



# Appendix C

## Examples of VEPM Emission Factors



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## Vehicle Emissions Prediction Model

Entry required in white cells. Entry optional in grey cells

Year

Run Number

Run Model

Repeat a Previous Run

Fleet Profile				
	Weight category	Fuel type	% of VKT	
			default values	optional user entry
			2021	
<b>Cars</b>	< 3.5 t	petrol	62.3%	72.21%
	< 3.5 t	diesel	11.8%	7.73%
<b>LCV</b>	< 3.5 t	hybrid	2.5%	0.36%
	< 3.5 t	petrol	2.1%	3.52%
	< 3.5 t	diesel	14.0%	12.16%
<b>HCV</b>	< 3.5 t	hybrid	0.7%	0.03%
	3.5 - 7.5 t	diesel	1.4%	0.84%
	7.5 - 12 t	diesel	0.7%	0.44%
	12 - 15 t	diesel	0.2%	0.11%
	15 - 20 t	diesel	0.3%	0.17%
	20 - 25 t	diesel	1.1%	0.66%
	25 - 30 t	diesel	1.1%	0.63%
<b>Buses</b>	> 30 t	diesel	1.3%	0.75%
	> 3.5 t	diesel	0.6%	0.39%

100%

Average Speeds		
<b>cars</b>	<b>50</b>	km/h
<b>LCV's</b>	<b>50</b>	km/h
<b>HCV's/buses</b>	<b>50</b>	km/h

Note: valid HCV speed range for selected load and gradient is 6 - 72 km/h

Optional Inputs			
	default values	optional user entry	options
average trip length (km)	9.1		8 to 25
ambient temperature °C	13.1		-10 to 30
petrol fuel type - see worksheet	6		0 to 7
diesel fuel type - see worksheet	5		0 to 5
consider cold start?	yes		no
consider degradation?	yes		no
% of catalyst not working - old vehicles	15%		0-100%
% of catalyst not working - new vehicles	0%		0-100%
Gradient	0%	-6%	±2, 4, 6
Heavy vehicles: load	50%		0, 100%
Number of wheels			
Vehicle type	default values	optional user entry	
Car	4		
LCV	4		
HCV 3.5-7.5 t	6		
HCV 7.5-12 t	6		
HCV 12-15 t	8		
HCV 15-20 t	8		
HCV 20-25 t	8		
HCV 25-30 t	8		
HCV >30 t	8		
Buses >3.5 t	6		
Brake and tyre PM output	PM10		



