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**Alberto Ayala**

December 23, 2021

Assemblymember Kevin McCarty  
California Assemblymember 7<sup>th</sup> District  
915 L St #110  
Sacramento, CA 95814

**Subject: Status Update – Development of AB 661 Wildfire Smoke Air Pollution Emergency Plan for Sacramento County**

Dear Assemblymember McCarty:

I would like to provide you with a progress update on AB 661 *Wildfire Smoke Air Pollution Emergency Plan* (Plan). Unfortunately, while we must acknowledge that we will not be able to meet the legislative deadline in your bill requiring our agency to submit the Plan to the Legislature by January 1, 2022, this delay is unavoidable and justified. The COVID pandemic and the lack of state resources made available for this effort made the deadline unattainable. We anticipate being able to submit the Plan by mid-year 2022 once we obtain approval of it by our Board of Directors. However, we are pleased to report now that there has been significant progress in the Sacramento region, and we would like to share some highlights.

Since adoption of AB 661 in October 2019, the Sacramento Metropolitan Air Quality Management District (Sac Metro Air District) has been working closely with the Sacramento County Department of Public Health (Sac County Public Health), Breathe California - Sacramento Region (Breathe), and other regional partners in the development of the Plan. Most importantly, we have also been working on the identification and implementation of early actions that can lead right away to an improved response to wildfire pollution episodes. To date, we can point to the following accomplishments:

**Formation of core AB 661 coalition for improved coordination and response**

One of the first actions taken in the region under your legislative direction was the establishment of a broad and response-driven coalition of decision makers and key partners within Sacramento County public health, agencies with emergency response functions, and county school superintendents. This new coalition is active and already effectively coordinating important decisions such as sheltering-in-place orders, the opening of cleaner air centers, and school closures. This new effort fully utilizes relevant expertise of all members and optimizes the use of existing emergency response resources.

**Action charts and other communication aids for key stakeholder groups: schools, public agencies, businesses, and residents**

One of the most popular requests we heard from stakeholders was the need for simple and clear direction for taking protective action from wildfires as a function of the severity of the pollution impacting the region. In response, our agency developed four distinct AB 661 charts building on previous efforts by other California air districts. The charts include a list of succinct recommended response actions based on the Air Quality Index (AQI) reported for each of the various communities and jurisdictions in the county. The response actions are now readily available to those who need to make decisions.

**Regional survey for informing an evidence-based AB 661 Plan**

In one unique feature of our approach, we conducted a survey of three key cohorts to determine the characteristics and typical responses being taken when the region was affected by wildfire pollution. The target cohorts were businesses, public agencies, and non-profit organizations. The objective of the survey was to establish a baseline to understand how these sectors are impacted by wildfire smoke, what decisions and actions were being made during previous events, and what best practices could be implemented during future wildfire smoke events that could help reduce overall air pollution and reduce employee smoke exposure. The survey responses will ultimately inform the Plan and represent a key defining element of the work.

In brief, the survey showed most employers from both public and private sectors were either highly or moderately impacted during previous smoke events. Loss of revenue and productivity were the most often mentioned impact. The survey also revealed that employers are interested in taking additional steps during future smoke events to decrease smoke exposure for their employees – increasing access to personal protective equipment, implementing telework for employees, reducing or cancelling outdoor work and monitoring indoor air quality. Lastly, the survey confirmed that tools created for the emergency plan, like the Air Quality Action Charts, will be helpful resources for our business and public agencies during wildfire smoke events.

**Outreach**

In an effort to learn from all jurisdictions about existing emergency response, and in order to raise awareness about our new AB661 collaboration and the new resources available, the Sac Metro Air District and Breathe established communication with city leadership in the region. Typically, a city manager and/or emergency response personnel are active members of the AB 661 coalition. This network was used throughout the Plan development and was especially beneficial in understanding how cities respond to assist vulnerable populations during wildfire smoke events.

**New AQI science and resources**

Determining the appropriate response to impacts from wildfire pollution has been based on the AQI. The AQI is a metric that captures ambient air pollution levels averaged over the previous 24 hours. Since the worst wildfire pollution impacts tend to occur over a shorter time interval, for our AB 661 work we sought to explore the potential for a more appropriate and shorter AQI timeframe, presuming an adjusted AQI would be more health protective. Through efforts spear-headed by our partners, in particular the state Office of Environmental Health Hazard Assessment and the California Air Pollution Control Officers Association, we now have evidence to support the continued use of the existing AQI since we see no better health effect from use of an AQI average over shorter timeframes. Moreover, we benefit from a readily available new AQI resource, the AirNow Fire & Smoke Map ([fire.airnow.gov](http://fire.airnow.gov)),

thanks to the efforts of our federal partners, the US Environmental Protection Agency and the US Forest Service.

We are providing the new resources and tools described above as attachments to this memo. In addition, we are sharing the full summary results from the online survey. We would like to thank you again for bringing attention and support to the important topic of wildfire smoke impacts and the need for improved local coordination. It is unfortunately something that all areas in California will continue to deal with in the foreseeable future and AB 661 has already provided the springboard for Sacramento to be better prepared and organized when the next wildfire results again in unhealthy particle pollution levels in the capital region.

Sincerely,



Alberto Ayala, Ph.D., M.S.E.  
Executive Director/Air Pollution Control Officer

cc: Councilmember Eric Guerra, City of Sacramento and  
Board Chair, Sacramento Metropolitan Air Quality Management District  
915 I Street, 5th Floor  
Sacramento, CA 95814

Supervisor Patrick Kennedy, County of Sacramento and  
Board Member, Sacramento Metropolitan Air Quality Management District  
700 H Street, Room 2450  
Sacramento, CA 95814

Enclosures: Air Quality Action Chart for Schools (1), Air Quality Action Chart for Public Agencies (2), Air Quality Action Chart for Businesses (3), Air Quality Action Chart for General Public (4), Advisory: Contact Information for Schools to Use During Wildfire Smoke Events (5), Advisory: 5 Steps to Take During Wildfire Smoke Events (6), Advisory: You Can Help Reduce Pollution During Unhealthy Air Quality Events (7), Survey Summary Results: Impacts of Wildfire Smoke Events on Businesses, Non-Profits, and Public Sector Agencies in the Sacramento Region (8)

# School Districts

# Recommended Actions During Wildfire Smoke & Other Unhealthy Air Quality Events

## HOW TO USE THIS CHART:

**STEP 1:** Find the current local air quality conditions (AQI) at [fire.airnow.gov](http://fire.airnow.gov). To find forecasted air quality conditions go to [airquality.org](http://airquality.org).

**STEP 2:** Once you know the AQI nearest your school or outdoor event, use the table below to help you plan & make decisions during a wildfire smoke event or anytime the AQI increases.

