



**Department of  
Environmental  
Conservation**

# **Portable Monitoring in the Albany South End Neighborhood Air Quality Initiative**

**NEDC Ports Workgroup Call  
January 15, 2020**

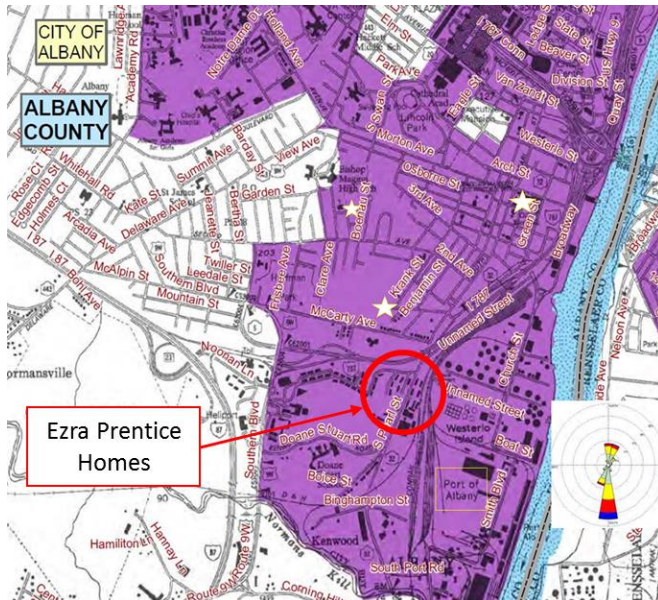
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# Outline

- **Study Background**
- **Findings**
- **Mitigation Approaches**

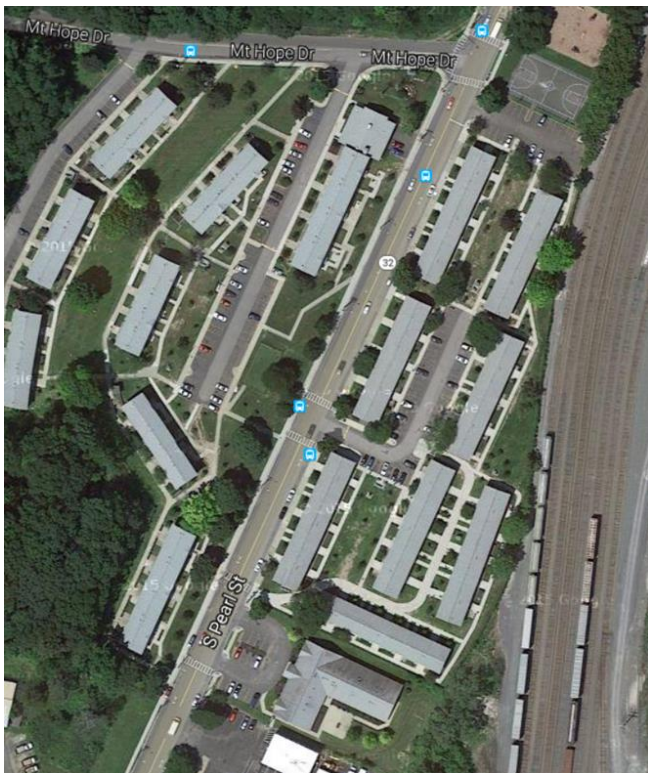


# Albany South End Potential Environmental Justice Area (PEJA or EJ)



- **NYS PEJA**
  - 51.1% minority (urban) or
  - 33.8% minority (rural) or
  - 23.59% household incomes below federal poverty level

# Ezra Prentice Homes



- **Community concerns:**
  - **Rail lines**
  - **Mobile Sources**
    - **~ 1,000 trucks/day**
  - **Port of Albany**

## Study details: Summer 2017 – Fall 2018

- 3 Fixed monitors (70,000 hours)
  - PM2.5, PM10, NO2, VOCs, carbonyls
  - Ultrafine particles and black carbon
  - Overall picture (temporally and spatially)



- Portable monitors
  - Ultrafine particles and black carbon
  - Backpacks: 260 hours, 780 miles
  - Mini-stations: 6,480 hours and 8,570 vehicle photos
  - Zoom in from fixed monitors



