Urban Futures Summer Workshop 2020 Community Engagement Group

Title: Popping into Focus: Community Engagement for Environmental Impact and Awareness

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Introduction

An eerie orange sky along North America's West Coast heralds a "new normal" that, scientists have warned, will be marked by increasingly frequent and severe weather events including wildfires, droughts, and extreme precipitation (Lustgarten, 2020). In the absence of intervention, climate change is predicted to contribute in excess of 150 million needless premature deaths due to air pollution over the next 40 years (Shindell *et al.*, 2018), reinforcing preexisting social and economic disparities in respiratory disease burdens (Krieger, 2011). Within the next 70 years, rising sea levels could displace another 150 million people globally (Kulp & Strauss, 2019) and more than 10 million people in the United States (Hauer, 2016), reshaping housing landscapes within and between cities (Boustan *et al.*, 2020; Keenan, Hill & Gumber, 2018). Heat waves will become more common, exacerbating urban heat island effects (IPCC, 2014, p. 109) that disproportionately affect historically redlined neighborhoods in the U.S. (Hoffman, Shandas, & Pendleton, 2020) and rapidly urbanizing cities globally (IPCC, 2014, p. 932).

Even though climate change is a global phenomenon, many of its consequences—and the actions needed to minimize those consequences—are local. Local governments, civic institutions, businesses, and residents have the power and opportunity to mitigate and adapt to climate change (Guikema, 2009; IPCC, 2014, Ch. 8), but local community engagement is critical to drive coordinated and collective action.

A future in which cities invest in climate resiliency and promote environmental and health equity will require collaboration between scientists, technologists, and communities. A particularly important area of collaboration is the deployment of low-cost, air quality networks. When integrated with other environmental, social, and health data, data from sensor networks can make the environmental hazards communities face more salient — potentially spurring mitigation and adaptation measures. Despite significant cross-sector investment to implement and improve urban air quality sensor networks (see e.g. The Alan Turing Institute, n.d.; City of Chicago, n.d.; Schusterman *et al.,* 2016), persistent data gaps, a lack of coordination among related efforts, and challenges associated with meaningful and iterative engagement with affected communities have constrained air quality improvement efforts and progress. That is, because of high barriers for meaningful engagement with novel, hyper-local sensing data, creative and community-specific engagement approaches are needed to ensure these new technologies achieve their potential for environmental insight and action.

Problem Statement: The deployment of new technologies within cities is not just a hard problem, but a wicked one: a series of essentially unique situations, each socially and politically complex, with no singular solution and no stopping rule—merely outcomes that can be better or worse (Rittel & Webber, 1973). One cannot solve wicked problems in white papers. Instead, we are proposing a prototype that will grow and change over time. By incorporating on-the-ground practice and experimentation in collaboration with local partners and governments, we hope that our solution will promote the rights of residents to shape how and where new technologies are deployed within their cities, and how the data from those technologies are used.

