Diesel Pollution In Lents

June 2016 – October 2016

Oregon Environmental Council | ROSE Community Development's Lents Youth Initiative
Livable Lents project of Green Lents

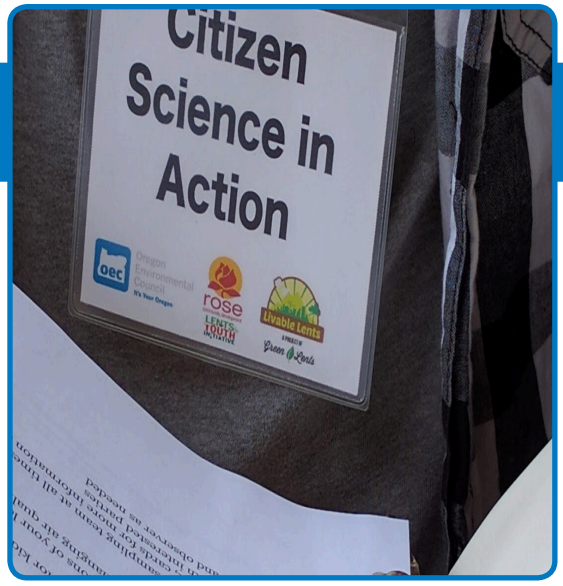
Oregon Environmental Council
It's Your Oregon

Livable Lents
Green Lents

ROSE community development

LENTS YOUTH initiative

ABOUT COMMUNITY AIR SAMPLING



Information is power: and observation is the first step to an informed public. Only when we are aware of the potential pollution in our neighborhoods can we can work together on solutions.

We designed this community air sampling project to build awareness of diesel pollution in our lives. Community members identified locations of concern and then conducted observations and air quality sampling at those locations.

The result is a series of air quality "snapshots" revealing personal exposures to diesel pollution.

National models predict that we have reason to be concerned about diesel pollution in our neighborhoods. But they don't provide a clear picture of local pollution: what we breathe as we wait for the bus, play in the park—or what pollution might end up inside our homes and in community spaces.

To better understand diesel pollution in our lives, community members conducted an air sampling project. Our team worked to LOCATE, OBSERVE and MEASURE the fine black carbon particles found in diesel pollution.

LOCATE

First, we identified places where diesel engines are likely to be used and where community members spend time outdoors. We focused on places where there may be children, the elderly and people with health challenges who are most vulnerable to air pollution.

OBSERVE

Second, we spent time in those spaces making observations about what we see, smell, hear and feel. We also take notes on how people are spending time in the space, whether they are passing through orlingering. Just using our senses can give us a better idea of air pollution sources and exposures.

MEASURE

Third, we used a micro-aethalometer to measure fine black carbon particles in the air. When these measurements are matched to our observations, we get a better idea of how a passing diesel truck—or other source of particle pollution—might affect the air we breathe.

We hope that by gathering and sharing this information, our neighbors will have a better idea of how diesel engines affect our air quality.

MICRO-AETHALOMETER ("micro-eth-el-ah-meh-ter" AKA "micro-eth") This air sampling device is about the size of a bulky cell-phone with a small tube attached.

The machine runs air across a tiny white filter. Then, it shines a light on the filter and measures how much light is absorbed by the miniscule dark particles of black carbon. Measuring black carbon helps us see particles from burning fossil fuel as separate from dust, pollen or other particles.

ABOUT DIESEL POLLUTION IN OREGON

Diesel pollution causes more fatalities than car crashes in Oregon.

Exposure to diesel fumes can harm the heart, lungs and brain. Diesel is also a carcinogen. National models suggest that many counties in Oregon experience diesel exhaust at levels that raise the risk of cancer over a lifetime.

Diesel exhaust in Oregon today is estimated to cause as many as 460 premature deaths each year and cost up to $3.5 billion a year in health costs and lost productivity.

Oregon lags behind neighboring states in addressing this health crisis; in fact, dirty old diesel engines that are no longer allowed in California can be dumped into Oregon where they can run for decades more.

Diesel pollution is an invisible threat

The diesel exhaust particles that are most dangerous to health are microscopic. Fine particles are smaller than red blood cells and ultrafine particles fall within the size range of viruses. Some are too small to be seen even with a light microscope.

Our lungs can trap the larger particles (greater than 2.5μm) so that we can cough them up. Fine and ultrafine particles can reach past our natural defenses in the lungs into sensitive areas, causing inflammation and irritation associated with heart and lung problems. Some particles can actually pass into the bloodstream, and can deliver toxics to other sensitive areas of the body.

Most diesel pollution in Oregon comes from older heavy duty trucks, buses and construction equipment.

