

STEP FOUR ORGANIZER'S GUIDE

Developing Your AirCasting Field Plan & Training Volunteers

Using the information that you generated in Step 2 “Build a Plan” and the community feedback your organization received during the prior community meeting, create an AirCasting Field Plan. To begin, plan your mobile AirCasting routes, or if you’ll only be doing fixed monitoring, jump down to the heading “Siting Fixed AirBeams”.

MOBILE AIRCASTING ROUTE PLANNING

If you’ll be recording mobile AirBeam sessions, you need to decide what routes your volunteers will be walking while sampling. The more air quality measurements you collect (throughout the day, week, and year) and the larger the area you cover, the more representative your results will be. When your air quality data is representative that means your measurements not only accurately assess what the air quality was like at the time and place where the measurements were collected, but your measurements also accurately represent what the air quality was like at locations and times during which you did not sample. The representativeness of your data can be further enhanced when fused with other data - e.g. weather data, land use data, data from other air quality instruments. Having representative air quality data will enable you to make claims that go beyond qualifying the personal air pollution exposures of the volunteers who were conducting the air monitoring; representative air quality data will enable you to make valid claims regarding neighborhood level air pollution exposures and how they change throughout the day, week, and year.

To get started, use an online or printed map of your community to mark locations where air pollution is a concern, referencing both your knowledge of the community and the information gathered at the prior community meeting you organized. If known, note the time of day during which air pollution is a concern at these locations. Possible sources include bus depots, warehouses, construction sites, power plants, factories, traffic-congested streets, bulk storage facilities, restaurants with charbroilers or wood/coal fired ovens, buildings with oil or wood boilers, and agricultural burning. Do your best to plan routes that will pass in close proximity to the air pollution sources you identified during the times they’re most active. Also consider whether you’ll be pausing along your route to collect more data at specific locations, like a suspected emissions source, an intersection where you’ll be conducting traffic counts, or a park where students hang-out or children and their caregivers spend time.

Finally, draw your route on the map while marking points of interest, potential emissions sources, and locations where volunteers will pause (if any) along their route. Assess how long the route will take to complete and if need be, modify the route to make it shorter or longer to

accommodate your volunteers' availability. Then name the route; you'll use this name when naming the sessions inside the AirCasting app.

SAFETY & PUBLIC COMMUNICATIONS

Before finalizing the routes, consider whether the route that's been selected is safe to traverse for your volunteers and modify the route accordingly. For instance: Does the route have sidewalks? Do the street crossings have painted crosswalks and signaled crossings? Might having volunteers wear fluorescent vests improve safety? Are there restrooms available along the route? Is the route entirely in the public right of way, and if not, do you have the required permissions?

You also need to consider the weather and make sure your volunteers are properly supplied with water, jackets, etc. If it's too hot, too cold, or too wet you may need delay AirCasting until later in the day or week.

Use of the equipment might generate questions from curious passersby or facility security wondering why someone is stopped outside. To prepare for this eventuality, equip your volunteers with information sheets or cards summarizing the campaign and it's importance to the community. Remind volunteers that they are entitled to occupy public rights of way, like sidewalks, and take pictures, notes and measurements. However, businesses and homeowners may not always respect their right to occupy public spaces. Inform your volunteers that if confronted by an unfriendly person they should avoid confrontation, move on, and inform your campaign's project manager so they can take appropriate action.

SITING FIXED AIRBEAMS

Creating a spatially dense network of fixed AirBeams will improve the representativeness of your results. Whereas mobile AirBeams enable you to generate spatially representative data as you traverse your neighborhood; fixed AirBeams enable you to generate temporally representative data as they collect air quality measurements 24 hours a day 7 days a week. Having spatially and temporally representative data will enable your organization to identify both where and when air pollution levels are highest.

If you'll be recording fixed AirBeam sessions, you need to decide where to site them. Fixed monitoring requires a secure place to hang your AirBeam where it won't be vandalized or stolen, a power outlet or other power supply (e.g. photovoltaic panel or lead-acid battery), a 2.4 GHz WiFi connection that doesn't require consent to terms and services via a web browser or a 4G cellular network plus a compatible and activated SIM card, an Internet-connected Android or iOS device, and the latest version of the free AirCasting App. AirBeam3s are weather resistant so they can be hung outside without need for shelter. Note that in the case of fixed monitoring, the Android or iOS device is only needed for the initial AirBeam3 configuration. This

means, a single Android or iOS device can be used to configure multiple fixed AirBeam3s.

You may be interested in siting fixed AirBeams on public infrastructure, like light poles, as this will allow you to better target your monitoring around specific air pollution sources or create an evenly distributed grid of monitors. If so, reach out to the relevant municipal agencies to find out whether this is possible and what's required. Barring the cooperation of public authorities, you'll likely be restricted to siting fixed AirBeams outside the homes and businesses of your volunteers. Once you've decided where to site your fixed AirBeams, work with your volunteers, city agencies, and any outside parties to get them up and running. You may need to seek permission or gather additional materials - e.g. extension cords, wall plugs, zip ties, nylon string, solar panels - before you can successfully site your fixed AirBeams. Before getting to the site, figure out how you plan to hang and power the AirBeam and practice configuring the AirBeam to record a fixed session. Make sure to have the "Getting Started with AirBeam" Guide handy. Once the AirBeams are operating, keep tabs on the data streams via the AirCasting app or website. If they stop streaming you'll need to visit the location, troubleshoot any problems, and get the AirBeam back online. The two most common problems are loss of power and interruption of the WiFi network.

