




## Regional Air Quality Briefing Highline Forum September 27, 2017



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

- 
- 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?

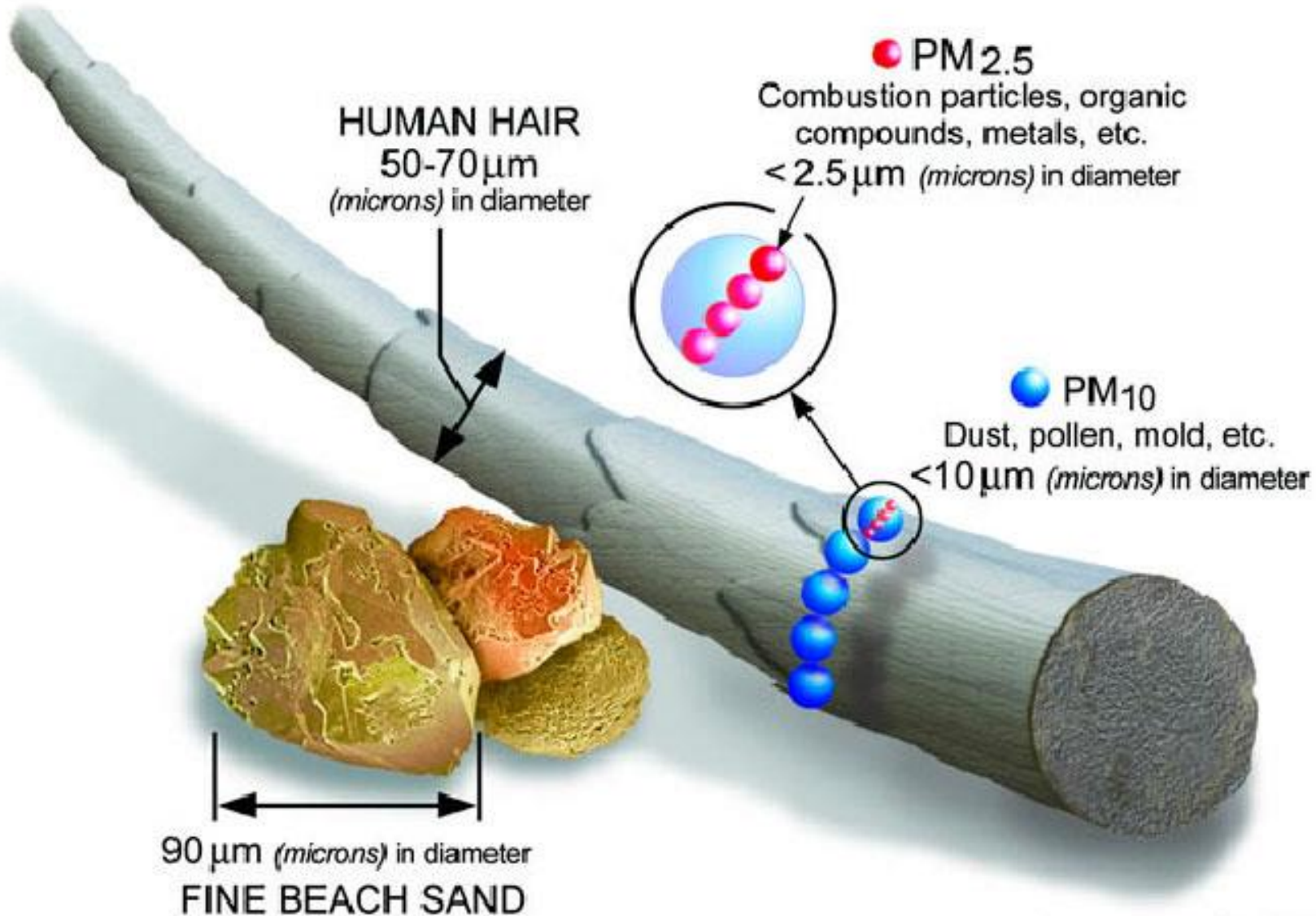
- All the people and natural systems in our region benefit from clean and healthy air all the time, regardless of socio-economic status or geographic location.
- Our region does its part, and more, to protect the climate.

