

West Oakland Air Pollution Impact Zones and Story Maps

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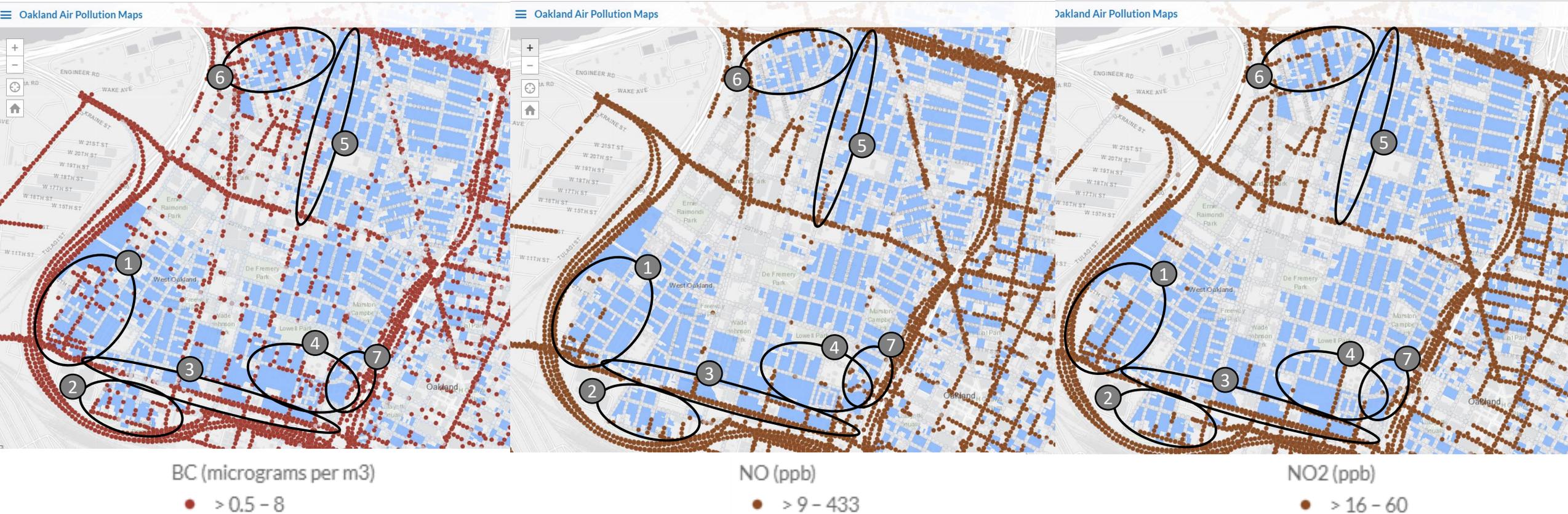
Potential Impact Zones

These are intended to be illustrative examples. Others might also identify different areas for impact zones that are not indicated below.

Black Carbon above median

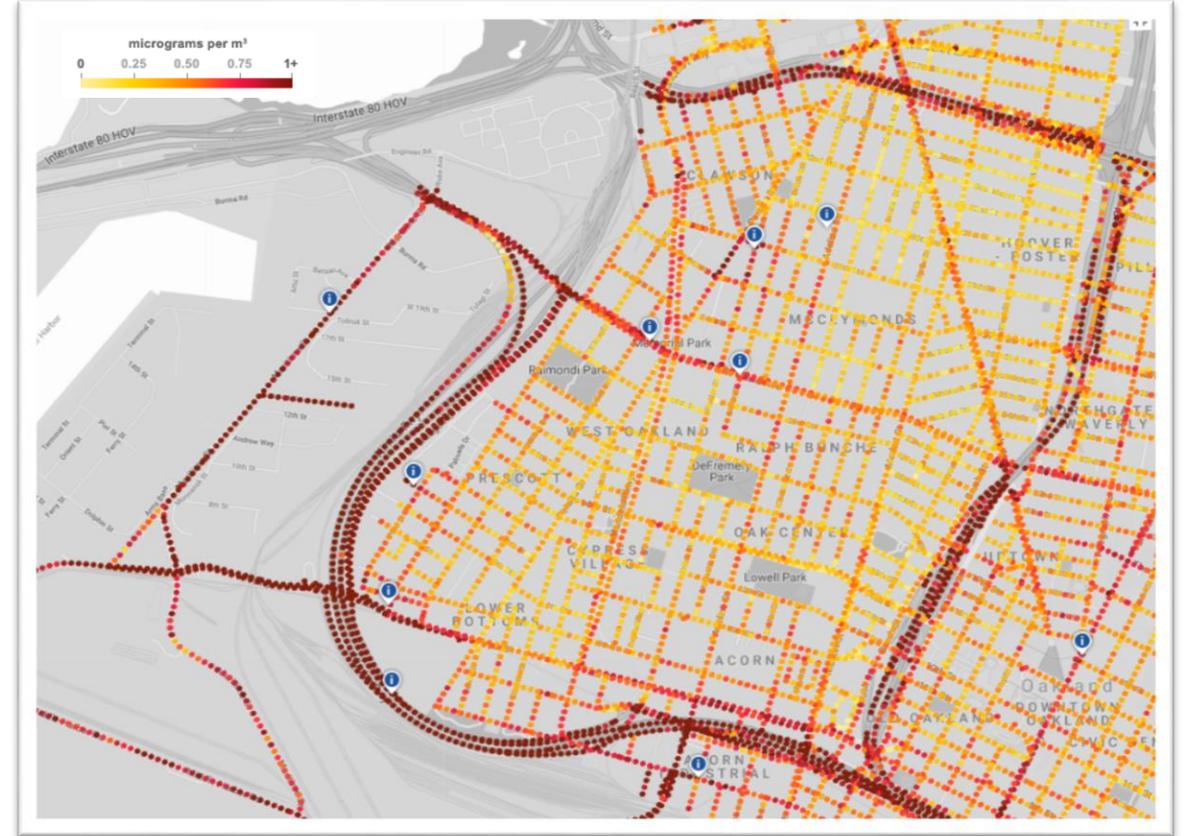
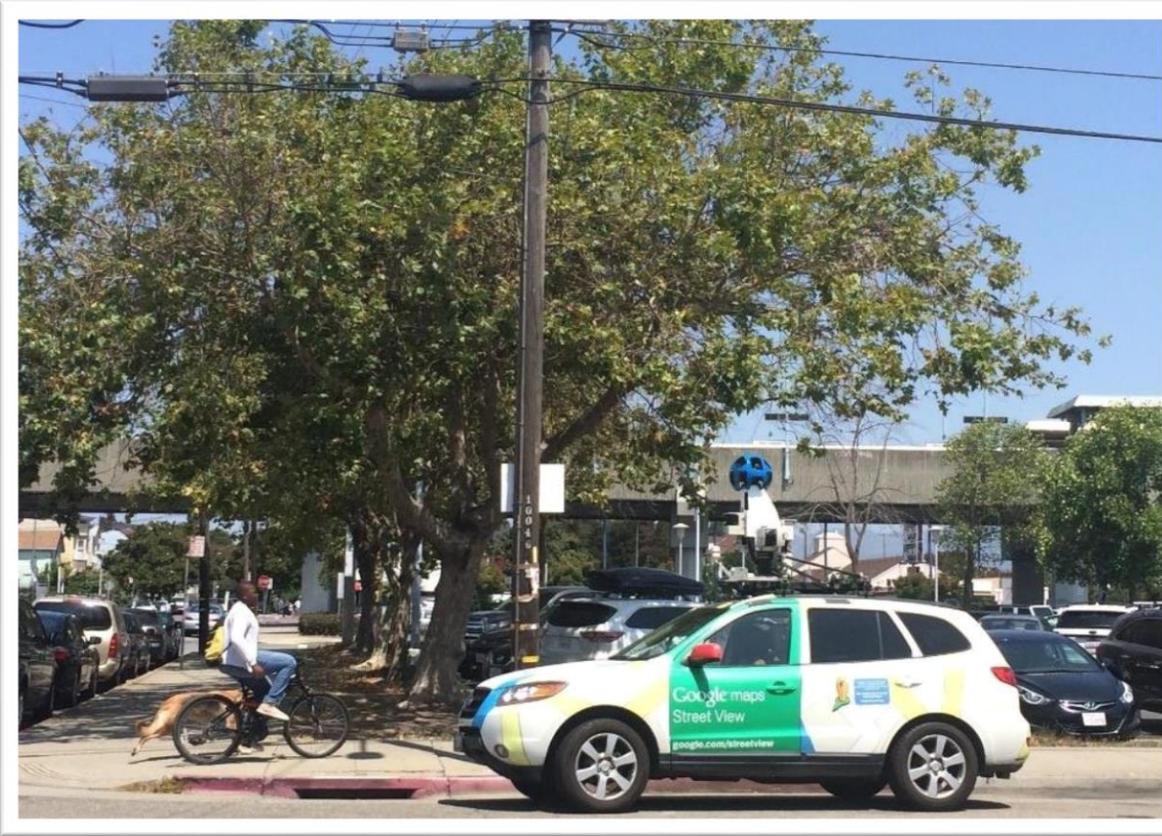
Nitrogen Oxide above median

Nitrogen Dioxide above median



The online mapping tool used in this presentation can be accessed at <https://arcg.is/1Cf50L>

Background: High resolution air pollution mapping with Google Street View cars



Examples

Zone 1: Truck-attracting businesses near residential homes

Zone 3: Main thoroughfare flanked by residential homes, with children facilities nearby

