Room Air Purifier Program:

Preparing Your Community for Smoke

A How-to-Guide by Smokewise Ashland

SmokewiseAshland.org

Confidence comes from being prepared.

-John Wooden

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Preface

Smokewise Ashland is a local collaborative working group in southwest Oregon dedicated to protecting public health and creating economic resiliency in the face of increasing summer wildfire smoke and the overwhelming need to reduce community wildfire risk through proactive, safely conducted controlled burning. In this how-to-guide for creating safer indoor air quality for residents living in communities at risk from smoke, we have collected our knowledge from our recent residential room air purifier program and public communication experiences on smoke in Ashland, Oregon.

For the purposes of this how-to guide, examples will be shared from Ashland, Oregon's residential room air purifier program. 600 HEPA grade purifiers were distributed to qualified Ashland residents free of charge by the Wildfire Division with Ashland Fire & Rescue. The City of Ashland and participating partners funded the room air purifiers pilot project as part of a grant program with the Oregon Department of Environmental Quality (Oregon DEQ). A community response plan for smoke was also developed which includes a detailed summary of smoke-vulnerable populations in Ashland and various ways organizations can communicate about smoke impacts, and the additional actions planned for addressing the needs of residents during planned burns and summer wildfire smoke.

Introduction

With higher temperatures and drier conditions making wildfires larger, and the need to mitigate risk using prescribed fire greater, the pressure is on local officials to provide solutions to poor air quality and smoke. For those communities who are seeking assistance to better prepare for smoke from all sources, room air purifiers can provide relief. Several factors influence a communities' smoke vulnerability and it can be addressed with careful planning, robust education and technology. By following this step-by step guide for starting a residential room air purifier program, you can help your community be better prepared for when wildfire or controlled burn smoke impacts your local area.

Air Filtration: An Intervention for Smoke During wildfires, it is generally advised that people stay inside to protect themselves from the dense air pollution. Air pollution from smoke still poses a significant danger to individuals that are indoors if pollutants infiltrate structures through multiple points of entry and are not filtered out of the air. One of the most effective ways to protect individuals from indoor smoke pollutant

exposure and the health impacts associated with it is to ensure that proper air filtration mechanisms are in place. A wide variety of air filtration technologies are available to protect individuals from fine particulate matter and harmful gases indoors.

How effective are residential room air purifiers and programs which promote preventive actions? The Environmental Protection Agency (EPA) is researching the effectiveness of air purifiers and innovative approaches for preparing communities for smoke. Across the western U.S., rural and urban areas are organizing smoke education and residential room air purifier programs to promote actions that will reduce exposure to fine particulates.

Communities in the western U.S. with residential room air purifier programs:

- Ashland, Oregon: Smokewise Ashland
- Eugene, Oregon: Lane Regional Air Protection Agency (LRAPPA)
- Hoopa, California: Hoopa Valley Tribal EPA (TEPA)
- Missoula, Montana: Climate Smart
- Santa Fe, New Mexico:
    - Three Sisters Collective
    - Greater Santa Fe Fireshed Coalition

Depending on the decisions made by program organizers and the community need, access to funding and capacity for distribution of purifiers – different models have evolved for providing room air purifier technology including a few listed here:

- Loan programs for residential room air purifiers during periods of smoke.
- Retrofitting businesses using available technology to create public clean air spaces.
- Give-away air purifier programs for qualified applicants.

This guide will help in steps for a give-away room air purifier program and could be helpful in starting another distribution model or hybrid model for providing air purification technology in your community.

Step One: Understand How Smoke Enters Your Community

Smoke can travel long distances then settle in low-lying valleys. In other situations, prescribed fires or local open burning among private individuals may put smoke into communities. Factors vary depending on the time of day a controlled burn is conducted, prevailing winds in the area and when and where cool air and warm air mix with air either rising or falling towards lower elevations. The good news is that controlled burn professionals work under highly regulated conditions, making it possible to select days

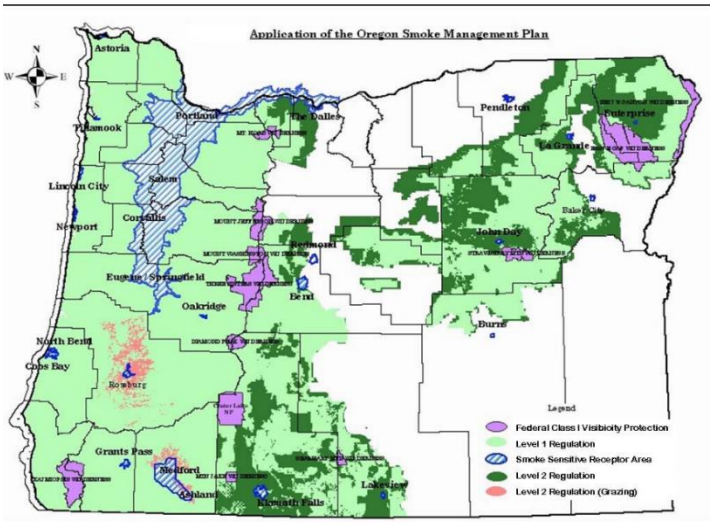
when conditions are favorable for smoke to move away from communities. Wildfire smoke, on the other hand, can drift for many miles, covering huge distances, threatening human health, and crippling economies for days and sometimes weeks at a time. Though outdoor activities are often impacted by smoke, indoor air purifiers are a safe, effective, and affordable solution for preventing the long-term damage caused by smoke exposure.