Our jurisdiction



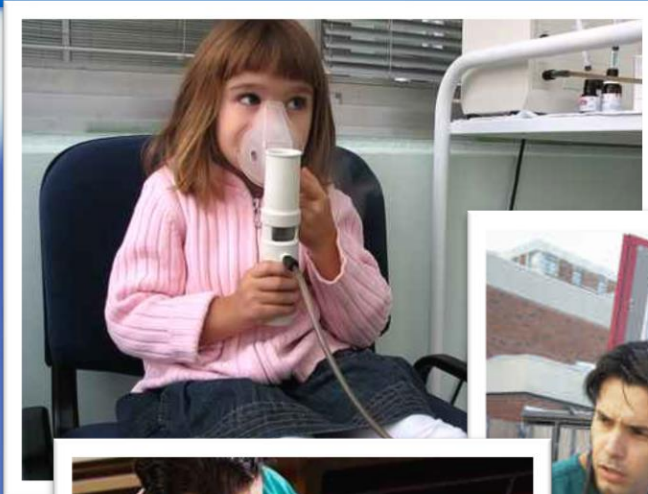
# Fine Particle Pollution

Small size; Cardiac and Respiratory Effects



# Why focus on fine particle pollution (PM<sub>2.5</sub>)

Variety of health effects

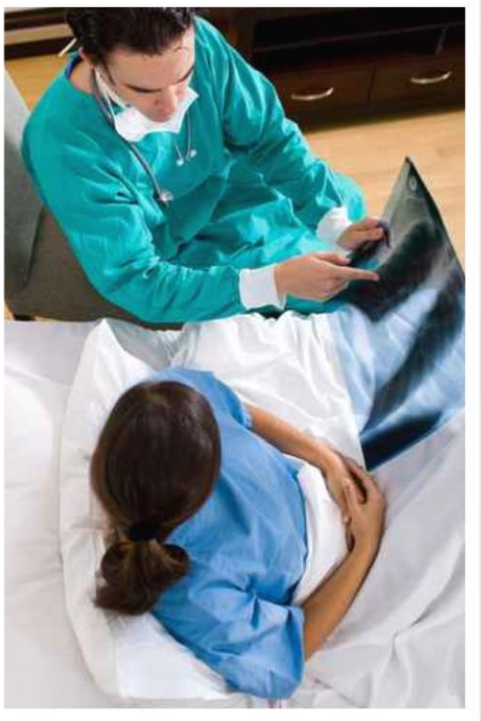


Most established health effects include:

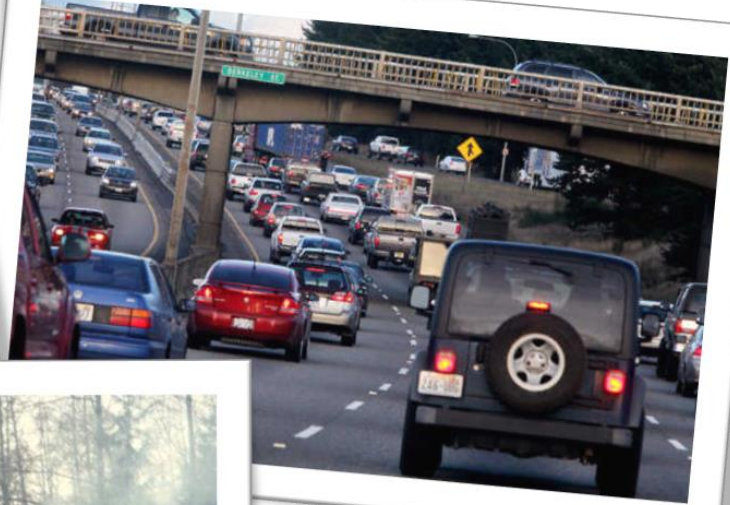
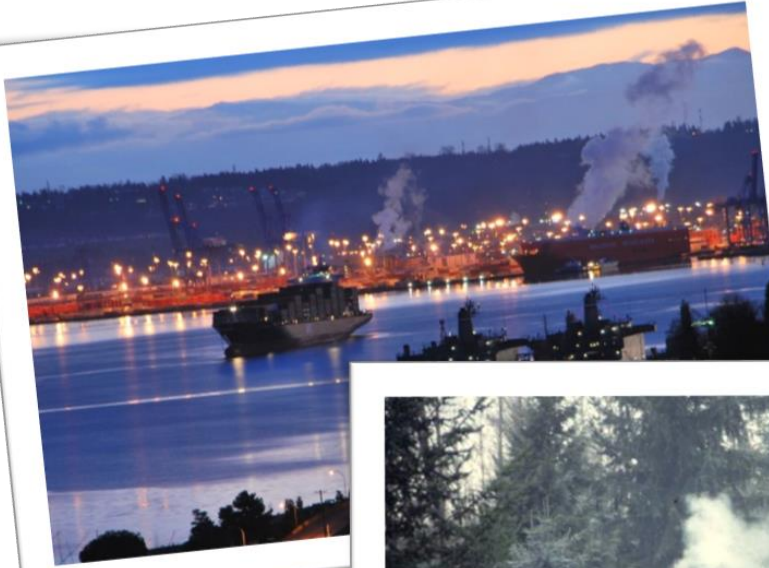
- Asthma aggravation
- Reduced lung function
- Heart attacks
- Strokes
- Premature death

