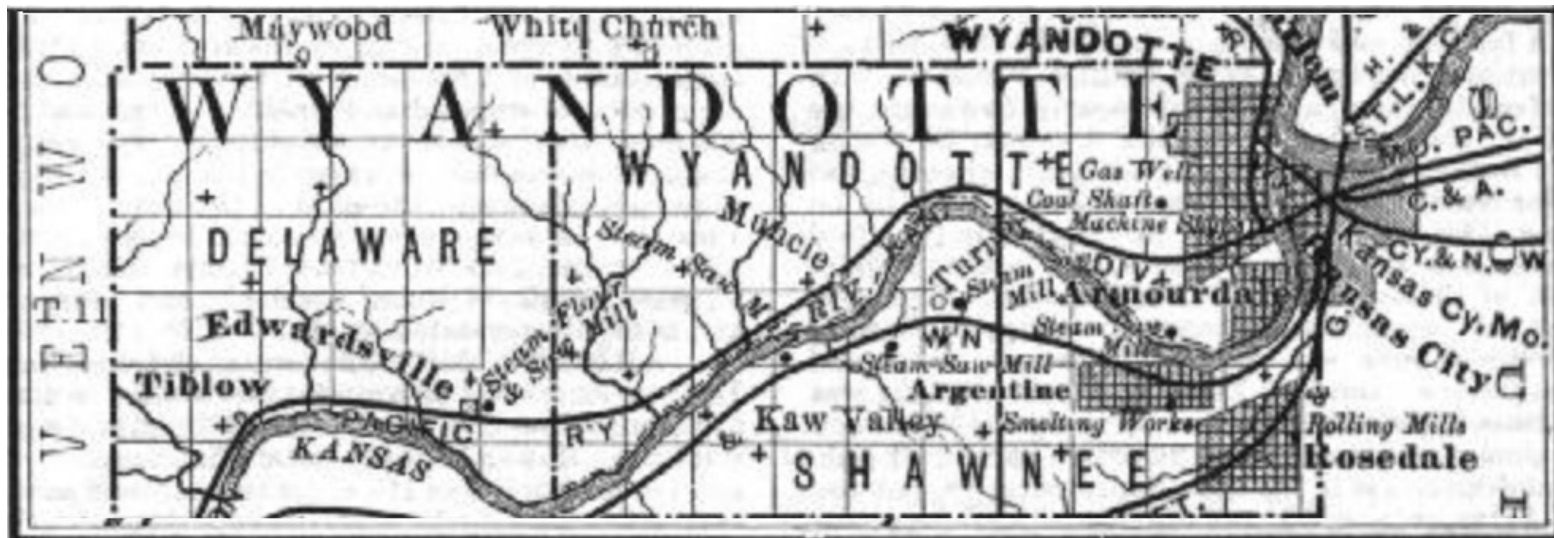


Kansas City Transportation Air Quality Study (KC-TRAQS)



Talking Points:

- Background on Air Quality, NAAQS, Particulate Matter (PM_{2.5})
- Air Quality in SE Wyandotte County
- Introduction to KC-Transportation Air Quality Study

Air Quality

Clean Air Act (CAA) Requirements

The Clean Air Act requires EPA to set National Ambient Air Quality Standards (NAAQS) for six common air pollutants (also known as "criteria air pollutants").

NAAQS Pollutants

6 Criteria Pollutants:

Particulate Matter (**PM2.5**)

Sulfur Dioxide (**SO2**)

Ground Level **Ozone**

Nitrogen Dioxide (**NO2**)

Carbon Monoxide (**CO**)

Lead (**Pb**)

The states are responsible for creating plans to meet the federal standards.

Air Monitoring

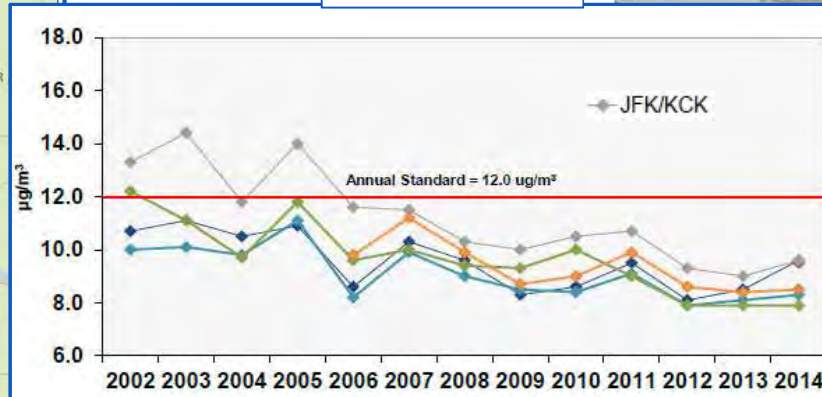
Levels are measured by air monitors located around the state.

