Local air pollution insights for local planning decisions: Oakland, CA

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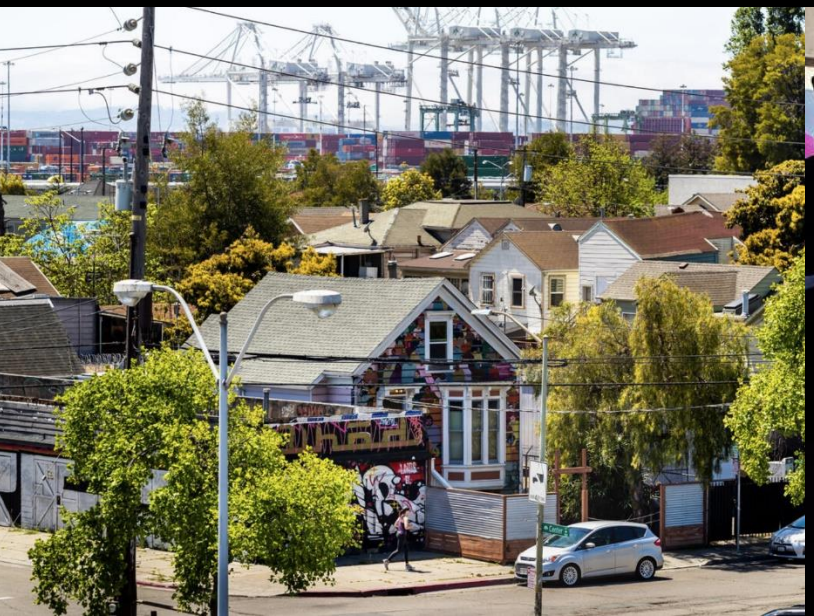
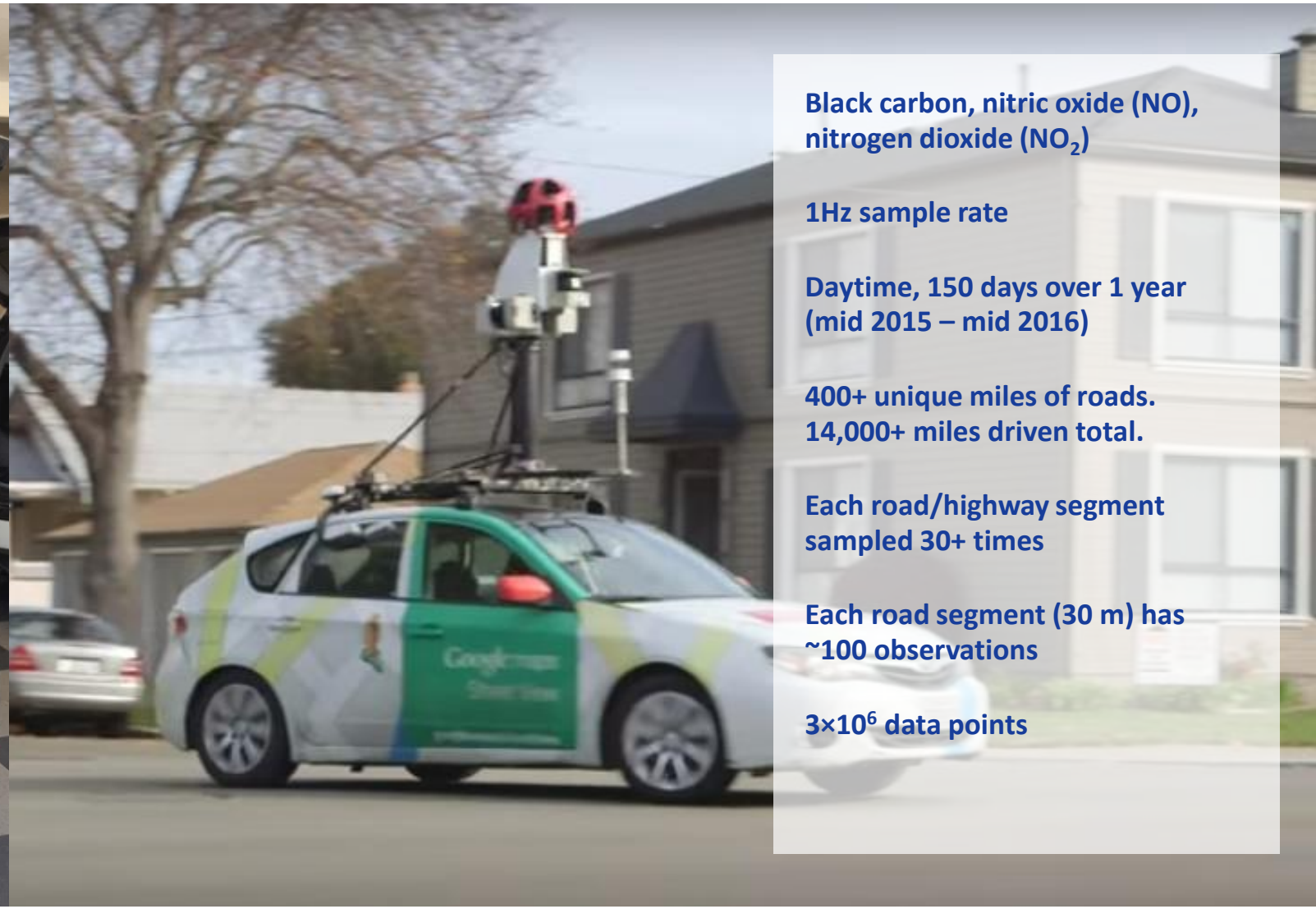
Environmental Defense Fund

WEST OAKLAND, CA



High resolution air pollution mapping with Google Street View cars



Black carbon, nitric oxide (NO), nitrogen dioxide (NO_2)

1Hz sample rate

Daytime, 150 days over 1 year (mid 2015 – mid 2016)

400+ unique miles of roads. 14,000+ miles driven total.

Each road/highway segment sampled 30+ times

Each road segment (30 m) has ~100 observations

3×10^6 data points

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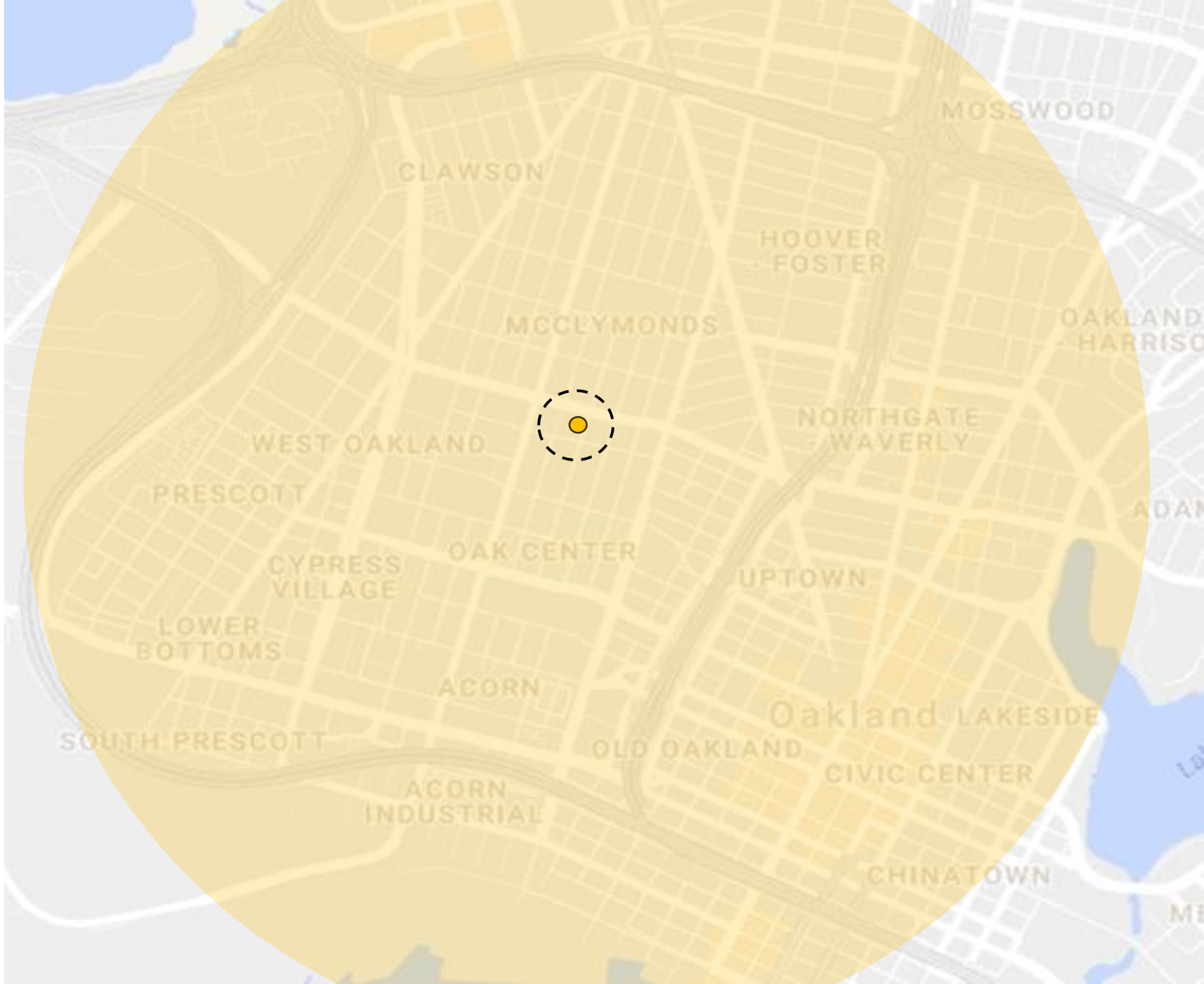
West Oakland Environmental Indicators Project
know which way the wind blows

