

# Little Room to Breathe:

Evaluating Air Quality & Health  
Impacts in San Francisco's Single  
Room Occupancy (SRO) Buildings

July 2021

**brightline**  
DEFENSE

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## **Brightline Team**

Eddie Ahn | *Executive Director*

Sarah Xu | Tanya Hanson | *Policy Associates*

Cecilia Mejia | Daniela Cortes | *Program Coordinators*

Lujain Al-Saleh | *Public Health Research Fellow*

Eleanor Kim | Icelyn Yopez | *California Climate Action Corps Fellows*

Jack Malamud | *Policy Fellow*

**Brightline Office** | 1028A Howard St., San Francisco, CA 94103

415-252-9700 | [frontdesk@brightlinedefense.org](mailto:frontdesk@brightlinedefense.org)

Graphics and Layout | Tanya Hanson & Sarah Xu

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Photograph by Tanya Hanson

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# Executive Summary

While living in some of the densest and poorest urban conditions across the nation, residents of Single Room Occupancy (SRO) hotels in San Francisco face unique environmental justice issues. Surviving in tightly knit spaces with shared restroom and kitchen facilities, SRO residents face poor air quality and compounding health impacts from escalating wildfires. During the COVID-19 pandemic, nonprofit Brightline Defense and its community partners conducted a first-of-its-kind survey on climate change impacts and unique health burdens borne by SRO communities in 2020 and 2021. Far exceeding the original goal of 100 responses, this community-driven effort garnered extraordinary community interest with 255 tenants in 54 buildings responding to this survey.

The survey yielded key insights into the health and living conditions of SRO residents. Firstly, SRO residents are concerned about both outdoor and indoor air quality. Additionally, the survey found that air filtration is a priority for SRO residents as over 57% of residents reported living with at least one chronic health condition such as asthma, chronic obstructive pulmonary disease, and hypertension. These chronic health conditions are exacerbated by catastrophic air quality events such as wildfires. Furthermore, despite strong interest, only a small fraction (18%) of SRO residents are able to afford an air filtration system.

These findings have led to several recommendations in how to improve the environmental health of SRO communities. Greater state resources and programs could be used to install air filtration systems and alleviate air quality concerns in SROs. Moreover, local city agencies, such as the San Francisco Department of Public Health, should expand services to address the impacts of wildfires on preexisting health conditions, improve access to personal protection equipment, and improve green building infrastructure. Finally, greater resourcing could lead to expanded programs improving physical and mental health as well as community resiliency against future catastrophic climate events.

A photograph showing a vibrant, colorful mural on a wall. The mural depicts a landscape with various buildings, including a large purple house on a hill, a blue house, and a yellow building. There are trees and a small structure with a flag. In the foreground, a black air quality monitor is mounted on a pole, with a street lamp below it. The scene is set in an urban environment with a brick building visible in the background.

**A mural in Boeddeker Park and an air quality monitor**



# Introduction

## Hotel Hartland is an SRO in the Tenderloin

Escalating wildfires and worsening air quality impact vulnerable communities in urban areas, and these climate change impacts have particularly affected residents of Single Room Occupancy hotels (SROs). Primarily located in the neighborhoods of the Tenderloin, Chinatown, the Mission District, and South of Market (SoMa), SROs house low-income to very low-income tenants with entire families living in rooms as small as 8 by 10 feet with shared bathrooms and kitchens. As a result, SROs constitute the densest housing stock in San Francisco for 18,000 residents in an estimated 530 SRO buildings. Despite the small size and cramped living conditions, the monthly rent for a single SRO unit in 2016 ranged from \$650 to \$1000.<sup>1</sup> In 2021, unofficial estimates put the current price range of these units at \$800 to \$1,500 a month, a price range unaffordable to many of San Francisco's low-income and fixed-income residents.

As the frequency and intensity of climate change events increase, understanding SROs in the context of air quality and wildfires is important. This work contributes to the growing community-driven reporting of the conditions in SRO communities.<sup>2</sup> This report also evaluates residents' perceptions of air quality, community health, access to air filtration, and personal protective equipment (PPE) during wildfires.

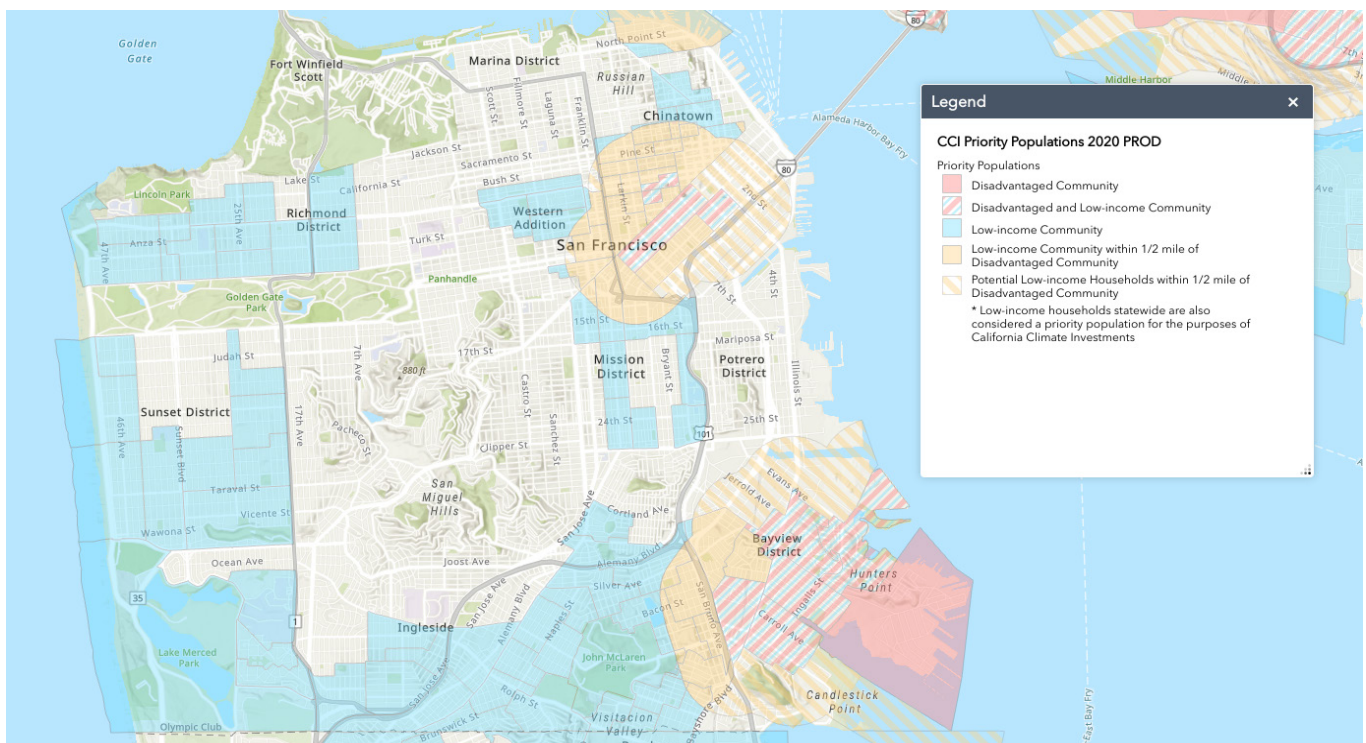
# SRO Communities Are Unique Environmental Justice Communities