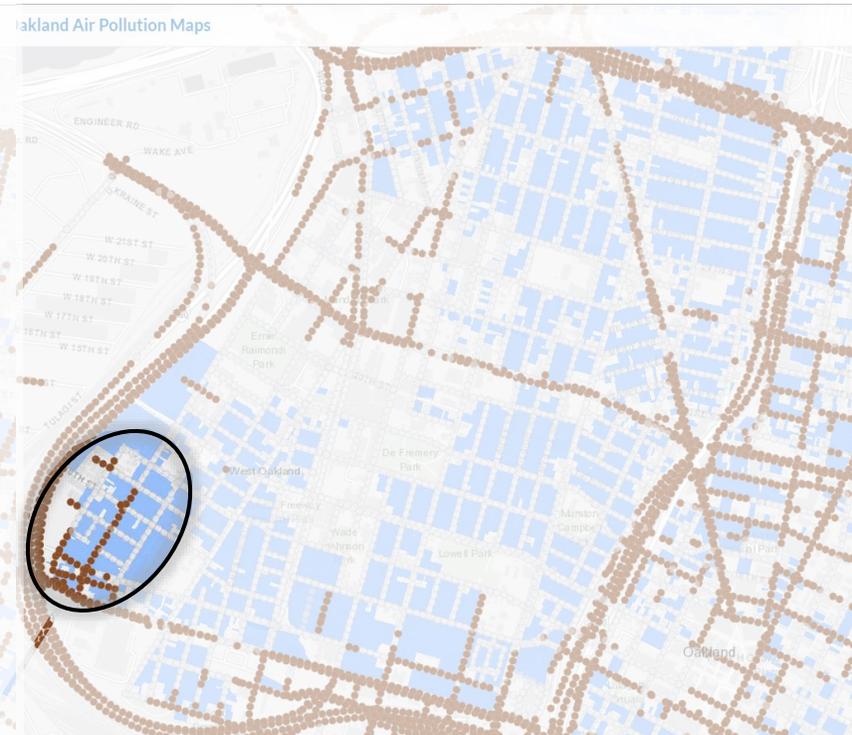
Zone 7: Elderly facilities near strip mall and freeway

Zone 1

BC above median

NO above median

NO₂ above median

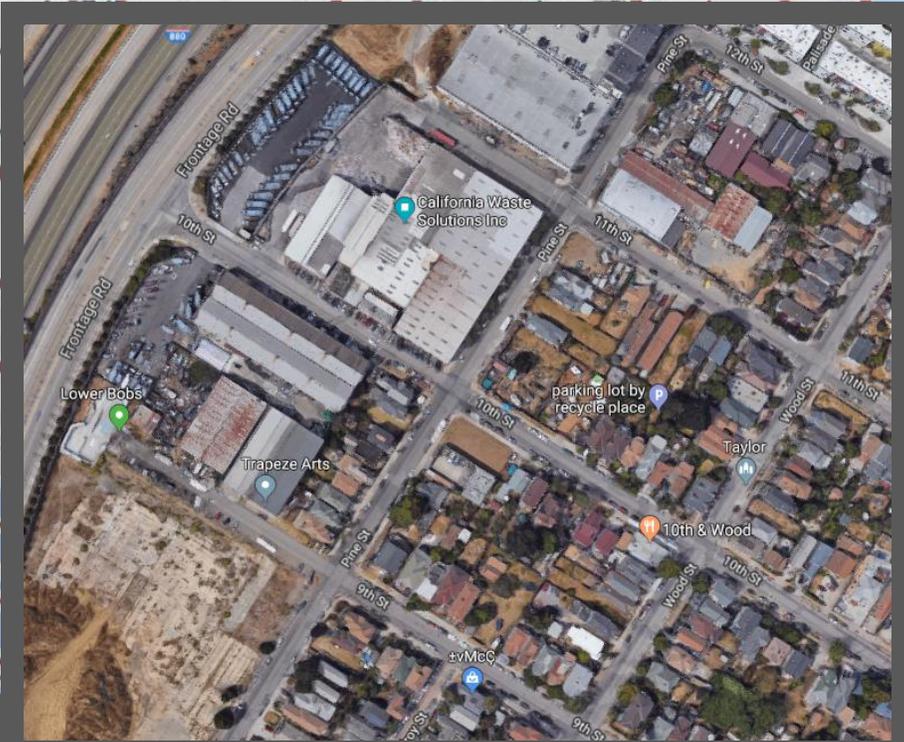


Legend About Layers

- Legend**
- Truck Businesses (as of December 13, 2018)
 - Prohibited Truck Routes - City of Oakland
 - Designated Truck Routes - City of Oakland
 - Above Median BC Levels
 - BC (micrograms per m3)
 - > 0.5 - 8
 - 0 - 0.5
 - Residential Parcels - Alameda County

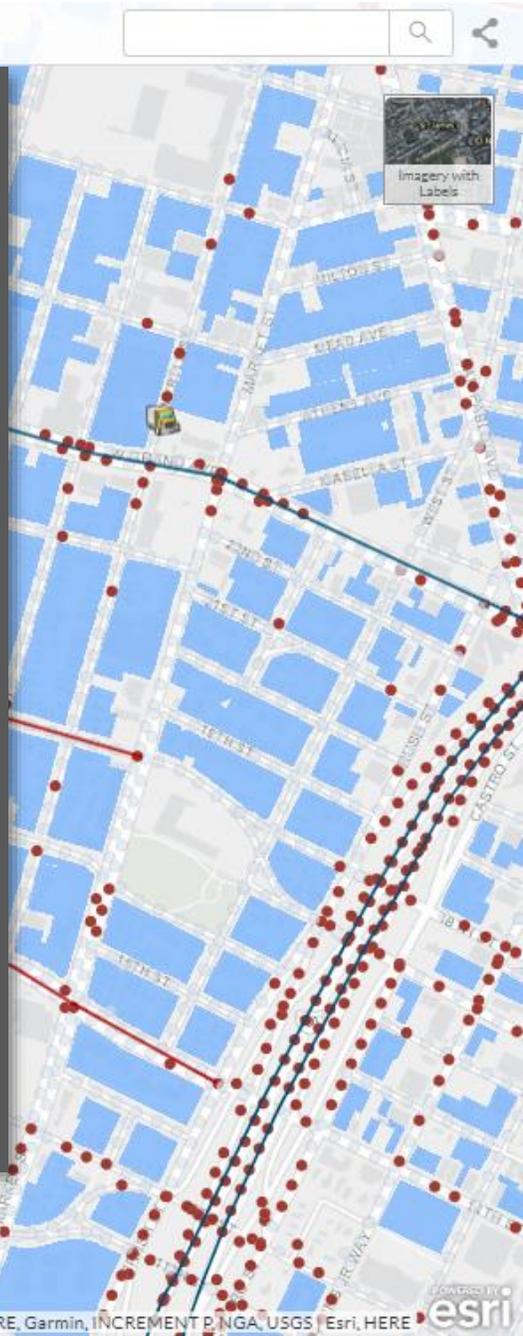


Cal Waste Solutions and US Freight Systems



Elevated BC levels in this residential area may be due to trucks trying to find their way to the two nearby businesses.

While trucks are allowed on truck-prohibited streets to reach their destination of business, they could readily access these two businesses via Frontage Rd and 7th St without needing to go on prohibited side streets.



Legend

Oakland Public and Charter Schools - OUSD

- Elementary
- Charter
- High
- Middle

Oakland Private Schools - CA DOE

- Private (Elementary, Middle, High)

Child Care Centers - licensed by California Dept of Social Services

-

Truck Businesses (as of December 13, 2018)

-

Above Median BC Levels

BC (micrograms per m3)

- > 0.5 - 8
- 0 - 0.5

Percent of Population Under 5 Years Old - ACS 2016/5yr estimates

- > 20%
- > 10-20%
- > 5-10%
- Less Than 5%



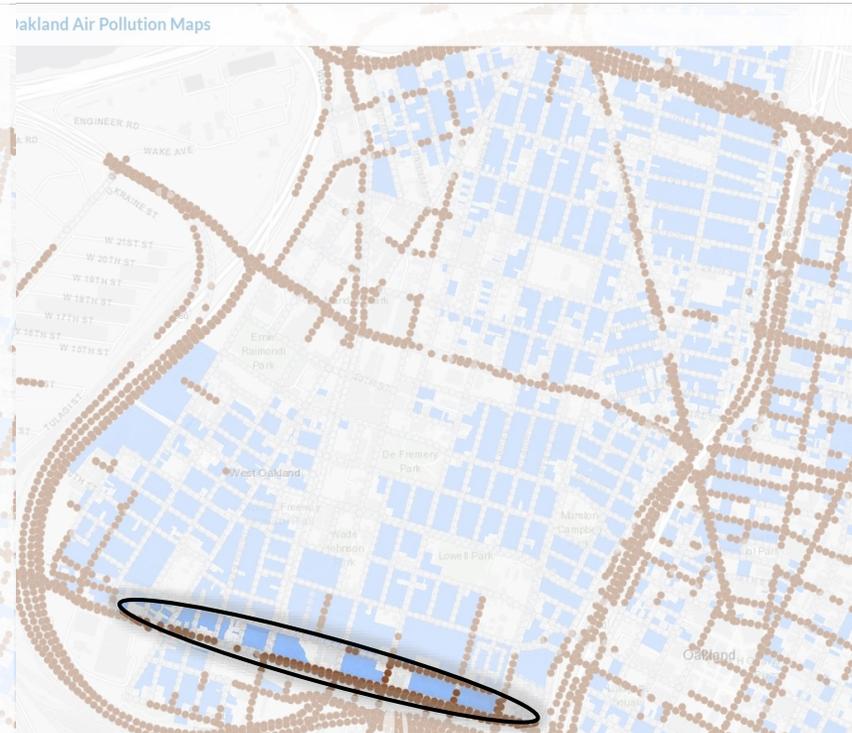
Around 5-20% of the population in this zone are children under 5 years old (roughly 280 children). There is also an elementary school and a few childcare facilities in this zone. We observed elevated levels of black carbon along streets ~1-2 blocks from these facilities.