One way to inform the community, motivate local officials and spur education and local investment for programs to address wildfire and prescribed fire smoke, is by knowing what the smoke trends and sources of smoke are in your area. The smoke trends can also help your community decide where and when air purifiers should be delivered. Research and explore sources of smoke in your community with local partners, air quality regulators and stakeholders.

Here are some example questions that can be answered:

1. *Is wildfire smoke increasing? If so, what is the duration of wildfire smoke and when is the impact likely?*
2. *How high is the Air Quality Index (AQI) during the summer months for wildfire smoke and where is it most intense?*
3. *Where do people live who are impacted by smoke?*
4. *Is controlled burning regularly happening, and if so, when, and where?*
5. *What topography and weather influence the movement of smoke for our area?*

Organizations conducting controlled burning, state regulators and health authorities can assist in defining the areas most impacted by smoke or, in some cases use a detailed model of where and when smoke moves through your community. Begin by learning how smoke is regulated in your state and make a list of potential partners for the project who understand air quality, controlled burning and regulations. In Oregon, the DEQ has identified areas of concern for impact by smoke and designated them as Smoke Sensitive Receptor Areas (SSRA). A SSRA is an area designated, in consultation with the DEQ, and provides the highest level of protection under the Oregon Smoke Management Plan.



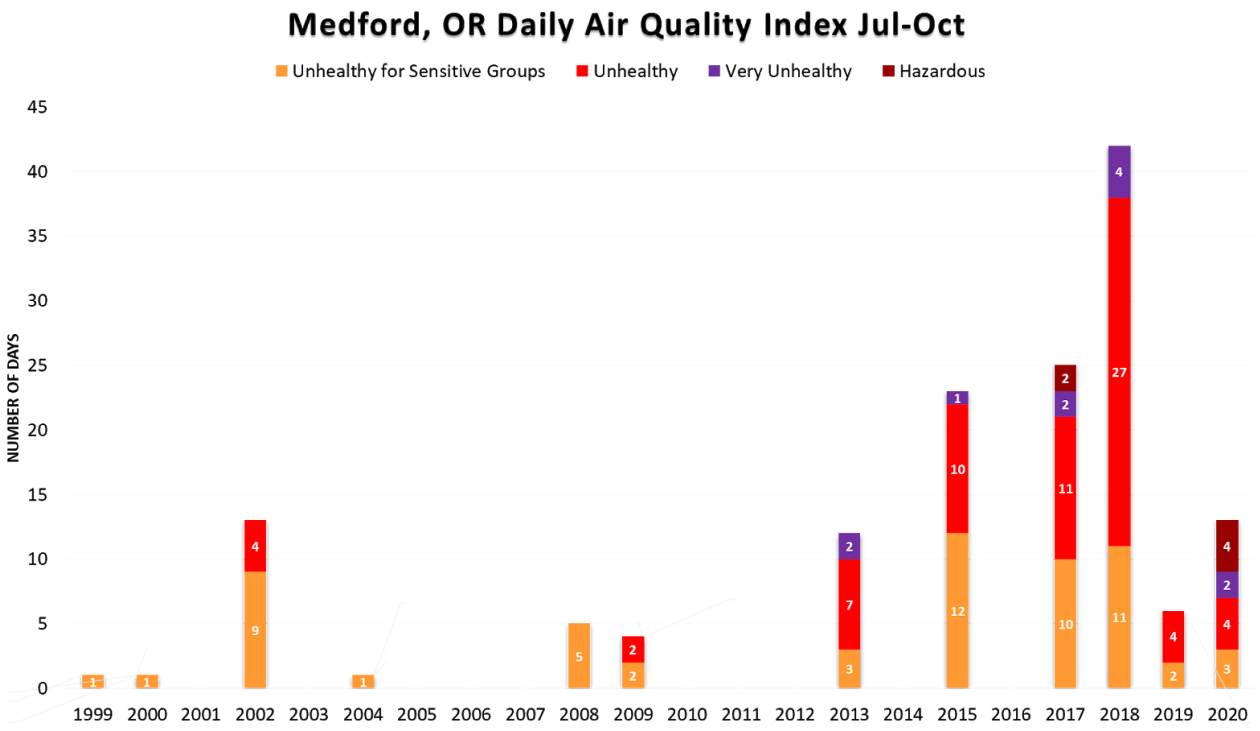
Oregon DEQ Designated Smoke Sensitive Receptor Areas

A yearly wildfire smoke report is also available from the Oregon DEQ which provides a general overview of the year and wildfire smoke trends for each county.