Kansas City, KS JFK NCore Site

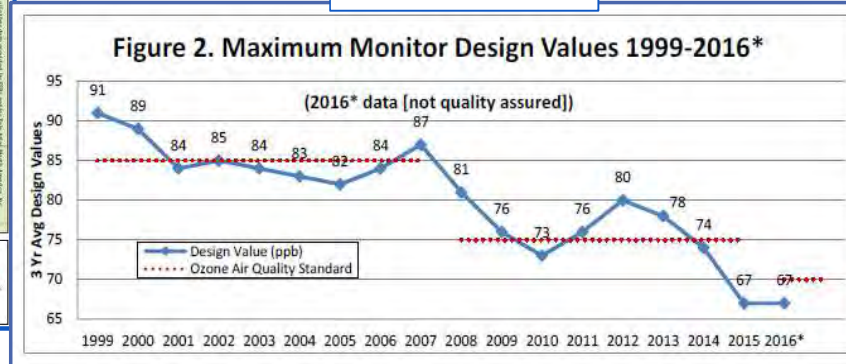


Nebraska Ave & North 10th

PM2.5 Trends

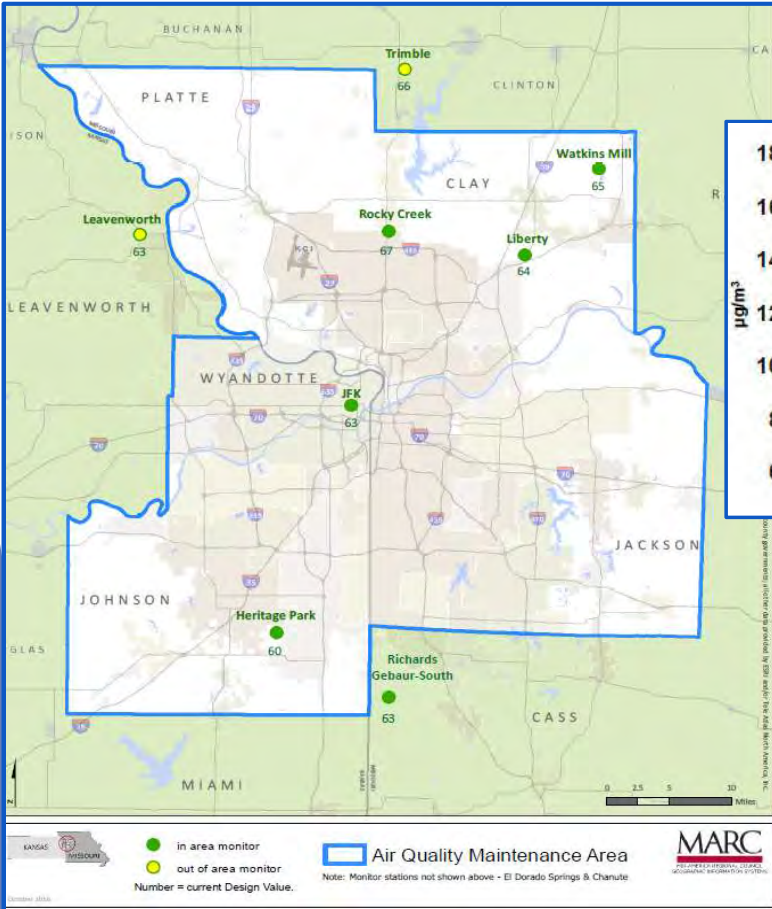


Ozone Trends

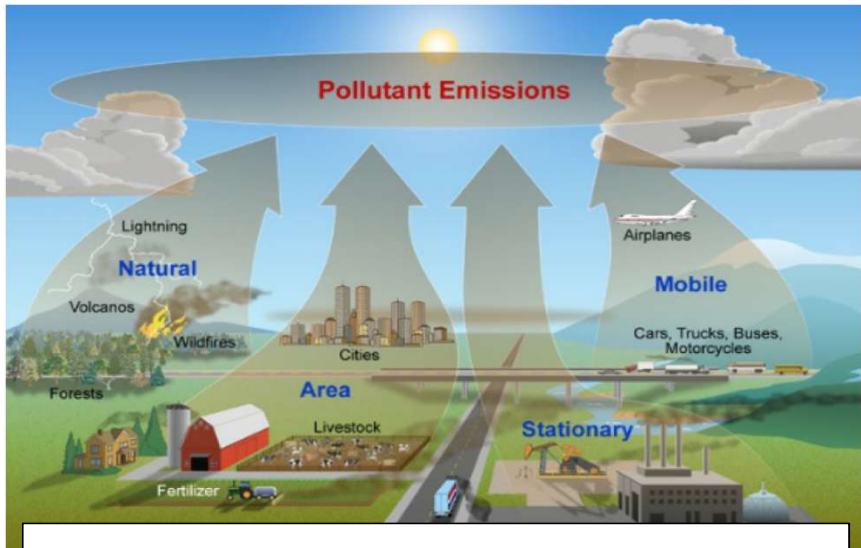


NCore Parameters

Parameter
PM _{2.5} speciation
PM _{2.5} FRM mass
continuous PM _{2.5} mass
continuous PM _(10-2.5) mass
lead (Pb)
ozone (O ₃)
carbon monoxide (CO)
carbon monoxide (CO) trace level
sulfur dioxide (SO ₂)
sulfur dioxide (SO ₂) trace level
oxides of nitrogen (NO _x)
total reactive nitrogen (NO/NO _y)
surface meteorology