## ***Increased Wildfires Exacerbate Existing Burdens on SRO Communities***

SRO residents face unique environmental burdens as a result of the increased frequency and magnitude of recent wildfires throughout Northern California. SROs are older housing stock that lack modern air filtration systems. In San Francisco, SROs make up the largest supply of low-cost housing for seniors, adults with disabilities, and children — vulnerable populations who face the highest wildfire-related health risks. Moreover, since localized air sensors tend to be concentrated in wealthier neighborhoods, SRO residents lack precise information regarding air quality in their communities.<sup>3</sup> This inequality is exacerbated during wildfire events like the Lightning Complex Fires in August 2020 when San Francisco had the world’s worst air quality.<sup>4</sup>

## ***Mapping Tools Reveal How SRO Communities Face Disproportionate Exposure to Environmental and Health Burdens***

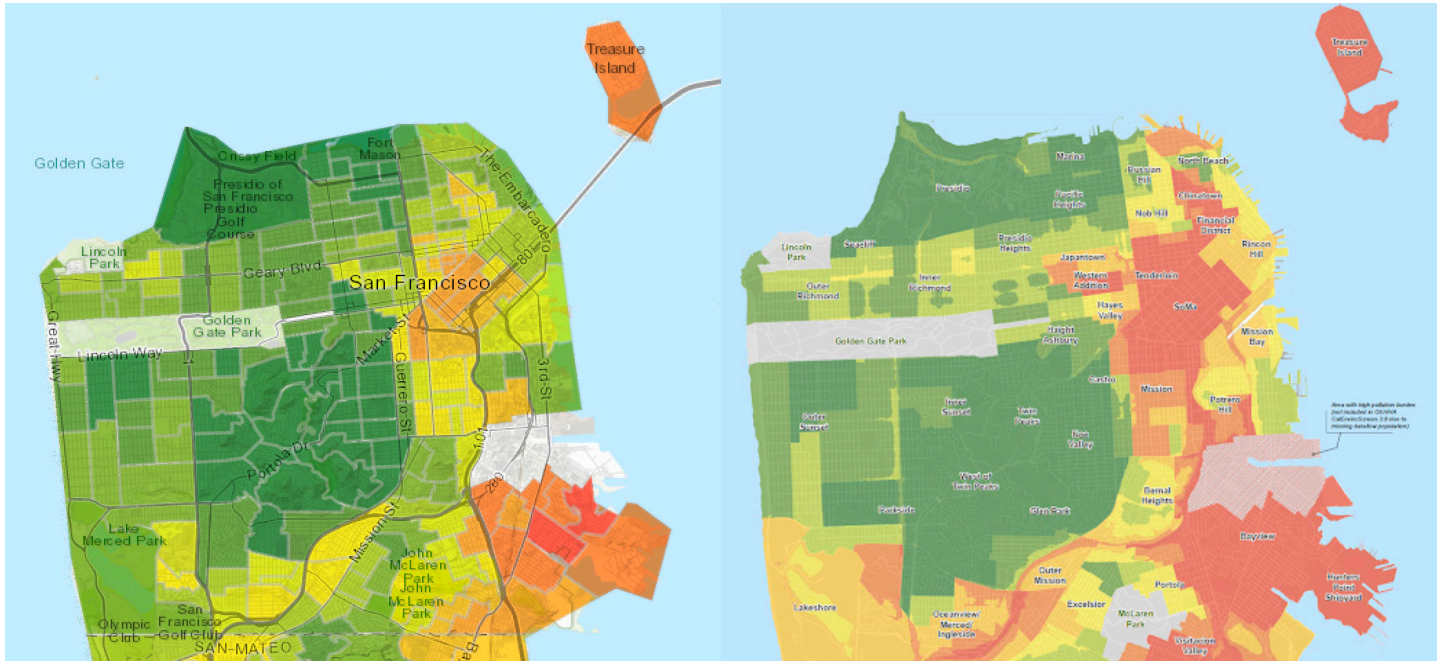
Multiple state definitions have been combined to map SRO communities and their conditions across San Francisco. “Disadvantaged Communities” (DACs) are defined by CalEPA as census tracts that rank in the top 25% of communities experiencing disproportionate amounts of pollution, environmental degradation, as well as socioeconomic and public health conditions according to CalEnviroScreen, a state mapping tool of California communities.<sup>5</sup> Previous versions of CalEnviroScreen (CES) have underrepresented SRO communities, but CES 3.0 includes parts of SoMa, Mid-Market, and the Tenderloin in its DACs definition. While CES 3.0 leaves out large portions of each neighborhood despite the concentration of SROs within each,<sup>6</sup> the “Priority Populations” definition by the California



“Priority Populations” map created by the California Air Resources Board

Air Resources Board includes more SRO communities as it uses two definitions, SB 535 Disadvantaged Communities (as mapped by CalEnviroScreen) and AB 1550 Low-Income Communities.