In every state, air quality management plans help guide the approach for maintaining and regulating air quality.

The ABC's of Smoke Conditions:

a. **Topography and Conditions:** The shape of the land with valleys relative to surrounding mountains influences where smoke is funneled or settles based on elevation, topographic winds, and weather patterns.
b. **Prescribed Fire Smoke:** Controlled burning smoke is highly regulated and generally done during the mornings and afternoons when warming air transports smoke higher into the atmosphere where transport winds can carry it away. In the evening hours, when cool air moves down off the mountains, smoke from controlled burning can enter populated areas. Residential room air purifiers are a good solution for homes impacted by smoke from controlled burning during the evening hours. It may be beneficial for your program to graphically display the timing of poor air quality throughout the year to understand the impact of prescribed fire versus wildfire smoke on your community.
c. **Wildfire Smoke:** When compared to prescribed fire smoke, there is significantly more days of poor air quality when smoke from wildfires across the Western United states pours into communities. New research from the University of Utah ties the worsening trend of extreme poor air quality events in Western regions to wildfire activity, with growing trends of smoke impacting air quality clear into September. Researchers are finding that the future will bring more fire areas burned in the Western U.S., with an accompanying increase in wildfire smoke exposure throughout the West and the resulting impacts of that smoke on human health. Research the trends for your county to help summarize the threat for decision-makers. Below is an example of wildfire smoke trending upwards in Medford, Oregon in Jackson County.



Daily Air Quality Index at the Medford nephelometer (located at the corner of Welch and Jackson roads). The Medford nephelometer recorded 18 "unhealthy" days between 1985 and 2014 and then had 46 between 2015 and 2020. Medford had nine "very unhealthy" days between 1985 and 2014, mostly in 1987. From 2015 to 2020 the Medford nephelometer recorded nine. Additionally, this nephelometer has recorded six "hazardous" air days, in 2017 and 2020.

Step Two: Identify *Who* is Most Vulnerable in Your Community

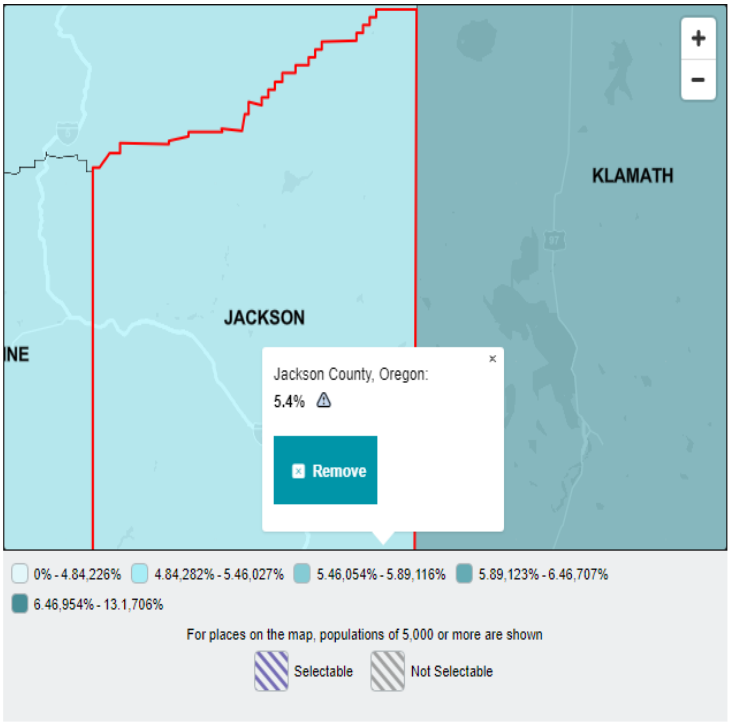
Develop a profile of the people who are vulnerable to smoke in your community Some people are more at risk of harmful health effects from wildfire smoke than others. The Center for Disease Control (CDC), Environmental Protection Authority (EPA), Department of Environmental Quality (DEQ) and your state, local health authority may have slight variations in who is most vulnerable to smoke. However, given these slight variations, many of them center around a few key groups:

- **Children less than 18 years old**
- **Adults aged 65 years or older**
- **People with chronic health conditions such as heart or lung disease, asthma, and diabetes**
- Pregnant women
- Outdoor workers

- People who are immunocompromised or taking drugs that suppress the immune system
- People who have lower socioeconomic status, including individuals experiencing homelessness or those who have limited access to medical care

How to Compile Population Data:

Step 1: Contact local county and state health authorities. Your local county health authority can help in providing population data and help you identify who is most vulnerable to smoke in your community. For example, Jackson County Health & Human Services produced a health survey in 2018 summarizing different health risks for residents of Jackson County. While the health summary is not specific to wildfire smoke, it does examine the overall health of the population with indicators from housing status, general health, and income all which have been linked to increased risk from the health problems associated with exposure to smoke.



