Gordie Howe International Bridge: Air Monitoring & Health Impact Assessment

Community Meeting
January 25, 2017

A collaboration between the

Southwest Detroit Community Benefits Coalition
Detroit Health Department
Michigan Department of Environmental Quality, and
University of Michigan School of Public Health

Agenda

- Welcome & introductions
- Air monitoring and health impact assessment purpose & goals
- Overall timeline
- Proposed MDEQ stationary monitoring site plans
- Proposed mobile and indoor air monitoring plans
- Proposed health impact assessment plans
- Questions

Community benefits agreement

- **Air & Health studies**
- **$2.4 million for new air monitoring over 10 years**
  - stationary monitors
  - mobile monitors
  - indoor monitors
- **Community Air and Health studies conducted helped pave the way**
- **Working with leading experts**
- **Other benefit programs – like Bridging Neighborhoods "home swap" for target area, and jobs programs**

Purpose & Goals

WHAT? Examine our air and health *before, during, and after* construction of the new Gordie Howe International Bridge to see any changes

WHY? Truck traffic is expected to double over time with the bridge

HOW? State, City, and Residents are working together on air and health monitoring programs

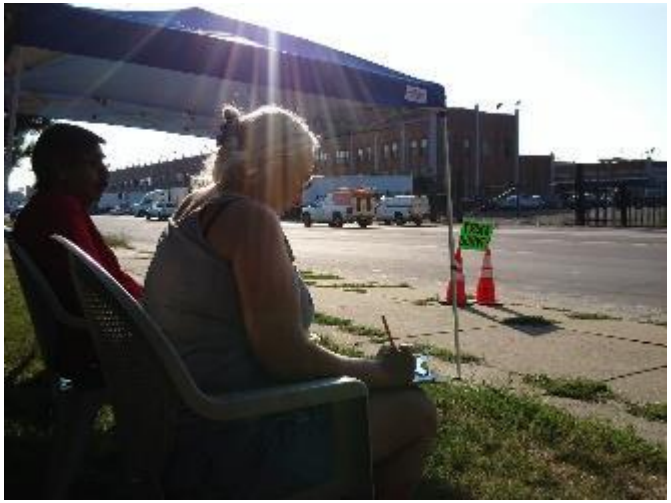
We will be looking at air quality and health to detect any changes that might occur with the bridge development.

Preliminary project timeline

- **Summer 2018:**
  - Install 3 new MDEQ Stationary monitoring sites
  - Install indoor air and mobile monitoring equipment
  - Collect baseline health and exposure data

- **Year 1 and 2 of GHIB opening:**
  - Additional health and exposure data collected to evaluate health impacts associated with bridge-related activities