Engines made after 2007 meet strict Federal limits for diesel pollution. However, old heavy duty engines last a long time; and in Oregon, they are lasting longer than federal authorities predicted.

Oregon has tens of thousands of older school buses, transit buses, trucks and construction engines running today. What's more, the oldest vehicles tend to operate locally in neighborhoods rather than doing long hauls on the highway.

Diesel hot spots can be found at the workplace and in communities where there are more than average low-income and people-of-color households.

People who are regularly exposed to diesel exhaust at work on railroads, docks, and construction sites, in trucks or buses, or as diesel mechanics have a greater risk of lung cancer.

Communities located at the margins of urban areas near busy roads and highways, rail lines and ports, business and industrial facilities are also likely to experience more air pollution. Many times, these are neighborhoods where there are more low-income families and people of color.

ABOUT THE LENTS COMMUNITY

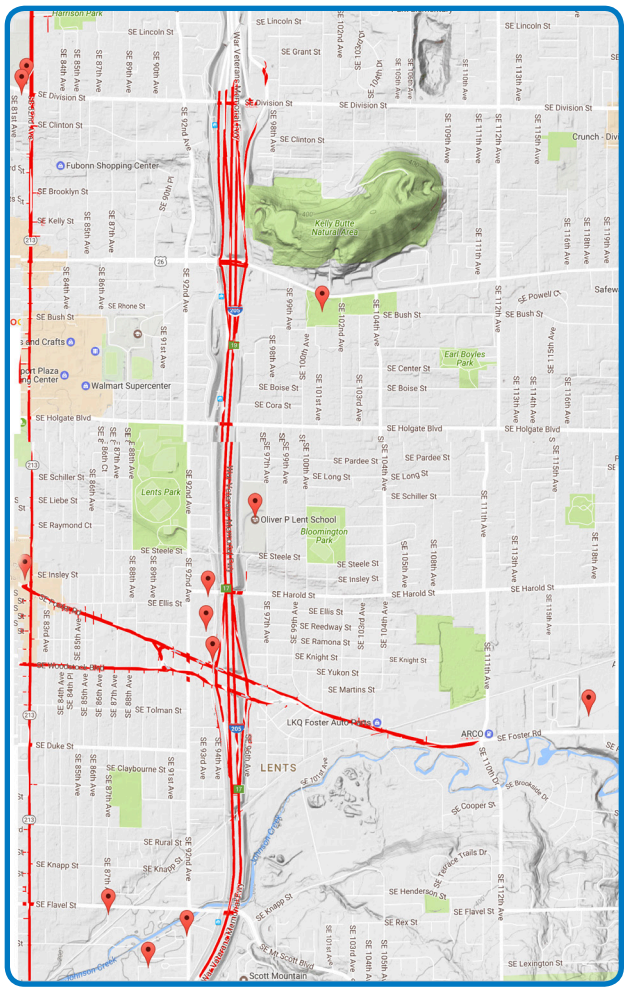
Lents is increasingly a racially and ethnically diverse neighborhood. Today, 1 in 2 residents identifies as a person of color, compared to 1 in 4 in 2000. Nearly 40% of Lents families speak languages other than English at home, including Spanish, Vietnamese, Cantonese, Russian, and Somali.

Lents also has a higher than average proportion of low-income households, as well as more children under the age of five, compared to other neighborhoods in the state.

Many residents in Lents live in close proximity to roadways including Interstate 205, 82nd Avenue and Foster Road.

The red marks on this map indicate the sampling locations for this project. Neighbors chose locations where they were concerned about vulnerable people being exposed to pollution. Locations included parks, schools, community centers, low-income housing and public transportation facilities.

Diesel particulate matter concentrations as predicted by the 2015 National Air Toxics Assessment



Models predict air quality problems in Lents

Because there is no nationwide monitoring network for air toxics like diesel, we rely on models to predict areas of concern. The US EPA uses a model for their National Air Toxics Assessment (NATA). The latest assessment, based on 2011 data, predicts that diesel pollution in Lents is in the 95th percentile compared to other parts of the state.

The map to the left, created by Multnomah County Health Department using US EPA data, displays the estimated concentration of diesel particulate matter in outdoor air. The estimate exceeds Oregon's health benchmark by as much as 20x.

WHAT WE FOUND IN LENTS

Our results: How to interpret the data

A comprehensive scientific research study might measure multiple components of diesel exhaust over a long period of time in many locations. Our project looked only at one component of diesel exhaust–black carbon—over relatively short periods of time. If a comprehensive study is like a feature film, our samples are a series of snapshots.

