NATIONAL ENVIRONMENTAL JUSTICE ADVISORY COUNCIL

November 23, 2022

Michael S. Regan, Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, D.C. 20460

Dear Administrator Regan:

The National Environmental Justice Advisory Council (NEJAC) is pleased to submit this Letter of Recommendations on Air Quality and Community Monitoring. For decades, NEJAC has heard from members of the public whose health and quality of life have been adversely affected by unregulated or inadequately regulated sources of air pollution. In 2020, NEJAC established the Air Quality and Community Monitoring (AQCM) Workgroup to explore these concerns in greater detail and develop recommendations to improve air quality in overburdened and underserved communities. The Workgroup submitted its findings to the full NEJAC for review and approval; within this letter, we present NEJAC's recommendations.

The United States Environmental Protection Agency's (EPA's) establishment of a competitive grant program under the American Rescue Plan (titled *Enhanced Air Quality Monitoring for Communities*) to support community air monitoring represents the Agency's heightened recognition of the problem and is a positive step forward. Building upon this effort, the NEJAC AQCM Workgroup and EPA Office of Air and Radiation (OAR) worked collaboratively to develop eight questions that are the framework for this Letter of Recommendations:

1. What are the primary ways in which the public and environmental justice (EJ) communities will want to engage with the air quality data from new technologies (e.g., federal reference method (FRM)/and equivalent monitors, sensors or mobile equipment, remote-sensing and other techniques) that may be funded under the ARP or other types of funding? What questions or uses are anticipated?
2. What are the issues related to understanding the quality of the data obtained?
    - How will communities and regulators evaluate data quality?
    - From the community perspective, what are the strengths and limitations of various types of monitoring approaches?
3. How might we improve public understanding about issues such as the geographic scope or timing of monitoring? Or how to relate measures to human exposures or health-relevant benchmarks?
4. From the community perspective, how should EPA evaluate and interpret the data communities are collecting?

5. From the community perspective, how should EPA engage with state and local agencies responsible for air quality protection?
6. How might we improve practices and future decision-making regarding permitting, siting, compliance reviews, enforcement actions, and ways we convey the purpose of the data collection to enhance its use, application, and impact, and avoid misuse or lack of consideration of community-generated data?
7. What are examples of previous successful programs or pilots with lessons learned about using new monitoring data to meet community needs?
8. What strategies and approaches should EPA consider for reducing harm to fence-line communities from cumulative impacts from multiple sources of air pollution?

EPA's ARP-funded grant program has an important focus on community air monitoring. However, it must be emphasized that monitoring alone will not reduce air pollution problems in our communities. This Letter of Recommendations addresses important steps to improve community air monitoring programs, and how community air monitoring should be combined with other measures to spark regulatory actions necessary to achieve EPA's Strategic Goal to *Ensure Clean and Healthy Air for All Communities* and the Strategic Objective to *Improve Air Quality and Reduce Localized Pollution and Health Impacts.*

Thank you for this opportunity to provide the Letter of Recommendations on Air Quality and Community Monitoring. NEJAC believes EPA's community air monitoring program, done correctly, will provide EPA with additional data that it needs to more effectively reduce air pollution in overburdened and vulnerable communities, empower citizens to effectively oversee the environmental conditions of their neighborhoods, and build trust between EJ communities and EPA and the state and local agencies responsible for air quality protection. Done incorrectly, however, the program could fail to achieve progress toward environmental equity and thus exacerbate impacted communities' long-standing distrust and frequent conflicts with regulatory agencies. NEJAC's hope is that the recommendations in this letter help EPA improve benefits to and outcomes for EJ communities.

Sincerely,

Sylvia Orduño, Co-Chair

Na'Taki Osborne Jelks, PhD, Co-Chair

cc: NEJAC Members
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1. Introduction

The impact of polluted air on overburdened and underserved communities has been a major concern of the National Environmental Justice Advisory Council (NEJAC) since its establishment in 1993. NEJAC has expressed its concerns through many reports and recommendations to United States Environmental Protection Agency (EPA) Administrators over several decades.[1] At its public meetings, NEJAC has repeatedly heard from members of the public whose health and quality of life have been adversely affected by unregulated or inadequately regulated sources of air pollution. Members of the public describe how limited or no air monitoring in the community and a lack of timely information on air quality have compromised communities' ability to protect themselves and take effective action to clean up or shut down significant sources of air pollution. In 2017, NEJAC submitted a report on Recommendations and Guidance for EPA to Develop Monitoring Programs in Communities[2]. In 2020 NEJAC established the Air Quality and Community Monitoring (AQCM) Workgroup to explore these concerns in greater detail and develop recommendations to improve air quality in overburdened and disadvantaged communities. Members of the AQCM Workgroup are listed in **Attachment 1**.

2. General Principles and Focus Areas

At its formation, the AQCM Workgroup developed a set of general principles and identified six major focus areas where these principles should be applied.

a. General Principles

Environmental justice (EJ) requires that EPA offices implement reforms in communities experiencing environmental harm, including but not limited to its permitting, rulemaking, and enforcement practices, that:

- Systematically reduce environmental hazards in the most overburdened and vulnerable communities,
- Reduce environmental inequality across communities, and
- Enable members of overburdened and vulnerable communities to have greater influence over government decisions that affects their lives.

b. Focus Areas

i. <u>Monitoring, Data, and Reporting</u>

- Improving the quantity, availability, access, and timeliness of air quality data (particularly for fence-line communities),
- Effectively integrating community air quality data with data from EPA's network of regulatory air monitoring stations and using those integrated air quality data-streams in permitting, compliance, and enforcement decisions, and
- Moving monitoring in an "upstream" direction by collecting real-time air quality data from industrial facilities "inside the fence," at the source or as close as practical to the point of discharge, making that real-time data readily available to the public in an understandable

[1] For example: https://www.epa.gov/sites/default/files/2019-08/documents/nejac-letter-ethylene_oxide-may-3-2019-final.pdf; https://www.epa.gov/environmentaljustice/strategies-enhance-school-air-toxics-monitoring-environmental-justice https://www.epa.gov/environmentaljustice/reducing-air-emissions-associated-goods-movement-working-towards-environmental

[2] https://www.epa.gov/sites/default/files/2018-01/documents/monitoring-final-10-6-17.pdf

format, and triggering "push notifications" to the public and to the regulators where facilities are out of compliance, or the public is at risk from unhealthy air.

ii. Fence-line Community Health

- Assessing cumulative impacts from multiple sources of air pollution on vulnerable communities and factoring cumulative impacts into making permitting and compliance decisions and in enforcement actions.

