

**FAIRNESS
FOR FAIRVIEW**

IT'S TIME.

Fairview Air Quality Monitoring:

Air Quality in the Fairview
Neighborhood of Anchorage, AK

SUMMARY REPORT

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The Fairness for Fairview initiative is a collaborative partnership between the Fairview Community Council and NeighborWorks Alaska. This project is possible through an Environmental Justice Small Grant from the U.S. Environmental Protection Agency and a Community Leadership Institute grant from NeighborWorks America.

Community members in the Fairview neighborhood of Anchorage, Alaska, make up the backbone of this effort. This includes the Fairview Community Council Executive Board members of Allen Kemplen (president), SJ Klein (vice president), Sharon Chamard (treasurer), Loren Hill (secretary), and members-at-large James Thornton, Laura Orega de Gaffory, Denise Janson, Karen Gonné-Harrell, and David Rittenberg. Through NeighborWorks Alaska, Lindsey Hajduk serves as the Director of Community Engagement & External Affairs and staffs this effort.

The Fairview Air Monitoring project could not have happened without the guidance and support of the Alaska Department of Environmental Conservation (DEC) Division of Air Quality, Air Monitoring, and Quality Assurance. This team helped develop the Quality Assurance Project Plan, compile and analyze the air quality data, and assisted with questions and interpretation. The DEC team includes Lydia Johnson, Taylor Borgfeldt, and Barbara Trost. The Anchorage Health Department's Matthew Stichick also supported the development of the Quality Assurance Project Plan.

For more information on the Fairness for Fairview initiative, visit: www.FairviewAK.org



Executive Summary

Fairness for Fairview: It's Time.

Residents within the neighborhood of Fairview in Anchorage, AK, are working to empower residents and transform their community. The latest effort began in 2022 as “Fairness for Fairview: It’s Time.” The Fairness for Fairview initiative is a collaborative partnership between the Fairview Community Council (FVCC) and NeighborWorks Alaska (NWAK). Through this effort, community residents are invited to participate in team building, workshops, networking, and neighborhood projects to make Fairview a safer, more connected, and vibrant neighborhood.

The Fairness for Fairview initiative has three main focuses:

Fairness for Fairview Projects:

We work on projects that heal the Gambell-Ingra Corridor, including through community events, air quality monitoring, and more.

Activating a Fairview Action Team:

We train local residents to organize neighbors to create the future they want to see. These efforts guide and shape our projects.

Creating the Voices of Fairview Stories:

We showcase neighborhood leaders that represent the diverse fabric of people that make Fairview home.

Air Quality and Your Health

Particulate matter, noted as PM, is a term for the mixture of solid particles and liquid droplets found in the air, such as soot, dust, dirt, or smoke¹. There are many sources of PM, including construction sites, unpaved roads, smokestacks or fires, and atmospheric particles may be from power plants, industries, or automobiles.

This study focused on fine particles called PM_{2.5}, because these particles can enter the lungs or bloodstream, and have been linked with a variety of problems, including premature death in people with heart or lung disease, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms, such as irritation of the airways, coughing or difficulty breathing.

¹EPA “What is PM, and how does it get into the air?” <https://www.epa.gov/pm-pollution/particulate-matter-pm-basics#PM>

Impact of Air Quality in the Fairview Neighborhood of Anchorage, AK

This project set out to learn more about the air quality within the Fairview neighborhood over the course of one year. The intention was to assess fine particle concentration data in correlation with highway or airport traffic counts and meteorological conditions. However, after reviewing the data from the year, there were few causes for concern identified. Instead, based on this study our current findings do not indicate any references to any health hazards.

Although we did not find significant data to suggest $PM_{2.5}$ air quality is a serious issue, there are interesting variations of note and potential next steps to learn more.

In general, evening air quality readings were higher than during the daytime as compared to evenings, as well as higher during the winter as compared to the summer. Idling vehicles and roadway dust may play a role in the air quality readings, but behaviors outside of transportation can contribute to air quality, including wood burning, temperature inversions, lawn mowing, or grilling.

To learn more about the variations of air quality in the neighborhood, the Fairview Community Council shares the following recommendations:

- 1 Continue collecting air quality data** for the next year and provide an updated analysis.
- 2 Identify locations of interest** based on the current data, such as Ingra St. and 10th Ave., and collect transportation data in addition to air quality data for a more definitive comparison analysis.
- 3 Cluster air monitors** around the transportation corridor (up to 500 feet) to compare to the control site for a clearer focus along the highway corridor.
- 4 Consider collecting additional data**, including for noise, as this was a request from numerous community members throughout the air quality analysis study.

Overview of “Fairness for Fairview: It’s Time.”

For decades, residents within the Fairview neighborhood in Anchorage, AK, have been working to empower residents and transform their community. The latest effort began in 2022 as “Fairness for Fairview: It’s Time.” The Fairness for Fairview initiative is a collaborative partnership between the Fairview Community Council (FVCC) and NeighborWorks Alaska (NWAK). Through this effort, community residents are invited to participate in team building, workshops, networking, and neighborhood projects to make Fairview a safer, more connected, and vibrant neighborhood.

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Overall, the guiding goals for the Fairness for Fairview initiative are to:

- **Make Fairview whole.** Correct the wrongs that have been inflicted on Fairview, like disinvestment, unsafe roads, pollution, and more.
- **Put environmental justice first.** Address ongoing environmental injustices, including health and economic inequities.
- **Shape our future.** Enact Fairview’s community vision in the Anchorage 2040 Land Use Plan & Fairview Neighborhood Plan.
- **Revitalize Fairview.** Improve economic conditions, strengthen community resilience, improve health outcomes, and advocate for a more livable Winter City.
- **Reduce the highway’s impact.** Be innovative with options, like the Fairview Greenway, three-lane road diet, and more.
- **Safety for all.** Include pedestrian, bicycle, and transit users at every step.
- **Better public engagement.** Improve outreach by working with residents of all backgrounds. Meet us where we’re at.

