANCHED C10 ALKANES	0.012959	0.007175
9027	C10 AROMATIC	0.042794	0.015138
9039	INDANE	0.026149	0.012882

Table D4: Diesel vehicle exhaust organics speciation

ID	SUBSTANCE	%VOC	%PM_{10}
36	POLYCHLORINATED DIOXINS AND FURANS	1.13443×10^{-11}(1)	N/A
37	POLYCYCLIC AROMATIC HYDROCARBONS	1.653019608	5.451313029
47	METHANE	16.5185403	N/A
49	FORMALDEHYDE	9.857485684	N/A
51	METHYL ALCOHOL	1.285347044	N/A
83	ACETYLENE	1.830792388	N/A
84	ETHYLENE	7.144818931	N/A
85	ETHANE	0.330141281	N/A
88	ACETALDEHYDE	3.813449267	N/A
95	GLYOXAL	1.048217283	N/A
141	1-PROPYNE	0.153061139	N/A
144	PROPYLENE	2.15900632	N/A
145	PROPANE	0.777626258	N/A
147	ACROLEIN (2-PROPENAL)	0.36004626	N/A
148	ACETONE	1.661385072	N/A
151	PROPIONALDEHYDE	0.524844839	N/A
177	GLYCEROL	0.231432472	0.162409786
182	TRANS-1,3-DICHLOROPROPENE	0.039637989	N/A
201	1,3-BUTADIENE	0.402828324	N/A
202	1-BUTYNE (ETHYLACETYLENE)	0.024021726	N/A
203	2-BUTYNE	0.341212869	N/A
204	1,2-BUTADIENE {METHYLALLENE}	0.052135995	N/A
207	1-BUTENE	0.393198455	N/A
208	2-METHYLPROPENE (ISOBUTENE)	0.393198455	N/A
209	CIS-2-BUTENE	0.086546961	N/A
210	TRANS-2-BUTENE	0.10213283	N/A
211	N-BUTANE	0.213892723	N/A
212	2-METHYLPROPANE; ISOBUTANE	0.049195411	N/A
218	2-METHYL-2-PROPENAL (METHACROLEIN)	0.078487941	N/A
219	CROTONALDEHYDE	0.337822302	N/A
221	METHYL ETHYL KETONE (MEK) (2-BUTANONE)	0.313840411	N/A
224	BUTYRALDEHYDE	0.43145365	N/A
225	ISOBUTYRALDEHYDE	0.099802372	N/A
287	ISOPRENE	0.08560134	N/A
288	CYCLOPENTENE	0.147266129	N/A
291	1,4-PENTADIENE	0.145701264	N/A
292	CYCLOPENTANE	0.025515882	N/A
293	1-PENTENE	0.270149525	N/A
294	3-METHYL-1-BUTENE	0.059268897	N/A
295	2-METHYL-2-BUTENE	0.048430672	N/A
296	2-METHYL-1-BUTENE	0.141459013	N/A
297	CIS-2-PENTENE	0.049392997	N/A
298	TRANS-2-PENTENE	0.052988293	N/A
299	2,2-DIMETHYLPROPANE	0.106498242	N/A

