Environmental Research, Technology Demonstration and Conference Project

ECF Project:	ECF 2022-74
Project Title:	Environment and Conservation Fund - Modelling the effects of noise barriers and moving vehicles on traffic-induced air pollution dispersion in urban areas of Hong Kong
Principal Investigator:	Professor Li Qiusheng, Department of Architecture and Civil Engineering, City University of Hong Kong
Total Approved Grant:	$817,600
Duration:	1/10/2023 to 30/9/2026
Project Status/Remarks:	On-going
Project Scope:	Noise barriers are common urban roadway configurations that intend to block and reflect sound waves to alleviate traffic noise in the urban area. Currently, Hong Kong has around 115 kilometres of noise barriers, benefiting about 390,000 people living near roadways. The configurations of these noise barriers are usually different in the aspect of their types and dimensions. However, how various noise barriers influence traffic-induced air pollution dispersion has not been fully understood due to its complex mechanism. Moreover, moving vehicles on the road can generate additional turbulence to the wind field and complicate the effect of noise barriers on pollution dispersion. Yet most studies related to noise barriers neglected the influence of moving vehicles. This project will comprehensively investigate the combined influence of complex noise barrier configurations and moving vehicles on traffic-induced pollution dispersions in Hong Kong by field measurement, wind tunnel test, and computational fluid dynamic simulation. Moreover, the obtained results will be used for the parameterisations in the dispersion model to reflect the roles of noise barriers and moving vehicles in pollution dispersion. The outcome of this project will help to improve the modelling technique of near-road air quality.
Summary of the Findings/ Outcomes:	To be available upon completion of the project