Electronic Supplementary Material (ESI) for Environmental Science: Processes & Impacts.

Supplementary Information

for

Concentration dynamics of coarse and fine particulate matter at and around the signalised traffic intersections

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The SI Materials include:

Figures S1 to S7

Tables S1 to S12

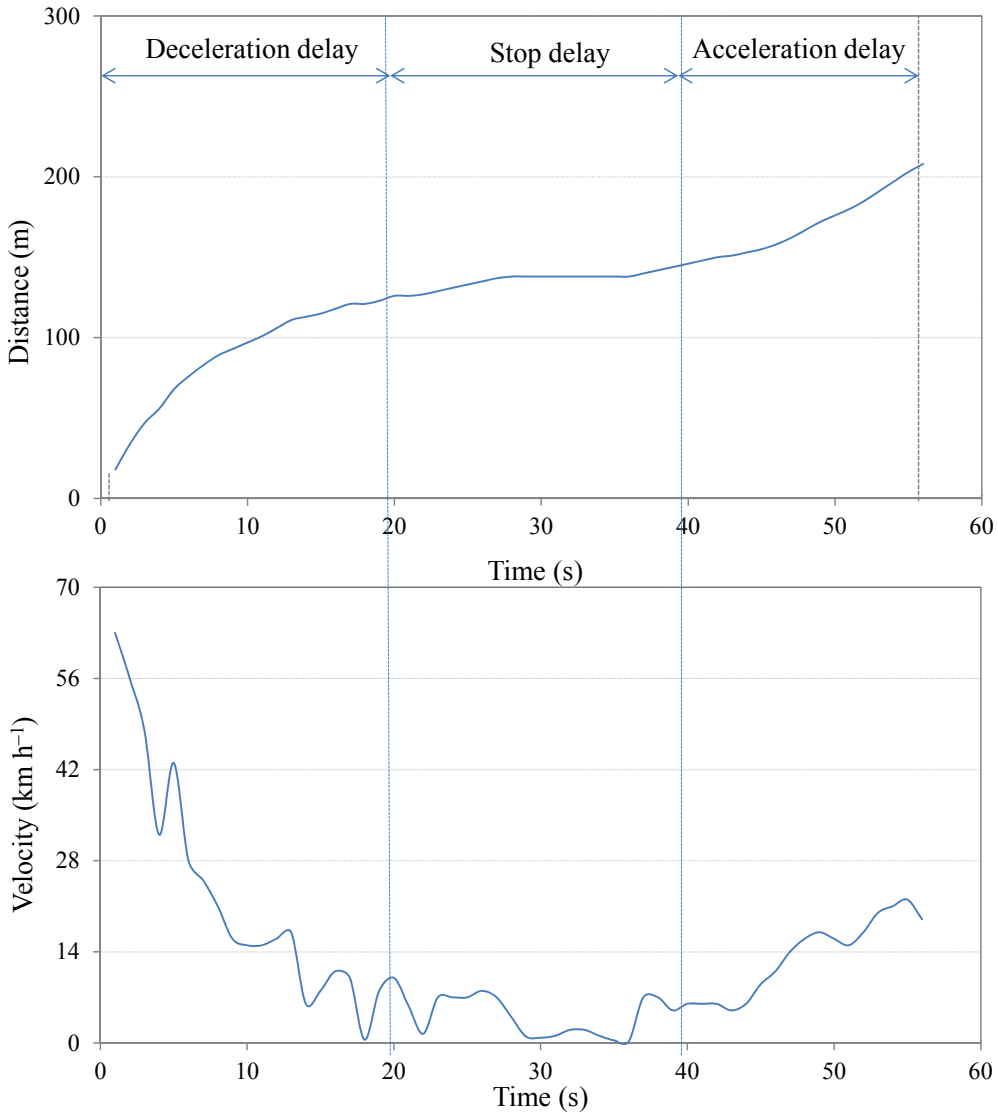

Figure S1. (a) Distance versus time, and (b) velocity versus time, plots of an experimental car during a delay event at a TI.

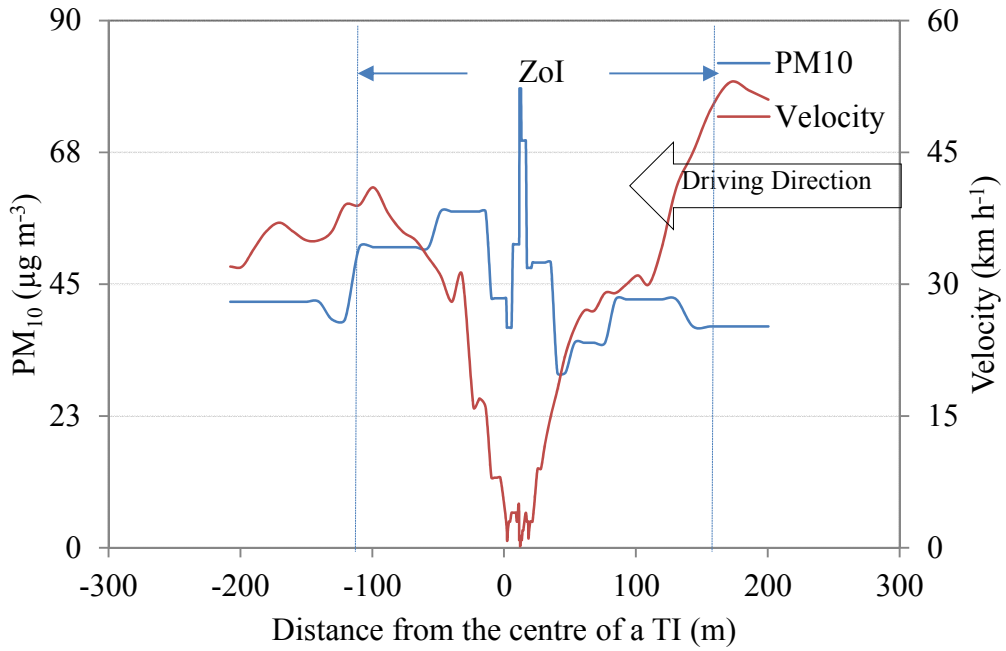

Figure S2. An example showing the estimation of ZoI at TI_2 during a Run 3.