- Over 100 benzene sample locations
- NYSDOT traffic counter (4,400 hours)

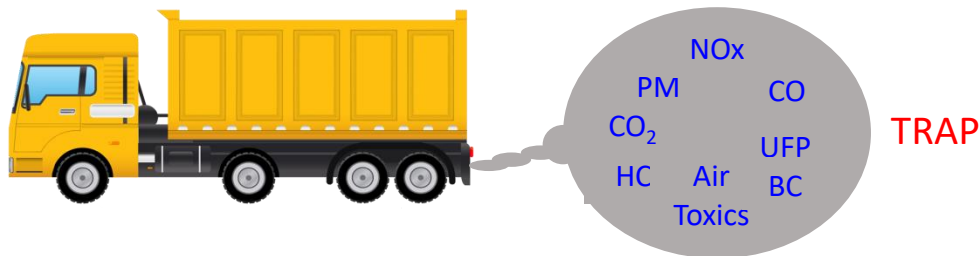
# Study objectives

What are the main sources of air pollution in South Albany?

- 1. How much particulate matter comes from motor vehicles versus Port activities?**
- 2. How far does particulate matter travel from the road into the neighborhood?**
3. How much benzene comes from sources in the Port versus vehicles on local roadways?
4. What approaches can we take to help the community understand air quality?



# Traffic-Related Air Pollution (TRAP)

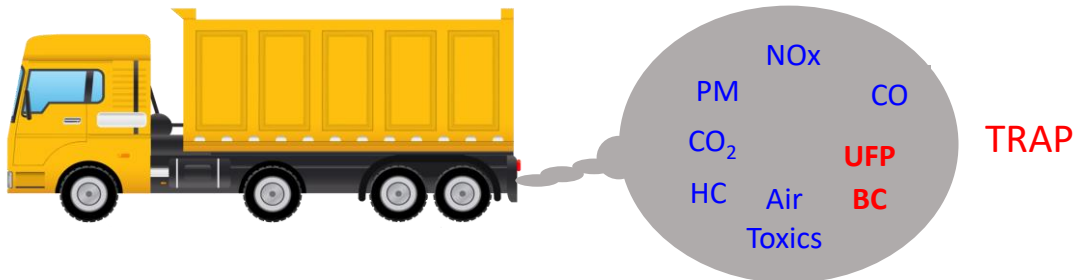


- **Exposure to TRAP has health effects**
  - Worsens asthma & may cause onset
  - Other respiratory effects
  - Preterm birth
  - Cardiovascular effects
  - Possible neurological effects
  - Diesel exhaust defined as carcinogen by WHO
  - Higher risk for sensitive or vulnerable populations
- **Cannot definitively tie these effects to individual components of TRAP or to specific levels**
- **Reduce exposure to TRAP, reduce health effects**

NO<sub>x</sub> (nitrogen oxides), PM (particulate matter), CO (carbon monoxide), CO<sub>2</sub> (carbon dioxide), HC (hydrocarbons), Air toxics (such as benzene and formaldehyde)



# Traffic-Related Air Pollution (TRAP)



There is – unfortunately – no sensor for TRAP, so ...

We are looking at

- Ultrafine particles (**UFP**)
- Black carbon (**BC**)

as **indicators** of local diesel vehicle emissions



NO<sub>x</sub> (nitrogen oxides), PM (particulate matter), CO (carbon monoxide), CO<sub>2</sub> (carbon dioxide), HC (hydrocarbons), Air toxics (such as benzene and formaldehyde)