iii. Education

- Enhancing and expanding the availability and accessibility of climate change information and education for vulnerable communities, enabling those communities to make informed choices on energy and other activities that contribute to climate change, and connecting community members to career information and other opportunities to enhance local climate resilience.

iv. Community Voices

- Rebalancing how community-based air quality complaints (often, but not solely odor-related) are addressed, and reversing the burden of proof that currently falls on the community. Presuming that resident complaints are legitimate, making it the responsibility of the facility/source of emissions to demonstrate that it is operating in compliance and in a manner protective of public health and that corrective action is not needed to protect the public.

v. Implementation

- Equipping, training, and providing technical assistance to fence-line communities that are starting or expanding real-time air quality monitoring programs, and
- Equipping, training, and providing technical assistance for air quality monitoring in schools and other public facilities where children and other vulnerable populations gather.

vi. Regulatory Action

- Integrating findings on cumulative impact into compliance, enforcement, and permitting decisions, and
- Moving decisively to establish, expand, and implement EPA's authority to require that decisions by EPA and its state partners pertaining to permitting, rulemaking, and enforcement advance EJ protections and support EJ goals.

3. The American Rescue Plan and the Community Air Monitoring Grant Program

The AQCM Workgroup's collaboration with EPA OAR began shortly after the launch of the competitive grant program to support community air monitoring titled *Enhanced Air Quality Monitoring for Communities,*[3] authorized as part of the American Rescue Plan (ARP). Under the ARP, EPA received $50 million to enhance air quality monitoring, with funds awarded to support community and local efforts to monitor their own air quality and to promote air quality monitoring partnerships between communities and tribal, state, and local governments, and in November 2022, EPA selected 132 communities to receive a total of $53.4 million to conduct ambient air monitoring in communities across the country. EPA requested recommendations and insights from the NEJAC AQCM Workgroup on matters related to

[3] https://www.epa.gov/grants/enhanced-air-quality-monitoring-communities-closed-announcement-fy-2021

community needs around data collection, management, and interpretation, and on issues surrounding access to the data that will be collected.

The goals of EPA's community air monitoring grant program include:

- Enhanced air quality monitoring in and near underserved communities across the United States,
- Support for community and local efforts to monitor their own air quality and to promote air quality monitoring partnerships between communities and tribal, state, and local governments,
- Leverage existing air quality monitoring expertise,
- Expand use of community monitoring advisory groups and other approaches that give the community a voice in the monitoring of their air quality, and
- Build a foundation of trusting relationships and enhanced understanding from which sustainable solutions to community air pollution problems can be found.

These goals align closely with the focus areas identified by the NEJAC AQCM Workgroup, providing a solid foundation for collaboration. Through that collaboration, EPA and the AQCM Workgroup developed a set of questions, and the AQCM Workgroup took on the task of developing recommendations in response to those questions. The full NEJAC reviewed and approved the Workgroup's recommendations.

4. Framework for Recommendations

Through a collaborative process, the NEJAC AQCM Workgroup and EPA OAR jointly developed an overarching question, or prompt, as the basis for the AQCM's development of recommendations, followed by several "granular" questions, or sub-prompts, to organize the AQCM's work. EPA OAR was primarily interested in getting feedback from NEJAC that would add value to the launch and implementation of the ARP-funded grant program, *Enhanced Air Quality Monitoring for Communities.* The AQCM Workgroup strongly shared that interest.

Importantly, however, it must be emphasized that monitoring alone will not reduce air pollution problems in our communities. Monitoring must be followed with action to reduce emissions threatening human health. This letter thus includes both recommendations on how to improve community air monitoring programs so they have an impact in reducing air pollution, and how community air monitoring should be combined with other measures to spark regulatory action and achieve EPA's Strategic Goal to *Ensure Clean and Healthy Air for All Communities* and the Strategic Objective to *Improve Air Quality and Reduce Localized Pollution and Health Impacts: Reduce air pollution on local, regional, and national scales to achieve healthy air quality for people and the environment.*[4,5] Some of these recommendations can be implemented immediately as the new community air monitoring grants are implemented, while other recommendations, which are also essential to achieving clean and healthy air for all communities, will require a longer-term effort.

Expanded and enhanced air monitoring in communities is an essential and beneficial step, but the real test for each community air monitoring grant must be whether or not air pollution is reduced and whether or not the air is healthier to breathe. A community air monitoring program's value depends on how that program contributes to actions that reduce pollution and improve air quality in the community.

4 EPA FY 2022- 2026 Strategic Plan, Goal 4

5 EPA FY 2022- 2026 Strategic Plan, Strategic Objective 4.1

a. Prompt:

We monitored the air, now what? Gathering public and community input on data management, interpretation, access, application, and impact of air quality monitoring data in anticipation of ARP grants and new techniques.

Questions:

1. What are the primary ways in which the public and environmental justice (EJ) communities will want to engage with the air quality data from new technologies (e.g., federal reference method (FRM)/and equivalent monitors, sensors or mobile equipment, remote-sensing and other techniques) that may be funded under the ARP or other types of funding? What questions or uses are anticipated?
2. What are the issues related to understanding the quality of the data obtained?
    - How will communities and regulators evaluate data quality?
    - From the community perspective, what are the strengths and limitations of various types of monitoring approaches?
3. How might we improve public understanding about issues such as the geographic scope or timing of monitoring? Or how to relate measures to human exposures or health-relevant benchmarks?
4. From the community perspective, how should EPA evaluate and interpret the data communities are collecting?
5. From the community perspective, how should EPA engage with state and local agencies responsible for air quality protection?
6. How might we improve practices and future decision-making regarding permitting, siting, compliance reviews, enforcement actions, and ways we convey the purpose of the data collection to enhance its use, application and impact, and avoid misuse or lack of consideration of community-generated data?
7. What are examples of previous successful programs or pilots with lessons learned about using new monitoring data to meet community needs?
8. What strategies and approaches should EPA consider for reducing harm to and improve health in fence-line communities from cumulative impacts from multiple sources of air pollution?

5. Summary of Recommendations

The ARP-funded community air monitoring program, done correctly, could be transformative, providing EPA with additional data that enables the Agency to more assertively restrict air pollution in overburdened and vulnerable communities, empower residents to effectively oversee the environmental conditions of their neighborhoods, and build trust between EJ communities and EPA and the state and local agencies responsible for air quality protection.

Done incorrectly, however, the program could fail to achieve progress toward environmental equity and thus exacerbate communities' long-standing distrust and frequent conflicts with regulatory agencies. NEJAC's hope is that the recommendations in this letter help EPA to improve the benefits to and outcomes for EJ communities.

a. Recommendations

(A discussion of each recommendation follows in Section 6)

We list recommendations in Exhibit 1.