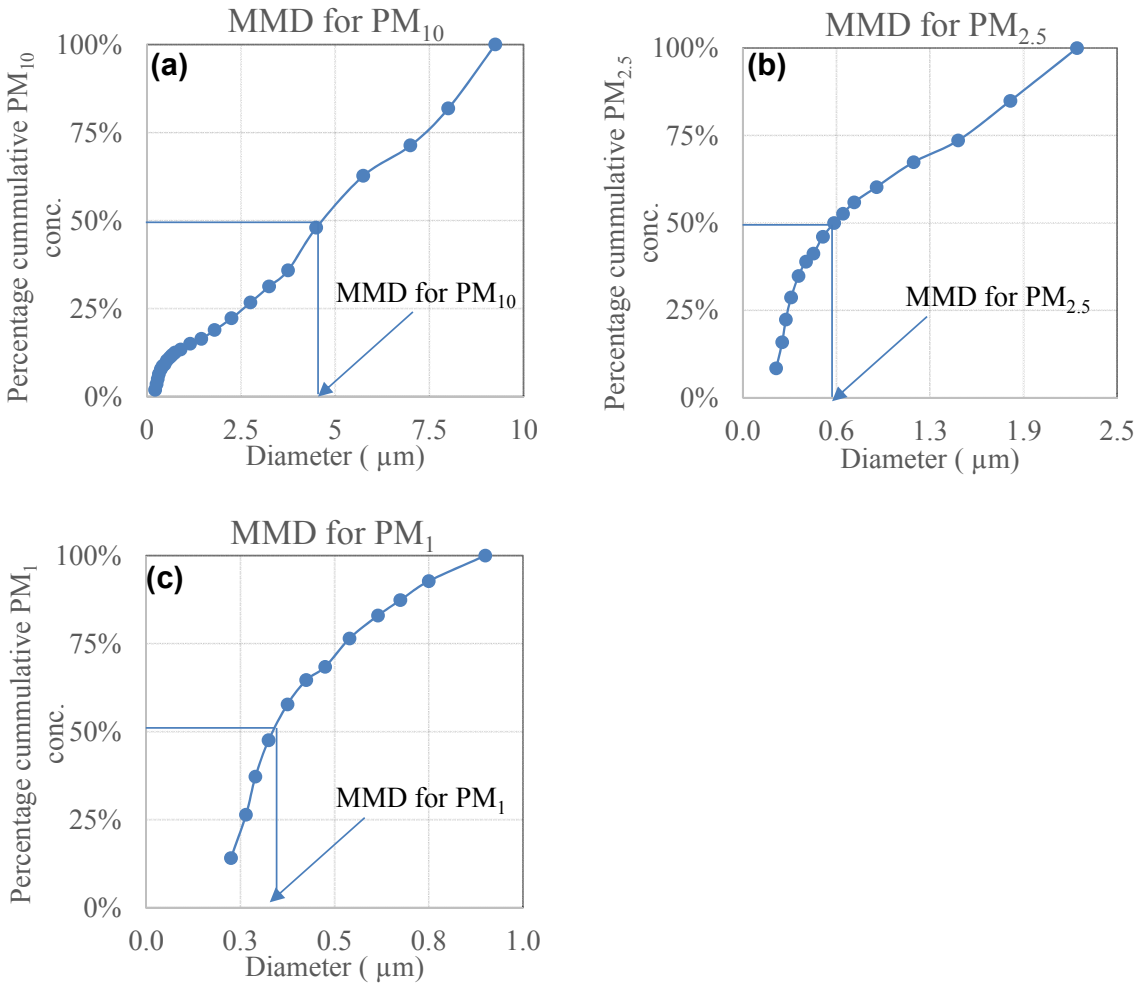

Figure S3. An example of Set_2 showing a method to estimate the MMD of (a) PM_{10}, (b) $PM_{2.5}$ and (c) PM_1.

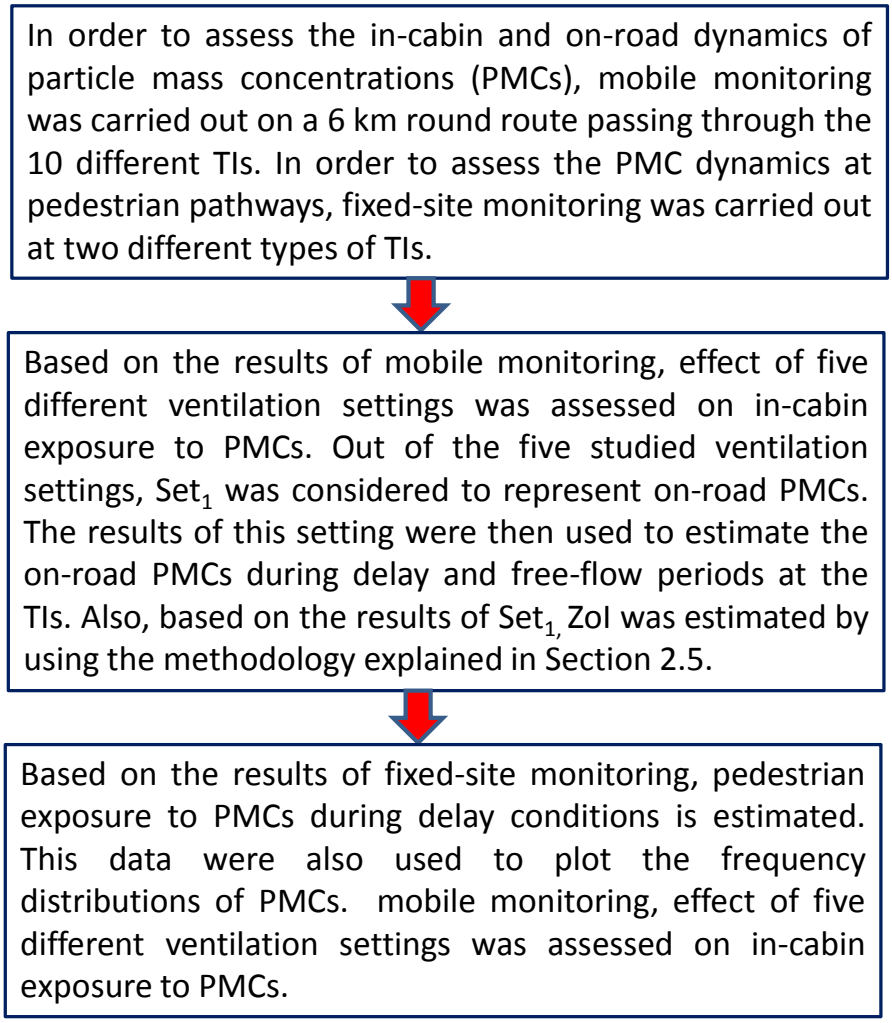

Figure S4. Overall framework for study design.