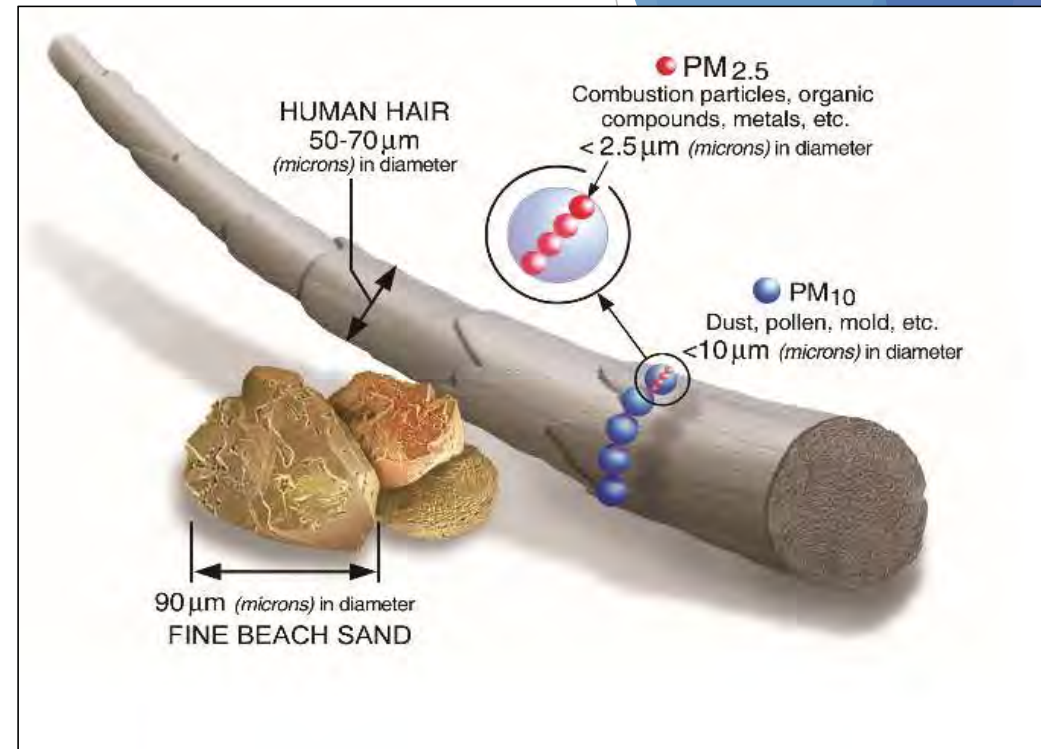


Particulate Matter (PM_{2.5}) and Health



Numerous scientific studies have linked particle exposure to:

- premature death in people with heart or lung disease
- nonfatal heart attacks
- irregular heartbeat
- aggravated asthma
- decreased lung function
- increased respiratory symptoms

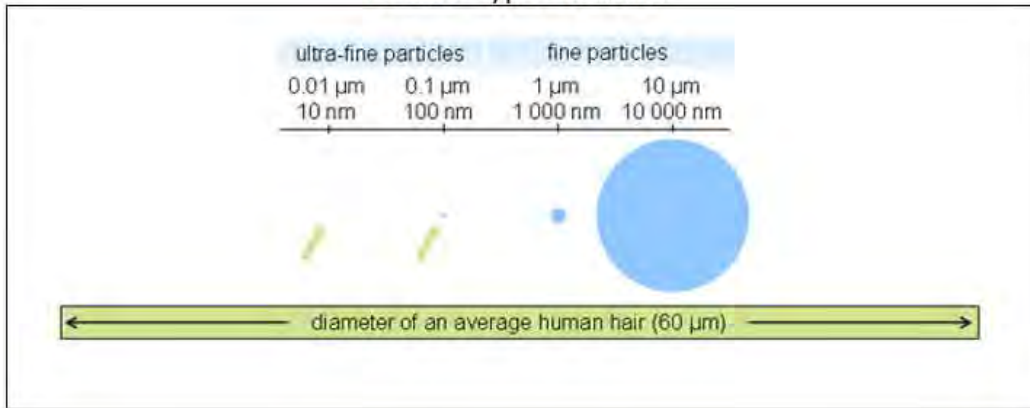


Diesel exhaust emits Particulate Matter (PM) or PM_{2.5}:

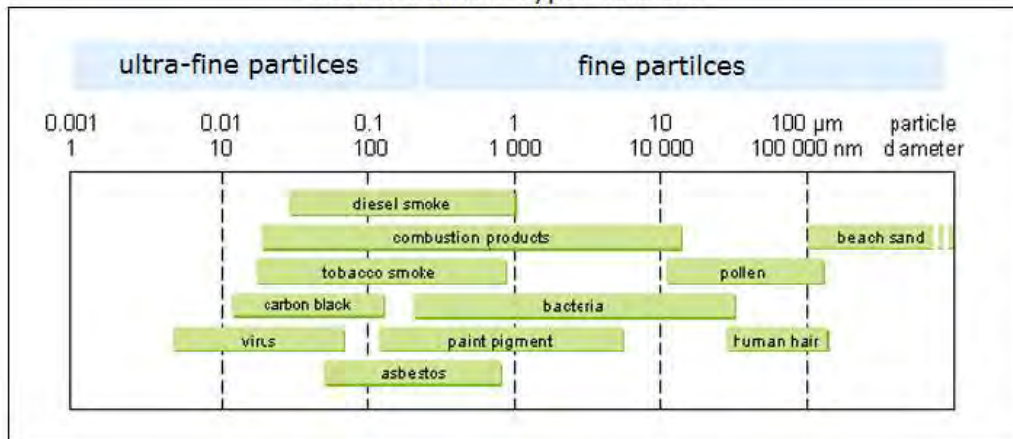
Note: Human epidemiological studies demonstrate an association between diesel exhaust exposure and increased lung cancer rates in occupational settings.

Particulate Matter to Scale

Particle Types to Scale



Source Particle Types to scale



KC-TRAQS RESEARCH PROJECT



Questions?

What is it?

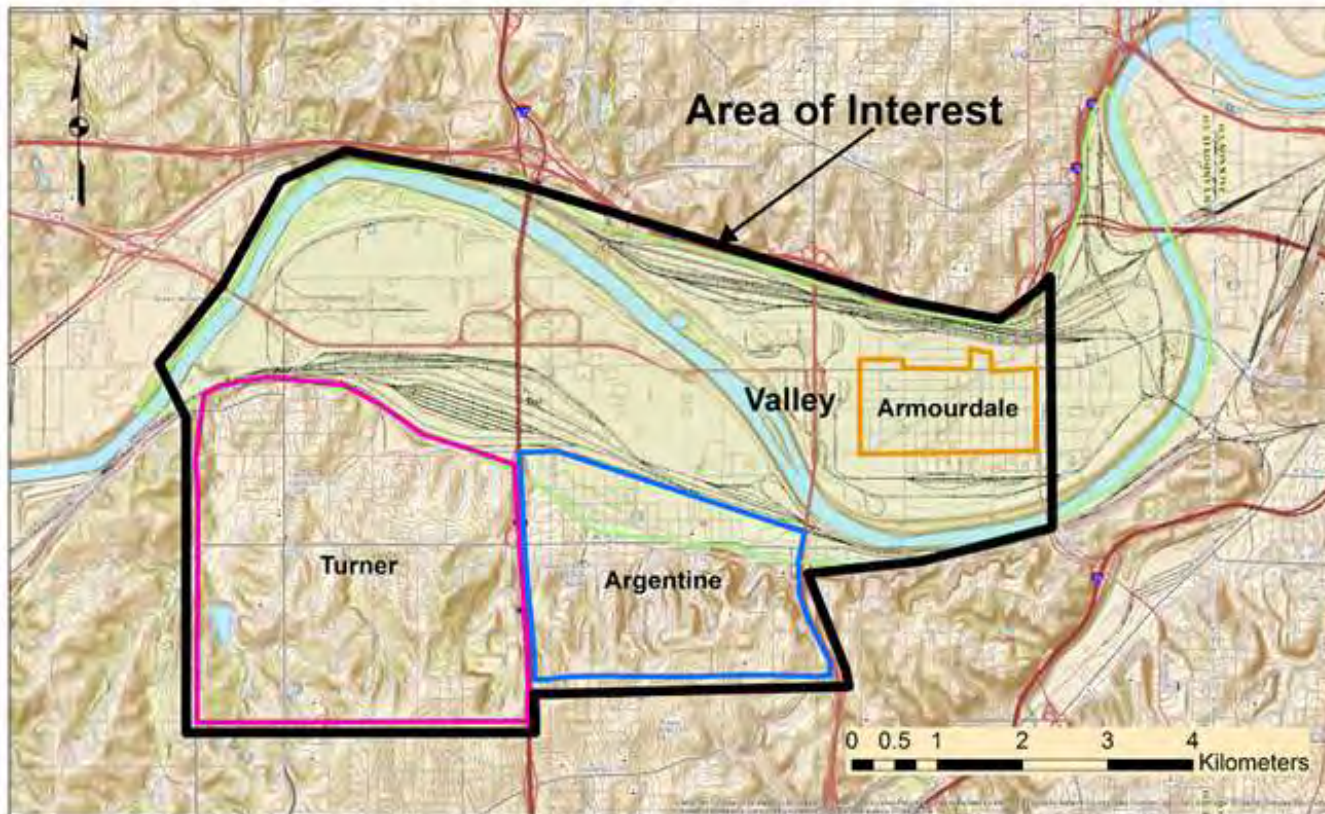
...one year air quality study that utilizes several measurement instrument approaches at multiple locations in the study area.

Purpose:

...to characterize the impact of local air pollution sources (PM_{2.5}) in and around the Argentine community including the neighborhoods of Turner and Armourdale.

