


Air Quality Initiatives at Sea-Tac Airport

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Overview

- Port Air Quality Goals and Priorities
- Types and Sources of Air Pollution
 - › Span of control
- Pollution Reduction Initiatives
- Emerging Science
- Impacts of Air Pollution
- Next Steps



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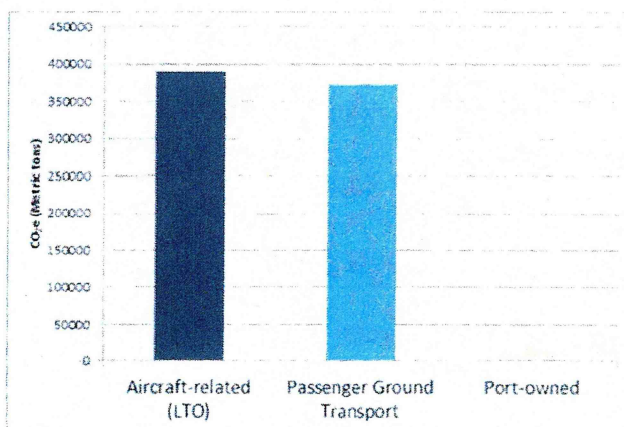
Types of Air Pollution

- **Greenhouse gases**
 - › Trap heat in our atmosphere
 - › Causes climate change: droughts, flooding, heat waves, loss of snow pack, forest fires, etc.
- **Regulated Pollutants**
 - › NO_x, SO_x, CO, VOCs
 - › Particulate matter (PM₁₀, PM_{2.5})
 - › Air toxics
 - › Cause direct adverse health effects in humans

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5

Sources of Greenhouse Gases at Sea-Tac Airport



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Promoting Clean Vehicles

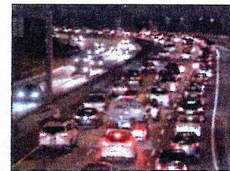
- First US airport to require green taxis
- First US airport to require green TNCs in 2016
- Converting CNG buses to electric
- Adding more electric charging stations



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Passenger Vehicles

- Ground Transportation Access Plan
 - › Improve access to public transportation
 - › Identify efficient transportation modes
 - › Identify costs and infrastructure changes
- What's future of transportation look like?



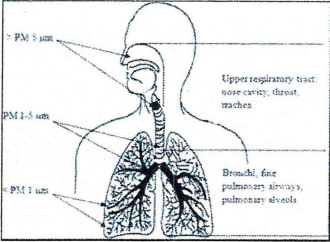

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10

Port
of Seattle

Health Effects of Air Pollution

- Air Toxics
 - › Cancer
 - › Respiratory
- Particulate Matter
 - › Respiratory and cardiovascular diseases
 - › Increased mortality

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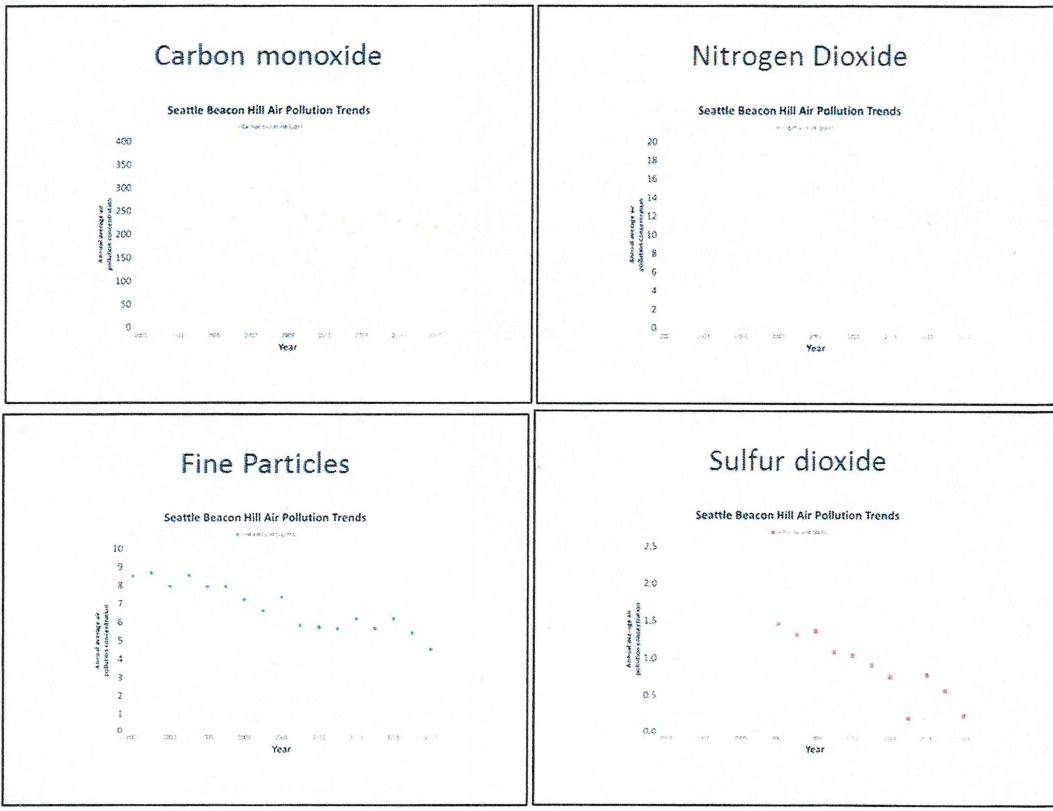
Air Quality Studies near Sea-Tac