Example Data from Jackson County, Oregon for Children Under 5

Step 2: Research your communities' existing population data for vulnerable groups. We suggest consulting widely available U.S. Census data and reviewing health surveys if they are available from your local health authority and organizations serving persons at risk from smoke.

Step 3: Lead a discussion or conduct a survey in the community for further refining and identifying who is most at risk from smoke particulates. Here are some example guiding questions for the conversation:

1. *How many persons in our community are over the age of 65?*
2. *Is there a large population of families with children under the age of 18?*
3. *How can we reach people with pre-existing health conditions?*

Population data and estimates can be found online through the following source:

U.S. Census will have population for your county. Select different facts such as age of residents, percentage of those with disabilities and poverty information to build out a community profile of those most vulnerable to smoke. In the following example, for zip code 97520, children under 5 make up 5.4% of the population.

Example Population Profile of Smoke Vulnerable Groups in Ashland, Oregon

Local officials who conduct controlled burns and participants in Smokewise Ashland developed a complete population profile of residents in Ashland, Oregon who are vulnerable to smoke. A community profile of smoke vulnerable residents helped define the parameters for the program to reach those persons most in need of residential room air purifiers. See the table below for an example of how the smoke vulnerable population was defined in Ashland, Oregon.

Vulnerable Group	Description
Children	The 2018 U.S. Census Bureau estimated that over 3,400 children under the age of 18 live in Ashland.
Adults Over 65	Persons over the age of 65 are vulnerable to smoke. According to 2018 U.S. Census data, there are an estimated 4,678 Ashland residents over the age of 65.
Pre-Existing Conditions	9.6% percent of residents within Jackson County are reported to have cardiovascular disease while 8.5% are reported to have COPD.
Low Income Residents	The World Populations Review's report found that one out of every five citizens (20.1%) within Jackson County lives in poverty. This is nearly twice the national average (11.8%).
The Unhoused	An assessment in July of 2019 found there were 712 homeless people in Jackson County, with 12 percent of that figure from Ashland.

Step Three: Grow Partnerships in Your Community

Partner with community advocates, health organizations, local schools and civic organizations for assistance in reaching your defined smoke vulnerable groups. Growing partnerships can take several years, however; regular meetings with key organizations and planning each year builds a solid foundation for moving forward on projects for addressing your communities needs for smoke education and improvements for indoor air quality. Partnering with these organizations is critical to connecting with smoke-vulnerable residents in your area; these are trusted resources

that can help spread the word to the smoke-vulnerable residents you are attempting to help through your program.

Example Partnership Model for Ashland, Oregon

In Ashland, we worked closely with partners we had collaborated with in recent years to help get the word out about the air purifier program. The local YMCA had an email list of persons who attended who were lower income, over the age of 65 and families who had children under 15. An email was sent to participating YMCA members with the application link. Here is an example list of mobilized community groups and the population group they serve:

Organization	Smoke Vulnerable Population Served
OHRA (Options for Helping Residents of Ashland)	Low-income/Unhoused
Ashland Food Bank	
Maslow Project	
Access, Inc.	
Asante	Pre-Existing Conditions
Urgent Care	
Rogue Community Health Clinic	
The Community Pre-School at SOU	Children Under 5
Children's World Montessori	
Stone Soup Playschool	
Pomegranate Preschool for the Arts	
Ashland Head Start	
Oregon Child Development Coalition	
Ashland Senior Center	Adults Over 65
Mountain Meadows	
OLLI - Osher Life-Long Learning Institute	
Brookdale	
Oxford Gardens	
Ashland at Home	
Ashland YMCA	
The Siskiyou School	Students (1-8th)
Ashland School District	
Helman Elementary School	
Bellview Elementary School	

In the example above, organizations for outreach were organized based on the smoke vulnerable populations served. It's important to note, some organizations served more than one population. For example, the YMCA serves both children and adults over 65. Pre-planning in this way, can help in your outreach effort and bring in additional partners to help with program capacity.

Step Four: Design Equitable Access for Your Program

Diversity, equity, and inclusion (DEI) should be at the core of your air purifier program and included with your considerations for program design from beginning to end.

Diversity:
Diversity is the representation of all our varied identities and differences (race, ethnicity, gender, disability, sexual orientation, gender identity, national origin, tribe, socio-economic status, thinking and communication styles, etc.), collectively and as individuals. Seek to proactively engage, understand, and draw on a variety of perspectives and seek to include a diversity of people who can mobilize participants in your purifier program.

Spanish Language Program Flyers Were Circulated through the Department of Human Services

Equity:
Equity seeks to ensure fair treatment, equality of opportunity, and fairness in access to information and resources for all. Equity is made more possible in an environment built on respect and dignity. Each person should have an equal opportunity to participate in your room air purifier program from a diversity of backgrounds, income, health or wellness because smoke is harmful to all community members.