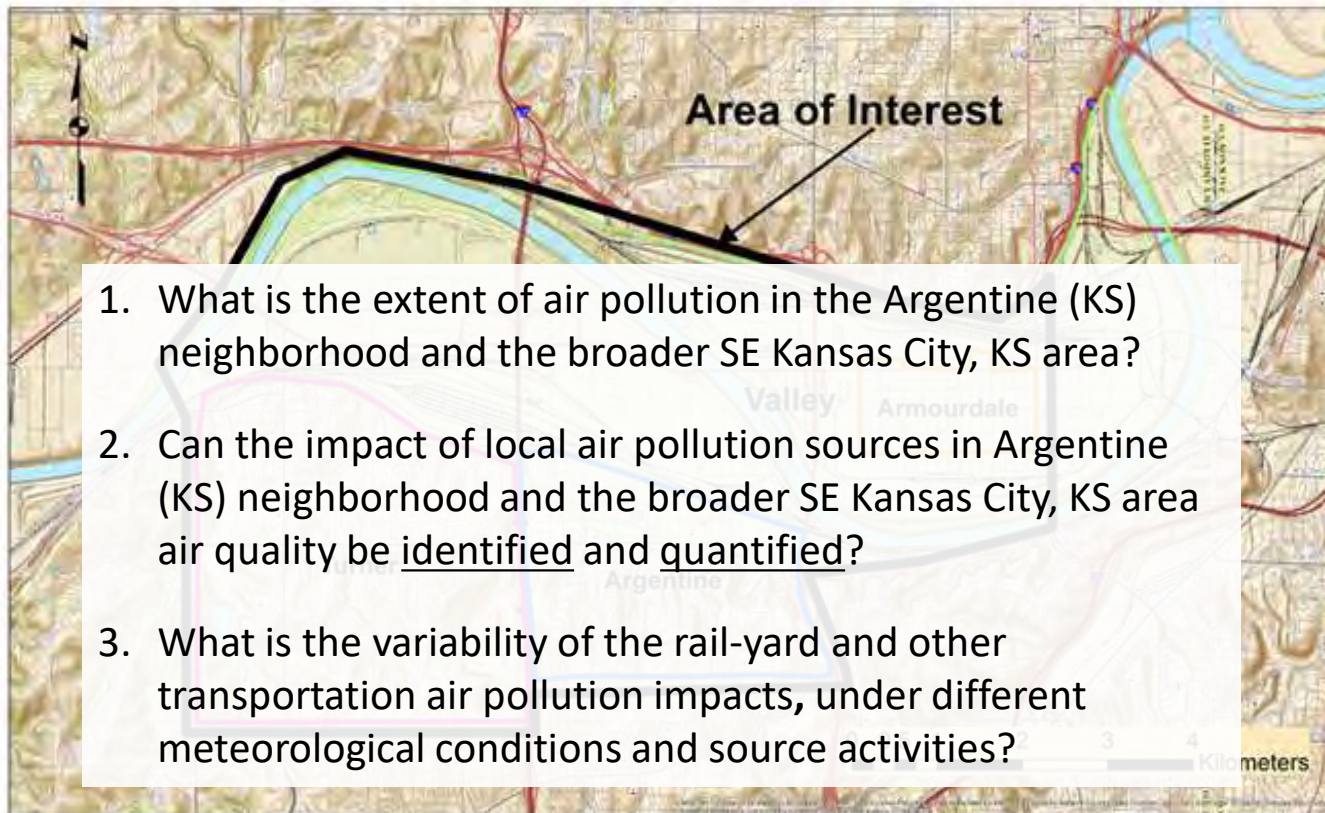
Note: Data results are for research purposes only and not for regulatory purposes.

KC TRAQS RESEARCH PROJECT



Note: Data results are for research purposes only and not for regulatory purposes.

KC TRAQS RESEARCH PROJECT



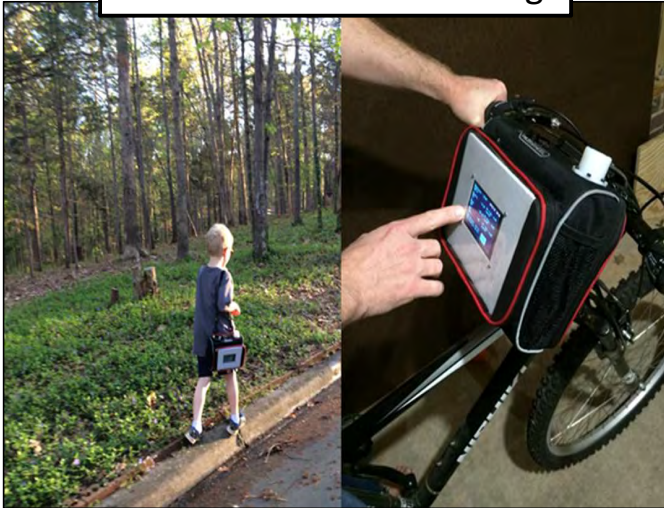
1. What is the extent of air pollution in the Argentine (KS) neighborhood and the broader SE Kansas City, KS area?
2. Can the impact of local air pollution sources in Argentine (KS) neighborhood and the broader SE Kansas City, KS area air quality be identified and quantified?
3. What is the variability of the rail-yard and other transportation air pollution impacts, under different meteorological conditions and source activities?

Note: Data results are for research purposes only and not for regulatory purposes.