Comparing our results to Oregon's benchmark

Oregon also has set a benchmark for PM 2.5 fine particles of diesel at ***0.1 µg/m3 of PM 2.5.*** Concentrations above that level pose an unacceptable cancer risk; if people breathed diesel pollution above this benchmark 24 hours a day, 7 days a week for 70 years, then the risk of cancer would exceed Oregon's benchmark.

Our samples found short-term exposures consistently 10-20 times above the state health benchmark and as high as 70 times. We found levels that would increase risk of heart and lung disease as well as increase risk of cancer with consistent exposure over a lifetime.

Our Conclusion

These samples reinforce what national models have suggested: there is reason to be concerned about what we're seeing, and it is time to take action both to understand our exposure and to reduce it.

Using a Micro-Aetholometer provided by Oregon Environmental Council, Green Lents staff and Lents Youth Initiative interns with ROSE Community Development collected air quality samples at ten fixed locations around the Lents neighborhood between September 2016 and October 2016.

LOCATION	30-SECOND AVERAGE *µg/m3 of black carbon PM 2.5*	30-SECOND RANGE *µg/m3 of black carbon PM 2.5*
BELLROSE STATION INDOORS	0.22	-0.6 - 1.02
JAMS SPACE INDOORS	0.25	0.037 - 0.576
LENTS TRANSIT CENTER: PM	0.59	0.19 - 2.49
ZENGER FARM	0.61	0.397 - 0.968
SE 82ND AVE & SE DIVISION	0.69	0.24 - 2.24
BEYER COURT	0.72	0.465 - 1.38
BELLROSE STATION	0.74	0.237 - 1.42
ED BENEDICT PARK	0.83	0.355 - 1.52
LENTS TRANSIT CENTER: AM	1.43	.72 - 6.9
LENT ELEMENTARY	1.61	0.953 - 2.31
MALDEN COURT CMTY ORCHARD	1.67	1.303 - 2.013
SE 82ND & SE FOSTER	8.86	5.62 - 16.1
OREGON HEALTH BENCHMARK	0.1 µg/m3 of PM 2.5	

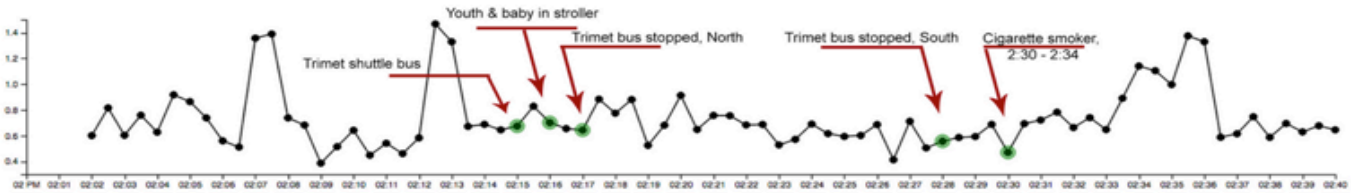
- "Average" is the sample average every 30 seconds after cleaning data of any erroneous values.
- "Range" is the 5th Percentile - 98th Percentile of black carbon measured at each location.

BEYER COURT APARTMENTS (A ROSE PROPERTY)

9/15/16, 1:45 PM - 2:40 PM

BUS STOP 10 FEET FROM THE CURB, IN FRONT OF BOYS & GIRLS CLUB

AVERAGE CONCENTRATION: 0.72 UG/M3 RANGE: 0.465 - 1.38

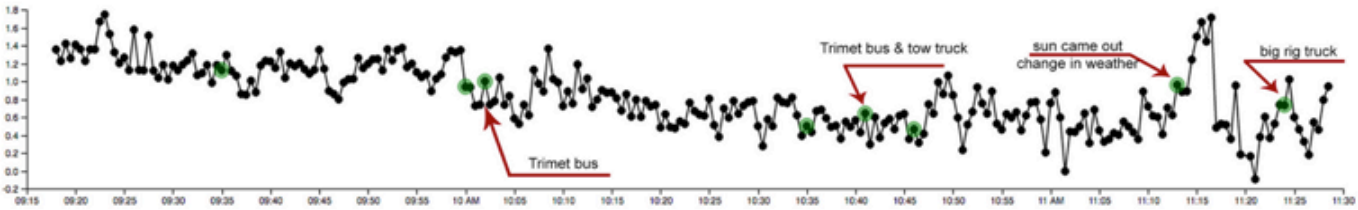


Plot showing the concentration of black carbon (ug/m3) over the course of the study. Any observations that were logged during the study are shown as larger circles along the path.