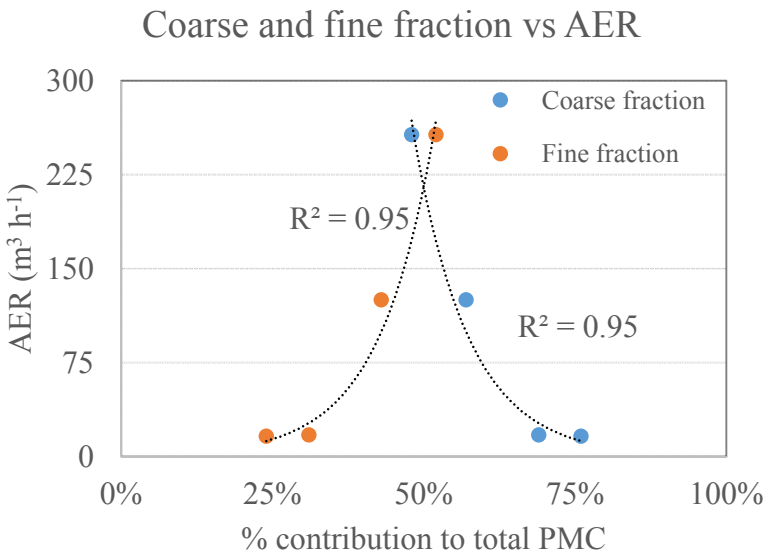

Figure S5. Correlation between AER and percentage contribution of the coarse ($PM_{2.5-10}$) and fine ($PM_{2.5}$) particles to total PMCs during different ventilation settings.

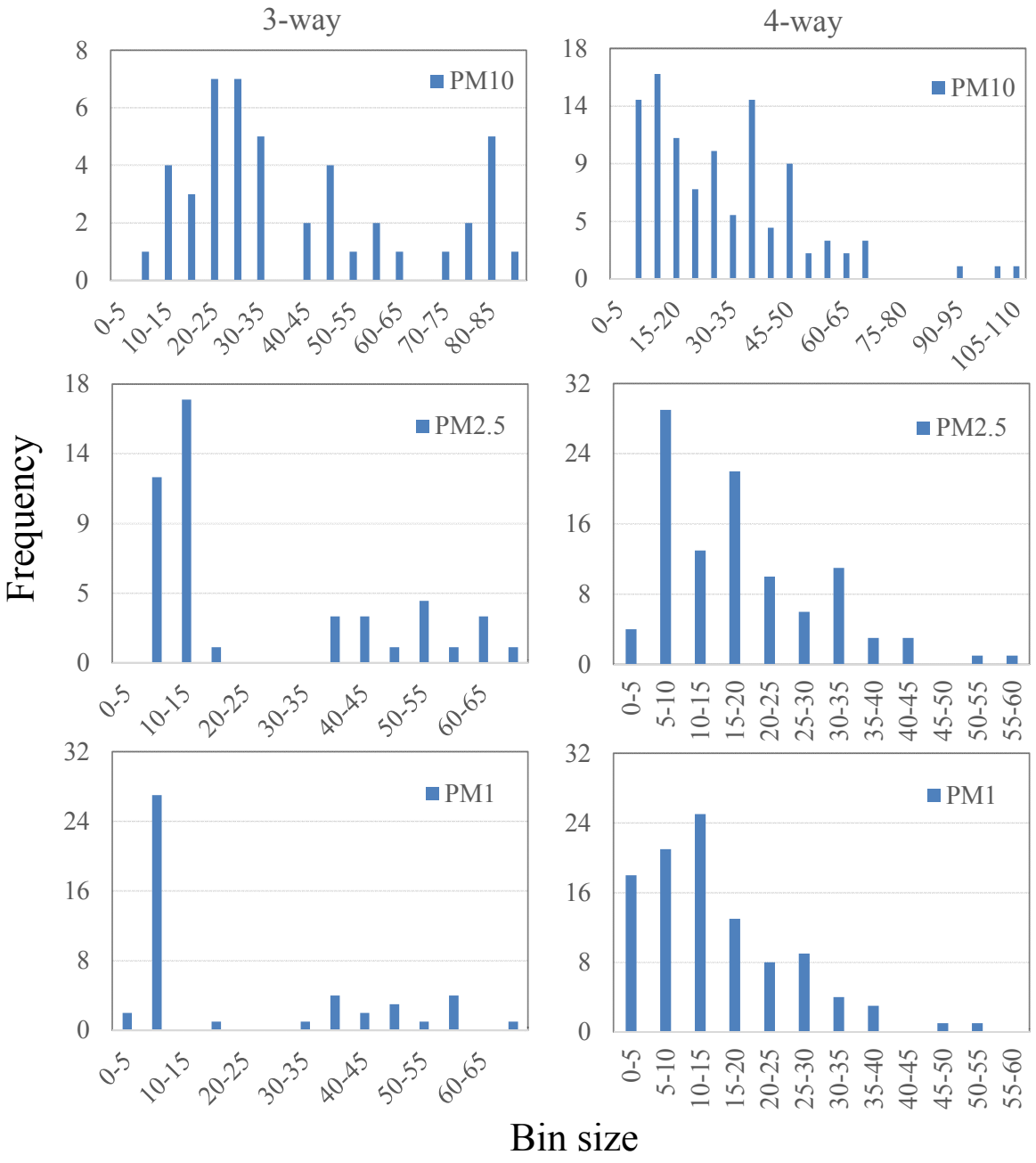

Figure S6. Frequency histogram for PM_{10}, $PM_{2.5}$ and PM_1 at 3- and 4-way TIs, respectively.