Exhibit 1. NEJAC Recommendations

QUESTIONS	RECOMMENDATION
1	1.1 Develop a Joint Data Communication and Response Plan with Communities 1.2 Develop Joint Data Accessibility and Data Visualization Tools for Communities 1.3 Provide Guidance on Equipment Choices and Operational Support 1.4 Share Best Practices Among Community Air Monitoring Grantees
2	2.1 Jointly Prepare Written Agreements on Practices to Achieve Data Quality 2.2 Jointly Prepare Written Agreements on How Community-Generated Data (C-G Data) will be Integrated into Regulatory Decision Making
3	3.1 Expand the Current Network of FRM and FEM Monitors 3.2 Connect Air Quality Data to Health Data at the Local Level 3.3 Improve the Public's Understanding of Air Quality Data by Using Better Visualization Tools 3.4 Educate the Public on the Causes and Impacts of Air Pollution 3.5 Invest Greater Resources in Risk Communication Focused on Air Pollution 3.6 Coordinate Education and Outreach Efforts with Other Health Agencies
4	4.1 Establish Clear "Rules of the Road" for how EPA will use C-G Data 4.2 C-G Data Indicating Unhealthy Air in the Community Should Trigger a Regulatory Response 4.3 Integrate C-G Data into Risk Communication to the Public and Regulatory Decision Making
5	5.1 Establish Internal Processes and Guidance for Asserting EPA's Authority to Protect Communities from Unhealthy Air 5.2 Strengthen Expectations and Develop Guidance for Public Engagement in the Air Permitting Process 5.3 Provide Technical Assistance to Communities in the Review of Proposed Air Permits 5.4 Research, Identify, and Share Best Practices 5.5 Establish Requirements and Mechanisms for Meaningful Engagement Between Permit Holders and the Impacted Community
6	6.1 Connect Air Pollution Measurement Directly to Regulatory Decision Making 6.2 Factor Historical Performance into Permit Conditions and Include Up-Front Funding for Mitigation and Response 6.3 Update Permitting and Sting Laws and Regulations 6.4 Require Higher-Performing Air Pollution Control Technologies that are More Robust and Resilient, and Plan for Immediate Response When Malfunctions Occur 6.5 Incorporate Enforceable Short-Term Limits in Permits Tied to Specific Contaminants
7	Examples of successful air monitoring programs are in **Attachment 2**
8	8.1 Conduct Research, Develop, and Implement an Air-Shed Equivalent to the Total Daily Maximum Load Program 8.2 Focus on source monitoring 8.3 Strengthen Accountability by Maximizing Transparency 8.4 Develop a Federal Reference Method for Diesel Particulates 8.5 Develop a "Model EJ Ordinance"

The recommendations are organized according to a series of questions developed through multiple discussions with the staff of EPA OAR.

Question 1: What are the primary ways in which the public and EJ communities will want to engage with the air quality data from new technologies that may be funded under ARP or other types of funding, (e.g., FRM/and equivalent monitors, sensors or mobile equipment, remote-sensing techniques and other techniques)? What questions or uses are anticipated?

Issues of Concern:

Integrating the first and second parts of the question, the primary issue is that community-generated (C-G) data obtained in conformance with an established quality process should be fully considered and used in making permitting, compliance, and enforcement decisions. A scenario in which communities submit air quality data of acceptable, known quality that demonstrate air quality problems, but where no follow-up action is taken by the regulator, directly conflicts with EPA's Strategic Goals and Strategic Objectives, undermines the purpose of the ARP Community Air Grant program, and will undermine the trust between the community and the regulators that is essential to future progress.

Recommendations:

1.1. Develop a Joint Data Communication and Response Plan with Communities: EPA, state and local regulators should develop a Data Communication and Response Plan (or whatever title is most appropriate) for each community air monitoring program established/expanded through the ARP *Enhanced Air Quality Monitoring for Communities* grants. Both the community and the regulators will be data providers and data recipients. The Plan should clearly define those regulators and discharging facility owners who will receive C-G data and explain specific follow-up actions the regulators commit to taking where C-G data demonstrate air quality problems of concern. The data should flow in both directions. The Plan should also define who in the community will receive government- and facility-generated data, and how the data will be communicated.

1.2. Develop Joint Data Accessibility and Data Visualization Tools for Communities: As part of technical assistance to ARP community air monitoring grantees, EPA should support the development of both tabular and graphical user-friendly and map-based displays of air quality data, with the ability to integrate and display highly localized C-G data along with EPA-generated data coming from EPA's existing FRM/FEM network.[6] Data and accompanying map displays should be accessible and end-user friendly through the internet and mobile applications.

1.3. Provide Guidance on Equipment Choices and Operational Support: Monitoring efforts undertaken with technology that authorities do not consider reliable will not serve constructive purposes in this program. Thus, EPA should provide guidance and technical assistance to communities, advising on air monitoring/sensor equipment choices, support for equipment start-up and calibration, operations and maintenance training, and other technical assistance areas, as appropriate. Such support could be provided through the EJ Thriving Community Technical Assistance Centers that are now being formed, and expanded in the EJ grants program.

1.4. Share Best Practices Among Community Air Monitoring Grantees: EPA should lead in organizing and facilitating a communication network between ARP-funded grant awardees and other communities engaged in community air quality monitoring to share information on challenges, lessons learned, and best practices.

6 Federal Reference Methodology/Federal Equivalent Methodology

Question 2: What are the issues related to understanding the quality of the data obtained?

- ***How will communities and regulators evaluate the quality?***
- ***From the community perspective, what are the strengths and limitations of various types of monitoring approaches?***

Issues of Concern:

The overarching model concerning data quality under the ARP community monitoring program should be one of "shared success." The public and regulators have a mutual interest in data quality, and the regulator has an important role in helping the community collect data of known and acceptable quality. The regulator should be a resource to and a partner with the community in obtaining quality data. All of that is essential to avoid an outcome where C-G data is dismissed, discounted, rejected, or otherwise not fully considered in permitting, compliance, and enforcement decisions. It is deeply problematic if air quality data generated by the community using quality technologies and processes according to a quality plan is not used for making such decisions.

With respect to the air monitoring equipment communities use, EPA has a long-standing practice of collecting performance data on air monitoring equipment, and it is EPA's role to share its expertise and communicate its best understanding of a "level of confidence" or related rating of an instrument, with the understanding that no specific product can be endorsed. The community's role is to access and use the information provided by EPA to select what equipment to procure, and how much and where to deploy that equipment. While this is the community's role, EPA should provide technical assistance to help communities make these determinations.

As noted in the Framework for Recommendations, better ambient air monitoring in communities is an important part of an overall approach to achieving healthier air, but it does not directly impact air quality or reduce pollution. An adequate monitoring approach also requires better source monitoring and a regulatory system that effectively accounts for, bases decisions on, and reduces cumulative impacts on overburdened and underserved communities with a plan of action and timeframe.

