Supplementary data

Numerical simulations of air flow and traffic-related air pollution distribution in a real urban area

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Tables S1 – S2; Figure S1

Table S1. CFD setup conditions

Spatial Discretization	
Gradient	Least Squares Cell Based
Pressure	Standard
Momentum	QUICK
Turbulent Kinetic Energy	QUICK
Turbulent Dissipation Rate	QUICK
User Scalar 0	QUICK
User Scalar 1	QUICK

Table S2. Urban Form Indices

Index	Definition of Index	Calculation Method	Research Content
Building Density (BD)	Base area of buildings divided by the unit area of the neighborhood	BCR = Building base area/total neighborhood area	An increase in building density will increase the surface roughness, hinder the wind flow in the neighborhood, and increase the regional heat conduction
Floor Area Ratio (FAR)	Ratio of total building area to neighborhood area	FAR = Total building area/total area of neighborhood	High volumetric ratio will reduce airflow and hinder the diffusion of pollutants
Space Openness (SO)	Ratio of the total building area to the open space area in the region	SO = (1-Building density)/Floor area ratio	In the case of a constant building density, an increase in the floor area ratio will reduce the openness of the space
Average Building Height (AH)	Average height of all buildings in the area	AH = Total building height/number of buildings	It can be used to measure the volume of a building and indicate the vertical impact of the building on airflow and pollutants

Standard Deviation of Building Height (SDH)	Standard deviation of all building heights in the area	$SDH = \frac{\sum_{i=1}^{n}(h_i - \acute{h})^2}{n}$	SDH represents the uplifting disturbance effect of the differences in building height in the area on airflow and pollutants
Mean Building Volume (MBV)	Average building volume in the study area	MBV = Total building volume/number of buildings	The total volume of the same building can be achieved by different building numbers, and show different aerodynamic effects
Degree of Enclosure (DE)	Ratio of the sum of the perimeters of all buildings in the area to the total perimeter of the neighborhood	DE = Perimeter of building/total perimeter of neighborhood	Study the influence of building enclosure degree on airflow in a specific area

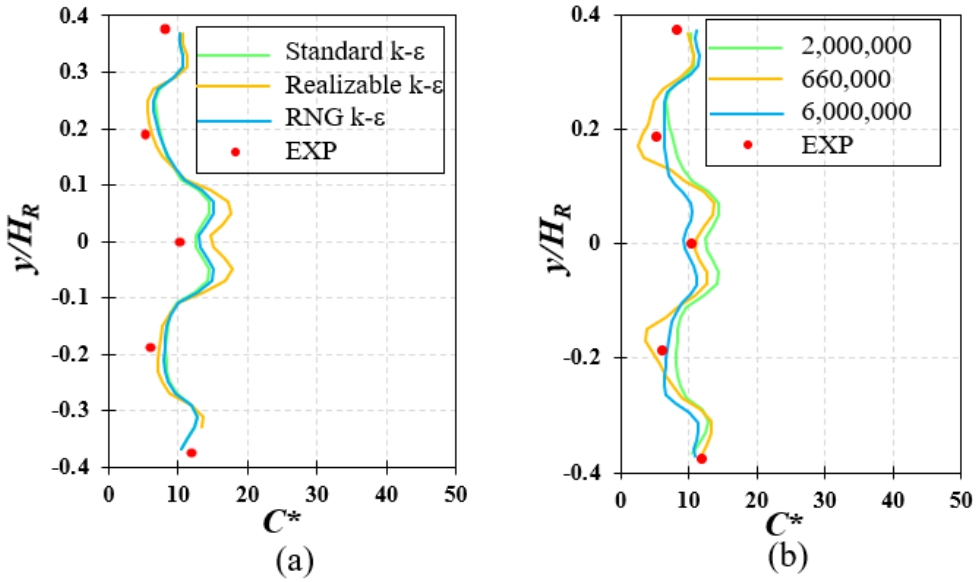

Figure S1. Turbulence model test (a) and mesh sensitivity test (b).