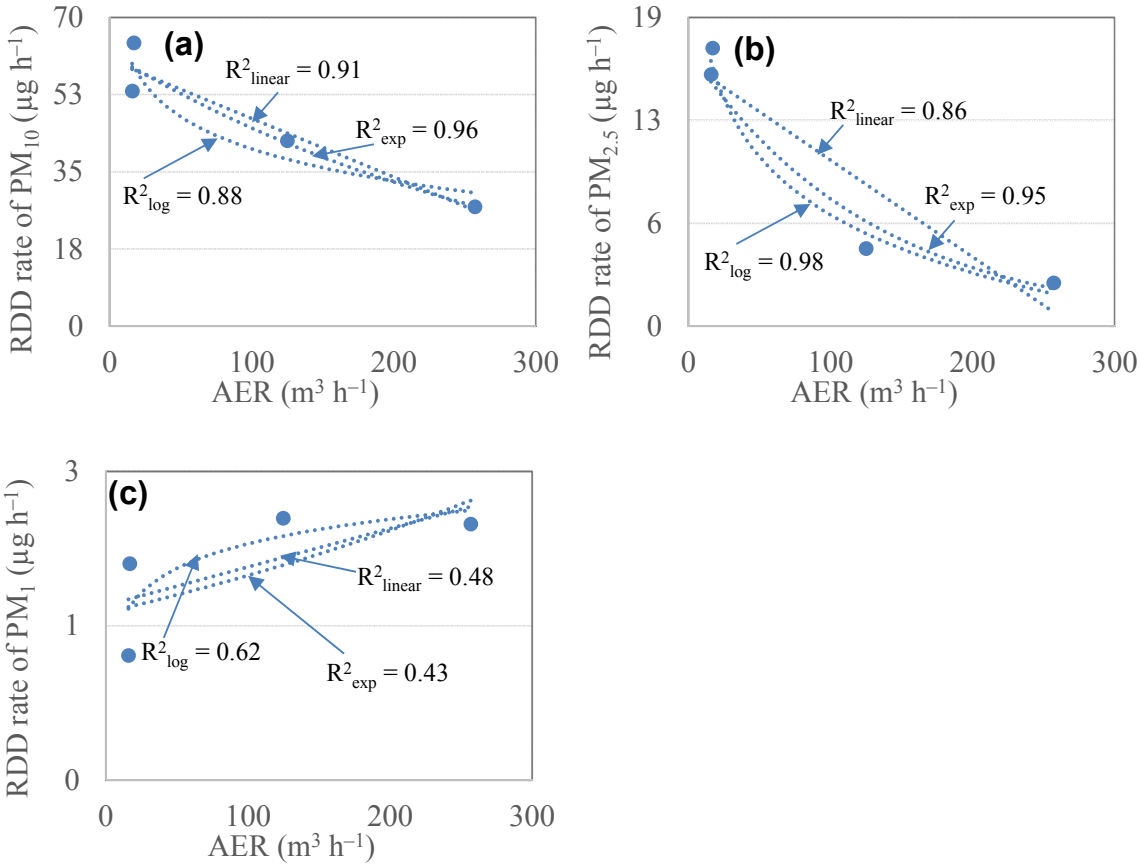

Figure S7. Correlation between AER of different ventilation settings and RDD rate of (a) PM_{10} (b) $PM_{2.5}$ and (c) PM_1 during delays at TIs.

Table S1. Summary of traffic volume (veh h^{-1}) and heavy duty diesel vehicles (HDVs) at two different types of TIs.[12]

Hour	4–way TI		3–way TI	
	Total traffic	HDV	Total traffic	HDV
8–9	6672	192	5316	324
9–10	5652	312	5160	432
10–11	3828	156	4464	372
11–12	4656	264	6096	312
12–13	3996	192	5400	432
13–14	5439	266	6252	216
14–15	4584	144	5616	336
15–16	5436	228	6060	312
16–17	6576	192	5496	396
17–18	5844	240	5124	348
18–19	4860	144	4764	96
19–20	2628	72	4652	56
Total (%)	60171	2402 (4%)	64400	3632 (6%)

Table S2. Average local background PMCs (μg m^{-3}) of PM_{10}, $PM_{2.5}$ and PM_1 along with standard deviation (σ) during the different ventilation settings. These are estimated based on 5^{th} percentile value of 30 s rolling average of the 6s PM concentration time series.

Monitoring type	Ventilation settings / Types of TI	PM_{10} (Average±σ)	$PM_{2.5}$ (Average±σ)	PM_1 (Average±σ)
Mobile monitoring	Set_1	28±6	16±2	11±2
	Set_2	16±3	9±3	7±2
	Set_3	10±5	8±4	7±4
	Set_4	21±10	7±3	5±2
	Set_5	25±10	11±7	8±5
Fixed–site monitoring	3–way	22±21	16±15	13±15
	4–way	16±10	11±6	8±6

Table S3. Average deposition fraction (DF) of PM_{10}, $PM_{2.5}$ and PM_1 during mobile and fixed–site measurements. "σ" refers to standard deviation and MMD means mass median diameter that have been estimated using method explained in Section 2.5 (SI Figure S2).