This report is primarily concerned with CES indicators on air quality and population indicators. Multiple decades of public health research indicate that air pollution negatively impacts respiratory and cardiovascular health.<sup>7</sup> Pollutants found in wildfire smoke such as ozone, nitrogen dioxide, and sulfur dioxide are significant public health concerns. Exposure to outdoor air pollution has a substantial effect on health, exacerbating preexisting asthma and chronic obstructive pulmonary disorder (COPD), increasing susceptibility to infection and sensitivity to allergens, and increasing risk of arrhythmia, ischemia, cardiac failure, and stroke.<sup>8</sup>



The two maps above show contrasting mapping approaches to San Francisco created by different state legislative frameworks. The environmental justice map created by SB 1000 (right) captures more SRO communities than CES 3.0 (left).

## **Additional Research Affirms That SRO Communities Face Disproportionate Health and Environmental Burdens**

While much work has been done to improve the living conditions within and around SROs, residents still face many challenges regarding community health and safety. Chronic maintenance issues and health code violations continue to impact residents living in SRO hotels. From early 2015 to August 2016, SROs had more building code violations than any other supportive housing site, received more abatement orders from city agencies to fix serious problems, and were last in residents' ratings on maintenance and repairs.<sup>9</sup>

The 2016 San Francisco Department of Public Health Report on *Single Room Occupancy Hotels in San Francisco: A Health Impact Assessment* shows that neighborhoods with significant SRO populations see higher rates of hospitalization and emergency room (ER) admission. SRO communities face adult asthma hospitalization rates that are twice the city average, COPD rates that are three times the city average, ER admissions for falls that are 2-3 times the city average, and ER admissions for self-inflicted injuries that are 3-4 times the city average.<sup>10</sup> The combination of demographic and environmental

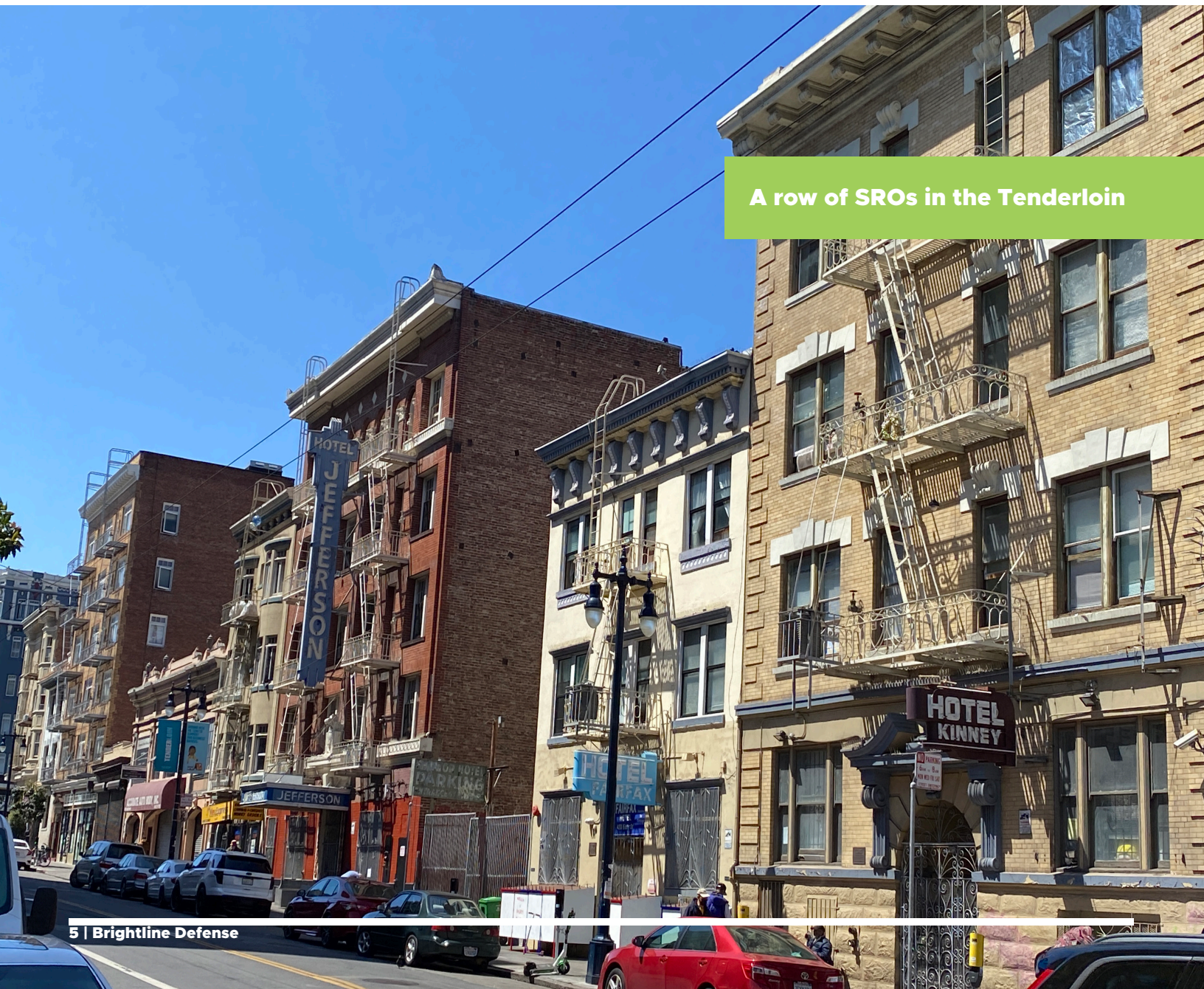
vulnerabilities can contribute to poor health outcomes and can benefit from targeted policy changes to protect and promote resident health.<sup>11</sup>

## **SRO Community Input Is Needed to Understand Air Quality Impacts**

This study highlights community demographics and health issues related to air quality for SRO residents living in Chinatown, the Tenderloin, SoMa, and the Mission District neighborhoods in San Francisco, California.