Recommendations:

2.1. Jointly Prepare Written Agreements on Practices to Achieve Data Quality: As a supplement to the Quality Plan each community submitted as part of its grant application, it is critical that the community and the relevant regulatory agencies agree up front and in writing what will be considered adequate data quality and what will be the practices required to achieve that quality. There is a core need for EPA to reach these agreements with the community at the outset of the community monitoring program. Ideally, agreements will be made in advance, including discussing and obtaining a clear understanding with communities poised to engage in monitoring efforts. These actions align with EPA's recent activities to promote best practices around quality assurance and documentation for citizen science and should be incorporated into the scope of services provided by the EJ Thriving Communities Technical Assistance Centers (EJ TCTAC) that are in the process of being launched. EJ communities seeking to set up air quality monitoring programs or strengthen existing programs should be supported by the EJ TCTACs.[7,8,9]

2.2. Jointly Prepare Written Agreements on How C-G Data will be Integrated into Regulatory Decision Making: As above, communities and regulators should agree in advance and in writing

[7] https://www.epa.gov/sites/default/files/2019-03/documents/508_csqapphandbook_3_5_19_mmedits.pdf

[8] https://www.epa.gov/sites/default/files/2019-03/documents/508_csqappexamples3_5_19_mmedits.pdf

[9] https://www.epa.gov/sites/default/files/2019-03/documents/508_csqapptemplates3_5_19_mmedits.pdf

how data collected from certain monitors will be used and interpreted in making permitting, siting, compliance, and enforcement decisions.

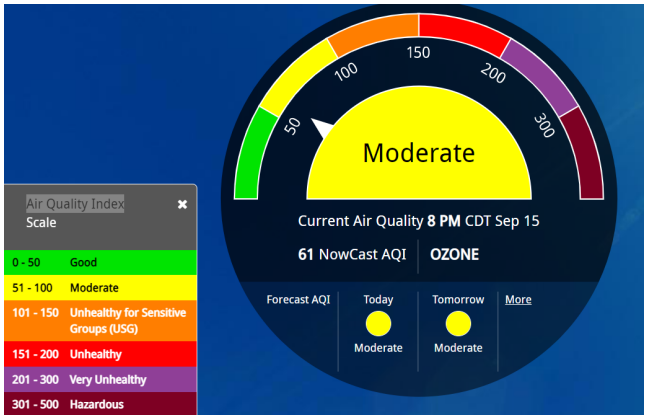
Question 3: How might we improve public understanding about issues such as the geographic scope or timing of monitoring? Or how to relate measures to human exposures or health-relevant benchmarks?

Issues of Concern:

EPA maintains multiple air quality data and mapping tools on its website, including the Air Data Air Quality Monitors mapping application, Ambient Air Monitoring Network, National Air Toxics Trend Network, Air Quality System Database, AirNow/AQI, and others. Understanding that these tools are intended to serve different functions, the presentation of the data generated at multiple websites is complex and likely to be confusing to the public. Differences between which pollutants are being measured, the locations, geographic spacing and scale of monitors, the frequency with which air quality data is collected, the frequency with which data are reported, whether results are reported as a measurement in time or averaged over time, how data are "layered" within a mapping tool (and how many "clicks" are required to get to the data), complicated legends, and other characteristics of the various data bases and displays make them difficult for the public to navigate and interpret.

Moreover, many of these mapping tools do not connect measurement results and potential health impacts. The AirNow/AQI tool, with dashboard graphics, current air quality data and air quality forecasts, air quality trends over time, and measurement-related risk displays (see Exhibit 2), is a positive step forward as a website/tool designed to meet the public's need to understand the quality of the air they are currently breathing, air quality trends over time, and communicate helpful information on how to reduce exposure and risk from unhealthy air.[10] Nonetheless, it would be beneficial to EPA's expanded intent in working with communities for the Agency itself to create summaries and fact sheets that explain each of its monitoring programs' relevance to each other, highlight gaps and inconsistencies, and provide expert interpretation for communities to use as they review the data provided.

Exhibit 2. AirNow/AQI Tool (Snapshot- Air quality index in Mossville, LA, 9/15/2022, 8:00 PM)



10 https://www.airnow.gov/how-to-use-this-site/

The lack of public knowledge and understanding of air quality can undermine community air monitoring projects in multiple ways, including:

- The community's ability to hold regulators accountable for problematic air pollution levels, and
- Community members not understanding the impacts on their health and what actions to take to reduce the risks from unhealthy air.

Providing user friendly access to information from monitoring and clear explanations of existing gaps will help build trust with communities and create constructive stakeholder relationships over time.

Recommendations:

3.1. Expand the Current Network of Federal Reference Method (FRM) and Federal Equivalency Method (FEM) Monitors: EPA should significantly expand the current network of FRM and FEM monitors, filling geographic gaps and ensuring that the expanded network locates additional monitoring devices where communities are exposed to multiple stationary industrial and/or significant mobile sources of air pollution.

3.2. Connect Air Quality Data to Health Data at the Local Level: EPA should expand air quality mapping tools by linking air quality data to databases on local health data, potentially in conjunction with the Centers for Disease Control and Prevention (CDC), including the frequency of emergency department (ED) visits for acute respiratory illness, chronic respiratory diseases (including long-term impacts from covid infection) , heart disease, and other conditions exacerbated by air pollution.

3.3. Improve the Public's Understanding of Air Quality Data by Using Better Visualization Tools: EPA should communicate air pollution data and associated risks in a more visual, dynamic and robust way. Develop data visualization tools modeled after the work of the National Weather Service (NWS), which does an excellent job of graphically communicating the nature of multiple potential risks, probabilities, consequences, and protective actions related to weather events. While the variables and axes for air pollution would obviously be different than weather events, EPA OAR should develop similar communication and data visualization tools to help communities understand air pollution exposure and individual and community risk.

3.4. Educate the Public on the Causes and Impacts of Air Pollution: The EPA should increase investments aimed at improving environmental literacy in EJ communities, including education, outreach, and technical assistance to enable the public to understand the health impacts of air pollution and meaningfully participate and provide insights into permitting, compliance, and enforcement decisions. A key aspect of that educational effort should focus on geographic scale: understanding the significance and the differences between measurements at the neighborhood level v. census tract v. regional scale. These public education efforts should use multiple media and be presented in multiple languages.