Monitoring type	Ventilation setting/ type of TI	DF for $PM_{10,}$ average ± σ (MMD, µm)	DF for $PM_{2.5,}$ average ± σ (MMD, µm)	DF for $PM_{1\ ,}$ average ± σ (MMD, µm)
Mobile	Set_1	0.92±0.04 (4.0)	0.24±0.11 (0.7)	0.13±0.003 (0.3)
	Set_2	0.88±0.06(3.2)	0.23±0.01 (0.7)	0.15±0.02 (0.4)
	Set_3	0.80±0.09 (2.2)	0.15±0.02 (0.4)	0.13±0.002 (0.3)
	Set_4	0.95±0.001(4.6)	0.32±0.03 (0.8)	0.13±0.001 (0.3)
	Set_5	0.94±0.004(4.1)	0.32±0.115 (0.8)	0.13±0.003 (0.3)
Fixed–site	3–way	0.84±0.01(2.3)	0.14±0.02 (0.4)	0.13±0.002 (0.3)
	4–way	0.88±0.01(2.5)	0.14±0.02 (0.4)	0.13±0.002 (0.3)

Table S4. Average concentrations with and without background corrections of PM_{10}, $PM_{2.5}$ and PM_1 under five different ventilation settings along with mass median diameter (MMD) and air exchange rate (AER) inside the car cabin.

Ventilation settings	PM_{10} (Average±σ) ($\mu g\ m^{-3}$)		$PM_{2.5}$ (Average±σ) ($\mu g\ m^{-3}$)		PM_1 (Average±σ) ($\mu g\ m^{-3}$)		AER ($m^3\ h^{-1}$)
	Without background correction	With background correction	Without background correction	With background correction	Without background correction	With background correction	
Set_1	44±13	16±7	21±4	5±2	14±3	3±1	–
Set_2	31±8	15±5	13±5	4±2	9±4	2±2	125
Set_3	23±7	13±2	12±4	4±1	11±4	4±0	257
Set_4	38±12	17±2	9±3	2±1	5±2	0	16
Set_5	45±14	20±4	14±7	3±0	9±5	1±0	17

Table S5. Starting point (X_1) and end point (X_2) of the zone of influence for PM_{10} at ten TIs during each of the 22 runs of Set_1 in stop– and go–driving conditions.

Run No	TI_1		TI_2		TI_3		TI_4		TI_5		TI_6		TI_7		TI_8		TI_9		TI_{10}	
	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2
R1	109	–23	23	–56	–	–	–	–	–	–	–	–	107	52	–	–	–	–	68	54
R2	13	–96	–	–	–	–	153	99	83	–167	87	49	–	–	54	15	–	–	79	31
R3	102	–68	–	–	45	–38	59	–17	34	–115	–	–	129	17	42	–11	–	–	–	–
R4	–	–	108	–121	15	–71	58	32	110	–160	–	–			39	6	134	–27	–	–
R5	–	–	90	31	143	–55	–	–	–	–	–	–	–	–	–	–	–	–	97	–5
R6	–	–	–	–	–		116	–33	–	–	–	–	–	–	53	–100	154	–7	–	–
R7	144	59	–	–	–	–	–	–	–	–	–	–	–	–	–	–	131	26	–	–
R8	81	29	–	–	–	–	34	–78	–	–	–	–	164	49	114	–77	–	–	–	–
R9	–	–	–	–	–		0	–190	–	–	–	–	16	–82	–	–	109	–7	61	27
R10	–	–	84	–18	–	–	141	–73	–	–	–	–	–	–	–	–	–	–	68	31
R11	50	–19	126	7	–	–	65	37	156	137	–	–	–	–	–	–	25	–21		
R12	19	50	–	–	–	–	83	–18	–	–	–	–	200	23	–	–	–	–	70	–16
R13	–	–	–	–	–	–			117	–81	–	–	–	–	22.3	9.2	–	–	–	–
R14	–	–	137	97	–	–	46	–15	–	–	–	–	–	–	110	48	11	–5	–	–
R15	–	–	84	–120	–	–	75	27	–	–	50	–134	151	–33	70	–31	68	–47	–	–
R16	–	–	–	–	–	–	19	–120	117	–81	–	–	133	66	–	–	153	–47	–	–
R17	–	–	150	–28	–	–	189	–104	85	52	91	–137	181	–22	–	–	–	–	–	–
R18	137	44	–	–	92	14	–	–	–	–	137	–94	–	–	89	49	–	–	–	–
R19	–	–	58	–43	74	–22	109	14	–	–	123	21	–	–	–	–	–	–	55	–20
R20	51	–72	72	0	–	–	142	–6	73	–67	–	–	116	23	97	68			100	58
R21	94	–46	58	–35	–	–	140	70			–	–	73	–73	–	–	–	–	–	–
R22	–	–	84	–68	–	–	74	–91	146	–77	–	–			–	–	–	–	–	–
Max	**144**	**59**	**150**	**97**	**143**	**14**	**189**	**99**	**156**	**137**	**137**	**49**	**200**	**66**	**114**	**68**	**154**	**26**	**100**	**58**
Min	**13**	**–96**	**23**	**–121**	**15**	**–71**	**0**	**–190**	**34**	**–167**	**50**	**–137**	**16**	**–82**	**22**	**–100**	**11**	**–47**	**55**	**–20**
Average	**80**	**–14**	**90**	**–30**	**74**	**–34**	**88**	**–27**	**102**	**–62**	**98**	**–59**	**127**	**2**	**69**	**–2**	**98**	**–17**	**75**	**20**
Stdev	**46**	**57**	**36**	**61**	**48**	**33**	**52**	**74**	**38**	**98**	**34**	**88**	**54**	**52**	**32**	**54**	**57**	**24**	**16**	**30**
Median	**88**	**–21**	**84**	**–32**	**74**	**–38**	**75**	**–17**	**110**	**–81**	**91**	**–94**	**131**	**20**	**62**	**8**	**120**	**–14**	**69**	**29**

Table S6. Starting point (X_1) and end point (X_2) of the zone of influence for $PM_{2.5}$ at ten TIs during each of the 22 runs of Set_1 in stop– and go-driving conditions.