Google Earth Outreach

TEXAS
The University of Texas at Austin

aclima

1 regulatory air pollution monitoring site in WO

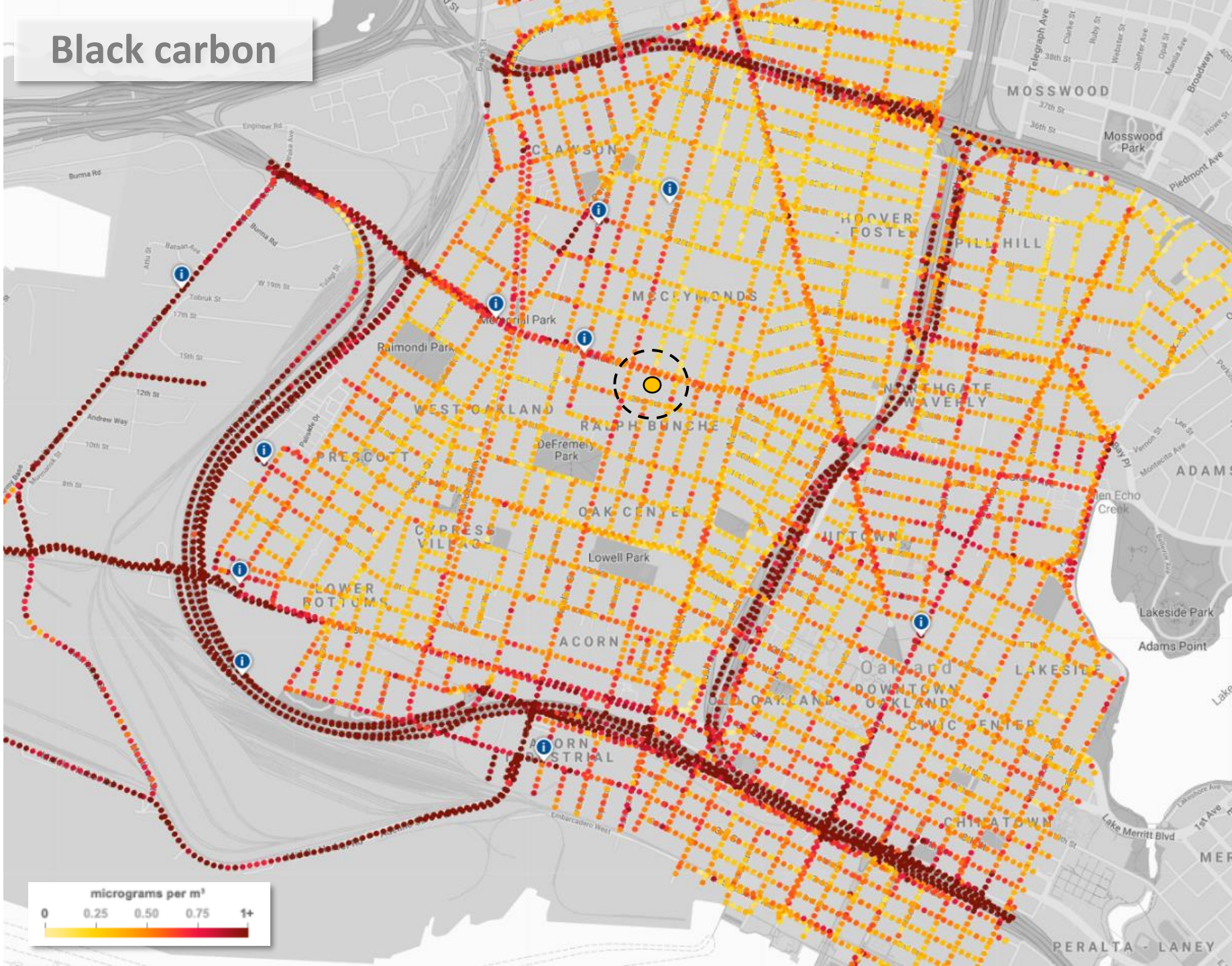


Mobile monitoring measurements every 30 meters

Levels vary by a factor of >8 times within West Oakland.

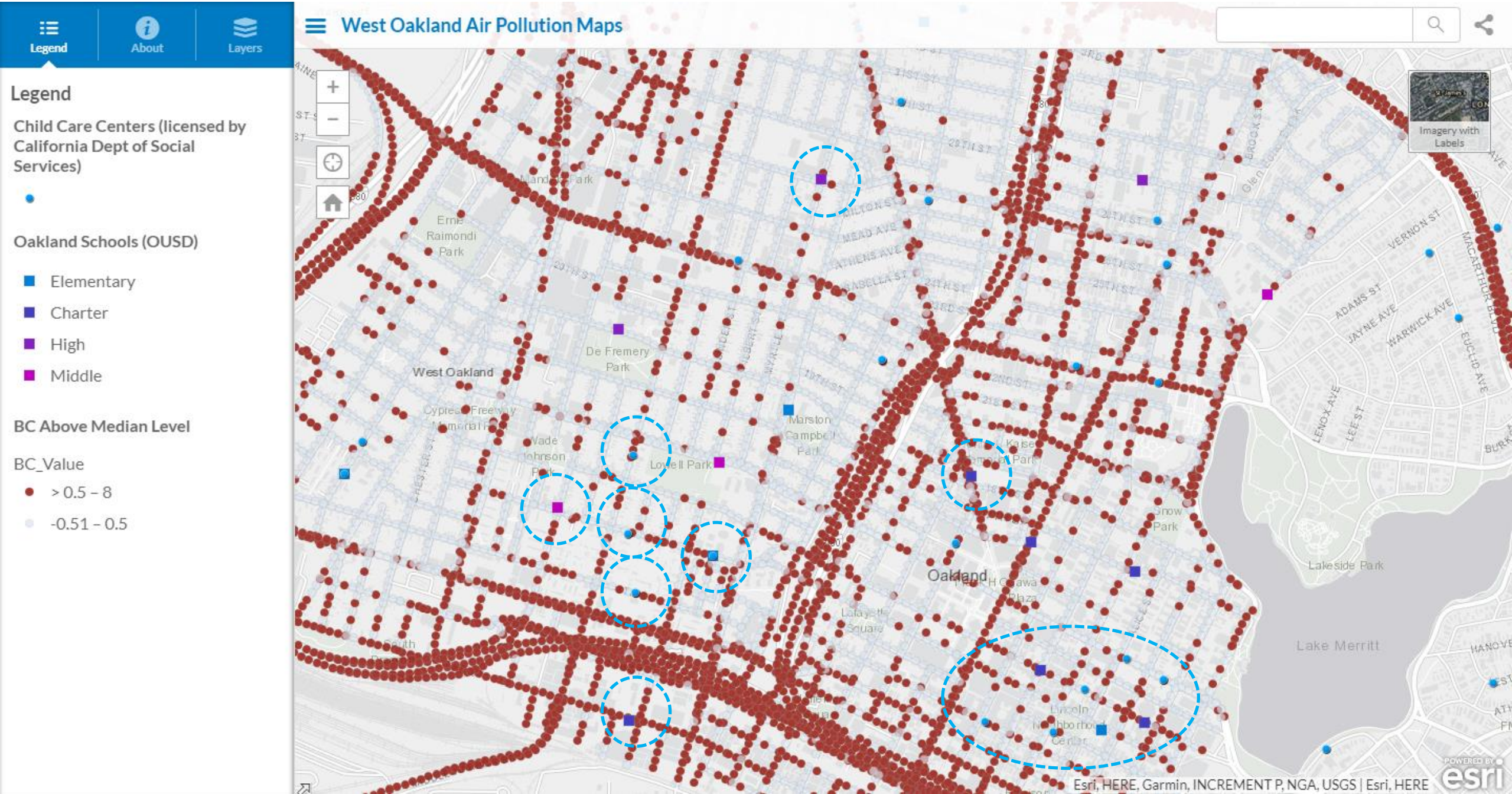
In some areas, levels vary by a factor of >5 times within a single city block.

Many places higher than levels measured at BAAQMD central site.



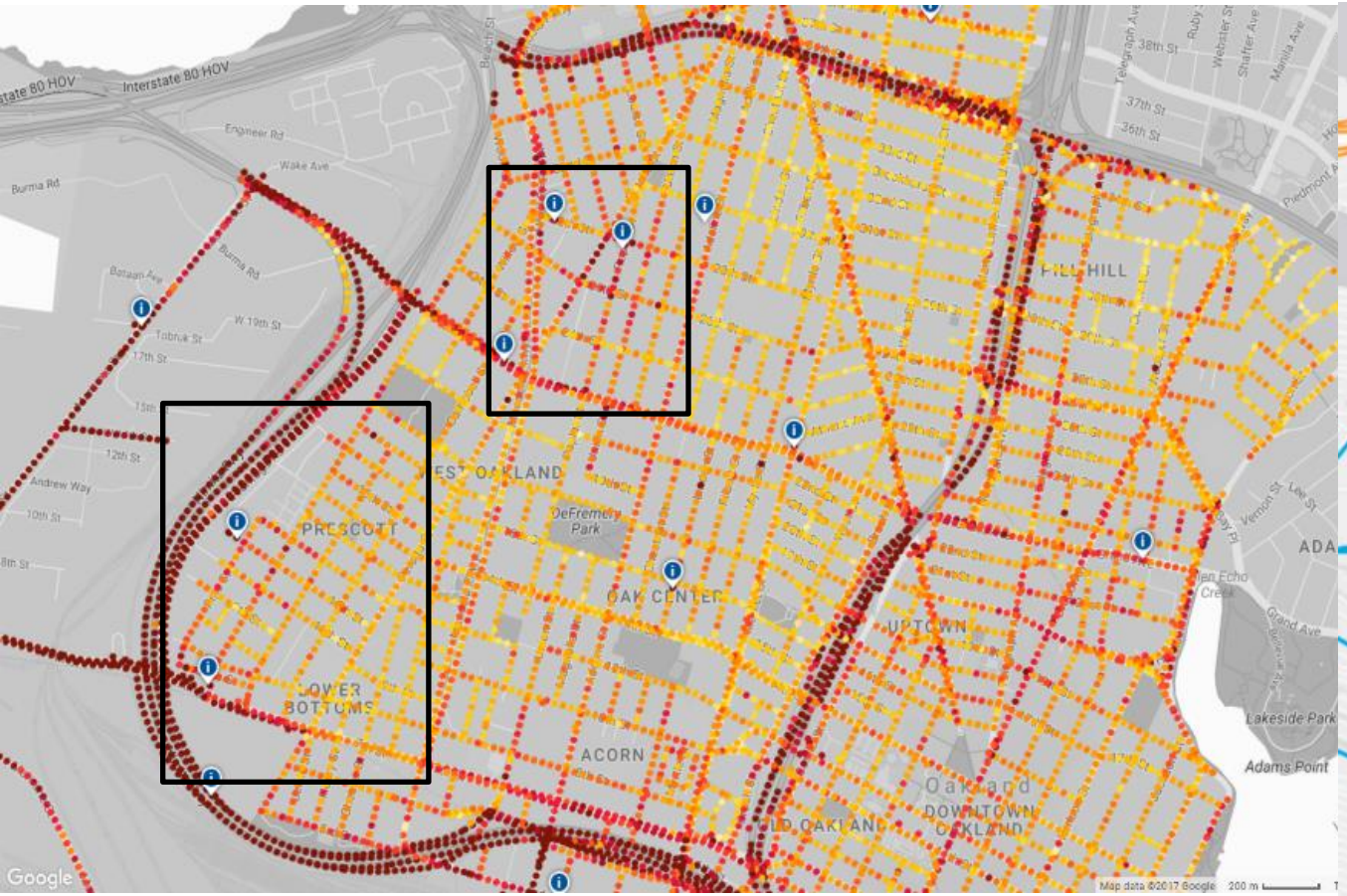
Confirmed multiple hotspots of elevated air pollution

