

Community Based Air Monitoring Wheels on the Ground: Citizen Science + The Fairmount Greenway

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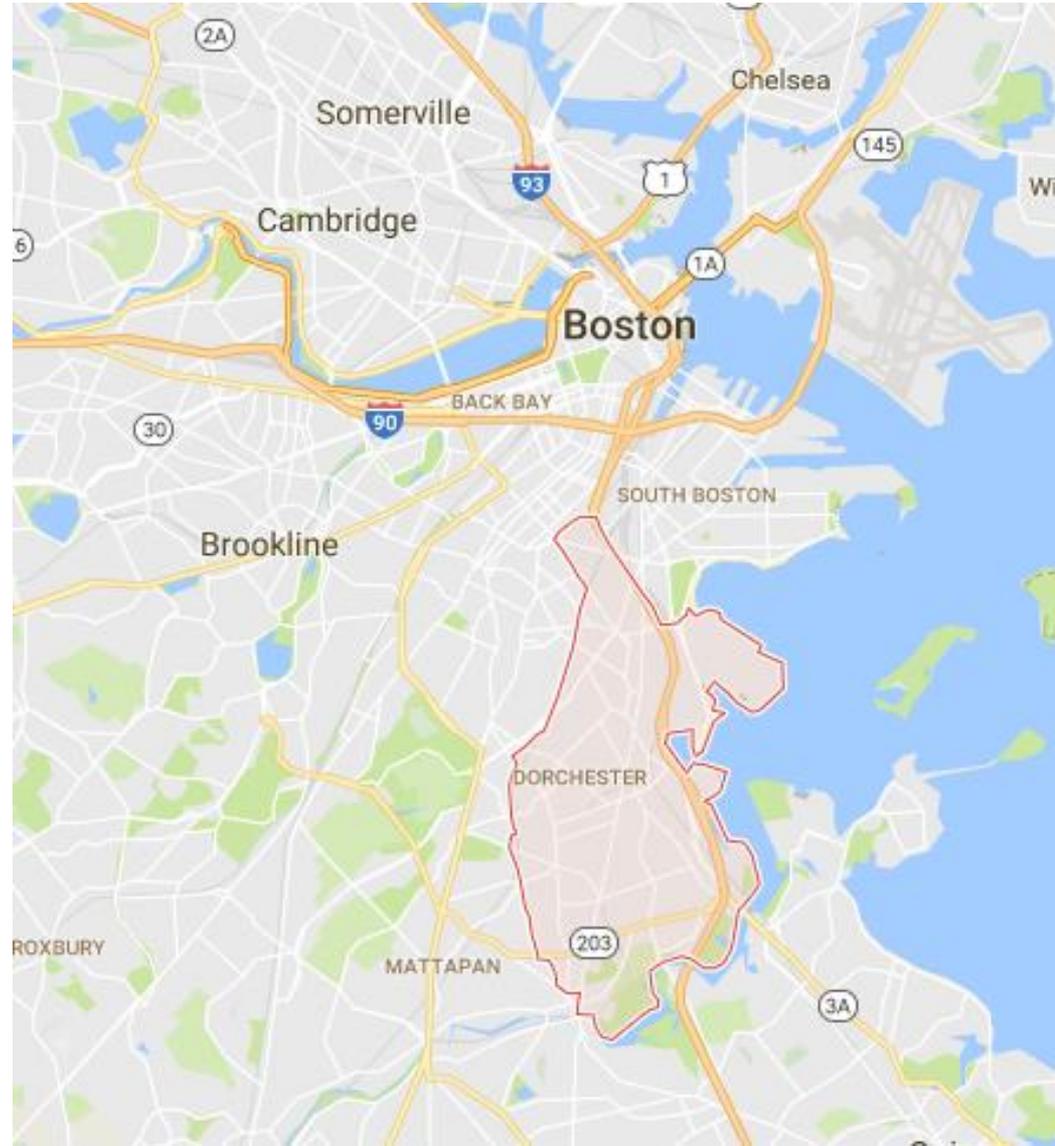
Community Background



The Communities of Dorchester

Goal of Community Outreach and Engagement Core:

Respond to the expressed needs of the Dorchester communities to reduce the prevalence of asthma and obesity through outreach programs.