Community Surveys: Health, Trucks, Air

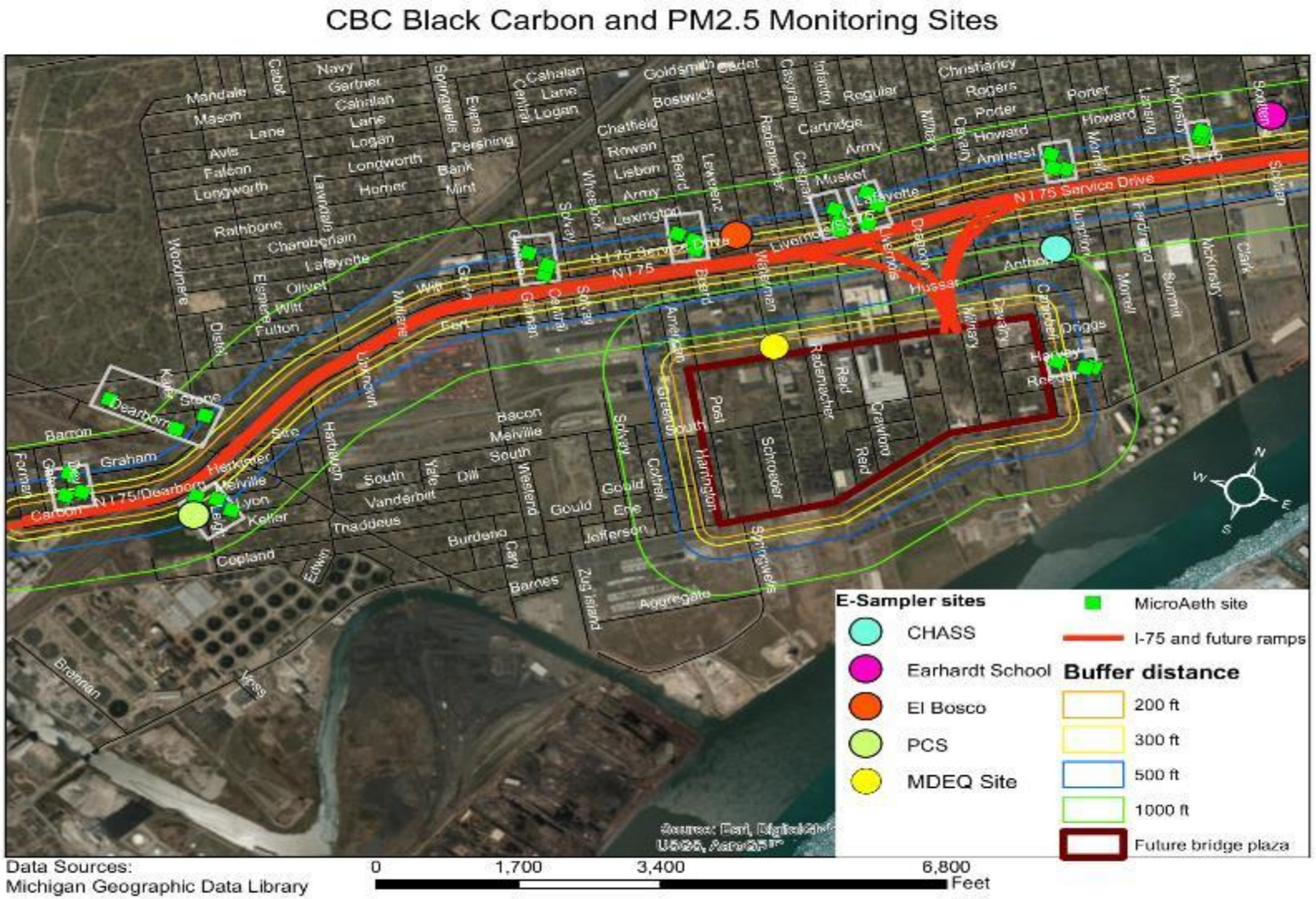


Focus on diesel exhaust

Diesel exhaust emission is a common air pollutant

- Living near a busy roadway can increase risks to health such as:
  - Asthma and breathing conditions
  - High blood pressure, heart disease, cancer
  - Low birth weights, pre-term births
  - And other conditions

Community monitors ongoing



Data Sources:
Michigan Geographic Data Library

0 1,700 3,400 6,800 Feet

How will we assess impacts?

1) Will be measure air pollution in 3 phases:

- **Baseline:** before major construction begins
- **During construction:** effects of demolition and construction
- **Post-construction:** impacts of traffic and bridge operation

2. Analyze and interpret findings

3. Engage community to develop plans and communicate results

Background: What is ambient air monitoring?

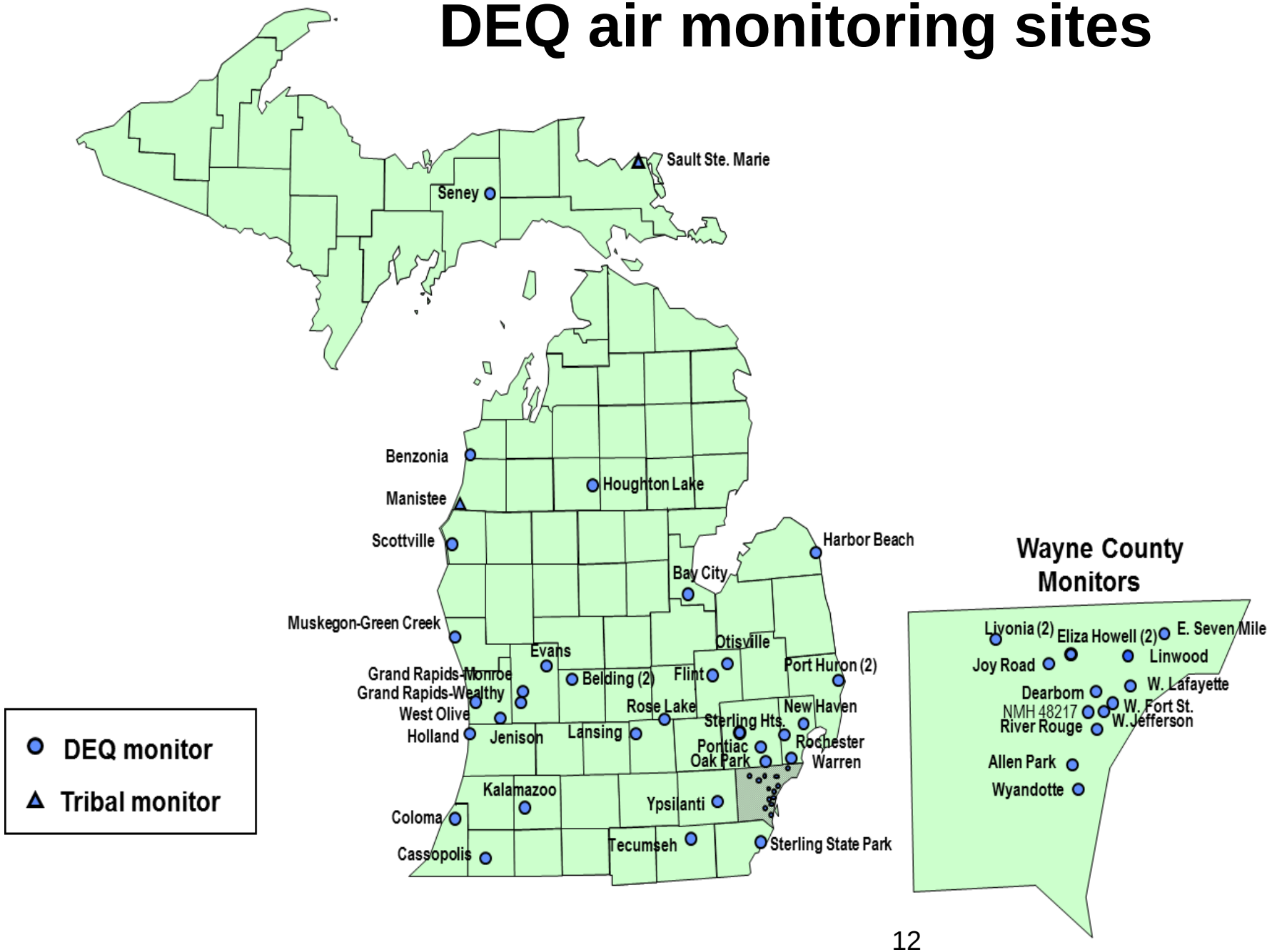
Ambient air is air in the outdoor environment, and is what humans and animals breathe

