EXHIBIT A

SCOPE OF WORK

☒ Contract ☐ Grant

Does this project include Research (as defined in the UTC)? ☒ Yes ☐ No

PI Name: Chelsea V. Preble

Project Title: Reducing Exposure with Air Cleaners and Technology (REACT) in At-Risk Communities

Project Summary/Abstract

Historically and persistently divested communities experience disproportionate air pollution and health burden. Mitigation strategies that create protective environmental spaces are critical to reducing exposures and benefiting health. Using an interrupted time series design, we will evaluate the impact of air filtration devices (cleaners) on indoor fine particulate matter ($PM_{2.5}$) exposures and respiratory health outcomes. In addition, using a multistage randomized control trial design, we will assess how inputs like indicators from low-cost $PM_{2.5}$ sensors and technical assistance can increase the use and effectiveness of air cleaners (Figure 1). We will recruit 100 households residing in Bayview Hunters Points (BVHP). Each household will be randomized to receive a PurpleAir $PM_{2.5}$ sensor with (n = 50) and without (n = 50) an indicator. After a 30-day baseline $PM_{2.5}$ monitoring period, all households will receive an air cleaner. After an additional 30 days, households not consistently using air cleaners (<50% of average logged use) will receive additional technical assistance. All participants will complete in-the-moment surveys twice weekly to capture general behaviors and respiratory symptoms. Using segmented regression models, we will estimate how the presence of air quality indicators, air cleaner use, and targeted assistance affect indoor air quality and health symptoms. This study will test the effectiveness of these individual-level interventions, guiding future policymaking and advocacy efforts to improve indoor air quality for over-exposed communities.

If Third-Party Confidential Information is to be provided by the State:

☐ Performance of the Scope of Work is anticipated to involve use of third-party Confidential Information and is subject to the terms of this Agreement; ***OR***

☐ A separate CNDA between the University and third-party is required by the third-party and is incorporated in this Agreement as Exhibit A7.

Scope of Work

Introduction

Across the United States and in California, social adversity and environmental pollution are geospatially distributed and concentrated in communities of color and of low socioeconomic status. These environmental justice (EJ) communities carry a disproportionate burden of exposure that has significant impacts on health, including mortality. Bayview Hunters Points (BVHP)—an EJ community through decades of divestment and policies favoring industrial development— experiences disparate pollution and health burdens. Local sources of $PM_{2.5}$ include heavy industrial activity, commuter traffic, heavy-duty diesel trucks, freight trains, and port and maritime activities. Health-protective guidance in these highly impacted communities would improve if we better understood indoor infiltration of outdoor air pollution, especially during extreme events like Spare the Air Days and wildfire smoke periods.

Our research team has extensive experience with community-partnered air quality monitoring and health assessments using low-cost sensors and surveys. We have previously completed an indoor monitoring study using PurpleAir sensors that quantified overall IAQ and the infiltration of outdoor $PM_{2.5}$ into indoor residences across single-room occupancy hotels in San Francisco and investigated modifiable behaviors that may impact IAQ (Nguyen et al., in prep). Study staff worked with SRO Tenant Leaders to recruit participants, and installed a PurpleAir sensor with each resident that was matched to an outdoor PurpleAir sensor. In-moment text surveys were sent to residents throughout the study period to capture and temporally link health behaviors to PurpleAir measurements. Estimated infiltration factors in this study were generally higher than other studies in California, suggesting older multifamily structures like the studied SROs may be leakier than other homes. We found that health education on modifiable health behaviors to reduce indoor $PM_{2.5}$ concentration may reduce residential exposure when outdoor concentration is low. Additionally, we previously implemented a limited personal air cleaner distribution program, which found low device use by residents. This prior experience motivates the proposed study framework to both quantify the impact of air cleaners on IAQ and health improvements and understand how we can increase their usage and effectiveness.

Study Design

This study will be a collaborative partnership between UC Berkeley (UCB), UC San Francisco (UCSF), and local EJ organizations, BVHP Community Advocates (Advocates) and Brightline Defense (Brightline). We propose an interrupted study design to assess the effectiveness of air cleaners to improve IAQ and health in BVHP. PurpleAir sensors will be used to quantify $PM_{2.5}$ concentrations before and after air cleaners are distributed (Figure 1). Using a multistage randomized controlled trial design, we will also evaluate how additional information and training can impact participant use of the air cleaners. We will recruit 100 households in BVHP and monitor for a total of 90 days in each participating household. UCB will be responsible for the overall project management and oversight in addition to leading the IAQ monitoring and $PM_{2.5}$ analysis, UCSF will lead the health assessments and modeling, and Advocates and Brightline will lead community engagement and recruitment.