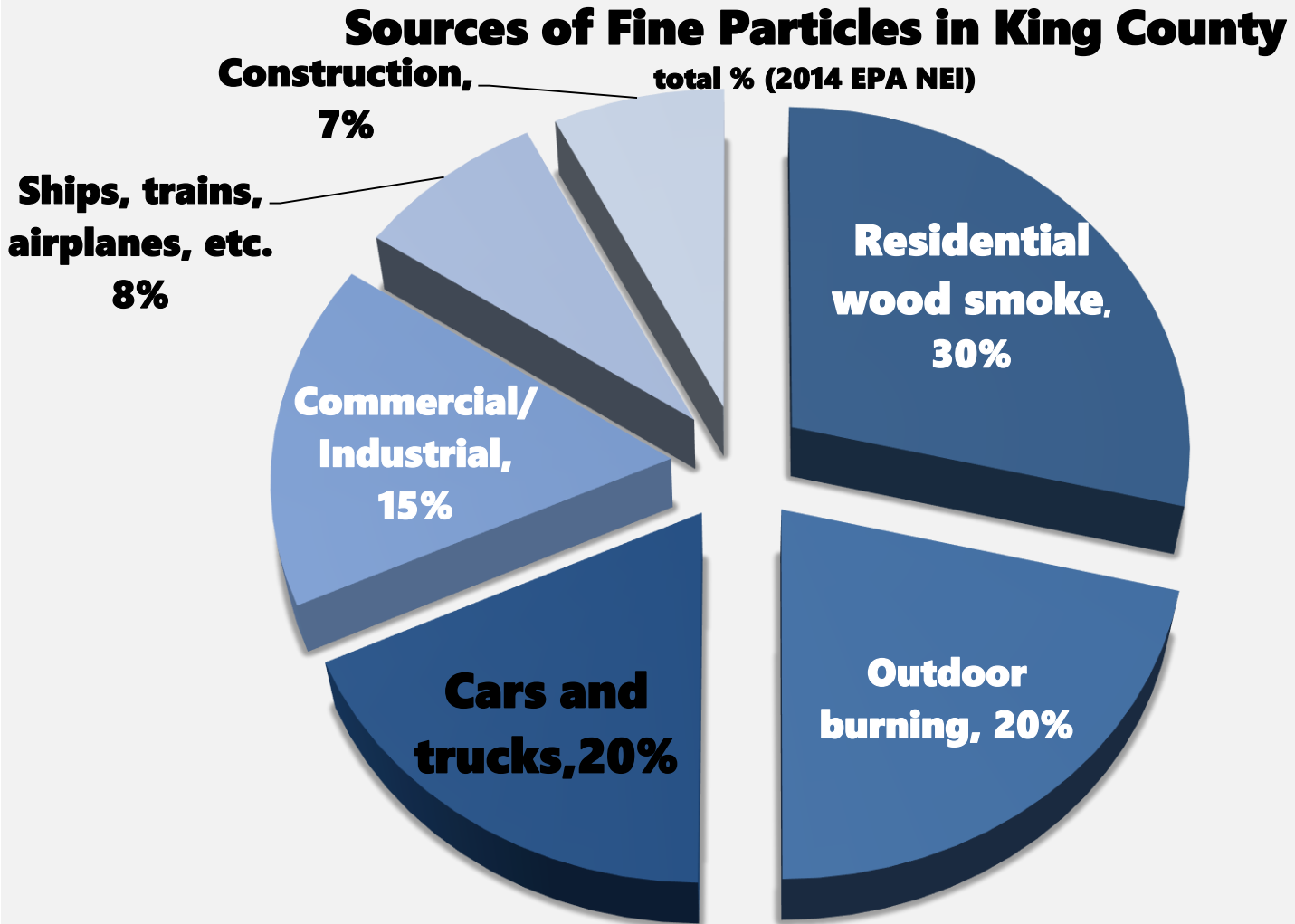
Well established – based on large body of evidence

