Improving our understanding of New Zealand's vehicle fleet greenhouse gas and harmful emissions using measured emissions data – Stage 1

Appendix B - UET analysis for NO_x – emission technology

February 2022

Waka Kotahi NZ Transport Agency research report 687
Contracted research organisation – Pattle Delamore Partners Ltd

WAKA KOTAHI NZ TRANSPORT AGENCY

New Zealand Government

Appendix B: UET analysis for NO_x – emission technology

$$E_{NO_2,URB,v} = E_{NO_x,URB,v} \times f_{NO_2}$$

$$E_{NO_x,URB,v} = E_{hot,NOx,v} \times f_{NO_x,v} \times s(m)_{NO_x,v} \times g(x)_{NO_x,v} + E_{cold,NO_x,v} \times Cold\ Start?$$

Direct from VFEM (No population/mileage breakdown)

			Base year X	Speed						Cold start on?					
			2018	77						1					
Emission Inventory										(1 or 0)					
i	j	v		eijv	M1ijv	M2ijv	M3ijv	eMijv hot	M4ijv	M5ijv	eMijv cold	Eijv	Eijv	Emission Inventory	
Substance	Situation	Vehicle Standard	VKT (% fleet)	Ehot (g/km)	f	s(m)	g(x)		Ecold (g/km)	Cold Start?		emission (g/km)	fleet emission (g/km)	Absolute Annual VKT	Total Emissions (kg)
NOx	RUR	PC_Petrol PRE ECE Small < 1.4 l		2.08	1.08	1.00	1.66		0.04	1		3.756			
NOx	RUR	PC_Petrol PRE ECE Medium 1.4 - 2.0 l		2.79	1.08	1.00	1.66		0.06	1		5.055			
NOx	RUR	PC_Petrol PRE ECE Large-SUV-Executive > 2.0 l		4.40	1.08	1.00	1.66		0.09	1		7.967			
NOx	RUR	PC_Petrol ECE 15/00-01 Small < 1.4 l		2.08	1.08	1.00	1.66		0.04	1		3.756			
NOx	RUR	PC_Petrol (ECE 15/00) Medium 1.4 - 2.0 l		2.79	1.08	1.00	1.66		0.06	1		5.055			
NOx	RUR	'C_Petrol (ECE 15/00) Large-SUV-Executive > 2.0		4.40	1.08	1.00	1.66		0.09	1		7.967			
NOx	RUR	PC_Petrol ECE 15/00-01 Small < 1.4 l		2.08	1.08	1.00	1.66		0.04	1		3.756			
NOx	RUR	PC_Petrol (ECE 15/01) Medium 1.4 - 2.0 l		2.79	1.08	1.00	1.66		0.06	1		5.055			
NOx	RUR	'C_Petrol (ECE 15/01) Large-SUV-Executive > 2.0		4.40	1.08	1.00	1.66		0.09	1		7.967			
NOx	RUR	PC_Petrol ECE 15/02 Small < 1.4 l		2.26	1.08	1.00	1.66		0.05	1		4.092			
NOx	RUR	PC_Petrol ECE 15/02 Medium 1.4 - 2.0 l		2.56	1.08	1.00	1.66		0.05	1		4.626			
NOx	RUR	PC_Petrol ECE 15/02 Large-SUV-Executive > 2.0		2.87	1.08	1.00	1.66		0.06	1		5.201			
NOx	RUR	PC_Petrol ECE 15/03 Small < 1.4 l		2.45	1.08	1.00	1.66		0.05	1		4.436			
NOx	RUR	PC_Petrol ECE 15/03 Medium 1.4 - 2.0 l		2.76	1.08	1.00	1.66		0.06	1		5.003			
NOx	RUR	PC_Petrol ECE 15/03 Large-SUV-Executive > 2.0		3.66	1.08	1.00	1.66		0.08	1		6.631			
NOx	RUR	PC_Petrol ECE 15/04 Small < 1.4 l	0.282%	2.21	1.08	1.00	1.66	0.011133641	0.05	1	0.000127666	3.994	0.011	134621748	537707
NOx	RUR	PC_Petrol ECE 15/04 Medium 1.4 - 2.0 l	0.770%	2.92	1.08	1.00	1.66	0.040272799	0.06	1	0.000461797	5.291	0.041	367632668	1945002
NOx	RUR	PC_Petrol ECE 15/04 Large-SUV-Executive > 2.0	0.418%	2.93	1.08	1.00	1.66	0.021889245	0.06	1	0.000250998	5.295	0.022	199655581	1057156
NOx	RUR	PC_Petrol Euro 1 Small < 1.4 l	0.145%	0.31	1.08	2.12	1.66	0.001698103	0.23	1	0.000333959	1.405	0.002	69075702	97027