Zone 3

BC above median

NO above median

NO2 above median



Legend

TruckBusinesses121318

Prohibited_Truck_Routes

Designated_Truck_Routes

NO Above Median Level

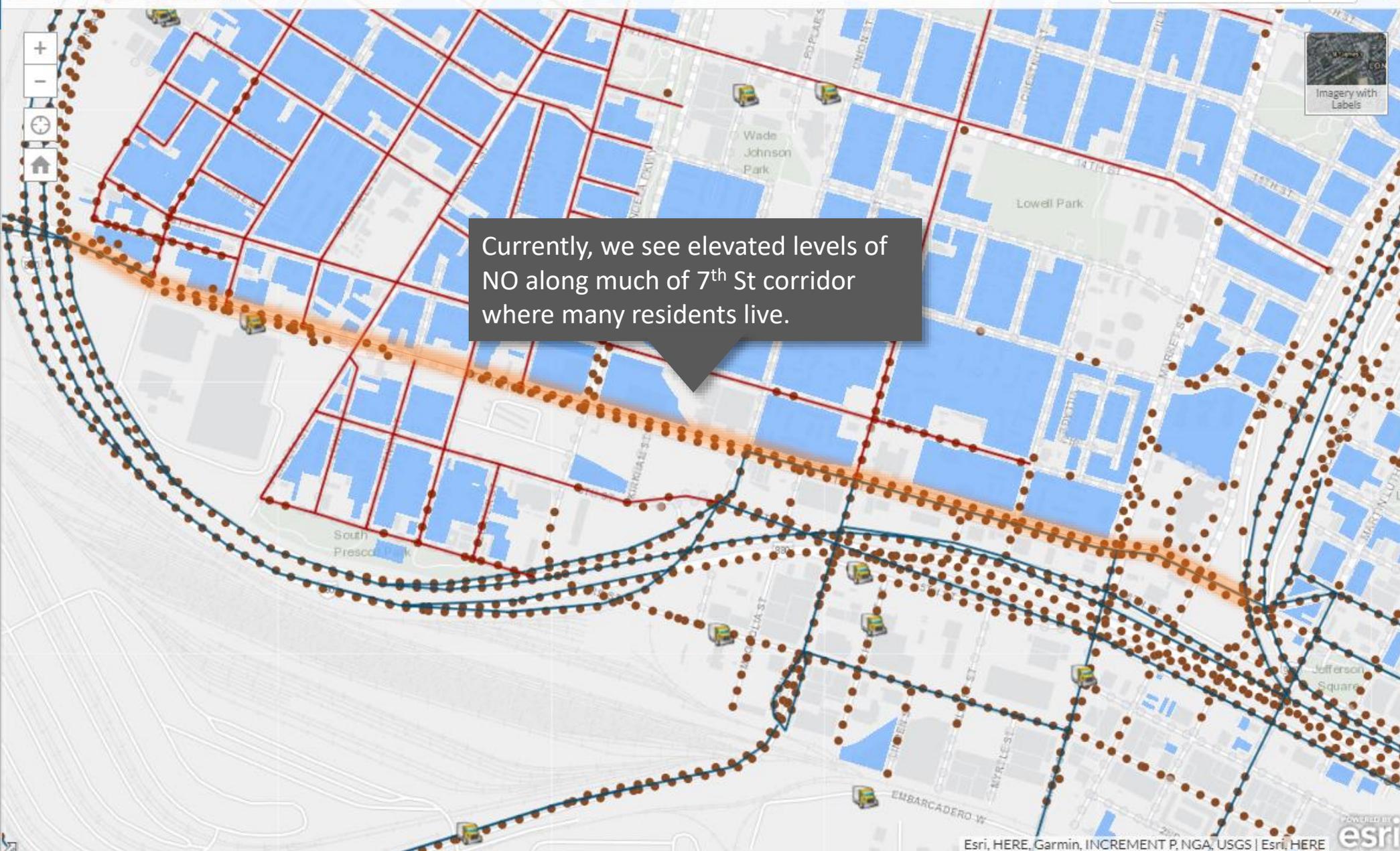
NO (ppb)

- > 9 - 433
- 0 - 9

Residential Parcels

New Potential Truck Prohibited Street

New Potential Truck Route



Legend

TruckBusinesses121318



Prohibited_Truck_Routes



Designated_Truck_Routes



NO Above Median Level

NO (ppb)

> 9 - 433

0 - 9

Residential Parcels



Population Density (ACS 2016/5yr estimates)

