

Virtual Lunch-n-Learn

Tuesday, September 27, 2022 12:00 PM – 1:30 PM



We acknowledge the land on which we are meeting – the ancestral lands of **Duwamish**, **Muckleshoot**, and **Snoqualmie Tribes** – and recognize their continuing connection to land, water, and community. We honor with gratitude the land itself and the **Coast Salish people** who are still here today.

We recognize the systemic oppression of Indigenous people, enslaved Africans, and other historically exploited people which has led to the disproportionality in representation and disparities in health of these communities we serve.



Introduce yourself in chat.

Name, Pronouns, Organization, and Email.

• Mute your mics.

Unless you are presenting, in a Breakout Session, or engaging in Q&A, we ask that your mics be muted. We may mute you if necessary. Your visible face on camera and screen is encouraged.

• What's said here stays here – but what's learned here leaves here.

Transparency is critical to providing safe, supportive conversations. We will record this session for review purposes. Presentations slides and the recording will be made available.

• Take care of yourself.

Stretch, eat, drink, and bio-breaks as needed!



1. When you are in another neighborhood **outside Beacon Hill, is it quiter, noisier or the same?**

2. When you are in another neighborhood outside Beacon Hill, is the air quality better, the same or worse?



- Welcome 5 min (John Kim, Pacific Hospital PDA)
- Educational Information 30 min
 - Issue Background (Maria Batayola, Beacon Hill Council)
 - Health (Dr. Kris Johnson, Public Health Seattle & King County)
 - Climate (Laura Gibbsons, 350 Seattle)
- **Q & A** 15 min
- Breakout Groups 20 min
 - Group 1: Increasing Health Access & Equity
 - Group 2: Potential Next Steps for Health
 - Group 3: Potential Next Steps for Climate
- Report Back & Closing 15 min





John Kim (he/him)

PHPDA Executive Director



Goals for Today:

- Share information about Beacon Hill and Air Impacted communities' environmental, health and climate justice issues*
- 2. Get some brainstorming going

*won't be able to cover Historic Preservation impact.

Presenters:

1. Background & Environment & Equity Impacts

Maria Batayola. Beacon Hill Council chair, BHC EJ Task Force Co-Chair, El Centro De La Raza EJ Coordinator

2. Health Impacts

Dr. Kris Johnson, Senior Social Research Scientist with Seattle King County Public Health Assessment, Policy Development & Evaluation Division. Author of Study Community Health & Airport Operations Related to Noise and Air Pollution required by WA HB 1109

3. Climate Impacts

Dr. Laura Gibbons. Co-chair of the 350 Seattle Aviation Team past 3 years. Biostatistican studying Alzheimer's Disease at UW. PhD in Public Health and Gerontology

About Beacon Hill

PROBLEMS:

- Displacement & Gentrification
- Air & Noise Pollution from Roads
- Air Pollution from Oil Home Heating
- Air & Noise Pollution from Aircraft

WHY PICK AIRCRAFT:

- Unrecognized EJ, Health, Climate, Equity & Historic Preservation issue

BEACON HILL EXPERIENCE:

North BH Airplanes fly 90-180
 seconds 70-90 decibels (spikes v avg)

- ALL BH 50% OF FLIGHTS AT 65 + db
- 70% of landings to SeaTac Airport
- Not eligible for mitigation.



From No Added Harm to Fix The Current Harm



Pre-Covid 2019 450,000 flight take offs and landings.

Accommodate 540,000 flights by 2034:

- 1. Expansion of small Everett Airport
- Expansion of SeaTac Airport
- Building a new
 Airport (that takes
 20 years)





FIX THE CURRENT HARM FROM 450,000 **SEATAC ELIGHTS**



Flights from SeaTac Airport produce 1/4 of King County's greenhouse gas emissions.

SIGN OUR LETTER OF CONCERN AND JOIN THE MOVEMENT









419,716 airport impacted residents include 64% people of color and 29% immigrants and refugees.

