

# Impact of Outdoor Air on Indoor Air Quality in Urban Office Environments:

## A Case Study from the Royal College Building in Glasgow

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### ABSTRACT

This research examines both indoor and outdoor air quality (IAQ) across seven offices within the Royal College building in Glasgow, explicitly analysing levels of carbon dioxide (CO<sub>2</sub>), volatile organic compounds (VOCs), and particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>). Through continuous monitoring, this study evaluates fluctuations in IAQ parameters and the influence of external pollution sources on indoor air quality. Preliminary findings indicate a notable observation: offices with windows facing the main road show increased particulate matter concentrations when windows are open, compared to baseline levels. This shows a significant impact of external traffic emissions on indoor air quality, especially when windows are open. The study underscores the importance of heightened awareness regarding ventilation practices and the development of local government strategies to reduce outdoor pollution.

These findings are crucial for shaping workplace health policies and suggest modifications in building operational strategies to enhance air quality. This investigation enriches our understanding of the complex interactions between external air pollution sources and indoor environments, providing important insights for future urban planning in Glasgow and related public health initiatives.