Ambient air monitoring is taking measurements of outdoor air pollutants near neighborhoods, schools, parks, and off-site from industry.

Why the DEQ conducts air quality monitoring?

- To show we are meeting the federal health standards and to comply with other EPA monitoring rules and requirements
- To provide/gather data to evaluate the air quality in an area or region
- Based on population or industry type – MDEQ is required to monitor in certain areas for certain pollutants

DEQ air monitoring sites



Gordie Howe Bridge: Stationary Air Monitoring

GOALS:

To conduct ambient air monitoring where people live, work, and play to assess the air quality

Data from the air monitoring will be available for other agencies to determine health effects

Timeline: Monitoring to start in June 2018

Gordie Howe Bridge – Stationary Air Monitoring

- DEQ received funds from *Michigan State Housing Development Authority (MSHDA)* to monitor in Delray
- 3 NEW monitoring stations plus additional parameters to the existing monitoring site near the former SW High School site
- All monitoring stations to measure:
  - Carbon monoxide (CO)
  - Sulfur dioxide (SO_2)
  - Nitrogen dioxide (NO_x)
  - Particulates ($PM_{2.5}$)
  - Lead
  - Black carbon (BC)

How were sites selected?

- Review of wind direction data
- Schools and where children attend are preferred
- Locations where trees and air-flow obstructions are minimal
- Electricity hook-ups available
- Safety – Security concerns

3 New Monitoring Stations

Proposed Locations:

1. People's Community Center (Delray House)

2. Former Beard Elementary School

3. Earhart Elementary – Middle School

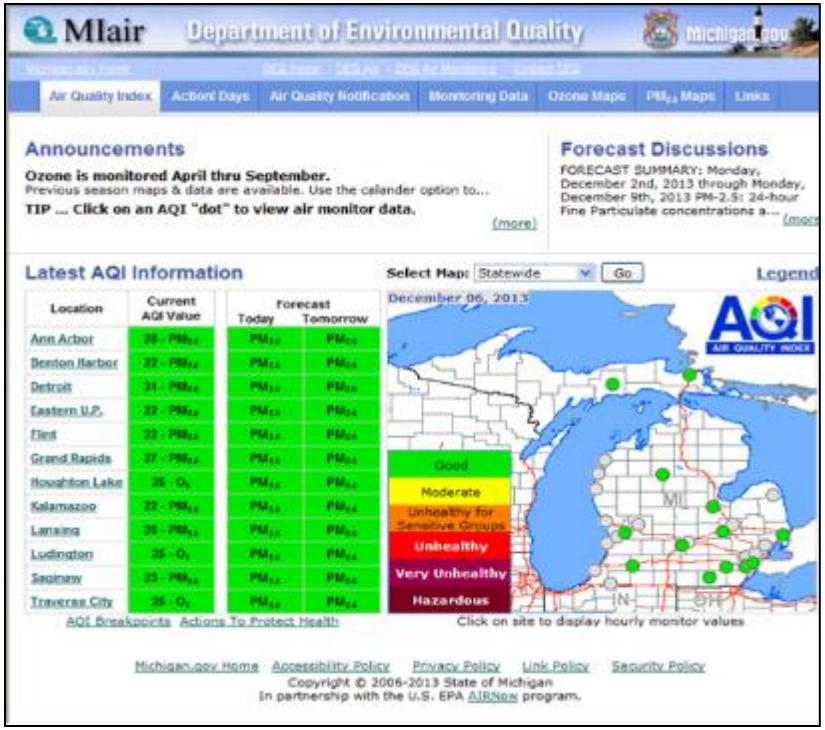
Monitors and stationary sources in SW Detroit