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FROM 450,000 SEATAC FLIGHTS

419,716 airport impacted residents include 64% people of color and 29% immigrants and refugees.

SIGN OUR LETTER OF CONCERN AND JOIN THE MOVEMENT







Community Health and Airport Operations-Related Noise and Air Pollution

Kris Johnson Public Health Seattle and King County

September 27, 2022

Understanding the community health effects of pollution related to Seattle-Tacoma International Airport (SeaTac) operations

- a) Airport community health profiles
- b) Strength of evidence to date
- c) UW School of Public Health Study on UFP
- d) Recommendations to address health issues



The airport communities are home to a majority of King County's people of color

Percent of King County Population by Race/Ethnicity, 2014-2018 Average



WHAT IS THE HEALTH OF AIRPORT COMMUNITIES COMPARED TO THE REST OF KING COUNTY?

Compared to the rest of the county, people in airport communities face disparities in

- Health
- Health risk factors
- Resources

For some measures, health outcomes worsened with proximity to airport

- Hospitalization rates for heart disease
- Rate of death from all causes
- Rate of death from heart disease
- Life expectancy (2-5 years lower for airport communities)

Mothers in airport communities were 43% more likely to have a premature birth than the rest of King County



Airport communities had twice as many children living in poverty or near poverty than the rest of King County



Children in Poverty/Near Poverty



Adults were more likely to be uninsured in airport communities than in the rest of King County



Uninsured (age 19-64)

Airport communities had a higher rate of hospitalization from heart disease than the rest of King County



Heart Disease Hospitalization Rate per 100,000

Airport communities had a higher rate of hospitalization from stroke than the rest of King County

пп

Cerebrovascular Disease (Stroke) Hospitalization Rate per 100,000



Airport communities had a higher rate of hospitalization from diabetes than the rest of King County

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Diabetes Hospitalization Rate per 100,000

Airport communities had a higher rate of death than the rest of King County

Death Rate per 100,000 All Causes



900



<1 mile from 1 to <5 miles from 5 to 10 miles from Rest of County SeaTac SeaTac SeaTac WHAT POLLUTANTS RESULT FROM AIRPORT OPERATIONS AND WHAT ARE THE LIKELY HEALTH IMPACTS?

Airport-related Pollutants and Their Likely Health Effects

Noise pollution

- Hypertension & Heart disease
- Poor school performance among children

Air pollution

- Respiratory problems (asthma, respiratory diseases)
- Cardiovascular issues (Hypertension, heart disease/attack, stroke)
- Nervous system (dementia, oxidative stress)
- Metabolic issues (Diabetes, metabolic syndrome)
- Reproductive health

concerns



ARE COMMUNITIES NEAR AIRPORTS EXPOSED TO NOISE AND AIR POLLUTION FROM AIRPORT OPERATIONS?

We need to know more about exposure

- Several studies in urban areas identified noise and air pollution related to airports and adverse health effects
- 2018 Beacon Hill study showed that >50% of 24hour day-night avg noise levels over 65 <u>dB</u> (WHO recommends 45 dB).
- 2019 Puget Sound Clean Air Agency report shows particulate matter levels over EPA-recommended levels 22 days in winter



Figure 3. Arrival flight paths for Seattle-Tacoma International Airport. Beacon Hill neighborhood in yellow. Airport runways shown as two black lines center-bottom of image.