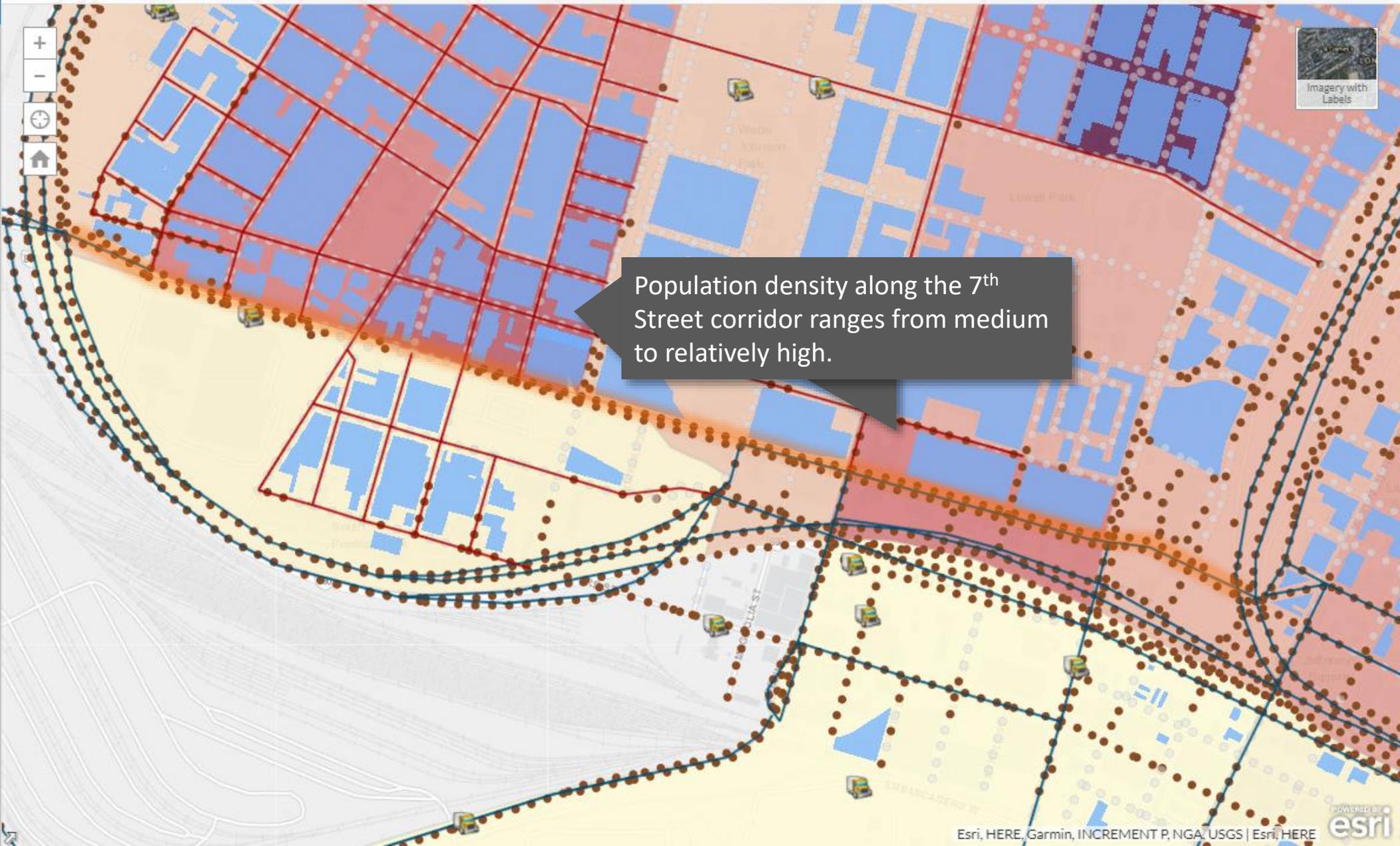


Population Density

> 34,891

18,595

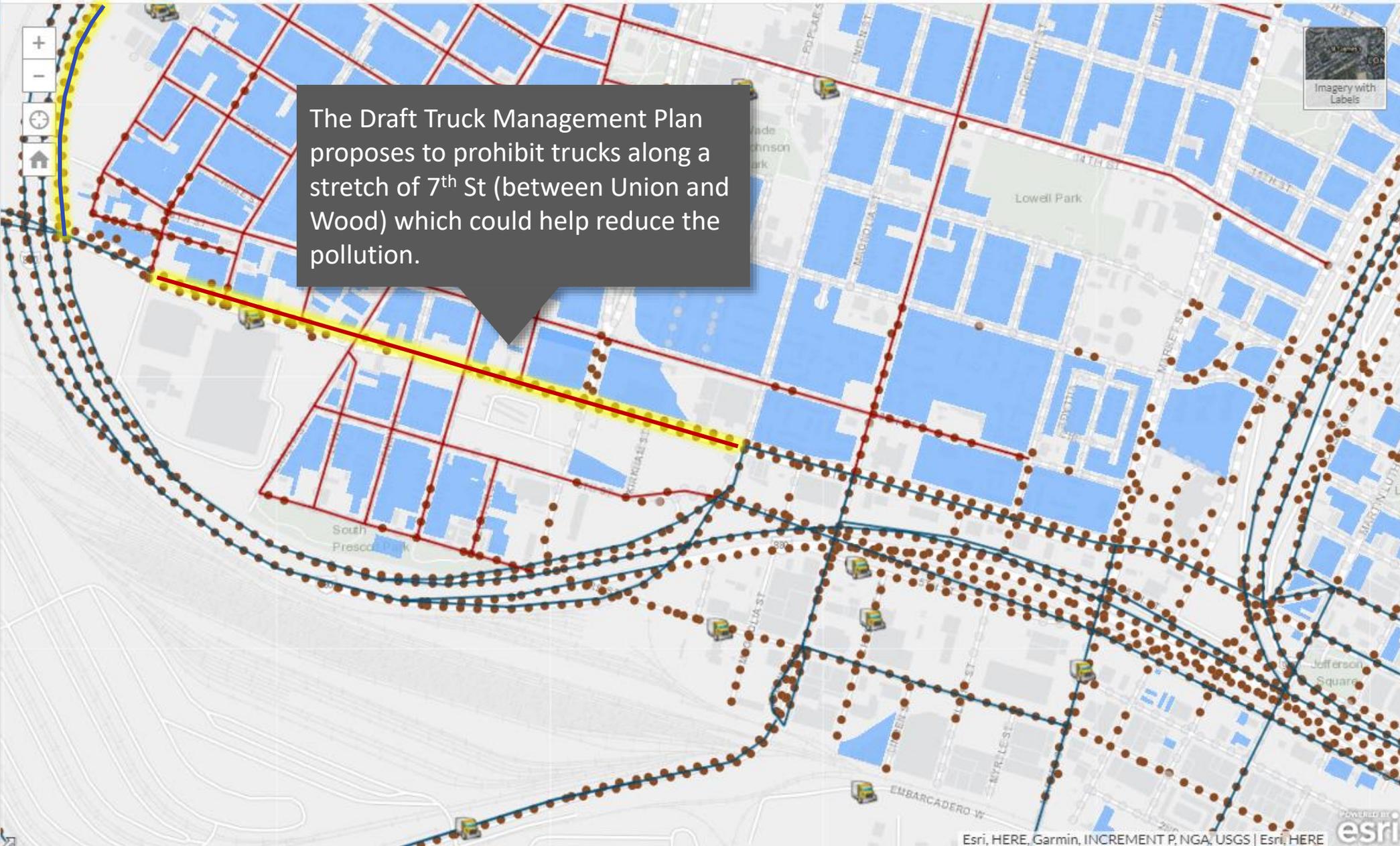
< 2,301



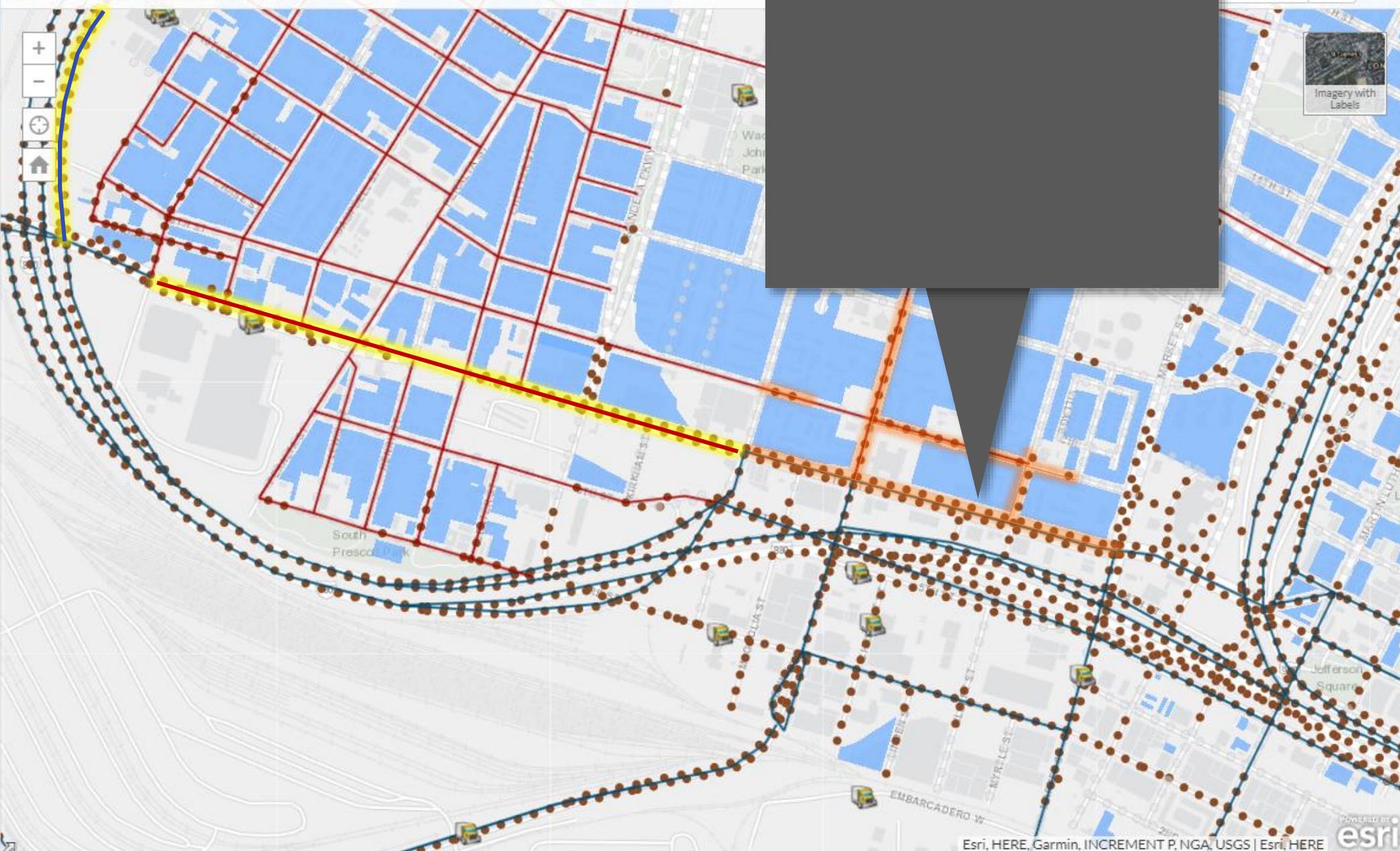
Population density along the 7th Street corridor ranges from medium to relatively high.



- Legend
- TruckBusinesses121318
- Prohibited_Truck_Routes
- Designated_Truck_Routes
- NO Above Median Level
- NO (ppb)
 - > 9 - 433
 - 0 - 9
- Residential Parcels
- New Potential Truck Prohibited Street**
- New Potential Truck Route**



- Legend
- TruckBusinesses121318
- Prohibited_Truck_Routes
- Designated_Truck_Routes
- NO Above Median Level
- NO (ppb)
 - > 9 - 433
 - 0 - 9
- Residential Parcels
- New Potential Truck Prohibited Street
- New Potential Truck Route



However, the remaining stretch of

Legend

Oakland Public and Charter Schools - OUSD

- Elementary
- Charter
- High
- Middle

Child Care Centers - licensed by California Dept of Social Services

- Child Care Center

After School Programs

- After School Program

Above Median NO Levels

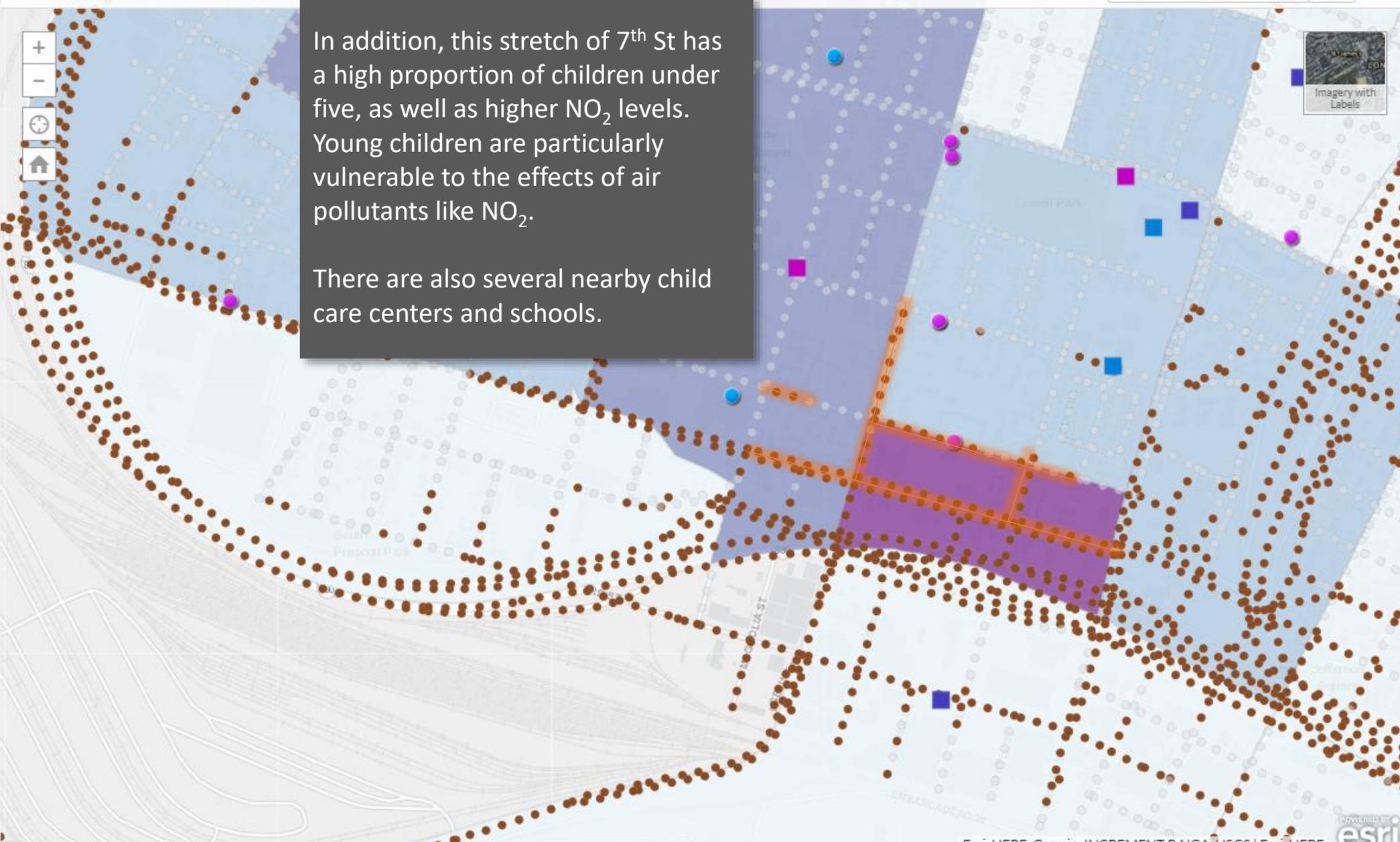
NO (ppb)

- > 9 - 433
- 0 - 9

Percent of Population Under 5 Years Old - ACS 2016/5yr estimates

Proportion of Population Under 5 Years Old

- > 20%
- > 10-20%
- > 5-10%
- Less Than 5%



In addition, this stretch of 7th St has a high proportion of children under five, as well as higher NO₂ levels. Young children are particularly vulnerable to the effects of air pollutants like NO₂.

There are also several nearby child care centers and schools.