- Stationary pollution sources
- MDEQ monitors
- Marathon monitors
- New/enhanced monitors
  - PCS
  - SW High School
  - Beard School
  - Earhart School

Where to find air monitoring data

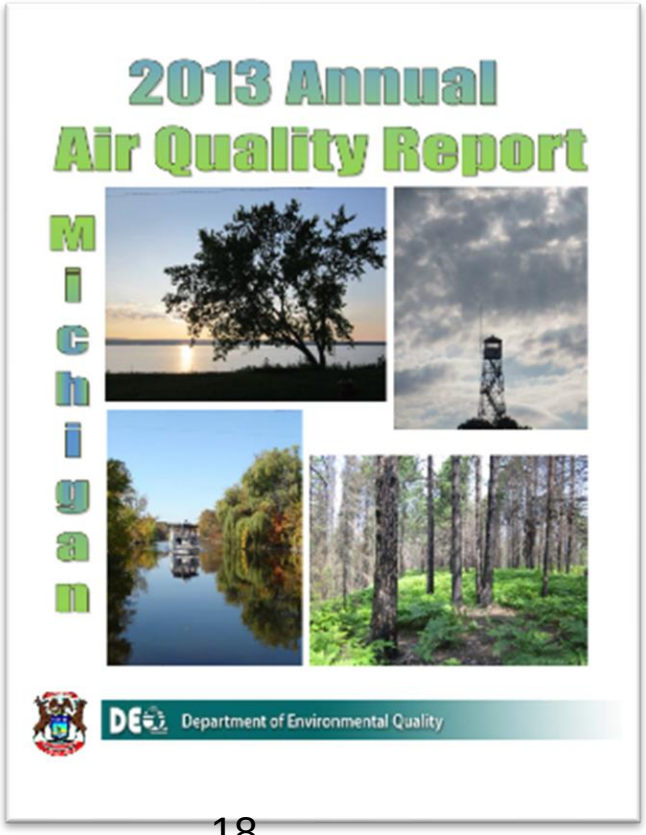
Near Real Time

www.deqmiair.org



Summary Data

Annual Report



Mobile & Indoor Air Monitoring – Goals

Conduct **mobile** and **indoor monitoring** to measure air pollution exposures in the area of the new Gordie Howe Bridge

- May include homes, churches, schools, early learning centers, senior facilities, clinics, etc
- Compliments the stationary MDEQ monitoring sites
- Monitor data will inform the health assessment