ACTIVITY	Level 1 GOOD	Level 2 MODERATE	Level 3 UNHEALTHY FOR SENSITIVE GROUPS	Level 4 UNHEALTHY	VERY UNHEALTHY (School closure may be considered <sup>2</sup> )	Level 6 HAZARDOUS (School closure may be considered <sup>2</sup> )
AQI	0-50	51-100	101-150	151-200	201-300	≥301
<b>Recess (15 min)</b>	No Restrictions	Ensure sensitive individuals <sup>1</sup> are medically managing their condition	Sensitive individuals <sup>1</sup> should exercise indoors or avoid vigorous outdoor activities  Allow individuals who complain of difficulty breathing to play indoors	Exercise indoors or avoid vigorous outdoor activities  Sensitive individuals <sup>1</sup> or any individual who complains of difficulty breathing should remain indoors	No outdoor activity  All activity should be moved indoors or discontinued	No outdoor activity  All activity should be moved indoors or discontinued
<b>Physical Education Class (60 min)</b>	No Restrictions	Ensure sensitive individuals <sup>1</sup> are medically managing their condition	Sensitive individuals <sup>1</sup> should exercise indoors or avoid vigorous outdoor activities  Make indoor space available for sensitive individuals <sup>1</sup>  Increase rest periods and substitutions to lower breathing rates	Exercise indoors or limit vigorous outdoor activity to maximum 15 minutes  Sensitive individuals <sup>1</sup> or any individual who complains of difficulty breathing should remain indoors	No outdoor activity  All activity should be moved indoors or discontinued	No outdoor activity  All activity should be moved indoors or discontinued
<b>Athletic Practice/ Scheduled Sporting Events</b>	No Restrictions	Ensure sensitive individuals <sup>1</sup> are medically managing their condition	Ensure sensitive individuals <sup>1</sup> are medically managing their condition  Reduce vigorous exercise to 30 minutes per hour  Increase rest periods and substitutions to lower breathing rates	Reduce vigorous exercise to 30 minutes per hour  Increase rest periods and substitutions to lower breathing rates  Sensitive individuals <sup>1</sup> should remain indoors	Practice or event should be rescheduled, moved indoors or discontinued	Practice or event should be rescheduled, moved indoors or discontinued
<b>Scheduled Outdoor Events</b>	No Restrictions	Ensure sensitive individuals <sup>1</sup> are medically managing their condition	Ensure sensitive individuals <sup>1</sup> are medically managing their condition	Decrease duration of events exceeding 2 hours  Consider rescheduling or relocating event	Event should be rescheduled, moved indoors or discontinued	Event should be rescheduled, moved indoors or discontinued

<sup>1</sup> Sensitive Individuals include anyone with asthma or other heart/lung conditions. Students with asthma should follow their asthma action plans and keep their quick-relief medicine handy.

<sup>2</sup> To meet waiver approval conditions due to emergency conditions ([Form J-13A](#)) from the State Superintendent of Public Instruction, poor air quality must be shown to be caused by an emergency event such as a wildfire.

# Public Agencies

## \*DRAFT\* Recommended Actions & Regulatory Requirements During Wildfire Smoke & Unhealthy Air Quality Events \*DRAFT\*

### HOW TO USE THIS CHART:

**STEP 1:** Find the current local air quality conditions (AQI) at [fire.airnow.gov](http://fire.airnow.gov). To find forecasted air quality conditions go to [airquality.org](http://airquality.org).

**STEP 2:** Once you know the AQI nearest your location, use the table below to help you plan and make decisions during a wildfire smoke event. Please note, **BOLDED TEXT** denotes regulatory requirements; all other items are recommended actions. Refer to regulations for complete information.

ACTIVITY	Level 1 GOOD	Level 2 MODERATE	Level 3 UNHEALTHY FOR SENSITIVE GROUPS	Level 4 UNHEALTHY	Level 5 VERY UNHEALTHY	Level 6 HAZARDOUS
AQI	0-50	51-100	101-150	151-200	201-300	≥301
Landscaping Activities	No additional recommended actions	No additional recommended actions	Limit leaf blower use <b>(check local ordinances for use restrictions<sup>1</sup>)</b> Limit landscaping activities	Don't use leaf blowers <b>(check local ordinances)<sup>1</sup></b> Discontinue all landscaping activities until AQI returns to Level 3 or less	Don't use leaf blowers <b>(check local ordinances)<sup>1</sup></b> Discontinue all landscaping activities until AQI returns to Level 3 or less	Don't use leaf blowers <b>(check local ordinances)<sup>1</sup></b> Discontinue all landscaping activities until AQI returns to Level 3 or less
Activities that create dust emissions	Prevent dust per Air District <a href="#">Rule 403</a>	Prevent dust per Air District <a href="#">Rule 403</a>	Prevent dust per Air District <a href="#">Rule 403</a>	Prevent dust per Air District <a href="#">Rule 403</a>	Discontinue all activities until AQI returns to Level 4 or less; at minimum <b>prevent dust per Air District <a href="#">Rule 403</a></b>	Discontinue all activities until AQI returns to Level 4 or less; at minimum <b>prevent dust per Air District <a href="#">Rule 403</a></b>
Outdoor Work Activities / Employee Safety	Establish wildfire communication plan <sup>2</sup> Train employees on Cal/OSHA Wildfire Smoke Standards <sup>2</sup>	Monitor AQI forecast to help plan work activities <sup>2</sup>	Monitor AQI forecast to plan work activities & public events <sup>2</sup> Provide air quality info to employees <sup>2</sup> Sensitive groups should consider wearing N95 masks	Reduce employee exposure to smoke <sup>2</sup> If exposure can't be reduced, provide N95 masks for voluntary use <sup>2</sup> Everyone should consider wearing N95 masks	Reduce employee exposure to smoke <sup>2</sup> If exposure can't be reduced, provide N95 masks for voluntary use <sup>2</sup> Everyone should consider wearing N95 masks	Reduce employee exposure to smoke <sup>2</sup> If exposure can't be reduced, provide N95 masks for voluntary use <sup>2</sup> <b>Require employees wear N95 masks at AQI &gt;500<sup>2</sup></b>
Indoor Work <sup>3</sup> Activities / Employee Safety	No additional recommended actions	No additional recommended actions	Monitor AQI forecast to help plan work activities and public events Provide air quality information to employees	Check nearby AQI levels at <a href="http://fire.airnow.gov">fire.airnow.gov</a> to determine work activities and public events	Create cleaner air workspace or consider telework for employees	Create cleaner air workspace or consider telework for employees
Public Safety Messaging/ Cleaner Air Centers	No additional recommended actions	Monitor Air Quality	Activate Wildfire Smoke Action & Public Messaging Plan (when wildfire smoke creates 2 consecutive days PM 2.5 >100 AQI)	Consider opening cleaner air centers Consider issuing public health advisory/messages Consider cancelling outdoor public events	Publicize availability of cleaner air centers (if open) Discuss school closure potential, public health alert, event cancellation	Publicize availability of cleaner air centers (if open), public health alerts and any event cancellations

<sup>1</sup> [City of Sacramento Code section 8.70](#); review ordinance for full requirements

<sup>2</sup> Cal/OSHA Emergency Regulation to protect employees from smoke during wildfire events ([§5141.1 Protection from Wildfire Smoke](#)); review regulation for full requirements. During certain health crises, N95 masks may be in short supply and/or reserved for healthcare personnel; follow state and local guidance on allowed alternatives for respiratory protective equipment.