Run No	TI_1		TI_2		TI_3		TI_4		TI_5		TI_6		TI_7		TI_8		TI_9		TI_{10}	
	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2
R1	110	75	112	0	–	–	–	–	–	–	–	–	115	40	–	–	–	–	95	22
R2	46	–165	–	–	–	–	169	67	92	–157	115	20	–	–	–	–	–	–	79	31
R3	115	–14	–	–	93	10	–	–	0	94	–	–	119	–43	60	–30	–	–	–	–
R4	–	–	97	–62	51	–61	–	–	74	–25	–	–	–	–	47	0	56	0	–	–
R5	–	–	95	54	143	43	–	–	–	–	–	–	–	–	–	–	–	–	46	0
R6	–	–	–	–	–	–	112	–16	–	–	–	–	–	–	76	–88	65	–7	–	–
R7	178	27	–	–	–	–	–	–	–	–	–	–	–	–	–	–	126	94	–	–
R8	122	22	–	–	–	–	162	82	–	–	–	–	107	49	125	–77	–	–	–	–
R9	–	–	–	–	–	–	155	22	–	–	–	–	32	–43	–	–	37	0	49	34
R10	–	–	91	17	–	–	125	57	–	–	–	–	–	–	–	–	–	–	78	–12
R11	50	–14	126	44	–	–	183	48	21	–39	–	–	–	–	–	–	25	–13	–	–
R12	101	–112	–	–	–	–	82	46	–	–	–	–	171	160	–	–	–	–	70	–23
R13	–	–	–	–	–	–	–	–	161	–81	–	–	–	–	70	–44	–	–	–	–
R14	–	–	137	97	–	–	54	17	–	–	–	–	–	–	91	52	119	–25	–	–
R15	–	–	40	–57	–	–	154	69	–	–	50	–194	164	–71	138	–46	68	–34	–	–
R16	–	–	–	–	–	–	164	79	161	–81	–	–	150	54	–	–	44	–47	–	–
R17	–	–	65	–38	–	–	194	74	74	0	–	–	109	–49	–	–	–	–	–	–
R18	137	32	–	–	79	19	–	–	–	–	–	–	–	–	121	0	–	–	–	–
R19	–	–	38	–13	62	–33	88	56	–	–	133	–10	–	–	–	–	–	–	94	–11
R20	74	–72	96	–22	–	–	142	0	83	–46	–	–	138	27	196	35	–	–	96	44
R21	62	0	59	0	–	–	160	70	–	–	–	–	–	–	–	–	–	–	–	–
R22	–	–	61	–7	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Max	**178**	**75**	**137**	**97**	**143**	**43**	**194**	**82**	**161**	**94**	**133**	**20**	**171**	**160**	**196**	**52**	**126**	**94**	**96**	**44**
Min	**46**	**–165**	**38**	**–62**	**51**	**–61**	**54**	**–16**	**0**	**–157**	**50**	**–194**	**32**	**–71**	**47**	**–88**	**25**	**–47**	**46**	**–23**
Average	**100**	**–22**	**85**	**1**	**86**	**–4**	**139**	**48**	**83**	**–42**	**99**	**–61**	**123**	**14**	**103**	**–22**	**68**	**–4**	**76**	**11**
Stdev	**42**	**73**	**32**	**46**	**36**	**42**	**41**	**31**	**57**	**73**	**44**	**116**	**41**	**73**	**47**	**48**	**37**	**43**	**20**	**25**
Median	**106**	**–7**	**93**	**–4**	**79**	**10**	**155**	**57**	**79**	**–43**	**115**	**–10**	**119**	**27**	**91**	**–30**	**61**	**–10**	**79**	**11**

Table S7. Starting point (X_1) and end point (X_2) of the zone of influence for PM_1 at ten TIs during each of the 22 runs of Set_1 in stop– and go-driving conditions.

Run No	TI_1		TI_2		TI_3		TI_4		TI_5		TI_6		TI_7		TI_8		TI_9		TI_{10}	
	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2
R1	115	79	103	0	–	–	–	–	–	–	–	–	107	40	–	–	–	–	113	10
R2	46	–135	–	–	–	–	190	0	145	–157	156	44	–	–	–	–	–	–	87	27
R3	69	22	–	–	24	16	–	–	34	–88	–	–	119	–43	50	–17	–	–	–	–
R4	–	–	87	–40	51	–92	–	–	49	–4	–	–	–	–	42	0	50	0	–	–
R5	–	–	83	–15	158	–36	–	–	–	–	–	–	–	–	–	–	–	–	97	–23
R6	–	–	–	–	–	–	194	–16	–	–	–	–	–	–	53	–60	117	19	–	–
R7	153	70	–	–	–	–	–	–	–	–	–	–	–	–	–	–	126	115	–	–
R8	110	29	–	–	–	–	186	72	–	–	–	–	164	18	104	–77	–	–	–	–
R9	–	–	–	–	–	–	155	40	–	–	–	–	125	–137	–	–	22	8	54	27
R10	–	–	99	–51	–	–	146	69	–	–	–	–	–	–	–	–	–	–	68	–12
R11	31	40	126	54	–	–	183	48	0	74	–	–	–	–	–	–	20	–7	–	–
R12	127	–112	–	–	–	–	90	17	–	–	–	–	134	15	–	–	–	–	62	–16
R13	–	–	–	–	–	–	–	–	40	–60	–	–	–	–	70	–30	–	–	–	–
R14	–	–	112	100	–	–	54	16	–	–	–	–	–	–	81	52	22	–64	–	–
R15	–	–	35	–32	–	–	59	27	–	–	50	–194	164	–93	–	–	60	–47	–	–
R16	–	–	–	–	–	–	158	83	40	–60	–	–	149	48	–	–	32	–47	–	–
R17	–	–	106	36	–	–	183	38	63	0	–	–	–	–	–	–	–	–	–	–
R18	81	18	–	–	79	19	–	–	–	–	–	–	–	–	129	0	–	–	–	–
R19	–	–	34	0	86	–12	86	57	–	–	133	–43	–	–	–	–	–	–	84	0
R20	127	–72	96	–22	–	–	–	–	100	14	–	–	157	33	190	18	–	–	96	30
R21	62	28	59	14	–	–	139	70	–	–	–	–	–	–	–	–	–	–	–	–
R22	–	–	38	5	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Max	**153**	**79**	**126**	**100**	**158**	**19**	**194**	**83**	**145**	**74**	**156**	**44**	**164**	**48**	**190**	**52**	**126**	**115**	**113**	**30**
Min	**31**	**–135**	**34**	**–51**	**24**	**–92**	**54**	**–16**	**0**	**–157**	**50**	**–194**	**107**	**–137**	**42**	**–77**	**20**	**–64**	**54**	**–23**
Average	**92**	**–3**	**82**	**4**	**80**	**–21**	**140**	**40**	**59**	**–35**	**113**	**–64**	**140**	**–15**	**90**	**–14**	**56**	**–3**	**83**	**5**
Stdev	**40**	**75**	**32**	**43**	**50**	**46**	**51**	**30**	**45**	**71**	**56**	**120**	**22**	**69**	**50**	**42**	**43**	**56**	**20**	**21**
Median	**96**	**25**	**92**	**0**	**79**	**–12**	**155**	**40**	**45**	**–32**	**133**	**–43**	**142**	**17**	**76**	**–9**	**41**	**–4**	**86**	**5**