ID	SUBSTANCE	%VOC	%PM_{10}
300	N-PENTANE	0.18946637	N/A
301	2-METHYL-BUTANE	0.376168714	N/A
312	N-PENTANAL (N-VALERALDEHYDE)	0.127290919	N/A
313	ISOVALERALDEHYDE (3-METHYLBUTANAL)	0.232453945	N/A
314	2,2-DIMETHYLPROPANAL (PIVALDEHYDE)	0.116672195	N/A
315	METHYL T-BUTYL ETHER (MTBE)	0.167144816	N/A
356	BENZENE	1.066778195	N/A
359	CYCLOHEXENE	0.054745091	N/A
360	1-METHYLCYCLOPENTENE	0.043867913	N/A
365	1,3-HEXADIENE	0.035052353	N/A
368	METHYLCYCLOPENTANE	0.354898693	N/A
369	CYCLOHEXANE	0.059643408	N/A
370	3,3-DIMETHYL-1-BUTENE	0.044444444	N/A
371	1-HEXENE	0.119541821	N/A
372	4-METHYL-1-PENTENE	0.033736594	N/A
373	3-METHYL-1-PENTENE	0.033736594	N/A
375	TRANS-2-HEXENE	0.02939456	N/A
378	3-METHYL-TRANS-2-PENTENE	0.013717463	N/A
379	2-METHYL-2-PENTENE	0.017284602	N/A
380	4-METHYL-TRANS-2-PENTENE	0.004395343	N/A
381	4-METHYL-CIS-2-PENTENE	0.004395343	N/A
383	2-METHYL-1-PENTENE	0.499148175	N/A
385	CIS-2-HEXENE	0.030965917	N/A
386	3-METHYL-CIS-2-PENTENE	0.008791196	N/A
387	2,2-DIMETHYLBUTANE	0.053722155	N/A
388	2-METHYLPENTANE	0.097640232	N/A
389	N-HEXANE	3.293132722	N/A
390	2,3-DIMETHYLBUTANE	0.099628587	N/A
391	3-METHYLPENTANE	0.07308181	N/A
393	PHENOL (CARBOLIC ACID)	0.233277032	0.757740781
402	METHYL T-BUTYL KETONE (PINACOLIN)	0.299431701	N/A
403	METHYL ISOBUTYL KETONE	0.106153587	N/A
406	HEXANAL (HEXANALADEHYDE)	0.068333807	N/A
412	ETHYL T-BUTYL ETHER	0.086956522	N/A
430	N-HEXANOIC ACID	0.128996813	0.286701096
457	ADIPIC ACID	0.016699148	0.012107275
460	1,3-DICHLOROBENZENE {M-DICHLOROBENZENE}	0.007379842	0.052343564
461	O-DICHLOROBENZENE	0.012312756	0.040802668
482	TOLUENE	0.469120337	N/A
493	METHYLCYCLOHEXANE	0.090264511	N/A
494	CIS-1-2-DIMETHYLCYCLOPENTANE	0.049741636	N/A
496	ETHYLCYCLOPENTANE	0.008310047	N/A
497	TRANS-1,3-DIMETHYLCYCLOPENTANE	0.025084653	N/A
499	CIS-1,3-DIMETHYLCYCLOPENTANE	0.024466606	N/A
501	TRANS-1-2-DIMETHYLCYCLOPENTANE	1.643539652	N/A
503	3-METHYL-1-HEXENE	0.090909091	N/A