The overall goal of this analysis includes the following primary objectives:

- Evaluate community demographics related to health and housing conditions
- Better understand community perceptions of air quality and health
- Analyze gaps in information that SRO residents face regarding air pollution





## Brightline Air Quality Monitoring Program: Working with SRO Communities

Under the Community Air Protection Program established by the California Air Resources Board, the Brightline Air Quality Monitoring Program is a community-driven collaborative technical air quality monitoring program in SoMa and the Tenderloin, San Francisco.<sup>12</sup> Partnering with two other organizations Central City SRO Collaborative and Community Youth Center (CYC) of San Francisco. Brightline has installed, collected, and analyzed data from 15 Clarity Node-S stationary sensors, with 4 additional sensors placed in other neighborhoods. Furthermore, through a unique Tenant Leadership organizing program, this data empowers and educates tenants in low-income housing, especially SRO buildings, as well as youth enrolled in local environmental leadership programs.

**Tenant Leader Reggie Reed and Brightline Executive Director Eddie Ahn placing air quality informational posters**



## Installation of an air quality monitor by Brightline and community partner Community Youth Center (CYC) of San Francisco

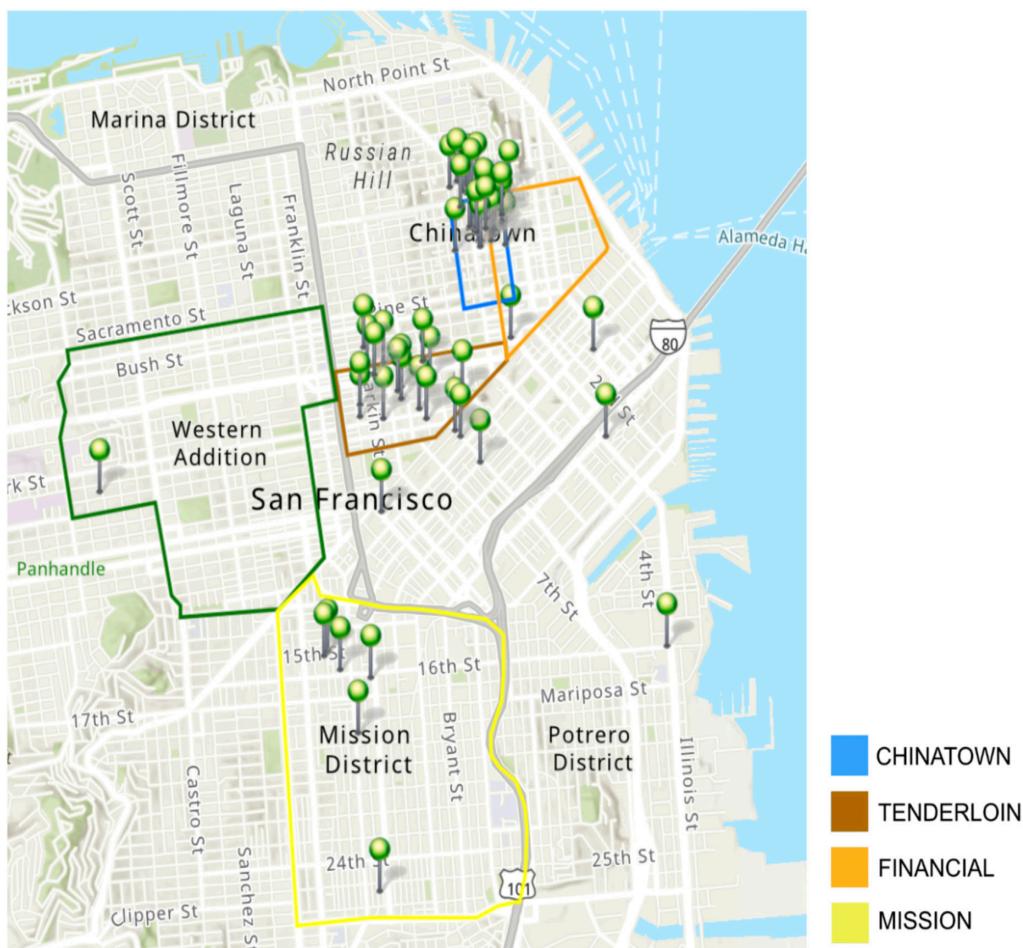


With 15 SRO Tenant Leaders and 10 Youth Leaders conducting outreach to thousands of households, the Brightline Air Quality Program distributed surveys to tenants and identified key air quality concerns. During the 2020 wildfire season, the program's air quality monitors revealed that every neighborhood experienced air quality in the unhealthy range. Data patterns show that SoMa and Chinatown were particularly vulnerable to wildfire smoke impact. This innovative project serves neighborhoods in Eastern San Francisco that face unique socio-economic burdens and air quality concerns due to close proximity to highways and increasing vehicular traffic from across the region, among many other concerns.

# Survey Methodology During COVID-19

The surveys were designed in collaboration with SRO tenant leaders and community-based organizations via online Zoom meetings. Each survey includes a total of 25 questions related to community demographics, health, and air pollution and incorporates both multiple-choice and open-ended questions (Appendix). To serve monolingual environmental justice communities, surveys were conducted in English, Chinese, and Spanish. Based on further input, surveys that were distributed in the Mission District included additional questions on smoking to better assess additional sources of poor air quality.

Due to the COVID-19 pandemic and shelter-in-place restrictions, traditional community outreach methods were significantly restricted. From December 2020 to March 2021, staff distributed paper surveys to residents at socially distanced sites, such as housing management offices and food pantries. Brightline staff collected surveys, inputted responses into a survey database system, and analyzed the data.



The four neighborhoods in which the vast majority of the respondents live are the Tenderloin (46.9%), Mission District (19.7%), SoMa (14.2%), and Chinatown (8.3%). These four neighborhoods are also the communities that were previously identified in the 2016 study on SRO living conditions.<sup>13</sup>

Due to high SRO resident interest in wildfire and air quality concerns, a total of 255 survey responses were collected, surpassing outreach goals. The distribution of survey results is depicted in the map on the left.