High exposure near schools and childcare facilities

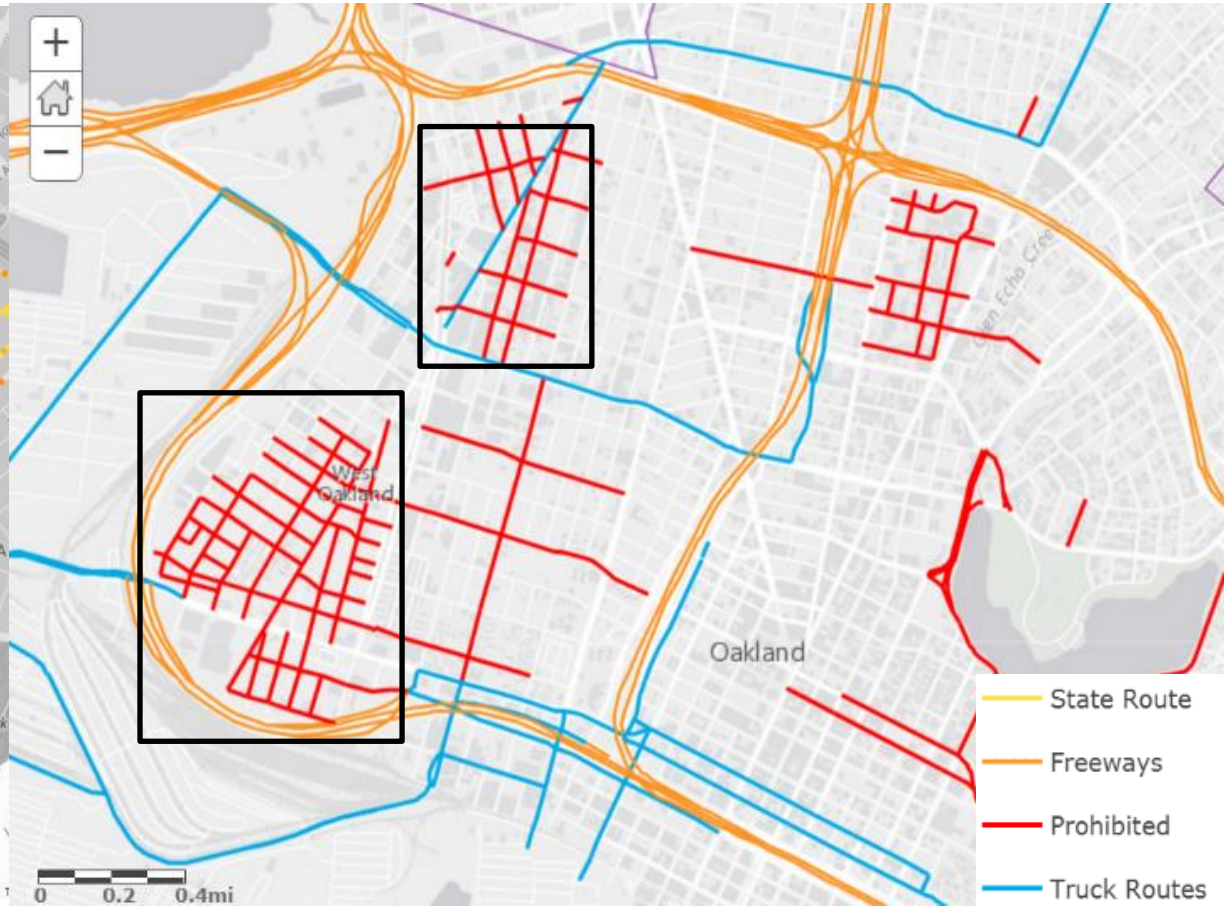


Elevated air pollution on truck-prohibited routes

EDF Black Carbon Map

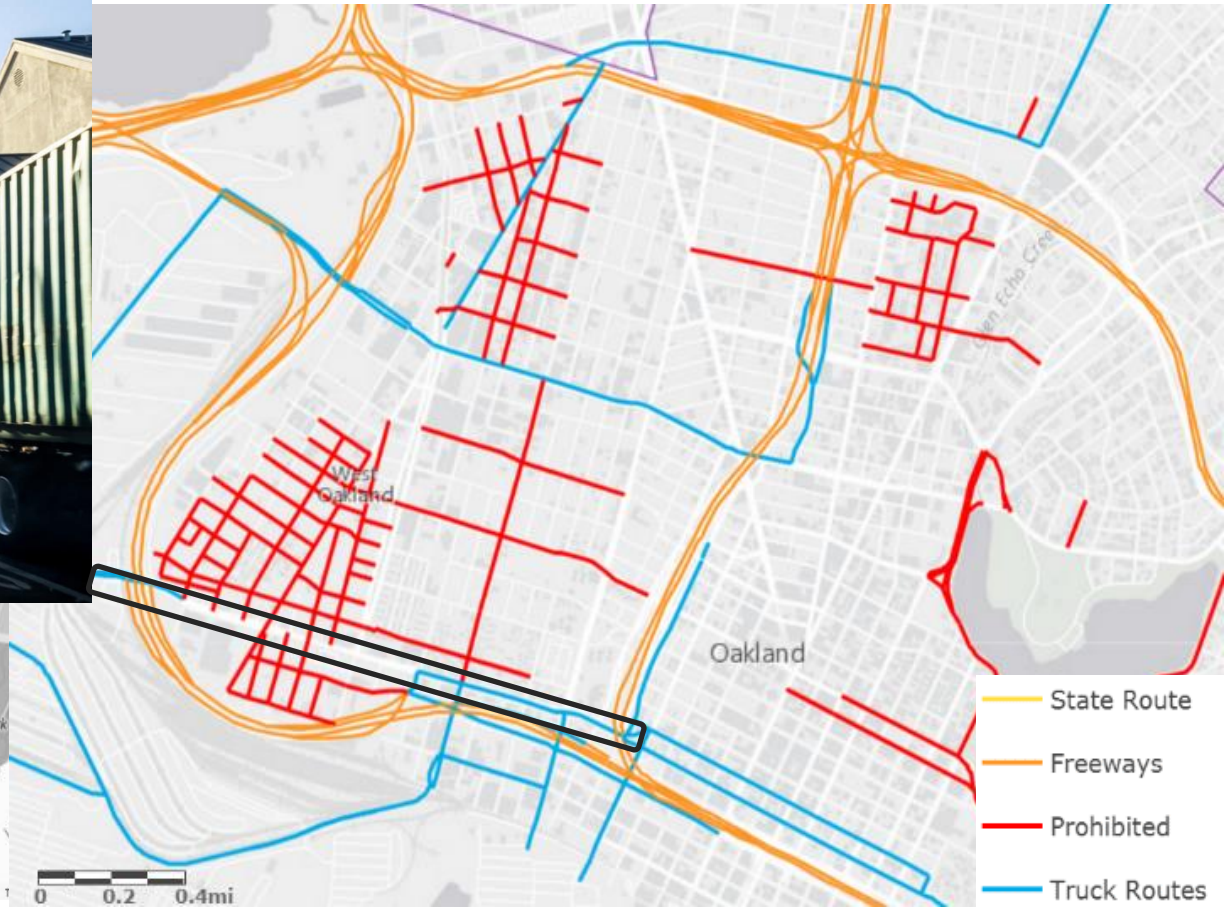


Oakland Truck Routes and Truck Prohibited Streets

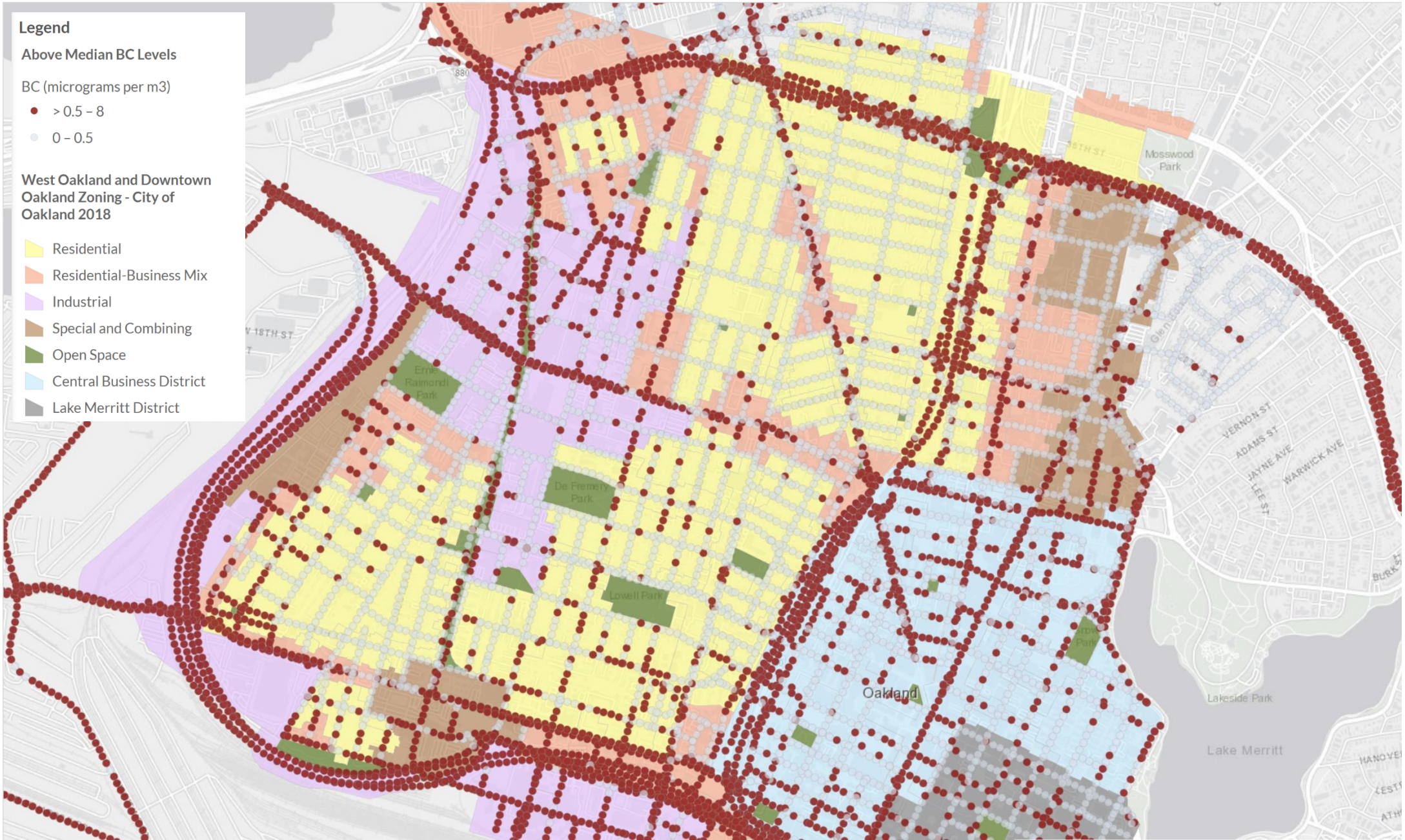


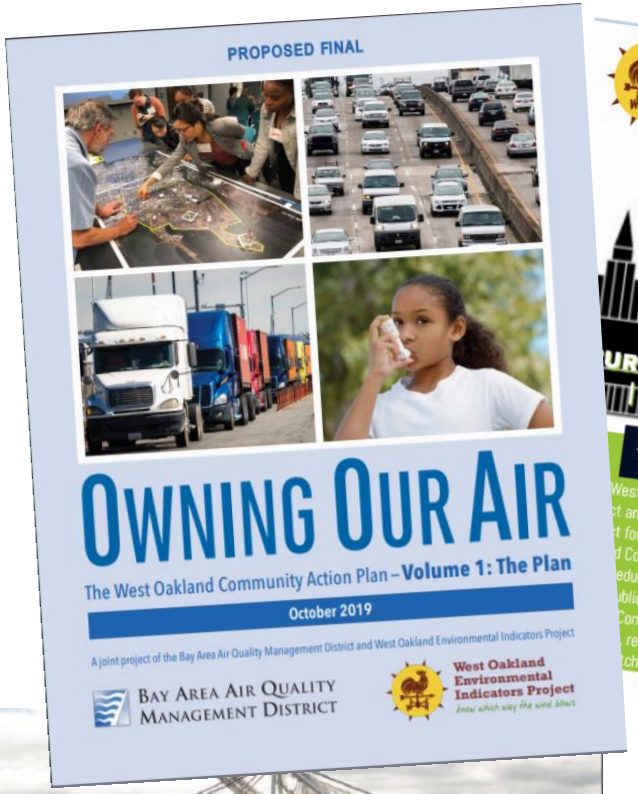
Air pollution high on prohibited truck routes

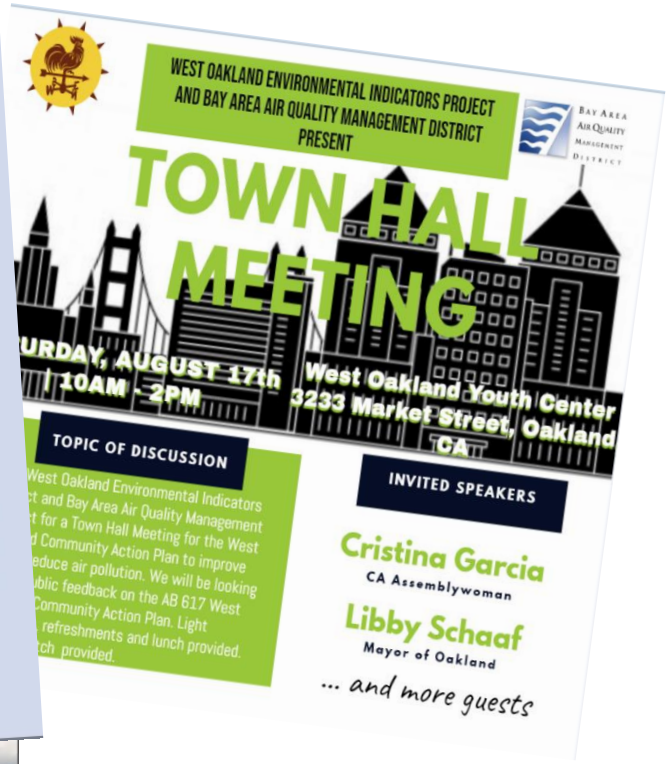
Oakland Truck Routes and Truck Prohibited Streets



Elevated air pollution in buffer and residential zones




PROPOSED FINAL
OWNING OUR AIR
The West Oakland Community Action Plan – Volume 1: The Plan
October 2019
A joint project of the Bay Area Air Quality Management District and West Oakland Environmental Indicators Project
Bay Area Air Quality Management District
West Oakland Environmental Indicators Project


WEST OAKLAND ENVIRONMENTAL INDICATORS PROJECT AND BAY AREA AIR QUALITY MANAGEMENT DISTRICT PRESENT
TOWN HALL MEETING
URDAY, AUGUST 17th
10AM - 2PM
West Oakland Youth Center
3233 Market Street, Oakland CA
TOPIC OF DISCUSSION
West Oakland Environmental Indicators
t and Bay Area Air Quality Management
t for a Town Hall Meeting for the West
d Community Action Plan to improve
educe air pollution. We will be looking
ublic feedback on the AB 617 West
Community Action Plan. Light
refreshments and lunch provided.
ch provided.
INVITED SPEAKERS
Cristina Garcia
CA Assemblywoman
Libby Schaaf
Mayor of Oakland
... and more guests

Revised Draft
Seaport Air Quality
2020 and Beyond Plan
June 29, 2018
PORT OF OAKLAND

Policy responses

Planning and Building Codes:

- ❑ Relocate industrial facilities to outside the community and redevelop former sites for new business and light industrial uses that align with green economy. This requires the City to identify locations outside of West Oakland for these businesses, while ensuring that any relocated businesses do not cause harm at the new location.