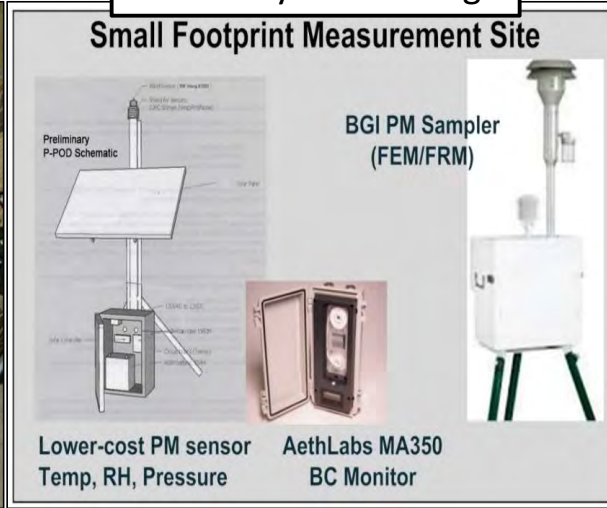
KC TRAQS RESEARCH PROJECT

KC-TRAQS - three monitoring approaches;

Citizen Science Monitoring



Stationary Monitoring

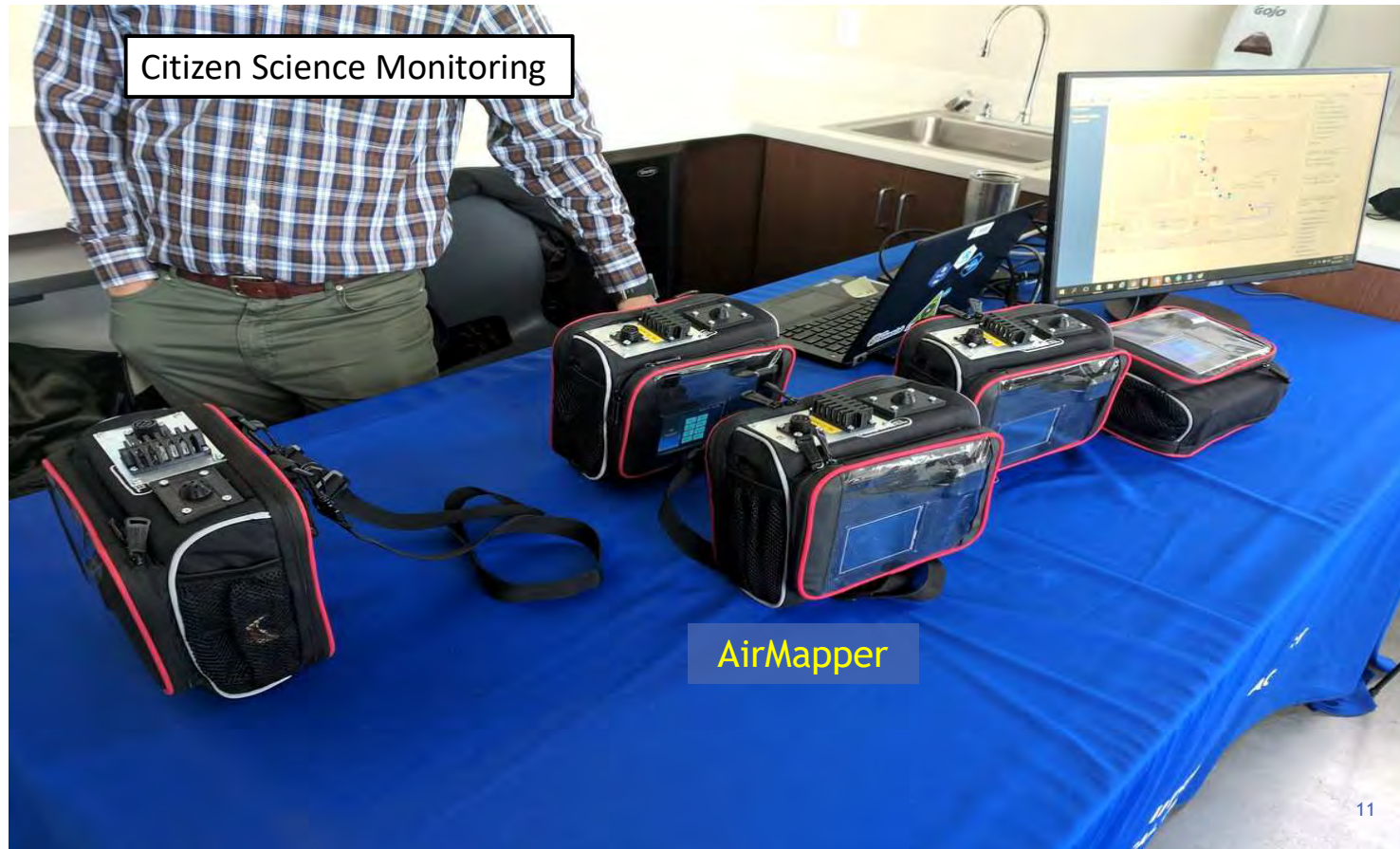


Mobile Monitoring (GMAP Vehicle)



Note: Data results are for research purposes only and not for regulatory purposes.