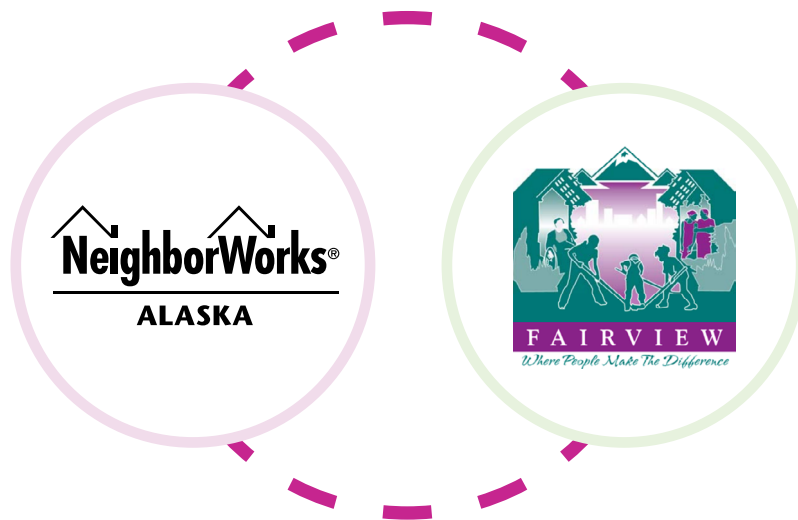
Partnership

NeighborWorks Alaska (NWAK) has served the Fairview neighborhood through providing affordable housing at its Merrill Crossing property. NWAK is a Community Housing Development Organization dedicated to improving the quality of life for families and individuals by preserving homes, creating new housing opportunities, and strengthening neighborhoods. NWAK has a long history of working with disenfranchised neighborhoods to create successful partnerships for neighborhood revitalization. NWAK currently houses nearly 2,000 residents in affordable housing across Anchorage, including in Fairview, and is dedicated to community engagement and advocacy to make our neighborhoods safer and more vibrant.

The Fairview Community Council (FVCC) is the official recognized voice of neighborhood residents since the formation of the unified Municipality of Anchorage in 1975. The FVCC motto is: “Fairview: Where People Make the Difference.” Fairview leaders are strong and passionate advocates for citizen participation in the public decision-making process.

NWAK and FVCC began this formal partnership in 2021 and will continue efforts beyond 2023 thanks to a recent award for a Reconnecting Communities Pilot Program from the U.S. Department of Transportation. This is the first-ever Federal program to reconnect communities previously cut off from economic opportunities by transportation infrastructure. Efforts will begin in 2023 through 2025.

More information on the Fairness for Fairview initiative is located at: www.FairviewAK.org



Air Monitoring Project Purpose

The Fairview Community Council (FVCC) is working in partnership with NeighborWorks Alaska (NWAK), the State of Alaska Department of Environmental Conservation (DEC) Air Division, and the Anchorage Health Department (AHD) to collaborate on an air quality monitoring project in the Fairview neighborhood in Anchorage, Alaska.

FVCC and NWAK, with the assistance of DEC's Air Monitoring and Quality Assurance Program, sponsored a citizen-led air quality monitoring study in Fairview during the April 2022 – May 2023, focusing on the overall ambient air quality. A saturation study places many air monitors throughout a study area to evaluate the local air quality patterns. For this study, fine particulate matter ($PM_{2.5}$) is an indicator for traffic related combustion sources, like vehicle and aircraft exhaust. Other sources that might impact the measurements are home heating emissions, neighborhood grilling activities, as well as wildfire smoke. With the support of DEC, residents established a network of approximately 20 Purple Air PA-II-SD (PA) real-time particulate matter sensors to assess $PM_{2.5}$ levels along the highway and the Merrill Field airport in Fairview.

The study objectives are:

- 1 to increase public understanding of air quality and air monitoring through community engagement and education;
- 2 to address ambient air quality complaints centered on transportation emissions;
- 3 to determine which areas of Fairview are most affected by $PM_{2.5}$;
- 4 to assess if the scale in terms of frequency, duration, spatial variability and severity of these impacts has the potential to significantly affect public health and/or violate Clean Air Act air quality standards.

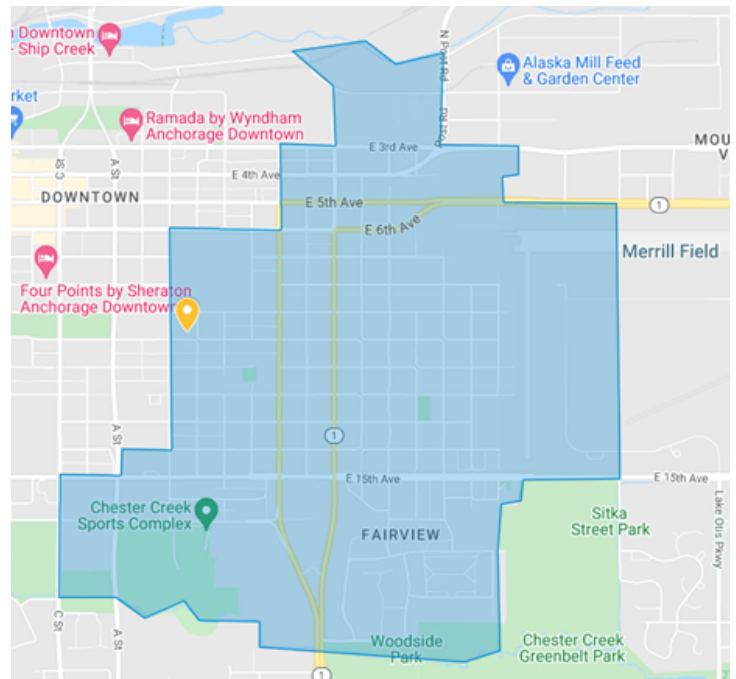


Air quality impacted by transportation-related emissions can potentially have negative impacts on public health, especially within systematically under served communities. Currently only two regulatory air monitoring sites exist within the Anchorage Bowl. This project established a network of PurpleAir low-cost air monitoring sensors with a focus on $PM_{2.5}$ within the Fairview neighborhood, and involved community members to engage in the monitoring and educate each other throughout the process.

Neighborhood Background

The Fairview Community Council area is located east of Downtown Anchorage and is one of the city's oldest neighborhoods. Fairview has a population of approximately 7,918 individuals in 3,290 households, according to 2014-2018 American Community Survey (ACS) estimates. The 1.33 square mile community consists of Census Tracts 9.02, 10 and the western sections of Census Tracts 9.01 and 6 (see "Other Attachments" for a map). The area is demographically disadvantaged, both within Alaska and Environmental Protection Agency (EPA) Region 10. Nearly half of the population (47%) is low income and 15 percent of the population has less than a high school education--twice the state percentage. People of color comprise a sizeable part of the population (62%) and seven percent of the population is linguistically isolated. Eighty-four percent of occupied housing units are rentals.²

Fifty years ago, the city and state converted two local streets to serve as high-speed arterials connecting the Glenn and Seward Highways, effectively creating a highway of an eight-lane couplet separated by one street and averaging 25,000 vehicle trips per day.³ Fairview is also bounded on the east by the Municipally-owned Merrill Field, one of the nation's busiest general aviation airfields. Aircraft frequently violate published departure procedures and conduct air operations below the required minimum elevations for an urban area. This results in significant disproportionate environmental and public health impacts relative to Anchorage, Alaska, and EPA Region 10. The affected area is in the 98th percentile in Alaska and 89th percentile in the United States for traffic proximity and volume.⁴



Map of Fairview Community Council in relation to neighboring councils within Anchorage, Alaska. FVCC area is marked in blue.