Fairmount GREENWAY



CONNECTING COMMUNITIES

Fairmount Corridor

93,000 low-income residents

= 15% of Boston's population

- **61% are black or African American**
- **16% speak Spanish as a first language**
- *Half of Boston residents of Caribbean descent and 65% of Bostonians with roots in Cape Verde live here.*

40% of households

earn less than

\$40,000 per year

Boston's median household income = \$50,684

20% of families

live below the poverty line

including 35% of children under 17 years old



Fairmount GREENWAY

9-Miles

Dorchester, Roxbury,
Mattapan, Hyde Park

700+ PEOPLE

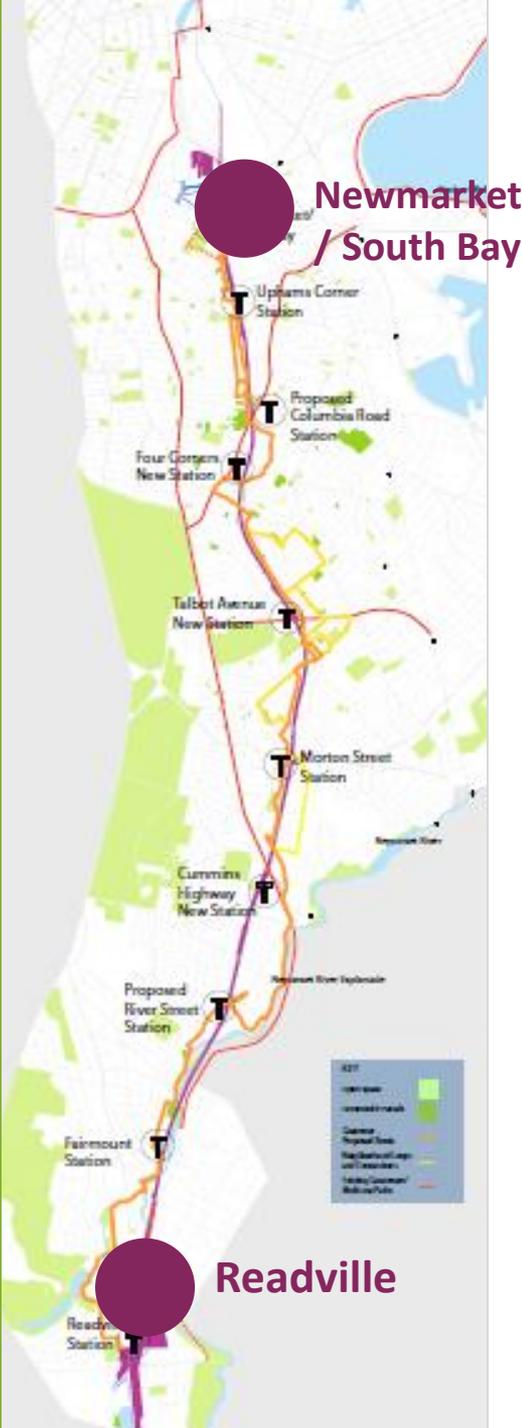
have been engaged in the planning and events as part of the Fairmount Greenway's work

10

Member Fairmount Greenway Task Force

6 priority parcels

2 completed sites - a community garden and an urban agriculture site









Build New
Open Space



Improve
Existing Parks



Create
Pop-up Parks



Build
A neighborway



Promote
Active Transit



Green
The greenway

Neighborhood Greenways

Fairmount
GREENWAY



Fairmount GREENWAY

Research Background



Air pollution increases the risk for the development of asthma¹ and triggers asthma attacks²

