# The Team

## Olin College

Olin College of Engineering is a small project-based college in Needham, MA whose goal is to prepare students to **recognize needs, design solutions, and engage in creative enterprise for the good of the world** through innovation in engineering. Founded in 1997, it hosts less than 400 students and is still garnering international recognition in engineering and education innovation, producing forward-thinking individuals to better the world.

## ADE

Affordable Design and Entrepreneurship (ADE) is a senior capstone program at Olin College of Engineering and a joint venture with Babson College. This program allows teams of students to **collaborate with communities to iterate pathways to solutions** for complex issues over a period of years: working slowly to be both **responsible and ethical**. ADE teams seek to **support communities** and promote their agency, accelerating their existing initiatives with access to enthusiastic students and technical resources.

## Air Partners

Air Partners is a research group comprising Olin faculty and an ADE student team. Air Partners works to **reduce the burden of air pollution** in highly impacted communities by **building awareness and curating tools**, such as sensors, that give community members elevated agency and the capacity to influence policy change for their public health. We are here to work with ACE (Alternatives to Community and Environment) and Roxbury residents to establish a **community-owned air quality monitoring network.**

**Comments? Questions? Feel free to contact Francesca Majluf, the Air Partners Program Manager, at fmajluf@olin.edu.**

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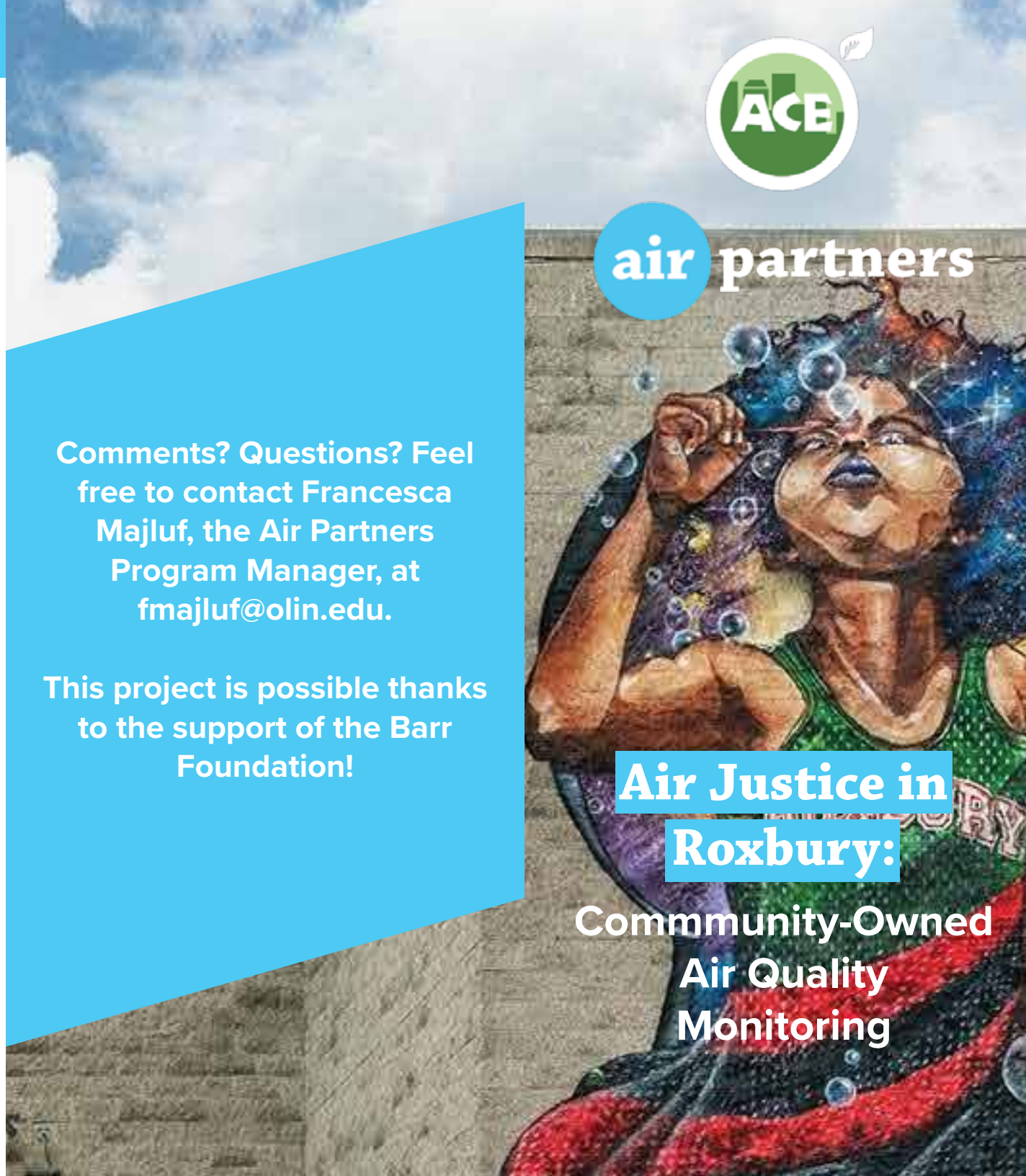

ACE

air partners

# Air Justice in Roxbury:

## Commmunity-Owned Air Quality Monitoring

# Air Pollution

## The Basics

According to the WHO, 99% of the world's population live in places where **air pollution levels exceed healthy limits**. The general quality of the air can be evaluated by levels of **particle pollution** (often referred to as particulate matter, or **PM**), which are extremely small particles that can get stuck in your lungs or bloodstream, causing a variety of health issues. Adding to this, these particles usually **cannot be seen nor smelled**, so it is crucial to use **sensors** and other tools to measure and prevent them.

## Causes

Particle air pollution is mostly caused by the **burning of fossil fuels** to produce and consume energy. When, for example, a **power plant** burns coal or a **bus** runs on diesel fuel, they release multiple particle pollutants into the air. According to the EPA, in 2020, about **68 million tons** of air pollutants were emitted into the atmosphere in the United States.

## Consequences

Poor air quality can cause a myriad of health issues for humans, animals, and plants. There are both short-term and long-term effects: illnesses like **pneumonia and bronchitis** are temporary but dangerous, and air pollution increases the risk of **heart disease, lung cancer, and respiratory diseases** like emphysema. In 2016, the WHO attributed over **77,500 deaths** in America alone to indoor and outdoor air pollution.

# Our Project

## Right now in Roxbury...

Currently, the ***only* air quality sensor in Roxbury** is located near Nubian Square. This sensor only collects one data point per hour. While it provides valuable data, **just one sensor is not enough** to provide a full picture of air quality in Roxbury–air quality can vary a lot depending on time and location, so an **expansive network of sensors** is necessary to keep the community informed and healthy.

## Our Vision

With your help, we will be installing **40 air quality sensors** in key locations, half of them outdoors and half of them indoors, around Roxbury over the course of the next year. Once these sensors are set up, any Roxbury resident will be able to keep track of local air quality in **real time online**. Additionally, these sensors will give elected officials valuable air quality data that they can use to create more informed **environmental protection policies** in Roxbury.

## A Three-Part Strategy



## Our Sensors

ACE and Air Partners will be collaborating to install **QuantAQ MODULAIR™-PM** sensors. These sensors take in air through a small inlet in the bottom of the sensor, **testing it for Particulate Matter** of different sizes, then uploading those test results **every minute** to the web for **any community member to access**. They're designed and built just a few miles away in Somerville, MA, and only collect data about air quality– they **don't have cameras, microphones, or any other type of surveillance features.**