Task 1: Community Outreach and Engagement Plan (Leads: Advocates & Brightline, Q1–Q2). The research team has close ties with key stakeholders that will be leveraged for community outreach, including local residents and businesses, Bay Area Air Quality Management District (BAAQMD), City of San Francisco (SF), SF Department of Public Health (SFDPH), and local health clinics and programs. Additionally, the Advocates lead AB617-related work in the community, including the Community Emission Reduction Program (CERP) and the Community Steering Committee (CSC). Through its job training, youth leadership, and tenant organizing programs, Brightline collaborates and engages with multiple community-based organizations on air quality in BVHP. Through its campaigns in local hiring, power plant siting, and clean energy advocacy, Brightline's staff is also highly trained in policy nuance and connecting between different levels of government.

We will leverage these existing partnerships for our community outreach and engagement plan, including for the recruitment of the Community Advisory Board (CAB). The CAB will be formed in Q1 of the study and will follow a hybrid model that includes both key stakeholders and organizations who work in the community as well as BVHP residents. Using their existing network of health and EJ allies working in this community—including Community Youth Center (CYC), 3rd Street Youth Clinic, Marie Harrison Community Foundation, Literacy for Environmental Justice (LEJ), Samoan Community Development Center (SCDC), and El Centro—Advocates and Brightline will collaborate to identify 10 organizations and individuals to serve as consultant experts on the CAB, bringing together diverse backgrounds and perspectives to inform the study and its implementation.

The CAB will meet 10 times over the course of the 2-year study. For the first three meetings after being formed, the CAB will meet monthly in Q1 and Q2. For the rest of the study, the CAB will meet roughly quarterly. The CAB will provide literature review feedback; advise on proposed questionnaires, including the development of additional surveys; advise on research objectives, study design, and recruitment plans; participate in data interpretation; and, co-develop a dissemination plan to ensure study is incorporated into broader community goals. Members of the CAB will be compensated $140 per 90-minute meeting as consultants, up to $1400 for their time and expertise. Advocates will host and conduct these CAB meetings to advise and monitor the progress of the study, with support from Brightline, UCSF, and UCB, as needed. Communication of study activities will occur regularly with community partners, study participants, and stakeholders, through distribution of information to the CAB, updates at CERP and CSC meetings, the existing advocacy networks of Advocates and Brightline, email newsletters, and social media posts.

All researchers will update their cultural competency training within the first month of the contract. By the end of Q1, the research team will deliver a 1-page project summary in plain language to share with the public, hold a public kickoff meeting, and the contract agreement for CAB members. The initial community outreach and engagement plan will be developed in collaboration with the CAB and delivered by the end of Q2, along with community engagement materials that have been co-developed with CARB. As the study progresses, the plan and materials will be updated and delivered to CARB by the end of the first year of the study.

Task 2: Literature Review (Leads: UCB & UCSF; Q1–Q4). In our pilot study, we conducted a literature review on infiltration factors and trends in indoor and outdoor pollution patterns, focusing on studies that included older buildings and infrastructure. This literature review and several other studies led by the research team in the SF Bay Area (see CVs) have equipped us with a nuanced understanding of how local meteorology and pollution patterns impact both outdoor and indoor $PM_{2.5}$ concentrations, indoor/outdoor ratios, and infiltration factors. We will update this literature review with recent publications and prior studies of PM interventions, along with those that capture the local indoor and outdoor air pollution sources, health, and housing characteristics that may be pertinent to BVHP. As part of our community outreach and engagement plan, we will share the findings of the review and solicit feedback from the CAB to understand alignment or differences with their unique lived experiences. This literature review will be delivered to CARB by the end of the first year. UCB and UCSF will lead the literature review, with input and guidance from Advocates, Brightline, and the CAB.