Zone 7

BC above median

NO above median

NO₂ above median



Legend About Layers

Legend

Truck Businesses (as of December 13, 2018)

Prohibited_Truck_Routes

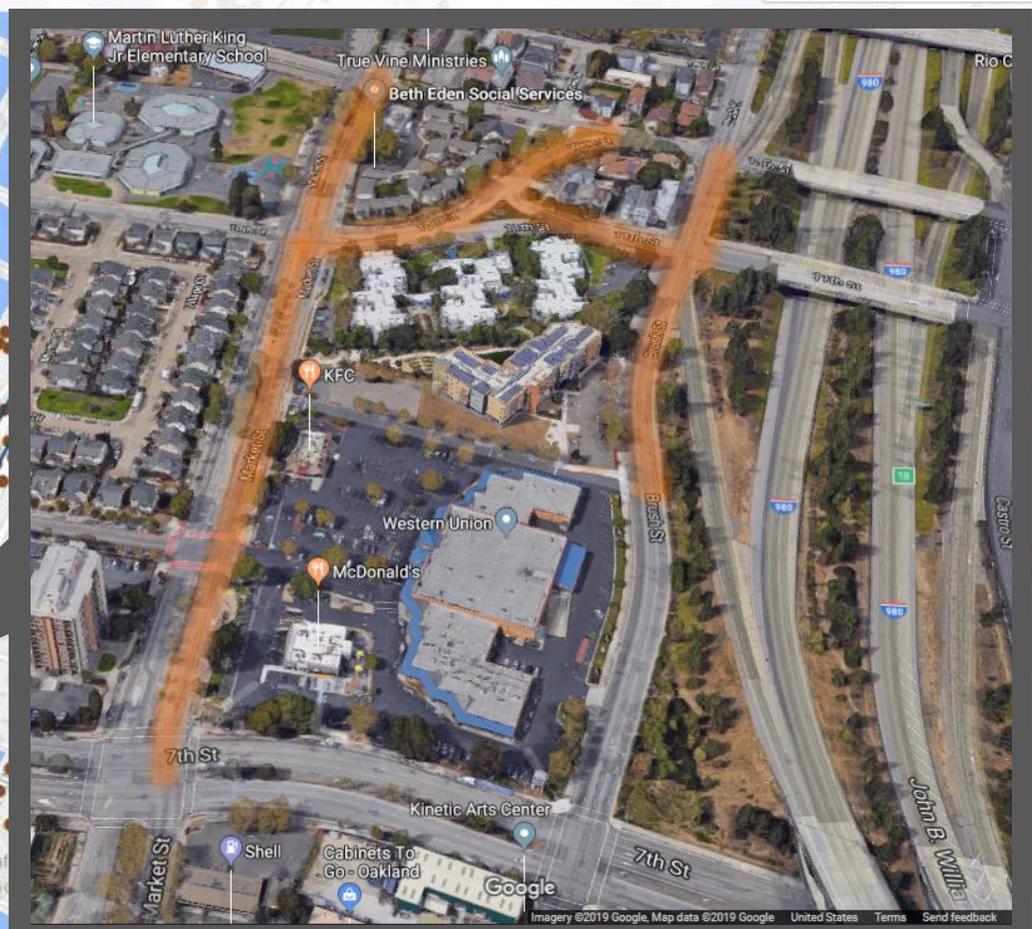
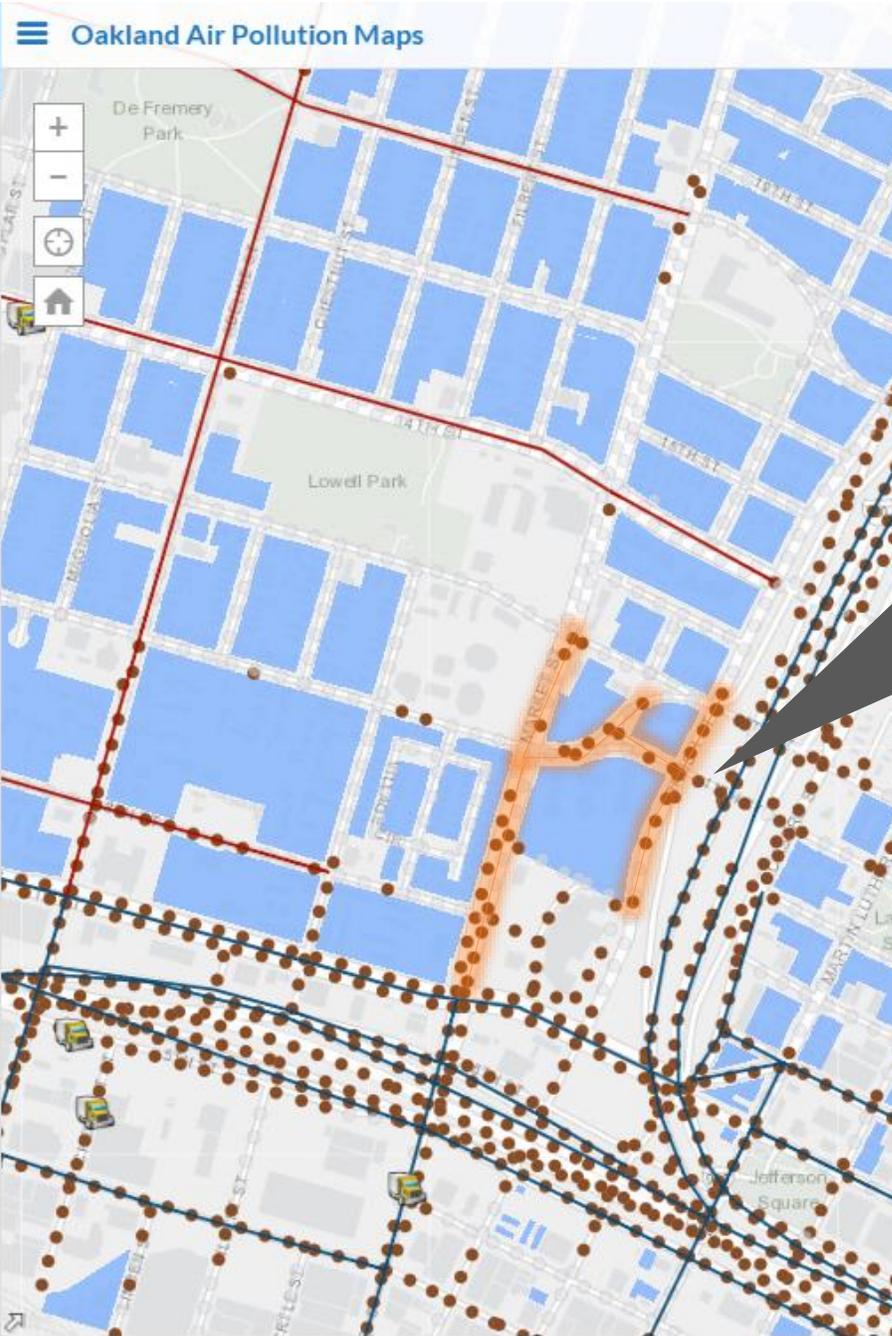
Designated_Truck_Routes

Above Median NO Levels

NO (ppb)

- > 9 - 433
- 0 - 9

Residential Parcels (Alameda County)



This area is upwind of I-980 and pollution from the freeway is potentially limited. The elevated NO observed may be driven other factors such as vehicular traffic to/from the nearby strip mall.

Legend

Senior Housing and Centers



Residential Care Facilities for Elderly (licensed by California Dept of Social Services)



Prohibited_Truck_Routes



Designated_Truck_Routes



Above Median NO Levels

NO (ppb)

> 9 - 433

0 - 9

Percent of Population Over 65 Years Old (ACS 2016/5yr estimates)

Proportion of Population Over 65 Years Old

> 30%

> 20-30%

> 10-20%

Less than 10%



A few senior housing are located in zone flanked by streets with elevated levels of NO.

Appendix: Air Pollution Mapping Tool User Manual

Content

1. What's in the mapping tool
2. How to use the tool
3. Where did the data come from
4. What information or insights can you get from the tool

Click link to go to online map

<https://arcg.is/1Cf50L>

1. What's in the mapping tool

What's in the mapping tool

- Data layers (so far) include:
 - Google/EDF/WOEIP air pollution data collected during mid-2015 to mid-2016
 - Kaiser/EDF health risk analysis results
 - Sensitive receptor locations such as schools, childcare centers, senior housing and care facilities
 - Locations of truck-related businesses and truck routes
- Tool developed in collaboration with WOEIP
- Uses publicly available data
- More data layers can be added
- Access on browser, no account or login needed

2. How to use the tool

Landing page

Legend

Residential Parcels



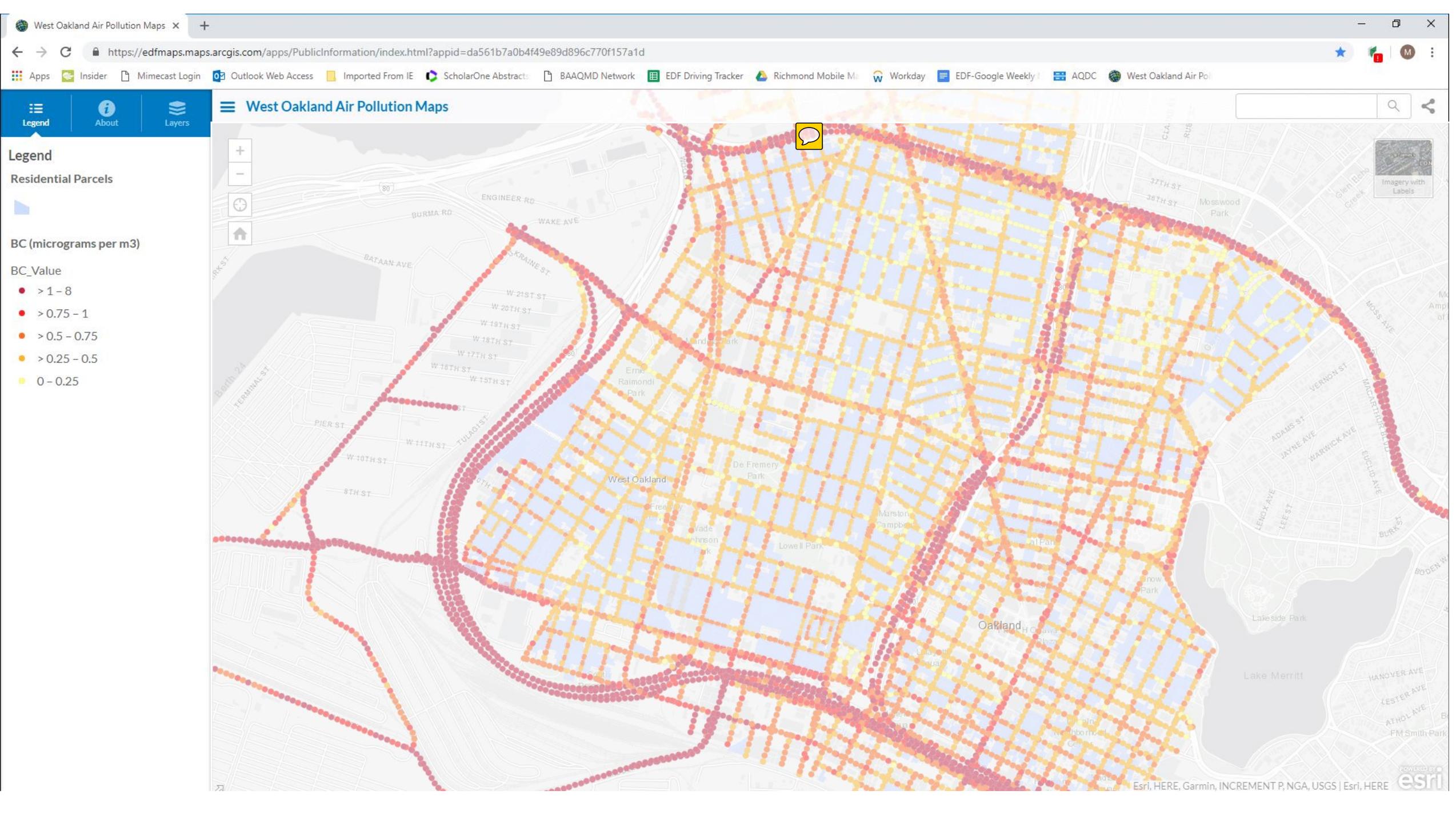
BC (micrograms per m3)