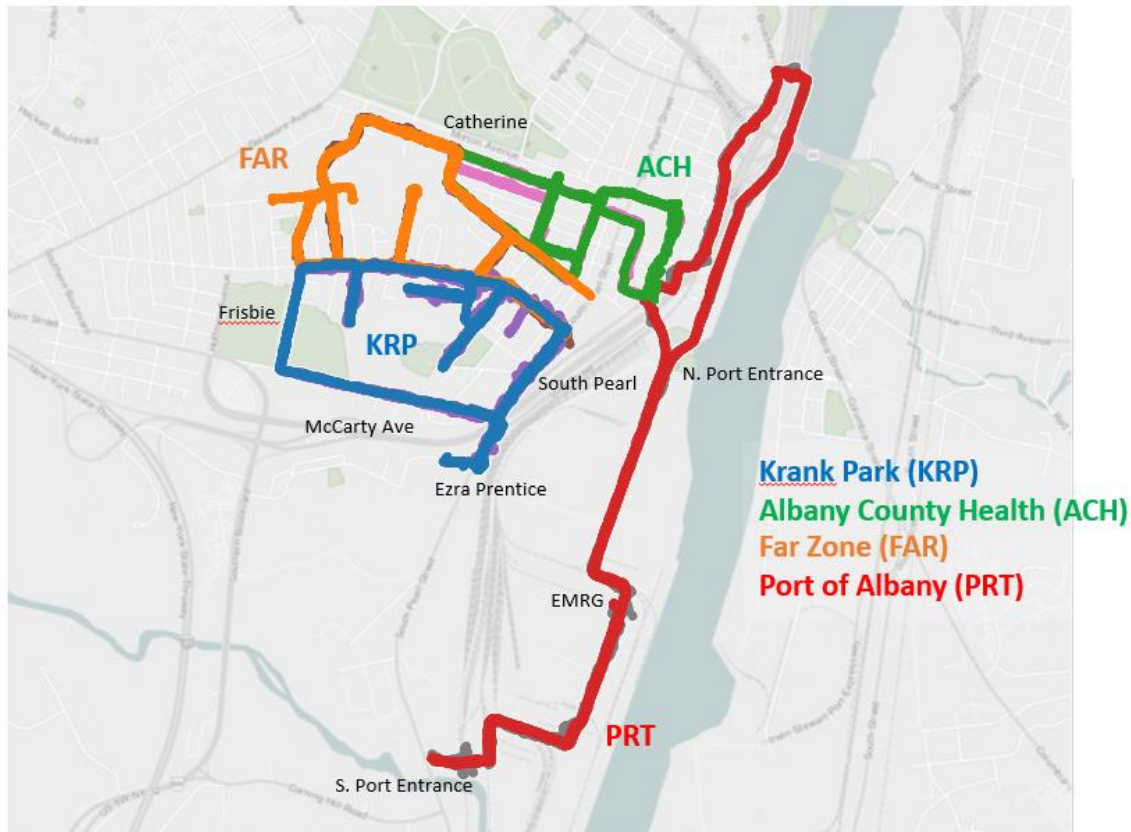


# Backpacks

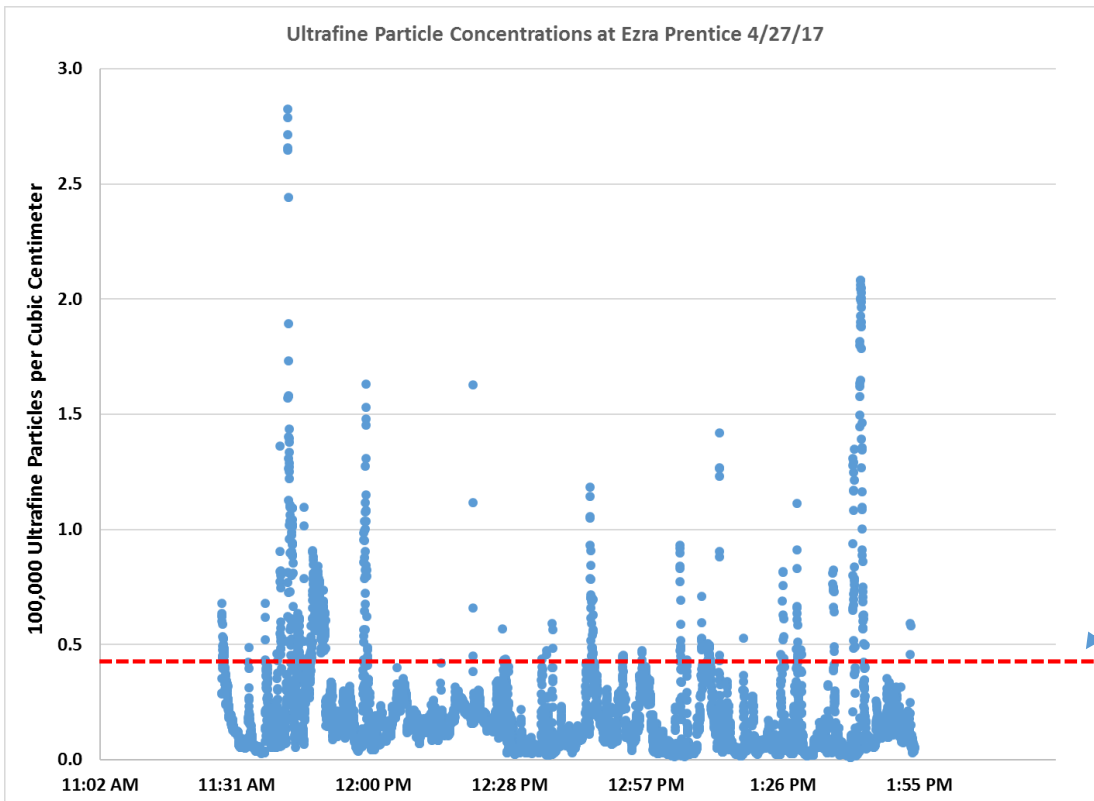


- **Equipped with GPS**
- **Create a map of pollutant concentrations**
- **Measure personal exposure**