3.5. Invest Greater Resources in Risk Communication Focused on Air Pollution: Relating air quality data to human exposures and health benchmarks is a risk-communication question. NEJAC does not recommend or expect that the public should be responsible for making its own independent evaluations of the significance of pollutions levels, the period/duration of unhealthy air, toxicity, cancer risk, non-cancer risk, age, body weight, sensitive populations, etc., and render that evaluation into a judgment about risk. That is EPA's role, and EPA (or delegated air quality agencies at the State level) should provide the public with clear, visual tools to communicate levels of risk and likelihood of impacts.

3.6. Coordinate Education and Outreach Efforts with Other Health Agencies. Working with CDC or other health entities, EPA's education and outreach efforts should address health benefits

achievable through air pollution reductions. Those education and outreach efforts should be broader than the current NAAQS and be geographically targeted at the community scale.

Question 4: From the community perspective, how should EPA evaluate and interpret the data communities are collecting?

Issues of Concern:

As noted above, EPA and the communities implementing or expanding community air monitoring programs should adopt a "shared success" model, with EPA assisting the community in developing and implementing quality processes for all aspects of data acquisition and communication in order to generate data of known quality. C-G data of known and acceptable quality should be considered a critical supplement to the data collected by EPA and its partnering regulatory agencies. The fact that it is collected in the community where people live and work makes C-G data essential in determining whether the air in that community is healthy to breathe. As addressed in these recommendations and in the recommendations under Question 6, it is essential that C-G data of known quality be used to inform decisions that are made regarding permitting, compliance, and enforcement.

Recommendations:

4.1. Establish Clear "Rules of the Road" for how EPA will Use C-G Data: EPA should collaborate with community air monitoring groups to document in a written agreement how C-G data will be integrated with FRM, FEM, and other EPA-generated air quality data. The agreement should address how data collected from specific monitors will be used and interpreted in permitting, siting, compliance, and enforcement decisions.

4.2. C-G Data Indicating Unhealthy Air in the Community Should Trigger a Regulatory Response: Air quality problems detected through C-G data should consistently activate a follow up response from regulators, whether that be direct corrective action undertaken by the regulator or supplementary monitoring.

4.3. Integrate C-G Data into Risk Communication to the Public and Regulatory Decision Making: C-G data of known quality should be integrated into EPA's air quality data from the FRM and FEM monitoring network to evaluate and communicate risk and potential health impacts. C-G data should be assessed and considered in permitting, siting, compliance, and enforcement decisions.

Question 5: From the community perspective, how should EPA engage with state and local agencies responsible for air quality protection?

Issues of Concern:

Public comments made at NEJAC's meetings commonly focus on community concerns that the state or local agencies responsible for air quality protection consistently make decisions weighted in favor of private sector/industrial development interests, and these agencies are reluctant and, in some cases, recalcitrant in fulfilling their core responsibility to protect communities from harmful levels of pollution. The common pattern and practice, where first local agencies ignore community concerns including the community's air quality data, and then EPA's response is to claim it is not able to intervene– has the effect of depriving EJ communities of their right to breathe healthy air. That practice must change if EPA is to achieve its Strategic Goal to *Ensure Clean and Healthy Air for All Communities.* This community air monitoring initiative offers EPA a vital opportunity to respond more effectively to the biases that local and state officials commonly bring to their decision-making. NEJAC recognizes that there are significant complexities in the roles, responsibilities, and authorities between EPA, State, and local regulatory agencies, but believes that a more direct and forceful communication of EPA expectations combined with

a robust community air monitoring program generating quality data, and EPA *affirmation* of the reliability and relevance of C-G data, can help to level the playing field, elevate the power and influence of the community, and move state or local regulatory agencies that have historically ignored or undervalued the concerns of EJ communities exposed to unhealthy air in the right direction.

Recommendations:

5.1. Establish Internal Processes and Guidance for Asserting EPA's Authority to Protect Communities from Unhealthy Air: After further consultation with impacted communities, EPA should revise or update its processes for determining where EPA should step in to approve, deny, or modify a permit if the state or local environmental entity is incapable or unwilling to act to protect the public from unhealthy air. In a nutshell, where data indicate threats to human health and the environment, EPA must either ensure that local and state authorities take appropriate action or undertake the action itself.

5.2. Strengthen Expectations and Develop Guidance for Public Engagement in the Air Permitting Process. Review, update, and communicate expectations through new guidance that agencies responsible for air quality protection must proactively and meaningfully engage the public before the issuance of a new air permit or modification of an existing air permit, describing in appropriate detail and specificity what "meaningful engagement" requires in the permit review process. This should include notification through emails, newspapers, social media (including ads), TV and radio Public Service Announcements, bottom of TV screen banners on local public news stations, mailings, billboards with QR codes, and notifications through schools to student households.

5.3. Provide Technical Assistance to Communities in the Review of Proposed Air Permits. EPA should provide technical assistance to overburdened and underserved communities to help in the review and interpretation of permit conditions, and in the development of comments and recommendations.

5.4. Research, Identify, and Share Best Practices. Identify those state and local air quality agencies that have demonstrated effective public engagement and inclusive permitting processes where the community's voice and the community's air monitoring data have factored into siting, permitting, compliance, and enforcement decisions in a meaningful way. Develop a "digital compendium" of effective practices and make that widely accessible to the regulatory agencies and the public.

5.5. Establish Requirements and Mechanisms for Meaningful Engagement Between Permit Holders and the Impacted Community. Working with state and local air quality agencies, establish "model" permit conditions that encourage and include requirements for permit holders to engage with the community to address public concerns over air quality and communicate corrective actions when permit conditions are not being met.

Question 6: How might we improve practices and future decision-making regarding permitting, siting, compliance reviews, enforcement actions, and ways we convey the purpose of the data collection to enhance its use, application, and impact, and avoid misuse or lack of consideration of community-generated data?

Issues of Concern:

The current regulatory process is primarily reactive. Public comments presented to NEJAC from community representatives and the direct experience of NEJAC members living or working in fence-line communities provide examples of where unhealthy air quality in a community is acknowledged only if the community complains. The problem is compounded by the geographic concentration of polluting facilities in poor neighborhoods and communities of color, reflecting institutionalized and long-standing

environmental racism. This reactive regulatory process frequently fails to protect the public, particularly in EJ communities that are most likely to be surrounded by multiple polluting industries.

Furthermore, our current regulatory system does not protect vulnerable communities from transportation-related emissions, including diesel trucks and emissions in other areas where freight movement is concentrated (e.g., rail, marine, airports, and distribution centers). The lack of a standard method for measuring diesel emissions remains a significant weakness in our ability to protect vulnerable communities from unhealthy air.