² EJSCREEN ACS Summary Report

³ See http://www.dot.alaska.gov/stwdplng/transdata/traffic_AADT_map.shtml

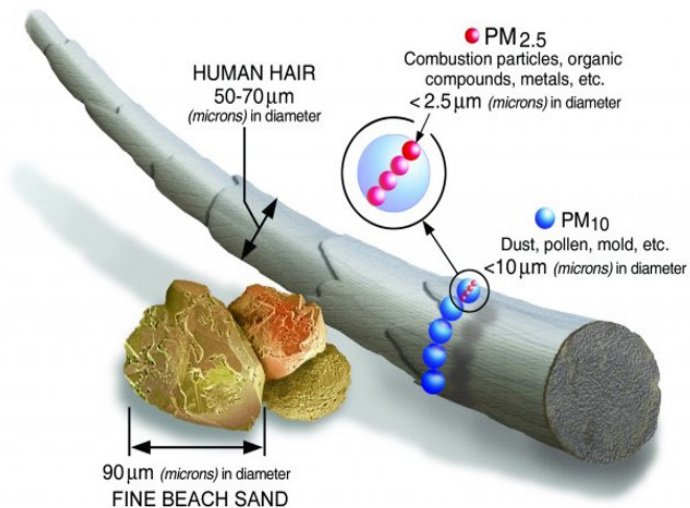
⁴ EJSCREEN Report

Air Quality and Your Health

Particulate matter, noted as PM, is a term for the mixture of solid particles and liquid droplets found in the air, such as soot, dust, dirt, or smoke.⁵ There are many sources of PM, including construction sites, unpaved roads, smokestacks or fires, and atmospheric particles may be from power plants, industries, or automobiles.

This study focused on fine particles called PM_{2.5}, which include fine particles with diameters 2.5 micrometers and smaller, or 30 smaller than the human hair. These fine particulates are of most concern for health. These particles can enter the lungs or bloodstream, and have been linked with a variety of problems, including:

- **premature death in people with heart or lung disease**
- **nonfatal heart attacks**
- **irregular heartbeat**
- **aggravated asthma**
- **decreased lung function**
- **increased respiratory symptoms**, such as irritation of the airways, coughing or difficulty breathing.



EPA's size comparisons for PM particles.

People with heart or lung diseases, children, and older adults are the most likely to be affected by particle pollution exposure.⁶ Fine particulates also cause reduced visibility and haze, or can be carried by wind to settle on ground or water, which can affect sensitive ecosystems.

⁵ EPA "What is PM, and how does it get into the air?" <https://www.epa.gov/pm-pollution/particulate-matter-pm-basics#PM>

⁶ EPA "Health and Environmental Effects of Particulate Matter (PM)" <https://www.epa.gov/pm-pollution/health-and-environmental-effects-particulate-matter-pm>

Transportation and Air Quality

Air pollutants from cars, trucks and other motor vehicles are found in higher concentrations near major roads, which includes fine particulate matter. Beyond vehicles' tailpipe and evaporative emissions, roadway traffic also emits brake and tire debris and can throw road dust into the air. Individually and in combination, many of the pollutants found near roadways have been associated with adverse health effects. People who live, work or attend school near major roads appear to have an increased incidence and severity of health problems associated with air pollution exposures related to roadway traffic including higher rates of asthma onset and aggravation, cardiovascular disease, reduced lung function, impaired lung development in children, pre-term and low-birthweight infants, childhood leukemia, and premature death. Other than air pollution, road noise may also play a role in the health problems associated with roadway exposure.⁷

The type of vehicles and fuel used, traffic activity, and the wind speed and direction can all have big effects on pollutant levels near major roadways. Generally, the more traffic, the higher the emissions; however, certain activities like congestion, stop-and-go movement or high-speed operations can increase emissions of certain pollutants. Per vehicle, heavy-duty diesel trucks can emit more of certain pollutants (e.g., NO_x and PM) and contribute disproportionately to the emissions from all motor vehicles. Gasoline-powered passenger cars generally emit more of other pollutants (e.g., CO, and benzene, a volatile organic compound) (EPA, 2014). A number of studies have reported air pollution in elevated concentrations near rail yards and marine ports. In general, diesel engines power the trains, trucks, and large marine vessels that are found in these facilities. PM_{2.5} acts like a gas regardless of the source and mixes with air. plumes will leave and are usually warmer than ambient air, but then dilutes as it mixes with more air.

Children, older adults, people with preexisting cardiopulmonary disease, and people of low socioeconomic status are among those at higher risk for health impacts from air pollution near roadways (EPA, 2014). Because of these reasons, Fairview residents have been concerned regarding transportation-related air pollution due to the Seward to Glenn Highway connection dissecting the neighborhood along Gambell and Ingra Streets.

The Fairview neighborhood experiences increased noise associated with traffic, decreased air quality (Fairview is in the 95-96th percentile in Alaska for NATA Diesel PM, NATA Air Toxics Cancer Risk, and the NATA Respiratory Hazard Index)⁸ and decreased pedestrian safety. Anchorage received a grade of F by the American Lung Association in their 2023 "State of the Air" report for short-term particle pollution (PM_{2.5}).⁹ A November 2020 article in *Frontiers in Public Health* revealed a significant correlation between air pollution and COVID-19 infections and mortalities. The available data also indicates that exposure to air pollution may influence COVID-19 transmission.¹⁰ Cleaner air in the community keeps people healthier, including safer from COVID-19. To date there has not been a comprehensive air monitoring study specific to the Fairview neighborhood.

The EPA has worked to reduce harmful roadway-related emissions through stringent standards and cleaner fuel requirements, setting health-based National Ambient Air Quality Standards (NAAQS) and requiring air monitoring along roadways, and it is conducting research to identify more solutions. This citizen-science air monitoring project in Fairview was an effort to collect local data to learn about existing conditions in the community.

⁷ EPA (2014, August). Near roadway air pollution and health: Frequently asked questions. Office of Transportation and Air Quality.

⁸ EJSCREEN Report

⁹ American Lung Association. (2023). Alaska report card: Anchorage Municipality [press release]. <https://www.lung.org/research/sota/city-rankings/states/alaska/anchorage-municipality>

¹⁰ *Frontiers in Public Health*. (2020, November). The effects of air pollution on COVID-19 infection and mortality: A review on recent evidence. <https://www.frontiersin.org/articles/10.3389/fpubh.2020.580057/full>

Air Monitoring Project Description

Over the course of the year, a community will experience variability in air quality. Within Fairview, the impacts depend on the local meteorology, the number and types of vehicles using the Gambell-Ingra corridor, the number and types of aircraft at Merrill Field, as well as surrounding activities in the community that can contribute to localized pollution (for example, idling vehicles within the neighborhood on cold days, or home heating emissions). Variability in weather is one of the dominating factors for whether an area is impacted and for how long. The other factor is the emission source.