- ❑ Enact new rules or policies to accelerate the relocation of businesses in West Oakland that do not conform with the current zoning designations. This may entail sunsetting land use permits for these facilities and/or providing incentives and subsidies to relocate businesses away from West Oakland.
- ❑ Update Performance Standards (Particulate Matter & Air Contaminants)
- ❑ Shorten termination timeframe for conditional use permits and non-conforming uses
- ❑ Increase buffer requirements between commercial/industrial and residential uses
- ❑ Require current and proposed businesses to disclose truck visits per day and air pollution permits
- ❑ Revise land use codes to prohibit new truck-attracting or truck-serving businesses in West Oakland.
- ❑ Revise zoning to allow electric truck parking under freeways

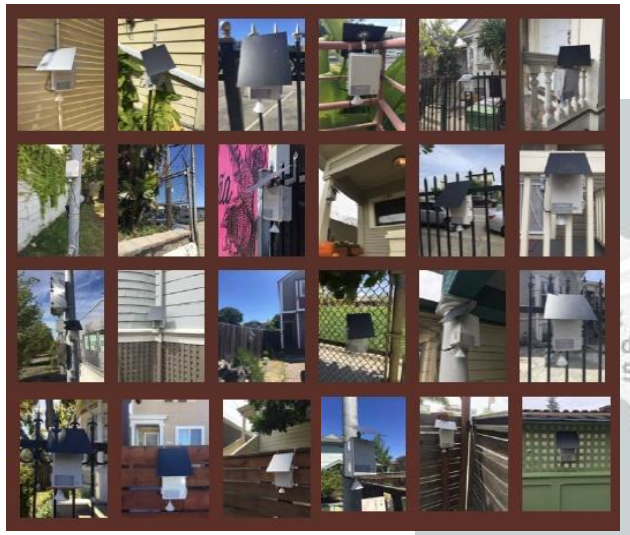
Urban Design Policies:

- ❑ Create a comprehensive, area-wide urban canopy and vegetation plan that identifies locations where trees can be added and maintained, such as parks and along Caltrans' right-of-ways, and develop a plan to protect existing trees that reduce exposure to air pollution emissions in West Oakland.
- ❑ Develop and implement a pilot project to build a green barrier (‘biofilters’) between a freeway and a residential neighborhood.
- ❑ Explore a policy requiring solid or vegetative barriers to be incorporated into site design between buildings and sources of air pollution (for example, a freeway).

Additional Policies:

- ❑ Prohibit natural gas systems in new builds (residential and most commercials).
- ❑ The City of Oakland adopts more stringent air quality construction and operations requirements.
- ❑ As air pollution condition improves and West Oakland becomes more livable, the City of Oakland works with local community groups to address gentrification and the pricing out of long-term residents and businesses.