- 17 air quality and/or health studies have been conducted near Sea-Tac over the past 40 yrs
 - › None show exceedances of National Ambient Air Quality Standards (NAAQS)
 - › Ambient air contaminants consistent with mobile sources
 - › Sea-Tac Airport contributes less than 5% of NOx to the surrounding area
- Health Studies
 - › WA Dept of Health and King County Health Dept analyzed cancer rates from 1985 to 2006 and found an increase in brain cancer in **one year only - 1992**
 - › Cancer risks from air toxics similar to other urban areas in Seattle and US and largely due to mobile sources and diesel soot.

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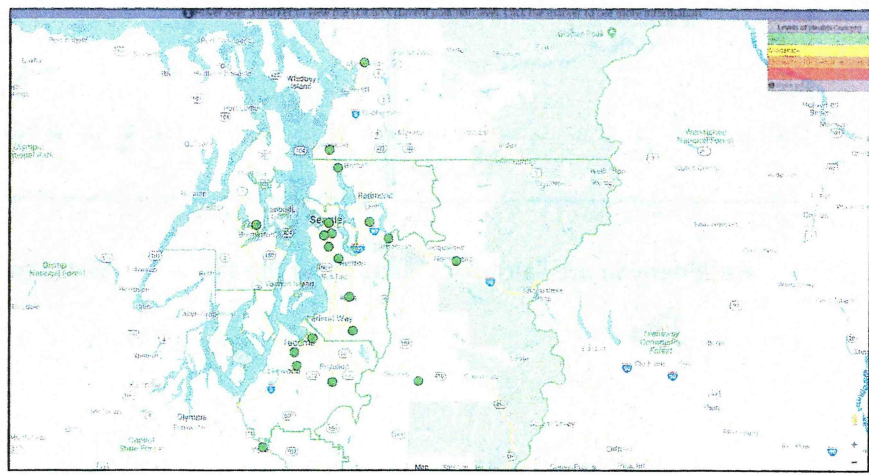
CRITERIA POLLUTANTS