ED BENEDICT COMMUNITY PARK 9/24/16, 9:02 AM - 11:30 AM

SATURDAY MORNING BETWEEN SKATE PARK AND SOCCER FIELD, 100 FT FROM POWELL BOULEVARD

AVERAGE CONCENTRATION: 0.83 UG/M3 RANGE: 0.355 - 1.52



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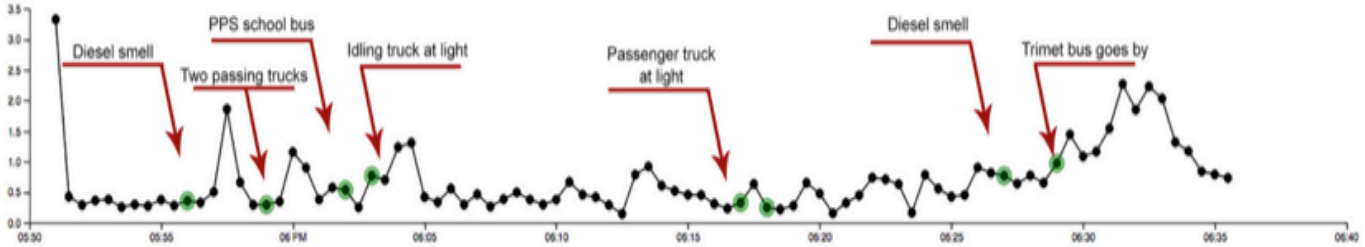
SE 82ND AVE & SE DIVISION ST 9/6/16, 5:50 PM - 6:40 PM

NW Corner, 5 feet from the street

Average concentration: 0.69 ug/m3 Range: 0.24 - 2.24



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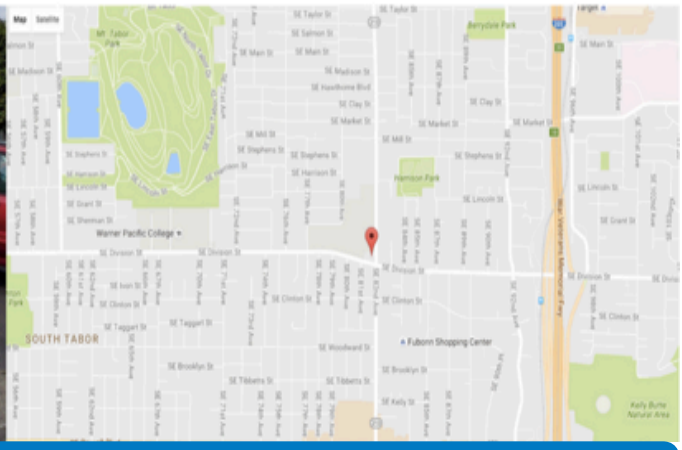
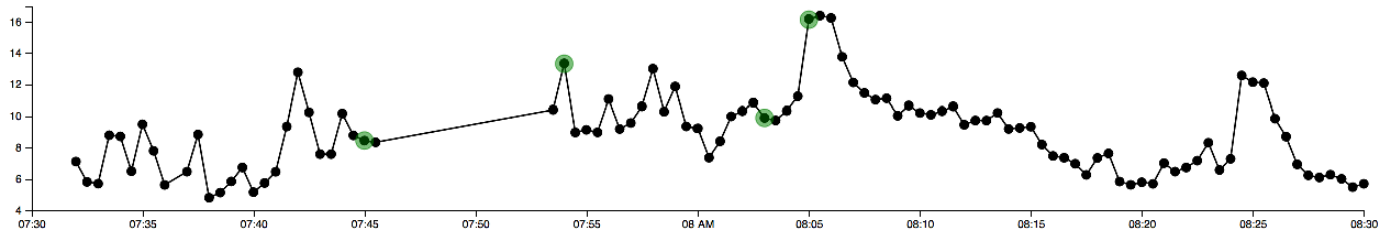


SE 82ND AVENUE & SE FOSTER STREET 10/21/16, 7:19 - 8:30 AM

Morning rush hour, 5 feet from Foster road

Average concentration: 7.46 ug/m3 Range: 5.6 - 8.9



“Some days I’m around traffic a lot waiting for buses. And it does affect me.”

Richard Rollins is a retired veteran who lives at Beyer Court. He gets around by public transit and walking, frequently visiting 82nd and Foster. Richard has emphysema. He believes a lot could be done to make diesel engines cleaner.