100×100 West Oakland Community Air Quality Study

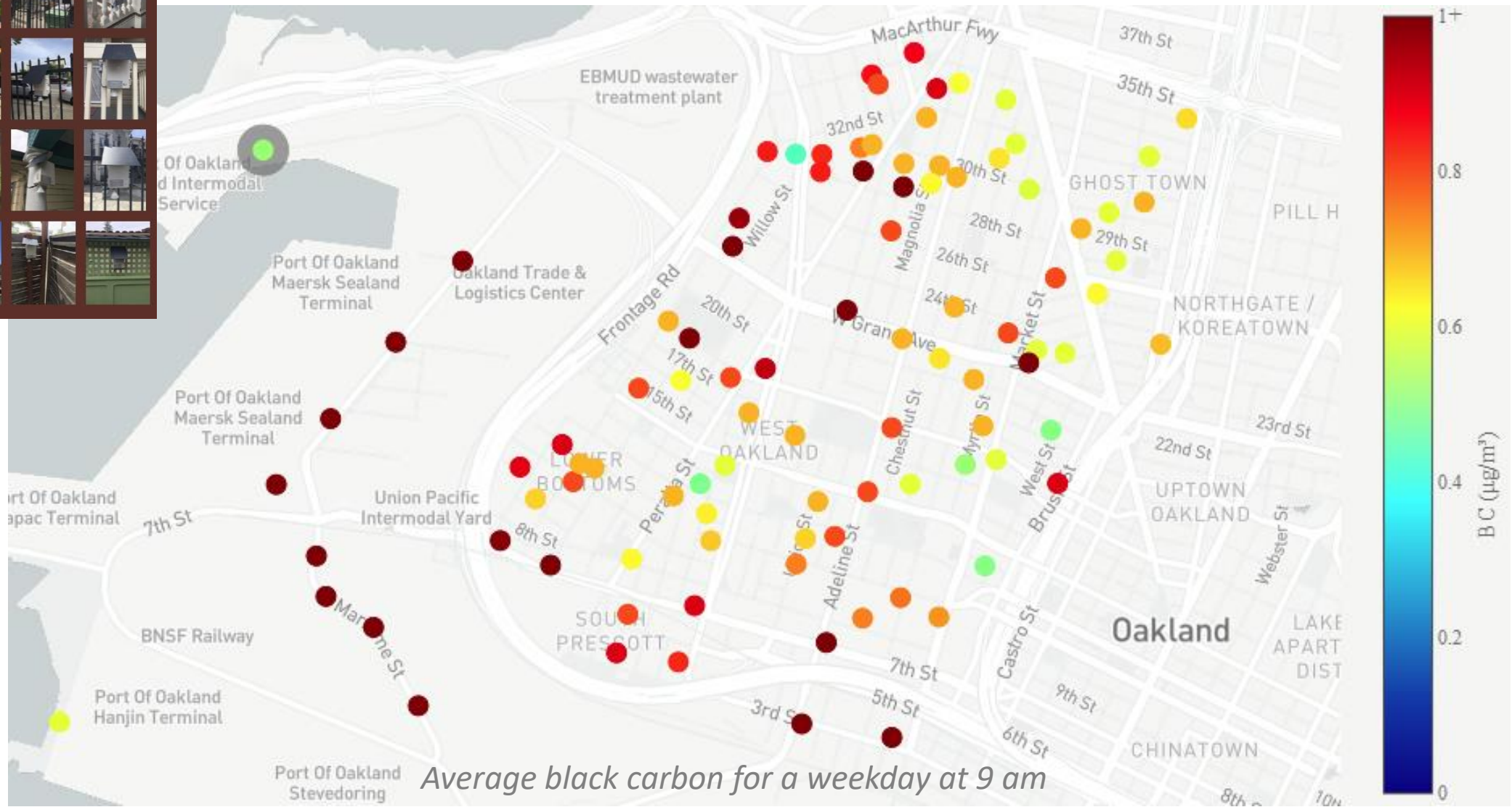


Berkeley
UNIVERSITY OF CALIFORNIA

West Oakland Environmental Indicators Project
know which way the wind blows

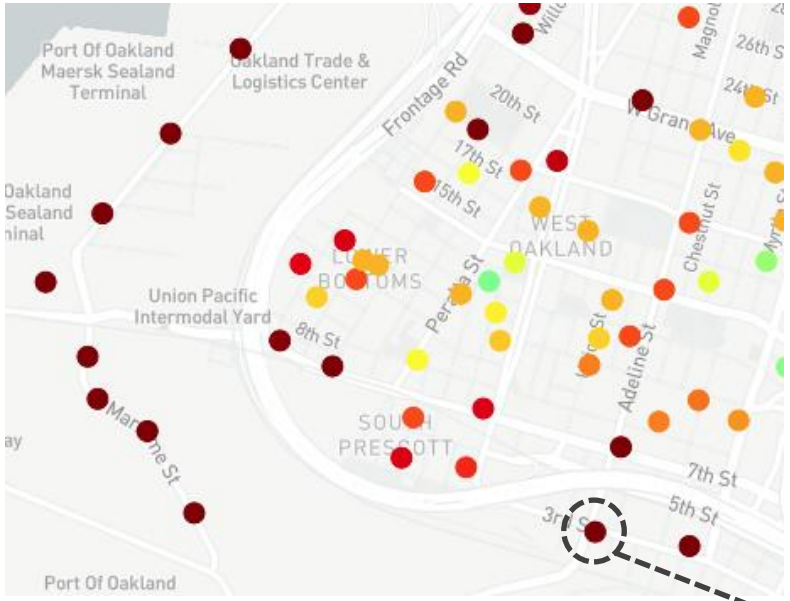
Bay Area Air Quality Management District

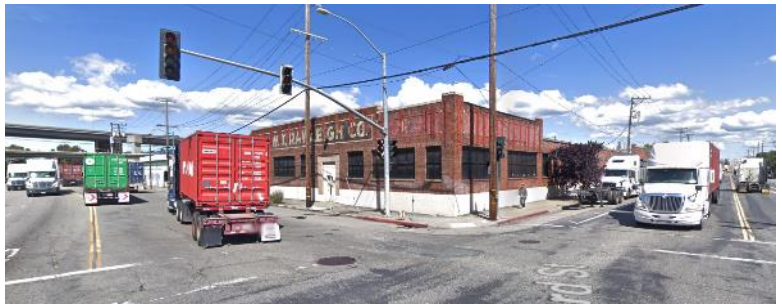
Environmental Defense Fund



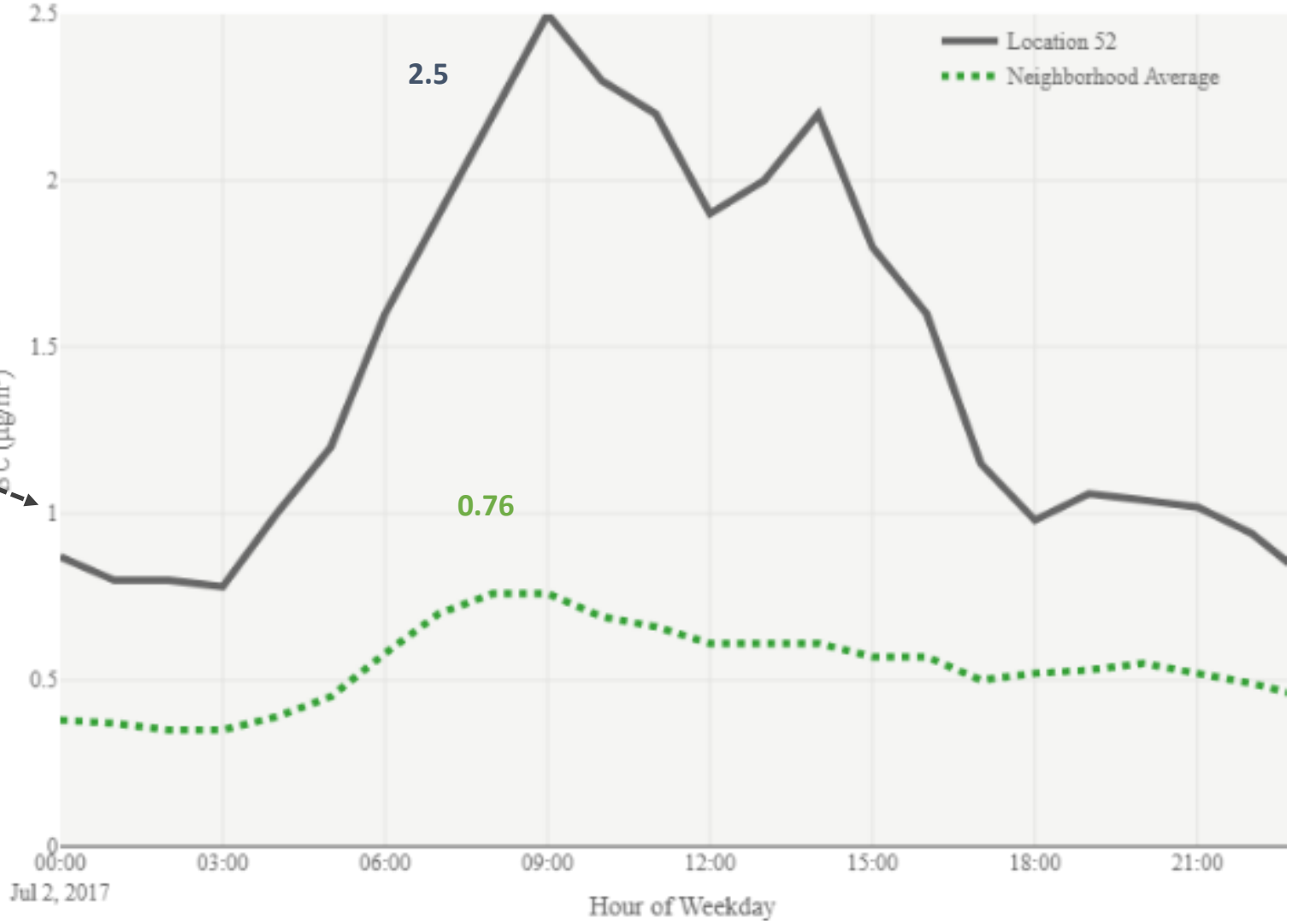
Average black carbon for a weekday at 9 am

3rd St and Adeline St

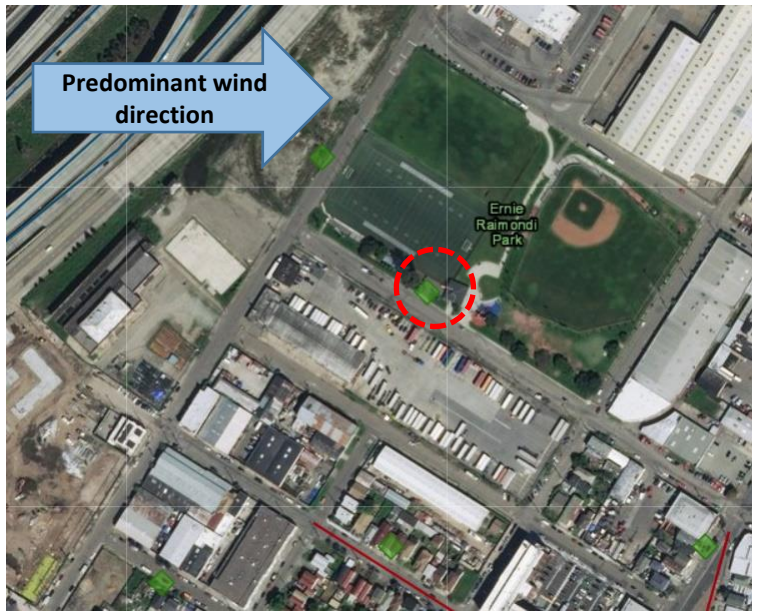


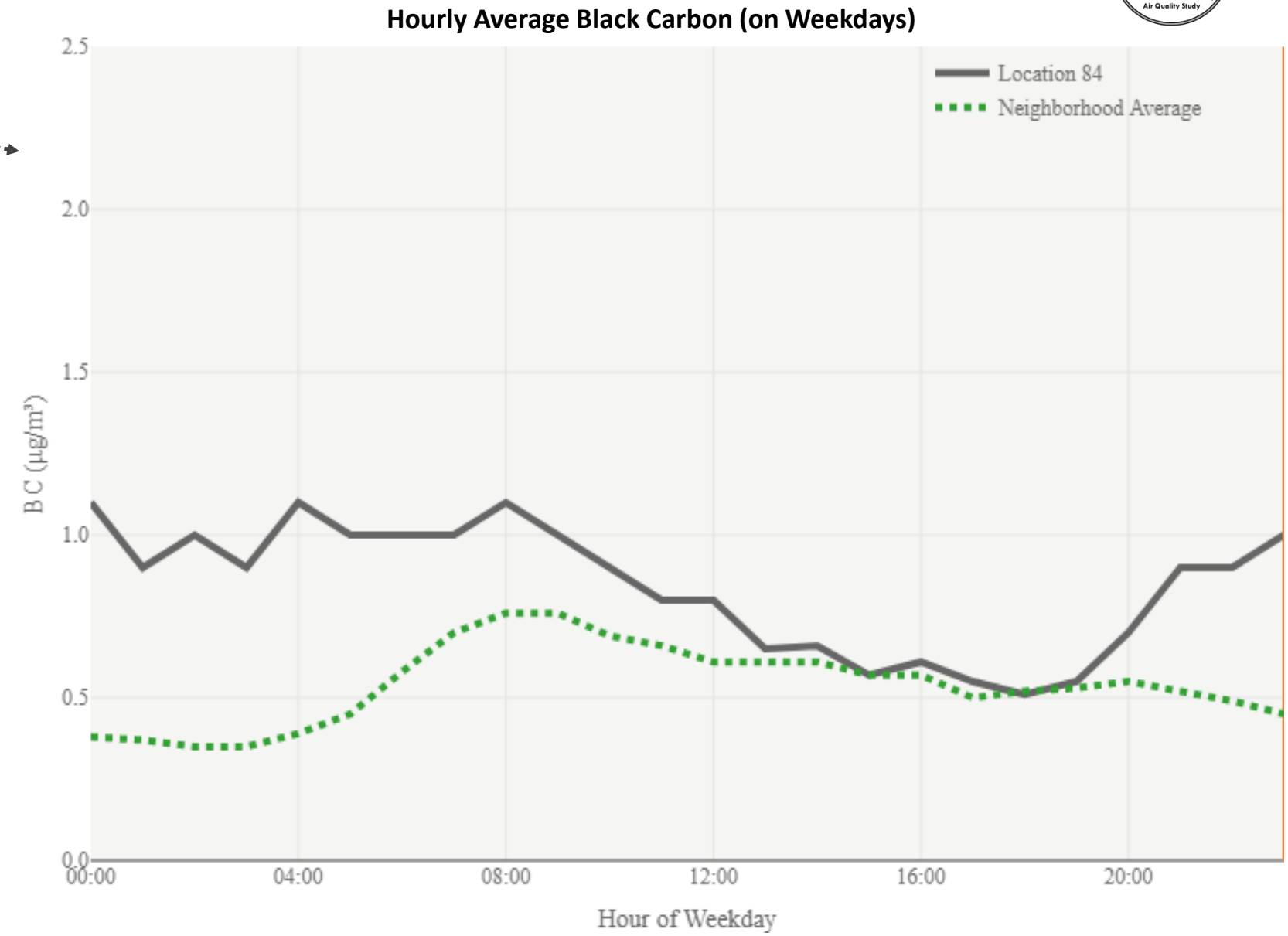


Hourly Average Black Carbon (on Weekdays)