BC_Value

- > 1 - 8
- > 0.75 - 1
- > 0.5 - 0.75
- > 0.25 - 0.5
- 0 - 0.25

Legend for the current map





West Oakland Air Pollution Maps

Legend

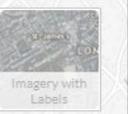
Residential Parcels



BC (micrograms per m3)

BC_Value

- > 1 - 8
- > 0.75 - 1
- > 0.5 - 0.75
- > 0.25 - 0.5
- 0 - 0.25



West Oakland Air Pollution Maps

Layers

- Child Care Centers (licensed by California Dept of Social Services)
- Oakland Schools (OUSD)
- Senior Housing and Centers
- Residential Care Facilities for Elderly (licensed by California Dept of Social Services)
- Estimated pollution(NO2)-related cardiovascular risk for the elderly (65+)
- Residential Parcels
- Truck magnets (shipping, trucking and transport)
- Prohibited Truck Routes
- Designated Truck Routes
- BC (micrograms per m3)
- BC 50th percentile
- BC 75th percentile
- BC 90th percentile
- NO2 (ppb)
- NO2, 50th percentile



Check box to make a new layer appear. You can check multiple boxes. For example, here the Black Carbon and Truck Magnets layers are checked.

Legend

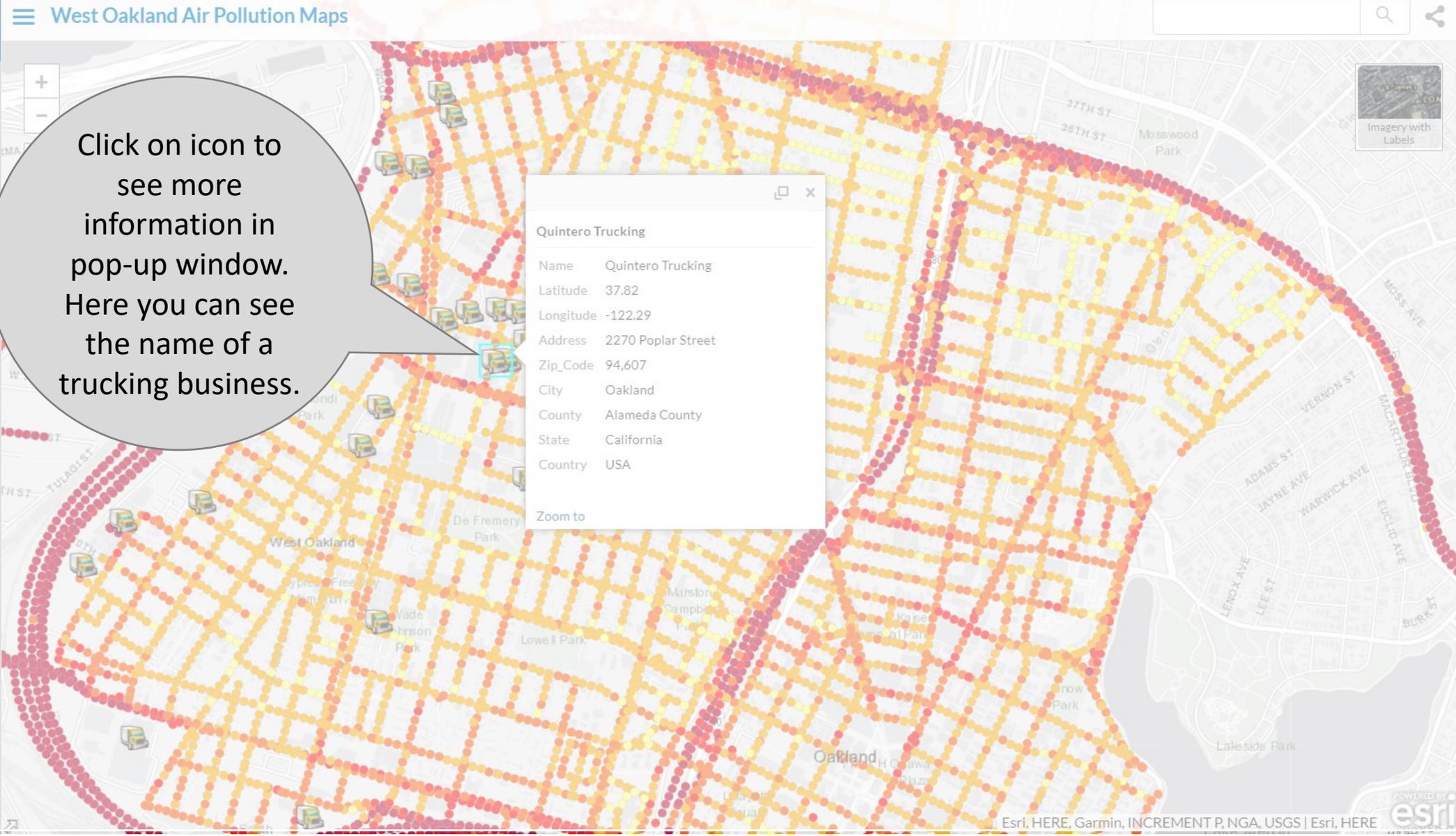
Truck magnets (shipping, trucking and transportation businesses)



BC (micrograms per m3)

BC_Value

- > 1 - 8
- > 0.75 - 1
- > 0.5 - 0.75
- > 0.25 - 0.5
- 0 - 0.25



3. Where did the data come from

Several data layers came from results of studies conducted by EDF, WOIEP and partners

← → ↻ 🏠 🔒 https://e

- Child Care Centers (licensed by California Dept of Social Services)
- Oakland Schools (OUSD)
- Senior Housing and Centers
- Residential Care Facilities for Elderly (licensed by California Dept of Social Services)
- Estimated pollution(NO2)-related cardiovascular risk for the elderly (65+)**
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- Prohibited Truck Routes
- Designated Truck Routes
- BC (micrograms per m3)
- BC 50th percentile
- BC 75th percentile
- BC 90th percentile
- NO2 (ppb)
- NO2, 50th percentile
- NO2, 75th percentile
- NO (ppb)

Background on West Oakland Air Pollution Studies

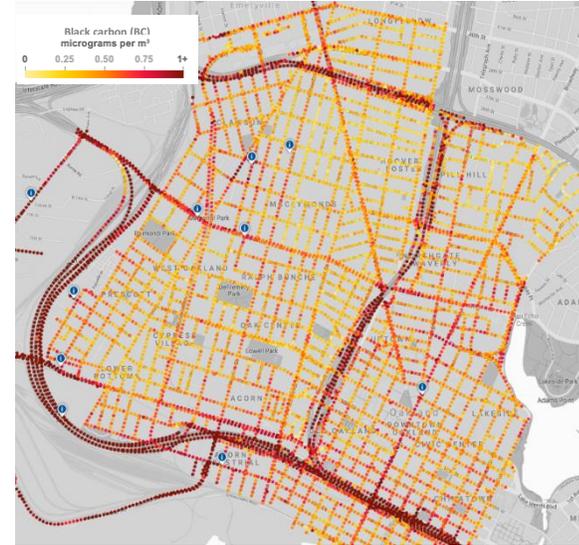
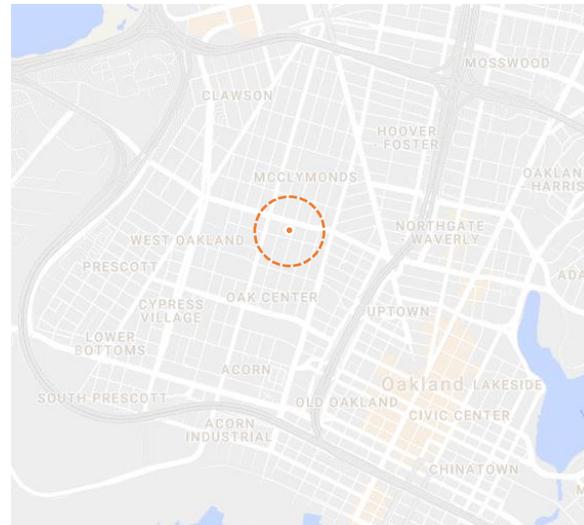
Regulatory air pollution monitoring for West Oakland, CA: 1 stationary site



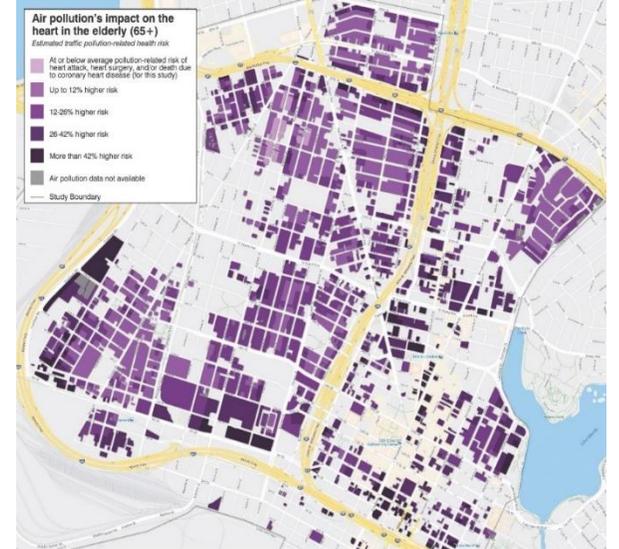
Data: 1 year of air pollution measurements (BC, NO, NO₂) using fast response sensors on Google Street View cars.



Data: Electronic medical records of 41K people insured by Kaiser Permanente health care, linked with air pollution at residential address.