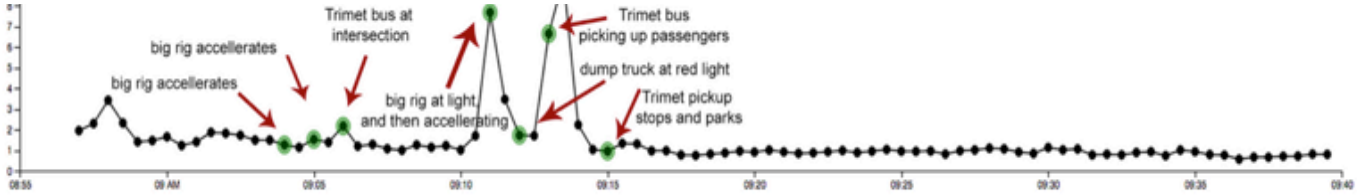
Tanesha Dawson lives at Bellrose Station and gets around by car and public transit. She spends time at area schools and parks. Tanesha experiences asthma and migraines. She is concerned about her family’s health as well as the socio-economic disparities she sees evident in air quality, housing and education policies.

“You can’t live if you can’t breathe. Struggling to try to do that just makes everything else really hard.”

LENTS TRANSIT CENTER 9/7/16, 5:01 PM - 6:00 PM

15 FEET FROM BUS STOP

AVERAGE CONCENTRATION: 0.59 UG/M3 RANGE: 0.19 - 2.49



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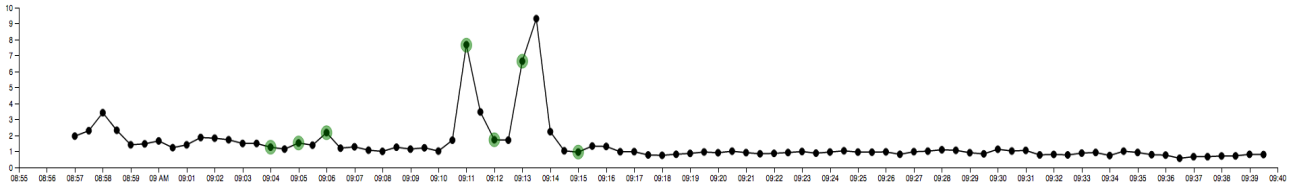
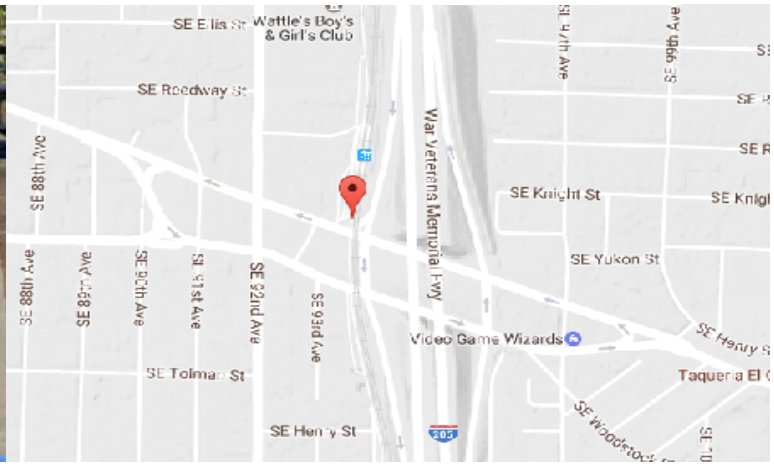
LENTS TRANSIT CENTER MORNING 9/8/16, 8:57 AM - 9:40 AM

15 FEET FROM BUS STOP

AVERAGE CONCENTRATION: 1.43 UG/M3 RANGE: 0.72 - 6.95





"I know that diesel, which we get a lot of here from I-205, is one of the worst pollutants we've got. It runs right down the middle of the neighborhood, and we're breathing it day and night."

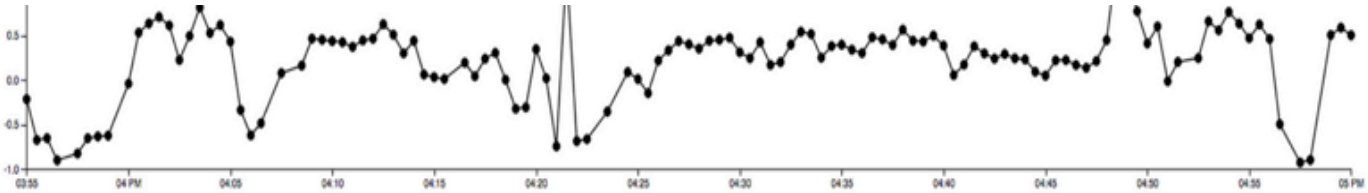
Barbara Bader enjoys being involved in her community. She lives just north of Lents Park, and gets around the neighborhood mostly by walking. She frequently visits Zoighaus brewery, Lents Town Center and Lents Park. She is concerned about the health of her neighbors, especially young children.

