

**Supplemental Materials:**

Fig. S1. Changes in the population density of Zhengzhou from 1978 to 2015.

Fig. S2. The photos of the sites for different dust sources.

Table S1 Description of sampling sites (HDV: heavy-duty vehicles, LDV: light-duty vehicles).

Table S2 Coefficient of divergence values for the  $PM_{2.5}$  and  $PM_{10}$  profiles of fugitive dust in Zhengzhou.

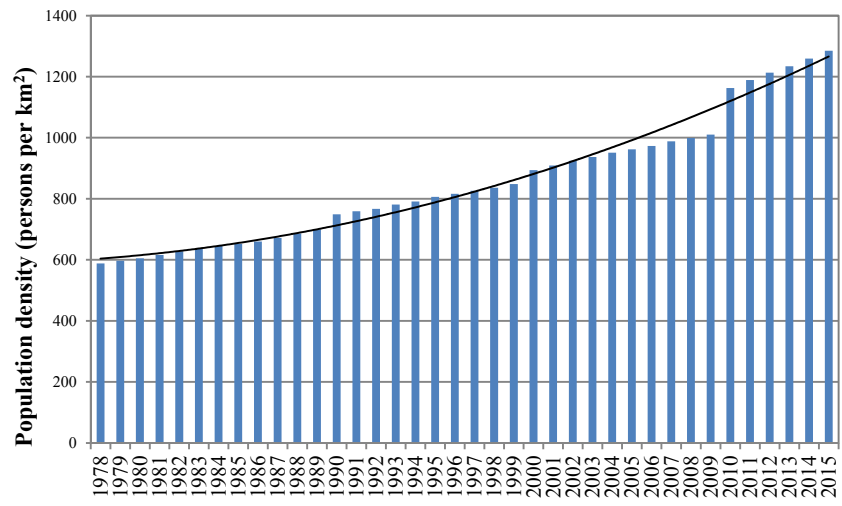


Fig. S1. Changes in the population density of Zhengzhou from 1978 to 2015.



**RD-5**



**RD-7**



**DD-2**



**DD-5**



**SD-1**



**SD-3**

Fig. S2. The photos of the sites for different dust sources.

Table S1 Description of sampling sites (HDV: heavy-duty vehicles, LDV: light-duty vehicles).

Category	Code	Longitude	Latitude	Sampling date	Location name	Description
<b>RD</b>	RD-1	113°31'40" E	34°56'51" N	28 Sept. 2015	Jiangshan road	Entrance of tourism area of the Yellow River; slow traffic with LDV
	RD-2	113°31'34" E	34°52'2" N	28 Sept. 2015	Guxu road	Guxing town in the northern suburbs of Zhengzhou; slow traffic with HDV and LDV
	RD-3	113°31'27" E	34°47'5" N	28 Sept. 2015	West side of the fourth beltway	High traffic with HDV and LDV
	RD-4	113°18'39" E	34°31'11" N	30 Oct. 2015	No. 316 provincial road	Low traffic with HDV and LDV
	RD-5	113°18'40" E	34°30'53" N	30 Oct. 2015	No. 232 provincial road	Low traffic with HDV and LDV
	RD-6	113°42'6" E	34°47'1" N	4 Nov. 2015	Zhongzhou artery road	High traffic with LDV
	RD-7	113°40'37" E	34°39'59" N	4 Nov. 2015	South side of the fourth beltway	High traffic with HDV and LDV
<b>DD (Urban village)</b>	DD-1	113°36'46" E	34°49'50" N	3 Nov. 2015	Laoyachen	Building partly demolished; debris covered
	DD-2	113°34'8" E	34°45'53" N	4 Nov. 2015	Beigang	Building demolished; debris covered
	DD-3	113°36'41" E	34°46'35" N	4 Nov. 2015	Xinshiji	Building demolished; debris moved; samples taken from top of soil
	DD-4	113°41'40" E	34°41'31" N	4 Nov. 2015	Nearby intersection of Zhongzhou artery road and south side of the third beltway	Building demolished; debris moved; samples taken from top of soil
	DD-5	113°36'10" E	34°41'35" N	8 Jan. 2016	Zhangxian	Building demolished; debris not covered
	DD-6	113°38'40" E	34°43'13" N	8 Jan. 2016	Sunbazhai	In the process of demolition; debris covered
	DD-7	113°38'35" E	34°45'42" N	8 Jan. 2016	Shakou village	In the process of demolition; debris covered
<b>SD</b>	SD-1	113°39'11" E	34°54'51" N	28 Sept. 2015	North of Zhengzhou	Clay and sand
	SD-2	113°27'49" E	34°49'8" N	29 Sept. 2015	West of urban area	Corn fields after harvest
	SD-3	113°44'34" E	34°48'6" N	29 Sept. 2015	East of urban area	Cotton field before harvest

Table S2 Coefficient of divergence values for the PM<sub>2.5</sub> and PM<sub>10</sub> profiles of fugitive dust in Zhengzhou.

