



## Identification of Cleaner Air Shelters/Spaces for Protection from Wildfire Smoke September 8, 2017

For recommendations about when to open and publicize a Cleaner Air Shelter/Space, see Table 4 of the [Oregon Wildfire Response Protocol for Severe Smoke Episodes](#).

### Minimal requirements:

- Identify one or more facilities with tight-sealing windows and doors and public access (for example, public schools, fire stations or hospitals). As a rule of thumb, newer buildings will generally be more desirable than older ones.
- Desirable facilities are those with a ventilation system able to significantly reduce, or even eliminate, intake of outdoor air. If possible, reduce the intake of outdoor air by the ventilation system when the building is used as a Cleaner Air Shelter/Space. Open the damper and flush the building when the outdoor air quality improves.
- At a minimum, a Cleaner Air Shelter/Space should have a central air filtration system that is at least medium or high-efficiency. If needed, filters should be upgraded prior to the fire season, after assuring that the system can handle the increased airflow resistance.

### Best practices also include:

- Install/inspect a room air cleaner or, preferably, a central air cleaner with sufficient capability, i.e., a Clean Air Delivery Rate (CADR) that is twice the room volume for room units, or American Society of Heating, Refrigeration and Air-conditioning Engineers (ASHRAE) filter efficiency greater than 80% for central air cleaners.<sup>1</sup> Ensure proper maintenance of air cleaners, keep spare filters on hand, and provide instructions on changing the filter to trained personnel.
- Assure that the facility can handle the increased cooling load due to high occupancy.
- Install a properly calibrated carbon monoxide (CO) alarm that has a digital display and battery backup function (available at most hardware stores).
- Provide a radio for updates on fire status and access to a telephone in case of emergency.

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<sup>1</sup> American Society of Heating, Refrigeration, and Air-conditioning Engineers (ASHRAE) Standard 52.1-1992. "Gravimetric and Dust-Spot Procedures for Testing Air-Cleaning Devices Used in General Ventilation for Removing Particulate Matter".

**Issues to consider when recommending home clean air shelters (HCAS) vs. community clean air shelters/spaces (CCAS):**

- Residents may be required to travel longer distances to reach CCASs, and may be exposed to smoke in transit.
- Mobility may be limited for families with small children and elderly residents, or residents who may not be able to walk or drive to a CCAS.
- Community members who are trying to access CCAS versus remaining at home may experience additional stresses.
- The benefits of potentially more effective filtration obtained intermittently at CCASs (e.g., malls) should be weighed against less effective but more consistent filtering obtained in HCAS for extended periods of time.
- Encouraging individuals to remain in CCASs may be a challenge if extended stays are required. If smoke events are expected to persist, HCASs might be a more viable option than encouraging prolonged stays at CCASs.
- CCAS may be particularly helpful for populations without adequate shelter - particularly people experiencing homelessness.

**Brief review of evidence:**

The evidence supports the use of home-CASs in reducing indoor particulate matter concentrations during wildfire smoke events. In the absence of High Efficiency Particulate Air (HEPA) filtration or an Electro Static Precipitator (ESP) increased filtration may be achieved by using a higher efficiency filter within existing HVAC systems or even by running HVAC systems with standard filtration, provided that they are on recirculation mode.

There is limited published research demonstrating that HEPA filters and ESPs improve health outcomes during wildfire events. The evidence is suggestive of improved markers of cardiac effects in adults and reduced asthma symptoms in children. Given that improved filtration provided by home-CAS reduces exposure to smoke, an associated health benefit is expected, however there is limited research in this area.