KC TRAQS RESEARCH PROJECT



KC TRAQS RESEARCH PROJECT

Citizen Science Monitoring



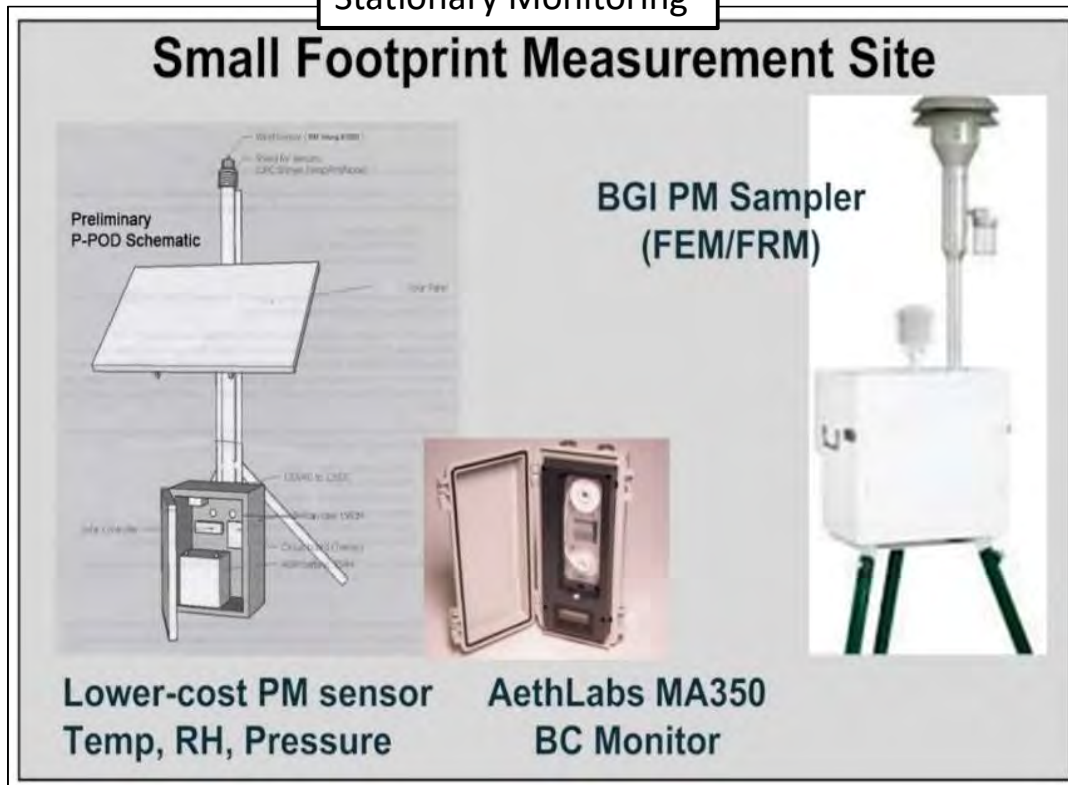
Note: Data results are for research purposes only and not for regulatory purposes.

- **AirMapper monitors record:**
 - PM levels,
 - CO₂,
 - latitude & longitude
 - date & time
 - noise level
 - temperature and humidity

- **AirMapper Deployment**
 - Scheduled type
 - teachers/instructors
 - community groups
 - Nonscheduled type
 - library check-out

KC TRAQS RESEARCH PROJECT

Stationary Monitoring



- **P-POD** - (solar)
 - PM2.5 Sensor (low cost)
 - Meteorological Data
- **Black Carbon**
- **BGI PM Sampler** - (solar)
 - Teflon filter or quartz filter (1-3 day sampling)
 - Meteorological Data
- **E-BAM** - (not shown)
 - Continuous PM2.5 Sensor
 - Meteorological Data

Note: Data results are for research purposes only and not for regulatory purposes.