Inclusion:
Inclusion builds a culture of belonging by actively inviting the contribution and participation of all people. Every person's voice adds value, and your program should strive to create balance in the face of power differences. No one person can or should be called upon to represent an entire community and multiple partnerships and community members should be engaged. When planning your communities' room

air purifier program, remember to include people who are underrepresented in your community or have challenges for participating.

Be careful to consider how your program is marketed. For example, if you *only* reach out digitally, you will reduce or even eliminate participation of people with limited access to technology.

Tips for Increasing Diversity, Equity, and Inclusion:

- Communication for the program can be provided in more than one language in your community if there is a secondary language for a percentage of the population.
- Reach out to people in a variety of communication vehicles including digital, print and by telephone.
- Participation can be difficult due to illness or a disability, reach out to organizations serving those individuals.
- Send direct mailing to persons who are disabled, lower-income or over the age of 65. Direct mailings are one of the best communication forms for this segment of the population. In using this form of communication, applicants could call directly and apply for a purifier over the phone and did not need access to technology, a potential barrier for participation.

Example Direct Mailing to Residents Lacking Technology Access

Example Marketing and Communication Strategy: The City of Ashland used a website along with marketing materials distributed at identified locations where smoke vulnerable persons were served. Emails from local partners, direct mailings for smoke vulnerable people and local social media also helped reach a diversity of persons for participation in the give-away room air purifier program.

Step Five: Data Collection and the In-Take Process

Map out the process for in-take of participants for your residential room air purifier program. Make sure you use a secure program for collecting data. For best practices, have a person do in-take that is compliant with HIPPA information security. *Do not*

share or distribute any names, health information or program details that could make a person identifiable.

If you have a limited number of air purifiers to distribute and more people requesting a purifier than what is available, it may be helpful to rank the applicants in order of priority or need. Consider asking key questions that will help you understand the vulnerability of residents seeking a purifier:

- How many people in the household have heart or lung disease, asthma, or COPD?
- How many children ages 0-5, 6-10, 11-15 are in the household?
- How many adults over 65 are in the household?
- What is the gross annual income from all household members?
- Does anyone in the household smoke?

Households that contain several vulnerability factors should be more strongly considered to receive a purifier. This will help you distribute your purifiers to those most in need in an unbiased manner. No one factor was relied on for qualifying applicants so persons could apply and qualify for a free air purifier from multiple income levels, backgrounds, and ages. Pre-existing health conditions such as asthma or heart and lung disease were important factors and well over half of the participants who received a room air purifier had pre-existing medical conditions. Each person who participated in the program was rated through the same point system to eliminate bias.

Screening Factor	Number People in household	Factor Value	Points
Adults over 65 years	1	10	10
Children 5 and under	0	15	0
Children 6-10	1	10	10
Children 11-15	0	5	0
Persons with Qualifying Conditions*	2	10	20
Income Factor Value (use Income Level chart below)		27	27
TOTAL POINTS			**67**

Example: With guidance from Ashland's Affordable Housing Program, we created a point system so we could rank the applications. The point system weighted heavily on household income; we wanted these purifiers to get to people who would otherwise not be able to purchase the purifier due to a limited budget.

Income Level	Number of Persons in Household						
	1	2	3	4	5	6	Value
Extremely Low Income (30% of Median)	$13,700	$17,240	$21,720	$26,200	$30,680	$35,160	20
Low Income (50% Median)	$22,800	$26,050	$29,300	$32,550	$35,200	$37,800	18
Income at 60% of Median	$27,850	$31,820	$35,800	$39,780	$42,960	$46,150	16
Moderate Income (80%)	$36,500	$41,700	$46,900	$52,100	$56,300	$60,450	14
Median Income (100%)	$45,570	$52,080	$58,590	$65,100	$70,310	$75,520	12
Income at 120% of Median	$54,680	$62,500	$70,310	$78,120	$84,370	$90,620	10
Income at 130% of Median	$59,240	$67,700	$76,170	$84,630	$91,400	$98,170	8
Over 130% of Median							0

The Above Table Shows Income Levels for Ashland, Oregon

Here is a link to the income guidelines for the Federal Housing Program where you can reach out to your local development office for your community's income guidelines.

Step Six: Select a Cost-Effective Air Purifier

Size Guide: Air purifiers come in four sizes, with each one being good for a specific room size that's measured in total square feet.

- **Small air purifier:** Good for personal spaces and rooms up to 200 square feet.
- **Medium air purifier:** Good for rooms between 200 and 400 square feet.
- **Large air purifier:** Good for rooms between 400 and 1,500 square feet.
- **Whole-House air purifier:** Good for purifying every room in the house.

Residential Air Purifier Purchasing Tips:

Company	ABC
Sales Contact	Mr. Jones
Model	HPA300
Listed Price Retail	$195.99
Bid Price	$155.00
Sq. Ft.	360
HEPA	99.90%
Features	Remote Control
Filter Replacement Cost	$59.00
Maintenance and Warranty	2-Years
Energy Star Rated	Yes
Max Decibels	60
California Air Resources Board Certified	Yes
Consumer Reports Rating	76
Video or Manual	Link and Share

Example Analysis for Selecting an Air Purifier

1) Always buy a certified air cleaning device listed on the California Air Resources Board. Purchasing a certified device ensures you are providing a residential room air purifier that does not produce harmful ozone and meets electrical and safety standards.