MOV-UP Study Objectives



- Study the implications of air traffic at Sea-Tac
- Assess the concentrations of ultrafine particulate matter (UFP) in areas surrounding and directly impacted by air traffic
- Distinguish between and compare concentrations of aircraft-related and other sources of UFP
- Coordinate with local governments, and share results and solicit feedback from community

Slides 14-17 courtesy of MOV-UP Team: Elena Austin, Jianbang Xiang, Timothy Gould, Sukyong Yun, Jeff Shirai, David Hardie, Michael Yost, Timothy V. Larson, Edmund Seto with University of Washington, Seattle

Important characteristic of Ultrafine Particles

- They have a larger surface area, relative to their size.
- They are small enough to enter the bloodstream, cross the placenta, and cross the blood-brain barrier.
- Because they are small, they have very little mass.
- They are measured differently than PM_{2.5} (count for UFP vs mass for PM_{2.5})



Mobile Monitoring Results

- POSITIVELY correlated with Black Carbon and **Total Particle Number** Concentration
- Median diameter from Nanoscan is approximately 30 nm



- POSITIVELY correlated with ultra-UF particles
- NEGATIVELY ٠ correlated with Black Carbon
- Median diameter from Nanoscan is approximately 15 nm

Slide courtesy of MOV-UP Team



Understanding the health effects of jet pollution around Sea-Tac Airport

A policy brief for the Washington State Legislature

Summary

Communities underneath and downwind of jets landing at Seattle-Tacoma International Airport are exposed to a type of ultrafine particle pollution that is distinctly associated with aircraft, according to a 2019 University of Washington (UW) study that is the first to identify the unique signature of aircraft emissions in Washington.

The finding comes from the two-year Mobile ObserVations of Ultrafine Particles (MOV-UP) study funded by the Washington State Legislature and led by the UW Department of Environmental & Occupational Health Sciences and the Department of Civil and Environmental Engineering.

The MOV-UP study examined the air-guality impacts of aircraft traffic on communities located

The discovery creates opportunities to investigate the health effects of aircraft-related pollution, how different neighborhoods are impacted by it and specific interventions to reduce people's exposure to these pollutants.

Previous studies have linked exposure to ultrafine pollution particles to breast cancer, heart disease, prostate cancer and a variety of lung conditions.

This policy brief describes some of the remaining knowledge gaps about aircraft-related pollution.

It also proposes next steps that state legislators can take to better understand the health impacts of ultrafine particle pollution and to protect the health of people who live and work in the vicinity of Sea-Tac Airport.

Study Findings

- Ultrafine particles (UFP) are emitted from both traffic and aircraft sources.
- Total concentration of UFP (10 1000 nm) did not distinguish roadway and aircraft features.
- The spatial impact of traffic and aircraft UFP emissions can be separated using a combination of mobile monitoring and standard statistical methods.
- There are key differences in the particle size distribution and the black carbon concentration for roadway and aircraft features.
- Fixed site monitoring confirms that aircraft landing activity is associated with a large fraction of particles between 10-20 nm.

MOV-UP Project Website:

https://deohs.washington.edu/mov-up Slide courtesy of MOV-UP Team

Cumulative Effects

People in airport communities are:

- More likely to be exposed to air pollution.
- More likely to have health conditions that increase risk of pollutants' adverse effects.
- More likely to face health and resource disparities.

Historical practices and systemic racism underlie the disparities.

New study links historic redlining and air pollution in American cities

New research has revealed how the discriminatory and often racist practice of redlining that started nearly a century ago influenced who suffers the worst from air pollution in U.S. cities today.

1930s government-sponsored Home Owners' Loan Corporation investment risk rating



Source: Lane, Haley M., et. al, "Historical Redlining Is Associated with Present-Day Air Pollution Disparities in U.S. Cities," Environmental Science and Technology Letters.

EMILY M. ENG / THE SEATTLE TIMES

THE HEALTH OF AIRPORT COMMUNITIES



RECOMMENDATIONS

- Address the health disparities of airport communities
- Mitigate the health impacts of airport operations
- Continue development and implementation of strategies to mitigate airport-related air and noise pollution
- Implement new technologies to improve measurement of exposures indoors and outdoors
- Expand the systematic monitoring of pollutants (both outdoor and indoor exposures) in residences, schools, childcare settings, and long-term care facilities
- Support research to address gaps in knowledge



SEATTLE Aviation Team

Aviation Team Goals

- Achieving a meaningful reduction in aviation emissions through the degrowth of aviation activity.
- Ensuring transparency and accuracy in the measurement and reporting of aviation emissions and impacts.
- Supporting the voices of marginalized, impacted communities seeking environmental justice.