# Survey Results

## An SRO in South of Market

### **Linguistic Isolation Among SRO Residents Varies by Neighborhood**

Other important demographic data collected in the survey was the primary language of respondents. English was the primary language for more than half of the respondents, followed by Chinese and Spanish. This reflects the 2012-2016 American Community Survey results that found that significant portions of the identified neighborhoods spoke another language at home or were linguistically isolated.<sup>14</sup>

The primary language results reflect the sample SRO community surveyed. Primary language and language isolation vary by neighborhood. In the Tenderloin, English is spoken in a plurality of households (47%) and 23% of the households in the neighborhood are linguistically isolated.<sup>15</sup> In contrast, 75% of families in Chinatown speak an Asian or Pacific Islander language at home and 63% of all households in Chinatown are limited English-speaking households.<sup>16</sup>

### **Air Quality Impacts Constitute Significant Concerns in SRO Communities**

#### ***SRO Residents Are Concerned About the Air Quality in Their Neighborhoods***

Survey respondents are concerned about the air quality in their neighborhoods and its effects on their health. When asked to characterize the air quality in their neighborhood, 39.9% of the respondents reported that the outdoor air quality in their neighborhood ranges from poor to extremely poor. 35.2% of the respondents were neutral about the air quality in their neighborhood and only 12.1% of respondents described it as good. Furthermore, almost half of respondents (47.4%) believe that their neighborhood air quality has impacted their community's health.

For respondents who believe that air quality has impacted their community, responses ranged on its severity. The impact of air quality on the ability to work and engage in usual activities was the most commonly reported impact (35.5%). Increased hospitalizations (24.5%), health issues (18.7%), and loss of employment (12.3%) were also identified as significant impacts of air quality.

### ***Residents Are Particularly Concerned About Indoor Air Quality, Air Filtration, and Mold***

When asked about air quality in their SRO units, the plurality of survey respondents indicated they believe air quality is poor to extremely poor (37.2%). This percentage is similar to those who had a negative view of the air quality in their neighborhood. Additionally, 29.7% were neutral and 20.1% of respondents had positive views about the air quality in their units. Generally, respondents were more positive about indoor air quality within their SROs than outdoor air quality throughout their neighborhoods.

### ***Traditional Air Filtration Units Are Too Costly for Most SRO Residents***

73.4% of survey respondents did not have an air filtration system in their unit. This is a significant concern as the lack of air filtration and circulation were the major reasons identified by respondents for air quality issues within their units. Almost half of the respondents indicated that they are interested in having an air filtration system within their unit. Despite this interest, the lack of air filtration installation in SRO units is an issue of cost. The survey found that only 18% of respondents would be able to afford and install a good quality air filtration system. The standard price for residential air filtration systems ranges from \$200-\$600.<sup>17</sup>

### ***SRO Communities Lack Access to Proper PPE During Wildfire Events***

Survey respondents lack access to crucial supplies to deal with wildfire-related health concerns and face significant health impacts of the California wildfire season. Despite the effectiveness of N95 masks for wildfire air quality impacts, only 20.7% of respondents had access to an N95 mask to protect their lungs from the harmful particulate matter (PM) of wildfire smoke. About half of respondents reported using a cloth mask while 15.9% had no mask or PPE at all. Additionally, 55.1% of respondents experienced respiratory health effects or other symptoms during the wildfires. Unlike cloth or surgical

**Brightline Program  
Coordinator,  
Daniela Cortes,  
with Central City  
SRO Collaborative  
Director of  
Community  
Organizing,  
Pratibha Tekkey**



masks, N95 can filter out the carcinogenic particulate matter that causes respiratory distress and may exacerbate other health concerns.<sup>18</sup>

Residents reported how the wildfires impacted their daily life including issues like increased health issues and loss of employment. Based on survey responses, a majority (55.1%) of respondents reported they experienced respiratory health issues due to the wildfires. Furthermore, the survey revealed that the respondents' daily lives were most impacted by the wildfires with health issues (38.4%) and the inability to work/engage in usual activities (26.5%). The crowded living conditions and lack of modern air filtration systems in SROs also mean SRO communities suffer significantly more from wildfires.

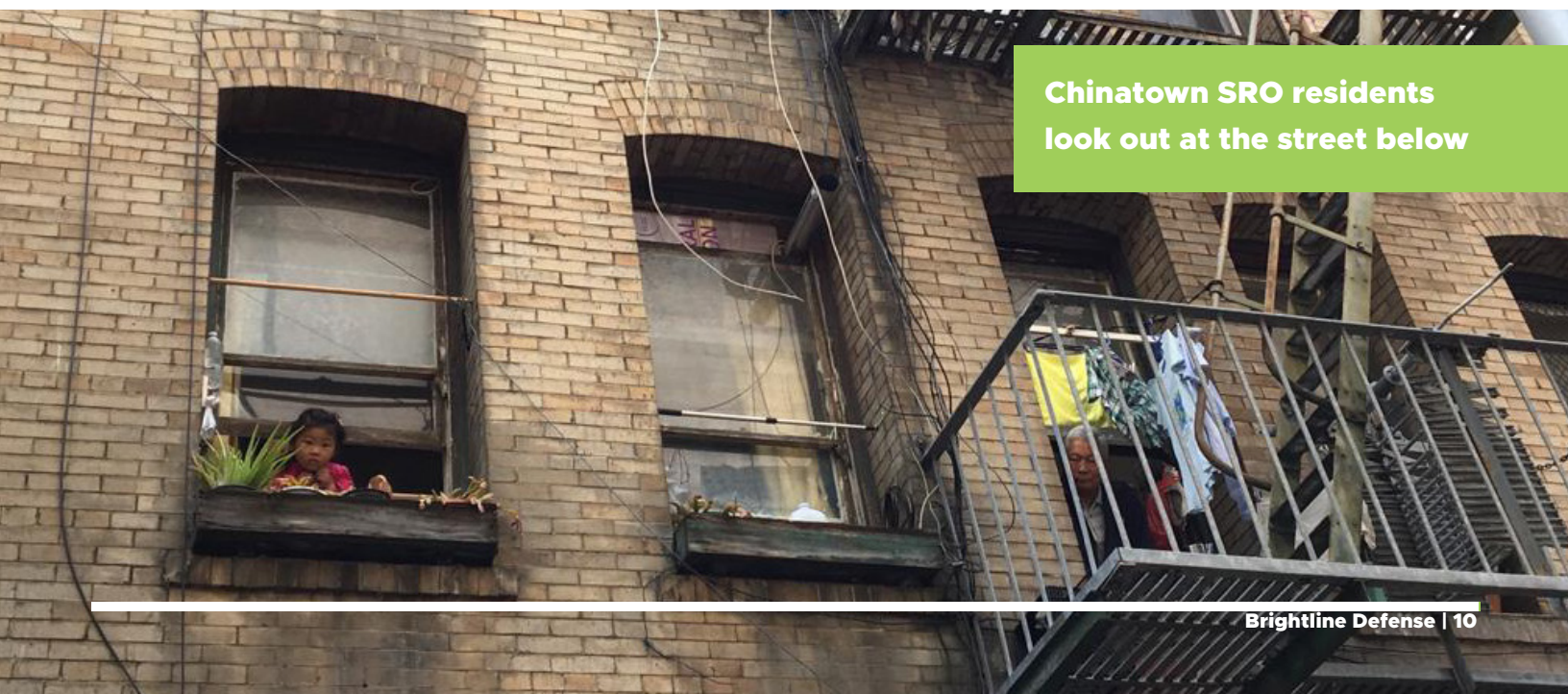
## **SRO Residents Face High Rates of Chronic Health Conditions**