Mobile monitoring – proposed approach

Use high quality instruments

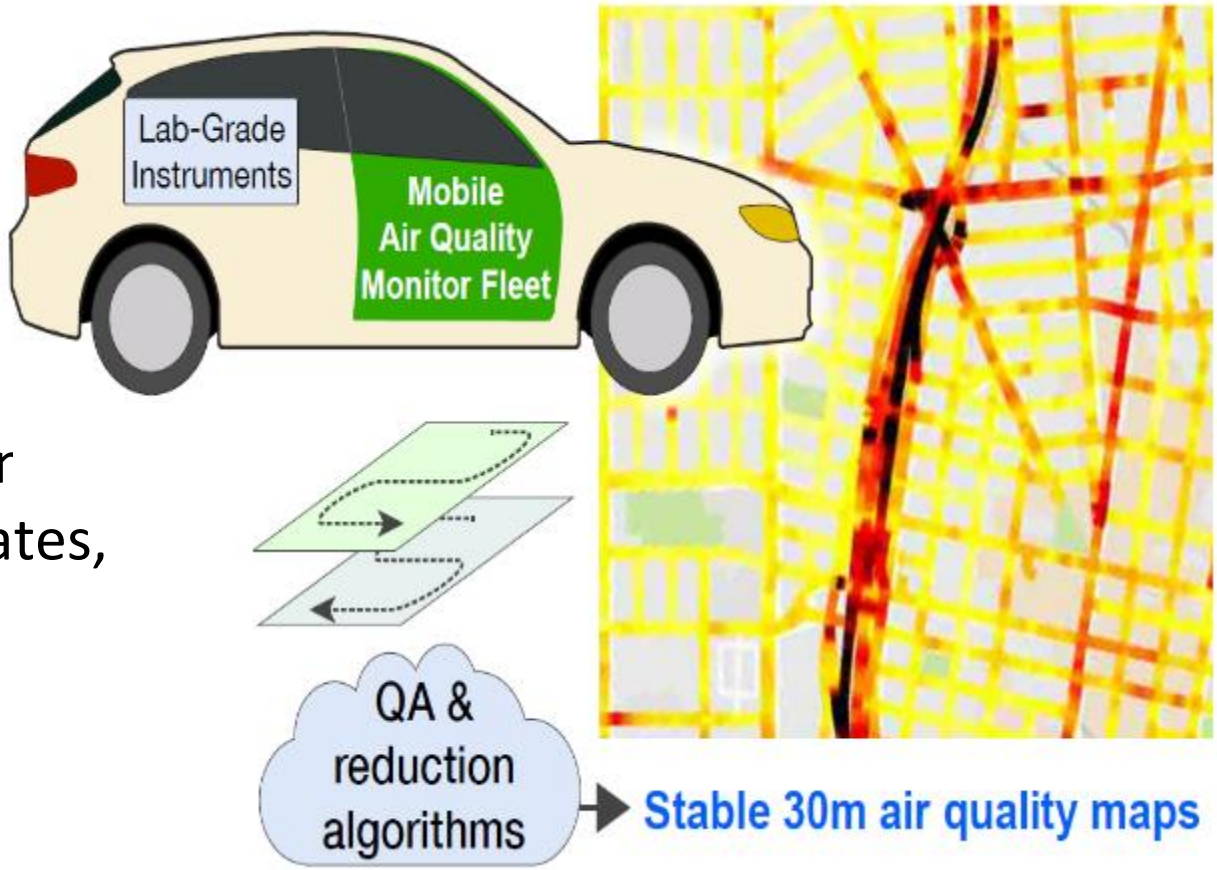
programmed routes
& **specific locations**

daily & seasonally

Measure various pollutar
Carbon dioxide, Particulates,
black carbon, other

repeated sampling

Capture “hotspots” – spatial
pattern of pollutants



Graphic: Joshua Apte, HEI, May 2017 (also ES&T, 2017)

Mobile monitoring near homes and schools

Graphic: Joshua Apte, HEI, May 2017 (also ES&T, 2017)

Indoor monitoring – proposed approach

Periodically sample air in resident homes **in two areas**:

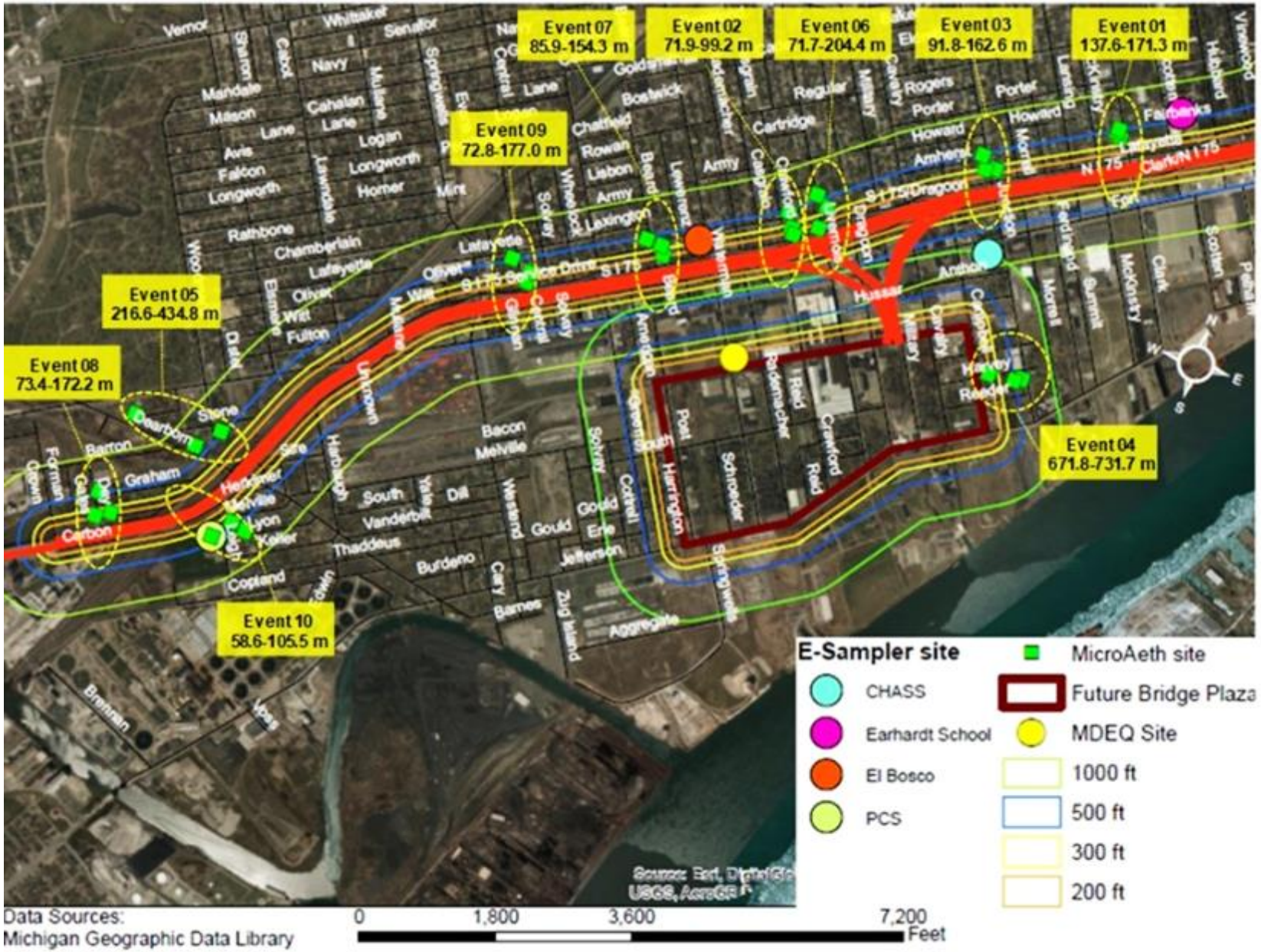
- Homes **near** the bridge terminal/freeway - case group
- Homes more **distant** – control group