Air Contaminant Trends from the Beacon Hill Air Monitor¹



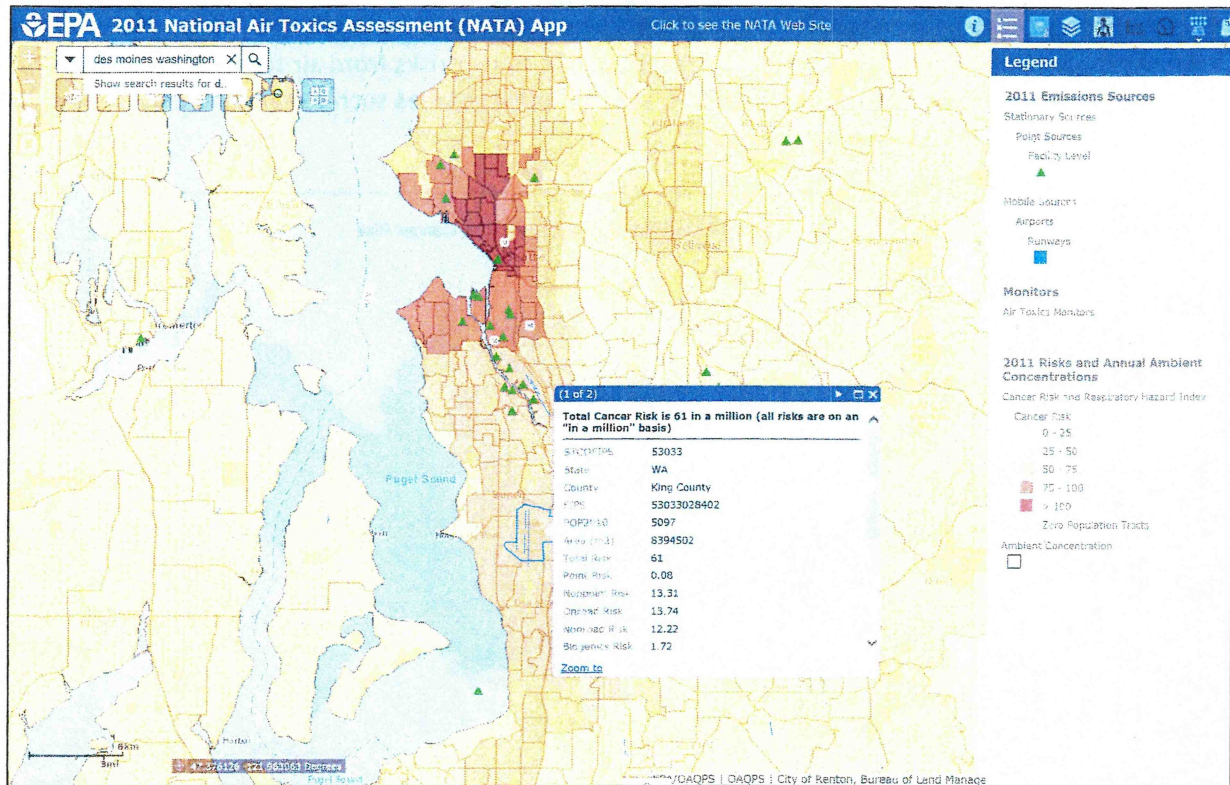
- Carbon monoxide, nitrogen dioxide, fine particles, and sulfur dioxide are “criteria pollutants.” None exceed National Ambient Air Quality Standards at this monitor.

Air Monitor Locations (<https://secure.pscleanair.org/AirQuality/NetworkMap>)



¹ Email from E Saganic (Puget Sound Clean Air Agency) to Beacon Hill Technical Advisory Committee, November 11, 2017.

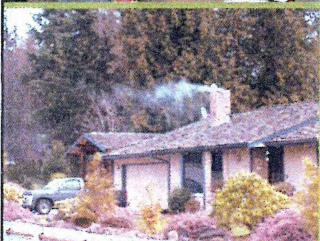
Map of Potential Cancer Risks from Air Toxics in the Puget Sound Region⁴



- NATA map shows cumulative cancer risks for exposure to 189 air contaminants (“air toxics”).
- The NATA cancer risk estimate for the highlighted area (Sea-Tac Airport) is 61 in a million. This means for every million people exposed to the levels of pollution emitted by the sources, the models estimate 61 additional (above the average risk) cancer cases. These numbers are designed to be highly protective, in other words they are likely to overestimate the potential cancer risks from exposure to chemicals.
- Compare 61 in a million risk to the risk of contracting cancer. For the average US citizen, the risk of contracting cancer is approximately 1 in 3 and risk of dying from cancer is 1 in 5.⁵
- The data shows that the sources contributing to the overall cancer risk are:
 - On road (13.74 or 23%), dominated by light duty gas vehicles
 - Nonpoint risk (13.31 or 22%), dominated by residential wood combustion
 - Nonroad risk (12.22 or 20%), of which the **risk due to airport and airplane sources is 7.58, or 12% of the total risk.**

⁴ USEPA. *National Air Toxics Assessment (NATA) App*. <https://gispub.epa.gov/NATA/>


⁵ (National Cancer Institute: <https://www.cancer.gov/about-cancer/understanding/statistics>, and SEER data on lifetime cancer risk).