Table S8. Starting point (X_1) and end point (X_2) of the zone of influence for PM_{10} at ten TIs during each of the 22 runs of Set_1 in multiple stopping driving conditions.

Run No	TI_1		TI_2		TI_3		TI_4		TI_5		TI_6		TI_7		TI_8		TI_9		TI_{10}	
	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2
R1	–	–	–	–	–	–	103	28	–	–	–	–	–	–	–	–	177	–133	–	–
R2	–	–	–	–	–	–	–	–	–	–	–	–	124	–17	–	–	158	–37	–	–
R3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
R4	–	–	–	–	–	–	–	–	–	–	–	–	185	–11	–	–	–	–	–	–
R5	–	–	–	–	–	–	70	–50	–	–	–	–	150	55	–	–	148	13	–	–
R6	–	–	98	–34	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
R7	–	–	140	10	–	–	138	–35	–	–	–	–	200	77	–	–	–	–	–	–
R8	–	–	204	0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
R9	–	–	102	–80	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
R10	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
R11	–	–	–	–	–	–	–	–	–	–	–	–	143	–41	–	–	–	–	–	–
R12	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
R13	–	–	132	11	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
R14	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
R15	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
R16	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
R17	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
R18	–	–	–	–	–	–	–	–	184	–70	–	–	139	27	–	–	–	–	–	–
R19	190	–26	–	–	–	–	–	–	–	–	–	–	138	18	–	–	–	–	–	–
R20	–	–	–	–	–	–	–	–	–	–	102	0	–	–	–	–	86	15	–	–
R21	–	–	–	–	–	–	–	–	111	–79	–	–	–	–	–	–	–	–	–	–
R22	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Max	**190**	**–26**	**204**	**11**	**–**	**–**	**138**	**28**	**184**	**–70**	**102**	**0**	**200**	**77**	**0**	**0**	**177**	**15**	**0**	**0**
Min	**190**	**–26**	**98**	**–80**	**–**	**–**	**70**	**–50**	**111**	**–79**	**102**	**0**	**124**	**–41**	**0**	**0**	**86**	**–133**	**0**	**0**
Average	**190**	**–26**	**135**	**–19**	**–**	**–**	**104**	**–19**	**148**	**–75**	**102**	**0**	**154**	**15**	**–**	**–**	**142**	**–36**	**–**	**–**
Stdev	**–**	**–**	**43**	**39**	**–**	**–**	**34**	**41**	**52**	**6**	**–**	**–**	**28**	**42**	**–**	**–**	**39**	**69**	**–**	**–**
Median	**190**	**–26**	**132**	**0**	**–**	**–**	**103**	**–35**	**148**	**–75**	**102**	**0**	**143**	**18**	**–**	**–**	**153**	**–12**	**–**	**–**

Table S9. Starting point (X_1) and end point (X_2) of the zone of influence for $PM_{2.5}$ at ten TIs during each of the 22 runs of Set_1 in multiple stopping driving conditions.

Run No	TI_1		TI_2		TI_3		TI_4		TI_5		TI_6		TI_7		TI_8		TI_9		TI_{10}	
	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2
R1	–	–	–	–	–	–	76	0	–	–	–	–	–	–	–	–	168	–8	–	–
R2	–	–	–	–	–	–	–	–	–	–	–	–	105	–10	–	–	143	0	–	–
R3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
R4	–	–	–	–	–	–	174	44	–	–	–	–	97	–11	–	–	–	–	–	–
R5	–	–	–	–	–	–	49	26	–	–	–	–	176	34	–	–	169	39	–	–
R6	–	–	77	13	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
R7	–	–	126	20	–	–	197	–35	–	–	–	–	196	44	–	–	–	–	–	–
R8	–	–	182	–13	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
R9	–	–	96	14	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
R10	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
R11	–	–	–	–	–	–	–	–	–	–	–	–	54	–52	–	–	–	–	–	–
R12	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
R13	–	–	55	–9	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
R14	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
R15	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
R16	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
R17	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
R18	–	–	–	–	–	–	–	–	148	–21	–	–	180	0	–	–	–	–	–	–
R19	133	–23	–	–	–	–	–	–	–	–	–	–	175	55	–	–	–	–	–	–
R20	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	66	28	–	–
R21	–	–	–	–	–	–	–	–	32	–80	–	–	–	–	–	–	–	–	–	–
R22	–	–	–	–	–	–	187	34	–	–	–	–	–	–	–	–	–	–	–	–
Max	**133**	**–23**	**182**	**20**	**–**	**–**	**197**	**44**	**148**	**–21**	**–**	**–**	**196**	**55**	**0**	**0**	**169**	**39**	**0**	**0**
Min	**133**	**–23**	**55**	**–13**	**–**	**–**	**49**	**–35**	**32**	**–80**	**–**	**–**	**54**	**–52**	**0**	**0**	**66**	**–8**	**0**	**0**
Average	**133**	**–23**	**107**	**5**	**–**	**–**	**137**	**14**	**90**	**–51**	**–**	**–**	**140**	**9**	**–**	**–**	**137**	**15**	**–**	**–**
Stdev	**–**	**–**	**49**	**15**	**–**	**–**	**69**	**32**	**82**	**42**	**–**	**–**	**54**	**38**	**–**	**–**	**49**	**22**	**–**	**–**
Median	**133**	**–23**	**96**	**13**	**–**	**–**	**174**	**26**	**90**	**–51**	**–**	**–**	**175**	**0**	**–**	**–**	**156**	**14**	**–**	**–**

Table S10. Starting point (X_1) and end point (X_2) of the zone of influence for PM_1 at ten TIs during each of the 22 runs of Set_1 in multiple stopping driving conditions.