The citizen science project distributed PurpleAir PA-II PM Sensors¹¹ throughout Fairview to record particulate matter concentrations throughout the community. For this study $PM_{2.5}$ is considered a tracer for exhaust plumes. To better distinguish which source is contributing to the measurements, the project intended to correlate data points of interest to traffic counts.

The team created a Quality Assurance Project Plan (QAPP) that details the monitoring program in detail. The QAPP is available [online here](#).

The study objectives are:

- 1 to increase public understanding of air quality and air monitoring through community engagement and education;
- 2 to address ambient air quality complaints centered on transportation emissions;
- 3 to determine which areas of Fairview are most affected by $PM_{2.5}$;
- 4 to assess if the scale in terms of frequency, duration, spatial variability and severity of these impacts has the potential to significantly affect public health and/or violate Clean Air Act air quality standards.



PurpleAir PA-II PM Sensor

¹¹ PurpleAir PA-II PM Sensors: <https://www.purpleair.com/sensors>

Study Area

This study was conducted by the Fairview Community Council, which is recognized by the Municipality of Anchorage as the official body to voice the common concerns, goals and planning objectives of the Fairview neighborhood. The community council boundaries are defined in municipal code.

Sampling locations were identified throughout the Fairview neighborhood with preference to locations regularly spaced, near the highway corridor and Merrill Field, as well as further away, and within the Chester Creek low-lying area. The council sought volunteers to host the air monitors throughout the community council boundaries (See Appendix A for outreach). The locations depended on willing volunteers as well as access to power and wifi. Volunteers signed agreements on their role in the study (See Appendix B).

Forty-five community members were solicited for participation, while nineteen agreed. Once monitors were distributed, community members needed training to use the devices and to keep them clean and free of debris. However, throughout the study there were approximately ten dependable locations sharing data while others were offline for various reasons. Some locations failed to register their devices to collect data. See Appendix C for location details.

Time Period

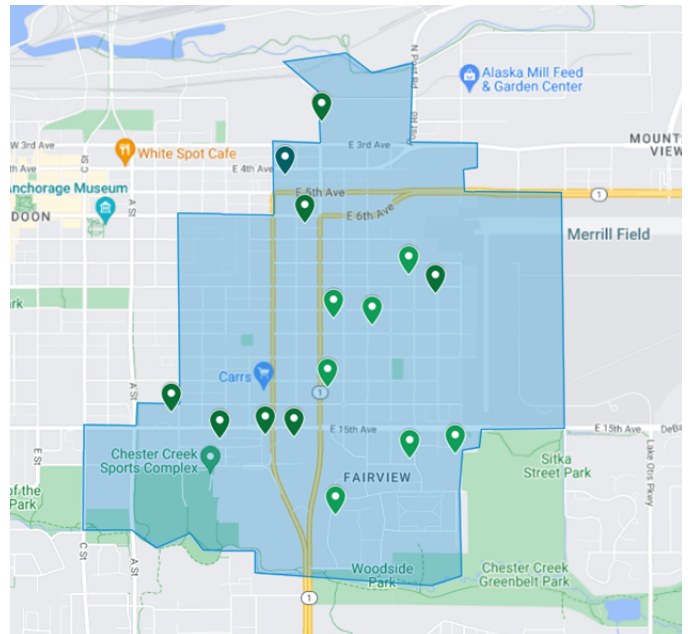
The project was able to offer a year-long timeline from April 2022 - March 2023. A full year of monitoring allowed for seasonal data collection.

Data Sharing

The project shared live data readings through the website: <https://fairviewak.org/projects/air-quality/>. Anyone was able to see live data throughout the entire course of the project, and this is also ongoing.

Project Team

The project team consisted of members from NeighborWorks Alaska, Fairview Community Council, Alaska Department of Environmental Conservation, and Anchorage Health Department. The partnership with the Alaska Department of Environmental Conservation and Anchorage Health Department are critical for the success of this project. ADEC's Division of Air Quality, Air Monitoring and Quality Assurance Program is managed by Barbara Trost, with relevant supporting documentation available here, <https://dec.alaska.gov/air/air-monitoring/>. This program operates ambient air quality monitoring networks to assess compliance with National Ambient Air Quality Standards (NAAQS), assesses ambient air quality for toxics, provides technical assistance in developing monitoring plans and projects, and issues air advisories as needed.



Map of Fairview Community Council of air monitors among residences, commercial properties, and churches.

The Anchorage Health Department’s Environmental Services Program includes the municipality’s Air Quality Program, which is responsible for monitoring and reporting levels of air pollutants and fine particles. Additional supporting documentation is available here, <https://www.muni.org/Departments/health/Admin/environment/AirQ/Pages/default.aspx>

A brief description of lead members and their roles are included below.

Name	Title	Organizational Affiliation	Responsibilities
Lindsey Hajduk	Director of Community Engagement	NeighborWorks Alaska	Project management, coordination, intern supervision
Allen Kempen	President	Fairview Community Council	Community outreach and recruitment, on-the-ground eyes and ears, maintenance of monitors
Sharon Chamard	Treasurer	Fairview Community Council	Community outreach and recruitment, on-the-ground eyes and ears, maintenance of monitors
Barbara Trost	Environmental Program Manager	Alaska Department of Environmental Conservation	Technical assistance, monitor testing and calibration, data acquisition and analysis
Matthew Stichick	Environmental Services Program	Anchorage Health Department	Technical assistance, monitor testing and calibration, data acquisition and analysis

Collocation Study

Before the study began, we hosted a collocation study to assess the precision and comparability of the sensors. This occurred for a 72-hour period prior to deployment. This intercomparison occurred at one of the volunteer locations to be compared to the average of the sensors in the network, by correlating the 5 minute and hourly averages of the individual sensors to the averages of the 20 sensors. In the end, fourteen sensors collected data throughout the 12 month period, and the collocation study focused on these devices. However, it was found that three of the devices did not complete the collocation study prior to deployment so the comparisons cannot account for these three devices.



Air calibration study in Fairview back yard.

Overall, the devices tracked well against each other. The r values indicate the correlation between the air monitoring unit and the reference unit, with an r value (0.9) indicating a stronger correlation. Some units are 0.8, which is still a strong connection.