2) Air purifiers will vary in price depending on the time of year purchased, purifier size and overall quality. If you are planning a bulk purchase for your community or organization, *you may save money by purchasing from November to June*. Peak months for air purifier sales are typically from September to October and this is when they are most costly.

3) Compare the replacement filter cost, electric use, warranty, clean air delivery rate (CADR) and reviews for each purifier to find the best value.

4) Think about who you are purchasing residential room air purifiers for and define where purifier will be used. Is there evening smoke from air inversions for your community that require moving the air purifier to a bedroom?
    a. The purifier should be sized for a medium to large room for residential use.
    b. Small purifiers may be adequate for a workplace setting with individual offices.
    c. Portability is important. Can the purifier be moved to a bedroom space at night?

5) Select a purifier with quiet operating noise. Noise is measured in decibels or DB and quiet operation is generally from 20-60 decibels.

6) Contact a wholesaler or, sales team for the air purifier manufacturing company so you can negotiate a bulk purchase price.

7) Before finalizing your purchase with the air purifier distributor or manufacturer, request discounts and coupons for replacement filters and additional purifiers. With the coupons, you can encourage participants to purchase replacement filters and, have a coupon for sending to people who applied for your program and did not qualify. Provide detailed instructions to the public on how to use the discount and emphasize purchase of air filter replacements before summer wildfire season begins.

8) Plan for safely storing your air purifiers before they arrive. Air purifiers are large and bulky. The purifiers will need to be secured once they arrive until they are distributed to the public.

Step Seven: Funding an Air Purifier Program

Local organizations and municipalities can seek funding from federal and state grants or from foundations.

1. Federal granting agencies may fund your program:
    - EPA air quality grants are offered each year. These may have a research component so. These grants could be pursued with an institution of higher education or, with the assistance of a healthcare or health research partner. Keep in mind, federal grants are highly competitive and require in some cases more participating organizations and complexity or innovation for the residential air purifier project.
    - Additional federal agencies may fund residential air purifier projects.
        - Federal Grant Search Engine
2. Each state government can apply for and receive match federal funding for projects. Reach out to your local and state agencies who manage public health and air quality for help in formulating a plan for securing funding.
3. Private foundations with a mission to assist with community health are additional options for funding. List your organization or search for non-profits to partner with and funding organizations on Guidestar. Clearing houses can be used to research available funding but, frequently there is a small fee for these services. Here is a list of highly rated directories for foundation grants:
    - Funds for NGOs
    - Foundation Center
    - Grant Station
    - Grant Gopher
    - Tera Viva Grants Directory
    - Grantmakers.io is perhaps the best free resource for accessing grant information. Enter your state to see a full list of recent grants awards

along with the foundations providing the funding. Narrow down your search to county, then your town or city.

4. Doctors or community care organizations may be able to prescribe air filters for vulnerable residents. The cost could be covered by insurance.

Here are some tips for securing funding:

1. **Be prepared:** Before applying for grant funding, make sure you're prepared by following this guides' recommendations for evaluating your community's population and vulnerability to smoke, organizing with local leaders, performing initial planning and needs assessments and growing partnerships within the community.

2. **Make a budget:** Outline the project or the initiative you need funding for, and then determine the amount you need for the project.

3. **Align your project:** Does our mission for the project align with the vision and goals of the foundation offering funding?

4. **Start small and local:** Is there a local bank, non-profit, health organization or business who could partner with your organization or municipality for a residential air purifier program?

5. **Build relationships:** Just like with every other type of fundraising, relationships matter. When you begin organizing the project, try including organizations who would be the most interested in pursuing a residential room air purifier or indoor air quality project.

6. **Understand your program or project impact:** Government and non-profit foundations will want to know the impact of your program. Think about how smoke has impacted your community, what the health risks are and formulate how to measure the impact of the residential air purifiers. How will improving indoor air quality help residents at-risk?

Resources and Tools for Organizing Your Program

1. Wildfire Smoke: Guide for Public Health Officials
    a. Steps to take in advance of smoke.

   b. Health effects of wildfire smoke.
   c. Guidance for who is most at risk.
   d. Strategies for mitigating smoke.
   e. Decide when to issue closures, evacuations.
   f. Steps residents can take to reduce exposure to smoke.
2. CDC Wildfire Smoke Factsheet: Indoor Air Filtration
3. EPA Wildfires and Indoor Air Quality (IAQ): Website and Resources for IAQ

Links for citizen education on indoor air quality:

- EPA Smoke Ready Toolbox
- EPA Guide to Air Cleaners in the Home
- How Does Wildfire Smoke Affect Indoor Air Quality?
- What Can I Do Now to Protect My Family from Wildfire Smoke?
- What Can I Do During a Wildfire Smoke Event to Reduce My Family's Exposure to Smoke Indoors?
- What Can I Do After a Wildfire Smoke Event to Protect My Family from Ash Indoors?
- Additional Resources

Common Terms and Acronyms

AirNow: A one-stop source for air quality data. The website highlights air quality in your local area first, while still providing air quality information at state, national, and world views.