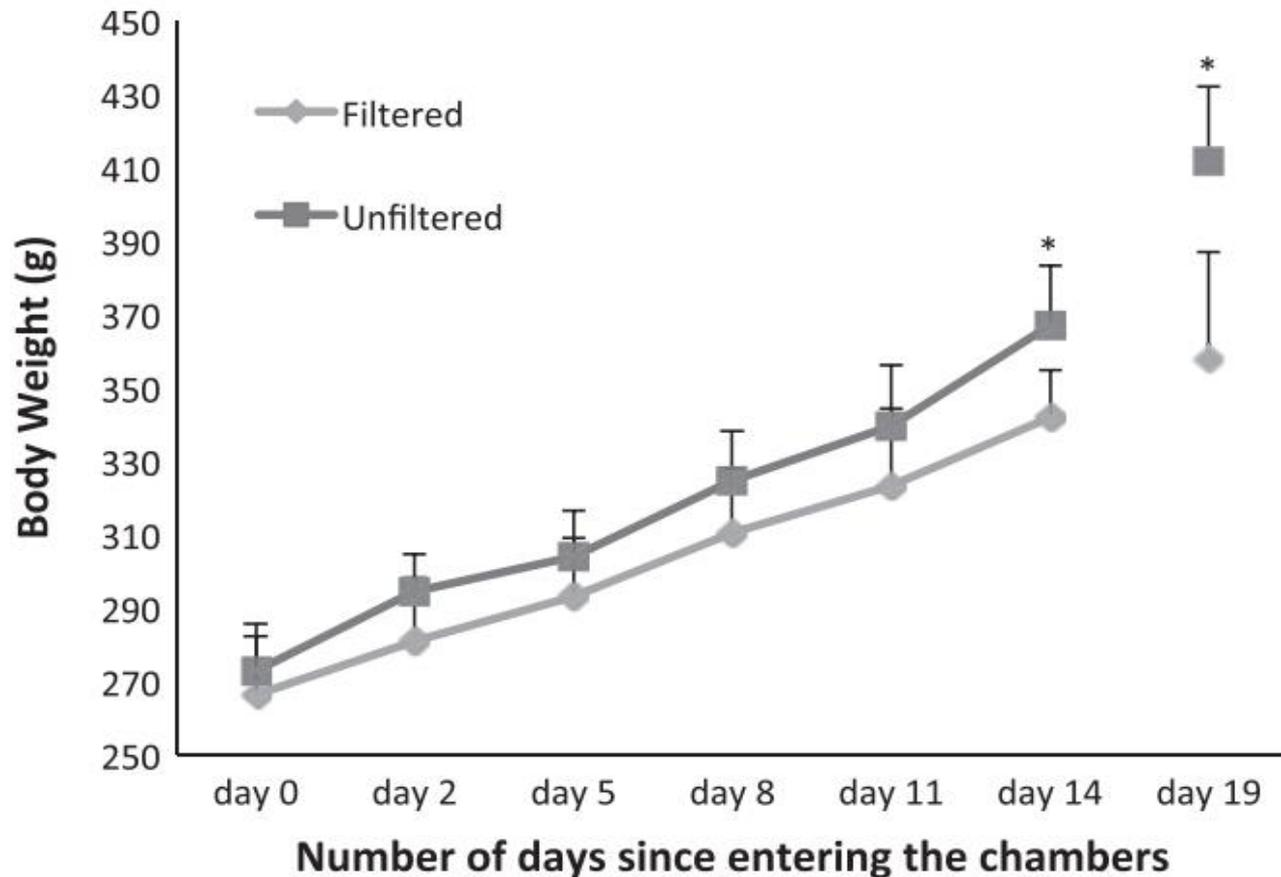


1 Outdoor air pollution and asthma
Michael Guarnieri, MD and John R. Balmes, MD

2 Health effects of air pollution
Jonathan A. Bernstein, MD

Picture: Huffington Post

Air pollution exposure increases bodyweight in mice

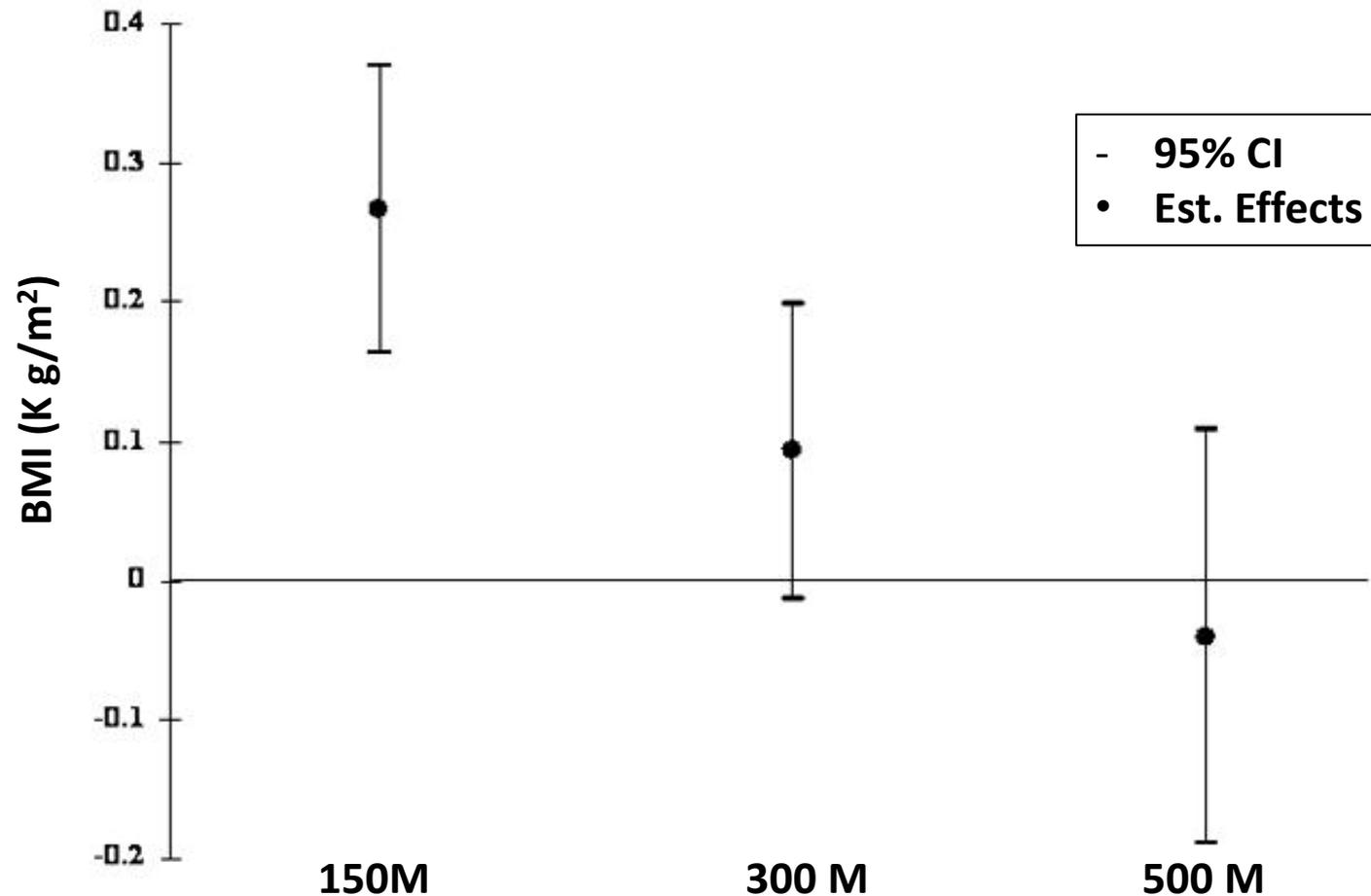


*Significant difference ($p < 0.05$) between the Filtered and Unfiltered groups

Chronic exposure to air pollution particles increases the risk of obesity and metabolic syndrome: findings from a natural experiment in Beijing.

Yongjie Wei, et. al.

Proximity to air pollution from automobiles increases BMI in children



Automobile Traffic around the Home and Attained Body Mass Index:
A Longitudinal Cohort Study of Children aged 10–18 Years
Michael Jerrett, PhD et al.