Collocation (5/20-5/23), PM2.5					
Unit	Average	Max	Min	RPD (precision)	r2 value
Orca House	N/A	N/A	N/A	N/A	N/A
1805 Juneau Dr	0.78	12.72	0.00	68.75	0.8998
1311 Ingra St	0.37	8.44	0.00	1.75	0.9508
West Fairview	0.73	13.89	0.00	62.70	0.9495
Merrill Crossing	N/A	N/A	N/A	N/A	N/A
910 Nelchina St	0.51	9.78	0.00	29.84	0.9636
1031 Karluk St	0.44	9.05	0.00	14.99	0.9714
F186	0.35	7.29	0.00	9.31	0.9383
1566 Medfra	N/A	N/A	N/A	N/A	N/A
10th & Orca	0.65	10.35	0.00	52.11	0.9235
Vista Glen	0.62	8.29	0.00	47.87	0.8468
Reference PA (Tri. Luth. Church)	0.38	10.34	0.00	-	0.0017
Secret Garden	0.63	9.90	0.00	48.76	0.9161
AK Sprouts	0.50	11.23	0.00	1.66	0.9028
*Orca House, Merrill Crossing, and 1566 Medfra did not complete the 72-hr collocation					

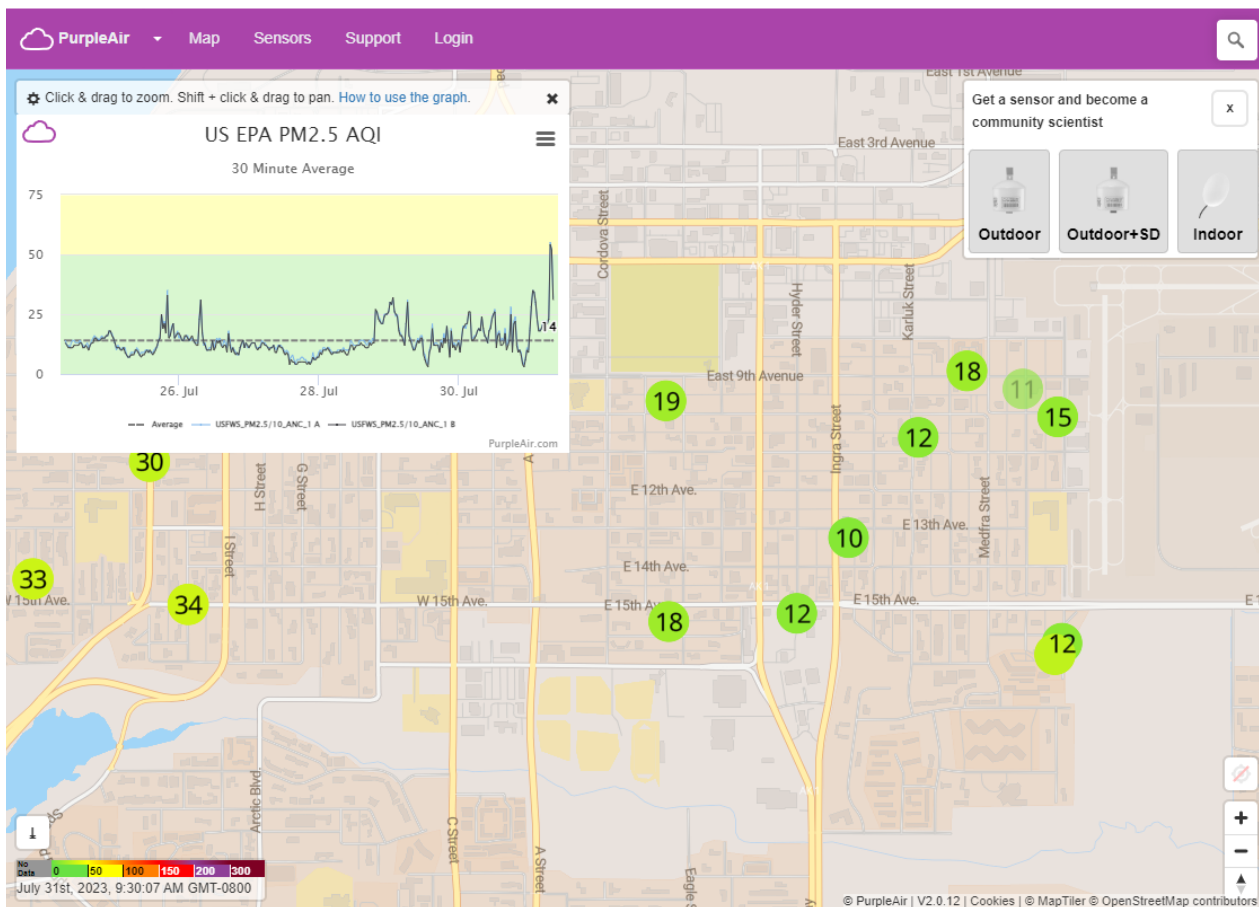
The collocation study found too few concentrations were > 3 to do a comparison. We would recommend conducting a post-study collocation with a smoke test, such as with a BBQ grill, to drive the PM concentrations higher to see how the devices track across a range.

Data Quality Indicators	DQI Goals	Findings
Precision	30% RPD (relative percent deviation from the collocated mean hourly average value).	See HourlyDataCombined.xlsx document for results.
Bias	Data are not biased in a particular direction (RPD < 20% for the 72-Hr test average values ≥ 5 ug/m3).	Undetermined- not enough values >3 in the collocation to calculate.
Representativeness	Sample at various distances from highway corridor and airfield. This round of data will establish a summer-fall baseline for this phase of study.	TBD
Completeness	>75% of full hourly average data set is minimum goal for each sensor.	Undetermined- % completeness for hourly values is unavailable based on hourly data download.
Comparability	Agreement for the individual sensor against the mean of the collective to be within ±50% of the PA sensors at comparison sites for concentration over 3 ug/m3.	Undetermined- not enough values >3 in the collocation study to calculate.

Findings

This project included continuous measurements of PM_{2.5} at both five-minute and one-hour intervals for a duration of twelve months. The intention was to assess fine particle concentration data in correlation with highway or airport traffic counts and meteorological conditions. However, after reviewing the data from the year, there were few causes for concern identified. Instead, based on this study our current findings do not indicate any references to any health hazards.