NOx	RUR	PC_Petrol Euro 1 Medium 1.4 - 2.0 l	1.432%	0.31	1.08	2.12	1.66	0.016809001	0.22	1	0.003176316	1.396	0.020	683759128	954262
NOx	RUR	PC_Petrol Euro 1 Large-SUV-Executive > 2.0 l	1.815%	0.31	1.08	2.12	1.66	0.02130696	0.17	1	0.003081798	1.344	0.024	866727795	1164518
NOx	RUR	PC_Petrol Euro 2 Small < 1.4 l	0.236%	0.16	1.08	2.12	1.66	0.00142236	0.09	1	0.000201405	0.688	0.002	112619436	77532
NOx	RUR	PC_Petrol Euro 2 Medium 1.4 - 2.0 l	2.200%	0.16	1.08	2.12	1.66	0.013264692	0.08	1	0.001804726	0.685	0.015	1050269954	719537
NOx	RUR	PC_Petrol Euro 2 Large-SUV-Executive > 2.0 l	1.991%	0.16	1.08	2.12	1.66	0.012005304	0.06	1	0.001250226	0.666	0.013	950554301	632927
NOx	RUR	PC_Petrol Euro 3 Small < 1.4 l	0.829%	0.06	1.08	1.00	1.66	0.000848846	0.01	1	0.000113177	0.116	0.001	395934999	45935
NOx	RUR	PC_Petrol Euro 3 Medium 1.4 - 2.0 l	6.172%	0.06	1.08	1.44	1.66	0.009088606	0.01	1	0.000809432	0.160	0.010	2947095705	472613
NOx	RUR	PC_Petrol Euro 3 Large-SUV-Executive > 2.0 l	5.553%	0.06	1.08	1.44	1.66	0.008176481	0.01	1	0.000557379	0.157	0.009	2651327465	417026
NOx	RUR	PC_Petrol Euro 4 Small < 1.4 l	1.110%	0.03	1.08	1.00	1.66	0.00053101	0.00	1	3.98248E-05	0.051	0.001	529791413	27256
NOx	RUR	PC_Petrol Euro 4 Medium 1.4 - 2.0 l	7.489%	0.03	1.08	1.23	1.66	0.004404336	0.00	1	0.000258271	0.062	0.005	3575809624	222631
NOx	RUR	PC_Petrol Euro 4 Large-SUV-Executive > 2.0 l	5.783%	0.03	1.08	1.23	1.66	0.003401227	0.00	1	0.000152662	0.061	0.004	2761401483	169692
NOx	RUR	PC_Petrol Euro 5 Small < 1.4 l	0.444%	0.02	1.08	1.00	1.66	0.000139508	0.00	1	1.04628E-05	0.034	0.000	211973459	7161
NOx	RUR	PC_Petrol Euro 5 Medium 1.4 - 2.0 l	4.074%	0.02	1.08	0.85	1.66	0.001085585	0.00	1	9.22662E-05	0.029	0.001	1945459847	56240
NOx	RUR	PC_Petrol Euro 5 Large-SUV-Executive > 2.0 l	2.453%	0.02	1.08	0.85	1.66	0.000653691	0.00	1	4.25258E-05	0.028	0.001	1171469400	33243
NOx	RUR	PC_Petrol Euro 6 up to 2016 Small < 1.4 l		0.02	1.08	1.00	1.66		0.00	1		0.037			
NOx	RUR	PC_Petrol Euro 6 up to 2016 Medium 1.4 - 2.0 l		0.02	1.08	0.80	1.66		0.00	1		0.030			
NOx	RUR	Petrol Euro 6 up to 2016 Large-SUV-Executive >		0.02	1.08	0.80	1.66		0.00	1		0.029			
NOx	RUR	PC_Petrol Euro 6 2017-2019 Small < 1.4 l		0.02	1.08	1.00	1.66		0.00	1		0.039			
NOx	RUR	PC_Petrol Euro 6 2017-2019 Medium 1.4 - 2.0 l		0.02	1.08	0.80	1.66		0.00	1		0.032			
NOx	RUR	Petrol Euro 6 2017-2019 Large-SUV-Executive >		0.02	1.08	0.80	1.66		0.00	1		0.031			
NOx	RUR	PC_Petrol Euro 6 2020+ Small < 1.4 l		0.02	1.08	1.00	1.66		0.00	1		0.039			
NOx	RUR	PC_Petrol Euro 6 2020+ Medium 1.4 - 2.0 l		0.02	1.08	0.80	1.66		0.00	1		0.032			
NOx	RUR	C_Petrol Euro 6 2020+ Large-SUV-Executive > 2.(		0.02	1.08	0.80	1.66		0.00	1		0.031			
NOx	RUR	PC_Petrol NZ new Small < 1.4 l		2.26	1.08	1.00	1.66			1		4.046			
NOx	RUR	PC_Petrol NZ new Medium 1.4 - 2.0 l		2.56	1.08	1.00	1.66			1		4.573			
NOx	RUR	PC_Petrol NZ new Large-SUV-Executive > 2.0 l		2.87	1.08	1.00	1.66			1		5.142			