(a) RD								
PM <sub>2.5</sub>	RD-average	RD-1	RD-2	RD-3	RD-4	RD-5	RD-6	RD-7
RD-average	0							
RD-1	0.293	0						
RD-2	0.304	0.426	0					
RD-3	0.390	0.345	0.459	0				
RD-4	0.421	0.522	0.336	0.562	0			
RD-5	0.400	0.517	0.304	0.551	0.551	0		
RD-6	0.426	0.529	0.470	0.605	0.605	0.476	0	
RD-7	0.314	0.466	0.413	0.534	0.534	0.422	0.331	0

(b) DD								
PM <sub>10</sub>	RD-average	RD-1	RD-2	RD-3	RD-4	RD-5	RD-6	RD-7
RD-average	0							
RD-1	0.311	0						
RD-2	0.270	0.420	0					
RD-3	0.277	0.248	0.361	0				
RD-4	0.570	0.684	0.508	0.670	0			
RD-5	0.510	0.648	0.432	0.618	0.213	0		
RD-6	0.318	0.461	0.403	0.463	0.552	0.482	0	
RD-7	0.349	0.500	0.403	0.494	0.525	0.461	0.299	0

(a) DD								
PM <sub>2.5</sub>	DD-average	DD-1	DD-2	DD-3	DD-4	DD-5	DD-6	DD-7
DD-average	0							
DD-1	0.355	0						
DD-2	0.325	0.282	0					
DD-3	0.320	0.265	0.305	0				
DD-4	0.284	0.367	0.349	0.314	0			
DD-5	0.402	0.534	0.510	0.506	0.412	0		
DD-6	0.408	0.563	0.555	0.519	0.436	0.295	0	
DD-7	0.376	0.525	0.517	0.475	0.426	0.329	0.270	0

(b) DD								
PM <sub>10</sub>	DD-average	DD-1	DD-2	DD-3	DD-4	DD-5	DD-6	DD-7
DD-average	0							
DD-1	0.250	0						
DD-2	0.256	0.293	0					
DD-3	0.347	0.373	0.378	0				
DD-4	0.285	0.342	0.374	0.412	0			
DD-5	0.392	0.476	0.467	0.508	0.381	0		
DD-6	0.325	0.444	0.453	0.513	0.399	0.302	0	
DD-7	0.381	0.464	0.474	0.519	0.385	0.277	0.297	0

(c) SD

PM <sub>2.5</sub>	SD-average	SD-1	SD-2	SD-3
SD-average	0			
SD-1	0.311	0		
SD-2	0.371	0.358	0	
SD-3	0.355	0.485	0.484	0

PM <sub>10</sub>	SD-average	SD-1	SD-2	SD-3
SD-average	0			
SD-1	0.200	0		
SD-2	0.188	0.208	0	
SD-3	0.279	0.389	0.360	0

(d) Cement

PM <sub>2.5</sub>	cement-average	cement-1	cement-2	cement-3
cement-average	0			
cement-1	0.367	0		
cement-2	0.244	0.382	0	
cement-3	0.295	0.497	0.403	0

PM <sub>10</sub>	cement-average	cement-1	cement-2	cement-3
cement-average	0			
cement-1	0.447	0		
cement-2	0.324	0.446	0	
cement-3	0.264	0.564	0.442	0

(e) Average values of four kinds fugitive dust

PM <sub>2.5</sub>	RD	DD	SD	Cement
RD	0.000			
DD	0.467	0.000		
SD	0.419	0.369	0.000	
Cement	0.488	0.409	0.513	0.000

PM <sub>10</sub>	RD	DD	SD	Cement
RD	0.000			
DD	0.396	0.000		
SD	0.415	0.415	0.000	
Cement	0.530	0.386	0.554	0.000