ID	SUBSTANCE	%VOC	%PM_{10}
509	1-HEPTENE	0.21691189	N/A
514	2,3-DIMETHYL-2-PENTENE	0.021875467	N/A
515	TRANS-2-HEPTENE	0.054367121	N/A
528	CIS-2-HEPTENE	0.201189461	N/A
534	3-ETHYL-2-PENTENE	0.044444444	N/A
537	2,4-DIMETHYLPENTANE	0.06863718	N/A
539	3-ETHYLPENTANE	0.025084653	N/A
540	N-HEPTANE	0.158771947	N/A
541	2,3-DIMETHYLPENTANE	0.035552012	N/A
542	3-METHYLHEXANE	0.059090196	N/A
543	2-METHYLHEXANE	0.183591386	N/A
544	BENZALDEHYDE	0.190016928	N/A
549	O-CRESOL (2-METHYL-BENZENOL)	0.009626224	0.069384281
558	HEPTANAL	0.012070199	0.112981152
565	BENZOIC ACID	0.383319896	0.697371539
575	N-HEPTANOIC ACID	0.06030115	0.314197844
593	STYRENE (ETHENYLBENZENE)	0.147621967	N/A
594	ETHYLBENZENE	0.178876785	N/A
595	P-XYLENE	0.135254869	N/A
596	M-XYLENE	0.135254869	N/A
597	O-XYLENE	0.113080114	N/A
616	1,1-METHYLETHYLCYCLOPENTANE	0.028098384	N/A
617	ETHYLCYCLOHEXANE	0.113071488	N/A
619	CIS,TRANS,CIS-1,2,3-TRIMETHYL CYCLOPENTANE	0.04299577	N/A
620	PROPYLCYCLOPENTANE	0.007773525	N/A
622	TRANS-1,3-DIMETHYLCYCLOHEXANE	0.004294957	N/A
623	TRANS-1,4-DIMETHYLCYCLOHEXANE	0.064019731	N/A
625	CIS-1-METHYL-3-ETHYLCYCLOPENTANE	0.130105402	N/A
626	CIS-1,CIS-2,3-TRIMETHYLCYCLOPENTANE	0.107236385	N/A
628	ISOPROPYLCYCLOPENTANE	0.021954369	N/A
629	1,1,2-TRIMETHYLCYCLOPENTANE	0.105139495	N/A
631	TRANS-1,2-CIS-4-TRIMETHYLCYCLOPENTANE	0.045849778	N/A
634	CIS-1,3-DIMETHYLCYCLOHEXANE	0.089728763	N/A
635	TRANS-1,2-DIMETHYLCYCLOHEXANE	0.747201207	N/A
641	2,4,4-TRIMETHYL-1-PENTENE	0.022222222	N/A
642	1-OCTENE	0.039668229	N/A
649	TRANS-2-OCTENE	0.026700587	N/A
656	CIS-2-OCTENE	0.346247492	N/A
659	2,2,4-TRIMETHYLPENTANE	0.055608622	N/A
660	2,2-DIMETHYLHEXANE	0.021988986	N/A
661	3-METHYL-3-ETHYLPENTANE	0.009152501	N/A
662	N-OCTANE	0.116052721	N/A
664	2,3,3-TRIMETHYLPENTANE	0.552360967	N/A
665	3,3-DIMETHYLHEXANE	0.032725786	N/A
666	2,2,3-TRIMETHYLPENTANE	0.023509305	N/A
667	2,3,4-TRIMETHYLPENTANE	0.021747526	N/A

ID	SUBSTANCE	%VOC	%PM_{10}
669	2,3-DIMETHYLHEXANE	0.03309026	N/A
670	2,4-DIMETHYLHEXANE	0.029314888	N/A
671	4-METHYLHEPTANE	0.035893498	N/A
672	3-METHYLHEPTANE	0.05751423	N/A
673	2,5-DIMETHYLHEXANE	0.008310047	N/A
674	2-METHYLHEPTANE	0.076866656	N/A
675	2-METHYL-3-ETHYLPENTANE	0.105139495	N/A
676	3-ETHYLHEXANE	0.045849778	N/A
678	P-TOLUALDEHYDE {4-METHYLBENZALDEHYDE}	0.103447361	N/A
679	O-TOLUALDEHYDE	0.144932043	N/A
680	M-TOLUALDEHYDE	0.09110471	0.933859074
688	OCTANAL	0.087824068	0.683149892
698	PHENYLACETIC ACID	0.034516216	0.034954421
713	N-OCTANOIC ACID	0.056430731	0.258616448
739	INDENE	0.015051964	0.130523571
740	INDAN	0.072622448	0.76306009
743	N-PROPYLBENZENE	0.072224356	0.434522458
744	CUMENE (1-METHYLETHYLBENZENE)	0.050320046	N/A
745	1,3,5-TRIMETHYLBENZENE	0.096803238	0.595869454
746	1,2,3-TRIMETHYLBENZENE	0.092663997	0.786223363
747	O-ETHYLTOLUENE	0.115228672	0.655842363
748	M-ETHYLTOLUENE	0.132037976	1.096321481
749	P-ETHYLTOLUENE	0.094150671	0.548620169
750	1,2,4-TRIMETHYLBENZENE	0.181125422	1.087233037
762	CIS-1,CIS-3,5-TRIMETHYLCYCLOHEXANE	0.113071488	N/A
767	N-BUTYLCYCLOPENTANE	0.384834806	N/A
771	ISOBUTYLCYCLOPENTANE (2-METHYLPROPYL CYCLOPENTANE)	0.038309057	N/A
782	ISOPROPYLCYCLOHEXANE (2-METHYLETHYL CYCLOHEXANE)	0.271640911	N/A
783	1,1,2-TRIMETHYLCYCLOHEXANE	0.133218204	N/A
784	1,1,4-TRIMETHYLCYCLOHEXANE	0.086875458	N/A
786	CIS,CIS,TRANS-1,2,4-TRIMETHYL CYCLOHEXANE	4.138265511	N/A
787	CIS,TRANS,CIS-1,2,4-TRIMETHYL CYCLOHEXANE	0.15904612	N/A
788	CIS-1,TRANS-2,TRANS-4-TRIMETHYLCYCLOHEXANE	0.063212799	N/A
794	1-NONENE	0.444444444	N/A
802	TRANS-3-NONENE	0.096077052	N/A
807	CIS-2-NONENE	0.112284688	N/A
808	TRANS-2-NONENE	0.062711634	N/A
810	3,3-DIETHYLPENTANE	0.210445966	N/A
811	2,2,5-TRIMETHYLHEXANE	0.017748652	N/A
812	4,4-DIMETHYLHEPTANE	0.065412368	N/A
815	2,2-DIMETHYLHEPTANE	0.065412368	N/A
817	N-NONANE	0.442685658	0.576876622
819	3-ETHYLHEPTANE	0.210445966	N/A
821	2,2,4-TRIMETHYLHEXANE	0.028098384	N/A
822	2,4,4-TRIMETHYLHEXANE	0.021954369	N/A
824	2,4-DIMETHYLHEPTANE	0.060997977	N/A