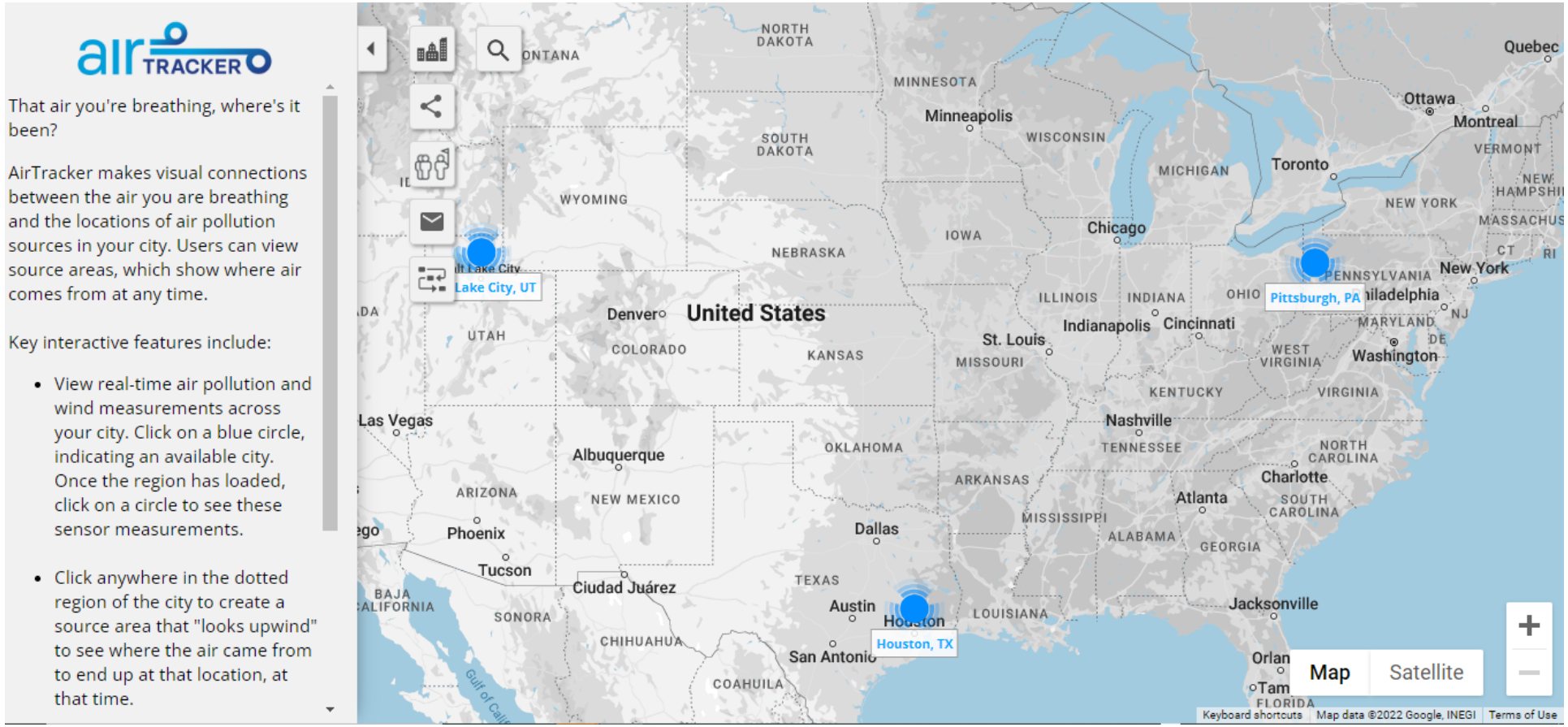
18th St between Wood and Campbell





Air Tracker

https://globalcleanair.org/air-tracker/map/



EDF ENVIRONMENTAL DEFENSE FUND
Finding the ways that work

CREATE Lab
Community Robotics, Education and Technology Empowerment

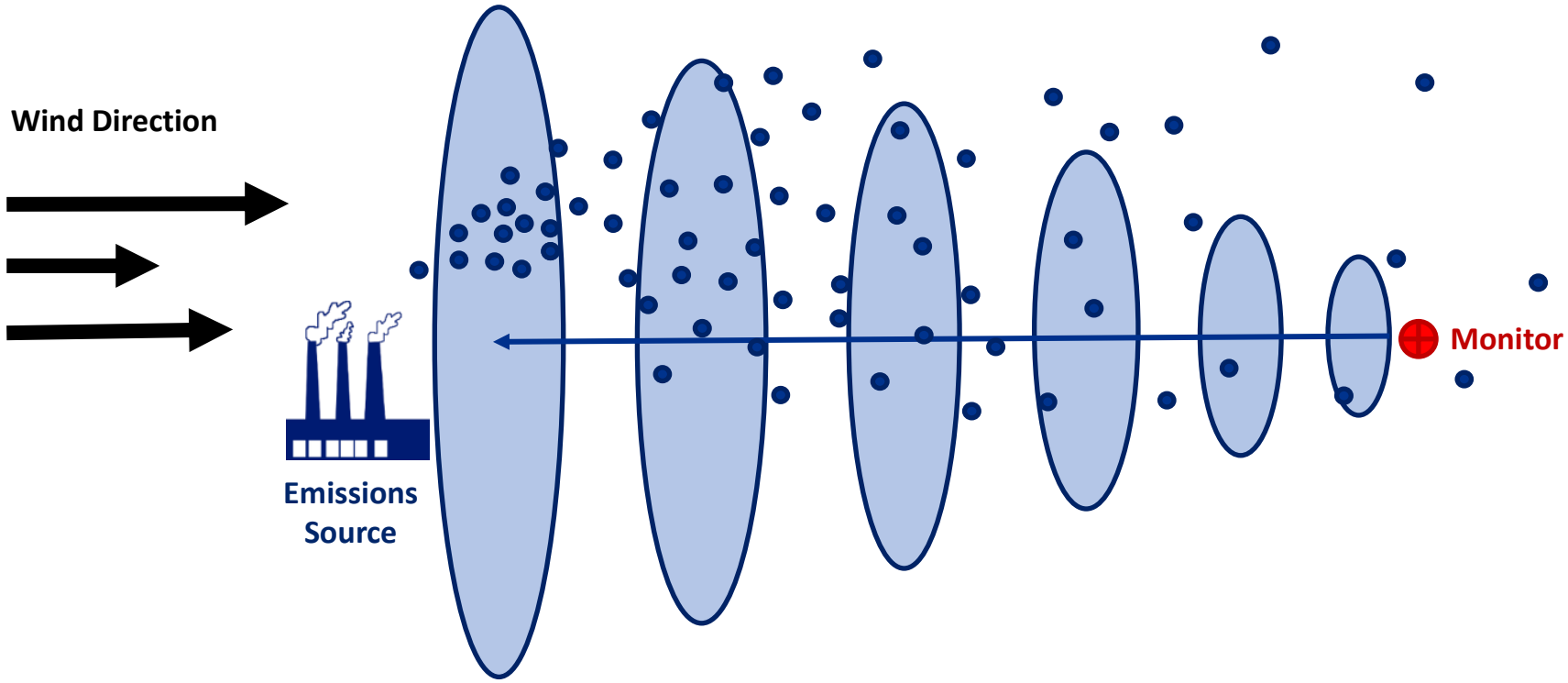
THE UNIVERSITY OF UTAH

Google Cloud

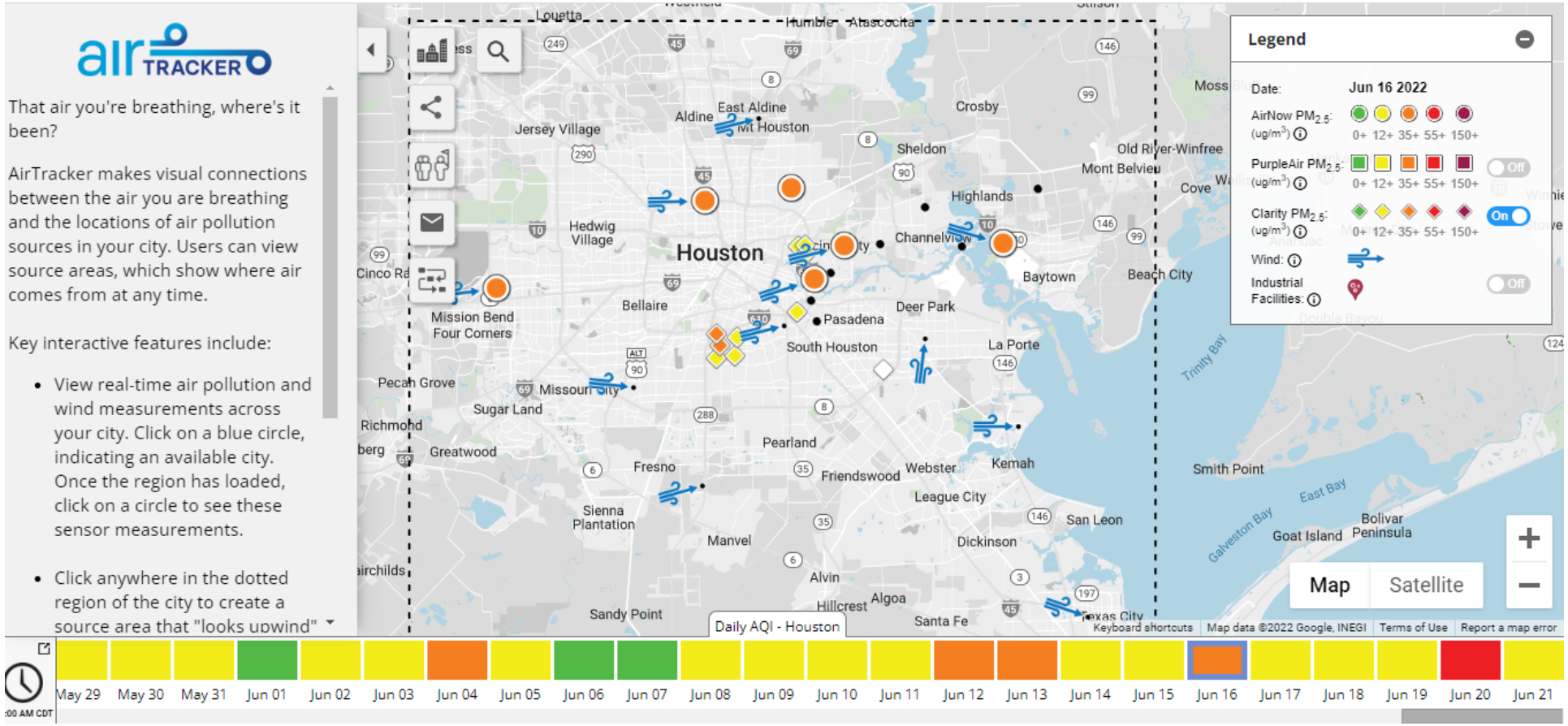
Receptor-based source apportionment: inverse dispersion modeling