Community air monitoring programs can be a force in turning the current regulatory battleship, and a course correction is needed to effectively move in the direction of EPA's Strategic Goal to *Ensure Clean and Healthy Air for All Communities*. Dismissing, devaluing, or disqualifying C-G data has historically been a common practice when compliance determinations and permitting or enforcement decisions are made. Through the expansion of community air monitoring programs; programs with established quality procedures and access to technical assistance (through the EJ TCTACs or other technical assistance resources), C-G data can and should be fully factored into the process of making regulatory decisions. Clearly, C-G data will only be part of the "data story" in regulatory decision-making processes. But full inclusion of C-G data in those decisions can have a significant and positive impact in reducing air pollution and the risks borne by communities who are now forced to breathe unhealthy air.

Recommendations:

6.1. Connect Air Pollution Measurement Directly to Regulatory Decision Making: Shift the current regulatory paradigm to directly connect air pollution measurement with tangible actions and decisions regarding permitting, compliance, and enforcement that measurably lower the air pollution burden in nearby communities.

6.2. Factor Historical Performance into Permit Conditions and Include Up-Front Funding for Mitigation and Response: Our approach to permitting air discharges should be grounded in historical performance, considering both facility performance and the industry sector. A practical, protective permitting system should account for the fact that unhealthy or harmful air releases will inevitably occur. For example, EPA should consider the frequency of permit exceedances from existing facilities when determining whether or not routine emissions from a new facility would trigger unacceptable levels of hazardous pollutants in the ambient air of a community. Permit conditions should account for this inevitability, potentially by requiring that a facility provide funding up front for air monitoring within the community and other mitigation measures, such as the purchase of home filtration equipment. An up front, funded account would have a preventive impact and empower the community and provides a benefit regardless of how well the facility is operated.

6.3. Update Permitting and Siting Laws and Regulations: EPA should encourage state and local agencies responsible for air quality protection to update their permitting and siting laws and regulations to prevent additional sources of air pollution in communities that are overburdened/underserved or have EJ populations unless the project proponent can demonstrate that emissions from the facility will not lead to further deterioration of air quality.

6.4. Require Higher-Performing Air Pollution Control Technologies that are More Robust and Resilient, and Plan for Immediate Response When Malfunctions Occur: Require higher performing air pollution control technologies and systems that are less prone to malfunction, including backup power and controls. This is especially critical for facilities that run round the clock (e.g., wastewater treatment facilities). In addition, a robust response plan should be in place for immediate corrective actions when air pollution equipment malfunctions occur.

6.5. Incorporate Enforceable Short-Term Limits in Permits Tied to Specific Contaminants: Permits are often written with compliance limits expressed in tons per year. Regulating air pollution based on mass measured over such long durations provides little or no protection to a community that is exposed to high concentrations of hazardous chemicals in ambient air over short periods. Reliance on a tons-per-year measure of compliance offers regulated facilities an unacceptably broad opportunity to pollute the air, makes it very hard for communities to connect air quality data to compliance, and undermines an air regulatory agency's ability to take enforcement actions. Air permits should have enforceable daily and hourly limits for specific pollutants, and a facility's performance against those daily and hourly limits should be made available to the community and local regulators as soon as the data are available.

Question 7: What are examples of previous successful programs or pilots with lessons learned about using new monitoring data to meet community needs?

Examples of successful air monitoring programs are included in **Attachment 2.**

Question 8: What strategies and approaches should EPA consider to reduce harm to fence-line communities from cumulative impacts from multiple sources of air pollution?

Issues of Concern:

Polluting industries, often combined with heavy truck traffic and diesel exhaust, are concentrated in EJ communities. Our current regulatory system is structurally deficient in terms of protecting those communities from unhealthy air. Under our current system, allowing hazardous levels of air pollution to accumulate in communities is perfectly legal where individual sources meet permit requirements. The cumulative effect of pollution loading from multiple sources is a critical problem in EJ communities. It is a problem that EPA needs to focus on as a priority to reduce environmental health impacts.

The limit of enforceable National Ambient Air Quality Standards (NAAQS), and the limitations on what data is measured and collected, significantly constrain the types of pollution that is identified and actionable. The six NAAQS criteria pollutants (including CO, Pb, NO_2, O_3, PM_{10}/$PM_{2.5}$, and SO_2) do not include a large number of toxic chemical pollutants that potentially have the highest impact on the most vulnerable communities. The absence of a standard for diesel emissions represents a major blind spot in protecting EJ communities. Diesel emissions may be the source of the most significant risk; the single biggest health driver and the driver of health disparities in EJ communities.

Along with expanded, local community air monitoring, fence-line communities also need much more effective source monitoring along with more rapid and accessible data. When ambient air measurements demonstrate a problem, communities, and regulators, including enforcement personnel, need to be able to identify the source of the problem, and know it in real-time, including what facility is out of compliance, the magnitude of the problem, and the duration of the problem so actions can be taken as soon as possible to control the source or sources of pollution.

Recommendations:

8.1. Conduct research, develop, and implement an air-shed equivalent to the Total Daily Maximum Load program: The water program has an established regulatory mechanism that effectively addresses cumulative impacts, establishing a Total Maximum Daily Load (TMDL) for a waterway where there are multiple dischargers to achieve the objective of protection of human health and the environment. The State of New Jersey and other localities have passed regulations or launched pilot projects that incorporate "TMDL" elements into their air quality protection

programs.[11] EPA should embark on an "airshed" version of TMDLs. While an "airshed TMDL" presents some different technical challenges than a watershed TMDL, these technical challenges can be readily solved, and air pollution models could be used to define total maximum daily loads for air pollutants that a receiving community can safely assimilate, followed by allocations defined for pollution sources in a community's "airshed." As a significant shift from how air pollution is currently regulated, this approach would presumably start as a pilot, with the approach further developed, improved, and expanded over time. Widespread adoption and implementation of an airshed TMDL approach to permitting, compliance, and enforcement holds the promise of significant long-term improvements to air quality in EJ communities.

8.2. Focus on source monitoring: Better ambient monitoring with much more localized measurements in communities is essential and positive. To effectively reduce air pollution, better technologies and expansion of ambient air monitoring must be coupled with significant improvements in source monitoring. The ability to truly achieve a meaningful "breakthrough" in terms of healthier air for EJ communities and the public requires that air monitoring is upgraded on "both sides of the fence." To reduce pollution, we need to know where the pollution is coming from and fix the problem.

8.3. Strengthen Accountability by Maximizing Transparency: A critical component of improved source monitoring is providing air emissions data in real-time to local communities in a map format that shows the location of the regulated sources, whether emissions comply (or not), how long a facility has been out of compliance, the severity of the problem, and automated "push notifications" to regulators when a facility is out of compliance. Regulatory systems with all these accountability/transparency components are fully operational and fully integrated in other countries and should be implemented in the U.S. EPA should move toward greater accountability and transparency as quickly as possible. A practical next step would be to add source emissions data to the AirNow/AQI mapping tool.