Appendix B: UET analysis for NO_x – emission technology

Absolute value
Data Gap
Red font = uncertainty computation
Input from lit review, data analysis, etc.

Uncertainty			Uncertainty										
Substance	Situation	Vehicle Standard	VKT (% fleet)	Ehot (g/km)	f_NOx	s(m)	g(x)	Eijv (hot)	Ecold (g/km)	Eijv (cold)	δEijv (hot)	δEijv (cold)	U-Eijv NOx
NOx	RUR	PC_Petrol PRE ECE Small < 1.4 l	3%	44%	20%	8%	14%	51%	*51%*	51%			
NOx	RUR	PC_Petrol PRE ECE Medium 1.4 - 2.0 l	3%	44%	20%	8%	14%	51%	*51%*	51%			
NOx	RUR	PC_Petrol PRE ECE Large-SUV-Executive > 2.0 l	3%	44%	20%	8%	14%	51%	*51%*	51%			
NOx	RUR	PC_Petrol ECE 15/00-01 Small < 1.4 l	3%	44%	20%	8%	14%	51%	*51%*	51%			
NOx	RUR	PC_Petrol (ECE 15/00) Medium 1.4 - 2.0 l	3%	44%	20%	8%	14%	51%	*51%*	51%			
NOx	RUR	PC_Petrol (ECE 15/00) Large-SUV-Executive > 2.0 l	3%	44%	20%	8%	14%	51%	*51%*	51%			
NOx	RUR	PC_Petrol ECE 15/00-01 Small < 1.4 l	3%	44%	20%	8%	14%	51%	*51%*	51%			
NOx	RUR	PC_Petrol (ECE 15/01) Medium 1.4 - 2.0 l	3%	44%	20%	8%	14%	51%	*51%*	51%			
NOx	RUR	PC_Petrol (ECE 15/01) Large-SUV-Executive > 2.0 l	3%	44%	20%	8%	14%	51%	*51%*	51%			
NOx	RUR	PC_Petrol ECE 15/02 Small < 1.4 l	3%	44%	20%	8%	14%	51%	*51%*	51%			
NOx	RUR	PC_Petrol ECE 15/02 Medium 1.4 - 2.0 l	3%	44%	20%	8%	14%	51%	*51%*	51%			
NOx	RUR	PC_Petrol ECE 15/02 Large-SUV-Executive > 2.0 l	3%	44%	20%	8%	14%	51%	*51%*	51%			
NOx	RUR	PC_Petrol ECE 15/03 Small < 1.4 l	3%	44%	20%	8%	14%	51%	*51%*	51%			
NOx	RUR	PC_Petrol ECE 15/03 Medium 1.4 - 2.0 l	3%	44%	20%	8%	14%	51%	*51%*	51%			
NOx	RUR	PC_Petrol ECE 15/03 Large-SUV-Executive > 2.0 l	3%	44%	20%	8%	14%	51%	*51%*	51%			
NOx	RUR	PC_Petrol ECE 15/04 Small < 1.4 l	3%	44%	20%	8%	14%	51%	*51%*	51%	0.01	0.00	51%
NOx	RUR	PC_Petrol ECE 15/04 Medium 1.4 - 2.0 l	3%	44%	20%	8%	14%	51%	*51%*	51%	0.02	0.00	51%
NOx	RUR	PC_Petrol ECE 15/04 Large-SUV-Executive > 2.0 l	3%	44%	20%	8%	14%	51%	*51%*	51%	0.01	0.00	51%