<sup>3</sup> Information on indoor air quality can be found here: <https://www.epa.gov/indoor-air-quality-iaq/wildfires-and-indoor-air-quality-iaq>

# Businesses

## \*DRAFT\* Recommended Actions & Regulatory Requirements During Wildfire Smoke & Unhealthy Air Quality Events \*DRAFT\*

### HOW TO USE THIS CHART:

**STEP 1:** Find the current local air quality conditions (AQI) at [fire.airnow.gov](http://fire.airnow.gov). To find forecasted air quality conditions go to [airquality.org](http://airquality.org).

**STEP 2:** Once you know the AQI nearest your business, use the table below to help you plan and make decisions during a wildfire smoke event. Please note, **BOLDED TEXT** denotes regulatory requirements; all other items are recommended actions. Refer to regulations for complete information.

ACTIVITY	Level 1 GOOD	Level 2 MODERATE	Level 3 UNHEALTHY FOR SENSITIVE GROUPS	Level 4 UNHEALTHY	Level 5 VERY UNHEALTHY	Level 6 HAZARDOUS
AQI	0-50	51-100	101-150	151-200	201-300	≥301
Landscaping Activities	No additional recommended actions	No additional recommended actions	Limit leaf blower use <b>(check local ordinances for use restrictions<sup>1</sup>)</b> Limit landscaping activities	Prohibit leaf blower use <b>(check local ordinances for use restrictions<sup>1</sup>)</b> Discontinue all landscaping activities until AQI returns to Level 3 or less	Prohibit leaf blower use <b>(check local ordinances for use restrictions<sup>1</sup>)</b> Discontinue all landscaping activities until AQI returns to Level 3 or less	Prohibit leaf blower use <b>(check local ordinances for use restrictions<sup>1</sup>)</b> Discontinue all landscaping activities until AQI returns to Level 3 or less
Activities that create dust emissions	Prevent dust per Air District <a href="#">Rule 403</a>	Prevent dust per Air District <a href="#">Rule 403</a>	Prevent dust per Air District <a href="#">Rule 403</a>	Prevent dust per Air District <a href="#">Rule 403</a>	Discontinue all activities until AQI returns to Level 4 or less; at minimum <b>prevent dust per Air District <a href="#">Rule 403</a></b>	Discontinue all activities until AQI returns to Level 4 or less; at minimum <b>prevent dust per Air District <a href="#">Rule 403</a></b>
Outdoor Work Activities / Employee Safety	Establish wildfire communication plan <sup>2</sup> Train employees on Cal/OSHA Wildfire Smoke Standards <sup>2</sup>	Monitor AQI forecast to help plan work activities <sup>2</sup>	Monitor AQI forecast to help plan work activities <sup>2</sup> Provide air quality info to employees <sup>2</sup> Sensitive groups should consider wearing N95 masks	Reduce employee exposure to smoke <sup>2</sup> If exposure can't be reduced, provide N95 masks for voluntary use <sup>2</sup> Everyone should consider wearing N95 masks	Reduce employee exposure to smoke <sup>2</sup> If exposure can't be reduced, provide N95 masks for voluntary use <sup>2</sup> Everyone should consider wearing N95 masks	Reduce employee exposure to smoke <sup>2</sup> If exposure can't be reduced, provide N95 masks for voluntary use <sup>2</sup> <b>Require employees wear N95 masks at AQI &gt;500<sup>2</sup></b>
Indoor Work <sup>3</sup> Activities / Employee Safety	No additional recommended actions	No additional recommended actions	Monitor AQI forecast to help plan work activities Provide air quality information to employees	Check nearby AQI levels at <a href="http://fire.airnow.gov">fire.airnow.gov</a> to determine work activities	Create cleaner air workspace or consider telework for employees	Create cleaner air workspace or consider telework for employees

<sup>1</sup> [City of Sacramento Code section 8.70](#); review ordinance for full requirements

<sup>2</sup> Cal/OSHA Regulation to protect employees from smoke during wildfire events ([§5141.1 Protection from Wildfire Smoke](#)); review regulation for full requirements. During certain health crises, N95 masks may be in short supply and/or reserved for healthcare personnel; follow state and local guidance on allowed alternatives for respiratory protective equipment.

<sup>3</sup> Information on indoor air quality can be found here: <https://www.epa.gov/indoor-air-quality-iaq/wildfires-and-indoor-air-quality-iaq>

# General Public

## \*DRAFT\* Recommended Actions During Wildfire Smoke & Other Unhealthy Air Quality Events

### HOW TO USE THIS CHART:

**STEP 1:** Find the current local air quality conditions (AQI) at [fire.airnow.gov](http://fire.airnow.gov). To find forecasted air quality conditions go to [airquality.org](http://airquality.org).

**STEP 2:** Once you know the AQI nearest your location, use the table below to help you plan & make decisions during a wildfire smoke event or anytime the AQI increases.

ACTIVITY	Level 1 GOOD	Level 2 MODERATE	Level 3 UNHEALTHY FOR SENSITIVE GROUPS	Level 4 UNHEALTHY	Level 5 VERY UNHEALTHY	Level 6 HAZARDOUS
AQI	0-50	51-100	101-150	151-200	201-300	≥301
<b>General Outdoor Activity</b>	No Suggested Actions	Sensitive individuals <sup>1</sup> should be prepared to medically manage their condition Know where to go to get air quality information so you can plan your activities if conditions worsen	Sensitive individuals <sup>1</sup> should stay indoors or avoid vigorous outdoor activities	Avoid vigorous outdoor activities Sensitive individuals <sup>1</sup> or <b>any</b> individual having difficulty breathing should remain indoors	No outdoor activity All activity should be moved indoors or discontinued	No outdoor activity All activity should be moved indoors or discontinued
<b>Exercise</b>	No Suggested Actions	Sensitive individuals <sup>1</sup> should be prepared to medically manage their condition Know where to go to get air quality information so you can plan your activities if conditions worsen	Sensitive individuals <sup>1</sup> should exercise indoors or avoid vigorous exercise activities Increase rest periods and lower breathing rates Reduce vigorous exercise to 30 minutes per hour or less	Exercise indoors or limit vigorous exercise activity to maximum 15 minutes Sensitive individuals <sup>1</sup> or <b>any</b> individual having difficulty breathing should remain indoors	No outdoor exercise All activity should be moved indoors or discontinued	No outdoor exercise All activity should be moved indoors or discontinued
<b>Indoor Air Quality</b>	No Suggested Actions	Sensitive individuals <sup>1</sup> should be prepared to medically manage their condition Understand and maintain HVAC system to reduce smoke indoors Install & keep high-efficiency filters on hand Consider purchasing a certified portable air cleaner <sup>2</sup> to help improve indoor air quality when needed	Sensitive individuals consider using a portable air cleaner to reduce indoor air pollution Don't use products that increase indoor air pollution (candles, cleaners, air fresheners) Reduce activities that create more dust (frying foods, vacuuming) Follow previous guidance under Level 2	Run HVAC system on recirculate mode to reduce smoke indoors Keep doors and windows closed Change dirty filters as needed Create a clean air space at home (use a certified portable air cleaner <sup>2</sup> or DIY air cleaner) Follow previous guidance under Levels 2-3	Follow previous guidance under Levels 2-4	Follow previous guidance under Levels 2-4
<b>N95 Mask Use</b>	No Suggested Actions	Keep N95 masks on hand in case air quality worsens and you must go outside	Sensitive individuals should consider using N95 masks only if you must go outside; other health conditions and breathing rates should be monitored	Use an N95 mask if you must go outside & monitor other health conditions and breathing rates	Use an N95 mask if you must go outside & monitor health conditions	Use an N95 mask if you must go outside & monitor health conditions

<sup>1</sup> Sensitive Individuals include anyone with asthma or other heart/lung conditions. Those with asthma should follow their asthma action plans and keep their quick-relief medicine handy.