Task 3: Questionnaire Development (Leads: UCB & UCSF; Q1). In collaboration with the CAB, we will develop the pre- and post-study questionnaires and in-the-moment SMS surveys that will be sent during the monitoring period. We will incorporate CAB suggestions for wording and content, and we will seek their input on any additional factors, behaviors, or health outcomes that should be collected given their lived experiences in BVHP. These questionnaires and surveys will allow us to evaluate potentially confounding factors that may influence the intervention benefits and self-reported health impacts, as well as capture behavior data to assist the research team in interpretation of collected data. We will maintain and protect data confidentiality in accordance with IRB protocols. Participants will be compensated for each questionnaire and survey they complete over the course of the monitoring period.

- Questionnaires: to be distributed at baseline and completion of the study
    1. *Demographics*: Income, race/ethnicity, gender, education, whether they rent or own their home, and how long they have lived at their current residence
    2. *Household Characteristics*: Address, unit size (number of rooms, approximate square footage), building type (single or multi-level, single- vs multi-family home, etc.), stove type (gas or electric), and presence of HVAC system or personal air cleaners. We will also ask the number and age of all household members to assess crowding.
    3. *Baseline Health Status*: Questions about smoking status, underlying health conditions, and daily symptom burden

- In-the-Moment Surveys: to be sent by SMS 2× per week
    1. *Occupancy*: Number of people currently at home
    2. *Recent Indoor Activities*: (within the last hour) open windows, air cleaner in use, running HVAC system, cooking using a stove or other appliance, burning candles or incense, and smoking or vaping of any kind.
    3. *Health & IAQ Status*: respiratory symptoms and impression of their current IAQ

- Health Outcome: to be measured at baseline, during in-the-moment surveys, and at study completion
    1. *Breathlessness, Cough, and Sputum Scale (BCSS)*: We will use the validated BCSS instrument to assess respiratory symptom changes with the introduction of the air cleaner (DeVries et al., 2016). The minimal clinically important difference (MCID) is >1 for substantial effect, >0.6 for moderate, and >0.3 for small effect (Leidy et al., 2004).

UCSF and UCB will lead the questionnaire development, with support and guidance from Advocates, Brightline, and the CAB. Questionnaires and surveys will be finalized by the end of Q1 so that they are ready to be implemented as soon as participant recruitment and enrollment begins in Q2. Preliminary results from the questionnaires will be delivered to CARB by the end of the first year of the study.

Task 4: Participant Selection & Recruitment (Leads: Advocates, Brightline, & UCSF; Q2–Q4). In collaboration with the CAB, eligibility criteria and the recruitment plan will be finalized by Q2 of the study. We aim to recruit 100 households from BVHP to receive PurpleAir sensors and air cleaners. Eligible households must reside in the BVHP AB617-designated map and have at least one residing adult (≥18 years old) with a chronic respiratory health condition (asthma or COPD). Residents who report active use of air cleaners in the past 6 months and those who plan to move during the 90-day study period will be excluded. There will be no exclusion criteria based on income, housing type, or health- or IAQ-impactful behaviors like smoking indoors.

Advocates and Brightline will lead participant recruitment by leveraging their existing outreach and engagement activities and through the working partnerships with our CAB members and other partner organizations. Advocates will develop informational and educational materials and events to inform the overall community about the project and recruit eligible households. Participants will be recruited using the Advocates' and Brightline's networks of other allied health and EJ advocate organizations, at CERP and CSC meetings, and with ongoing community events. Details about the study will be shared with eligible individuals, and those who are interested will be consented and enrolled in the study.

UCSF will obtain IRB approval for the research activities before participant recruitment begins. Participant recruitment will begin in Q2 and continue on a rolling basis until 100 households have been recruited. The agreement that will be used to consent and enroll participants in the study will be shared with CARB by the end of Q2, and the research team will deliver a progress update on participant recruitment at the end of the first year of the study.

Power & Sample Size Calculations: Informed by our prior pilot study and review of the literature, we conservatively anticipate air cleaner use will reduce daily-average $PM_{2.5}$ by 10 μg m^{-3} (standard deviation, SD = 20 μg m^{-3}). Interrupted time series design improves the rigor of pre/post study designs by incorporating

multiple time points of pre- and post-intervention data collection (Penfold and Zhang, 2013). With a 30-day baseline and 60-day post-intervention measurement period, we include a minimum of thirty mean daily $PM_{2.5}$ measures pre- and post-intervention. With these parameters, we need a minimum of 70 households to detect an effect size of 10 μg m^{-3} (Table 1). With a sample size of 100 households, anticipating 30% attrition based on prior engagement work, we will be well powered to detect very small effects in the final sample size of 70. As the availability of indicator data is a passive intervention, we anticipate its impact on improving air quality will be small. With a fixed sample size of 70, we will be able to evaluate differences in daily-average $PM_{2.5}$ as small as 10% when comparing households with PurpleAir monitors with or without IAQ indicators. At least 92 participants are needed to evaluate an MCID >1 (SD = 2.0) for substantial effect in self-reported respiratory symptoms using BCSS. Multiple participants can be recruited from a recruited household to increase sample size for this outcome, if needed. All effect and sample sizes are calculated at alpha = 0.05 and power = 0.8.