# Initial Survey Area

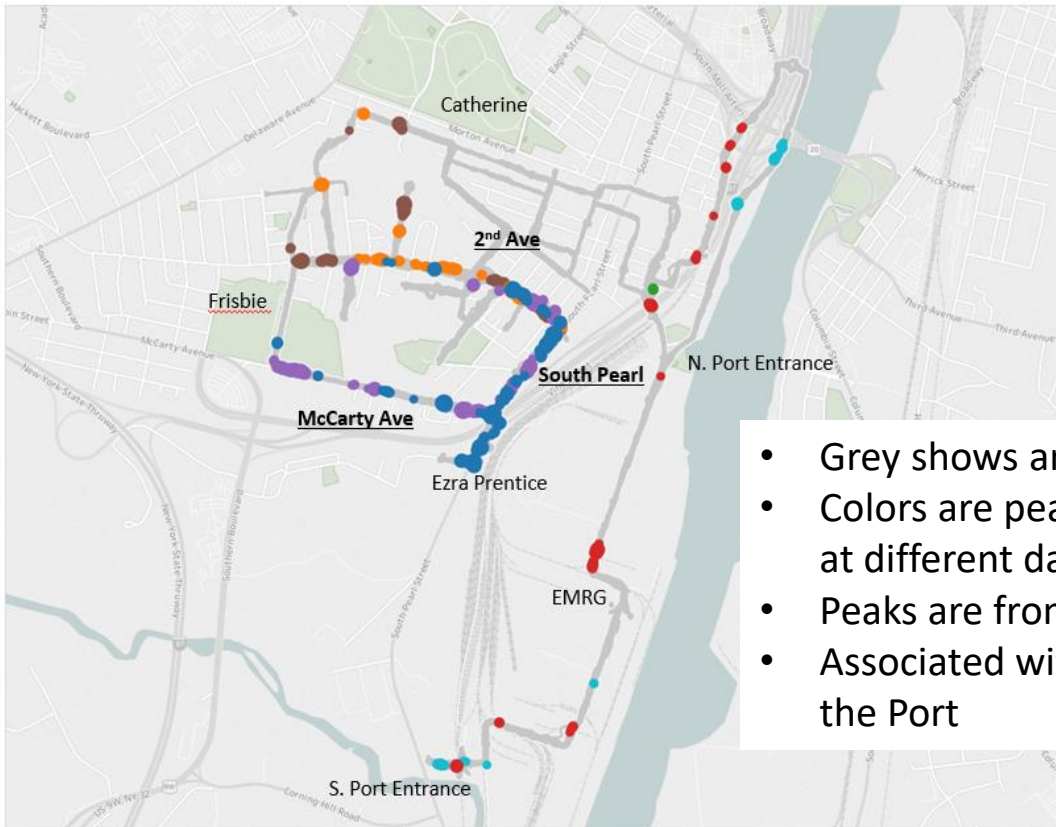


# UFP Data is characterized by frequent outlier peaks