Elsa San Juan lives at Bellrose Station. She and her three children drive and walk in the neighborhood. She spends time at Zenger Farm, at area schools and at 82nd and Foster. Elsa's neighborhood concerns include her family's health, traffic, and homelessness.

"It doesn't matter what day of the week it is, there's always a lot of traffic."

BELLROSE STATION HOUSING (A ROSE PROPERTY)
9/27/16 3:55 PM - 5:00 PM

Average concentration: 0.74 ug/m3 Range: 0.237 - 1.42



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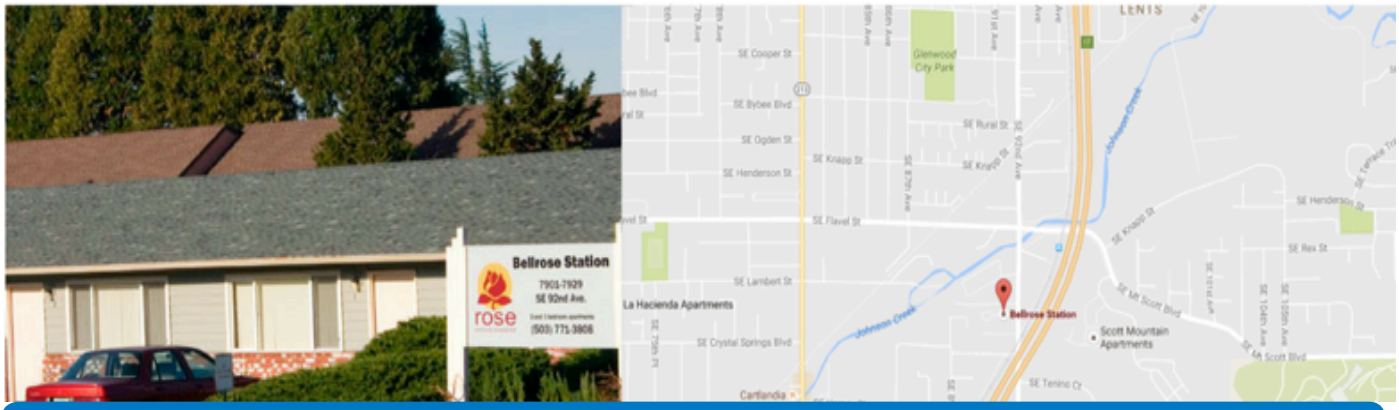
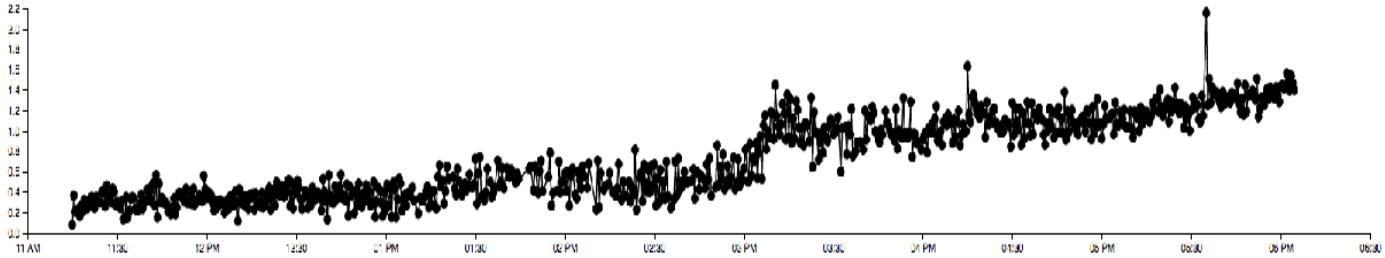
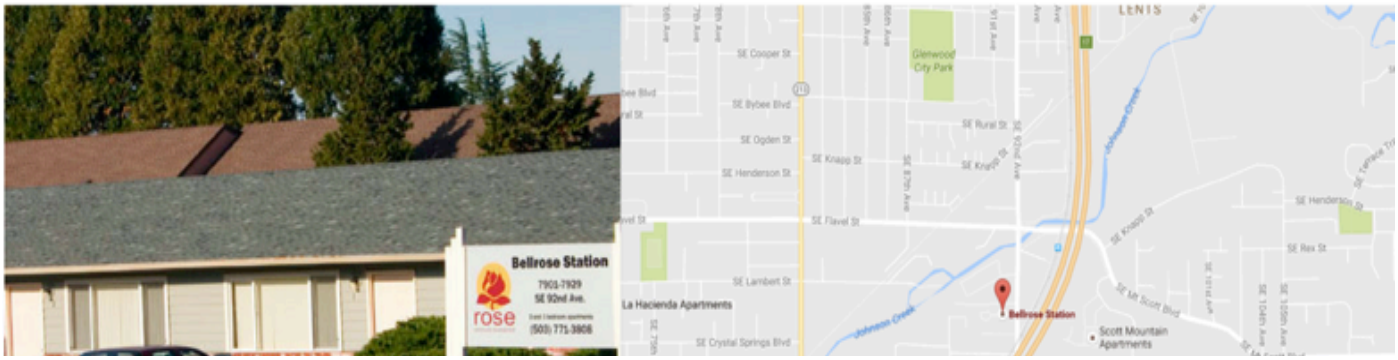