Regional Air Quality Briefing
Highline Forum
September 27, 2017


Kathy Strange
Manager, Technical Analysis

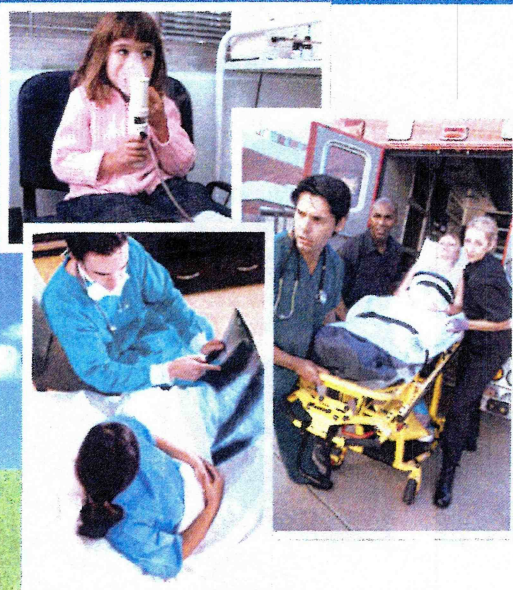
*Clear, healthy air
for everyone, everywhere,
all the time.*



To be covered

- Agency overview
- Which air pollutants and communities do we focus on, and why?
- Where do priority air pollutants come from?
- How does air quality in south King County compare with other areas? What are trends?
- What's being done to improve air quality?
- Ultrafine particle pollution and upcoming University of Washington study
- Questions?

 **Why focus on fine particle pollution (PM_{2.5})**
Variety of health effects




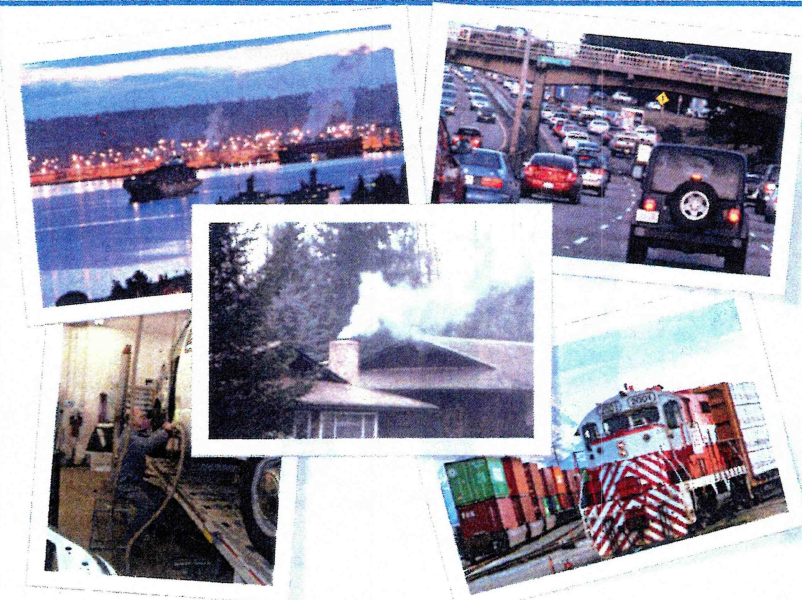
Most established health effects include:

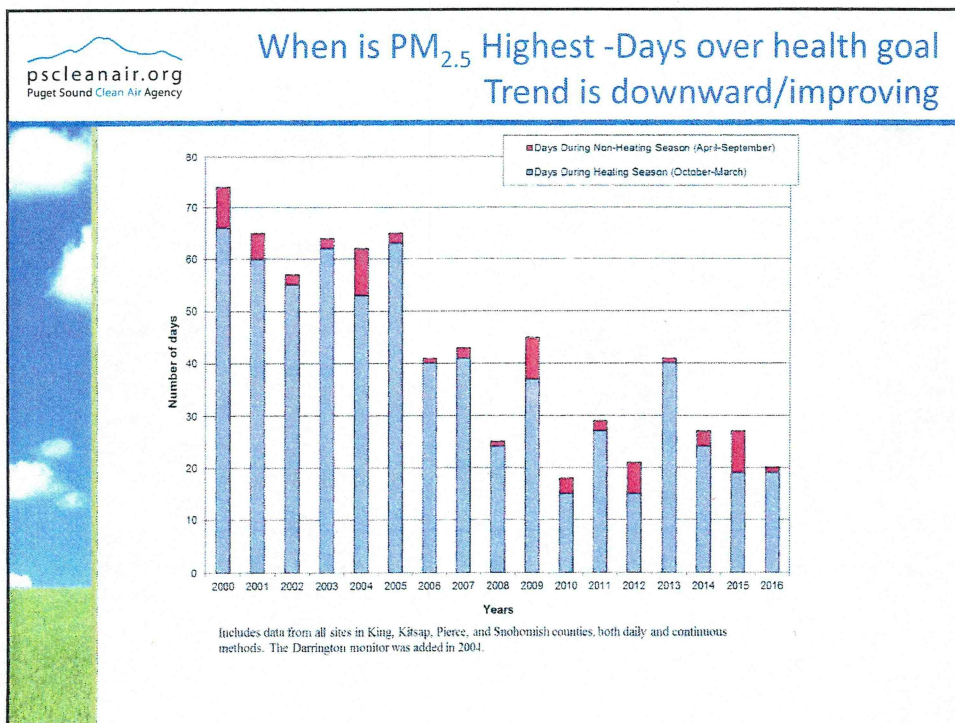
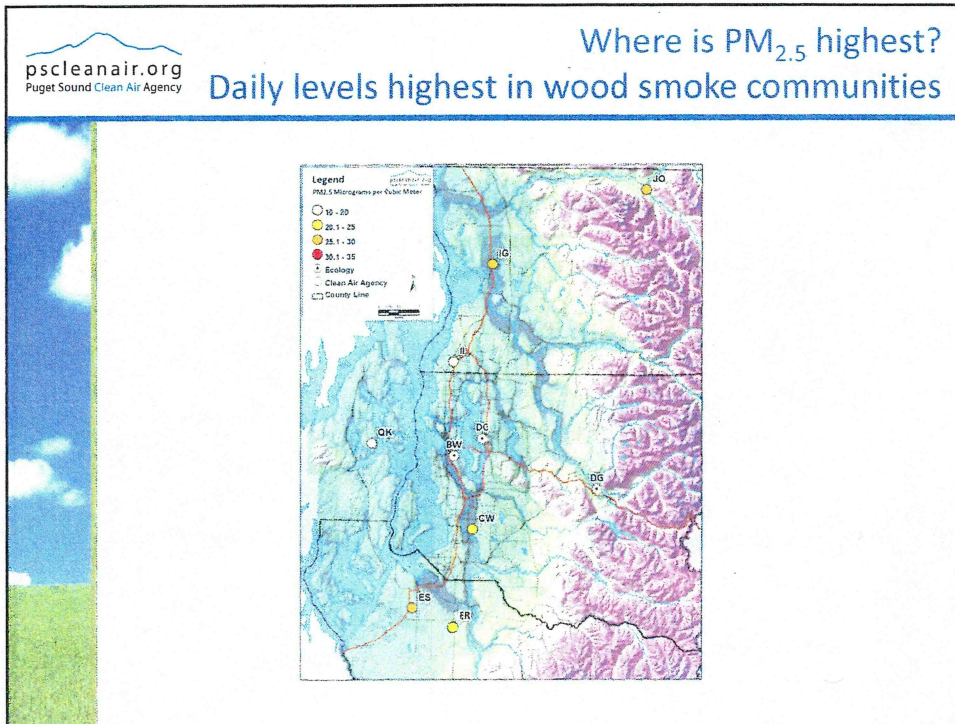
- Asthma aggravation
- Reduced lung function
- Heart attacks
- Strokes
- Premature death