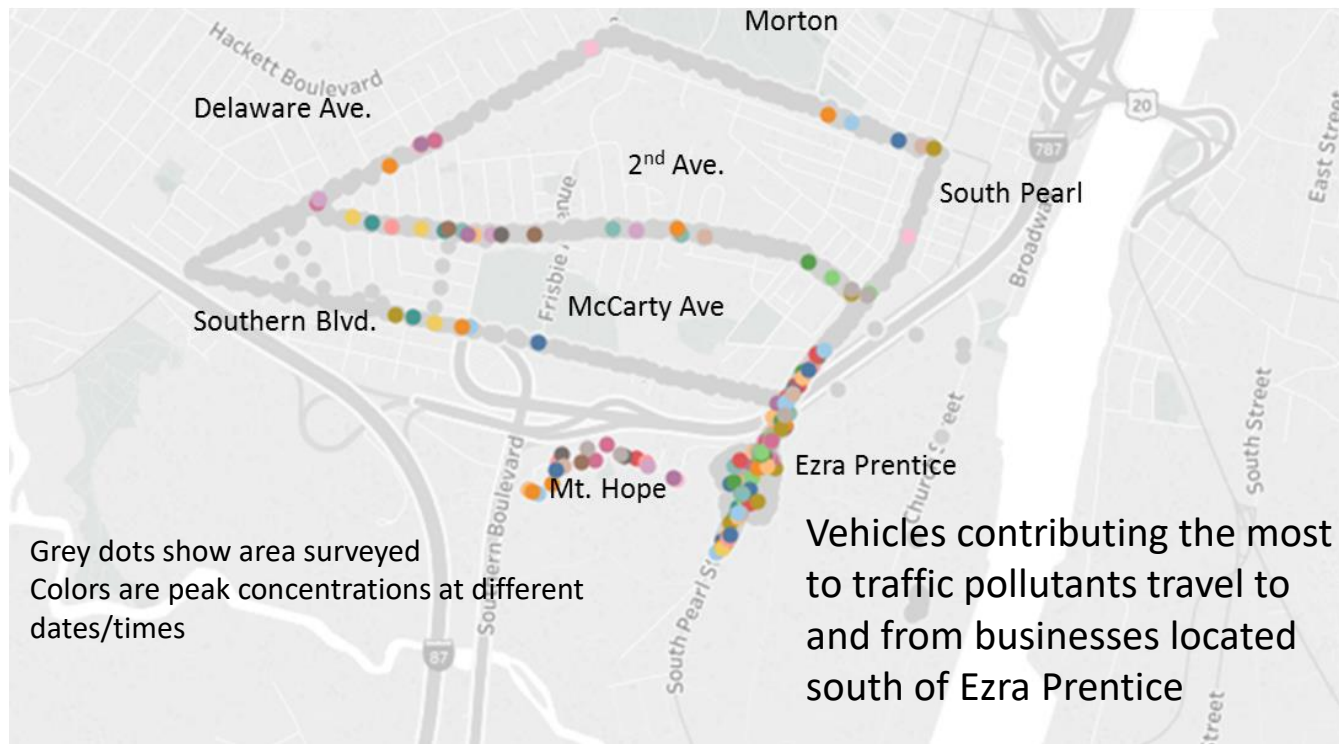
Concentrations above this line are outliers; statistically separate from those below.