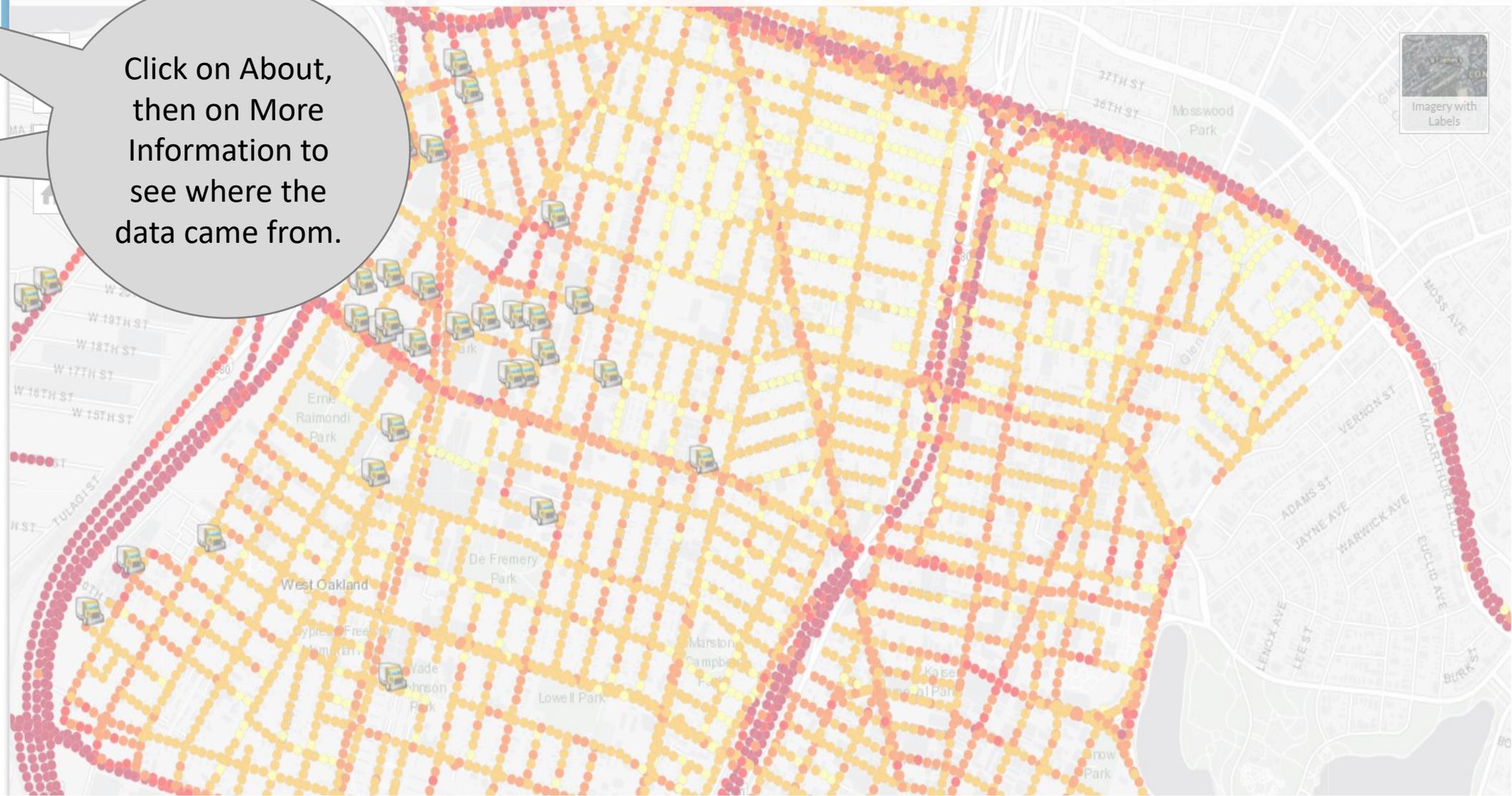


Finding: Within West Oakland, some areas had **5-8 times** higher median pollution levels than others. Many parts of the neighborhood had higher air pollution than levels measured at the central regulatory monitor.



Finding: Elderly residents (age 65+) living in areas of West Oakland with the highest concentrations of NO₂ would have **>40% greater risk** of a cardiovascular disease event than those in less polluted areas of the neighborhood.

West Oakland Air Pollution Maps
Last modified 9/26/18, 10:55 AM
211 views.
[More information](#)



Truck-Attracting Businesses

- Overview
- Data
- Visualization



Shipping, Trucking, and Trans
 Feature Layer by [gzayasdelrio](#)
 Created: Sep 24, 2019



Description

Source: West Oakland Works <http://www.westoaklandworks.com/our-directory>
 From the West Oakland Works list we selected businesses categorized as "shipping, trucking, and transportation" to include in this data layer. Data may be incomplete and/or not fully updated.

Layers

Truck_Businesses

Terms of Use

No special restrictions or limitations on using the item's content have been provided.

[Open in Map Viewer](#)

Details

Source: [Feature Collection](#)
 Size: 33 KB
 ★★★★★



Owner

[gzayasdelrio_edfmaps](#)

Tags

[Oakland](#), [trucks](#), [magnets](#)

Credits (Attribution)

No acknowledgements.

4. What information or insights can you get from the tool

Black carbon levels

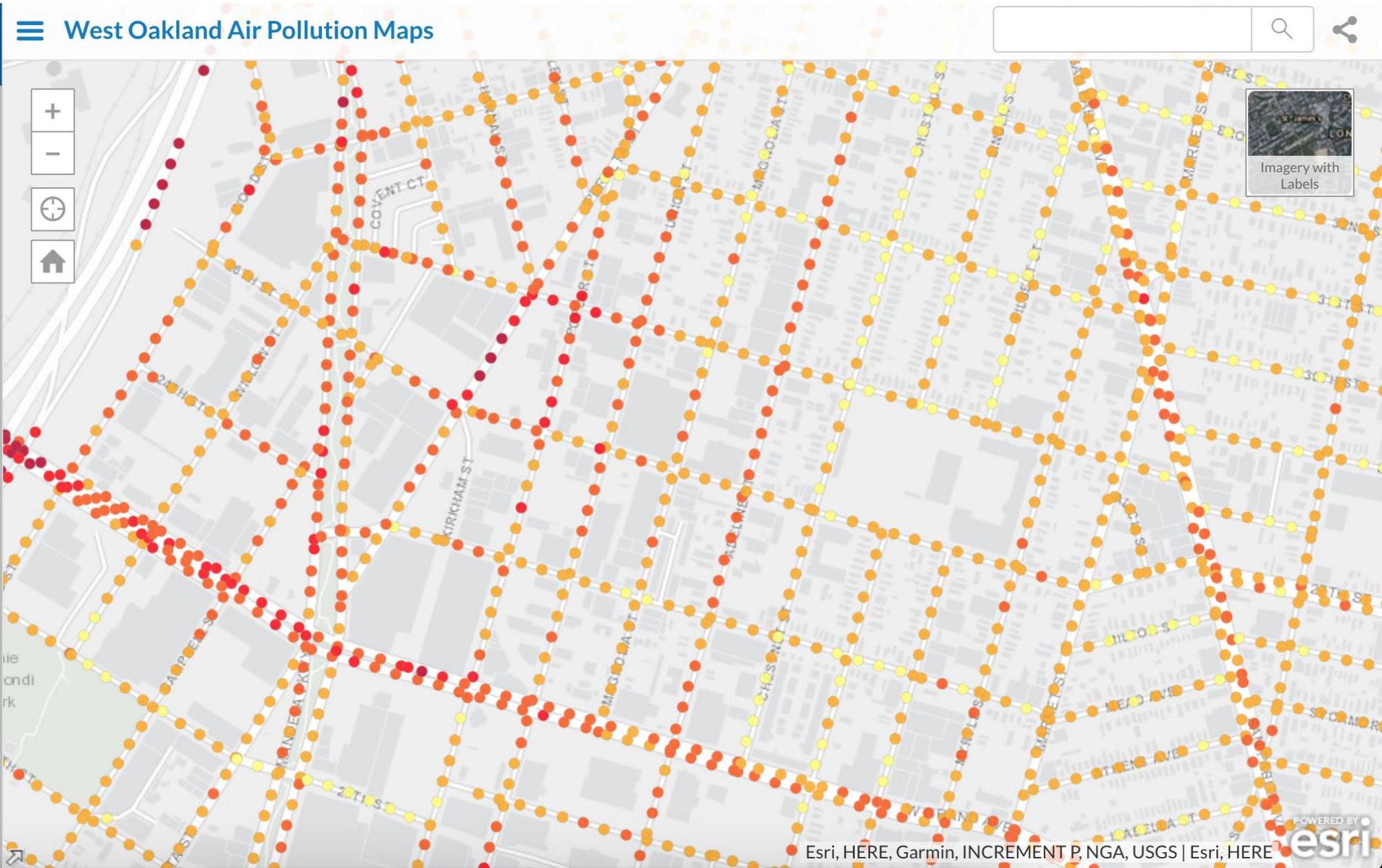
Legend About Layers

Legend

BC (micrograms per m3)