Dispersion processes can be calculated in reverse to look upwind and estimate the most likely area the contributing source(s) was/were located.

We are using the **Stochastic Time-Inverted Lagrangian Transport model (STILT),** developed by John Lin at the University of Utah.



Real-world use: fire in Houston



EDF Environmental Defense Fund — Finding the ways that work

CREATE Lab — Community Robotics, Education and Technology Empowerment

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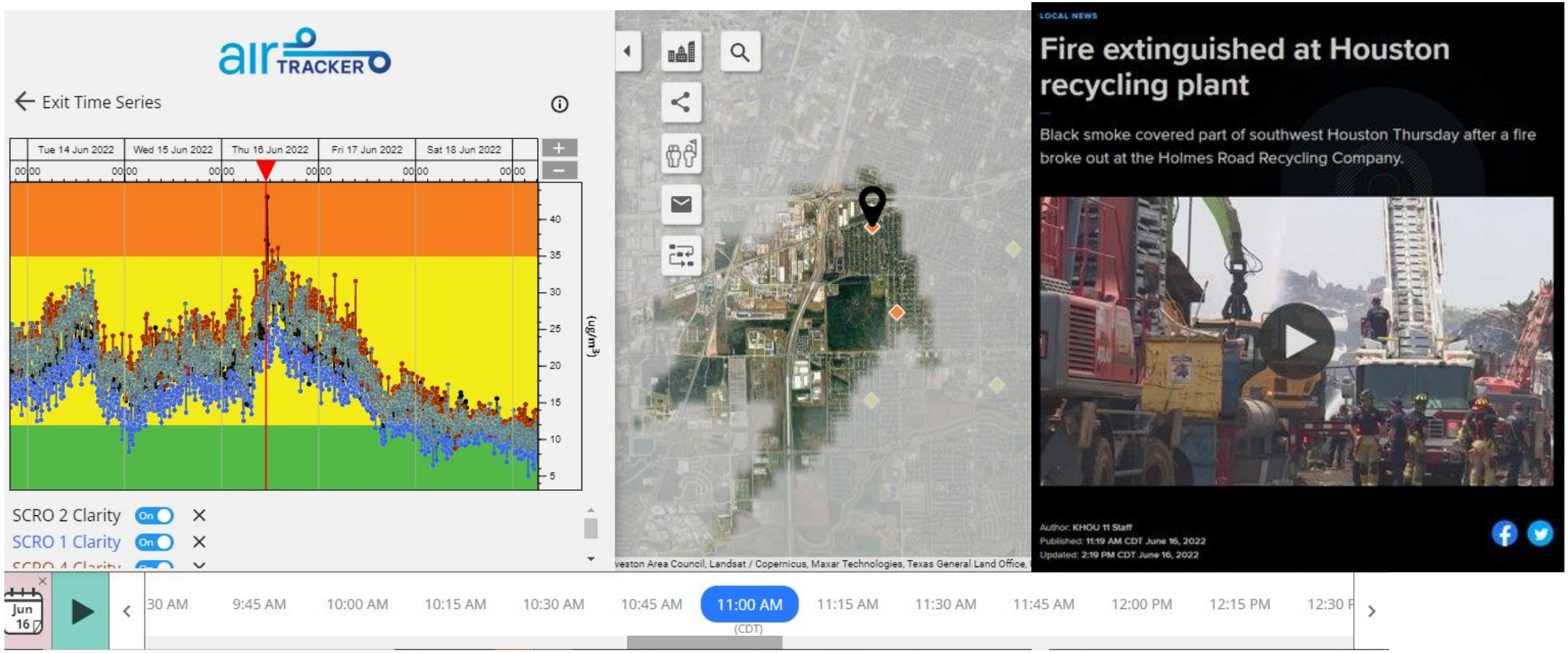
Local monitors show fire hot spot



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Finding the ways that work

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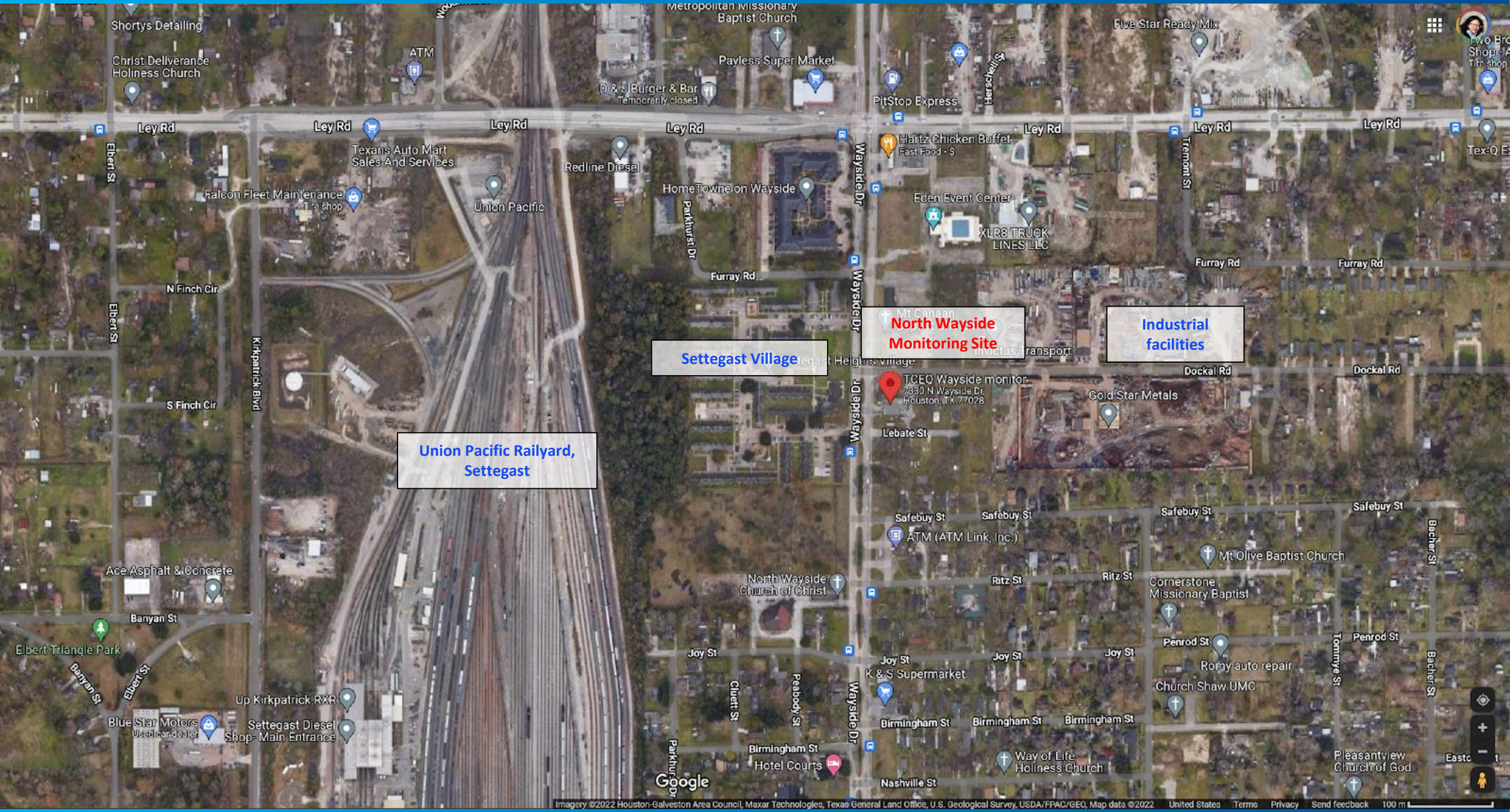
Union Pacific Railyard, Settegast
Settegast Village
North Wayside Monitoring Site
Industrial facilities
TCEQ Wayside monitor
7330 N Wayside Dr, Houston, TX 77028
Shortys Detailing
Christ Deliverance Holiness Church
ATM
Metropolitan Missionary Baptist Church
Payless Super Market
D & J Burger & Bar
Temporarily closed
PitStop Express
Five Star Ready Mix
Ley Rd
Texans Auto Mart Sales And Services
Redline Diesel
Union Pacific
Falcon Fleet Maintenance
Tire shop
HomeTowne on Wayside
Hartz Chicken Buffet
Fast Food · $
Eden Event Center
XLR8 TRUCK LINES LLC
Tex-Q
Elbert St
Parkhurst Dr
Wayside Dr
Tremont St
Furray Rd
N Finch Cir
S Finch Cir
Kirkpatrick Blvd
Mt Canaan
Invictus Transport
Dockal Rd
Gold Star Metals
Lebate St
Safebuy St
ATM (ATM Link, Inc.)
Mt Olive Baptist Church
Ace Asphalt & Concrete
North Wayside Church of Christ
Ritz St
Cornerstone Missionary Baptist
Banyan St
Elbert Triangle Park
Joy St
K & S Supermarket
Penrod St
Romy auto repair
Church Shaw UMC
Bacher St
Tommye St
Cluett St
Peabody St
Up Kirkpatrick RXR
Blue Star Motors
Used car dealer
Settegast Diesel Shop- Main Entrance
Birmingham St
Hotel Courts
Way of Life Holiness Church
Pleasantview Church of God
Nashville St
Google
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100 m