NOx	RUR	PC_Petrol Euro 1 Small < 1.4 l	3%	69%	20%	8%	14%	74%	*74%*	74%	0.00	0.00	63%
NOx	RUR	PC_Petrol Euro 1 Medium 1.4 - 2.0 l	3%	69%	20%	8%	14%	74%	*74%*	74%	0.01	0.00	63%
NOx	RUR	PC_Petrol Euro 1 Large-SUV-Executive > 2.0 l	3%	69%	20%	8%	14%	74%	*74%*	74%	0.02	0.00	65%
NOx	RUR	PC_Petrol Euro 2 Small < 1.4 l	3%	77%	20%	8%	14%	81%	*81%*	81%	0.00	0.00	72%
NOx	RUR	PC_Petrol Euro 2 Medium 1.4 - 2.0 l	3%	77%	20%	8%	14%	81%	*81%*	81%	0.01	0.00	72%
NOx	RUR	PC_Petrol Euro 2 Large-SUV-Executive > 2.0 l	3%	77%	20%	8%	14%	81%	*81%*	81%	0.01	0.00	74%
NOx	RUR	PC_Petrol Euro 3 Small < 1.4 l	3%	82%	20%	8%	14%	86%	*86%*	86%	0.00	0.00	77%
NOx	RUR	PC_Petrol Euro 3 Medium 1.4 - 2.0 l	3%	82%	20%	8%	14%	86%	*86%*	86%	0.01	0.00	80%
NOx	RUR	PC_Petrol Euro 3 Large-SUV-Executive > 2.0 l	3%	82%	20%	8%	14%	86%	*86%*	86%	0.01	0.00	81%
NOx	RUR	PC_Petrol Euro 4 Small < 1.4 l	3%	84%	20%	8%	14%	88%	*88%*	88%	0.00	0.00	82%
NOx	RUR	PC_Petrol Euro 4 Medium 1.4 - 2.0 l	3%	84%	20%	8%	14%	88%	*88%*	88%	0.00	0.00	83%
NOx	RUR	PC_Petrol Euro 4 Large-SUV-Executive > 2.0 l	3%	84%	20%	8%	14%	88%	*88%*	88%	0.00	0.00	84%
NOx	RUR	PC_Petrol Euro 5 Small < 1.4 l	3%	84%	20%	8%	14%	88%	*88%*	88%	0.00	0.00	82%
NOx	RUR	PC_Petrol Euro 5 Medium 1.4 - 2.0 l	3%	84%	20%	8%	14%	88%	*88%*	88%	0.00	0.00	82%
NOx	RUR	PC_Petrol Euro 5 Large-SUV-Executive > 2.0 l	3%	84%	20%	8%	14%	88%	*88%*	88%	0.00	0.00	83%
NOx	RUR	PC_Petrol Euro 6 up to 2016 Small < 1.4 l	3%	84%	20%	8%	14%	88%	*88%*	88%			
NOx	RUR	PC_Petrol Euro 6 up to 2016 Medium 1.4 - 2.0 l	3%	84%	20%	8%	14%	88%	*88%*	88%			
NOx	RUR	PC_Petrol Euro 6 up to 2016 Large-SUV-Executive > 2.0 l	3%	84%	20%	8%	14%	88%	*88%*	88%			
NOx	RUR	PC_Petrol Euro 6 2017-2019 Small < 1.4 l	3%	84%	20%	8%	14%	88%	*88%*	88%			
NOx	RUR	PC_Petrol Euro 6 2017-2019 Medium 1.4 - 2.0 l	3%	84%	20%	8%	14%	88%	*88%*	88%			