Health Impact of Noise Pollution

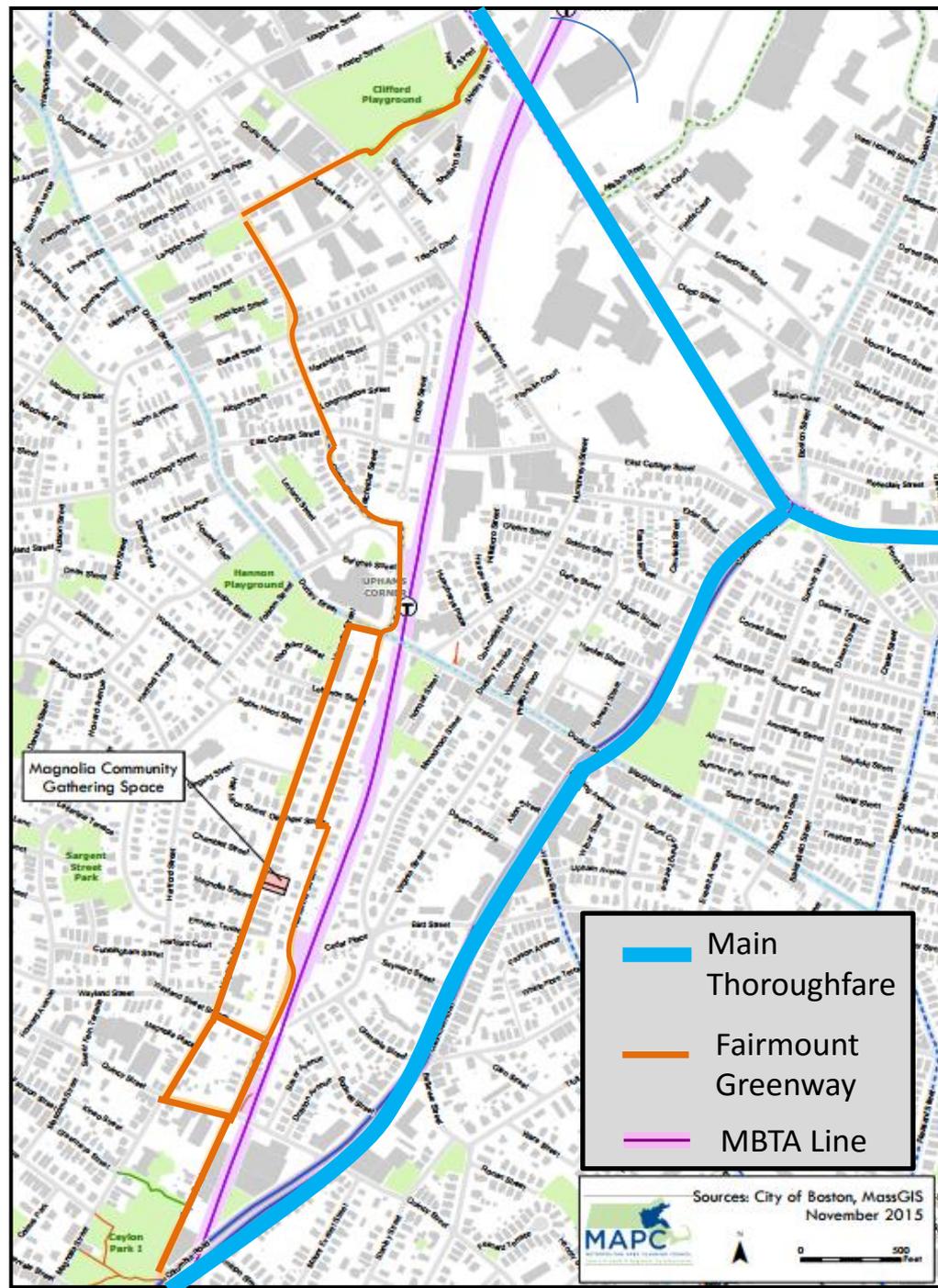
- Increases Stress
- Associated with increase incidence of
 - Hypertension
 - T2 Diabetes
 - Cardiovascular Disease
- Higher noise exposure in black/non-white and lower socioeconomic status residents in US.

Methods



Air Quality on Fairmount Greenway vs Main Thoroughfares

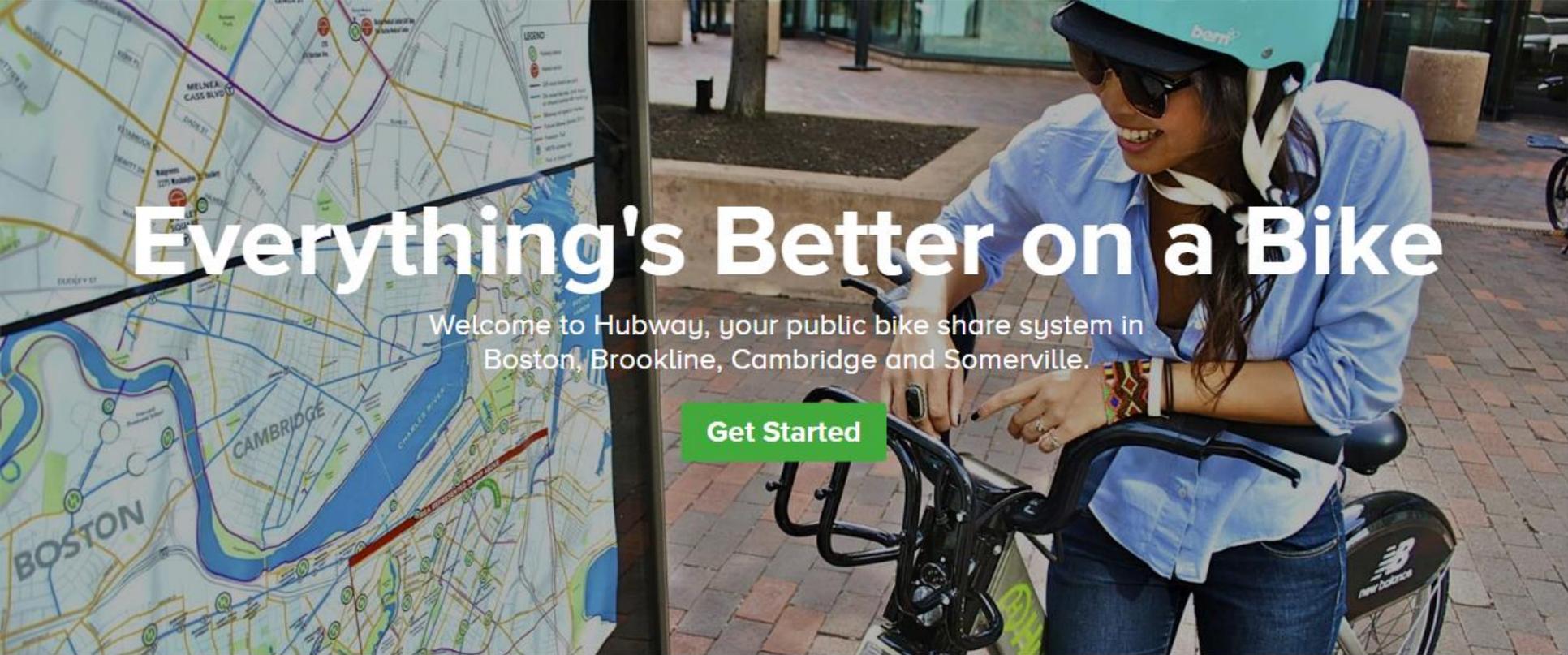
Measure air quality and noise pollution as we bike along Fairmount Greenway (orange) and compare it to main thoroughfare (blue).