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

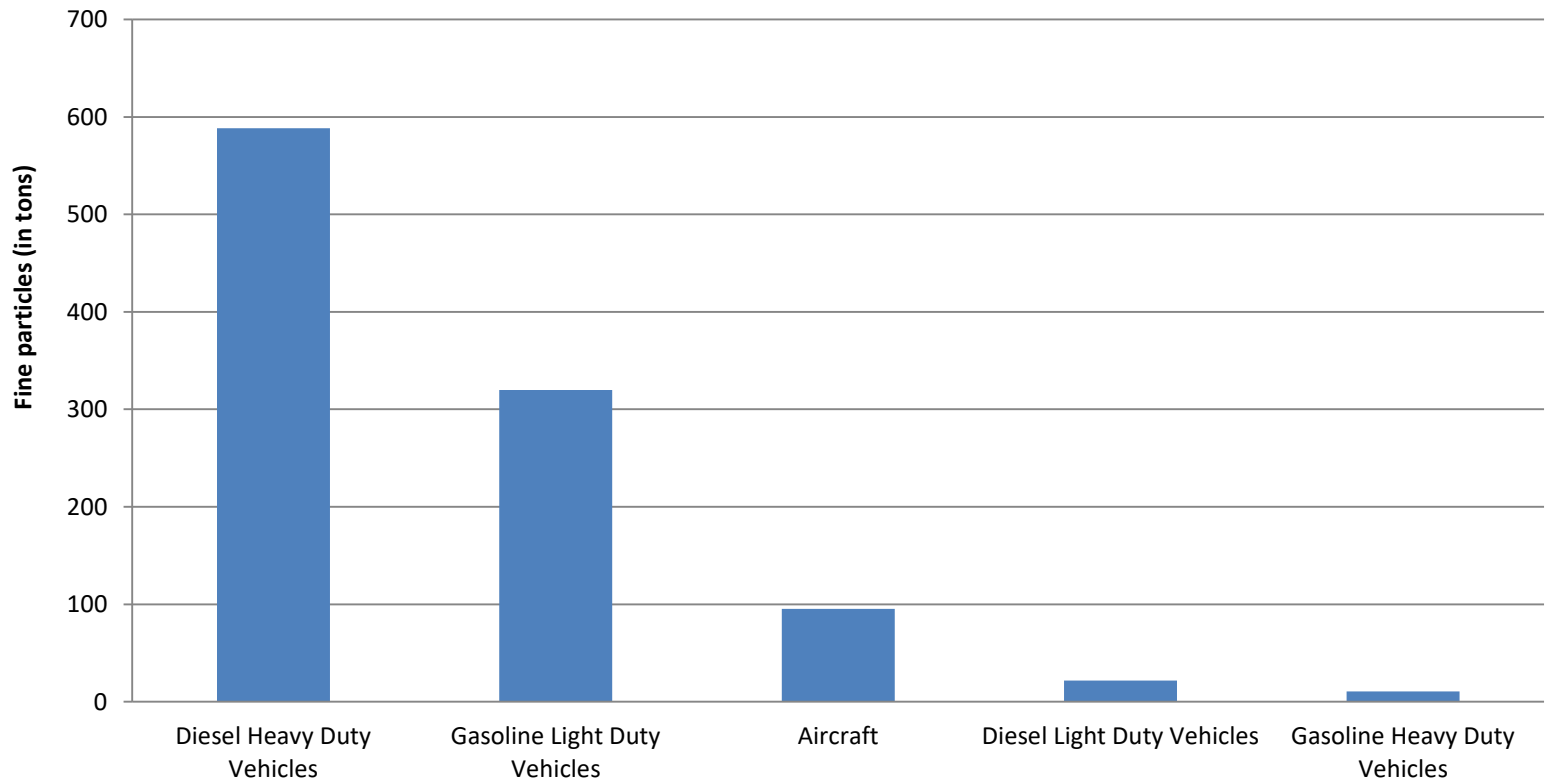


# Where does PM<sub>2.5</sub> come from?



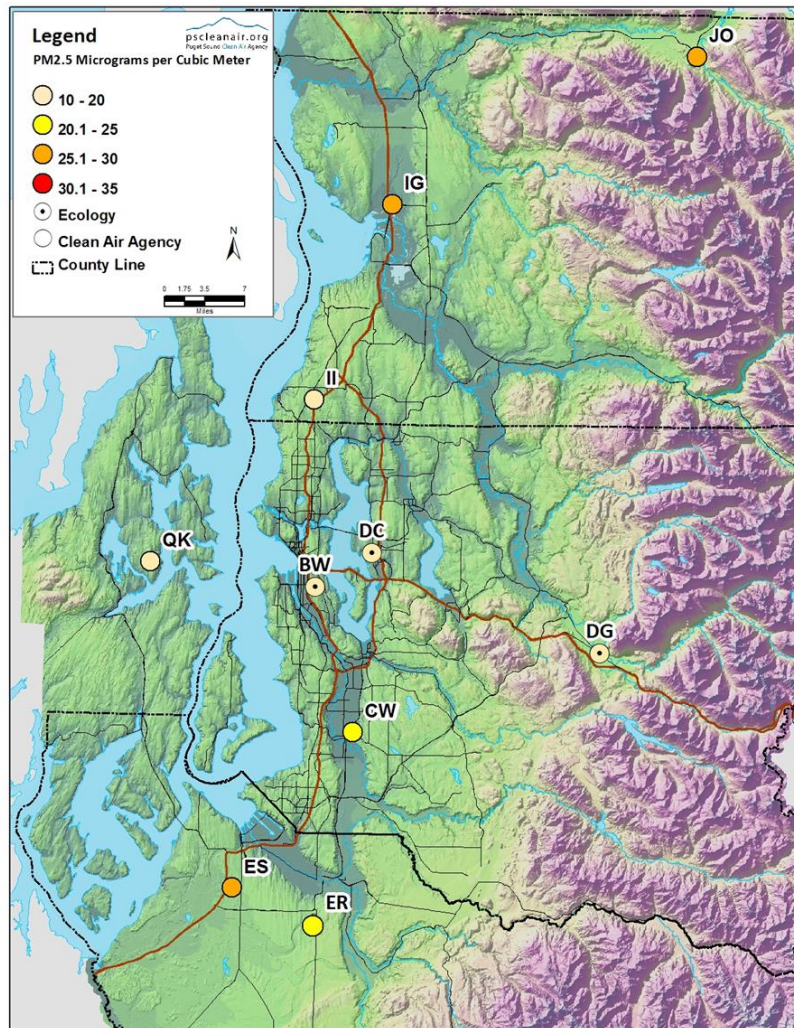


## 2014 King County Fine Particle Emissions, On-road and aircraft (including Sea-Tac, Boeing Field, Renton Field)



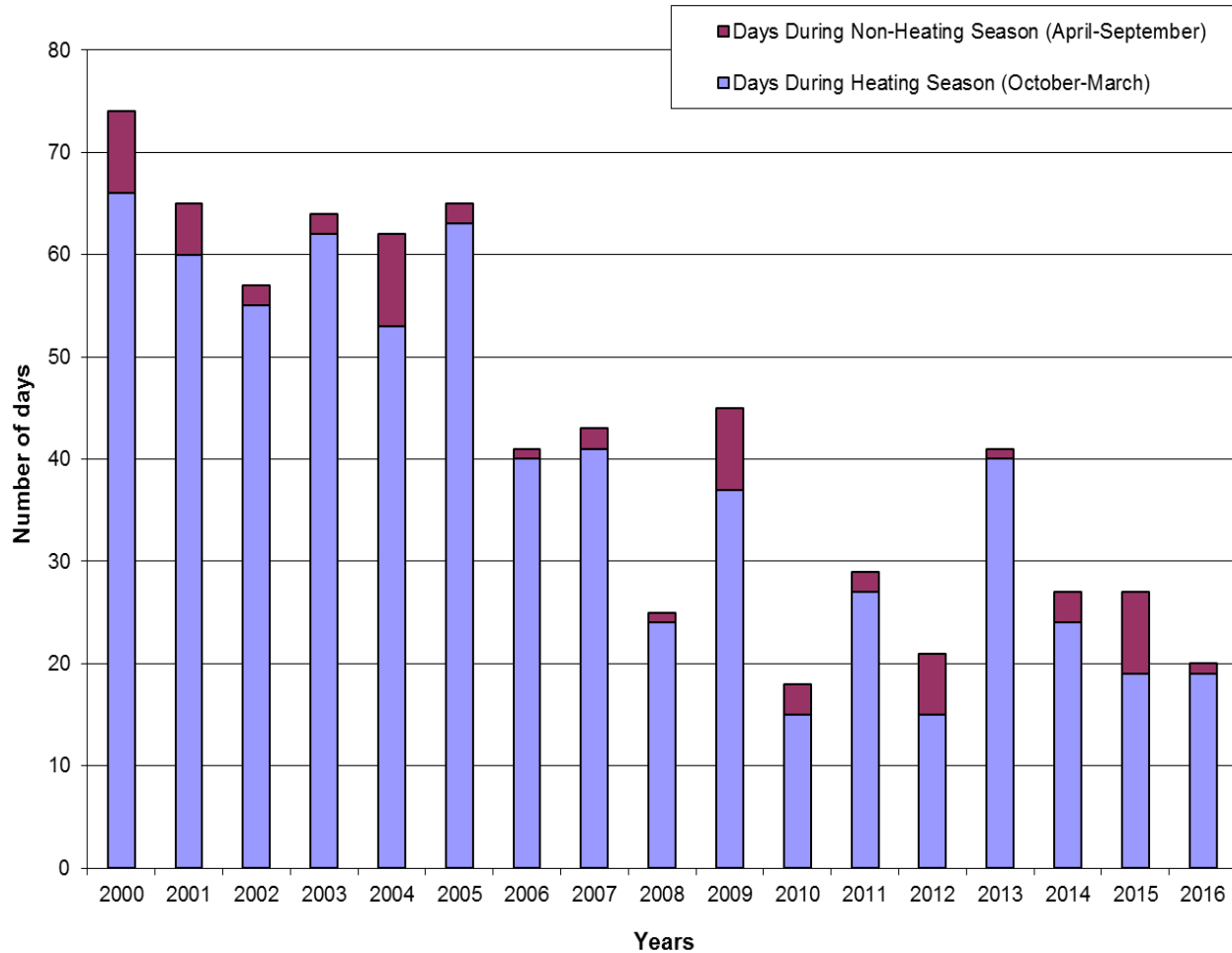