Table 1. Summary of power calculations to determine minimum sample sizes to detect expected effect size for the IAQ and health outcomes.

Outcome	Intervention	Effect Size (SD)	Sample Size
Air quality	Air cleaner	10 μg m^{-3} (20 μg m^{-3})	70 households
Air quality	AQ sensor indicator	> 10%	70 households
Self-reported respiratory symptoms	Air cleaner	>1.0 (2.0)	92 individuals

Task 5: Air Cleaner Intervention & Field Study (Leads: UCB, UCSF, Brightline, & Advocates; Q2–Q4). We will conduct an interrupted time series intervention study (Figure 1) over a 90-day period for each household, during which we will monitor indoor $PM_{2.5}$ concentrations continuously and collect in-the-moment health and behavior data twice weekly. At the end of study, all participants will keep the air cleaner (including a replacement filter) and PurpleAir sensor, as well as be compensated up to $265 for their participation. As compensation for hosting our sensors and taking the questionnaires at the beginning and end of the monitoring period, each participant will receive $200 in the form of Visa gift cards ($100 at the start of the study, $100 at the end). Additionally, each participant can earn up to $65 for taking our interval surveys over the course of the study ($2.50/survey), also given in the form of a Visa gift card. All gift cards will have their activation fees ($10.80/participant) covered.

The PurpleAir model was selected for this study because it is a commonly used low-cost sensor that has been deployed in other $PM_{2.5}$ studies, has well characterized performance, and offers the most flexibility for future use by study participants (Singer and Delp, 2018; Park et al., 2023). The research team will select the air cleaner model to be used in this study from the CARB list of certified air cleaning devices and in consultation with CARB. Important criteria to consider will include the affordability of each cleaner and replacement filters, verification that the model is ozone-free, and room size rating.

After consent, households will be randomized to receive sensors with visual IAQ cues (n = 50, PurpleAir Zen or Flex model; Intervention Arm 1) or sensors without IAQ indicators (n = 50, PurpleAir Classic SD model; Intervention Arm 2). The interrupted time series intervention study will be conducted as follows:

- Phase 1 (Days 1–30): We will collect baseline indoor $PM_{2.5}$ concentrations from PurpleAir monitors and health and behavior data from in-the-moment surveys over the first 30 days. Our prior work informs this monitoring duration as sufficient for establishing daily average $PM_{2.5}$ and typical

behaviors.

- Phase 2 (Days 31–60): Air cleaners will be distributed and data loggers capturing use will be installed. All participants will receive an educational handout on the air cleaners and best practices for use. Participants randomized to Arm 1 will also receive a fact sheet about the PurpleAir sensor and its IAQ indicator.

- Phase 3 (Days 61–90): At the conclusion of Phase 2, we will use data logger data to assess air cleaner usage. Participants with low cleaner usage (<50% average use) in either intervention arm will receive additional information and training to explore if more targeted technical assistance increases air cleaner use. This additional technical assistance includes targeted engagement with additional text message alerts to use air cleaners when outdoor $PM_{2.5}$ concentrations are high, text message reminders about tips for best practices like turning air cleaners on when cooking or using candles, and in-person visits for those who indicate that further hands-on education would be beneficial.