Citizen Science on the Greenway

- Grassroots effort
- Recruitment important
- Collaboration
 - frequent meetings, different venues (neighborhoods)
- Citizens trained to collect data
- Citizens gain public health literacy
- Data will be used to support grants and city funding to fund Greenway development and EJ initiatives

Hubway



Everything's Better on a Bike

Welcome to Hubway, your public bike share system in Boston, Brookline, Cambridge and Somerville.

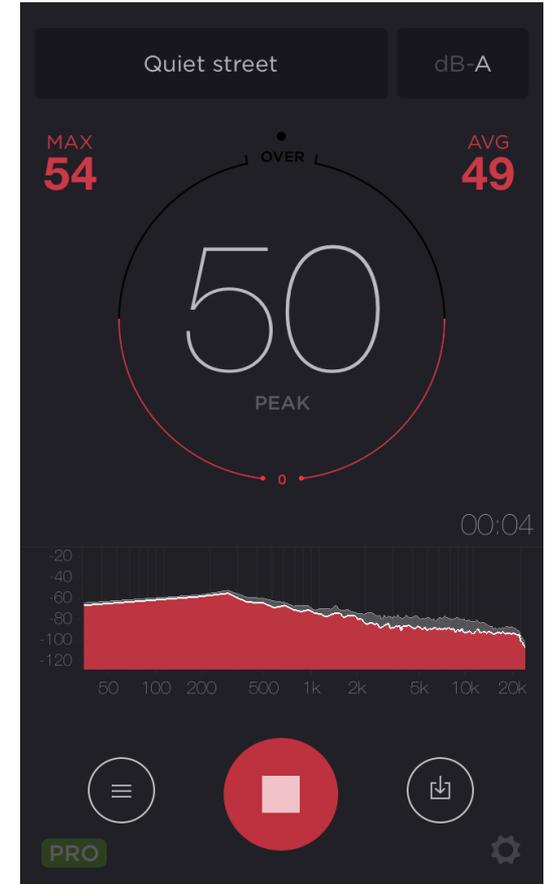
[Get Started](#)