The majority (57.9%) of SRO residents reported having a chronic health condition or physical health condition. When asked to identify their conditions, the most commonly reported health conditions include asthma (32.7%), hypertension (13.1%), COPD (9.5%), and diabetes (6.5%). These health concerns may be further exacerbated by poor air quality and extreme weather events like wildfires.

## **SRO Communities Want More Health Information**

### ***Gaps Remain in Understanding Chronic Health Conditions***

Brightline's survey revealed that there are also gaps in information regarding chronic health concerns in the surveyed community. Although some residents indicated that they did not have a chronic health condition, the same residents also stated that they have asthma, COPD, hypertension, respiratory infection, asthma, lung cancer, and/or a heart condition.<sup>19</sup> Some SRO residents may not be aware that they are experiencing a chronic health condition that could be exacerbated by poor air quality. For reporting purposes, these survey errors were added into the analysis as residents with chronic health conditions to highlight a key gap in information.



**Chinatown SRO residents  
look out at the street below**

## **SRO Residents Request More Information on Implementing Solutions to Air Quality Concerns**

In response to Brightline's survey, SRO communities also requested more information to make well-informed decisions. The most requested information was regarding better air circulation followed by information on air filtration and mold removal. The request information matches the indoor air quality concerns that were identified by residents.

Surveyed communities demonstrated that they were seeking solutions to persistently poor air quality and living conditions instead of education on their dangers. When asked about what information they would like to request, respondents did not want more information about air quality's impact on quality of life, "Spare the Air" days, or the effects of mold. Survey results show that SRO residents are not concerned about health hazard notification but rather policy and programmatic solutions, like the installation of air filtration devices and mold removal programs.



**Brightline Executive Director  
Eddie Ahn talking with SRO  
Tenant Leaders about air quality**



# Recommendations

## An SRO in the Mission District

In the era of climate change, San Francisco's SRO communities are uniquely vulnerable to extreme weather events.<sup>20</sup> Community-led and climate-resilient policies are essential in developing emergency response plans and protocols. To this end, air filtration and personal protective equipment (PPE) are among the most important short-term resources needed to address disproportionate environmental burdens faced by SRO communities throughout the next few years.

## AIR QUALITY

### ***Increase access to air filtration devices, programs, and infrastructure to address poor air quality***

Only 11.5% of respondents have air filtration devices in their homes, highlighting huge gaps in infrastructure to respond to air pollution and extreme fire events. However, precedent for state funding for air filtration exists through programs such as the Community Air Protection Program (CAPP) and Supplemental Environmental Project (SEP) under the California Air Resources Board.<sup>21</sup> Moreover, the state legislature has moved more aggressively to fund air filtration for vulnerable communities. Thanks to the leadership of Assemblymember Phil Ting, Assembly Bill 841 (Ting, Chapter 372, Statutes 2020) established the School Reopening Ventilation and Energy Efficiency Verification and Repair Program, which provides up to \$600 million for energy upgrades and to test, adjust and repair heating, air conditioning, and ventilation (HVAC) systems in schools. These funding streams could be subsequently expanded to increase access to air filtration.

- *Install air filtration devices in all SROs across San Francisco through potential state funding sources*

Despite a high demand for air quality filters, only 18% of SRO residents can afford the \$200-\$600 to install the filtration systems. Installation of air filtration systems would be delivering not only air quality benefits to SRO communities but also co-benefits as SRO communities have high rates of chronic health conditions.

- *Increase education and response to concerns regarding mold in SRO communities*

A significant health concern by respondents is the presence of mold in SRO buildings. In supportive housing, SFDPH should continue to work with SRO management to improve the accessibility and efficacy of current mold-removal processes. This could include further educational programs and encourage more tenant reporting of building conditions. Additional information on how SRO tenants can have their unit inspected for mold should be included.

## **WILDFIRES**

### ***Expand access to personal protective equipment and shelter during wildfires and climate distress***

Although cloth masks help decrease exposure to some pollutants, N95 masks are more effective in filtering out wildfire smoke. However, N95 masks are still in short supply due to the ongoing pandemic.<sup>22</sup>

- *Expand local efforts to increase access to personal protective equipment (PPE) through collaboration with SRO community-based organizations*

These efforts could be identifying communities in need, purchasing or redistributing PPE, and providing educational materials on how best to use PPE in the event of wildfires. Access to PPE is an especially important concern due to dense living conditions in SROs.

- *Strengthen climate resiliency planning and coordination with service providers to support SRO residents in extreme climate events*

In addition to the City's Department of Emergency Management (DEM) temporary shelters, expanded funding is needed for nonprofit partners to supplement shelter capacity and provide transportation and language support for SRO residents.

**Photo taken from  
Brightline's office  
in SoMa on  
September 9, 2020**





# HEALTH

## ***Physical health: Advance educational programs on chronic health conditions and environmental pollution***

Based on the survey results, it is evident that more than half of SRO residents have chronic health conditions that are exacerbated by poor air quality and wildfires. Given the high prevalence of chronic health conditions among SRO residents across each neighborhood, it is crucial that residents have more information to better understand how poor air quality could exacerbate those conditions.