<sup>2</sup> The California Air Resources Board certifies portable air cleaners. Before you purchase, check to make sure it is certified here: <https://ww2.arb.ca.gov/list-carb-certified-air-cleaning-devices>

# Guidance for Sacramento County Schools During Wildfire Smoke Events



This information sheet provides resources for school officials to help make decisions about school activities and closures during a wildfire smoke event.



For current information on fires, smoke and air quality, visit EPA's AirNow website at <https://fire.airnow.gov>



For information on local air quality and other wildfire resources, visit Sac Metro Air District's website at [AirQuality.org](http://AirQuality.org) and click on the Wildfire Smoke Information link



For information on limiting smoke exposure, visit the [Sacramento County Public Health Department website](#) and search for Wildfire Smoke Exposure



To address immediate public health concerns and wildfire smoke, call the Sacramento County Public Health Office at (916) 875-5881



For general inquiries, call Sac Metro Air District's main line at (279) 207-1122



For current smoke and air quality information, download the free EPA AIRNow app on Google Play, the App Store and the Windows Store



For current local air quality, download the free Sacramento Region Air Quality App on Google Play, the App Store, and the Windows Store

# WHAT TO DO DURING A WILDFIRE SMOKE EVENT

Follow these steps to find air quality conditions and know what actions to take to help keep you and others as healthy as possible during days of high air pollution.

## STEP 1

Find the Current Local Air Quality

- Current local air quality conditions: [fire.airnow.gov](http://fire.airnow.gov)
- Forecasted (Future) AQI: [airquality.org](http://airquality.org)

## STEP 2

Review Air Quality Action Chart

- Go to the **Wildfire Smoke Info** page at [airquality.org](http://airquality.org)
- Find the **Air Quality Action Chart** for your sector

## STEP 3

Make Your Plan

- Review the recommended actions on the chart
- Determine what steps you will take
- Make your action plan

## STEP 4

Communicate the Plan

- Follow your communication plan
- Alert students, employees, etc. of actions to be taken during the smoke event

## STEP 5

Implement the Plan

- Check current air quality at [fire.airnow.gov](http://fire.airnow.gov)
- Follow through with recommended actions when air quality meets certain levels

SACRAMENTO METROPOLITAN



# You Can Help Reduce Pollution During Unhealthy Air Quality Events

During wildfire events and days of high pollution, when the air quality index (AQI) exceeds 100, you can help by avoiding activities that add more smoke or dust into the air we breathe. Find the local AQI here: [fire.airnow.gov](https://www.fire.airnow.gov).

## Landscaping



Do not use lawn equipment that may put more pollution from motors, dust, or ash into the air.

Many activities can put dust in the air, like demolition and construction projects and driving on dirt roads. Make sure to use low speeds and prevent dust with water or other methods.

## Dust-making Activities



## Burning



Burning anything, even dry wood in an outdoor fire pit, creates harmful smoke. Visit [AirQuality.org](https://www.airquality.org) to see which burning activities are illegal in Sacramento County.

Avoid any outdoor cooking that produces smoke.

## Outdoor Cooking



Visit [SpareTheAir.com](https://www.sparetheair.com) to sign up for Air Alerts and find other tips and actions you can take to help reduce air pollution.



# Impact of Wildfire Smoke Events on Businesses, Non-Profits, and Public Sector Agencies in the Sacramento Region Survey Summary



June 2021

## Background & Methodology

Severe wildfires and the serious smoke impacts they bring have unfortunately become regularly occurring events, resulting in many days of poor air quality for those living in the Sacramento region. Businesses, government agencies, and other organizations can all take action to try to minimize health impacts on employees, customers, and clients from wildfire smoke events. In October 2019, the Sacramento Metropolitan Air Quality Management District (Air District) was tasked to develop a *Wildfire Smoke Air Pollution Emergency Plan* as a part of Assembly Bill 661 (McCarty). To make the plan as complete as possible, the Air District collaborated with Breathe California Sacramento Region (Breathe) and the Sacramento County Department of Public Health to gather information on the impact of wildfire smoke events experienced by local businesses. The Air District and Breathe worked with LPC Consulting Associates, Inc. (LPC) to create a survey tool to solicit information on:

1. Their experiences during previous wildfire smoke events,
2. Best practices businesses can implement on smoky days to help reduce smoke exposure for their employees and County residents, and
3. What information is needed to help businesses respond during wildfire smoke events.

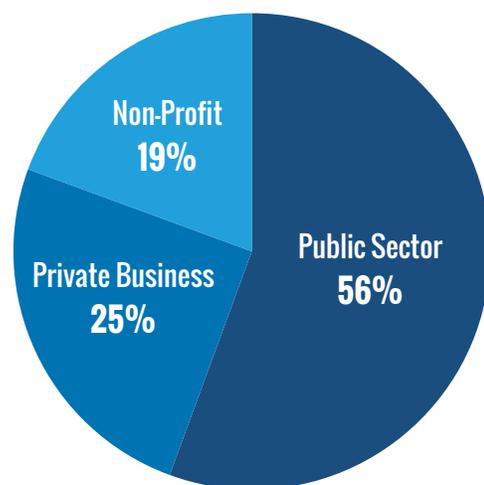
In May 2021, Breathe sent the online survey to 103 business organizations. The survey received a total of 50 responses, representing a 49 percent response rate.<sup>1</sup> The Air District plans to use the data gathered from the survey to help produce a useful plan that will help Sacramento County better respond during serious wildfire events. Below is a summary of key findings from the survey.

## Key Findings

### Respondent Characteristics

As shown in Figure 1, over half of survey respondents (56%) represented a public sector organization (including one school district), while a quarter of respondents (25%) were from a private business, and the remainder were from non-profit organizations (19%).

Figure 1 | Type of Business Represented (n=36)

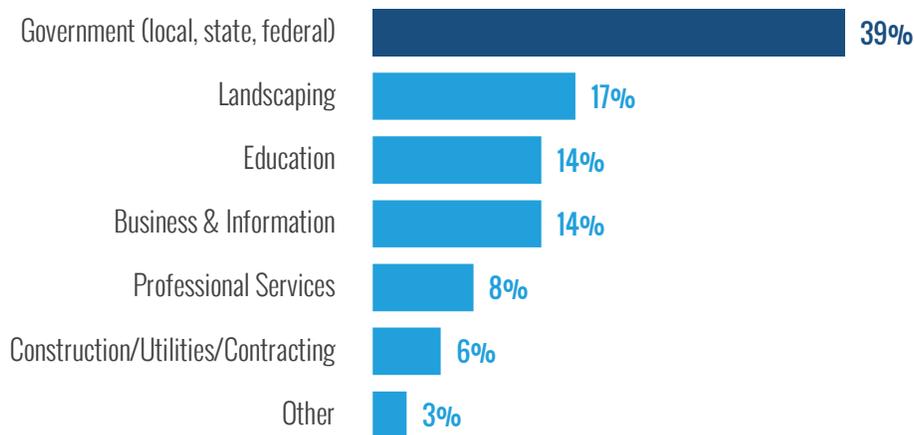


<sup>1</sup> Of the 50 responses, 27 responses were complete and 23 responses were partial. Data from the 23 partial responses is included in the key findings, if the question was answered.