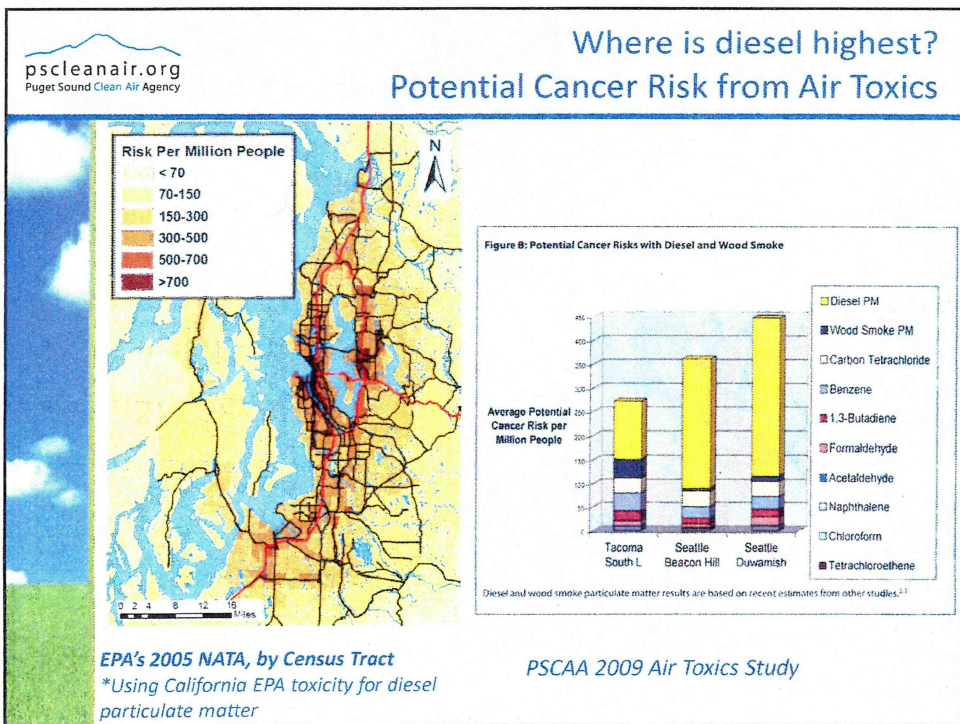
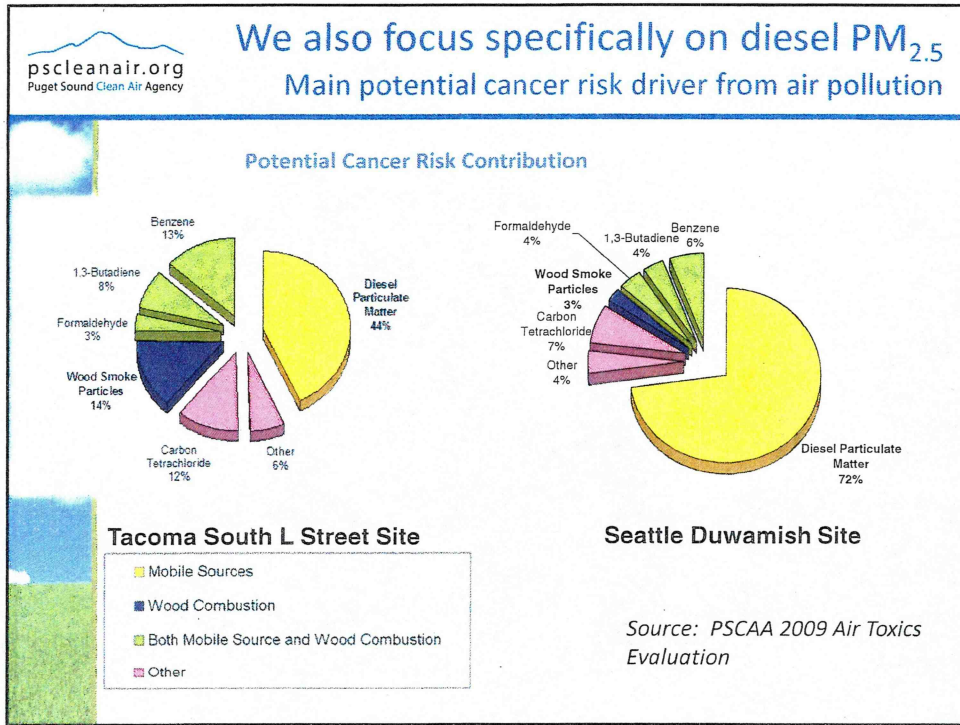
Well established – based on large body of evidence

National Ambient Air Quality Standard (acute and chronic); local health goal

 **Where does PM_{2.5} come from?**







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Grant programs that improve air quality across communities

- Northwest Ports Clean Air Strategy. Truck “ScRAPs” program has replaced 400 old polluting trucks with clean ones.
- Sound Transit locomotive upgrades
- Over 200 SeaTac Airport taxis converted to compressed natural gas engines; electrification of ground support equipment
- Retrofit over 650 school buses, private, and public fleets
- Tug boats servicing Des Moines and Elliot Bay were repowered and retrofitted
- Idle-reduction technology on diesel emergency vehicles
- Uncertified wood stove scrapage program

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“Ultrafines” – emerging area of research Upcoming University of Washington study

ultra-fine particles		fine particles	
0.01 µm	0.1 µm	1 µm	10 µm
10 nm	100 nm	1 000 nm	10 000 nm

← diameter of an average human hair (60 µm) →

“Relatively few studies have directly compared UFPs with other particle size fractions. These factors constrain our ability to draw definitive conclusions about the specific consequences of exposure to UFPs.”

HEI Perspectives 3
Understanding the Health Effects of Ambient Ultrafine Particles
HEI Review Board on Ultrafine Particles