# Initial Survey Results



- Grey shows area surveyed
- Colors are peak concentrations at different dates/times
- Peaks are from mobile sources
- Associated with local traffic, not the Port

# Traffic pollutants relatively uniform throughout the South End, except for Ezra Prentice



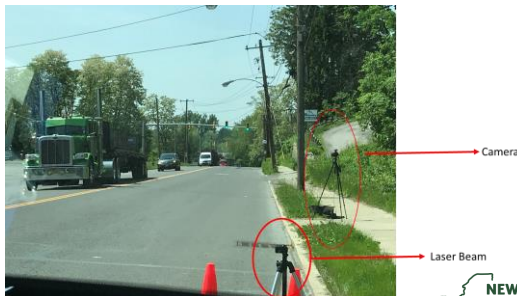
- Grey dots show area surveyed
- Colors are peak concentrations at different dates/times

Vehicles contributing the most to traffic pollutants travel to and from businesses located south of Ezra Prentice

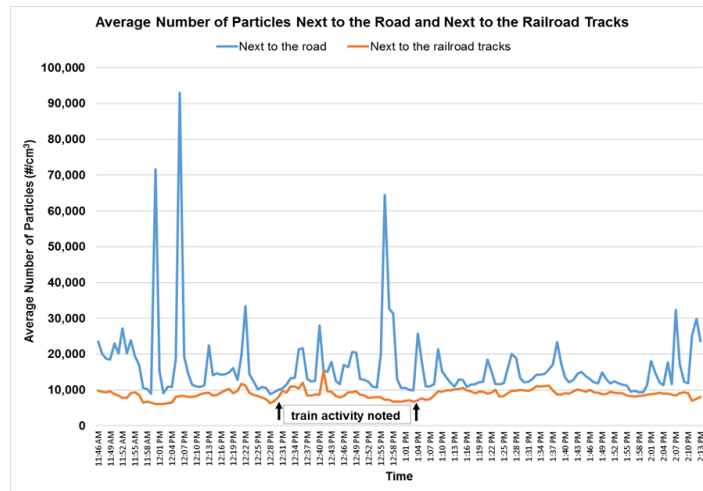
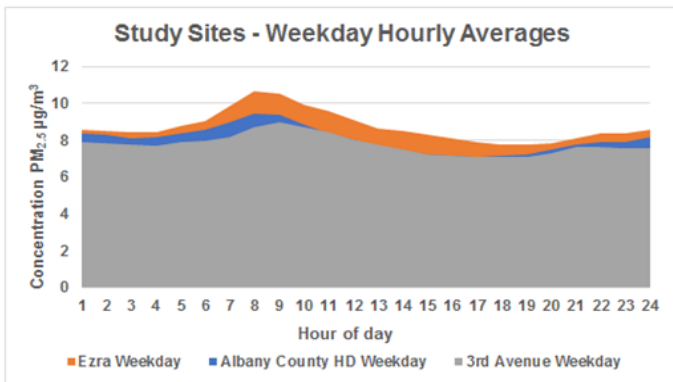
# Mini-Stations



- Multiple portable stations in fixed locations
- 5 hour run time
- Met at all locations
- Multiple instruments
- Measure personal exposure
- Cameras triggered by laser-photodiode system