Compare the near group to the distant group for differences.

Typically, monitor for 3-4 days at a couple homes per week, repeat each season.

- Pollutants including CO_2, $PM_{2.5}$, Black carbon, others.
- Might conduct walkthrough of home to determine possible air pollution sources – heating system types, and other factors may affect results.

Residential and stationary monitoring sites in CBA study

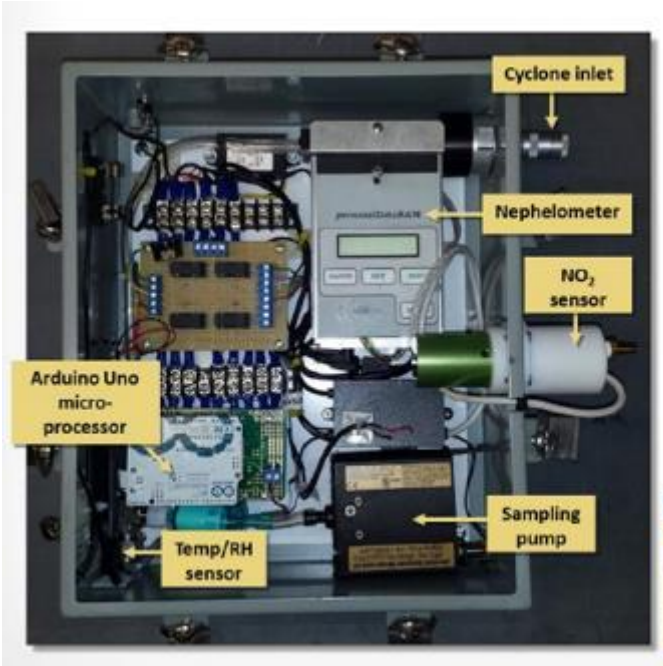


Indoor monitoring – possible instrumentation

Use portable, real-time, sensors

Compare favorably to MDEQ and laboratory-grade sensors.

A few integrated systems are under development.