BELLROSE STATION HOUSING (A ROSE PROPERTY) INDOORS
10/31/16 11:00 AM - 6:30 PM in a community room near a closed window

Average concentration: 022 ug/m3 Range: -0.67 - 1.02





Maria Isela Manzo is raising her children at Bellrose Station. She gets around by car and public transit, and spends time at Lane Middle School and area parks. She is concerned about her family's health and hopes our representatives will enforce stricter emissions standards

"We all know each other here and I like it. It's calm and safe for my kids."

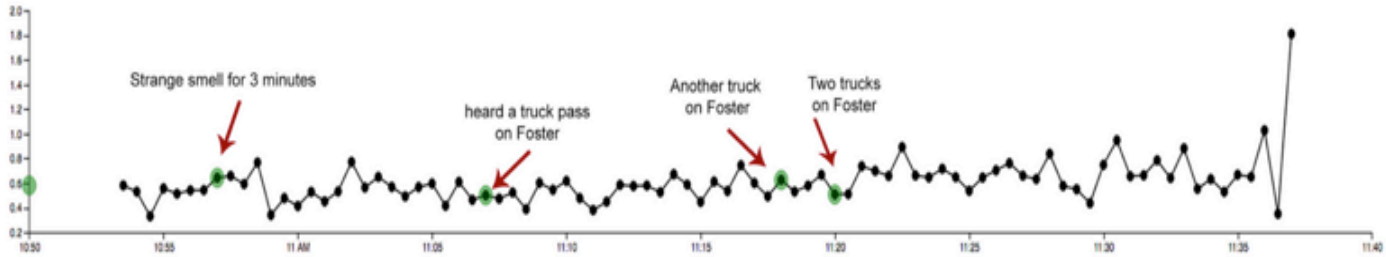
Valeen Hurley, a life-long resident of Lents, is happy about how much the neighborhood has improved. She lives at Bellrose Station and gets around by walking and public transit. She visits Flavel MAX station and Gateway often. She suffers from asthma.

"I think we blend together, you know. There's a lot of different kinds of people living here and it's really nice."

ZENGER FARM URBAN FARM AND EDUCATION SPACE

9/22/16 , 10:37 AM - 11:37 AM, BWTQEEN FARMHOUSE AND BARN 250' FROM FOSTER ROAD

AVERAGE CONCENTRATION: 0.61 UG/M3 RANGE: 0.397 - 0.968



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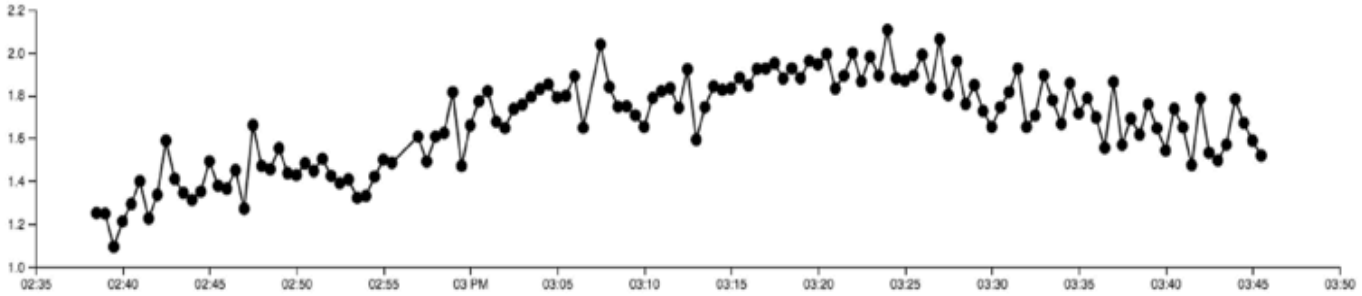
MALDEN COURT COMMUNITY ORCHARD

11/11/16 ,2:35 PM - 3:50 PM

AVERAGE CONCENTRATION: 1.67 UG/M3 RANGE: 1.303 - 2.013



"I don't think I can detect a difference in pollution with my bare senses."