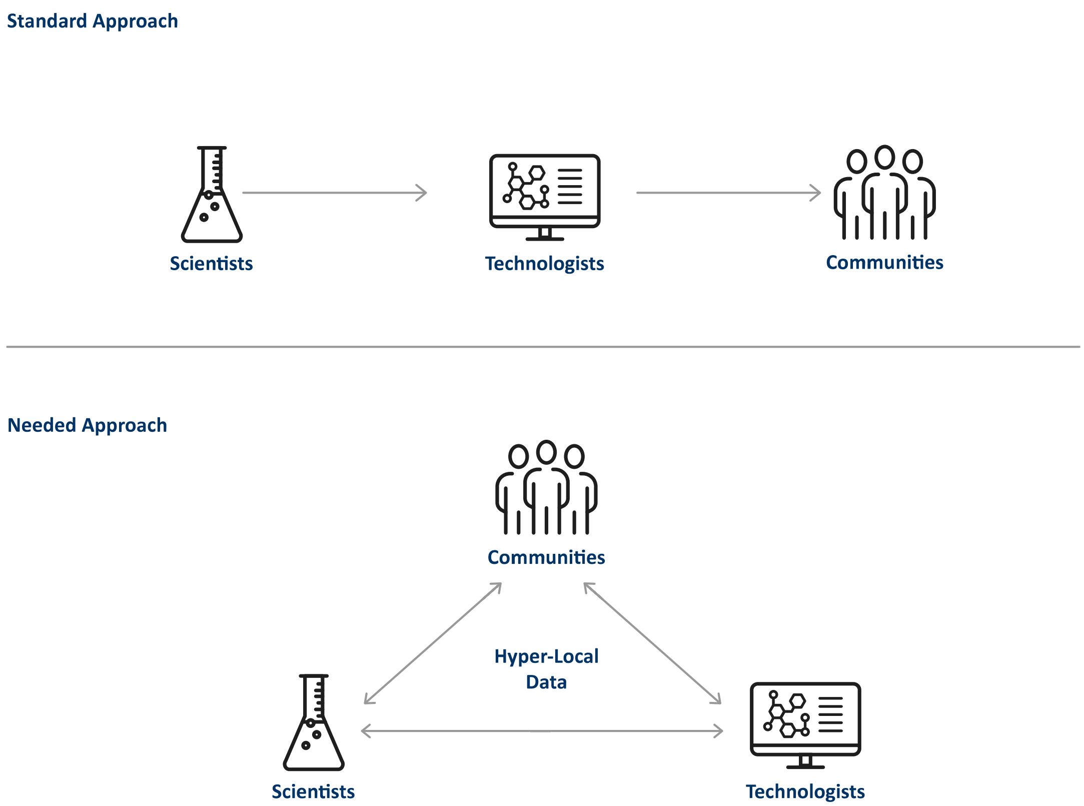

Figure 1: Engagement approaches toward actionable change and awareness with hyper-local data

In this white paper, we develop a dedicated space (physical and virtual) for the early and ongoing incorporation of community engagement through *a series of scalable pop-ups*[1] and *an open data platform* to complement local sensor deployments. We center our proposal around three key objectives: **(1) education**: providing a space where people can interact with and better understand air quality, heat and other novel, hyper-local sensing data specific to their region, city, and neighborhood; **(2) empowerment**: highlighting actions the community is already taking around environmental justice and enabling citizen scientists to evaluate context-specific hypotheses; and **(3) collaboration**: providing a mechanism by which the community can contribute their knowledge, activities, concerns, and questions to help guide sensor deployments and evaluations. Although we propose an array of solutions at different scales—from a standalone app to a network of container labs—six guiding principles emerge across approaches as key to successful implementation. Ultimately, we seek to complement the

[1] Adapting the successful idea of pop-up libraries (Davis *et al.*, 2015) to a sensor deployment context.

dashboards and data products proposed by other working groups by catalyzing local partnerships and fostering direct collaboration with cities and their residents.

Pop-Up Lab

Overview: We propose the use of a **pop-up lab (PL)**, deployed in parallel with a dense network of air quality sensors, as one mechanism for bridging the gaps between communities, air quality hazards to which they are exposed, and action needed to ameliorate those hazards. Pop-up installations have been used as a mechanism for public engagement, promoting literacy (pop-up libraries) and engaging with municipal data (Beta Blocks, see Gordon *et al.*, 2020), but to our knowledge, never in conjunction with wide-scale environmental sensor deployments. We envision the PLs as a temporary, but highly interactive vessel serving to permanently strengthen the link between communities and their environment (Figure 2).

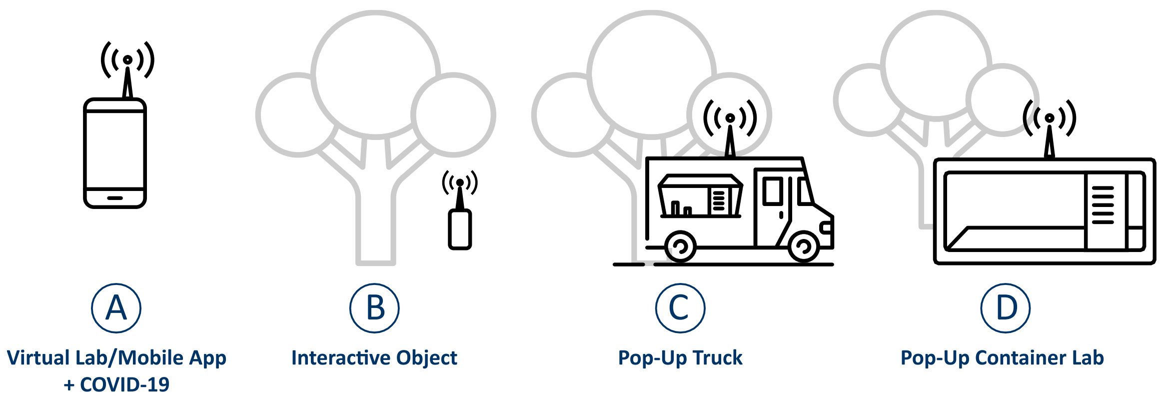

Figure 2: Pop Up Lab Models

Services to Be Built: Successful implementation of the PL will require the creation of strategic community engagement services, in coordination with and as part of exhibits and programming. Below, we describe key PL services to be created.