## Output Summary

Runs					fleet composition													
Run number	year	Speed Car	speed LCV	Speed HCV	Light Duty Vehicles <3.5t						Diesel HCV >3.5t							
					% car petrol	% car diesel	% car hybrid	% LCV petrol	% LCV diesel	% LCV hybrid	% buses	% HCV 3.5-7.5 t	% HCV 7.5-12t	% HCV 12-15t	% HCV 15-20t	% HCV 20-25t	% HCV 25-30t	% HCV >30t
1	2021	50	50	50	72.2%	7.7%	0.4%	3.5%	12.2%	0.0%	0.4%	0.8%	0.4%	0.1%	0.2%	0.7%	0.6%	0.8%
2	2021	50	50	50	72.2%	7.7%	0.4%	3.5%	12.2%	0.0%	0.4%	0.8%	0.4%	0.1%	0.2%	0.7%	0.6%	0.8%
3	2021	50	50	50	72.2%	7.7%	0.4%	3.5%	12.2%	0.0%	0.4%	0.8%	0.4%	0.1%	0.2%	0.7%	0.6%	0.8%
4	2021	50	50	50	71.5%	7.6%	0.4%	3.5%	12.0%	0.0%	0.5%	1.1%	0.6%	0.1%	0.2%	0.8%	0.8%	0.9%
5	2021	50	50	50	71.5%	7.6%	0.4%	3.5%	12.0%	0.0%	0.5%	1.1%	0.6%	0.1%	0.2%	0.8%	0.8%	0.9%
6	2021	50	50	50	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
7	2021	80	80	80	72.2%	7.7%	0.4%	3.5%	12.2%	0.0%	0.4%	0.8%	0.4%	0.1%	0.2%	0.7%	0.6%	0.8%
8	2021	80	80	80	72.2%	7.7%	0.4%	3.5%	12.2%	0.0%	0.4%	0.8%	0.4%	0.1%	0.2%	0.7%	0.6%	0.8%
9	2021	80	80	80	72.2%	7.7%	0.4%	3.5%	12.2%	0.0%	0.4%	0.8%	0.4%	0.1%	0.2%	0.7%	0.6%	0.8%
10	2021	80	80	80	72.2%	7.7%	0.4%	3.5%	12.2%	0.0%	0.4%	0.8%	0.4%	0.1%	0.2%	0.7%	0.6%	0.8%
11	2021	80	80	80	71.5%	7.6%	0.4%	3.5%	12.0%	0.0%	0.5%	1.1%	0.6%	0.1%	0.2%	0.8%	0.8%	0.9%
12	2021	80	80	80	71.5%	7.6%	0.4%	3.5%	12.0%	0.0%	0.5%	1.1%	0.6%	0.1%	0.2%	0.8%	0.8%	0.9%
13	2021	80	80	80	71.5%	7.6%	0.4%	3.5%	12.0%	0.0%	0.5%	1.1%	0.6%	0.1%	0.2%	0.8%	0.8%	0.9%
14	2021	80	80	80	71.5%	7.6%	0.4%	3.5%	12.0%	0.0%	0.5%	1.1%	0.6%	0.1%	0.2%	0.8%	0.8%	0.9%
15	2021	80	80	80	71.5%	7.6%	0.4%	3.5%	12.0%	0.0%	0.5%	1.1%	0.6%	0.1%	0.2%	0.8%	0.8%	0.9%
16	2021	80	80	80	71.5%	7.6%	0.4%	3.5%	12.0%	0.0%	0.5%	1.1%	0.6%	0.1%	0.2%	0.8%	0.8%	0.9%
17	2021	80	80	80	71.5%	7.6%	0.4%	3.5%	12.0%	0.0%	0.5%	1.1%	0.6%	0.1%	0.2%	0.8%	0.8%	0.9%
18	2021	80	80	80	69.2%	7.4%	0.3%	3.4%	11.7%	0.0%	0.8%	1.7%	0.9%	0.2%	0.3%	1.3%	1.3%	1.5%
19	2021	80	80	80	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
20																		



### fleet weighted emissions factors

CO	CO2	VOC	NOx	PM <sub>2.5</sub>	PM	FC
g/km	g/km	g/km	g/km	exhaust g/km	brake&tyre g/km	l/100km
1.71	183.00	0.14	0.09	0.0087	0.0102	7.88
2.03	190.88	0.14	0.22	0.0108	0.0102	8.18
2.20	204.61	0.14	0.35	0.0121	0.0102	8.69
1.87	184.25	0.14	0.14	0.0099	0.0102	7.92
2.18	208.61	0.14	0.37	0.0130	0.0102	8.83
0.13	77.18	0.06	0.45	0.0558	0.0136	2.89
1.90	185.42	0.11	0.24	0.0106	0.0102	7.93
2.08	200.01	0.11	0.38	0.0119	0.0102	8.48
4.28	219.04	0.11	0.55	0.0151	0.0102	9.19
7.21	236.93	0.11	0.73	0.0177	0.0102	9.85
1.55	177.54	0.11	0.09	0.0083	0.0102	7.63
1.73	178.90	0.11	0.15	0.0092	0.0102	7.68
1.88	185.26	0.11	0.24	0.0111	0.0102	7.92
2.06	203.50	0.11	0.40	0.0127	0.0102	8.60
4.24	227.29	0.11	0.59	0.0162	0.0102	9.48
7.14	249.65	0.11	0.78	0.0187	0.0102	10.32
10.07	277.00	0.11	1.01	0.0289	0.0102	11.34
2.01	213.98	0.11	0.47	0.0148	0.0103	8.96
0.46	438.20	0.11	2.48	0.0875	0.0136	16.37



optional model inputs																	
avg trip length	amb temp	petrol type	diesel type	cold start?	degradation?	% cats old car	% cats new	% grade	% load	number of wheels							Brake and Tyre PM
										HCV 3.5-7.5 t	HCV 7.5-12t	HCV 12-15t	HCV 15-20t	HCV 20-25t	HCV 25-30t	HCV >30 t	
								-6%									PM10
								-2%									PM10
								-4%									PM10
								-4%									PM10
								-2%									PM10
								2%									PM10
								4%									PM10
								-6%									PM10
								-4%									PM10
								-2%									PM10
								2%									PM10
								4%									PM10
								6%									PM10
																	PM10
																	PM10