ID	SUBSTANCE	%VOC	%PM_{10}
825	2,5-DIMETHYLHEPTANE	0.154488167	N/A
827	3-METHYLOCTANE	0.172650474	N/A
828	4-METHYLOCTANE	0.2	N/A
829	2,3-DIMETHYLHEPTANE	0.29217345	N/A
832	2-METHYLOCTANE	0.271715328	N/A
833	3,3-DIMETHYLHEPTANE	0.329277928	N/A
836	3,4-DIMETHYLHEPTANE	0.677960716	N/A
837	3,5-DIMETHYLHEPTANE	0.041767117	N/A
853	3,4-DIMETHYLBENZOIC ACID	0.014556465	0.110075918
865	N-NONANOIC ACID	0.127131939	0.468169361
884	NAPTHALENE	0.296480793	1.202276197
888	1,2-DIHYDRONAPHTHALENE	0.00894698	0.060019203
891	TETRALIN	0.099581563	0.397391833
892	1-METHYL INDAN	0.188764563	0.706374008
894	2-METHYLINDAN	0.02408181	N/A
899	N-BUTYLBENZENE	0.046716213	0.196988497
900	(1-METHYLPROPYL)BENZENE (SEC-BUTYL BENZENE)	0.021659186	0.20898164
901	(2-METHYLPROPYL)BENZENE	0.007281852	0.040323959
902	T-BUTYLBENZENE	0.026593498	0.281733183
903	1,4-DIETHYLBENZENE (PARA)	0.156817176	N/A
904	1-METHYL-2N-PROPYLBENZENE	0.048818788	0.321345102
905	1-METHYL-3N-PROPYLBENZENE	0.454040079	N/A
906	1-METHYL-4N-PROPYLBENZENE	0.050802946	0.291872001
907	1,2-DIETHYLBENZENE (ORTHO)	0.032461811	0.312391707
908	1,3-DIETHYLBENZENE (META)	0.081301931	0.241666362
909	1,4-DIMETHYL-2-ETHYLBENZENE	0.046407128	0.293192422
910	1,3-DIMETHYL-2-ETHYLBENZENE	0.449462546	N/A
911	1,2,3,4-TETRAMETHYLBENZENE	0.05222415	0.31496777
912	1,2,3,5-TETRAMETHYLBENZENE	0.089588459	0.706825479
913	1-METHYL-2-ISOPROPYLBENZENE	0.003664479	0.035695443
914	1-METHYL-3-ISOPROPYLBENZENE	0.019821296	0.190968815
915	1,3-DIMETHYL-4-ETHYLBENZENE	0.16	N/A
917	1,3-DIMETHYL-5-ETHYLBENZENE	0.053699047	0.330972067
918	1,2-DIMETHYL-4-ETHYLBENZENE	0.06828951	0.411175989
919	1,2,4,5-TETRAMETHYLBENZENE	0.049690824	0.384423278
920	1-METHYL-4-ISOPROPYLBENZENE	0.008751959	0.09042577
922	B-PINENE	0.003130409	N/A
927	A-PINENE	0.021627113	N/A
939	BUTYLCYCLOHEXANE	0.491586143	N/A
971	1-DECENE	0.065635371	0.419281136
983	N-DECANE	0.722418876	0.990193033
988	2,2-DIMETHYLOCTANE	0.039085485	N/A
1001	2,4-DIMETHYLOCTANE	0.043478261	N/A
1002	3,3-DIMETHYLOCTANE	0.88753567	N/A
1005	3-ETHYLOCTANE	0.278906881	N/A
1006	3-METHYLNONANE	0.789614903	N/A