Aviation is the fastest-growing source of climate pollution, both globally and locally

- Globally, air travel has tripled since 1990 and is on pace to triple again by 2050.
- Locally, aviation was 42% of Seattle's GHG emissions as of 2018.
- Seattle aviation emissions increased over 40% from 2008-2018.

Expanded Transportation

Emissions Share by Commodity



Source: City of Seattle, 2018 Community GHG Inventory: <u>http://www.seattle.gov/Documents/Departments/OSE/ClimateDocs/2018_GHG_Inventory_Dec2020.pdf</u>

CO₂ emissions are not the only climate damage caused by aviation

- Nitrogen oxide emissions
- Contrail cirrus clouds formed from airplanes
- The net impact = twice as much warming as the CO₂ emissions alone.
- This additional effect is called "Radiative Forcing".
- Multiply the CO₂ emissions by 3 to get the total warming effect from aviation green house gas (GHG) emissions.

Factoring in radiative forcing, aviation is 53% of King County's 2018 GHG emissions.



New York Times, May 28, 2021 A Big Climate Problem With Few Easy Solutions: Planes

- "It's a hard-to-abate sector. It will always emit some carbon."
- Renewable Fuels:
 - Renewable fuels can't meet aviation needs: 15-30% by 2050.
 - "Even if you are burning 100 percent biofuel, it's still not going to be getting you to carbon neutral."
 - Renewable jet fuel reduces lifecycle carbon emissions by only 30 percent to 50 percent compared with conventional jet fuel.
 - Production can cause deforestation when the raw materials are farmed.

Alternatives won't help or are decades off



Bio-fuel cannot replace traditional jet fuel. Aviation fuel use rises more **every four hours** (+10 million litres) than biofuel production has in a decade (+7 million litres). In addition, electric-powered airplanes are decades away from use for most commercial aviation."

Alternative aviation fuels

- Lifecycle, not actual use. Tailpipe emissions may produce just as much CO₂, so just as much warming.
- Ultrafine particulate matter from burning alternative fuel can cause different and potentially more dangerous lung responses than from burning conventional jet fuel.
- No reduction in health-threatening noise pollution.
- Require massive public subsidies that could be better invested in real solutions and redressing community harms.

How likely is it that emission reductions by offset projects are real, measurable and additional?

medium likelihood



- Scott Kirby, United Airlines chief executive (same NYT article):
 - "Traditional carbon offsets are a marketing initiative; they're greenwashing."
 - "Even in the few cases where they are real and are making a difference, they're just so small that they can't scale to solve the global problem."
- Guardian investigation: Offset programs used by major airlines overestimate carbon impact.
- We can't get to a carbon-free economy if we keep polluting and try to pay someone else to clean it up.



high likelihood

Electric Planes

If all jet fuel used today was to be replaced with e-fuels, that would require two and a half times the renewable electricity currently available globally (2019)

Source: :

CleanSky2&FCH (2020): https://bit.ly/report-hydrogen, p. 44 IEA (2019): https://bit.ly/IEA2019_Oil IEA (2019): https://bit.ly/IEA2019_Elec

stay-grounded.org STAY GROUNDED

Aviation is bad for the climate

- Truly carbon-neutral flight is at best decades off, if it's even possible.
- 350 Seattle says the only path to fixing the current harm is less flying.



• 15 minutes





- 20 minutes
- Join one of the following groups of your choice:

Group 1: Increasing Health Access & EquityGroup 2: Potential Next Steps for HealthGroup 3: Potential Next Steps for Climate



• 10 minutes

Group 1: Increasing Health Access & EquityGroup 2: Potential Next Steps for HealthGroup 3: Potential Next Steps for Climate

Thank you!







Virtual Lunch-n-Learn: "When You See it, You Breath it."