Air Quality Index (AQI): The Air Quality Index (AQI) is divided into six categories. Each category corresponds to a different level of health concern. Each category also has a specific color. The color makes it easy for people to quickly determine whether air quality is reaching unhealthy levels in their communities.

Carbon Filter: A method of filtering that uses a bed of activated carbon to remove impurities from the air or other fluids using adsorption. Carbon filtering is commonly

used for water purification, air filtering and industrial gas processing. Not all residential room air purifiers have a carbon filter, however, it is recommended.

Centers for Disease Control and Prevention (CDC or U.S. CDC): The national public health agency of the United States. It is a United States federal agency, under the Department of Health and Human Services, and is headquartered in Atlanta, Georgia. Its main goal is to protect public health and safety through the control and prevention of disease, injury, and disability in the US and internationally. The agency provides health recommendations for prevention of disease from wildfire smoke.

Clean Air Delivery Rate (CADR): CADR is a metric that was developed as a way of measuring the performance of residential air purifiers. The CADR rating reflects the volume of air in CFM (cubic feet per minute) that is cleaned of particles of certain sizes. To measure the effectiveness in removing different particle sizes, three types of particles are tested: smoke, pollen and dust. These represent small, medium, and large sized particles. Each is measured and assigned it's own CADR score. By combining the amount of airflow and particle removal efficiency, consumers are less likely to be misled by a high efficiency filter that is filtering a small amount of air, or by a high volume of air that is not being filtered very well.

Controlled Burning: Also called prescribed fire, is a tool used for managing the forests during the spring and fall months (cool seasons) generally from when wildfire season ends until wildfire season is declared over in October/November until May/June when wildfire season resumes.

Department of Environmental Quality (DEQ): Regulations for the minimum federal requirements for land, air and water quality that is administered through any of various U.S. state agencies.

Environmental Protection Agency (EPA): An independent federal agency, created in 1970, that sets and enforces rules and standards that protect the environment and control pollution. The EPA provides guidance for residential room air purifiers and improving indoor air quality.

High-Efficiency Particulate Air Filter: Also known as high-efficiency particulate absorbing filter and high-efficiency particulate arrestance filter (HEPA), the filters meet the HEPA standard and must satisfy certain levels of efficiency. Common standards require that a HEPA air filter must remove—from the air that passes through—at least 99.97% (ASME, U.S. DOE) of particles whose diameter is equal to 0.3 µm; with the filtration efficiency increasing for particle diameters both less than and greater than 0.3 µm.

Heating, Ventilation and Conditioning (HVAC): HVAC systems are typically for the entire residential house and air quality can be improved with appropriate air filtration technology. The filters only function when the system is operating. Most HVAC systems can run if needed to filter indoor air but are usually only operated when heating and cooling is necessary, which can be less than 25% of the time during heating and cooling seasons in residential structures.

Indoor Air Quality (IAQ): Refers to the air quality within and around buildings and structures, especially as it relates to the health and comfort of building occupants. Understanding and controlling common pollutants indoors can help reduce your risk of indoor health concerns.

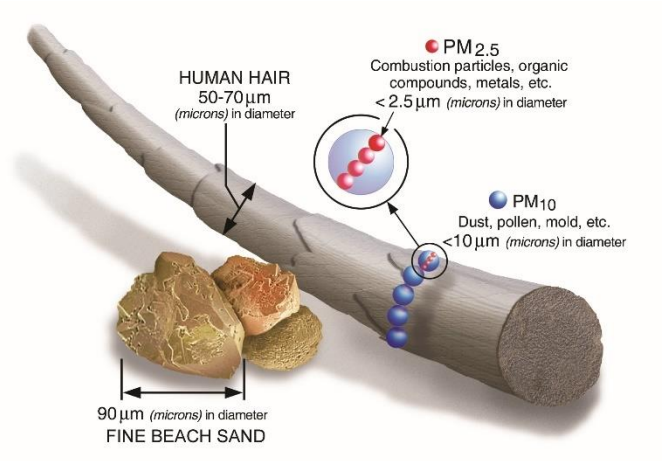
Minimum Efficiency Reporting Value (MERV): A measurement scale designed in 1987 by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) to report the effectiveness of air filters in more detail than other ratings. Or in English, "how effective is your air filter?" MERV ratings range from 1-16. The higher the MERV rating on a filter, the fewer dust particles and other contaminants can pass through it. For wildfire smoke, a MERV 13 or better is recommended for filtering PM 2.5.