Appendix B: UET analysis for NO_x – emission technology

If

$$X = a + b + c$$

Then

$$\delta X = \sqrt{(\delta a)^2 + (\delta b)^2 + (\delta c)^2}$$

Or

$$\frac{\delta X}{X} = \frac{\sqrt{\left(\left(\frac{\delta a}{a}\right)a\right)^2 + \left(\left(\frac{\delta b}{b}\right)b\right)^2 + \left(\left(\frac{\delta c}{c}\right)c\right)^2}}{X}$$

			%	g	(g)^2	Plausible Range		Uncertainty Contribution
Substance	Situation	Vehicle Standard	U-Eijv	U-Eijv	U-Eijv^2	LCL Eijv (g)	UCL Eijv (g)	Eijv to Eij (%)
NOx	RUR	PC_Petrol PRE ECE Small < 1.4 l						
NOx	RUR	PC_Petrol PRE ECE Medium 1.4 - 2.0 l						
NOx	RUR	PC_Petrol PRE ECE Large-SUV-Executive > 2.0 l						
NOx	RUR	PC_Petrol ECE 15/00-01 Small < 1.4 l						
NOx	RUR	PC_Petrol (ECE 15/00) Medium 1.4 - 2.0 l						
NOx	RUR	PC_Petrol (ECE 15/00) Large-SUV-Executive > 2.0 l						
NOx	RUR	PC_Petrol ECE 15/00-01 Small < 1.4 l						
NOx	RUR	PC_Petrol (ECE 15/01) Medium 1.4 - 2.0 l						
NOx	RUR	PC_Petrol (ECE 15/01) Large-SUV-Executive > 2.0 l						
NOx	RUR	PC_Petrol ECE 15/02 Small < 1.4 l						
NOx	RUR	PC_Petrol ECE 15/02 Medium 1.4 - 2.0 l						
NOx	RUR	PC_Petrol ECE 15/02 Large-SUV-Executive > 2.0 l						
NOx	RUR	PC_Petrol ECE 15/03 Small < 1.4 l						
NOx	RUR	PC_Petrol ECE 15/03 Medium 1.4 - 2.0 l						
NOx	RUR	PC_Petrol ECE 15/03 Large-SUV-Executive > 2.0 l						
NOx	RUR	PC_Petrol ECE 15/04 Small < 1.4 l	51%	0.01	0.00	0.006	0.017	1%
NOx	RUR	PC_Petrol ECE 15/04 Medium 1.4 - 2.0 l	51%	0.02	0.00	0.020	0.061	11%
NOx	RUR	PC_Petrol ECE 15/04 Large-SUV-Executive > 2.0 l	51%	0.01	0.00	0.011	0.033	3%
NOx	RUR	PC_Petrol Euro 1 Small < 1.4 l	63%	0.00	0.00	0.001	0.003	0%
NOx	RUR	PC_Petrol Euro 1 Medium 1.4 - 2.0 l	63%	0.01	0.00	0.007	0.033	4%
NOx	RUR	PC_Petrol Euro 1 Large-SUV-Executive > 2.0 l	65%	0.02	0.00	0.008	0.040	6%
NOx	RUR	PC_Petrol Euro 2 Small < 1.4 l	72%	0.00	0.00	0.000	0.003	0%
NOx	RUR	PC_Petrol Euro 2 Medium 1.4 - 2.0 l	72%	0.01	0.00	0.004	0.026	3%
NOx	RUR	PC_Petrol Euro 2 Large-SUV-Executive > 2.0 l	74%	0.01	0.00	0.003	0.023	2%
NOx	RUR	PC_Petrol Euro 3 Small < 1.4 l	77%	0.00	0.00	0.000	0.002	0%
NOx	RUR	PC_Petrol Euro 3 Medium 1.4 - 2.0 l	80%	0.01	0.00	0.002	0.018	2%
NOx	RUR	PC_Petrol Euro 3 Large-SUV-Executive > 2.0 l	81%	0.01	0.00	0.002	0.016	1%
NOx	RUR	PC_Petrol Euro 4 Small < 1.4 l	82%	0.00	0.00	0.000	0.001	0%
NOx	RUR	PC_Petrol Euro 4 Medium 1.4 - 2.0 l	83%	0.00	0.00	0.001	0.009	0%
NOx	RUR	PC_Petrol Euro 4 Large-SUV-Executive > 2.0 l	84%	0.00	0.00	0.001	0.007	0%
NOx	RUR	PC_Petrol Euro 5 Small < 1.4 l	82%	0.00	0.00	0.000	0.000	0%
NOx	RUR	PC_Petrol Euro 5 Medium 1.4 - 2.0 l	82%	0.00	0.00	0.000	0.002	0%
NOx	RUR	PC_Petrol Euro 5 Large-SUV-Executive > 2.0 l	83%	0.00	0.00	0.000	0.001	0%
NOx	RUR	PC_Petrol Euro 6 up to 2016 Small < 1.4 l						