## Daily levels highest in wood smoke communities



# When is PM<sub>2.5</sub> Highest - Days over health goal

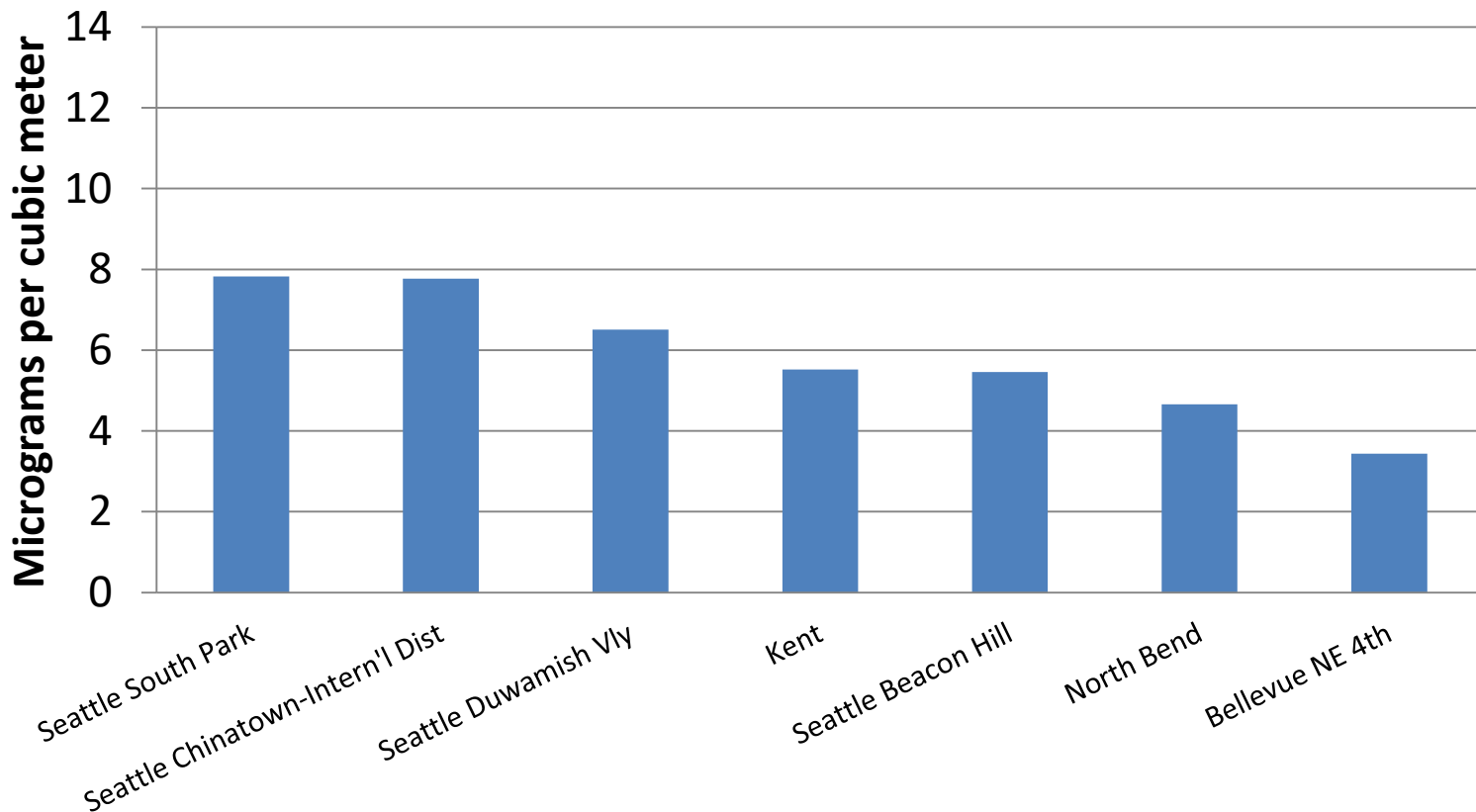
## Trend is downward/improving



Includes data from all sites in King, Kitsap, Pierce, and Snohomish counties, both daily and continuous methods. The Darrington monitor was added in 2004.