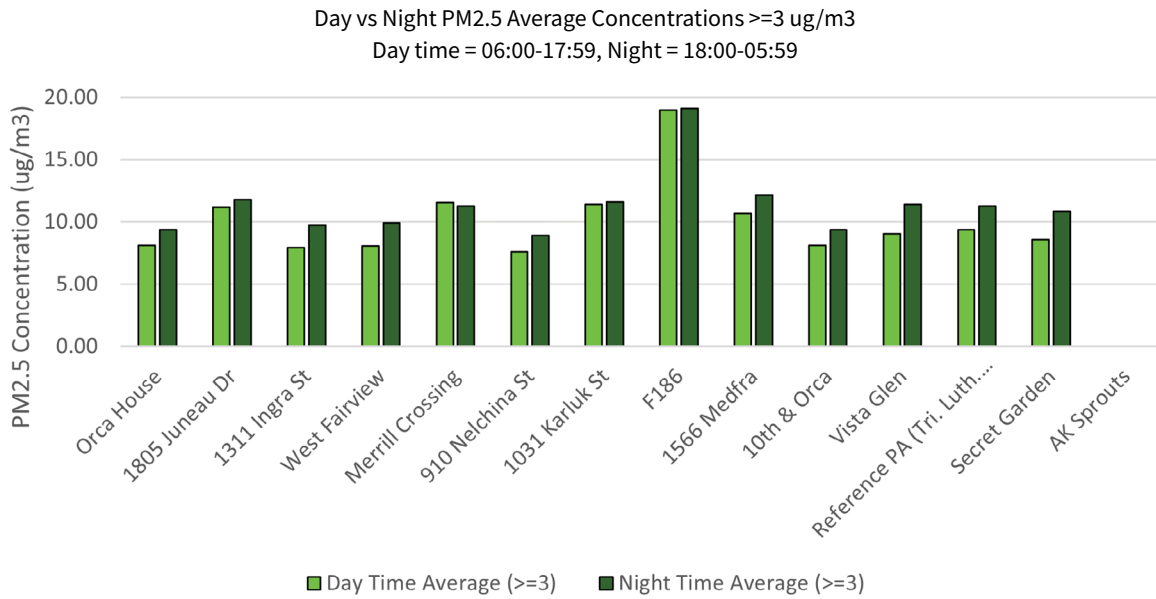
Our 24-hour data does not look to have exceeded standards for public health. The majority of readings across all sites for PM_{2.5} were at or below 3 ug/m3. We were trying to identify if there were differences in air quality closer or further from the highway, but we did not get data confirming this as few collections exceeded high standards. Specifically, across the sites in only 468 of 76,402 (0.61%) hourly readings did PM_{2.5} exceed the National Ambient Air Quality Standard (NAAQS) of 35 ug/m3. At the lower level of readings above 3 ug/m3, it is worth noting that these were measured between 20-24 percent of the time at four sites (1566 Medfra, Secret Garden, Orca House, and Vista Glen) and all are located within one or two blocks of E. 15th Ave. While this is surely not definitive, we can offer observations in the data collected as well as recommendations to learn more going forward.



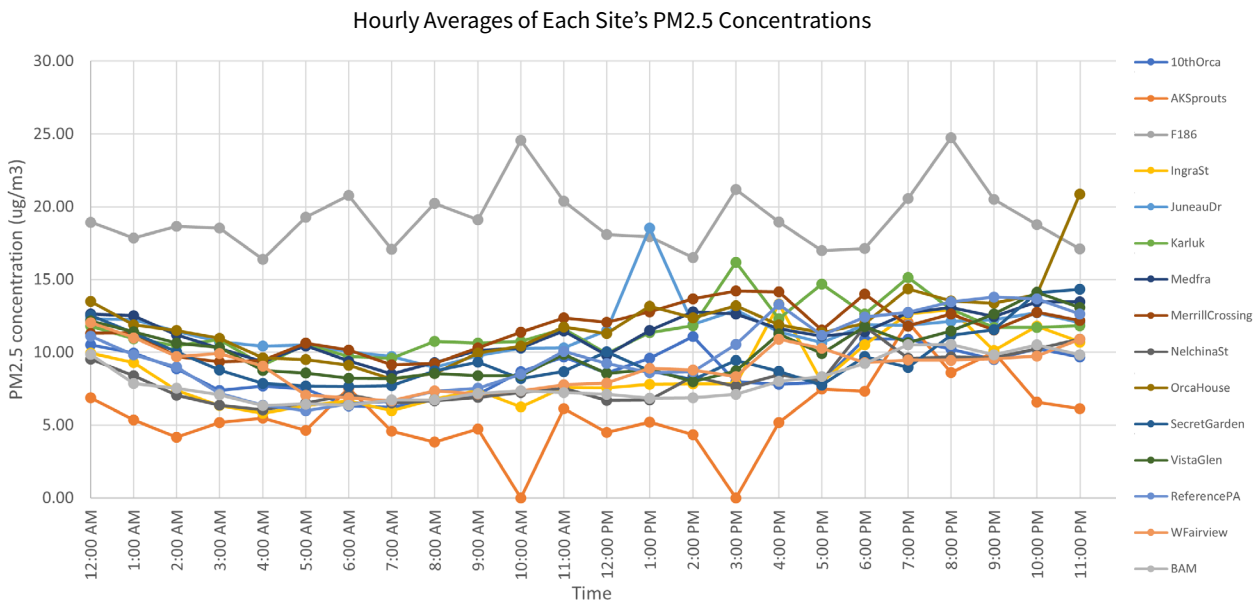
Example map of PurpleAir sensor data readings in Fairview.

Temporal Variations

In general, evening air quality readings were higher than during the daytime. Additionally, rush hour from 6-8am and 4-6pm did not correlate with higher air quality readings around those time periods.



Although we did not find significant data to suggest $\text{PM}_{2.5}$ air quality is a serious issue, there were nonetheless sporadic readings that were atypically high. We suspect this is due to lawn mowing. One particular site (F186) had very high readings relative to the others in the study. This might be attributable to the proximity of the site to the heavily-trafficked 9th Avenue and Ingra Street, or the placement of the air monitor on the side of the house closest to the adjacent unpaved alley.

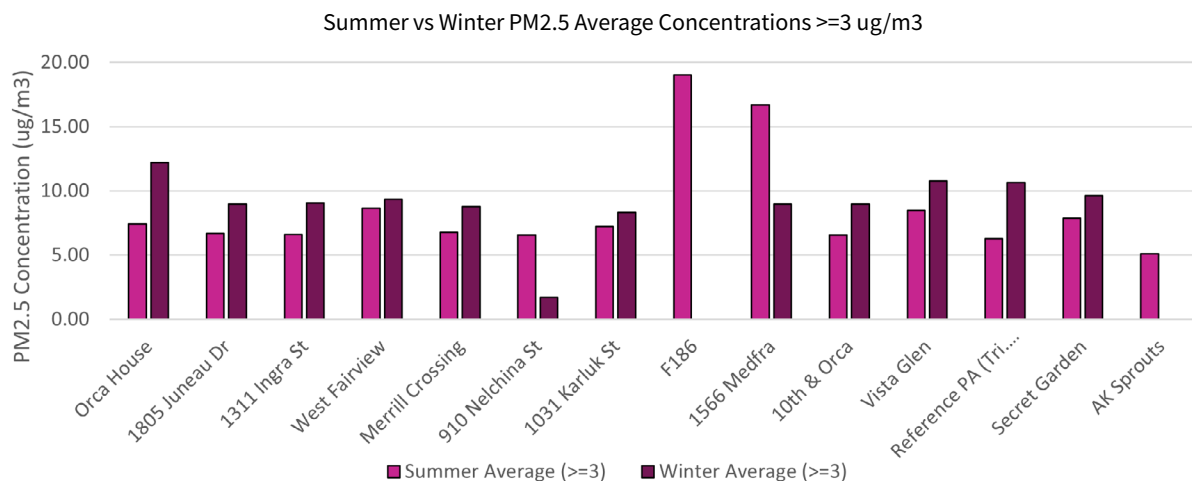


Seasonal Variations

In general, winter air quality readings were higher than during the summer. In the winter, there may be more wood burning, idling vehicles, or temperature inversions that “trap” pollutants from dissipating. Anchorage can be subject to negative air quality impacts, particularly during winter months, when periodic high-pressure air systems move over the Anchorage Bowl and create temperature inversions that trap automotive-generated pollutants. However, the winter of 2022-2023 saw few weather inversions impacting air quality as borne out by the data.