The majority of respondents (83%) have employees that work in urban regions, while 42 percent have employees that work in suburban settings, and one quarter (25%) have employees working in rural settings. Respondents with employees working in rural regions were overwhelmingly private business respondents (56% of private business respondents), compared to only public sector agency respondents or non-profit organization respondents (15% and 14%, respectively). Over half (51%) of respondents' employees work in both indoor and outdoor settings, while 43 percent have employees working indoors only, and 29 percent have employees working in outdoor settings only. Over half of the private business respondents reported employees working mostly outdoors (56%), compared to 20 percent of public sector agency respondents or non-profit organization respondents (14%). Interestingly, 60 percent of public sector agency respondents reported that employees work both indoors and outdoors, compared to 43 percent of non-profit respondents, and 33 percent of private business respondents.<sup>2</sup>

Figure 2 below shows the business and industry types represented by 36 respondents, with government organizations representing the greatest number of respondents. The respondent who represented another type of business not listed reported that they are from a “property-based improvement district.”

**Figure 2 | Business or Industry Type Represented (n=36)**



## Impact of and Response to Wildfire Smoke Events

Respondents reported on their awareness of employees and clients being part of “sensitive groups,” the impacts of wildfire smoke events on their business or organization, and how they have responded to previous wildfire smoke events.

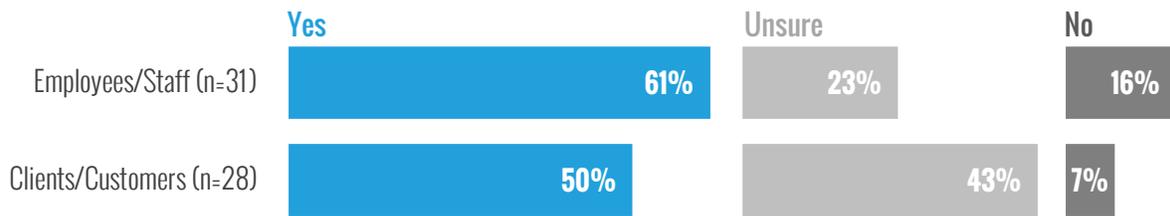
Survey respondents were asked if they were aware of any of their employees or clients that are members of “sensitive groups,” which means more likely to experience severe health problems as a result of exposure to air pollution. This includes people who suffer from heart disease, pregnant individuals, those with respiratory or lung conditions, older adults, and youth. As shown in Figure 3 below, to their

<sup>2</sup> Respondents could select multiple responses where employees typically work: indoors, outdoors, both indoors and outdoors.

knowledge, over three fifths of respondents (61%) employ individuals who are part of sensitive health groups, and half (50%) have clients in the same group. Respondents across all three organization types were unsure about whether some of their staff and/or clients were part of “sensitive groups,” although public sector agency respondents were more likely to affirm that staff (71%) and clients (67%) were part of sensitive groups.

**Figure 3 | Respondent Knowledge of Employee/Client Membership in “Sensitive Groups”**

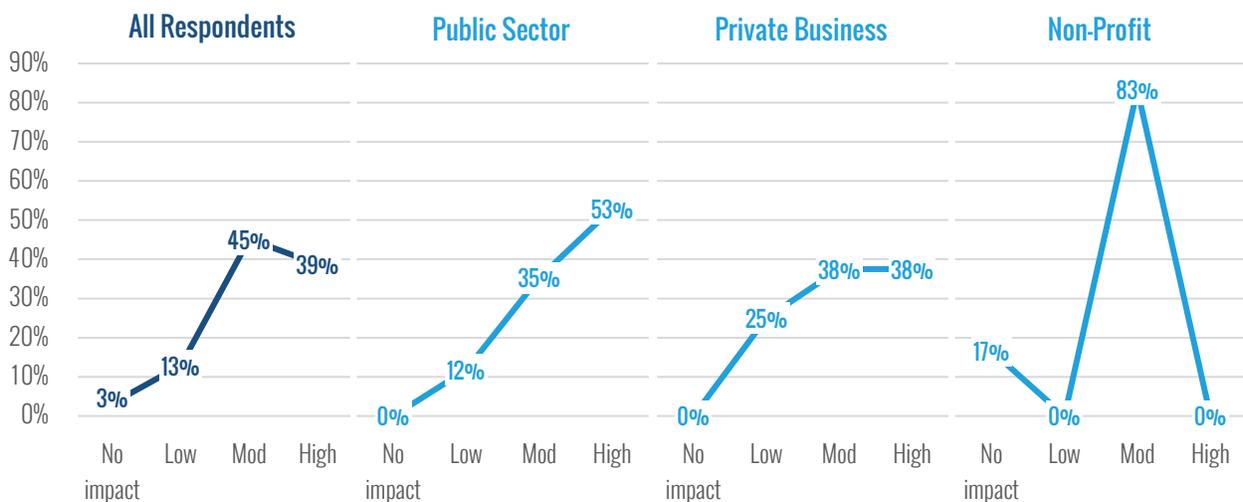
**To your knowledge, are any of your employees or clients members of “sensitive groups”?**



When asked about the impact of recent wildfire smoke events on their organization, 39 percent reported the events had a “high impact,” while 45 percent reported a moderate impact. The remaining reported low impact (13%) or no impact (3%). A greater proportion of public sector agency respondents reported a high impact (53%), compared to private business respondents (38%). No non-profit sector respondents rated the impact of recent wildfire smoke events as high impact, but the majority (83%) rated the impact as “moderate,” as shown below in Figure 4.

**Figure 4 | Impact of Recent Wildfire Smoke Events on Organizations**

**How would you rate the impact of recent wildfire smoke events on your organization?**



The survey asked an open-ended question about how wildfire smoke events have impacted businesses. The evaluator coded responses into common categories, listed in the table below.

**Table 1 | How Wildfire Smoke Events Impacted Business**

Impact Category	# of responses
Cancel or Limit Outdoor Activity	8
Health Concerns	5
Purchase or Issue Masks and Protective Personal Equipment	3
School District Closure	3
Employee Communications	2
County Government	2
Air Quality Monitoring	1
Policy Review	1
None – Indoor Work with HVAC Filtration System	1
Perception of Region	1

Below are explanations and respondent comments for both the most common categories, and for those that are unique or potentially unclear.

**Cancel or Limit Outdoor Activity & Health Concerns |** The majority of impacts on businesses were due to limiting or cancelling outdoor activities, which either could not be moved indoors or had to be conducted on a much smaller scale indoors. This impact went hand-in-hand with health concerns, as some employees could not work due to health concerns. One respondent elaborated that because of the inability of some employees being unable to work “due to health problems such as heart disease and lung problems – as a small company, that puts a strain on the rest of the workers.” One landscape contractor “worked through any smoke-filled days during the fires.” Some purchased and distributed protective personal equipment (PPE), such as masks to employees. However, while having PPE was a good step, these did not eliminate concerns about employee respiratory health.