8.4. Develop a federal reference method for diesel: Developing a FRM for measuring diesel is imperative in addressing disparities in EJ communities. Several methods have already been developed and are ready to be broadly used. The current uncertainty in these methods is not a good reason for delaying an official measurement method. It is not a unique problem in that other early measurement protocols for criteria pollutants were not 100% comprehensive when they were first implemented. The current technology and methods provide a solid starting point and should be refined and deployed as a federal standard, and a decision to regulate an air pollutant profoundly impacts investments in research and instrumentation. Multiple relevant research studies explore existing black carbon measurement methods and the relationship between black carbon and adverse health effects.[12]

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11 https://legiscan.com/NJ/text/S232/id/2213004/New_Jersey-2020-S232-Chaptered.html

12 Cai, Jing et al. 2013. "Optimization Approaches to Ameliorate Humidity and Vibration Related Issues Using the MicroAeth Black Carbon Monitor for Personal Exposure Measurement." Aerosol science and technology: the journal of the American Association for Aerosol Research 47(11): 1196–1204.
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Matti Maricq, M. 2007. "Chemical Characterization of Particulate Emissions from Diesel Engines: A Review." *Journal of Aerosol Science* 38(11): 1079–1118.
Ning, Zhi et al. 2013. "Black Carbon Mass Size Distributions of Diesel Exhaust and Urban Aerosols Measured Using Differential Mobility Analyzer in Tandem with Aethalometer." *Atmospheric Environment* 80: 31–40.
Olson, Michael R. et al. 2015. "Investigation of Black and Brown Carbon Multiple-Wavelength-Dependent Light Absorption from Biomass and Fossil Fuel Combustion Source Emissions." *Journal of Geophysical Research: Atmospheres* 120(13): 6682–97.

8.5. Develop a "Model EJ Ordinance": Many EJ communities are crowded by multiple facilities contributing to air emissions and have new facilities that are seeking air discharge permits in their neighborhoods. In these cases the community may be hard pressed to contest that permitting decision. Thus the community loses, with dirtier air (and deteriorating health) on the way. A model zoning ordinance, which would serve as a template that communities could use, would enhance a community's leverage in the permitting process. In September 2020, The State of New Jersey's Public Law 232 (see Footnote 11), which mandates EJ impact statements and requires permit denials if the analysis determines that a new facility will have a disproportionately negative impact on overburdened communities, may be a good foundation for a model ordinance.

Schauer, James J. 2003. "Evaluation of Elemental Carbon as a Marker for Diesel Particulate Matter." *Journal of Exposure Science & Environmental Epidemiology* 13(6): 443–53.

ATTACHMENT 1

MEMBERS OF THE NEJAC AIR QUALITY AND COMMUNITY MONITORING WORKGROUP

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- Rev. Dr. Ambrose Carroll.
- Scott Clow
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- Dennis Randolph (*Non-NEJAC; Member of Environmental Finance Advisory Board; City of Kalamazoo Public Services*)
- Jerome Shabazz
- Mike Tilchin (*Workgroup Chair*)

EPA Office of Air and Radiation Liaison to the AQCM Workgroup

- Dr. Patricia Koman *(Non-NEJAC, EPA OAR Senior EJ Coordinator, OAR's liaison/observer to the AQCM)*

ATTACHMENT 2

EXAMPLES OF SUCCESSFUL PROGRAMS OR PILOTS WITH LESSONS LEARNED ABOUT USING NEW MONITORING DATA TO MEET COMMUNITY NEEDS

Diesel Maps (DEQ, PSU & NCA)

- **Synopsis:** Based on the Portland Air Toxics Study (PATS) output, DEQ, along with partners PSU and Neighbors for Clean Air, applied for EPA's community-scale air toxics monitoring grant in 2017 to better understand and inform vulnerable communities of the sources of diesel particulate matter (DPM) impacting them. The first goal of this study is to identify sources of DPM, and therefore the communities affected the most, and further characterize DPM emissions. The second goal of this study is to improve community engagement and tools to assess which policies would have the most significant exposure reduction outcome. The PATS modeling in this study identified the four sectors that contributed most to DPM concentrations-construction, rails, marine, and heavy-duty vehicles. In addition, the Portland Metro Diesel Tool was developed to visualize DPM based on demographics and regional contextual data (schools, bus stops, etc.). The application also allows users to explore scenarios by altering current DPM to integrate clean construction, electric shore power, and more.

  Further community engagement consists of representatives from local community-based organizations and educational and governmental institutions working together to increase education among affected communities. This study's interactive diesel impact locator is a vital community engagement tool. This tool estimates the potential DPM impact in any location in Portland. The estimates are based on an algorithm developed to characterize construction sites into low, medium, and high Potential Diesel Impact (PDI) using the City of Portland's publicly available permit data.

Purple Air Project (NCA & Reed College)

- **Synopsis:** Neighbors for Clean Air (NCA) developed the Purple Air Project to fill in gaps around the Portland Metro Area, where air quality data is sparse. The program loans out PurpleAir monitors to hosts (residences, businesses, housing complexes, etc.) to increase the measurements over space and time. This helps identify hotspots and exposure patterns. However, the driving goal of this program is to increase environmental literacy among hosts and communities that are otherwise unaware of air quality issues in their community and subsequently inspire behavioral changes and advocacy for cleaner air. Continued education and engagement in underserved communities are vital in working to reduce air pollution in Portland.

Change is in the Air - Blueprint Foundation, Jacobs Engineering

- **Synopsis**: Jacobs Engineering developed the Blueprint Foundation to provide service-based mentoring to help eliminate the opportunity gap for Black youth in the Portland Metro Area. The project combines mentoring with civic engagement for short-term and long-term impacts on student development and community health. Some educational outcomes include learning the science of air pollution, electronics & microelectronics, building air sensors, and designing air quality studies. This impactful mentoring is foundational in engaging youth in EJ communities for long-term success in reducing air pollution in impacted communities.

Moss Study: Portland, OR

- **Synopsis:** Because moss lack roots, they absorb all of their water and nutrients from the atmosphere, much like mini sponges. In the process, they also take up and store whatever other compounds happen to be in the air—including pollutants. 346 moss samples were gathered. This demonstrated that moss growing on urban trees can be a useful bioindicator of the heavy metal which is linked to major health problems like cancer and kidney disease.
- **Take away:** The study showed that moss can serve as a low-cost screening tool to help cities strategically place their expensive and limited instrumental air-quality monitors.