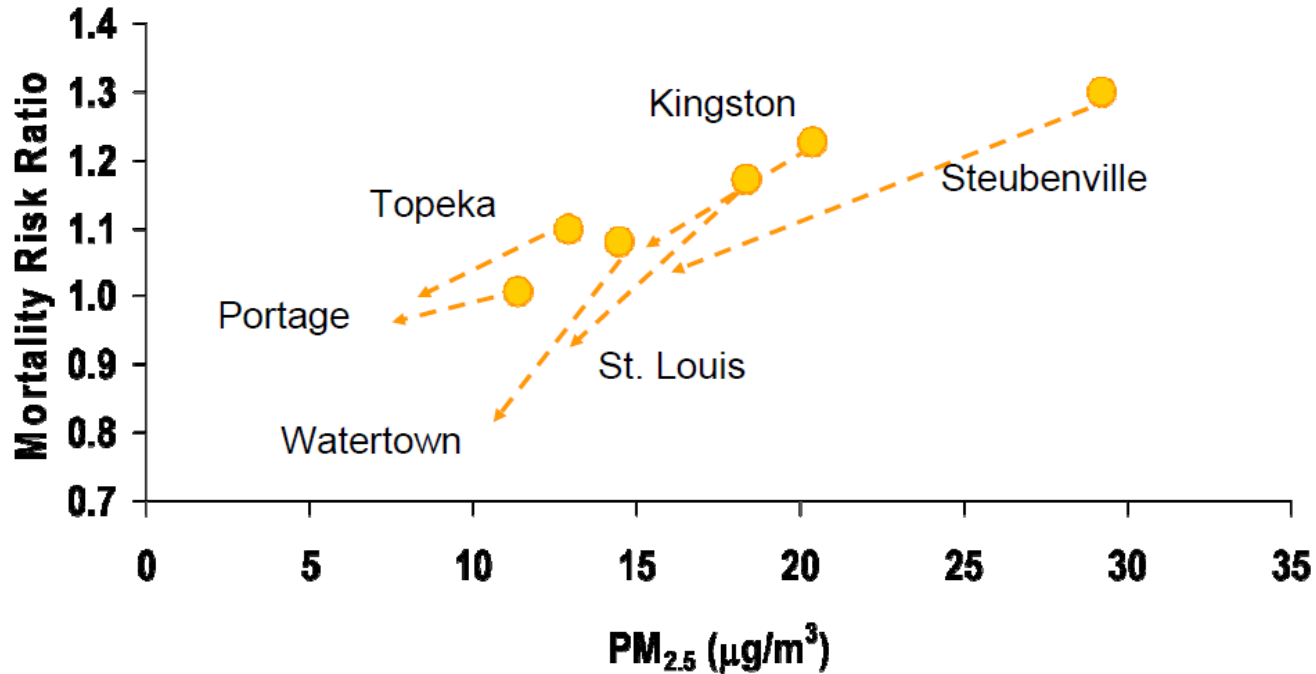
## Annual levels highest near roadways, ports, industry

### 2016 Annual Average Fine Particle Levels in King County



# Improved PM<sub>2.5</sub> levels = better health outcomes

Follow up analysis of the Six-Cities cohort:  
Air pollution reductions → reduced risk of death



Reduction in fine particulate air pollution:  
Extended follow-up of the Harvard Six Cities Study



