# TRAFFIC-RELATED AIR POLLUTION

## schools and childcare facilities

Traffic-Related Air Pollution (TRAP) is a **mixture of particles, chemicals and gases** that come from cars, buses, and trucks. TRAP includes pollution from vehicle exhaust, road dust, fuel evaporation, and tire and brake wear. TRAP is highest outdoors near sources such as major roads and truck routes but can also move indoors.

TRAP has both short-term and longer-lasting health impacts including the **development or worsening of asthma** in children. **Children** are especially susceptible to air pollution (e.g. TRAP, wildfire smoke) for reasons including:

- Children's lungs, other organs, and immune systems are developing rapidly, and air pollution may affect these processes.
- Children take in more air pollution because they breathe faster and inhale more air relative to body size than adults.
- Children take in more air pollution because they are generally more physically active than adults, especially outdoors.

### Taking measures to reduce exposure to TRAP can help protect health.

### How are people exposed to TRAP?

TRAP is highest near major roads, highways, and truck routes. Outdoor air pollution can also be worse near rail-yards, loading yards and certain industries.

Children can be exposed when they are outdoors near sources of air pollution. They can also be exposed indoors, because air pollution can move inside through infiltration into buildings. As people move further away from roadways and other traffic routes, their exposure to TRAP is lower.

# What can I do to reduce TRAP exposure?

**The following are recommended *options* to help protect health, implement them where feasible and appropriate.**

This guidance is primarily for facilities that are within 150m of major roads (e.g. Broadway), truck routes (e.g. Clark) or railways and within 300m of major highways (e.g. HWY 1).

## Improve the air quality inside:

- Keep **windows and doors closed** during periods of peak traffic (e.g. morning and evening rush hours) when TRAP is worst. Ensure it is safe to do so without overheating.
- **Seal and block** gaps and cracks in window frames, doors, and ducts to reduce TRAP entering the building.
- Ensure building ventilation and air filtration systems are maintained according to manufacturers' specifications and any repairs have been completed.
- Install the highest level of filtration possible in the HVAC system. Filters with a rating of **MERV 13 (MPR 1900)** or greater **(ideally MERV 16+ or HEPA filters)** are strongly recommended to improve the removal of small particles. If possible, add an absorbent media air filter to capture gaseous pollutants (e.g. activated carbon) and include a pre-filter for larger particles to extend the life of the other filters.
- For HVAC filters to be effective, fans should be set to ensure indoor air is circulated through the HVAC filter regularly to remove the small particles that are most concerning for health (i.e. not on auto fan). For example a MERV 13 filter only removes about 50% of the smallest particles on the first pass.
- **Use portable air cleaners with HEPA filters** and **activated carbon** filters. See pages 4 and 5 for advice on how to choose and use portable air cleaners.

## Reduce exposure when playing outside:

- **Schedule** outdoor activities at times of the day when outdoor air quality is better (e.g. outside of rush hour and drop-off/pick-up times).
- **Move bus and passenger vehicle loading zones** away from windows, play areas and building air intakes.
- **Promote walking, biking or rolling** to school to reduce the number of vehicles during drop-off/pick-up times.

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Crosstown Elementary, *SAB Magazine*

## How to design a facility to reduce exposure to TRAP

**The following are recommended *options* to help protect health, implement them where feasible and appropriate.**

- If possible, choose a site that is 150m or more away from major roads, truck routes, railways, or industry and 300m or more away from major highways.
- Place the outdoor play space on the side of the building away from roadways, drop-off zones, parking, and other sources of outdoor air pollution.
- Install a barrier (e.g. wall or bushes) to reduce exposure to outdoor air pollution in outdoor play spaces that are near major roadways (see US EPA resource on page 6).
- Place building air intakes as far away as possible from roadways, drop-off zones, parking, and other sources of outdoor air pollution.
- Install a mechanical ventilation system with air filtration with a rating of MERV 13 (MPR 1900) or greater (ideally MERV 16+ or HEPA filters) and add an absorbent media air filter (e.g. activated carbon). Consider including a pre-filter for larger particles in this system to extend the life of the other filters.
- Ensure the HVAC system is designed in a way to allow for the indoor air to be recirculated through the HVAC filter continuously and also allow for a reduction of outdoor air being brought into the building when needed.
- Locate bus and passenger vehicle loading zones away from classrooms, play areas, and building air intakes.
- Provide connections with walking/biking paths to promote active transportation and reduce the number of vehicles near the facility.