Run No	TI_1		TI_2		TI_3		TI_4		TI_5		TI_6		TI_7		TI_8		TI_9		TI_{10}	
	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2	X_1	X_2
R1	–	–	–	–	–	–	76	–40	–	–	–	–	–	–	–	–	168	0	–	–
R2	–	–	–	–	–	–	–	–	–	–	–	–	150	–5	–	–	137	0	–	–
R3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
R4	–	–	–	–	–	–	174	36	–	–	–	–	113	0	–	–	–	–	–	–
R5	–	–	–	–	–	–	83	11	–	–	–	–	155	21	–	–	161	23	–	–
R6	–	–	98	–17	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
R7	–	–	162	–12	–	–	197	–35	–	–	–	–	–	–	–	–	–	–	–	–
R8	–	–	100	22	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
R9	–	–	89	17	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
R10	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
R11	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
R12	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
R13	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
R14	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
R15	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
R16	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
R17	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
R18	–	–	–	–	–	–	–	–	136	61	–	–	186	0	–	–	–	–	–	–
R19	127	–54	–	–	–	–	–	–	–	–	–	–	175	60	–	–	–	–	–	–
R20	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	76	24	–	–
R21	–	–	–	–	–	–	–	–	26	–21	–	–	–	–	–	–	–	–	–	–
R22	–	–	–	–	–	–	74	0	–	–	–	–	–	–	–	–	–	–	–	–
Max	**127**	**–54**	**162**	**22**	**–**	**–**	**197**	**36**	**136**	**61**	**0**	**0**	**186**	**60**	**0**	**0**	**168**	**24**	**0**	**0**
Min	**127**	**–54**	**89**	**–17**	**–**	**–**	**74**	**–40**	**26**	**–21**	**0**	**0**	**113**	**–5**	**0**	**0**	**76**	**0**	**0**	**0**
Average	**127**	**–54**	**112**	**3**	**–**	**–**	**121**	**–6**	**81**	**20**	**–**	**–**	**156**	**15**	**–**	**–**	**136**	**12**	**–**	**–**
Stdev	**–**	**–**	**34**	**20**	**–**	**–**	**60**	**32**	**78**	**58**	**–**	**–**	**28**	**27**	**–**	**–**	**42**	**14**	**–**	**–**
Median	**127**	**–54**	**99**	**3**	**–**	**–**	**83**	**0**	**81**	**20**	**–**	**–**	**155**	**0**	**–**	**–**	**149**	**12**	**–**	**–**

Table S11. Maximum, minimum, median and the average length of ZoI for PM_{10}, $PM_{2.5}$ and PM_1 at four different categories of TIs during multiple stopping driving conditions.

Types of TIs	Max			Min			Median			Average		
	X_1 (m)	X_2 (m)	Length (m)	X_1 (m)	X_2 (m)	Length (m)	X_1 (m)	X_2 (m)	Length (m)	X_1 (m)	X_2 (m)	Length (m)
PM_{10}												
$TI_{4w–nb}$	204	–26	230	70	0	70	118	–13	131	133	–16	149
$TI_{3w–nb}$	200	77	123	86	–41	127	148	14	134	148	–10	158
$TI_{4w–wb}$	–	–	–	–	–	–	–	–	–	–	–	–
$TI_{3w–wb}$	184	–70	254	111	–79	190	148	–75	222	148	–75	222
$PM_{2.5}$												
$TI_{4w–nb}$	197	–23	220	49	0	49	133	13	120	126	–1	127
$TI_{3w–nb}$	196	39	157	86	–8	94	165	7	158	138	12	127
$TI_{4w–wb}$	–	–	–	–	–	–	–	–	–	–	–	–
$TI_{3w–wb}$	148	–21	169	32	–80	112	90	–51	141	90	–51	141
PM_1												
$TI_{4w–nb}$	197	–54	251	74	–17	91	99	0	99	120	–19	139
$TI_{3w–nb}$	186	24	162	86	0	86	152	6	146	146	13	132
$TI_{4w–wb}$	–	–	–	–	–	–	–	–	–	–	–	–
$TI_{3w–wb}$	136	61	75	26	–21	47	81	20	61	81	20	61

Table S12. Run-wise total RDD during Set_1 along with percentage contribution of RDD during delays at TIs to total RDD and percentage commuting time spent by the experimental car during delay conditions in Set_1.

	Total RDD during the whole run (μg)			% fraction of total RDD during delay			Commuting time spent during
Run No	PM_{10}	$PM_{2.5}$	PM_1	PM_{10}	$PM_{2.5}$	PM_1	delay (%)
R1	16	2	1	15%	13%	13%	12%
R2	11	1	1	2%	2%	2%	1%
R3	13	1	1	8%	7%	6%	5%
R4	18	2	1	12%	10%	11%	9%
R5	17	2	1	26%	20%	19%	19%
R6	19	2	1	4%	2%	2%	2%
R7	15	2	1	4%	2%	3%	2%
R8	9	1	1	6%	5%	6%	4%
R9	11	2	1	11%	4%	4%	4%
R10	9	1	1	10%	7%	9%	6%
R11	8	1	1	1%	1%	1%	1%
R12	9	1	1	7%	4%	5%	5%
R13	39	3	1	4%	4%	5%	4%
R14	19	2	1	28%	16%	23%	15%
R15	15	2	1	10%	7%	10%	8%
R16	20	2	1	21%	13%	17%	16%
R17	16	2	1	16%	9%	11%	11%
R18	30	5	1	7%	7%	6%	6%
R19	26	4	1	15%	11%	10%	9%
R20	25	5	1	10%	7%	6%	6%
R21	16	3	1	9%	6%	6%	6%
R22	14	3	1	3%	3%	2%	3%
Average	17	2	1	10%	7%	8%	7%