Physical Exhibits and Artifacts: We envision PL as an exhibit within a shipping container, temporarily located in a space central to a neighborhood in which air quality sensors are deployed. This container could be moved to several different neighborhoods within an urban area, bringing the exhibit *to* communities, signaling the importance of participation from residents in that neighborhood. The exhibit will include an **interactive map** through which residents explore environmental, demographic, and economic data on their city and neighborhood. Key components of this map will be question, environmental action, and data layers through which residents can add map entries. Importantly, this exhibit will also translate the quantitative data to a more narrative and personal form by featuring environmental justice stories told by residents, produced by local artists. Due to COVID-19, an in-person exhibit may not be possible. Adapting to this reality, we reconceive PL as an exhibit that could take one or multiple of several forms (Figure 2). For example, elements of the pop-up could be experienced through a web app or as residents scan QR codes while walking through a neighborhood park. Although different in form, many proposed services are usable across all four scales. (Environmental justice stories could either be read in an exhibit or heard through an app after scanning a QR code in a neighborhood park. The interactive map feature could be a large touchscreen display and/or something to interact with via a web browser.)

Promotion Campaign and Online Presence: Reaching all members within a community, particularly those most impacted by environmental burdens and those who have not previously engaged with environmental issues is critical to achieving the objectives of this project. As such, this project will need to develop a strong promotional campaign that leverages the knowledge and organizing skills of community champions.

Pop-up Lab Events and Activities: In addition to bridging the gap between individual residents and environmental knowledge, PL will serve as a space for bringing residents together in collaboration with each other, their municipalities, environmental scientists, and technologists. We will facilitate this collaboration through a series of workshops and activities, all of which will include interactive components focused on fostering connections. Workshops will be hosted by a wide array of partners including local environmental justice advocates, air quality, climate, and public health specialists, and municipalities. Paired with the air quality sensor network deployment, PL will also host activities through which residents learn to both map environmental factors in their neighborhoods and use air sensors to carry out their own investigations: (1) We will host workshops through which attendees learn about air quality science and conduct short investigations over the space of a few hours. (2) Community groups will be able to check sensors out for longer periods of time (1-2 weeks) and conduct experiments in collaboration with students from local universities.

Feedback Loops: PL is intended to be a temporary installment with a lasting impact in conjunction with a longer-term environmental sensor deployment. To ensure this lasting impact, the project needs systematic feedback loops by which resident feedback is incorporated into both the air sensing and PL projects. Potential mechanisms include small grants to local environmental justice organizations, continued access to interactive mapping tools after PL has moved, and collaboration between residents and air sensor deployment team to drive sensor placement based on community interests.

Community Partnerships and Data Expertise: Creating the services described above will require extensive collaboration among diverse partner groups with varied expertise. The roles we expect each of these partners to play is illustrated in detail in Figure 3. Because coordination of this complex ecosystem of partners will be a substantial undertaking, we will rely on a partner with expertise in facilitating the collaboration between different stakeholders to create solutions in the urban environmental sphere.