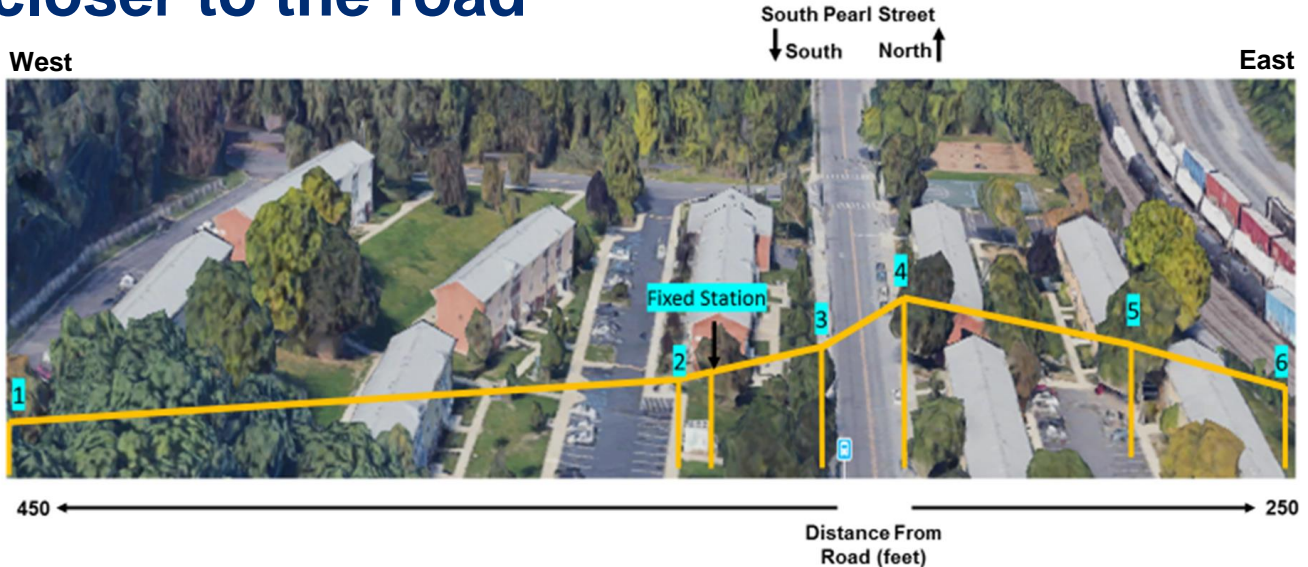


# Far more particulate matter is coming from local traffic than Port activities



- Emissions from locomotives and port shipping transport are minimal in comparison to local traffic
- Study then transitioned to focus on local traffic pollutants

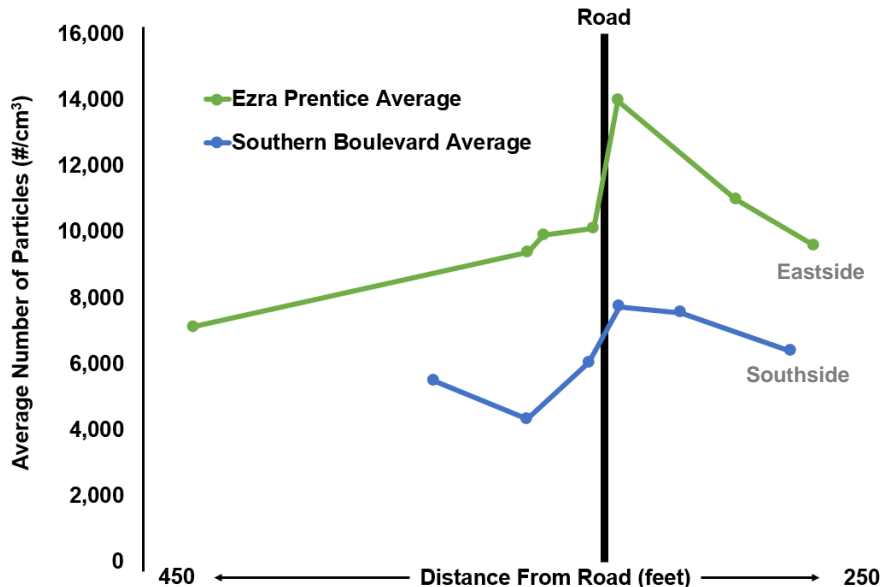
# Traffic pollutants are higher on the east side, closer to the road



- Traffic pollutant concentrations in the rest of the complex are relatively similar
- Traffic pollutant concentrations drop to background at around 250 feet from the road