Laden, Schwartz,  
Speizer, Dockery, 2006

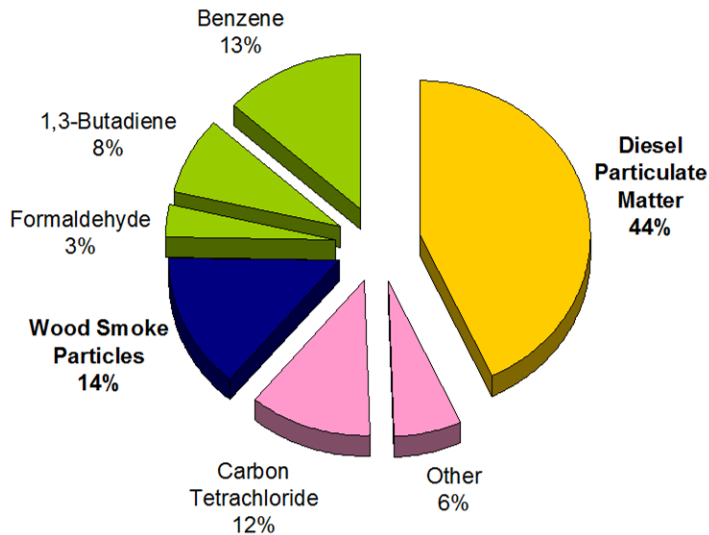
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Respiratory and  
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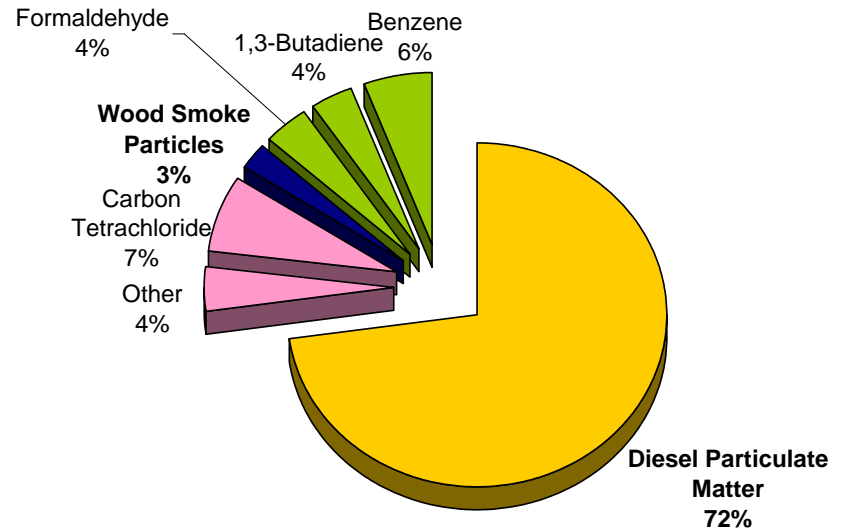
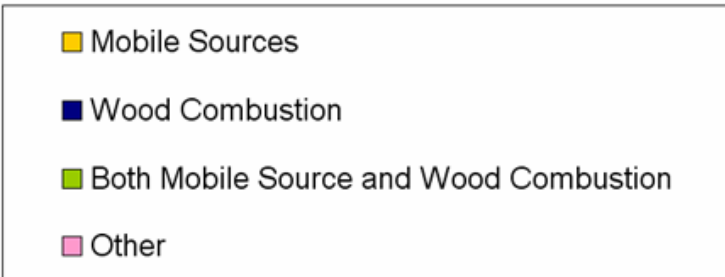
# We also focus specifically on diesel PM<sub>2.5</sub>

## Main potential cancer risk driver from air pollution

### Potential Cancer Risk Contribution



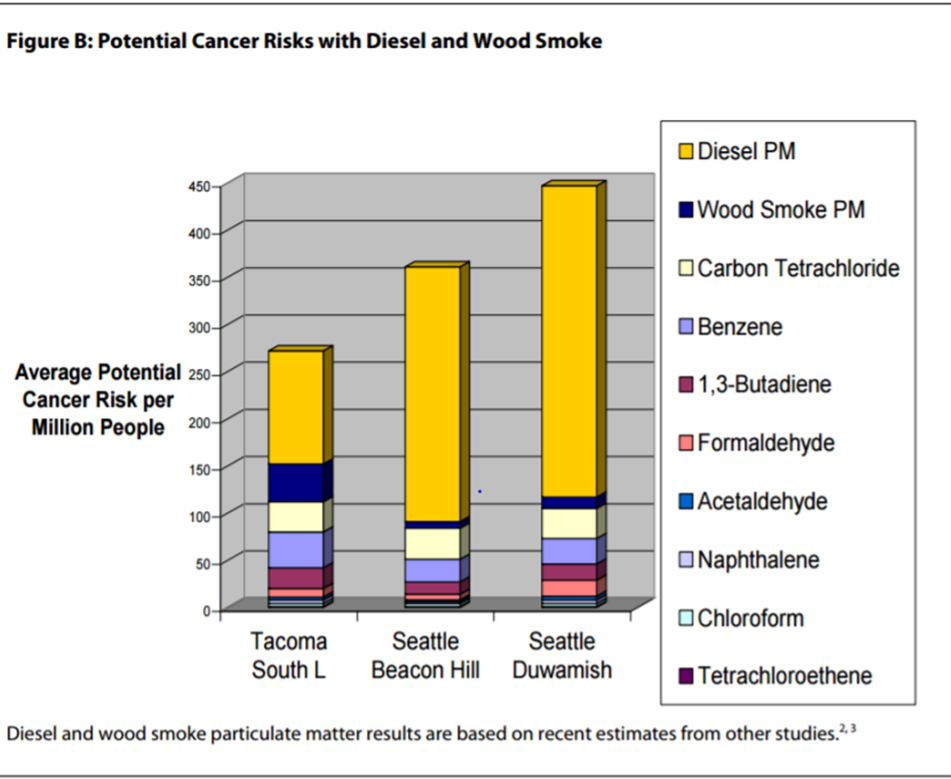
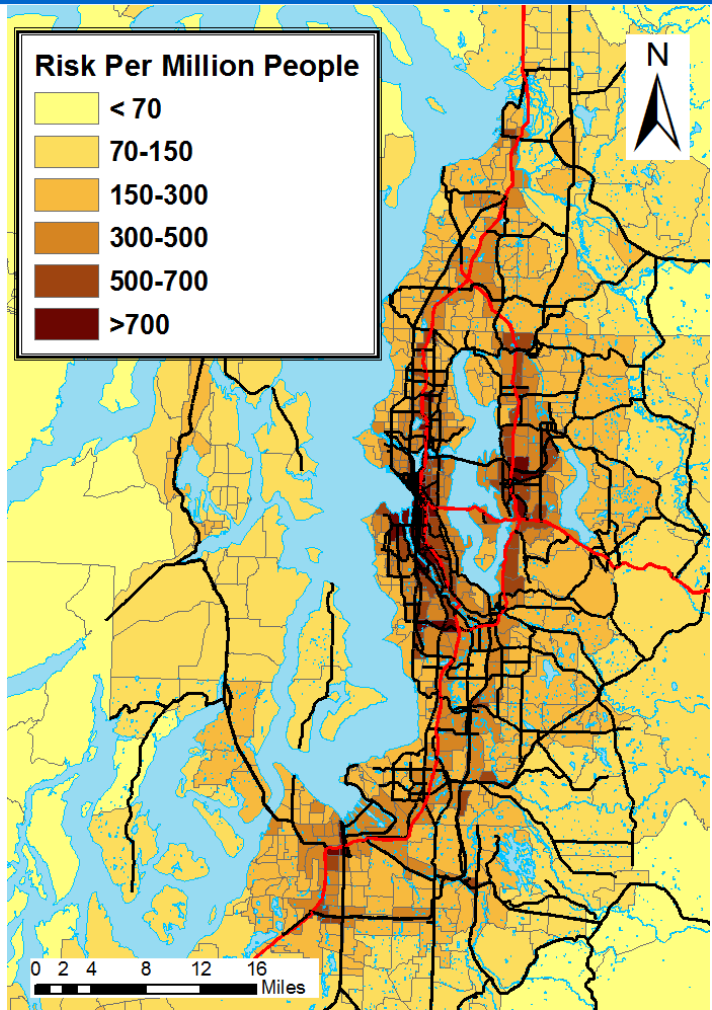
### Tacoma South L Street Site