- *Increase and improve access to information regarding chronic health conditions and the impacts of poor air quality especially during wildfire events*

The San Francisco Department of Public Health (SFDPH) should expand educational programs on how wildfires can exacerbate chronic health conditions. This information should clearly identify which health conditions put SRO residents most at risk of acute respiratory attacks in the event of poor air quality. The information should also be solution-oriented and advise SRO communities on how they can further protect themselves. Finally, this information should be tailored for SRO communities given their unique lived experiences.

- *Develop educational programs on the management and prevention of chronic health diseases*

In tandem with information about chronic health conditions, SFDPH should also work with community leaders and organizations to develop localized programs that address the wide range of chronic health conditions that are already present in the community. As demonstrated by Brightline’s survey, many residents are already aware of the adverse effects of poor air quality and mold in their individual units. Therefore this education should focus on filling other knowledge gaps in the prevention and management of chronic health diseases such as COPD.



**Brightline Public Health Fellow Lujain Al-Saleh helping to administer community surveys**

- *Invest in a capital and infrastructure grant program, similar to the San Francisco Public Utilities Commission's Project Learning Grants, to support community-led projects for SRO neighborhoods*

A grant program could support frontline communities in purchasing, upgrading, and installing crucial resources such as air filtration systems, smoke detectors, and create community cooling centers. Additionally, the grant could support monolingual community outreach and green building infrastructure projects.

### **Mental health: Expand mental health support programs and services for SRO residents**

As exemplified by 2020's record-setting wildfire season in California, there are numerous psychological risks that accompany the physical dangers of climate disasters according to the UCSF Department of Psychiatry.<sup>23</sup> Mental health challenges are not only exacerbated by wildfires, but are also likely underreported due to stigma around mental health. Furthermore, the spatial conditions of SROs and lack of privacy can further impact mental health.<sup>24</sup>

- *Behavioral and mental health services and resources for SRO residents and community-based organizations*

These services and resources should be made available and easily accessible to SRO communities. This would mean increased funding for nonprofit workers and case managers to improve staffing, operating in SRO buildings for ease of access, creating a diverse set of resources including printed materials, and creating materials that reflect the linguistic diversity in the community. This also includes increasing the accessibility of current resources, such as the Citywide Behavioral Health Roving Team.

- *Increase access to telehealth services and programs in the community*

The COVID-19 pandemic has shown that telehealth is a viable alternative to provide quality health services to everyone. Expanded services should reflect the language and cultural diversity of SRO communities.



# Conclusion



**Residents inside their Chinatown SRO unit**

As demonstrated by the intense interest in this survey, San Francisco's SRO residents have faced incredibly pressing community health needs. To advance community health, it is crucial that state and local government agencies expand their collaboration with SRO community-based organizations to accomplish the following recommendations:

| 1   | 2  | 3  | 4   | 5   |
|---|--|--|---|---|
| Improve access to information on outdoor air quality levels and the impacts on community health | Install air filtration systems in SROs to improve indoor air quality | Address barriers to health services and programs for SRO residents by neighborhood | Develop support programs for SRO residents and families on climate change events and more | Expand access to personal protective equipment (PPE) during wildfires |



# Endnotes

Installation of another Brightline air quality sensor with Interstate 80 (I-80) in the background

- 1 San Francisco Department of Public Health, *Single Room Occupancy Hotels in San Francisco - A Health Impact Assessment*. (Spring 2016). <https://www.pewtrusts.org/-/media/assets/external-sites/health-impact-project/sfdph-2016-sroh-report.pdf>.
- 2 SRO Families United Collaborative, *2015 SRO Families Report*. (2015) [http://www.chinatowncdc.org/images/stories/NewsEvents/Newsletters/sro\\_families\\_report\\_2015\\_.pdf](http://www.chinatowncdc.org/images/stories/NewsEvents/Newsletters/sro_families_report_2015_.pdf).
- 3 Danielle Echeverria, *Why is air quality data for the Bay Area so confusing?*, SF Chronicle. (Sept. 3, 2020). <https://www.sfchronicle.com/health/article/Why-is-air-quality-data-for-the-Bay-Area-so-15538940.php>.
- 4 Peter Arcuni, *Bay Area Experiences Worst Air Quality in the World Due to Wildfires*, KQED. (Aug. 19, 2020), [www.kqed.org/science/1968573/unhealthy-air-expected-to-continue-as-wildfires-winds-persist](http://www.kqed.org/science/1968573/unhealthy-air-expected-to-continue-as-wildfires-winds-persist).
- 5 California Climate Investments, *Priority Populations*. (2021) <http://www.caclimateinvestments.ca.gov/priority-populations>.
- 6 Distributed by California Office of Environmental Health Hazard Assessment, *CalEnviroScreen 3.0 Results*. (June 25, 2018) <https://oehha.ca.gov/media/downloads/calenviroscreen/document/ces3results.xlsx>.
- 7 United States Environmental Protection Agency, *Research on Health Effects from Air Pollution*,

(Nov. 25, 2020). <https://www.epa.gov/air-research/research-health-effects-air-pollution>.

8 Ibid.

9 Kevin Fagan & Joaquin Palomino, *Aging hotels, chronic problems*, Chronicle Investigation. (Dec. 5, 2016) <https://projects.sfchronicle.com/sf-homeless/hotels/>.

10 Supra 1.

11 Supra 1.

12 AB 617 (C. Garcia, Chapter 136, Statutes of 2017) are referred to by the California Air Resources Board as the Community Air Protection Program (CAPP). CAPP works with environmental justice communities to measure air pollution and reduce health impacts.

13 Supra 2.

14 San Francisco Planning Department, *SAN FRANCISCO NEIGHBORHOODS SOCIO-ECONOMIC PROFILES American Community Survey 2012–2016*. (2016). [https://default.sfplanning.org/publications\\_reports/SF\\_NGBD\\_SocioEconomic\\_Profiles/2012-2016\\_ACS\\_Profile\\_Neighborhoods\\_Final.pdf](https://default.sfplanning.org/publications_reports/SF_NGBD_SocioEconomic_Profiles/2012-2016_ACS_Profile_Neighborhoods_Final.pdf).