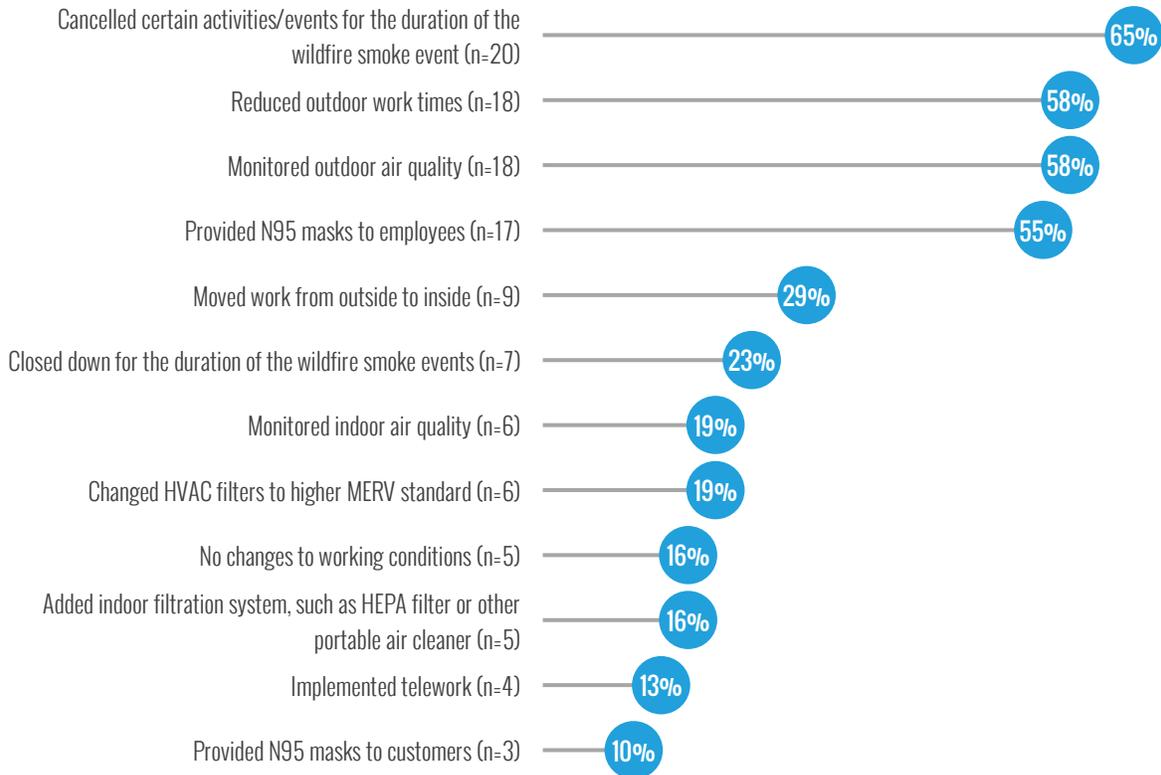
**School District Closure |** In addition to limiting recess and outdoor activity, some school districts had to close altogether, which leads to an unfortunate ripple effect. While they did not offer details on this ripple effect, they were most likely referring to after-school and supportive services, such as food and nutrition programs, parent programs, or after-school services. The wildfire smoke events had a “significant impact to our service and the supports we provide in our communities.”

**County Government |** Two respondents stated that they were impacted as a local government entity, and had to respond to the impact of wildfire smoke event on the community. However, these respondents did not offer further detail about how their organizations were impacted.

**Perception of Region |** Lastly, one survey respondent explained “wildfire smoke harms perception of the region more than anything in my line of work.” While they did not specify their line of work, this respondent may be in travel and hospitality, marketing, real estate, or another type of business that is heavily impacted by others’ perception of the Sacramento region.

Respondents also reported how they responded during previous wildfire smoke events, selecting all actions that applied from a multiple-choice list. Figure 5 below displays actions respondents took in reacting to wildfire smoke events. One respondent who marked “other” sent outdoor workers home with pay in cases where the air quality was unsafe, and their building management also implemented new filtration systems for indoor tenants. Another respondent that marked “other” stated that their standard operations stayed the same because all of their employees were working from home due to COVID.

**Figure 5 | Previous Actions Taken to Address Wildfire Smoke Events (n=31)**



Organizations responded differently, depending on the type of organization (see right). The most common way private business respondents reported dealing with previous wildfire smoke events in the past was monitoring outdoor air quality (67%), more than non-profit or public sector respondents (43% and 45%, respectively). In contrast, public sector respondents (65%) most frequently reported canceling certain activities/events for the duration of the wildfire smoke event, compared to non-profit respondents (57%) or private business respondents (33%). Non-profit respondents (57%) also most reported reducing outdoor work times, compared to 50 percent of public sector agencies and 44 percent of private businesses.

**Private Business | 67%**  
Cancelled certain activities/events for the duration of the wildfire smoke event

**Public Sector | 65%**  
Cancelled certain activities/events for the duration of the wildfire smoke event

**Non-Profit | 57%**  
Cancelled certain activities/events for the duration of the wildfire smoke event **OR** reduced outdoor work times

## Knowledge of Regulations and Resources, Potential Business Practices

### Knowledge of Regulations

Respondents reported on their level of knowledge, or the knowledge of someone in their organizations, around federal, state, or local regulations surrounding employee safety during wildfire smoke events. Thirty-one (31) respondents rated their knowledge on a five-point Likert scale ranging from “no knowledge” to “expert and can explain it to others.” Just over one-tenth each (13%) either have no knowledge, can understand and describe regulations, or can understand and discuss regulations, respectively. Most respondents (39%) reported they can integrate this knowledge into practice, and the remaining 13 percent reported they are an expert and can explain to others (Figure 6).

Figure 6 | Knowledge of Regulations Surrounding Employee Safety During Wildfire Smoke Events