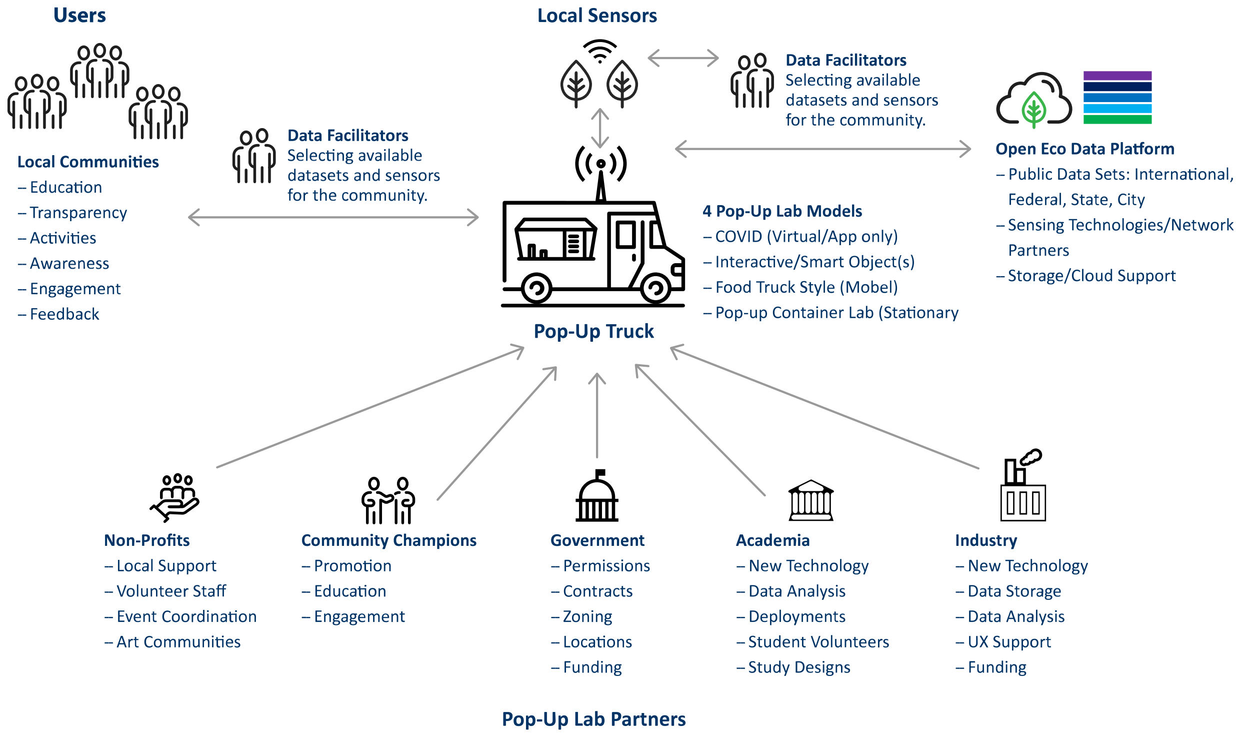

Figure 3: Partnerships and their roles for the Pop-Up Lab

It is critically important to the objectives of this project that (1) we are successful in equitably engaging a large number of community members with environmental issues through PL and (2) the services built are useful to the community in which PL is situated. For this reason, we will seek local community champions to guide the PL and sensor deployment planning and siting, the creation of the products described above, and the promotion campaign. Example community champions include members of local environmental justice groups, schools, churches, or unions, as well as any interested residents.

Additionally, we will rely on municipalities, non-profits, academic institutions, regulatory agencies, and industry, to appropriately site the location of PL components, create and curate physical and web-based interactive exhibits, gather and interpret local environmental data, and help facilitate and plan workshops hosted at the PL site. With this group of partners, we will engage in collecting, aggregating, and interpreting the community-specific, sensor-based, and inventory-based data necessary for creating the services outlined above.

Location-Specific Data Needed: Community-specific data is needed to tailor the promotional campaign, exhibit artifacts, interactive workshops, collaborative projects, and PL location to community needs. This may include a survey of community members' current environmental knowledge, the modes through which they are interested in building that knowledge further, and the existing ecosystem of advocacy groups and their interaction with local government and industry. Beyond planning the PL, we recommend a community-focused strategy for siting air sensors within the broader urban deployment. Environmental sensing and inventory-based data, including environmental, health, demographic, and economic data sets specific to the city and neighborhood, will also be critical to creation of interactive and collaborative pop-up exhibits and community events. This data will be discussed in more detail in the open data section of this paper.

Research Needed to Scale PL Concept: Above, we outlined key partners and data needed to pilot a PL in a specific city, deployed in parallel with high-density air quality sensors. A broader research agenda is necessary for application of PL model across multiple cities. This research agenda focuses on three central questions: (1) What are the best practices for using PL to connect communities with environmental issues in an equitable way? (2) What is the best framework for partner interactions, roles, and responsibilities in implementing PL? (3) How can we create a feedback loop of evaluation and improvement to measure success, diagnose shortcomings, and iteratively improve the PL model?

We will seek to address these questions first through the experiences of other projects combining environmental science with community engagement. For example, the University of Texas at Austin group with efforts such as the Planet Texas 2050 (PT2050) in partnership with the City of Austin, Office of Sustainability, and community members have developed a successful urban resiliency science-community engagement platform. Second, we will add to this knowledge, as it pertains specifically to PL, through our pilot. While it is important that we engage thoughtfully with each of these questions prior to the pilot, it is our intention that the pilot helps us learn, improve upon, and create a replicable framework for not just the physical or code-based aspects of such a project, but the community-interaction aspects as well.

Open Data

Overview: Supporting the PL efforts will be a system that gathers, reshapes, and shares open data in an interactive, digestible format for people engaging with the PL experience. This platform will be able to respond to questions, such as interactive mapping of air quality data based on user inputs, by and obtain feedback from the PL participants to playfully learn while investigating their environment. There is no shortage of data platforms, and several exist in the environmental space, but a novel contribution of this system will be the connection for neighborhood scale and resident-contributed data, or hyper-local, data. These efforts could be an extension of, and perhaps contribute to, larger IoT and digital mapping of urban and space ventures through Microsoft Azure's Digital Twins which allows 2D and 3D recreation of environments for data exploration and simulation (Microsoft Azure, n.d.). In this context, open data pertains to any data that is free for all in the legal sense, readily processable by computers (Shueh, 2014), and is useful and usable for our program (Open Knowledge Foundation, n.d.). Toward the educational objective, use of open data within the PL can demonstrate the range of data relevant to participants' local context, aid in environmental literacy, and extend the local information landscape (Lee & Butler, 2018). Education overlaps with the empowerment objective where the open data and our platform serves as an infrastructure through which participants can gain a meaningful experience regarding personal climate issues and become motivated to align and take positive action with environmental justice values. Education and empowerment objectives are made possible through project planning collaboration with community partners and then later by the participants who connect with the community partners for longer, sustained action.