Alaska’s typical fire season is in late May through July. In 2022, Alaska experienced one of its seventh biggest fire seasons with 590 wildfires burning over 3.1 million acres, including large tundra fires in Western Alaska.¹² However, little of the smoke made its way to Anchorage. Anchorage’s summer began with very dry conditions, which turned to rain in mid-July. Summer wildfire smoke from across the state, therefore, did not impact Anchorage’s overall summer air quality levels.

Other activities can negatively affect air quality, such as lawn mowing (which can kick up dust) and grilling. It is possible that some of the high readings, which were rare and apparently non-systematic, were due to these or related activities.

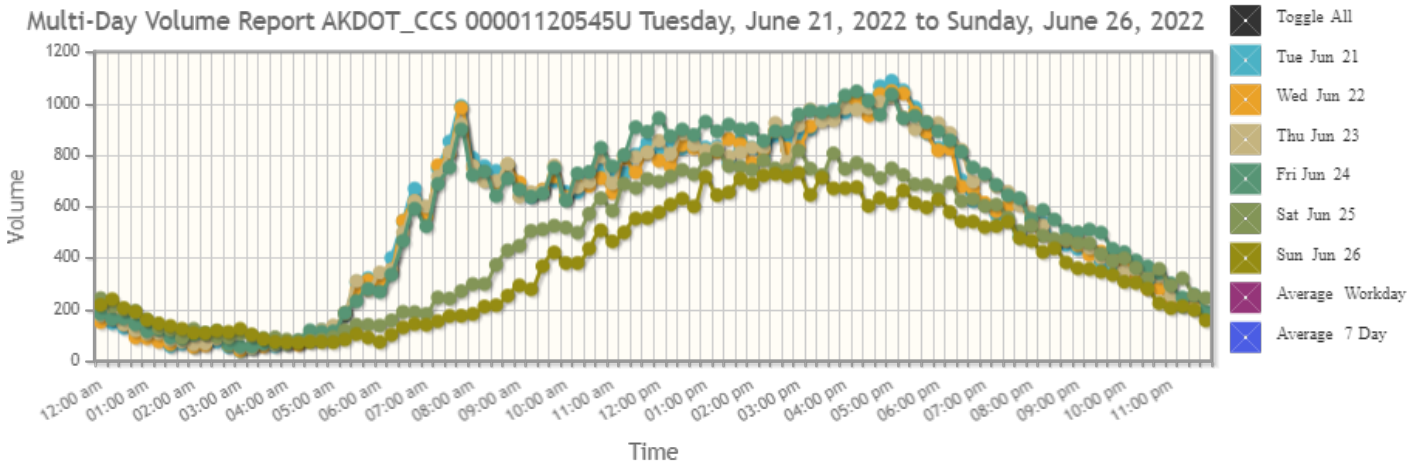


Site of Interest

One site at 10th and Ingra Street (F185) had relatively high $\text{PM}_{2.5}$ readings compared to other sites. One theory is this may be attributed to idling vehicles at the 9th Avenue signalized intersection, but more data would be needed. Comparing the air quality data to transportation data (number of vehicles during a specific time period) may offer insight into if air quality readings align with transportation volume. The Department of Transportation & Public Facilities (DOT&PF) share traffic data online at: <https://alaskatraficdata.drakewell.com/publicmultinodemap.asp>

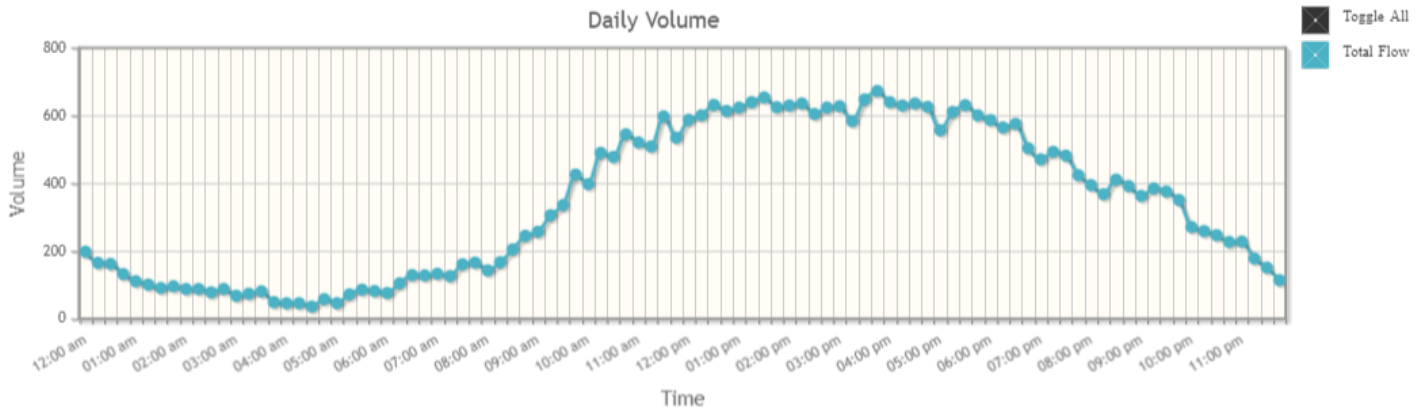
¹² Alaska Wildland Fire Information. (2023, May). Don't let the abundance of winter snow fool you; Alaskans should prepare for wildfire season. <https://akfireinfo.com/2023/05/08/dont-let-the-abundance-of-winter-snow-fool-you-alaskans-should-prepare-for-wildfire-season/>

Unfortunately, our team was not able to coordinate with the DOT&PF traffic data project in 2022 and did not know when or where traffic data would be collected. The DOT&PF collected traffic data at Ingra Street between E 7th Avenue and E 8th Avenue on June 9-15, 2022, but the F185 air monitor was not installed until three days later on 6/18/22. Another traffic data collection site on Ingra St. between E 12th Ave. and E 13th Ave. collected data in 2021 but not 2022. There is one permanent traffic data collection location on Ingra St. and E 20th Avenue. The F185 device had spikes in $PM_{2.5}$ levels on 6/24/22 compared to its surrounding dates, but the vehicle volumes for 6/24/22 track with the average workday readings for that timeframe.