MERV Table Showing Air Filters Used in HVAC Systems

MERV Rating	Particle size	Typical controlled contaminant	Typical Application
1–4	> 10.0 µm	Pollen, dust mites, cockroach debris, sanding dust, spray paint dust, textile fibers, carpet fibers	Residential window AC units
5–8	10.0–3.0 µm	Mold spores, dust mite debris, cat and dog dander, hair spray, fabric protector, dusting aids, pudding mix	Better residential, general commercial, industrial workspaces
9–12	3.0–1.0 µm	Legionella, humidifier dust, lead dust, milled flour, auto emission particulates, nebulizer droplets	Superior residential, better commercial, hospital laboratories
13–16	1.0–0.3 µm	Bacteria, droplet nuclei (sneeze), cooking oil, **most smoke** and insecticide dust, most face powder, most paint pigments	Hospital & general surgery

National Ambient Air Quality Standards (NAAQS): The Clean Air Act, which was last amended in 1990, requires EPA to set National Ambient Air Quality Standards (40 CFR part 50) for six principal pollutants ("criteria" air pollutants) which can be harmful to public health and the environment. The Clean Air Act identifies two types of national ambient air quality standards. ***Primary standards*** provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly. ***Secondary standards*** provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. Here is a link to the historic regulation of NAAQS for PM 2.5

PM 2.5: PM 2.5 refers to the size of the pollutant, in micrometers. The "Fine" particulate matter is measured by health agencies and pollution experts by certified nephelometers placed at different locations. PM 2.5 possess one attribute that makes them particularly dangerous, these particulates can't just penetrate your lungs, they are also small enough to pass directly into your bloodstream. Think about a single hair from your head. The average human hair is about 70 micrometers in diameter – making it 30 times larger than the largest fine particle.



Example of PM 2.5 Measurement as Compared to a Human Hair

Residential Room Air Purifier or Portable Room Air Cleaners and also known as HEPA Portable Air Cleaners (PACs for short): A certified air purifier or air cleaner is a device which removes contaminants from the air in a room to improve indoor air quality. Also known as air filtration units, these are portable appliances that filter out tiny particulate matter (PM) - 2.5 microns and smaller. These ultrafine bits are the most common and dangerous component of wildfire smoke. Air purifiers should be a HEPA filter rated at 99.97% or higher for safe removal of fine particulates called PM 2.5. The portable room air cleaners are low cost for installation and upfront cost when compared to HVAC systems. *It's important to remember that air purifiers must be properly maintained to work correctly. Maintenance neglect can inhibit functionality and performance of these devices.*

Room air purifiers

Smoke Vulnerable Population: Exposure to wildfire smoke poses a significant danger to everyone. However, certain populations may have a higher risk of experiencing negative effects. As define by the Center for Disease Control (CDC) smoke vulnerable people include pregnant women, children, older adults, those with pre-existing medical conditions and those with low socio-economic status.

Example Smokewise Ashland Air Purifier Application

To assist individuals most sensitive to smoke, the City of Ashland, through a grant from the State of Oregon, is offering free air purifiers to those in greatest need. Citizens will be screened based on income, medical condition and age-based smoke vulnerability. A limited quantity is available, so we are dedicated to serving those with the greatest need first. Applications will close at 5:00 p.m. on July 17th. You will be notified after July 17th if you qualify. Please fill-in the application below to establish eligibility. For questions regarding the application visit: www.ashland.or.us/airpurifier

First Name *

Last Name *

Street Address *

Address Line 2

City *

Phone Number *

Email Address

How were you referred to the air purifier program? *

Does anyone in your household regularly smoke cigarettes or use e-cigarettes inside your home? *

In whole dollars, please list your gross annual income from all household members. *

How many people are in your household? *

Please list the number of household members who have heart or lung disease, asthma or COPD. *

According to the Center for Disease Control, children and people over the age of 65 are most vulnerable to smoke. Please list the numbers of persons in your household in the following age categories:

	Number of household members in each age category.
Children Age 0-5	
Children Age 6-10	
Children Age 11-15	
Adults Over 65	

If you qualify to receive an air purifier, delivery of the purifier is available to residents who do not drive or do not have access to a vehicle. Please check the box below if you do not drive or have access to a vehicle and need the air purifier delivered to your home.

☐ Yes, I do not drive.

Please type your full name to certify all the information you have provided on all pages of this application is true and accurate to the best of your knowledge. *

Oregon law makes it a Class "A" misdemeanor (punishable by up to one year in prison or a fine of up to $1,000.00 for a person to issue a false statement with the intent to defraud, ORS 165.000). It is also a class "A" misdemeanor for a person to obtain the execution of documents by deception with the intent to defraud or injure another or to acquire a substantial benefit (ORS 165.102). I DECLARE THAT I HAVE EXAMINED THIS REQUEST FOR A FREE AIR PURIFIER AND TO THE BEST OF MY KNOWLEDGE AND BELIEF; THE INFORMATION CONTAINED IN IT IS TRUE, CORRECT AND COMPLETE.