

URBAN DESIGN FOR AIR QUALITY

Urban design influences where air pollution is produced, how it disperses through streets and neighbourhoods, and where, when, and how much people are exposed. Good urban design improves air quality.

Air quality mitigation strategies fit broadly into three categories:

1. REDUCE

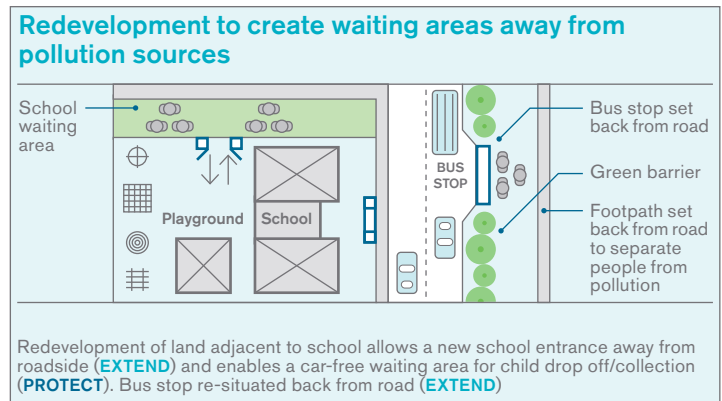
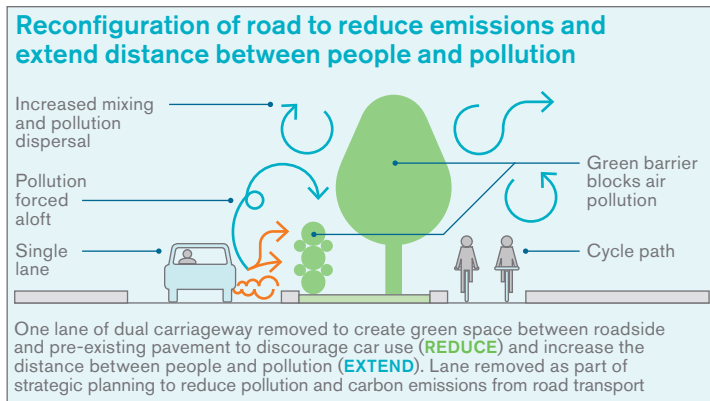
Reducing air pollution emissions is the most effective way to improve air quality. Road transport is one of the largest sources of air pollution in urban areas. Mitigation measures include facilitating active transport by creating walkways and cycleways, providing links to public transport, electric car charging points, and discouraging wood/coal combustion.

2. EXTEND

Increasing the distance between pollution source and human receptor allows for air pollution to disperse (mix into cleaner air), and can reduce exposure. This can be actual distance, or an “effective” distance, when barriers force polluted air to take a longer path, or via a heterogeneous surface that creates eddies and encourages mixing.

3. PROTECT

Older adults (>65), children (<12) and those with certain pre-existing health conditions (e.g. asthma, COPD) are most vulnerable to air pollution. Extra care must be taken to separate people and pollution in places where these vulnerable groups gather and wait, such as in front of hospitals, schools or at bus stops.



EARLY AIR QUALITY THINKING

Air quality should be considered at the earliest stages of planning and design, before the position of infrastructure and buildings is decided. Consider:

i. What is the current air quality on site?

If the site lies in an air quality management area (AQMA) or a clean air zone (CAZ) then planners and designers must consider how the site can **improve** existing air quality. Consulting with environmental health officers is essential as at least 3 months' air quality monitoring may be required pre application in AQMAs.

ii. How will the development change air quality in the development and surrounding neighbourhood?

1.1 REDUCE existing and new transport emissions by linking to public transport or mobility schemes (e.g. e-scooters), or creating/linking to cycleways or footpaths.

1.2 REDUCE existing and future combustion emissions by avoiding residential log burners or solid fuel combustion sources, and preventing

new industrial/commercial combustion in areas with air quality concerns.

2.1 EXTEND Opening up the site to promote wind flow can help air pollution disperse (mix away). A mixed height surface can promote the formation of eddies to encourage mixing and pollution dispersion.

iii. How are people on the development and surrounding neighbourhood exposed to air pollution?

Air pollution is generally highest at source. Separate people, especially vulnerable groups from air pollution sources.

2.2 EXTEND Separate pavements and cycleways from road traffic pollution.

2.3 EXTEND Avoid bus stops near busy intersections or where vehicles idle. Set bus stops back from roadside.

2.4 EXTEND Set buildings back from roads (e.g. car park in front of building) to reduce the exposure of residents. In roadside buildings locate sensitive rooms (where people spend a lot of time) away from roadside.

3.1 PROTECT Avoid co-locating vulnerable groups with pollution sources,

e.g. hospital bus stop next to idling cars. Locate school drop off/collection areas away from roadside.

3.2 PROTECT Avoid locating school playgrounds or play areas close to pollution sources.

GREEN INFRASTRUCTURE

Green infrastructure in itself is not the solution to air pollution. The amount of pollution removed or deposited on tree or shrub leaves is very low when compared to urban pollution concentrations.

As a component of good urban design, green infrastructure can help to: **REDUCE** emissions by encouraging usage of cycleways and footpaths; **EXTEND** the distance between pollution sources and individuals via mixed planting to create heterogeneous surfaces, or grass verges between roads and footpaths and; **PROTECT** vulnerable people (e.g. green barriers).

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