In some instances, regulatory agencies in charge of air quality surveillance are willing to have AirBeams collocated with their reference air quality monitors. Communities that have availed themselves of this option are able to use the comparison to gauge whether AirBeam measurements might be biased high or low. This information can then be used to adjust the data from your network of fixed AirBeams, thereby improving accuracy and data confidence. Collaborating with a regulatory agency also has the added benefit of bringing in subject matter experts that may be willing to help analyze or interpret your AirBeam data. If you're interested in learning more about collocating AirBeams with reference air quality monitors read through [this web page](#) and [this report](#) created by the US Environmental Protection Agency and reach out to your local air quality agency.

KEEPING TABS ON EQUIPMENT, PARTICIPANTS & DATA GATHERING

Getting organized before you start AirCasting in the field will ensure you don't lose equipment and enable you to better track participation and manage your air quality data gathering efforts. To begin, set up a charging station for all your AirBeams and smartphones/tablets. Whenever the equipment is not in use, make sure it's plugged-in so it'll be ready when you need it.

Next, install the AirCasting app on each of the smartphones/tablets. After installing the AirCasting app on the first device, create an AirCasting profile for your organization and then sign into that same profile after installing the AirCasting app on each subsequent device. If you're buying devices specifically for this project, be sure to buy one device and test it with the AirBeam and AirCasting app before buying multiples. If you have one smartphone/tablet for

every AirBeam, pair them together and label them both with the last four digits of the AirBeam’s unique identifier. To do this, turn on the AirBeam and launch the AirCasting app on the smartphone/tablet you will pair it with, access the smartphone/tablet’s Bluetooth settings, note the last four digits of the AirBeam’s unique identifier, label both the smartphone/tablet and the AirBeam with this number, then turn off the AirBeam.

To track who has the equipment, copy the AirCasting Actions online [“Equipment Tracker Template”](#). When checking out equipment, use this spreadsheet to track what equipment is being used, by whom, and for what use.

If you’ll be deploying fixed AirBeams, copy the AirCasting Actions [“Fixed Site Tracker Template”](#). When siting fixed AirBeams, complete an entry for each location.

TRAINING VOLUNTEERS

Access and make a copy of the [“AirCasting Training Slideshow”](#). Where indicated, update the slideshow with information specific to your organization and the information you generated in Step 2 “Build a Plan”.

Advertise and convene a community meeting.

Explain to attendees how the AirBeam detects and measures particle pollution. Then, introduce the AirBeams and smartphones/tablets to attendees by demonstrating how to power them on, launch the AirCasting app, and begin recording a mobile AirBeam session and a fixed AirBeam session. These steps are also detailed in the AirBeam instructional video series, linked to below, which you may elect to show during the community meeting.

[Watch “Getting Started with AirBeam3” \(Video\)](#)

[Watch “Mobile Monitoring with AirBeam3” \(Video\)](#)

[Watch “Fixed Monitoring with AirBeam3” \(Video\)](#)

To conclude the meeting, solicit questions from your attendees while circulating a sign-up sheet to collect potential volunteers’ names, phone numbers, email addresses, availability for mobile AirBeam monitoring, whether they are able to sample alone or would like to work in pairs, and their interest in hosting a fixed AirBeam monitor outside their place of residence or work.

ORGANIZING VOLUNTEERS FOR THE FIELD

Referencing the sign-up sheet you circulated during the volunteer training, do your best to match volunteers to the mobile AirCasting routes you planned and times during which you would like those routes to be sampled. If volunteers indicated they prefer to sample in pairs, take this into account. It's likely you may not have an exact match between the times your volunteers are available and the ideal times during which you would like monitoring to be conducted, so you'll have to be flexible when scheduling. After you make the initial matches between volunteers and routes, create a calendar noting when each volunteer is expected to monitor. Next, contact each of your volunteers with the dates and times during which you would like them to monitor and confirm these dates and times work for them or modify the schedule to accommodate them; then update your calendar accordingly.

Again, referencing the sign-up sheet, contact those volunteers who indicated an interest in hosting a fixed AirBeam monitor outside their place of residence or work and confirm the location they're offering is suitable. Fixed monitoring requires a secure place to hang the AirBeam where it won't be vandalized or stolen, a power outlet or other power supply (e.g. photovoltaic panel, lead-acid battery), a 2.4 GHz WiFi connection that doesn't require consent to terms and services via a web browser or a 4G cellular network plus a compatible and activated SIM card, an Internet-connected Android or iOS device, and the latest version of the free AirCasting App. AirBeam3s are weather resistant so they can be hung outside without need for shelter. Once you've confirmed your volunteer is both interested in setting up a fixed AirBeam and their location is suitable, consider how many AirBeams you'll be deploying as fixed instruments (these AirBeams will no longer be available for mobile monitoring), and select the locations that best meet the needs of your overall study design. For instance, you may prioritize spots close to air pollution sources, placements that allow you to evenly space AirBeams throughout the study area, colocations with reference monitors, or locations that are adjacent to or arrayed along your mobile monitoring routes.