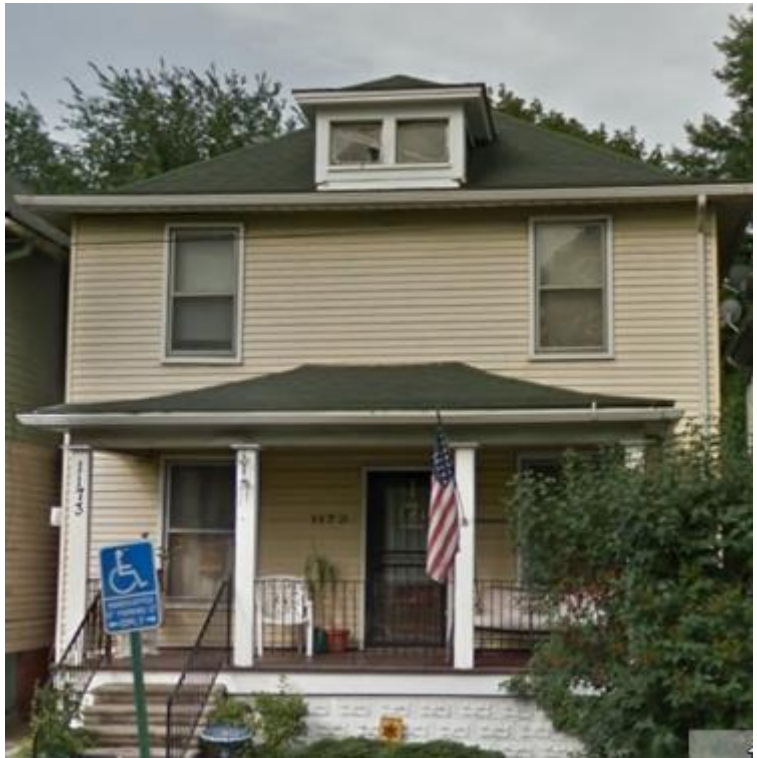
Measurement	Reporting Unit
NO_2 concentration	Parts per billion (ppb)
PM concentration	Micrograms per cubic meter (μg/m)
Temperature	Degrees Celsius (°C)
Relative humidity (RH)	Percent (%) at °C

2B OEM-106 Ozone

DUSTTRAK DRX

Indoor monitoring – outcomes

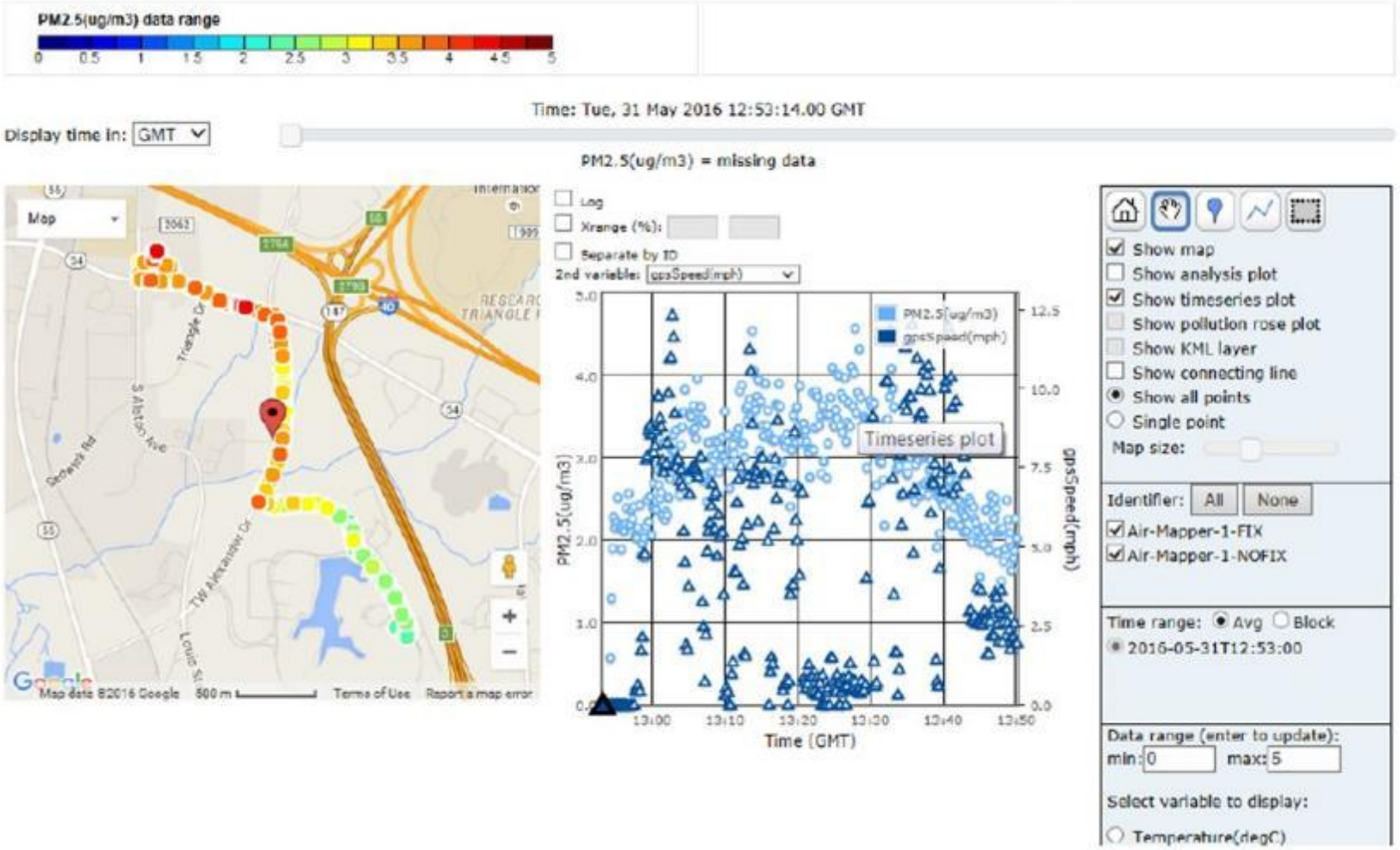
- Indoor monitoring is good measure of exposure to air pollution since so much time is spent indoors.
- Data could indicate effectiveness of interventions, like filters.
- IAQ monitoring results affected by many factors, like smoking, so data requires careful analysis.



