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.
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
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
Air pollution increases the risk for the development of asthma\(^1\) and triggers asthma attacks\(^2\)

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

2 Health effects of air pollution
   Jonathan A. Bernstein, MD
Air pollution exposure increases bodyweight in mice

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.

Race/Ethnicity, Socioeconomic Status, Residential Segregation, and Spatial Variation in Noise Exposure in the Contiguous United States
Joan A. Casey, PhD et al.
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 Thoroughfare (PM 2.5)

- Consistent Heavy Traffic
- Standing Vehicles at Intersections
# Summary

**Fairmount vs Main Thoroughfare**

## Air and Noise Pollution

### Average PM 2.5 Levels

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<tr>
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<th>Main Thoroughfare</th>
<th>Fairmount Greenway</th>
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<tbody>
<tr>
<td>PM 2.5 Levels</td>
<td>0.021 mg/m(^3)</td>
<td>0.016 mg/m(^3)</td>
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### Average Noise Pollution (Decibels)

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<tbody>
<tr>
<td>Noise Levels</td>
<td>74.3</td>
<td>67.7</td>
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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.

   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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Mattapan Food and Fitness
Thank you.
Questions?