uncertainty emission inventory

%	g
U-Eij	U-Eij
12%	0.063

Appendix B: UET analysis for NO_x – emission technology

			Emission Inventory			Relative				
			i	j	v	Importance				
Matrix	Rank	RI Rank	Substance	Situation	Vehicle Standard	RI	LCL RI	UCL RI	RNG RI	UCL - LCL
		72	NOx	RUR	PC_Petrol PRE ECE Small < 1.4 l	0%				
		72	NOx	RUR	PC_Petrol PRE ECE Medium 1.4 - 2.0 l	0%				
		72	NOx	RUR	PC_Petrol PRE ECE Large-SUV-Executive > 2.0 l	0%				
		72	NOx	RUR	PC_Petrol ECE 15/00-01 Small < 1.4 l	0%				
		72	NOx	RUR	PC_Petrol (ECE 15/00) Medium 1.4 - 2.0 l	0%				
		72	NOx	RUR	PC_Petrol (ECE 15/00) Large-SUV-Executive > 2.0 l	0%				
		72	NOx	RUR	PC_Petrol ECE 15/00-01 Small < 1.4 l	0%				
		72	NOx	RUR	PC_Petrol (ECE 15/01) Medium 1.4 - 2.0 l	0%				
		72	NOx	RUR	PC_Petrol (ECE 15/01) Large-SUV-Executive > 2.0 l	0%				
		72	NOx	RUR	PC_Petrol ECE 15/02 Small < 1.4 l	0%				
		72	NOx	RUR	PC_Petrol ECE 15/02 Medium 1.4 - 2.0 l	0%				
		72	NOx	RUR	PC_Petrol ECE 15/02 Large-SUV-Executive > 2.0 l	0%				
		72	NOx	RUR	PC_Petrol ECE 15/03 Small < 1.4 l	0%				
		72	NOx	RUR	PC_Petrol ECE 15/03 Medium 1.4 - 2.0 l	0%				
		72	NOx	RUR	PC_Petrol ECE 15/03 Large-SUV-Executive > 2.0 l	0%				
0%	15	14	NOx	RUR	PC_Petrol ECE 15/04 Small < 1.4 l	2%	1%	3%	1 - 3.1	2%
1%	3	3	NOx	RUR	PC_Petrol ECE 15/04 Medium 1.4 - 2.0 l	8%	4%	11%	3.9 - 11	7%
0%	7	7	NOx	RUR	PC_Petrol ECE 15/04 Large-SUV-Executive > 2.0 l	4%	2%	6%	2.1 - 6.1	4%
0%	34	37	NOx	RUR	PC_Petrol Euro 1 Small < 1.4 l	0%	0%	1%	0.1 - 0.6	0%
0%	6	9	NOx	RUR	PC_Petrol Euro 1 Medium 1.4 - 2.0 l	4%	1%	6%	1.4 - 5.9	5%
0%	5	5	NOx	RUR	PC_Petrol Euro 1 Large-SUV-Executive > 2.0 l	5%	2%	7%	1.6 - 7.3	6%
0%	38	40	NOx	RUR	PC_Petrol Euro 2 Small < 1.4 l	0%	0%	1%	0.1 - 0.5	0%
0%	10	11	NOx	RUR	PC_Petrol Euro 2 Medium 1.4 - 2.0 l	3%	1%	5%	0.8 - 4.7	4%