KC TRAQS RESEARCH PROJECT



KC TRAQS RESEARCH PROJECT

Geospatial Measurement of Air Pollution (GMAP) Vehicle

Mobile Monitoring



GMAP Vehicle

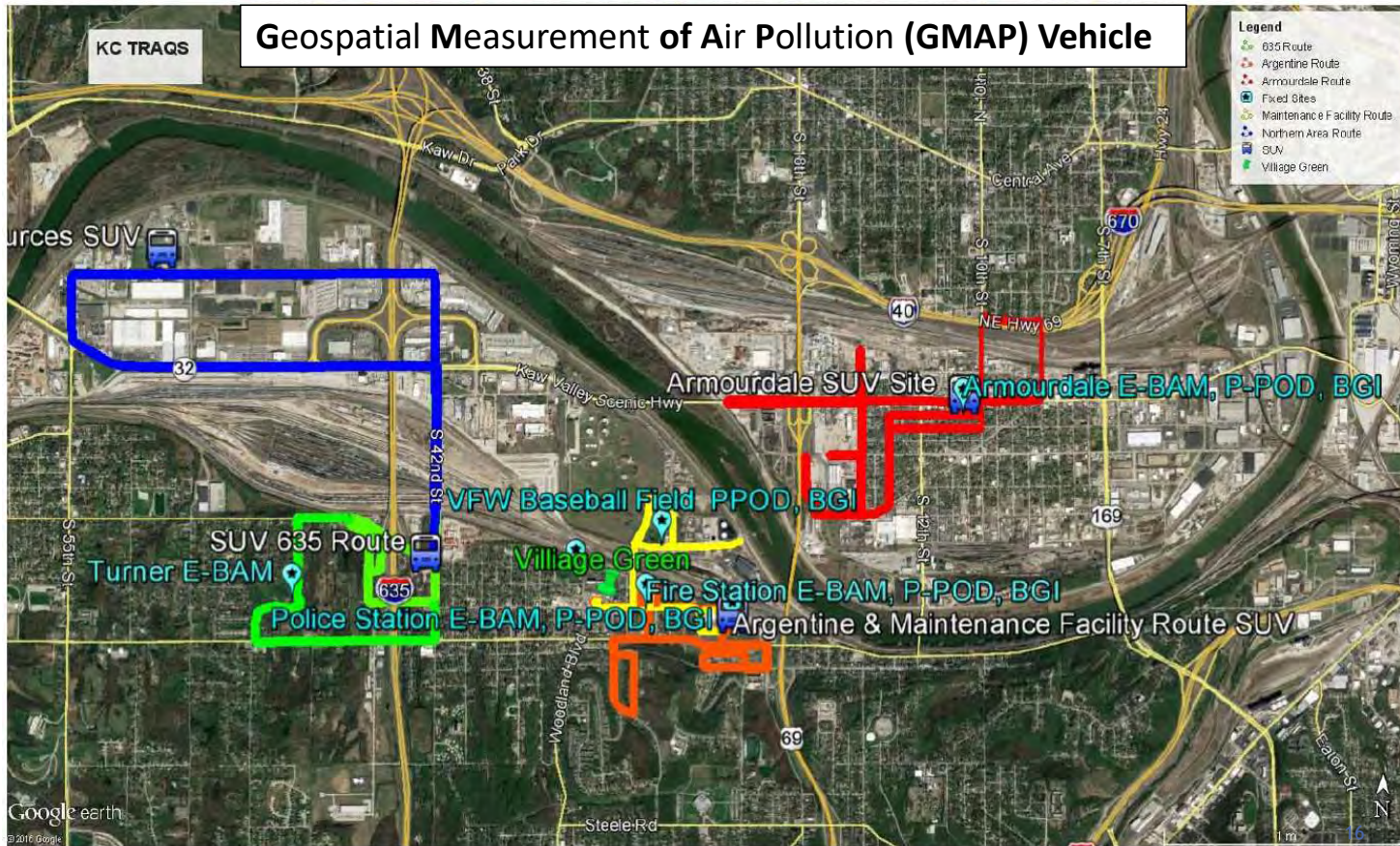


GMAP Vehicle

- All -electric
- Measures real-time
- On-board GPS
- Measures: BC, NO₂, PM, CO, CO₂

Note: Data results are for research purposes only and not for regulatory purposes.

KC TRAQS RESEARCH PROJECT



Note: Data results are for research purposes only and not for regulatory purposes.



Commissioner Angela Markley speaks at the open house event from a community perspective.



EPA's Stephen Krabbe explains the AirMapper to local students.



Students view the outdoor display beside the fixed monitoring fence and discuss the monitoring components.



Students visit the fixed site monitor and discuss the measurement types.

Questions?

Steven Cody Brown
Physical Scientist
USEPA Region 7
913-551-7718
brown.steven@epa.gov

Stephen Krabbe
Physical Scientist
USEPA Region 7
913-551-7991
krabbe.stephen@epa.gov

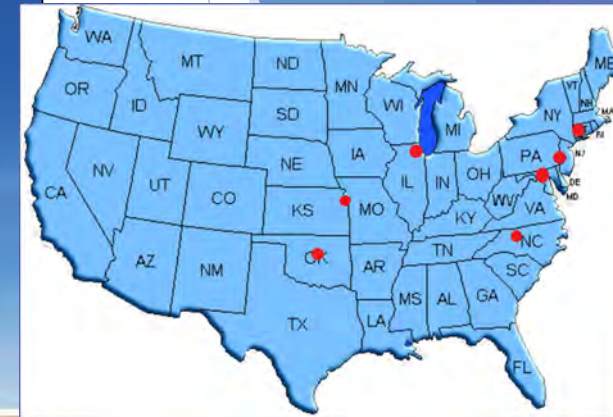
Village Green Bench

Located outside the Kansas City, KS South Branch Library

- Established Spring of 2015
- Engage communities in air pollution awareness
- Increase air pollution monitoring coverage
- Advance EPA's ability to measure and communicate air pollution information in real-time at lower cost and maintenance.

This is a research and educational air monitoring system with low cost instruments and the measurements should not be compared directly official air quality standards.

Argentine Neighborhood



Similar Studies

Rail Yard Studies

1. Atlanta
2. Chicago

Evaluation of local-scale air pollution trends using **stationary** and **mobile** monitoring.

Result:

While the study found variations in local air pollution levels downwind of the railyard area, the total concentration levels measured during the study are not significantly different from those of other major urban areas in the United States.