Previous work: There are a variety of data platforms from which we can learn and build upon. The World Resources Institute showcases a list of environmental open data platforms that focus on areas of climate, deforestation, sustainable energy and more. Typically, nonprofits maintain these platforms, often in partnership with and financial support from various levels of government and private sector collaboration. Given their topical focus, they attract government agencies and ministries, researchers, members of civil society organizations for use in policy, development programs, and advocacy. In some cases, private entities such as Up42, Veracity, and Ocean Protocol source this and other private data sources to offer marketplace, brokerage, data science services to paying customers; however, their models stray from our mission orientation. Open data portals often have poor usability because they are not designed for a broad set of user types, e.g. non-technical users (Osagie et al., 2017). Use features of intuitiveness, simplicity, and consistency are key areas of improvement for widespread adoption (ibid). Depending on the purpose of the platform and its target audience, topical literacy related to data used can also be problematic if the goal is wider public adoption; for example, the AirCasting platform from Habitat Map requires its users to understand a wide range of highly technical, atmosphere variables to fully engage the platform.

While platform design is a challenge for user experience (UX/UR) developers, it also requires high quality, reliable data (see Osagie *et al.*, 2017 for evaluation criteria and methods; see also Charalabidis *et al.*, 2018; Liu *et al.*, 2017). Underpinning open platforms are dynamic universes of datasets that vary in scope and detail based on the platform's purpose. Large scale public movements to democratize data and embrace values of transparency and accountability have nudged governments at various levels and nations to publish open data (Chu & Tseng, 2018).

Data sourcing: One of the great challenges of government provided open data is the top-down interests and pressures of government to provide services and meet the needs of its residents. This echoes throughout levels of government with some solutions from bottom-up community engagement, such as how Chicago reshaped its open data system (Kassen, 2013). While open data might be hosted by governments, it can also come from individuals and organizations submitting their data onto government platforms to improve data reach and usage. Similarly, open data comes from collaboration between government, industry, academia, and civil society. Chicago's Array of Things is one example of combining internet-enabled sensing technologies with multi-sector support to better understand urban activity, environments, and infrastructure. In addition to government sourced data, an abundance of open data exists, housed by providers such as Microsoft on its Azure platform. Open data efforts for the PL will pull data from both government and non-government sources.

Services and partnerships for development: Several services and partnerships are needed to build the open data system for community engagement. The platform will aggregate data from a wide range of sources, identified by the project team and its community partners. Initial data, as shown in Figure 4, will come from international, federal, state, and local data sources, supplemented by industry and academia. Community partners are integral to obtain hyper-local data. Such data can come from sources such as embedded sensor networks, citizen science efforts, local maker spaces focusing on environmental issues, and other community members. To make the data feasible for use, a singular set of standards is needed, as data across all these source types can be fragmented. After aggregation and standardization, a scalable, responsive interface will be crafted to meet the PL engagement needs. This will require full stack development skills and can be hosted on Microsoft Azure. Technical expertise can come from local partners, such as university fellows, hackerspaces, and grant-funded developers.