0%	11	13	NOx	RUR	PC_Petrol Euro 2 Large-SUV-Executive > 2.0 l	2%	1%	4%	0.7 - 4.2	4%
0%	46	48	NOx	RUR	PC_Petrol Euro 3 Small < 1.4 l	0%	0%	0%	0 - 0.3	0%
0%	13	16	NOx	RUR	PC_Petrol Euro 3 Medium 1.4 - 2.0 l	2%	0%	3%	0.4 - 3.3	3%
0%	16	19	NOx	RUR	PC_Petrol Euro 3 Large-SUV-Executive > 2.0 l	2%	0%	3%	0.3 - 2.9	3%
0%	50	50	NOx	RUR	PC_Petrol Euro 4 Small < 1.4 l	0%	0%	0%	0 - 0.2	0%
0%	24	26	NOx	RUR	PC_Petrol Euro 4 Medium 1.4 - 2.0 l	1%	0%	2%	0.1 - 1.6	1%
0%	27	28	NOx	RUR	PC_Petrol Euro 4 Large-SUV-Executive > 2.0 l	1%	0%	1%	0.1 - 1.2	1%
0%	55	55	NOx	RUR	PC_Petrol Euro 5 Small < 1.4 l	0%	0%	0%	0 - 0.1	0%
0%	42	45	NOx	RUR	PC_Petrol Euro 5 Medium 1.4 - 2.0 l	0%	0%	0%	0 - 0.4	0%
0%	49	49	NOx	RUR	PC_Petrol Euro 5 Large-SUV-Executive > 2.0 l	0%	0%	0%	0 - 0.2	0%
		72	NOx	RUR	PC_Petrol Euro 6 up to 2016 Small < 1.4 l	0%				
		72	NOx	RUR	PC_Petrol Euro 6 up to 2016 Medium 1.4 - 2.0 l	0%				
		72	NOx	RUR	PC_Petrol Euro 6 up to 2016 Large-SUV-Executive > 2.0 l	0%				
		72	NOx	RUR	PC_Petrol Euro 6 2017-2019 Small < 1.4 l	0%				
		72	NOx	RUR	PC_Petrol Euro 6 2017-2019 Medium 1.4 - 2.0 l	0%				
		72	NOx	RUR	PC_Petrol Euro 6 2017-2019 Large-SUV-Executive > 2.0 l	0%				
		72	NOx	RUR	PC_Petrol Euro 6 2020+ Small < 1.4 l	0%				
		72	NOx	RUR	PC_Petrol Euro 6 2020+ Medium 1.4 - 2.0 l	0%				
		72	NOx	RUR	PC_Petrol Euro 6 2020+ Large-SUV-Executive > 2.0 l	0%				
		72	NOx	RUR	PC_Petrol NZ new Small < 1.4 l	0%				
		72	NOx	RUR	PC_Petrol NZ new Medium 1.4 - 2.0 l	0%				
		72	NOx	RUR	PC_Petrol NZ new Large-SUV-Executive > 2.0 l	0%				
0%	17	15	NOx	RUR	PC_Petrol NZ new Small < 1.4 l	2%	1%	3%	0.9 - 2.8	2%
0%	21	22	NOx	RUR	PC_Petrol NZ new Medium 1.4 - 2.0 l	1%	1%	2%	0.6 - 1.9	1%
0%	8	8	NOx	RUR	PC_Petrol NZ new Large > 2.0 l	4%	2%	6%	1.9 - 5.8	4%