BC_Value

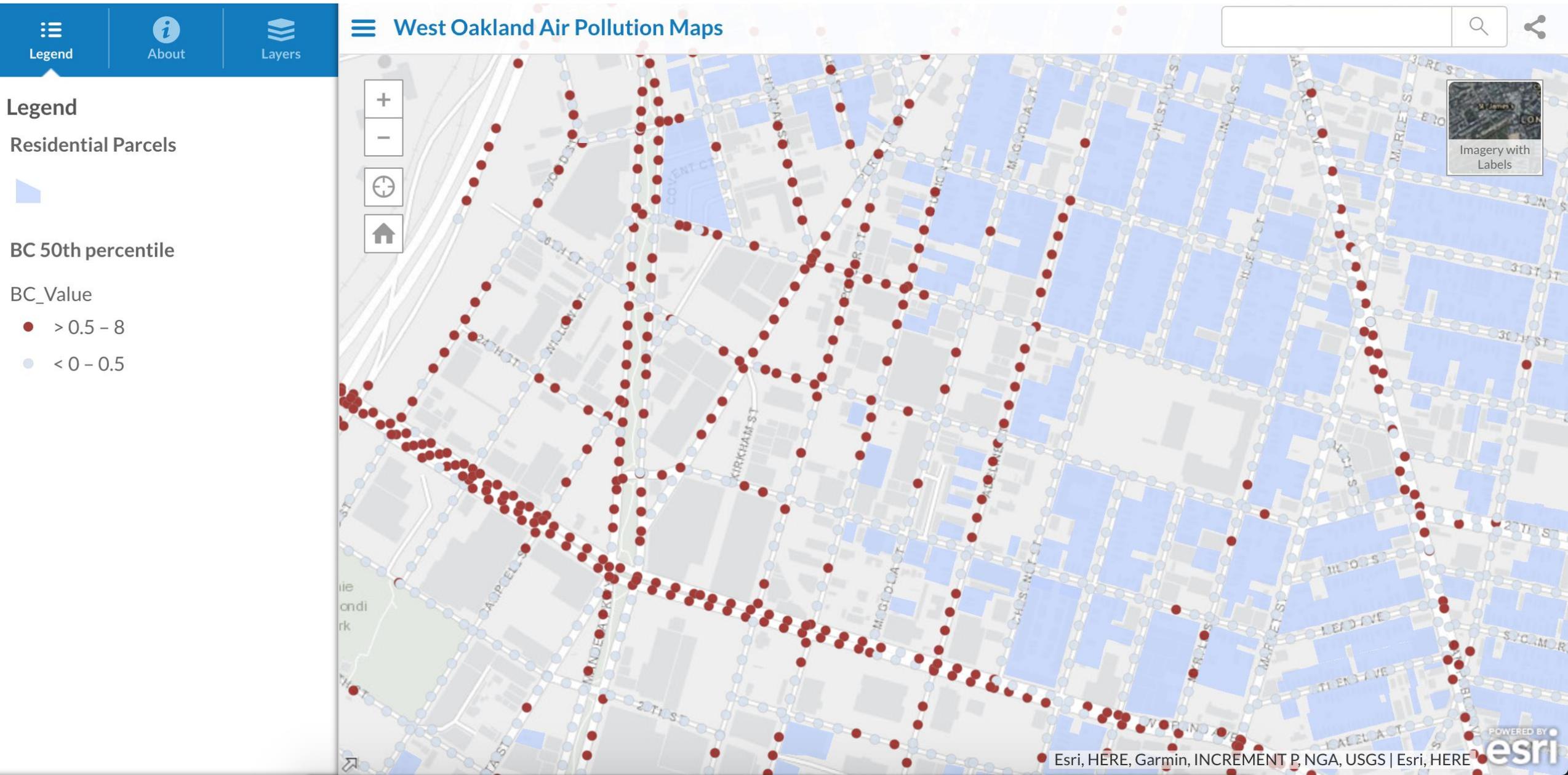
- > 1 - 8
- > 0.75 - 1
- > 0.5 - 0.75
- > 0.25 - 0.5
- 0 - 0.25



Where black carbon levels are higher than area median



Where black carbon levels are higher than area median & residential areas



Truck routes

Legend About Layers

West Oakland Air Pollution Maps

Search [] Share []

Legend

Residential Parcels

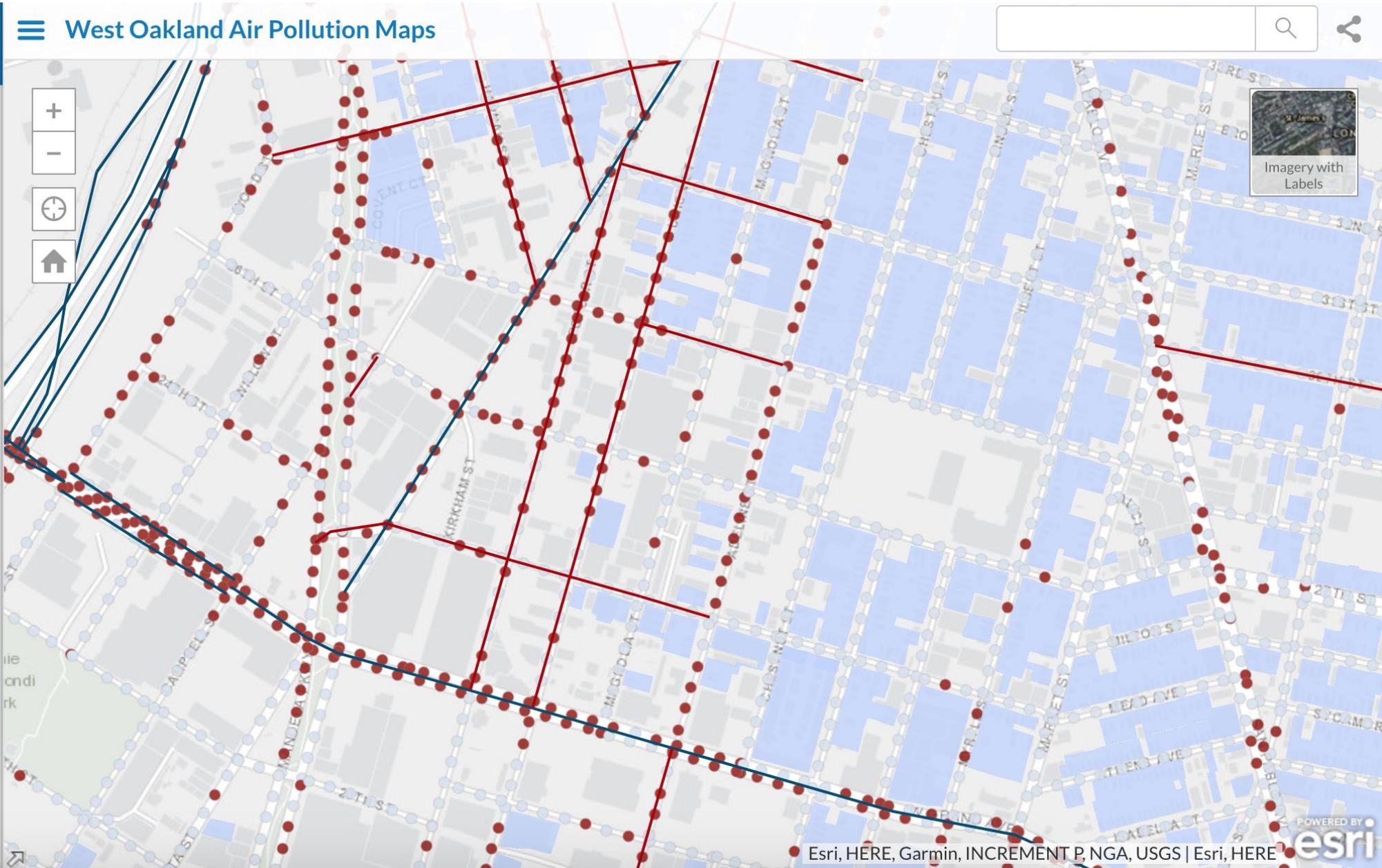
Prohibited_Truck_Routes

Designated_Truck_Routes

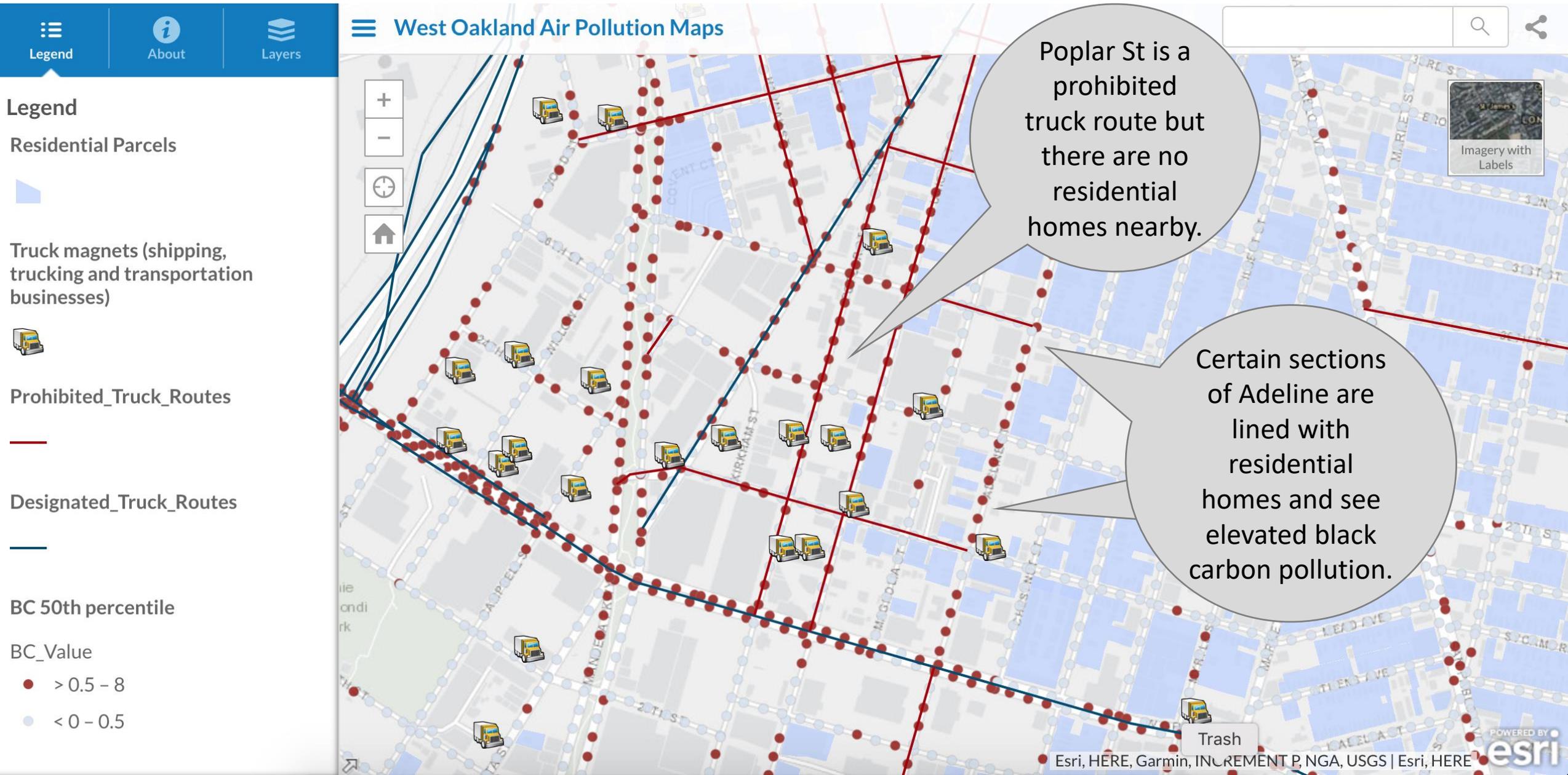
BC 50th percentile

BC_Value

- > 0.5 - 8
- < 0 - 0.5



Potential impact on residents who live near industrial zone and where trucks frequent





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