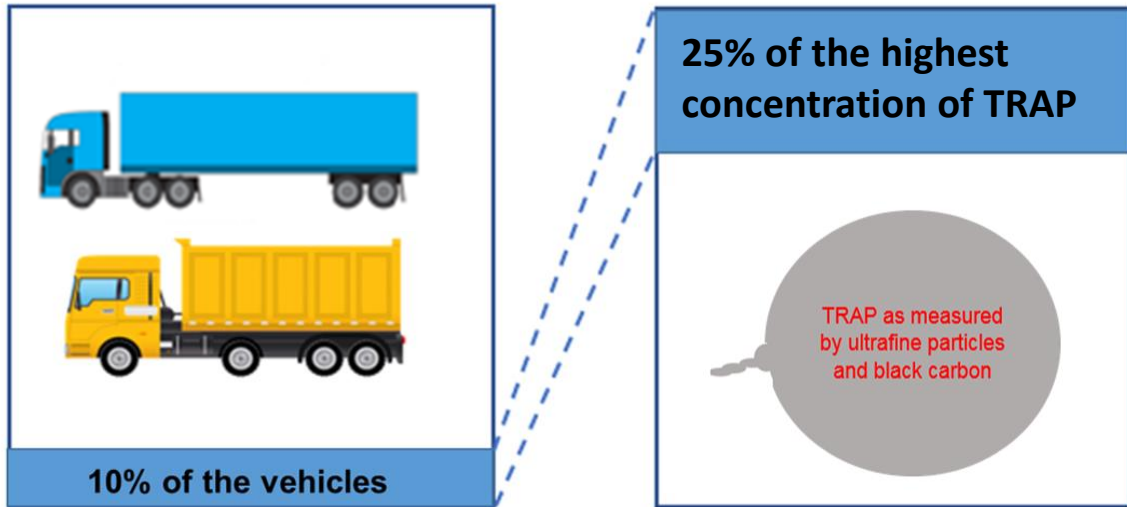
# Traffic pollutants at Ezra Prentice are twice as high as Southern Blvd



Ezra Prentice community is disproportionately impacted by traffic pollutants

- Total traffic volume at Ezra Prentice and Southern Boulevard are very similar
- Ezra Prentice has 6 times the truck volume

## HEVs are about 10% of total traffic, however responsible for the highest 25% of the total TRAP



- Reducing peak concentrations from HEVs would have the greatest benefit.

# Actions Underway to reduce Community Exposure to TRAP

- Vehicle Replacement
  - DEC and DOT are making funds available for replacement of trucks and buses statewide.
  - DEC is working with identified truck fleets to evaluate ways fleets can reduce emissions.
- Vehicle Re-routing
  - DOT has reclassified four roads within the Port to allow trucks to shift their current routes away from Ezra Prentice.
  - Albany coordinated the voluntary rerouting of truck traffic by commercial entities and City vehicles.
- Albany Housing Authority is taking steps to minimize residents' indoor exposure to TRAP.
- DEC, Mayor's Office and Housing Authority will lead workgroup efforts to develop additional mitigation strategies.



# General lessons for TRAP mitigation

- Objective is to reduce exposure
- There is no “magic bullet” single solution
- Incremental solutions on multiple fronts
- Air quality studies can help direct efforts appropriately
- Coordinated efforts by multiple stakeholders

# Acknowledgements

## Mobile Sources

Temple Bailey  
David Barnes  
Brian Frank  
Tom Giorgio  
Gil LaDuke  
Shida Tang  
Marilyn Wurth

## Air Quality Surveillance

Amanda Carpenter  
Mike Costello  
Fitzgerald Drummond  
Dirk Felton  
Kris Fitzpatrick  
Peter Furdyna  
George Hayner  
Matthew Hirsch  
Enrique Lopez  
Jackie Perry  
Oliver Rattigan  
Paul Sierzenga  
Erica Shipley  
Meaghan Valis  
Mike Walsh

## Air Quality Analysis & Research

John Kent  
Randi Walker

## Stationary Sources

Mark Lanzafame

## Communication Services

Andrew Breedlove  
Joan Kennedy  
Jomo Miller  
Robin Kuiper

## Div. of Law Enforcement

Luke Billotto  
Lieutenant Bobseine

## Air Resources Staff Volunteers

Marie Barnes  
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## Air Resources Interns

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## NY Leaders Internship Program

Alan Eapen  
Zoe Hutchins  
Michala Seibert  
Elizabeth Zeccola

## Environmental Justice

Lisa King DeJesus  
Rosa Mendez

## Student Volunteers

Julia Felton  
Olivia Sheppard



# Thank You

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# Resources

Study website, final report, and factsheets:  
<https://on.ny.gov/southendstudy>

Study press conference announcement:  
<https://www.youtube.com/watch?v=BAPxBa9FRGg&spfreload=5>

Our team at work with portable monitors:  
<https://www.youtube.com/watch?v=7v0lijpDeE4&spfreload=5>