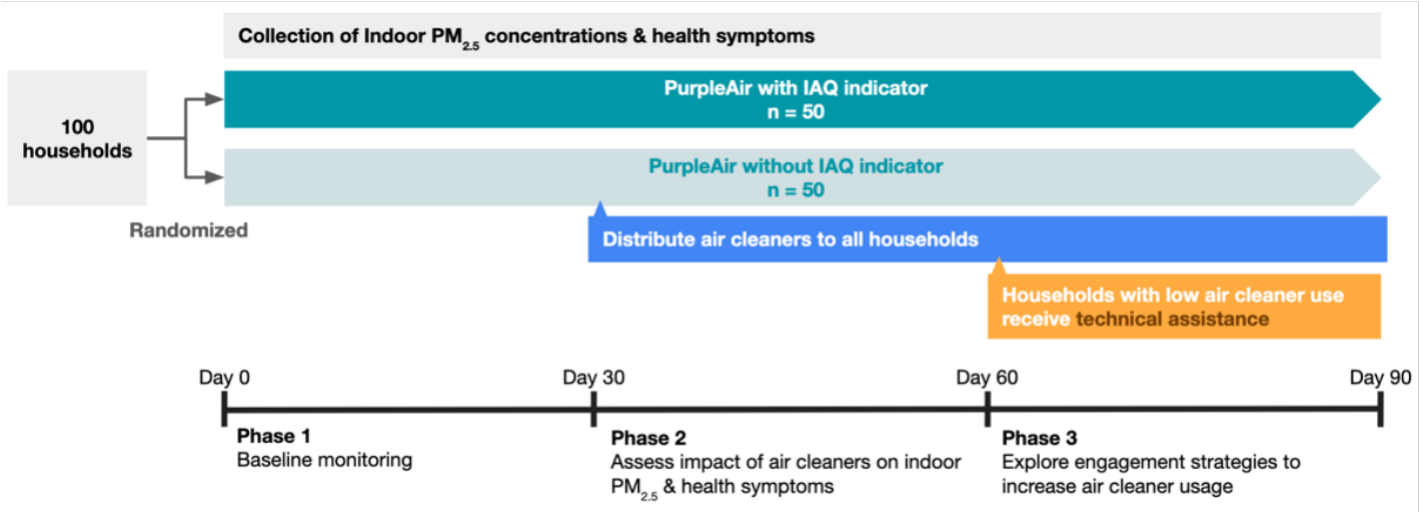

Figure 1. Study design with interrupted times and multistage randomized controlled trial design, with continuous IAQ and health monitoring for 90 days in each household.

The installation of the PurpleAir sensor and air filters will follow a standardized method. Both will be placed in a central, communal area like the living room. PurpleAir sensors will be installed on a non-floor surface with at least 1 foot of clearance on all sides, away from any vents, $PM_{2.5}$ sources like candles, and windows that may be opened. Sensor readings will be stored locally to an SD card that is retrieved at the end of the monitoring period. When installed, the air cleaner will be placed at least 3 feet away from the PurpleAir and installed with an energy data logger to determine usage and speed setting. Collected data from the PurpleAir and cleaner use loggers will be assigned a unique ID and will not include any identifiable information of the participant. During installation, technicians will survey the home and make a rough sketch of the layout with dimensions using a laser distance finder to estimate the total volume of the household. No personal or identifiable information will be stored with study data; it will be stored on an encrypted HIPAA-compliant, password-protected cloud server at UCSF.

We will leverage the existing low-cost $PM_{2.5}$ sensors that have been deployed in BVHP, including ~12 PurpleAir sensors with publicly accessible data and 3 Clarity sensors that are maintained by Brightline. As needed, we will deploy up to 20 additional PurpleAir sensors (PA-II model) to achieve sufficient spatial distribution across the community and pair to indoor sensors. Indoor sensors will be paired to the nearest outdoor sensor to characterize infiltration, indoor/outdoor ratios, and identify the indoor emissions signal relative to the outdoor background. The data from these outdoor sensors will be publicly available to the

community on the PurpleAir online map, while indoor sensors remain private to protect participant information.

UCB and UCSF will train outreach team members from Brightline and Advocates to conduct these home visits, including installing the PurpleAir sensors in Phase I, installing the air cleaners in Phase II, administering the questionnaires at the start and end of the monitoring period, resolving typical issues with general troubleshooting protocols, and conducting follow-up visits for hands-on training in Phase III. Advocates will have two outreach team members that will lead these installations and home visits, and Brightline will serve as technical support for Advocates. For the first ~10% of participants, a researcher from UCB and UCSF will also be present to support Brightline and Advocates with the installations and questionnaires. For the following ~20% of participating households, Brightline will be present to support Advocates with home visits. For the remaining 70% of participating households, Advocates will lead the home visits, with support from Brightline, UCSF, and UCB, as needed. In the case that basic troubleshooting protocols are not effective during a monitoring period, UCB and UCSF will support Advocates and Brightline with technical support. UCB and UCSF will work with Brightline and Advocates to develop: (1) the educational handouts about air cleaners and best practices for use that all participants will receive at the start of Phase II, (2) the fact sheet about the the PurpleAir sensor and its IAQ indicator that participants randomized to Arm 1 will also receive, and (3) the materials for the additional information and training that those participants with low cleaner usage will receive in Phase III of the study.