Jacob Hunt is a Lents resident who bikes, walks and uses public transit. He often visits the Malden Court Community Orchard. Jacob is concerned about equity and homelessness in his neighborhood and wishes local government would pay more attention to the priorities of Lents residents.

"I think it's more contaminated where I work because there isn't vegetation in that area."

Maria Estela Suarez lives at Bellrose Station and works at El Pato Feliz. She gets around by car and public transit, frequently visiting Lents Town Center and area stores. She is concerned about homelessness in her neighborhood and the health of her neighbors. She would like to see more trees planted in the neighborhood.

"That's the new playground!"

Lucy Hilkiah lives in Lents and gets around her neighborhood mostly by walking. She goes to kindergarten at Lent school. She likes the new playground, her teachers, and playing with her friends.

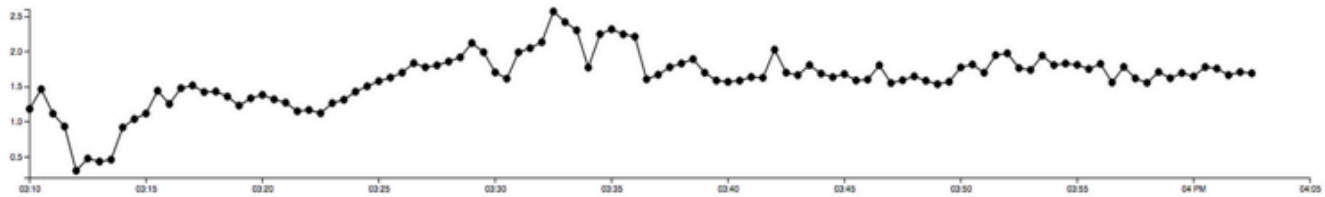
"Sometimes I can smell the exhaust from cars both on 82nd Avenue and from I-205. It's a health risk."

Amy Hilkiah lives in Lents, where she drives a car and walks.She spends time at Lent elementary and Malden Court orchard. She is concerned about the health of neighborhood children and her daughter who play outside near the freeway.

LENT ELEMENTARY 11/03/16 3:10 PM - 4:05 PM

Monitoring during school dismissal period, about 300 FT from highway I-205

Average concentration: 1.61 ug/m3 Range: 0.953 - 2.31



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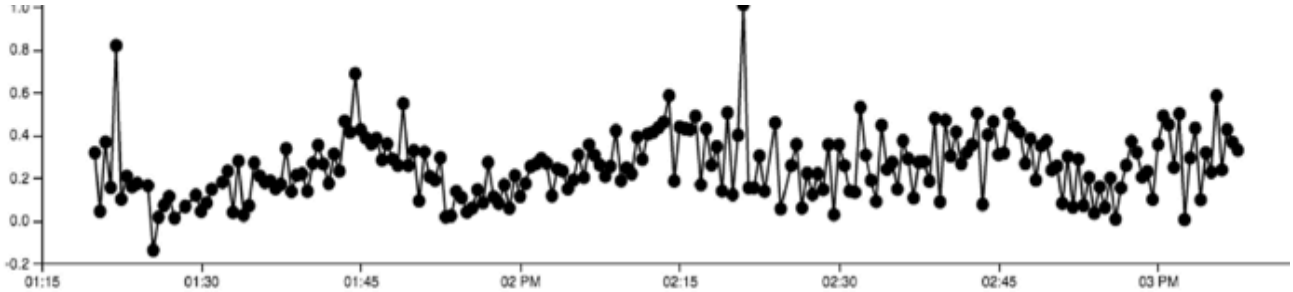
JADE/APANO MULTICULTURAL (JAMS) SPACE, INDOORS

10/18/16 , 1:15 PM - 3:15 PM, 2 FT from windows and doors

Average concentration: 0.25 ug/m3 Range: 0.037 - 0.576



Green Lents is a nonprofit founded in 2009 and supported by neighbors who work to promote a culture of sharing and environmental sustainability in and around the Lents neighborhood. Green Lents works in teams of volunteers to help support local projects that the community has prioritized to create a more sustainable and thriving community. Green Lents took the lead in observation and sample collection for this pilot project. www.greenlents.org

ROSE Community Development is dedicated to serving the needs of outer Southeast Portland communities by developing affordable housing and helping to create educational and economic opportunities. ROSE supervised interns in the Lents Youth Initiative, who performed observations and sample collection. ROSE also engaged interns to design and produce videos and other materials to present results to the community. www.ROSEcdc.org

Oregon Environmental Council advances innovative, collaborative and equitable solutions to Oregon's environmental challenges for today and future generations. OEC provided equipment, technical expertise and project management for the pilot project. OEC will ensure that the project design and materials are shared with other communities who wish to conduct sampling projects. www.oeconline.org