Aclima Study San Francisco & Oakland, CA

- **Synopsis**: Aclima used mobile monitoring systems to collect block-by-block data on air pollution. What they discovered was that the farther their mobile air monitors traveled away from the region's more than two dozen stationary air quality monitors, the more they detected elevated levels of pollution that the fixed monitors missed. Their data questions the reliability of the system the EPA uses to survey the air that millions of Americans breathe. The data released Tuesday by Aclima — a California-based tech company that measured the region's air quality block-by-block for the first time — found that communities of color are exposed to 55 percent more nitrogen dioxide, which contributes to smog, than mostly White communities.
- **Take away:** Hyperlocal monitoring by Aclima was far more effective in collecting reliable air-quality data. In the near future, company officials said, it will share results from large-scale hyperlocal pollution studies in the Midwest, the Mid-Atlantic between Virginia and New York, and in the South.

West Eugene Asthma Study

- **Synopsis:** In West Eugene, it was found that 96% of toxic air emissions in the city were released into West Eugene. West Eugene has a higher percentage of low-income and minority residents, and has higher rates of illness (asthma, cancer) than any other area of Eugene. In 2019 Lane County adopted Cleaner Air Oregon, an initiative that emphasizes bringing community members into the air permitting process
- **Take away:** local monitoring initiatives, like Beyond Toxics, Cleaner Air Oregon and the Lane Regional Air Protection Agency (LRAPA) provide "good paths forward" to address community concerns about the health consequences of toxic air pollutants
    - Community complaints/concerns drives LRAPA in investigations of facilities
    - LRAPA hosts meetings to discuss topics with community members who are concerned about the air quality in their neighborhoods. Meetings will be held via Zoom with LRAPA, focusing on specific industrial facilities in West Eugene. This will allow for community members who have specific complaints to raise those concerns with LRAPA. Community members can stay informed about upcoming meetings and facilities near them through the LRAPA "notify me" webpage.

North Carolina Aviation Study

- **Synopsis**: Lead emitted from aircraft using leaded aviation gasoline (AVGAS) is currently the largest source of lead in the air in the United States, constituting roughly 50% of lead emissions. In this study, the relationship between lead emitted from AVGAS and blood lead levels in children 9 months to 7 years of age was investigated at 500 m from airports and 1000 m from airports in six North Carolina counties. Lead levels in children were obtained through North Carolina's mandatory statewide registry of blood lead surveillance data. Factors such as age of housing, socioeconomic characteristics, and seasonality were controlled. Results suggest children living within 1000 m of an airport using AVGAS have higher blood lead levels than other children, and even more so those living within 500 m.
- **Take Away:** Hyperlocal testing overlaid with health data is important to draw connections between sources of emissions and directly correlated health impacts.

Cleaner Buses and Decreased Absenteeism

- **Synopsis:** The University of Michigan and University of Washington measured individual impact on children of the federal mandate to reduce diesel emissions. Diesel emissions on school buses are responsible for reducing inflammation markers in children by 16 percent, and by 20-31 percent in children with asthma. The concentration of airborne particles on school buses was also reduced by 50 percent. Researchers tracked the activity of 275 Washington elementary school students before and after the buses switched to ultra-low sulphur diesel fuel. The results suggest that out of the 25 million children who ride school buses every day, switching to a cleaner diesel fuel could result in 14 million fewer absences as well as improved health conditions among children, especially with asthma.
- **Take away**: This study shows measurable health improvements by taking air quality interventions.

Air Pollution and Health Risks in Bay Area Neighborhoods

- **Synopsis:** Epidemiologically derived health impact functions were used to estimate the mortality and morbidity from nitrogen dioxide, black carbon, and fine particulate matter. Geographic distributions of these pollutants were estimated using data from mobile monitoring and predictive modeling. Neighborhood level variation in air pollution health risks were quantified and compared from the resulting spatially resolved pollutants and disease rate data sets available. The results show that air pollutant-attributable health burdens varied significantly between neighborhoods.

Blueprint Project, Portland, Oregon

- **Synopsis:** The Blueprint project responds to a very real need for more and better-quality air pollutant and greenhouse gas emissions (GHG) data in Portland's Black Indigenous and People of Color and low-income neighborhoods. The Blueprint Foundation, a Portland, OR service organization that aims to eliminate the opportunity gap for Black youth within the Portland Metropolitan Area, worked with Multnomah County and Jacobs Engineering to develop a winning application for the Portland Clean Energy Fund Community Benefit Funds. This included development of technical content for lesson plans on air quality sensor building and developing an air quality and greenhouse gas study combining the results from the monitored air quality with an air quality model for the City of Portland and the use of the City's Congestion Mitigation and Air Quality model simulations.

- **Take Away:** The application allows residents to co-create a data platform and visualization tool to understand impacts and sources of GHG at the hyper-local, local, regional, and global levels, and understand and recognize the community's effect on climate change. The tool includes air quality monitoring, but also results in revenue that will in turn continue employment of data collectors and project management in the local community, thus increasing the number of green sector jobs while diversifying the sector. This pilot program sets the stage for ongoing expansion of the program in additional communities.

Planning for Resilience and Equity through Accessible Community Technology (PREACT), Philadelphia, PA

- **Synopsis:** The Clean Air Council, Philadelphia's oldest environmental non-profit that has been fighting for everyone's right to breathe clean air since 1967, teamed with a group of investigators from several universities (Temple, West Chester, MIT) piloting the PREACT model, a climate preparedness and neighborhood planning software application. The team is working on local air quality monitoring using low cost sensors (PurpleAir) as a way to better assess, understand, and communicate the relationship between local air quality and EJ. Resident groups were fully engaged in the creation of PREACT to ensure that the data and assumptions that underpin PREACT reflect community need and lived experience. The data necessary for policy that addresses cumulative EJ impacts is not currently captured by Philadelphia's Air Management Services (AMS) that relies on fewer more precise monitors that are not co-located near EJ hazards. The low-cost sensors can detect more localized air quality concerns in real-time they have been useful in building day-to-day awareness of local pollution sources. They have also been particularly instructive in the case of air emergencies (such as tire fires and scrapyard fires) that Philadelphians face because of a failure to regulate and monitor these industrial sites and their concentration in EJ communities across the City.
- **Take Away**: There are opportunities to systematically coordinate the low-cost sensors with the City's more formal air monitoring. For example, community residents who identify concerning local air quality might use the data to make the case for more formal local air studies using more exact City sensors. Community science using the low-cost monitors can help educate students, residents, and policy-makers about the cumulative health impacts associated with living in communities with significant EJ burdens. The hope is to connect this data-informed education with individual and policy actions that can make a difference, identifying ways to systematically address vulnerabilities through support for existing community assets (like parks and other greenspace), opportunities to reinvest in social, ecological, and physical infrastructure in communities, better local enforcement of existing public health regulations, and changes in land-use decisions and planning.