The intervention field study will begin in Q2 and is expected to continue through the end of Q4 as participants are recruited. This task will be complete once the intervention and 90-day monitoring period has been conducted in 100 BVHP households.

Task 6: Modeling & Analysis (Leads: UCB & UCSF; Q5–Q6). We will assess the changes in $PM_{2.5}$ and self-reported health outcomes over the intervention periods relative to the baseline. Air cleaner usage and speed settings will be verified with the recorded energy consumption data. We expect that air cleaner use will result in lower daily-average $PM_{2.5}$ concentrations, faster decay rate of episodic indoor emission events (e.g., cooking), and less frequent reports of adverse respiratory symptoms. We expect that these effects will be stronger in Intervention Arm 1 compared to Arm 2, with the additional visual cues of IAQ on the PurpleAir sensor increasing air cleaner use and its benefits. Finally, we expect that additional targeted assistance will increase air cleaner use and effectiveness in Phase 3 for those with prior low usage.

To characterize the relationships between indoor and outdoor $PM_{2.5}$, we will determine indoor/outdoor ratios and infiltration factors (F_{inf}). We will utilize morphological algorithms to identify and separate indoor episodic $PM_{2.5}$ peaks from the indoor baseline, which will be further decomposed into persistent indoor-generated $PM_{2.5}$ and infiltrating outdoor-generated $PM_{2.5}$. We will then use modified random component super-composition to estimate F_{inf} (Lunderberg et al., 2023). To evaluate the efficacy of air cleaners, we will determine decay rates for each identified indoor episodic event.

Household-specific total average $PM_{2.5}$, indoor episodic $PM_{2.5}$, and $PM_{2.5}$ decay rates comprise our $PM_{2.5}$ exposure metrics of interest. We will employ segmented regression models to assess the changes in these $PM_{2.5}$ exposure metrics over the sequence of interventions. Each metric will be modeled as a function of the intervention and other covariates, such as outdoor $PM_{2.5}$ concentration, F_{inf}, time of day, season, and self-reported behaviors like opening windows, cooking, and smoking. These segmented models will account for the clearly defined interruptions in the $PM_{2.5}$ time series data that result from the phased interventions. Inclusion of random effects will account for autocorrelation of data at the household level, and subanalysis by housing age and housing characteristics to explore effect modification.

Self-reported health outcomes will also be modeled using segmented regression, but will include subanalysis for potential effect modification by individual characteristics and social, spatial, and climate vulnerability and resilience factors. Such factors include age, gender, income, pre-existing and co-occurring diseases, housing age, neighborhood-level infrastructure (e.g. tree canopy cover, proximity to clean air centers), and historical

exposure to ambient and acute smoke events. We will isolate and quantify the immediate changes in these outcomes following each intervention, as well as any changes in the trends. Perceived benefits, including perceived respiratory improvements, will be qualitatively assessed by semi-structured interviews with participants at the end of the study. Interviews will last approximately 30 minutes and ask about use of air cleaners, including factors that may contribute to increase (e.g., IAQ indicators, extra support) and decrease (e.g., motivation, belief about efficacy) and perceived IAQ and health benefits. Interviews will be audio recorded, transcribed, and coded using an inductive approach (i.e., examine for emerging patterns and themes from interviews). Final thematic analysis will be completed in partnership with CAB.

This data analysis and modeling will take place after the conclusion of the field studies, in Q5 and Q6, and will be led by UCB and UCSF.

Task 7: Reporting (Leads: UCB, UCSF, Brightline, & Advocates; Q6–Q8). Our multidisciplinary team believes in deeply partnered, collaborative work that is meaningful, transparent, and impactful. Following our outreach plan, we will engage directly with the BVHP community and stakeholders through our existing partnerships, including the CERP and CSC, and share the results of our study so that the key insights and conclusions can immediately be incorporated into ongoing policy and advocacy work. Additionally, we will meet regularly with CARB staff and ensure all collaboration and reporting requirements are met and deliverables are completed as specified, including quarterly progress reports, monthly meetings, development of outreach materials, and draft/final reports.