15 Ibid.

16 Ibid.

17 Home Advisor, *How Much Does it Cost To Install Air Cleaners?*. (2021). <https://www.homeadvisor.com/cost/cleaning-services/install-a-central-air-cleaner/#:~:text=Since%20the%20typical%20American%20spends,%241%2C000%20to%20%245%2C000%20or%20more>.

18 Emergency Preparedness Office, *N95 Respirator Masks FAQs*, California Department of Health. (Oct. 29, 2019). <https://www.cdph.ca.gov/Programs/EPO/Pages/Wildfire%20Pages/N95-Respirators-FAQs.aspx>.

19 A total of 15 of 255 respondents (6%) answered they did not have or were not sure about having a chronic health condition, but later in the survey answered they had asthma, chronic obstructive pulmonary disease, hypertension, respiratory infection, asthma, lung cancer, and/or a heart condition.

20 Kurtis Alexander, *San Francisco wants to prepare for extreme weather, turns to climate scientists for help*, SF Chronicle. (April 10, 2019). <https://www.sfchronicle.com/science/article/San-Francisco-wants-to-prepare-for-extreme-13757656.php>.

21 Under SEP, the Barrio Logan College Institute was awarded \$55,634.00 to install air filtration systems in 25 homes of individuals that suffer from respiratory illnesses, or are in close proximity to high emission sources.

California Air Resources Board, *SEP Projects Funded In Process*, (March 11, 2019). <https://ww2.arb.ca.gov/resources/documents/sep-projects-funded-process>.

22 Denise Dador, *California hospitals to face PPE shortage for next 2 years, California Hospital Association says*, ABC 7. (July 31, 2020). <https://abc7.com/california-hospitals-ppe-shortage-supply-covid-19-coronavirus/6343819/>.

23 Brandon R. Reynolds, *The Psychological Threats of Climate Change and Wildfires Are Now Here – This Site Can Help You Cope*, University of California, San Francisco (Oct. 26, 2020). <https://www.ucsf.edu/news/2020/10/418886/psychological-threats-climate-change-and-wildfires-are-now-here-site-can-help>.

24 Supra 2.

# Appendix: Survey Questions

## Community Survey on Air Quality in the Mission

*For the Brightline Air Quality Monitoring Program with  
Central City SRO Collaborative and Community Youth Center*

### Introduction

This community survey is meant to gather community demographics and input, and help inform data analysis for the Brightline Air Quality Monitoring Program. Over the course of 2 years, nonprofit Brightline will be implementing this community-driven environmental program in partnership with nonprofits Central City SRO Collaborative and Community Youth Center. Each survey will take approximately 10 minutes to complete.

### Demographic Information

1. Name:

Phone:

Email:

Address:

2. Where is your household located?

- a. Chinatown
- b. Tenderloin
- c. South of Market
- d. Mission
- e. Other

3. What is the primary language you speak at home?

- a. English
- b. Spanish
- c. Chinese
- d. Arabic
- e. Hindi
- f. Other

### Health Information

4. Do you have a preexisting health condition?

- a. Yes
- b. No
- c. Not sure

5. Is your health condition respiratory?

- a. Yes
- b. No

6. If answered yes, what type of health condition/s (circle all that apply)?

- a. Asthma
- b. Chronic Obstructive Pulmonary Disease (COPD)
- c. Lung Cancer
- d. Respiratory Infection
- e. Other condition

\_\_\_\_\_

7. Do you believe the air quality in your neighborhood has impacted your health? (Circle your answer)

- Strongly Agree                      - Agree  
- Neutral                                - Disagree                      -  
Strongly Disagree

8. If you answered yes, how would you describe air quality in your neighborhood?

- Extremely poor                      - Poor  
- Neutral                                - Good                              - Very  
Good

9. Do you believe the air quality in your neighborhood has impacted your community's health? (Circle your answer)

- Strongly Agree                      - Agree  
- Neutral                                - Disagree                      -  
Strongly Disagree

10. If you answered yes, how has your community been impacted by air quality (circle all that apply)?

- a. Health issues
- b. Not able to work/engage in usual activities
- c. Other (please describe)

d. None of the above

b. No

c. I'm not sure

### Air Quality Information

11. Do you smoke inside of your home?<sup>25</sup>

a. Yes

b. No

12. How is the quality of air inside your home (circle all that apply if applicable)?

- Extremely poor                      - Poor -  
Neutral - Good                      -Extremely  
Good

13. What are the reasons for poor air quality inside your home?

a. Air pollution

b. Moisture

c. Lack of air filtration

d. Lack of air circulation

e. No window

f. Location of window

g. Smoking

h. Other \_\_\_\_\_

i. None of the above

14. Is there any additional information you would like to know regarding air quality and pollution in your home or neighborhood?

a. Yes

b. No

c. I'm not sure

15. What measures can be taken to improve air quality in your home? (circle all that apply)

a. Better air circulation

b. Air filtration system

c. Window repair

d. Other \_\_\_\_\_

e. None of the above

f. All of the above

16. Do you have access to an air filtration system inside of your home?

a. Yes

17. If answered no, are you able to afford an air filtration system?

a. Yes

b. No

c. I'm not sure

18. If answered yes, what type of air filtration system do you use?

a. Portable air filter

b. My building has proper air filtration

c. Clean Air Center (such as a school, library, or other public building)

d. Other \_\_\_\_\_

### Wildfire Information

19. During wildfires, have you had access to personal protective equipment?

a. Yes

b. No

20. If yes, what kind of personal protective equipment do you use or have access to?

a. N95 mask

b. Cloth mask

c. Self-contained breathing apparatus

d. Other

21. Due to the wildfires, did you experience any respiratory health effects (i.e. shortness of breath)?

a. Yes

b. No

c. I'm not sure

22. How have the wildfires most affected your daily life (circle all that apply)?

a. Health issues

b. Not able to work/engage in usual activities

c. Other \_\_\_\_\_

d. All of the above

e. None of the above

<sup>25</sup> Smoking option was only included in surveys administered in the Mission by community request.



View from an SRO  
in San Francisco  
Chinatown

**brightline**  
DEFENSE