ID	SUBSTANCE	%VOC	%PM_{10}
1010	2-METHYLNONANE	0.837197269	N/A
1023	2-DECANONE	0.010892904	0.067112766
1047	N-DECANOIC ACID	0.102469888	0.139597342
1067	1-METHYL NAPHTHALENE	0.144663517	0.654499514
1068	2-METHYLNAPHTHALENE	0.21721783	0.878431268
1074	DIMETHYL INDAN	0.091870277	0.479537213
1081	N-PENTYLBENZENE	0.073980813	0.393469147
1082	1-METHYL-2-TERT-BUTYLBENZENE	0.339760227	N/A
1085	1-METHYL-2-N-BUTYLBENZENE	0.553657625	N/A
1101	1,3-DIMETHYL-4-ISOPROPYLBENZENE	0.005305417	0.039464541
1105	PENTAMETHYLBENZENE	0.008471252	0.060144426
1106	1-METHYL-4-T-BUTYLBENZENE	5.43743×10^{-05}	0.001863557
1124	1-UNDECENE	0.126045822	0.836740635
1129	N-UNDECANE	3.2632807	1.381317936
1166	N-UNDECANOIC ACID	0.014345634	0.050898104
1168	ACENAPHTHYLENE	0.035893193	0.101280201
1169	BIPHENYL {PHENYL BENZENE}	0.079569626	0.445980569
1170	ACENAPHTHENE	0.015125114	0.021258361
1171	1,4-DIMETHYLNAPHTHALENE	0.024204629	0.126668509
1172	1,2-DIMETHYLNAPHTHALENE	0.018878137	0.082255587
1173	2,3-DIMETHYLNAPHTHALENE	0.016959887	0.062332602
1174	2,6-DIMETHYL NAPHTHALENE	0.088263946	0.406427692
1175	2-ETHYLNAPHTHALENE	0.062508043	0.216230332
1180	N-HEXYLBENZENE	1.323223559	N/A
1181	1,2-ISODIPROPYLBENZENE	0.000929077	0.009422602
1182	1,3,5-TRIETHYLBENZENE	0.201858736	N/A
1185	TRANS-1-BUTYL-4-ETHYLBENZENE	0.504549321	N/A
1187	1-(1,1-DIMETHYLETHYL)-3,5-DIMETHYLBENZENE	0.214571595	N/A
1191	DIBENZOFURAN	0.021140428	0.05877907
1196	1-DODECENE	0.385277778	N/A
1206	N-DODECANE	0.90307304	1.125741207
1240	N-DODEDANOIC ACID	0.139384952	0.178149034
1257	FLUORENE	0.032036954	0.074341301
1258	3-METHYL BIPHENYL	0.064550325	0.276812988
1265	HEPTYL CYCLOHEXANE	0.08738674	0.33408973
1282	N-TRIDECANE	0.588532111	1.21787401
1290	N-TRIDECANOIC ACID	0.012841584	0.011475376
1298	ANTHRACENE	0.005689401	0.010842142
1299	PHENANTHRENE	0.049906164	0.099792163
1301	1-METHYL-9H-FLUORENE	0.022671304	0.042682813
1302	DIPHENYL ETHANE {BIBENZYL}	0.212691331	0.267081652
1304	OCTYL CYCLOHEXANE	0.066752766	0.17128439
1311	N-TETRADECANE	0.393944707	0.810708902
1313	2,6,10-TRIMETHYL UNDECANE	0.217770938	0.361911268
1317	9,10-ANTHRAQUINONE	0.00661679	0.006343472
1319	N-TETRADECANOIC ACID	0.048983629	0.078693503