Table 2. Expected timeline of the proposed 2-year study, broken down into quarters and by task.

Timeline of Proposed Study	Year 1				Year 2			
Quarter of Study	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Task 1: Community Outreach & Engagement Plan [Leads: Advocates & Brightline]								
Task 2: Literature Review [Leads: UCB & UCSF]								
Task 3: Questionnaire Development [Leads: UCB & UCSF]								
Task 4: Participant Selection & Recruitment [Advocates, Brightline, & UCSF]								
Task 5: Intervention & Field Study [Leads: UCB, UCSF, Brightline, & Advocates]								
Task 6: Modeling & Analysis [Leads: UCB & UCSF]								
Task 7: Reporting [Leads: UCB, UCSF, Brightline, & Advocates]								

UCB and UCSF will be responsible for all technical materials and reporting to CARB, with the support of Brightline and Advocates. UCB and UCSF will work with Brightline, Advocates, and CARB to develop community-facing outreach materials in non-technical language that can be used to inform the CAB and larger community about the results of the study. Advocates and Brightline will lead community report-back events to get the community's feedback on the study results and develop a community plan with next steps that are based on the study outcomes. The draft final report will be delivered to CARB six months prior to the end of the contract, and will include all measurement and modeling results along with a discussion of

strategies and recommendations for improving IAQ and health. The final report will be delivered prior to contract close. Plain-language fact sheets and outreach materials will be developed with CARB and delivered by the end of Q7. In Q8, we will deliver a plain-language public seminar and a CARB research seminar.

Conclusion

With the proposed interrupted times series study, we will be able to characterize indoor and outdoor $PM_{2.5}$ trends in the highly impacted community of BVHP, assess the efficacy of low-cost $PM_{2.5}$ sensors and air cleaners to reduce exposures and improve health outcomes, and explore modifiable behaviors that could further improve these IAQ and health benefits. This work will be community-centered, with meaningful partnerships between UC researchers, local policy and advocacy experts, and community members. We aim to distribute PurpleAir sensors, air cleaners with a spare replacement filter, and technical assistance for how to best use these technologies to 100 BVHP households with at least one adult who experiences a chronic respiratory health condition. The results of this study can offer guidance for future policymaking and advocacy strategies to mitigate the harmful effects of poor air quality in at-risk communities.

References

DeVries, R.; Kriebel, D.; Sama, S. Validation of the breathlessness, cough and sputum scale to predict COPD exacerbation. *npj Primary Care Respiratory Medicine* (2016) 26, 16083. DOI: 10.1038/npjpcrm.2016.83.

Leidy, N.; Rennard, S.; Schmier, J.; Jones, M.; Goldman, M. The Breathlessness, Cough, and Sputum Scale: The Development of Empirically Based Guidelines for Interpretation. *Chest* (2004) 124. 2182-91. DOI: 10.1378/chest.124.6.2182.

Lunderberg, D.; Liang, Y.; Singer, B.; Apte, J.; Nazaroff, W.; Goldstein, A. Assessing residential PM2.5 concentrations and infiltration factors with high spatiotemporal resolution using crowdsourced sensors. *Proceedings of the National Academy of Sciences*, 2023, 120(50), e2308832120. DOI: 10.1073/pnas.2308832120.

Nguyen, A.; Chan, W.R.; Correa, C.; Preble, C.; Delp, W.; Wolf, M.; Morrison, A.; Ahn, E.; Thakur, N. $PM_{2.5}$ Levels, Infiltration, and Modifying Behaviors in Single Room Occupancy Hotels. (In Prep.)

Park, S.; Lee, S.; Yeo, M.; Rim, D. Field and laboratory evaluation of PurpleAir low-cost aerosol sensors in monitoring indoor airborne particles. *Building and Environment* (2023) 234, 110127. DOI: 10.1016/j.buildenv.2023.110127.

Penfold R.; Zhang F. Use of interrupted time series analysis in evaluating health care quality improvements. *Academic Pediatrics* (2013) ;13(6 Suppl):S38-S44. DOI:10.1016/j.acap.2013.08.002

Singer, B.; Delp, W. Response of consumer and research grade indoor air quality monitors to residential sources of fine particles. *Indoor Air* (2018) 28, 624–639. DOI: 10.1111/ina.12463.