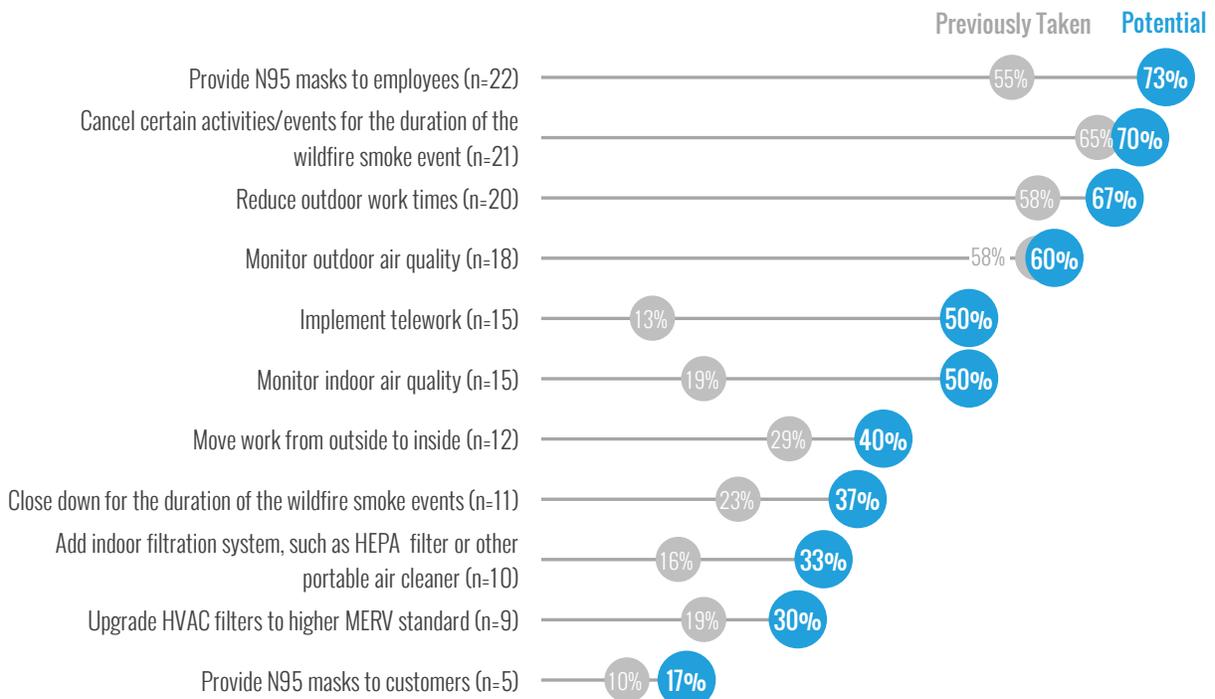
The greatest proportion of respondents (39%) believe they can integrate knowledge of regulations surrounding employee safety during wildfire smoke events into their practice.



### Potential Business Practices to Change or Institute

Survey respondents indicated which business practices they might be able to institute during a wildfire smoke event. The most frequent responses were providing N95 masks to employees, canceling certain activities or events, and reducing outdoor work times. Several respondents reported already taking these actions in the wildfire impact question asked earlier in the survey.

Figure 7 | Potential Business Practices to Institute (n=30) Compared to Actions Previously Taken (n=31)



While several comments referenced the cost and challenge in obtaining N95 masks, this potential response in the future was much more commonly reported (73%) than what respondents reported doing during past wildfire smoke events (55%). Again, potential business practices in response to wildfire smoke events differed between organization type. In the future, public sector respondents would be most likely to cancel certain activities/events for the duration of the wildfire smoke event (65%), compared to private business respondents (56%) or non-profit organization respondents (43%). Non-profit organizations will be most likely to provide N95 masks to employees (71%), as will private businesses (67%) and public sector agencies (55%). Private sector businesses may also continue to reduce outdoor work times (67%), as will public sector agencies (60%), compared to only 29 percent of non-profit organization respondents.

### Challenges in Implementing Business Practices

Survey respondents were asked about potential challenges faced in implementing the business practices selected in the figure above. Below are some potential challenges named by survey respondents:

Potential Challenge	Respondent Description
Revenue, Productivity & Logistics	<ul style="list-style-type: none"> <li>Loss of revenue, income, or funding source. (The most frequently mentioned response)</li> <li>Reduced productivity and effectiveness; reduced ability to do any outside portion of the job, or the entire job for outdoor workers such as maintenance and operations.</li> <li>The ability to find an indoor space to move outdoor activities into.</li> <li>Prioritizing profit: “upper management putting the safety and health of their employees over “work.”</li> </ul>
Supplies	<ul style="list-style-type: none"> <li>Acquiring N95 masks given the limited supply due to COVID.</li> </ul>
Location/Rental Space	<ul style="list-style-type: none"> <li>Limited availability to make changes to a building and its HVAC or filtration systems because they are a renting tenant.</li> <li>Potentially unsafe conditions at employee’s residences: “depending on people’s home environments, telework may not be as safe for air quality as coming to work, depending on the area impacted and quality of [the employee’s] home HVAC [system].”</li> </ul>
Information	<ul style="list-style-type: none"> <li>The need for a “science-based metric,” and more guidance from Cal/OSHA.</li> </ul>

### Current Communication or Action Plans for Wildfire Smoke Events

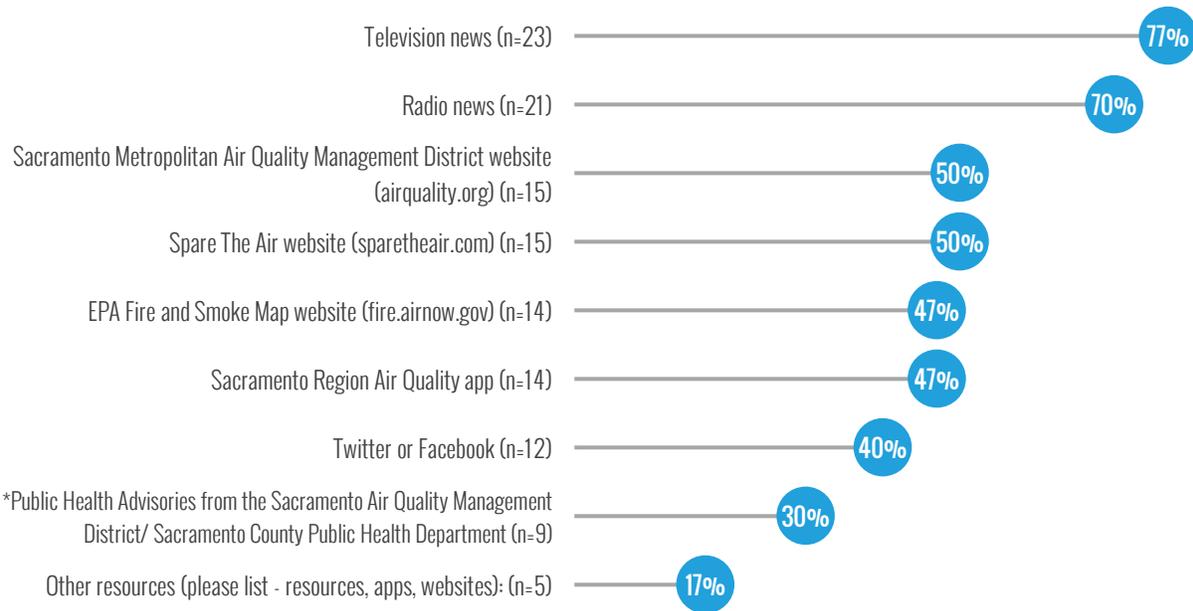
Interestingly, almost half (47%) of respondents have a communication and action plan developed for wildfire smoke events. Just under one third (30%) did not know, one fifth (20%) do not have a plan, and three percent intend to develop one. Non-profit organization respondents were the most likely to affirm that they had a communication or action plan (60%), compared to public sector agency respondents (47%) or private business respondents (38%). However, this may be a function of who completed the survey. Over 41 percent of public sector agency respondents did not know if they had a plan, so agencies may have

**47%**  
of respondents currently have a **Communication and Action Plan** for wildfire smoke events.

plans, but these respondents did not know about them. In addition to identifying a potential opportunity to support agencies to develop plans, this highlights an opening for employee education about plans that may already exist.