Annual average PM2.5 concentrations approaching National Ambient Air Quality Standards (NAAQS)

Annual Average PM-2.5 Concentrations

Summary Statistics	For 2021 (May 3 - December 31)	For 2022 (January 1 - June 14)
Annual Mean	12.7	11.2
Highest Daily Mean	31.4 (October 31)	33.9 (June 13)
Lowest Daily Mean	2.7 (October 27)	-0.8 (March 03)

This site began collecting PM-2.5 (Local Conditions) on May 3, 2021

12.5-month avg = 11.9µg/m3

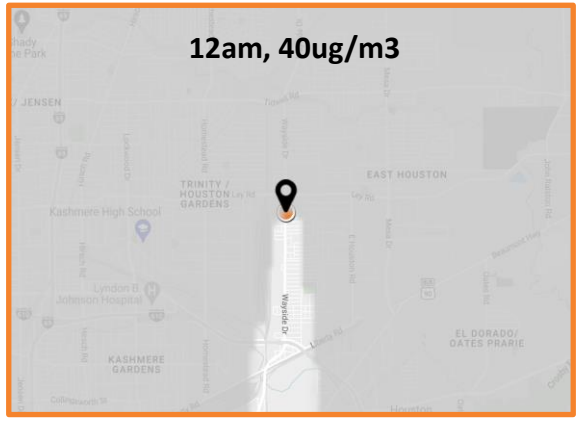
Four Highest 24-Hour PM2.5 Concentrations in 2022

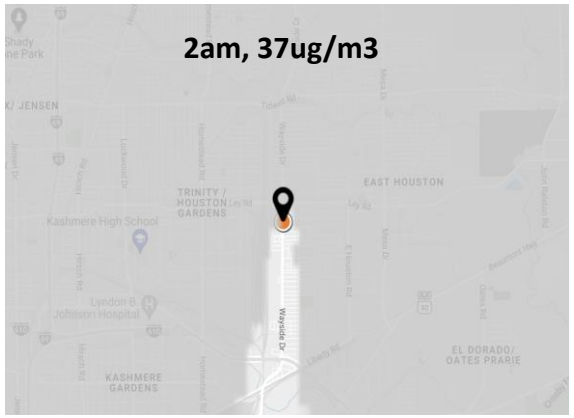
Monitoring Site	POC	Highest		Second Highest		Third Highest		Fourth Highest	
		Date	Value	Date	Value	Date	Value	Date	Value
Houston North Wayside C405/C1033	1	06/13/2022	**33.9**	06/12/2022	**30.9**	06/14/2022	**30.7**	03/01/2022	**27.4**

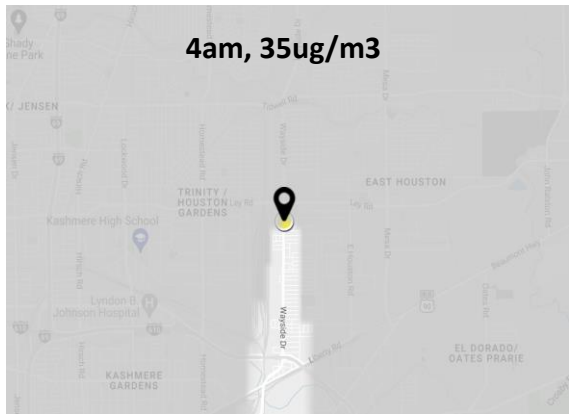
As of June 14, 2022. Source: https://www.tceq.texas.gov/cgi-bin/compliance/monops/24hr_annual.pl

Notes: PM2.5 NAAQS: Annual mean = 12.0 µg/m^3; 24-hour mean = 35 µg/m^3

June 13, 2022


12am, 40ug/m3


2am, 37ug/m3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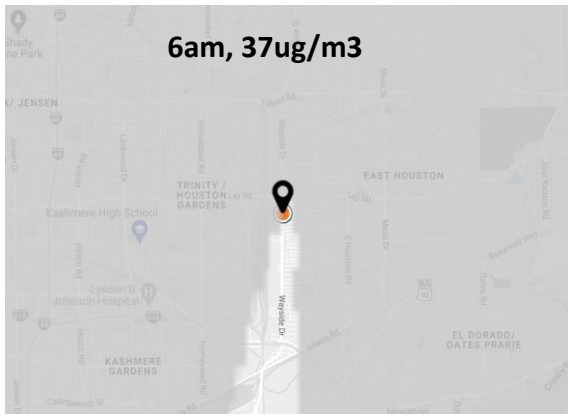
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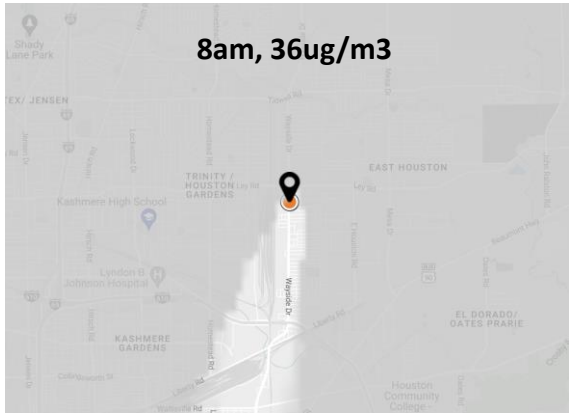
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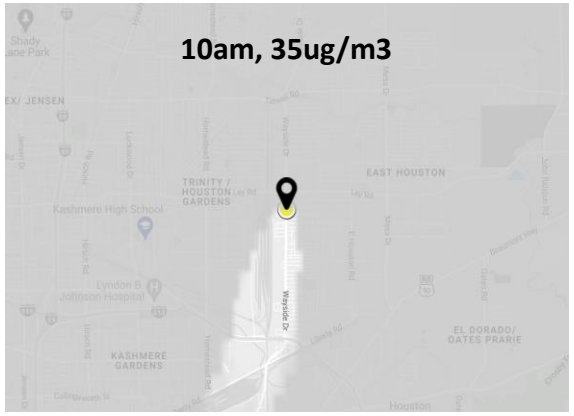
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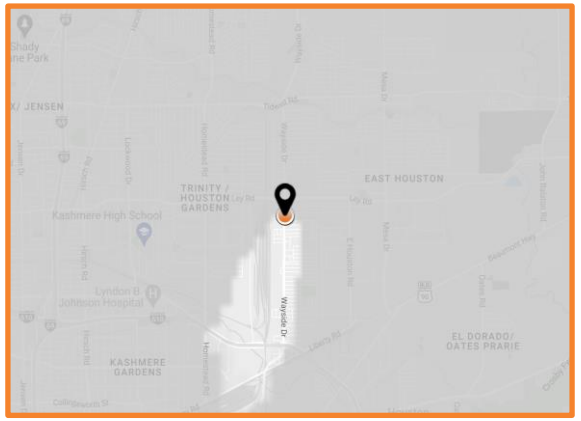
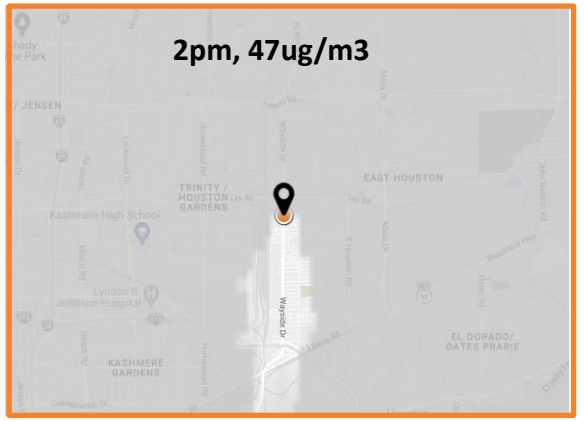
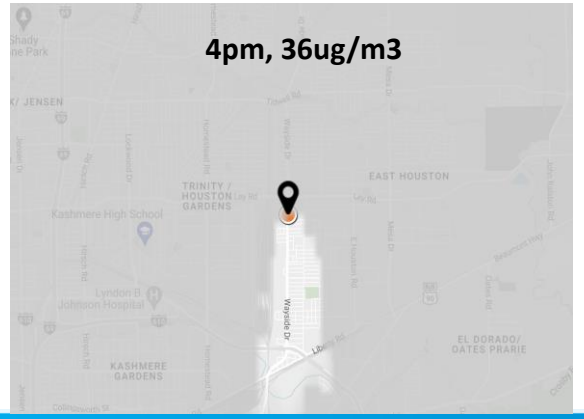



2pm, 47ug/m3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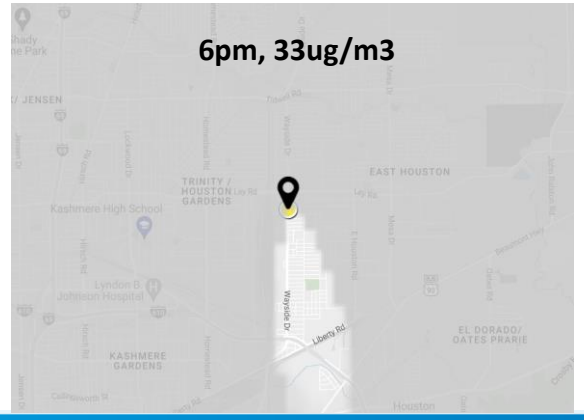
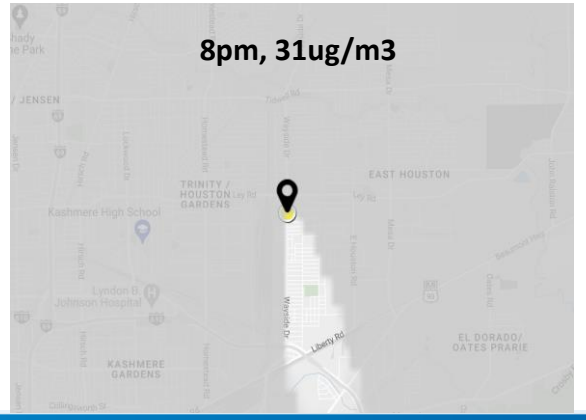
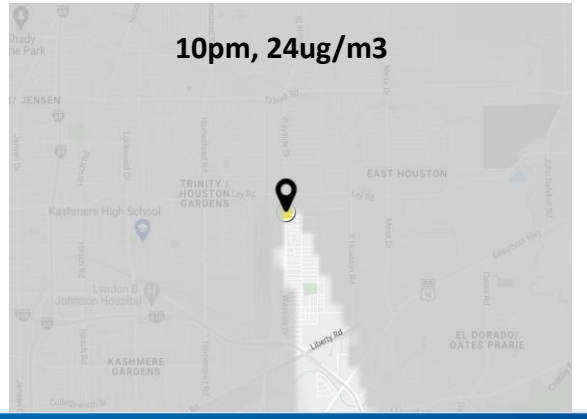

6pm, 33ug/m3


8pm, 31ug/m3


10pm, 24ug/m3

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Questions?

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