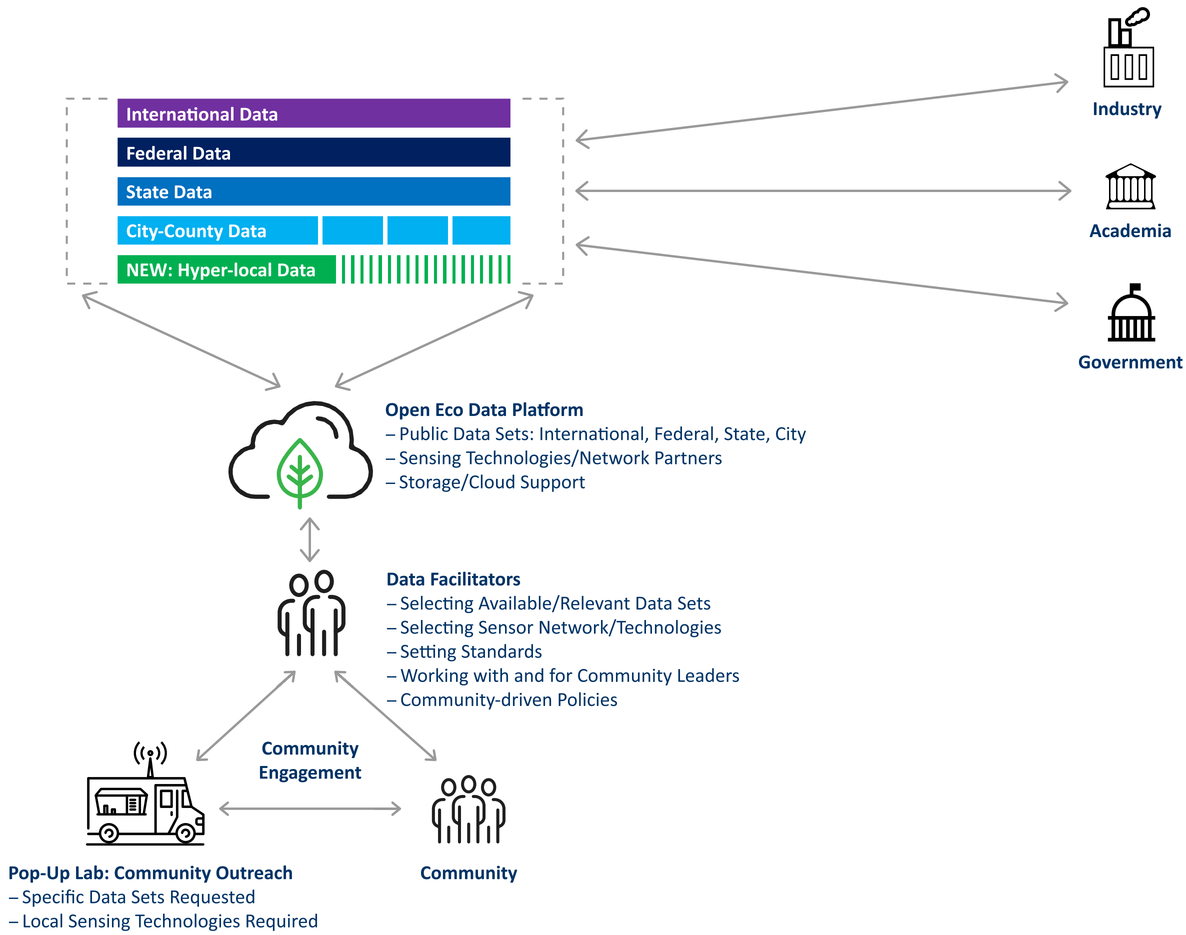

Figure 4: Open eco data platform design

In addition to work on any technical specifications, a review team with representation across the project team and partners will review any datasets used and discuss any potential concerns for inherent data bias, personal protection and privacy, or any other matters that could affect ethics, equity, inclusion. Open data platform development teams will conduct deeper reviews of lessons learned from case studies such as those from National Neighborhood Indicator Partnerships report on open data in the communities of Chicago, Milwaukee, Pittsburgh, and Oakland (Pettit *et al.*, 2014) and the Beta Blocks smart cities program in Boston as part of Project Eclipse (Gordon *et al.*, 2020).

Beyond those positions needed to actualize the open data system for the PL two other types of roles are needed, open data communicators helping at the PL sites and a Data Facilitator. Individuals helping with the PL implementation and work with participants need to be sufficiently versed in open data concepts to help with any questions raised. Data Facilitator position is needed to assist with developing hyper-local data sustainability. This person shall continue with engagement of the PL's community partners, as well as help onboard new interested individuals and organizations. The Data Facilitator will assist them learn how to make data open, where to house it online, and help make it available to the open data system.

Broader contribution and impact: This novel open data platform will contribute to the broader research agenda, the open data movement, and communities we serve. Increasing the presence and acceptance of hyper-local datasets advances data democratization as well as provides new data sources for research and policy. It serves as an example of unifying fragmented datasets from across disparate open data sources. It boosts citizen science efforts by giving voice and opportunity to showcase their efforts. The system also serves as an opportunity to demonstrate new avenues to make equitable and inclusive technologies that meet community needs. Local community partners can also benefit through platform use to get a better understanding of each other and invite synergies between them. Evaluation of the platform and its benefits will come through a series of lessons learned in comparison to similar predecessors, estimating the level of buy-in among partners, and degree of sustained activity post-PL.

Synthesis and Next Steps.

Emerging monitoring technologies, connected sensors, and advances in data science hold great promise to illuminate environmental quality *challenge*s, but direct public and community engagement with these tools is critical to drive political, social, and economic investment in viable *solutions*. In this paper, we have proposed scalable and dynamic complements to sensor deployments to help turn new data into shared knowledge and coordinated action. In the preceding discussion of community engagement opportunities and considerations, **six guiding principles** emerged as key pillars for the successful implementation of our proposal:

1. Community engagement must be an ongoing and iterative process, with **feedback loops** to ensure meaningful incorporation of local knowledge and needs into environmental monitoring efforts. Early community engagement on sensing technology and sensor deployment can inform and enhance air quality monitoring while increasing the likelihood that residents will actually engage with newly created data. Our proposed approach seeks to recognize and incorporate the unique forms of knowledge each community holds (Corburn 2005) and to foster the development of local partnerships and tailoring to each city's context.
2. To build public trust and genuine partnership on sensor deployment, we will also prioritize **transparency** in the implementation of projects, the use and ownership of data, and the evaluation of our work. This should include straightforward data policies that are co-developed with community stakeholders, publicly accessible data, and coordinated efforts to share monitoring plans, progress, and outcomes.
3. By prototyping and practicing, we seek to provide a vehicle for engagement that is **scalable** across time and space but also to different sizes that meet the needs and resources of the locality.
4. Amid the current COVID-19 pandemic, we recognize the need to ensure that community engagement includes specific measures and considerations to **protect the public and individual health** of all PL participants.
5. We seek to identify and amplify the **motivations** – both in the shape of economic incentives or non-economic rewards — that can keep people and organizations engaged over time and across cities. We recognize that making visible the invisible environmental inequities within and between cities can have adverse effects such as declines in housing values (Currie *et al.*, 2015, Barwick *et al.*, 2020) and the exacerbation of climate gentrification and displacement

(Anguelovski *et al.*, 2019). By focusing on education, collaboration, and empowerment and by inviting feedback in the early stages of a deployment, we seek to minimize potential costs while maximizing the health and social benefits made possible by new hyper-local sensing technologies.

6. Finally, we seek to **prioritize racial and economic equity** in all aspects of this work. Recognizing that environmental quality disparities have direct links to structural racism and economic inequity, we seek to make this work as **inclusive** and accessible as possible. In every aspect of our work, we must ask: how will this help promote equity? How can we minimize any potential to exacerbate disparities? That is, as we continue to develop features of design, location, partners, data ownership, and evaluation, we will be guided by an environmental justice lens.

To implement these ideas and principles, we propose the following next steps:

1. Identify one or more specific communities in which to deploy a pilot, including Project Eclipse sensors, PL, and an open data platform to generate new air quality data and meaningful community engagement.

   Community selection criteria might include:

   - Strong support, sponsorship, and/or engagement by local governmental officials, including public commitment and plan to improve air quality
   - A robust, diverse stakeholder community with demonstrated interest in understanding and addressing air quality issues (including public health, civic technology, academic / research, philanthropic, and / or cultural institutions)
   - Existence of local air quality datasets (though gaps, uncertain quality, or inaccessibility of the data may have impeded widespread or coordinated engagement)
   - Designated civic innovation ecosystem development partner to help articulate project opportunity, convene stakeholders, and provide structure for local engagement
   - Access to physical infrastructure in diverse geographic and socioeconomic communities for sensor deployment
   - Relevance and applicability to other communities to facilitate scaling and replication (including geographic, social, political, weather / climate, and other considerations)
2. Explore technical requirements for an Azure-based open data platform to aggregate, store, and enable access of existing and newly created air quality data.
3. Explore resident perspectives, interests, and preferences related to environmental engagement and learning to identify high-potential content and engagement formats to offer through popup labs.
4. Identify physical, digital, and human resources required to develop and deploy sensors, open data, and PL engagement in one or more locations, including projected costs and potential funding sources. Refer to Appendix A for a preliminary list of requirements and initial budget estimate.
5. Identify project lead(s) and create a preliminary work plan addressing these and other project success factors, including project-specific objectives, partners / roles, timing, milestones, and success metrics.

Initial deployment will generate learning and lay the groundwork for subsequent sensor deployments, broader data aggregation and analysis, and potential expansion to include other environmental quality and climate impact measures (including water quality, energy consumption, vehicle miles traveled, and/or greenhouse gas emissions). As a first step, we have developed a preliminary budget (see Appendix); we are seeking funding for a first prototype with the idea that replications would be considerably more affordable when fixed costs can be shared across sites. Our intention is to provide a blueprint, through our initial implementation, that other organizations could replicate and improve upon in new places throughout the country and, ultimately, globally.

We envision data collection, open data platforms, analysis, and direct community engagement through the proposed PL as a means of empowering urban residents and their elected officials to evaluate, understand, and prioritize climate action. By making sensor deployments more relevant, accessible, and responsive to the communities in which these sensors are deployed, we hope to broaden environmental awareness and activism to address root causes of environmental degradation and build urban environmental resilience. Through this work, we hope to build community capacity to respond to crises as well as to foster support for mitigation measures.

Ultimately, as part of a toolkit for citizen climate impact assessments, our approach could make accessible the hardware, software, and technical assistance that citizens and community organizations need to ask questions like:

- In my neighborhood, how will I start to feel the effects of climate change?
- In my city, where will the costs be concentrated?
- In my region, what kind of adaptation and mitigation should I advocate for?

That is, pop-ups and their accompanying open data platforms could "flip" the traditional idea of evaluating a person's impact on climate (EPA, 2016) by enabling people to evaluate the likely impact of climate change on themselves, their neighborhoods, and their cities. Importantly, these data sets will allow residents to explore not just the science of these topics, but the social, health, and political axes as well.