Survey respondents also indicated which resources they have used to obtain information during wildfire smoke events. Figure 8 below lists the sources utilized by respondents and their businesses.

**Figure 8 | Resources Used to Obtain Air Quality/Wildfire Information (n=30)**



\*usually through social media outlets

Three-quarters of public sector agency respondents (75%) reported using the Sacramento Metropolitan Air Quality Management District website (airquality.org), compared to non-profit respondents (57%) or private business respondents (44%). Non-profit organization respondents also reported using the Spare the Air website (sparetheair.com), as did a fair number of public sector agency respondents (65%) and private business respondents (44%). Overall, private business respondents were fairly evenly split between television and radio news, as well as city, county, and EPA websites. Only 22 percent of private business respondents reported referring to Public Health Advisories from the Sacramento Air Quality Management District/Sacramento County Public Health Department, usually through social media or other media outlets, compared to 43 percent of non-profit organization respondents or 50 percent of public sector agency respondents. Other resources listed include the Apple Weather App, which includes AQI, Weather Underground, other news websites, and Purpleair.com.

## Recommended Actions Chart

Of 28 respondents, three quarters (75%) believe the Recommended Actions Chart will be helpful to them during a future wildfire smoke event, and 7 percent do not believe it will be helpful to them. The only respondents who believed the Recommended Action Chart would not be helpful represented public sector agencies, which may have their internal own guidance or requirements. Approximately 18 percent of all respondents believe the Chart could be helpful with some modifications. Those that recommended modifications suggested:

**75%**  
of respondents believe the Recommended Actions Chart will be helpful to them.

### Suggested Modifications to the Recommended Actions Chart

- Identifying controls for ozone versus particulate matter.
- Add in when it is recommended for sensitive groups to wear N95 masks, as well as all employees regardless of health status.
- Addressing commuting and work-related travel in transportation modes outside the car, such as walking or biking.

### Potential Challenges to Utilizing or Following Chart

The survey asked respondents about potential challenges or barriers to adhering to recommendations listed in the Chart. Eighteen (18) respondents reported potential challenges, including the following:

Potential Challenge	Respondent Description
Additional Information	<ul style="list-style-type: none"> <li>• Conducting emergency work with an AQI over 301.</li> <li>• Controls for ozone: “not many and far more poor ozone days than wildfire smoke [days].”</li> <li>• The need to monitor indoor air quality, or the inability to control indoor air quality because the landlord manages the HVAC system.</li> <li>• Consideration and information for cities outside of Sacramento: “This does not incorporate actions from any of the other cities aside from City of Sacramento. Businesses outside this jurisdictional boundary may believe actions do not pertain to them. The City of Sacramento should be responsible for customizing messaging within their jurisdictional boundary.”</li> <li>• Specify timing of action implementation: “The chart does not indicate a duration of level needed before implementing actions. Are the values present for at least 1 hour, 12 hours, days? Or does reaching that level trigger the response - this element is unclear.”</li> <li>• Specify definition of clean indoor air and “clean workspace”: “Define clean air workspace when AQI levels in the valley are 250 and above for days on end.”</li> </ul>

Potential Challenge	Respondent Description
Productivity, Employees & Customers	<ul style="list-style-type: none"> <li>• Employee acceptance/adherence, overall organization acceptance and monitoring, especially in organizations with multiple crews and departments spread out around the region.</li> <li>• Customer expectations for performance and execution, or “angry customers because we need to close down for the day, because we can’t use led [sic] (leaf) blowers.”</li> <li>• Protecting and reassuring staff: “Getting staff to work when minimal air quality is at level 2.”</li> <li>• More information and consideration about the ripple effect of school closures: “public schools have multiple constituents who have varying needs for our open services [that we need] to be mindful about.”</li> <li>• Having sufficient supply of N95 masks for all employees, and some N95 masks to not properly fit employees.</li> </ul>

### Additional Suggestions to Help Improve the Recommended Actions Chart

- More specified geographic information: “Does the recommended action apply to the entire county each time? Could there be pockets?”
- Make the ozone information its own chart and recommendations.
  - Another respondent echoed the same recommendation, but for different reasons: “Three different readings at the bottom are challenging for a lay person to follow. The average employee or business owner does not understand the differences, so a single metric would be easier to follow since that is what the media reports.”
- Bring in Cal/OSHA review the chart.
- One respondent questioned whether indoor air monitoring is needed at the AQI 151-200 level and suggested switching this to 201 and above.

## Additional Tools or Guidance Needed

Survey respondents listed additional tools or guidance that would be useful to their organization during a wildfire smoke event. One respondent reported that they have already shared additional needs “in meetings we attended.” Additional tools that would be useful included:

### Additional Tools/Guidance Needed to Support Organizations

- Flame-resistant N95 face coverings.
- An app that offers push notifications and alerts.
- Additional general guidance documents.
- Forecasting tools.
- An air quality dashboard with smoke-related information.
- Additional geographical data: “good air quality data per region so we don’t have to close the entire district.”

- More information for schools: “Specific guidance for students and when schools should close due to wildfire smoke.”
- Additional information for those who use alternate modes of transportation: “Guidance and support to those dependent on transit, bike, and walk modes, especially to work, but in daily life, is critical for the highest levels of pollution.”

## Conclusion

Overall, the Impact of Wildfire Smoke Events on Businesses Survey provided valuable insight on how businesses have previously responded to wildfire smoke events, current practices and plans in place, and how businesses can utilize the Recommended Actions Chart along with other tools. The variety in respondents in the sample represent a diversity of business types with employees in multiple types of settings, and many are aware of both employees and clients who are part of sensitive health groups. Exploration of responses by business types provides multiple opportunities to prioritize specific needs among different organizations. Private businesses may have the most flexibility and resources to adjust and adapt during wildfire smoke events, though they may be less willing to cancel events or limit outdoor activity in order to maintain business operations and client relationships. For example, one private business respondent reported their challenge is “employee acceptance [and] customer expectations for performance.” Although non-profit organizations may have more resource limitations to purchase equipment, they were more likely to report possibly providing N95 masks to staff rather than move operations indoors or cancel events. Finally, public sector agencies may have more jurisdictional considerations (e.g., agency adoption of the Recommended Actions Chart, procuring N95 masks for the entire workforce, inability to adjust a centralized HVAC), they may have the most flexibility to adapt by cancelling events or limiting work outdoors.

While survey respondents reported some knowledge of current regulations surrounding employee safety, less than half have communication and action plans established for wildfire smoke events. While cancelling events or restricting outdoor activities are actions taken in the past that may continue into the future, more respondents reported possibly providing N95 masks in the future. However, respondents foresee challenges in certain responses to wildfire smoke events, such as productivity leading to a decrease in revenue and client satisfaction.

Respondents also offered several suggestions to help improve the Recommended Actions Chart and make it more utilizable for businesses, including simplifying metrics, and adding more specific information for specific areas as well as school districts. Overall, a common theme was that respondents want clarity in terms of geographic coverage, duration of air quality before implementing action, and establishing one standard or source of information that everyone can refer to. The Sacramento Metropolitan Air Quality Management District can utilize this information to improve the Recommended Actions Chart and to develop guidance for businesses in the *Wildfire Smoke Air Pollution Emergency Plan*.