## How to choose and use portable air cleaners

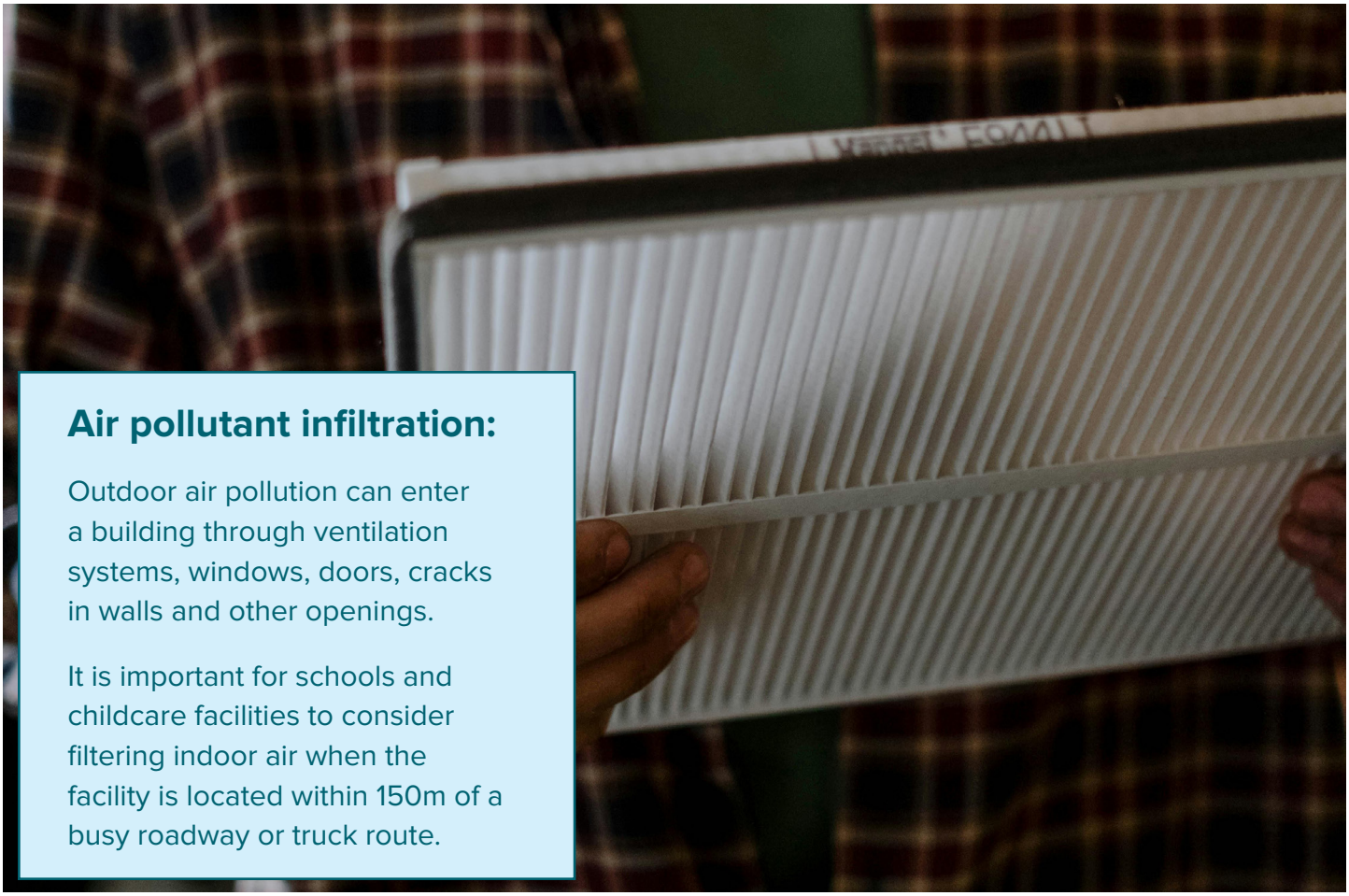
### When buying a portable air cleaner, ensure the following specifications are met:

- Has **HEPA air filters** — removes the small particles in TRAP and other sources, such as wildfire smoke.
- Has an **activated carbon filter** — removes some gaseous pollutants.
- Is **certified by AHAM** (Association of Home Appliance Manufacturers).
- **Is appropriate for room size** — check the recommended maximum room size to make sure the one you buy is sized for your space. See the BCCDC Portable Air Cleaners for Wildfire Smoke resource.
- **Does not produce ozone**, a lung irritant. Some units use electrostatic precipitation or ionizing technologies that can create ozone gas. If the unit has these features, make sure it has been tested for ozone production or is certified for low ozone production by the California Air Resources Board.
- Has **ENERGY STAR** designation to maximize energy efficiency.
- **Do-it-yourself (DIY) air cleaners**, such as box fans with high-quality filters, are a cheaper and effective alternative to lower indoor concentrations of small particles. See the BCCDC resource on Do-It-Yourself Air Cleaners to learn how to make one.

# How to choose and use portable air cleaners?

## Portable air cleaner tips:

- Use air cleaners in the room(s) where people spend most of their time.
- Place the air cleaner(s) in a location(s) where the **airflow is not restricted** by walls, furniture, curtains and/or other objects.
- **Run the air cleaners continuously** throughout the day, as well as for an hour before the start of the day if possible.
- Air cleaners work best when the **windows/doors are closed**. Ensure indoor temperatures are measured and the space does not get too hot**.**
- Operate the air cleaner at the **highest setting** feasible. If the unit(s) is too loud, consider using a lower setting.
- Set up a **maintenance plan** to replace air filters in the units regularly (as directed by the manufacturer).



### Air pollutant infiltration:

Outdoor air pollution can enter a building through ventilation systems, windows, doors, cracks in walls and other openings.

It is important for schools and childcare facilities to consider filtering indoor air when the facility is located within 150m of a busy roadway or truck route.

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**Note:** We do not recommend air quality testing for TRAP as it can be complex and requires significant expertise and expense. Portable air sensors may not measure the correct pollutants accurately.

## Traffic-Related Air Pollution Resources

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| Health Canada: TRAP Information | Information on the health impacts of traffic-related air pollution. |
| US EPA: Best Practices for Reducing Near-road Pollution Exposure at Schools | Recommendations to reduce traffic-related air pollution exposure in schools. |
| US EPA: Recommendations for Constructing Roadside Vegetation Barriers to Improve Near-road Air Quality | Guidance on vegetative barriers as an air pollution mitigation strategy. |
| BCCDC: Portable Air Cleaners for Wildfire Smoke | Information on the types of portable air cleaners to reduce wildfire smoke indoors. |
| BCCDC: Do-It-Yourself Air Cleaners | Information on how to build your own DIY air cleaner. |

## Want to learn more?

Check out these other guidance documents for schools and childcare facilities:





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