Appendix

Estimated Budget This budget presents projected costs for the one-year implementation of a prototype at a single site in the United States.

Some aspects of the budget contain development work that can be spread across multiple sites. The shared costs in this budget assume five (5) sites to spread the cost burden. Additional sites would then lower the listed shared costs, while fewer sites would increase the costs per site.

Item	*Description*	*Virtual Lab App*	*Interactive Object*	*Mobile pop-up*	*Pop-up Lab*
			Physical Exhibits and Artifacts		
Mobile App	Development (shared)	$25K	$25K	$25K	$25K
	Local tailoring	$5K	$5K	$5K	$5K
	Total	**$30K**	**$30K**	**$30K**	**$30K**
Exhibit Option 1 (buy)	Planning and design	N/A	$10-$15K	$25-$50K	$75-$150K
	Manufacturing	N/A	$5-$15K	$8-$50K	$25-$100K
	Permitting/ License	N/A	N/A	$500-$2,500	$1.5-$5K
	Insurance	N/A	N/A	$1,600-$2,500	$500-$1500
	Total	**--**	**$15-$30K**	**$35.1-$105K**	**$100.2-$256.6K**
Operation (monthly)	Space rental	N/A	N/A	$500-$1,500	$1,500-$3,000
	Fuel/ maintenance	N/A	N/A	$500-$1,000	$500-$1000
	Internet	N/A	$100-$200	$100-$200	$100-$200
	Monthly total	**--**	**$100-$200**	**$1,100-$2,700**	**$2,100-$4,200**
Exhibit Option 2 (lease)	Planning and design	N/A	N/A	$10-$15K	$15-$50K
	Total	**--**	**--**	**$10-$15K**	**$15-$50K**
Operation (monthly)	Equipment rental	N/A	N/A	$2-$4K	$5-25K
	Space rental	N/A	N/A	$500-$1,500	$1,500-$3,000
	Fuel/ maintenance	N/A	N/A	$500-$1,000	$500-$1,000
	Internet	N/A	N/A	$100-$200	$100-$200
	Monthly total	**--**	**--**	**$3,100-$6,700**	**$7.1-$29.2K**

Sensors	Existing equipment	$0	$0	$0	$0
	Addt'l sensors ($100/ea)	N/A	N/A	$500	$1,000
	Mini sensors ($50/ea loan)	N/A	N/A	$500	$2,000
	Total	**--**	**--**	**$1,000**	**$3,000**
Curator	Creative Coordinator	N/A	$10-$15K	$20-$35K	$30-$50K
	Total	**--**	**$10-$15K**	**$20-$35K**	**$30-$50K**
Promotion and Use Campaign					
Coordinating Entity	Survey of environmental knowledge	$3K	$3K	$3K	$3K
	Tailoring to existing social ecosystem	$5K	$5K	$5K	$5K
	Coordination of grants	N/A	$2K	$10K	$10K
	Coordination of workshops	N/A	N/A	$15K	$75K
	Identify site and permit/ licensing	N/A	N/A	$2K	$2K
	Program Evaluation	$2K	$2K	$5K	$5K
	Total	**$10K**	**$12K**	**$40K**	**$100K**
Grants to Community Organizations	$5K organizations	N/A	3	3	N/A
	$10K organizations	N/A	N/A	2	5
	Total	**$0**	**$15K**	**$35K**	**$50K**
Events and Activities					
Educational Workshops	Materials per 1-hour workshop ($300 ea)	N/A	N/A	$3,000	$6,000
	Speaker fees per panel ($500 ea)	N/A	N/A	$1,000	$2,500
	Total	**$0**	**$0**	**$4,000**	**$8,500**
Support Staff	$20/hour per person	N/A	1 person, 5 hrs/wk	2 people, 20 hrs/wk	4 people, 20 hrs/wk
	Total	**$0**	**$5,000**	**$40K**	**$80K**

Open Data Platform					
Data Repository	Development (shared)	$25K	$25K	$25K	$25K
	Total	**$25K**	**$25K**	**$25K**	**$25K**
Azure Credits	At $1 per unit	$10K	$10K	$25K	$50K
	Total	**$10K**	**$10K**	**$25K**	**$50K**
Data Facilitator	Grant to local entity	$10K	$20K	$30K	$50K
	Total	**$10K**	**$20K**	**$30K**	**$50K**
Equity and Inclusion Workshops	Focus groups ($1K ea)	3	3	3	3
	Community mtgs ($1K ea)	N/A	N/A	2	7
	Total	**$3K**	**$3K**	**$5k**	**$10K**

Note: Absolute totals are not included; we expect different communities to have different needs, so we have included a menu of options (with estimated price ranges) to allow prospective PL hosts to tailor the experience to their specific context.

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