ID	SUBSTANCE	%VOC	%PM_{10}
1327	2-METHYLPHENANTHRENE	0.014373249	0.02787467
1329	1-METHYLPHENANTHRENE	0.015141904	0.026691615
1333	NONYL CYCLOHEXANE	0.090412607	0.195595408
1341	N-PENTADECANE	0.340878521	0.681956238
1346	N-PENTADECANOIC ACID	0.00976185	0.018737832
1356	PYRENE	0.05887074	0.047480483
1358	FLUORANTHENE	0.045999152	0.034028711
1359	1-PHENYLNAPHTHALENE	0.003708592	0.006169151
1363	DECYL CYCLOHEXANE	0.022274071	0.073253269
1368	HEXADECANE	0.274057058	0.831761034
1371	PALMITIC ACID {N-HEXADECANOIC ACID}	0.051782542	0.062402615
1381	N-HEPTADECANE	0.212216191	0.890181852
1386	BENZO[GHI]FLUORANTHENE	0.004037396	0.010098406
1387	BENZO(C)PHENANTHRENE	0.001595649	0.001790357
1388	CHRYSENE	0.00591287	0.006563605
1389	CYCLOPENTA[CD]PYRENE	0.004147642	0.01049808
1390	BENZO(A)ANTHRACENE	0.008924152	0.011524626
1392	OCTADECANE	0.178915047	0.395194026
1395	STEARIC ACID (N-OCTADECANOIC ACID)	0.068917662	0.120005212
1397	6-METHYLCHRYSENE	0.000126509	0.000192879
1400	NONADECANE	0.139880529	0.256570036
1402	N-NONADECANOIC ACID	0.023526832	0.009462573
1404	BENZO(A)PYRENE	0.004122517	0.009730045
1405	BENZO(B)FLUORANTHENE	0.000133676	0.000191304
1406	BENZO(E)PYRENE	0.003194199	0.005613292
1407	PERYLENE	0.000193628	0.000442794
1408	BENZO(K)FLUORANTHENE	0.000187661	0.00029837
1412	EICOSANE	0.147294671	0.148356027
1414	HENEICOSANE	0.09425351	0.095403499
1418	INDENO(1,2,3-CD)PYRENE	0.000457416	0.001233682
1420	BENZO(G,H,I)PERYLENE	0.000666338	0.002099732
1421	DIBENZO(A,H)ANTHRACENE	1.54242×10^{-05}	3.26087×10^{-05}
1423	DOCOSANE	0.074564741	0.115741525
1427	CORONENE	0.000427859	0.000917734
1428	DIBENZO[A,H]PYRENE	0.000209472	0.000522681
1429	DI(2-ETHYLHEXYL)PHTHALATE	0.000437018	N/A
1440	DL-LIMONENE {DIPENTENE}	0.019085115	N/A
1529	METHYLBUTADIENE	0.069601896	N/A
1544	DIMETHYLBENZALDEHYDE	0.07825721	N/A
1611	1,3-DIMETHYLCYCLOPENTANE	0.023432569	N/A
1618	TRIMETHYLNAPHTHALENE	0.054806303	0.150064831
1619	DIMETHYLCYCLOPENTANE	0.000763359	N/A
1626	BUTYLBENZENE ISOMERS	0.976060291	N/A
1687	CRESOLS	0.048843188	N/A
1688	METHYLBENZALDEHYDE ISOMERS	0.103447361	N/A
1691	DIETHYLBENZENES	0.087536383	N/A