Top Vehicle Classes by RI

Rank	Vehicle Class
1	LCV_Deisel Euro 4 N1-III 08 - 15
2	LCV_Deisel Euro 5 N1-III 16 - 19
3	PC_Petrol ECE 15/04 Medium 1.4 - 2.0 l
4	PC_Petrol Euro 1 Medium 1.4 - 2.0 l
5	PC_Petrol Euro 1 Large-SUV-Executive > 2.0 l
6	LCV_Deisel Euro 3 N1-III 04 - 07
7	PC_Petrol ECE 15/04 Large-SUV-Executive > 2.0 l
8	PC_Petrol NZ new Large > 2.0 l
9	PC_Petrol Euro 1 Medium 1.4 - 2.0 l
10	PC_Diesel Euro 4 Large-SUV-Executive > 2.0 l
11	PC_Petrol Euro 2 Medium 1.4 - 2.0 l
12	LCV_Deisel Euro 2 N1-III 00 - 03
13	PC_Petrol Euro 2 Large-SUV-Executive > 2.0 l
14	PC_Petrol ECE 15/04 Small < 1.4 l
15	PC_Petrol NZ new Small < 1.4 l
16	PC_Petrol Euro 3 Medium 1.4 - 2.0 l
17	PC_Diesel Euro 4 Medium < 2.0 l
18	PC_Diesel Euro 1 Large-SUV-Executive > 2.0 l
19	PC_Petrol Euro 3 Large-SUV-Executive > 2.0 l
20	PC_Petrol Euro 1 Large-SUV-Executive > 2.0 l

Top Vehicle Classes by RI and UCL - LCL Matrix

Rank	Vehicle Class
1	LCV_Deisel Euro 4 N1-III 08 - 15
2	LCV_Deisel Euro 5 N1-III 16 - 19
3	PC_Petrol ECE 15/04 Medium 1.4 - 2.0 l
4	PC_Petrol Euro 1 Medium 1.4 - 2.0 l
5	PC_Petrol Euro 1 Large-SUV-Executive > 2.0 l
6	PC_Petrol Euro 1 Medium 1.4 - 2.0 l
7	PC_Petrol ECE 15/04 Large-SUV-Executive > 2.0 l
8	PC_Petrol NZ new Large > 2.0 l
9	LCV_Deisel Euro 3 N1-III 04 - 07
10	PC_Petrol Euro 2 Medium 1.4 - 2.0 l
11	PC_Petrol Euro 2 Large-SUV-Executive > 2.0 l
12	PC_Diesel Euro 4 Large-SUV-Executive > 2.0 l
13	PC_Petrol Euro 3 Medium 1.4 - 2.0 l
14	LCV_Deisel Euro 2 N1-III 00 - 03
15	PC_Petrol ECE 15/04 Small < 1.4 l
16	PC_Petrol Euro 3 Large-SUV-Executive > 2.0 l
17	PC_Petrol NZ new Small < 1.4 l
18	PC_Petrol Euro 1 Large-SUV-Executive > 2.0 l
19	PC_Diesel Euro 4 Medium < 2.0 l
20	PC_Diesel Euro 1 Large-SUV-Executive > 2.0 l