June 21-26, 2022 Traffic Volumes at Ingra St. and E 20th Ave. Source: Alaska DOT&PF.

Another isolated spike in the $PM_{2.5}$ level for F185 occurred on 8/28/22 at 8pm. However, review of traffic volumes at Ingra St. and E 20th Ave. do not show a spike in traffic use.



August 28, 2022 Traffic Volumes at Ingra St. and E 20th Ave. Source: Alaska DOT&PF.

Without better timed traffic data collection near the F185 site, it is not clear that traffic volumes impacted the air quality. The higher levels of $PM_{2.5}$ could be impacted by other sources of particulate matter, such as if the monitor was placed closer to the unpaved alley or more lawn mowing or grilling activities.

Recommendations

This project set out to learn more about the air quality within the Fairview neighborhood over the course of one year. Although we did not find significant data to suggest PM_{2.5} air quality is a serious issue, there are interesting variations of note and potential next steps to learn more.

In general, evening air quality readings were higher than during the daytime as compared to evenings, as well as higher during the winter as compared to the summer.

Idling vehicles and roadway dust may play a role in the air quality readings, but behaviors outside of transportation can contribute to air quality, including wood burning, temperature inversions, lawn mowing, or grilling. To learn more about the variations of air quality in the neighborhood, the Fairview Community Council shares the following recommendations:



Air monitor on home.

1

Continue collecting air quality data for the next year and provide an updated analysis.

2

Identify locations of interest based on the current data, such as Ingra St. and 10th Ave., and collect transportation data in addition to air quality data for a more definitive comparison analysis.

3

Cluster air monitors around the transportation corridor (up to 500 feet) to compare to the control site for a clearer focus along the highway corridor.

4

Consider collecting additional data, including for noise, as this was a request from numerous community members throughout the air quality analysis study.

Appendix

Appendix A. Public Outreach



VOICES OF FAIRVIEW

New opportunity
JOIN OUR AIR QUALITY MONITORING PROJECT

Speak up for Fairview!

JOIN OUR TEAM!

Do you have a home residence, business, church, or other space where we could set up a small air monitor? Join our team!

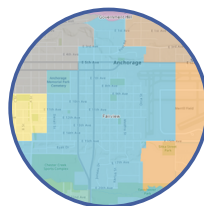
Here's what we're looking for:

- Connection to power outlet
- Use of wifi (to automatically upload air quality info)
- Collect data April/May through December, possibly into 2023!

SIGN UP AT:
tinyurl.com/FairviewAir

QUESTIONS?

Email
president@fairviewcommunity.org



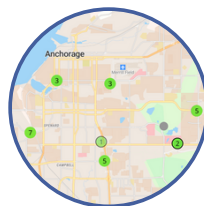
WHO CAN PARTICIPATE?

Anyone within the Fairview Community Council boundaries



HOW TO MONITOR AIR QUALITY?

We'll provide a small air monitor, training, and supports for the project



WHY MONITOR AIR QUALITY?

High levels of fine particulate matter 2.5 is a public health concern. We'll provide real-time data.

This project is in partnership with Fairview Community Council, NeighborWorks Alaska, Alaska Department of Environmental Conservation, and Anchorage Health Department. The project is made possible through a grant from the EPA.

Appendix B. Air Quality Agreement form

Air Quality Monitoring Initiative Site Placement Agreement

The Fairview Community Council (FVCC) and NeighborWorks Alaska (NWAK) have received an Environmental Justice Grant from the U.S. Environmental Protection Agency for the year 2022. A key element is the collection of air quality data in order to establish a representative air quality base line for the Fairview Community.

PurpleAir air monitoring sensors have been acquired and are being placed at strategic locations throughout the Fairview community. The sensors will measure particulate matter down to 2.5 microns and when connected to Wi-Fi, upload the data to an on-line database.

The air quality sensors have an effective life of three years. It is the intent of the FVCC to collect data for as long as the units remain operative.

The purposes of this agreement are:

1. To document receipt of the air quality monitoring sensor by the below responsible party.
2. To acknowledge the PurpleAir sensors require a power source drawing a minimum amount of power provided at no charge by the below responsible party.
3. To commit to return of the air quality sensor to the FVCC should there be any reason to no longer participate in the Monitoring Initiative by the below responsible party.
4. To release the FVCC from any liability associated with placement and operation of the air quality monitoring unit.

The below responsible party concurs with the purposes of this agreement.

Printed Name	Signature	Date
Phone Number	Email Address	
Address		

Sensor Unit # - _____

Appendix C. Sensor Device Names & Locations

Land Use Type	Device ID	Unit Name	Physical Location
	48:3F:DA:A7:19:C6	N/A	N/A
	C4:5B:BE:44:63:69	N/A	N/A
Residential	48:3F:DA:A6:FD:0	West Fairview	425 E 10th Ave, #B
Residential	9B:CD:AC:11:C6:C7	1311 Ingra St	1311 Ingra Street
Residential	48:3F:DA:A7:19:B9	910 Nelchina St	910 Nelchina Street
Church	98:CD:AC:12:44:C7		1420 Cordova St
Residential	48:3F:DA:A7:2C:B6	1031 Karluk Street	1031 Karluk Street
Residential	98:CD:AC:12:89:D8	Vista Glen	460 Vista Glen Ct
Residential	48:3F:DA:A7:1A:97	Orca House	1552 Orca Street
Residential	48:3F:DA:A6:F8:D5	Merrill Crossing	1275 E 9th Ave
Residential	48:3F:DA:AY:4:D3	10th & Orca	Orca & 10th Avenue
Commercial	48:3F:DA:A7:24:48		235 Ingra
Residential	BC:FF:4D:27:79:3F	1805 Juneau Dr	1805 Juneau Dr.
Commercial	48:3F:DA:A6:F1:86		The Raven Bar, 708 E 4th Ave
	C4:5B:BE:C1:12:2C	Trinity Lutheran Church	Garden Site - Alaska Department of Environmental Conservation
Commercial	48:3F:DA:A7:2C:A1		810 E 6th Avenue
Residential	48:3F:DA:A7:24:49	F186	928 East 10th Avenue
Commercial	48:3F:DA:A6:F8:A9	Secret Garden	726 East 15th Avenue
Commercial	C4:5B:BE:44:63:69	AK Sprouts	636 E 15th Ave, Unit E
Residential	48:3F:DA:A7:4:DB	1566 Medfra	1566 Medfra St