A fun and affordable way to get around town

Citizen Science Recruitment



Splitting Up the Tasks



Results and Discussion



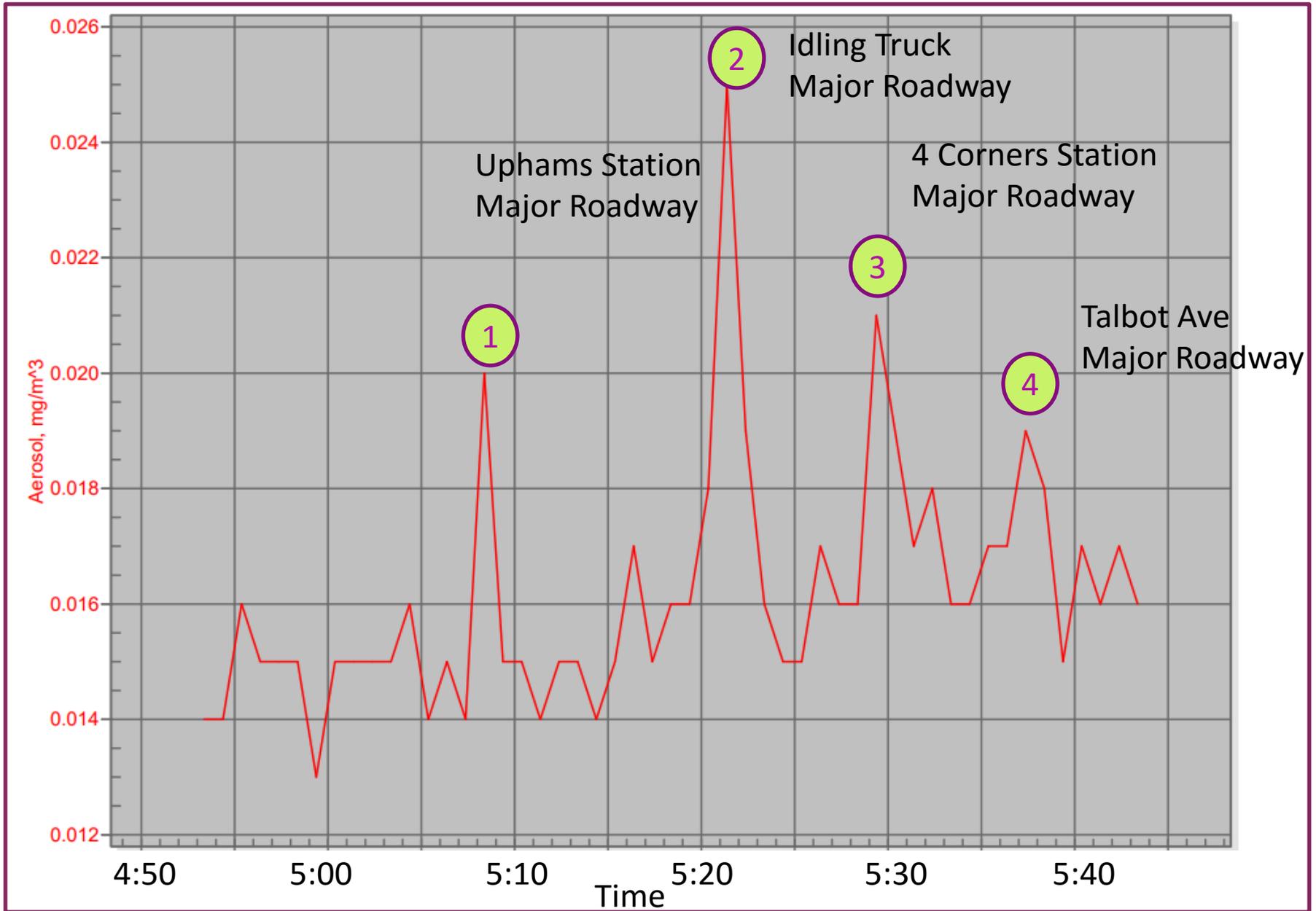


Main Thoroughfares

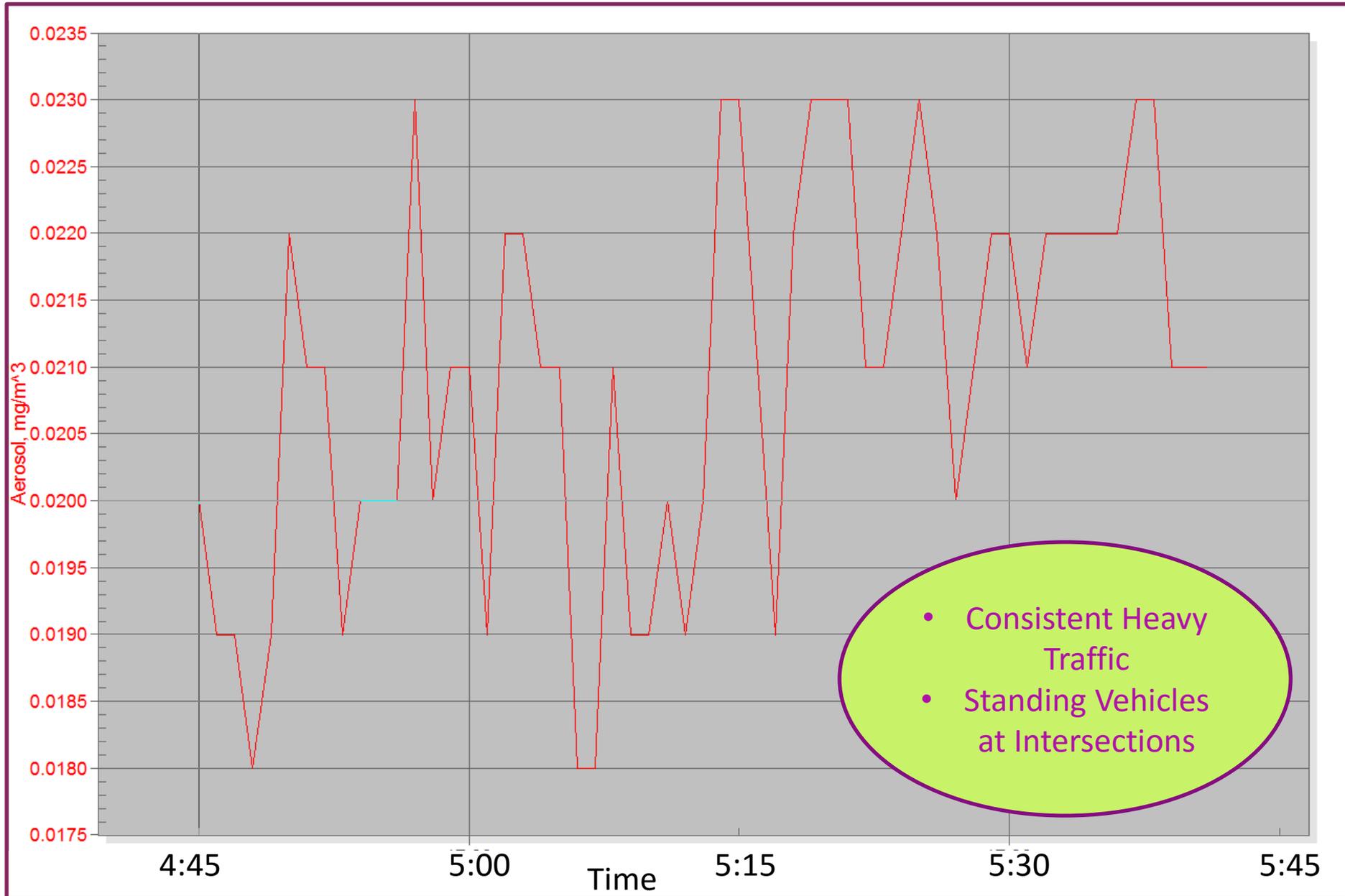
Fairmount Greenway



Fairmount Greenway (PM 2.5)



Main Thoroughfare (PM 2.5)



Summary

Fairmount vs Main Thoroughfare Air and Noise Pollution

Average PM 2.5 Levels	
Main Thoroughfare	Fairmount Greenway
0.021 mg/m ³	0.016 mg/m ³

Average Noise Pollution (Decibels)	
Main Thoroughfare	Fairmount Greenway
74.3	67.7



Next Steps

- Repeat experiment 3x
 - Take September measurements when traffic levels are more typical
- Share the data with community, advocates, and government agencies
 - Attending Local Meetings
 - Get Feedback
- Use the data
 - Environmental Justice Grants
 - Further Support Expanding the Fairmount Greenway

Lessons Learned

- Being flexible
- Weather
- Talking to residents on streets was a great way to engage people
- Recruitment-some kind of incentive?
 - Small stipend for older youth would increase participation when working with communities of color.
 - Snacks, water
 - Gift card

References

1. Outdoor air pollution and asthma.

Michael Guarnieri, MD and John R. Balmes, MD

2. Health effects of air pollution.

Jonathan A. Bernstein, MD

3. Chronic exposure to air pollution particles increases the risk of obesity and metabolic syndrome: findings from a natural experiment in Beijing.

Yongjie Wei, et al.

4. Automobile Traffic around the Home and Attained Body Mass Index: A Longitudinal Cohort Study of Children aged 10–18 Years.

Michael Jerrett, PhD et al.

5. Race/Ethnicity, Socioeconomic Status, Residential Segregation, and Spatial Variation in Noise Exposure in the Contiguous United States.

Joan A. Casey, PhD et al.

Acknowledgments

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Fairmount Greenway Task Force
Mattapan Food and Fitness

Thank you.
Questions?