Data analysis and availability

Real Time Geospatial Data Viewer (RETIGO) – one option, free US EPA platform. Can be used by anyone to explore data that they collected.

More sophisticated analyses using various models and statistical tools



Health Impact Assessment - Goals

The Health Impact Assessment will provide a baseline for evaluating how the bridge construction in Delray and surrounding neighborhoods may affect resident health.

Resident input will be used to help select the areas evaluated, the questions asked, and how results are reported.

Photo: Ryan Garza, Detroit Free Press

What is Health Impact Assessment?

A "systematic process that uses an array of data sources and analytic methods and considers input from stakeholders to determine the **potential effects of a proposed policy, plan, program, or project on health of a population** and the distribution of those effects within the population. HIA provides recommendations on monitoring and managing those effects."

National Research Council, 2011. National Academies Press, Washington, DC

Health Impact Assessment process

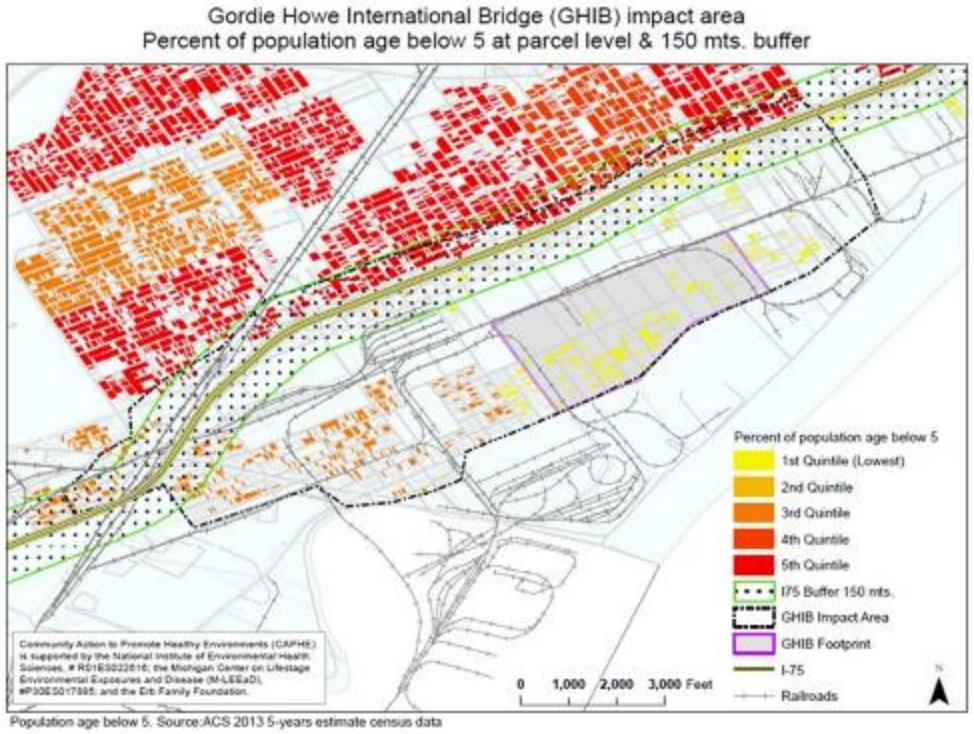
Sources: *Bhatia, R., et al., 2014. Minimum elements and practice standards for health impact assessments, Version 3;* Mecklenburg County, NC

Health Impact Assessment data sources

Monitoring Data
- Stationary MDEQ Sites
- Mobile Sites
- In-home air monitoring

Resident Survey

Health Care Utilization
- Medicaid Claims
- Hospital and Outpatient Records



Health Impact Assessment timeline

2018 Proposed Activities

- Community Meetings on Priority Questions for HIA
- Develop Survey
- Recruitment
- Survey Administration
- Data Cleaning and Analysis
- Initial Findings

How to get involved

Attend Community Meetings on Priority Questions for HIA

Participate in Indoor Air Monitoring

Complete Resident Surveys

Source: Consider Magazine

Thank you! Questions?

Small groups at tables of 6-8

- Complete Residents Interest Form
- Questions /Concerns half-sheet
- Evaluation form – will help for next meeting