ID	SUBSTANCE	%VOC	%PM_{10}
1693	TRIMETHYLBENZENES	2.79053288	N/A
1694	TRIMETHYLPENTANE	0.066666667	N/A
1736	TRIMETHYLCYCLOPENTANE	0.049741636	N/A
1774	DIMETHYLCYCLOHEXANES	0.052641496	N/A
1777	DIMETHYLHEPTANES	0.022222222	N/A
1787	DIMETHYLOCTANES	0.081697685	0.33162585
1857	4-NITROBIPHENYL	4.85849×10^{-05}	0.000123008
1917	DIBENZO(A,L)PYRENE	0.000156849	0.000393985
1921	5-METHYLCHRYSENE	0.000126509	0.000192879
1922	6-NITROCHRYSENE	9.71698×10^{-06}	2.46016×10^{-05}
1923	2-NITROFLUORENE	2.91509×10^{-05}	7.38047×10^{-05}
1924	1-NITROPYRENE	0.000303097	0.000575836
1925	4-NITROPYRENE	5.83019×10^{-06}	1.47609×10^{-05}
9040	RETENE	0.00075835	0.000911895
9050	9-METHYLANTHRACENE	0.000314784	0.000606965

[1] Dioxins are speciated as a proportion of CO_2 emissions as a proxy for fuel consumption

Table D5: Diesel vehicle exhaust PM speciation

ID	SUBSTANCE	%PM_{10}
3	LEAD & COMPOUNDS	0.017854
5	PARTICULATE MATTER 2.5µm	97.0
7	ANTIMONY & COMPOUNDS	0.041582
8	ARSENIC & COMPOUNDS	0.004709
12	CADMIUM & COMPOUNDS	0.044353
13	CHLORINE	0.083929
16	CHROMIUM (III) COMPOUNDS	0.011886
18	COBALT & COMPOUNDS	0.005551
19	COPPER & COMPOUNDS	0.015484
27	MANGANESE & COMPOUNDS	0.008748
28	MERCURY & COMPOUNDS	0.009124
30	NICKEL & COMPOUNDS	0.004307
38	SELENIUM & COMPOUNDS	0.005117
41	ZINC & COMPOUNDS	0.262438
44	TIN & COMPOUNDS	0.020358
45	VANADIUM & COMPOUNDS	0.009131
46	TOTAL SUSPENDED PARTICULATE	101
1865	PHOSPHORUS	0.201357
1936	BROMINE AND COMPOUNDS	0.010169
1997	SULFATES	2.850508
9051	MOLYBDENUM	0.0086

Table D6: Non-exhaust PM speciation

ID	SUBSTANCE	%PM
3	LEAD & COMPOUNDS	0.233091
5	PARTICULATE MATTER 2.5µm	53.2
7	ANTIMONY & COMPOUNDS	0.370289
8	ARSENIC & COMPOUNDS	0.002678
12	CADMIUM & COMPOUNDS	0.001051
13	CHLORINE	0.080079
16	CHROMIUM (III) COMPOUNDS	0.086676
18	COBALT & COMPOUNDS	0.000841
19	COPPER & COMPOUNDS	1.900353
27	MANGANESE & COMPOUNDS	0.093476
30	NICKEL & COMPOUNDS	0.013517
38	SELENIUM & COMPOUNDS	0.001685
41	ZINC & COMPOUNDS	0.67215
44	TIN & COMPOUNDS	0.330479
45	VANADIUM & COMPOUNDS	0.02448
46	TOTAL SUSPENDED PARTICULATE	155.09
1404	BENZO(A)PYRENE	0.000212
1405	BENZO(B)FLUORANTHENE	1.55×10^{-05}
1408	BENZO(K)FLUORANTHENE	2.3×10^{-05}
1936	BROMINE AND COMPOUNDS	0.002425
1997	SULFATES	1.354478
9051	MOLYBDENUM	0.370327