### Seattle Duwamish Site

Source: PSCAA 2009 Air Toxics Evaluation

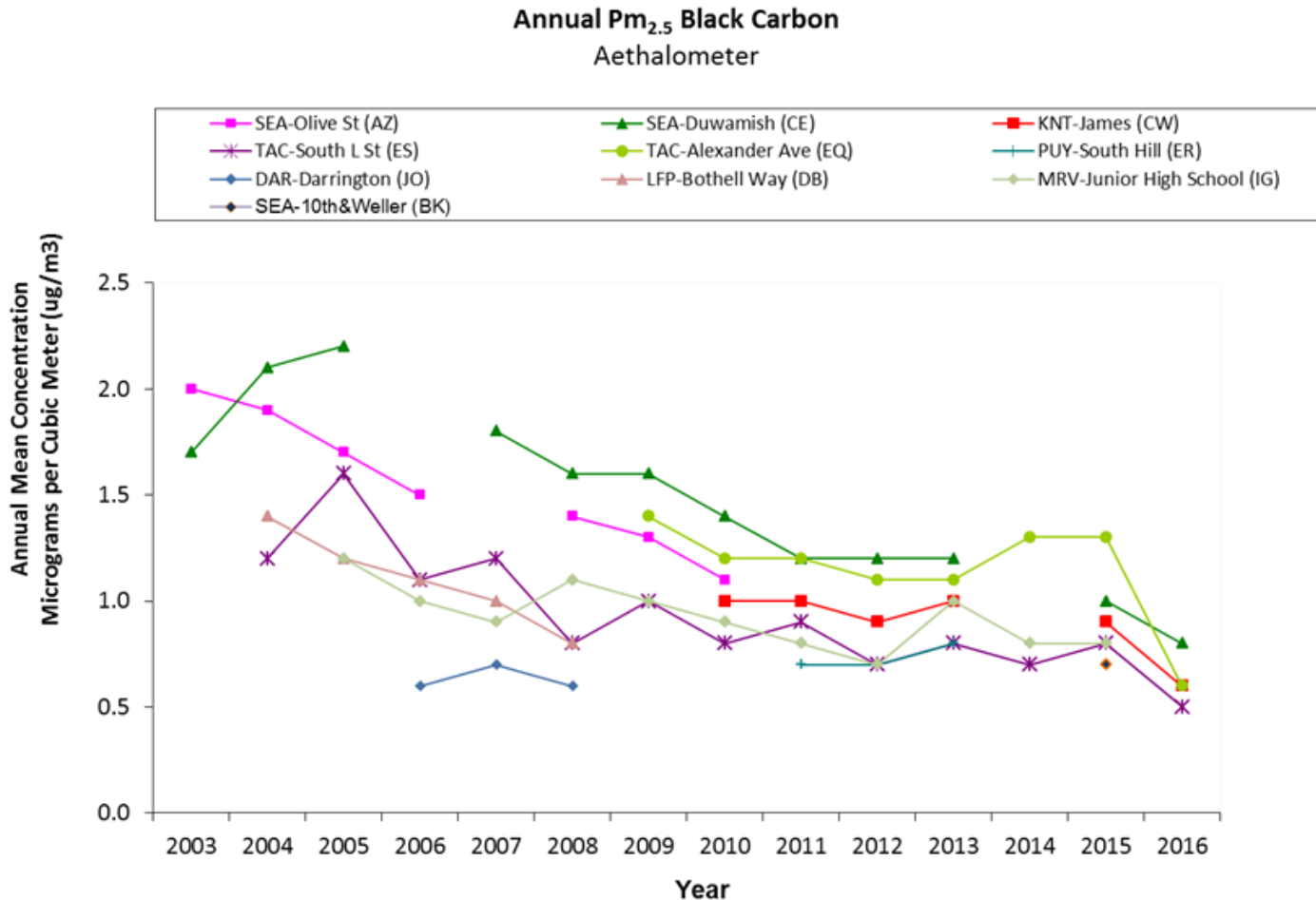
# Where is diesel highest? Potential Cancer Risk from Air Toxics



*EPA's 2005 NATA, by Census Tract*  
*\*Using California EPA toxicity for diesel particulate matter*

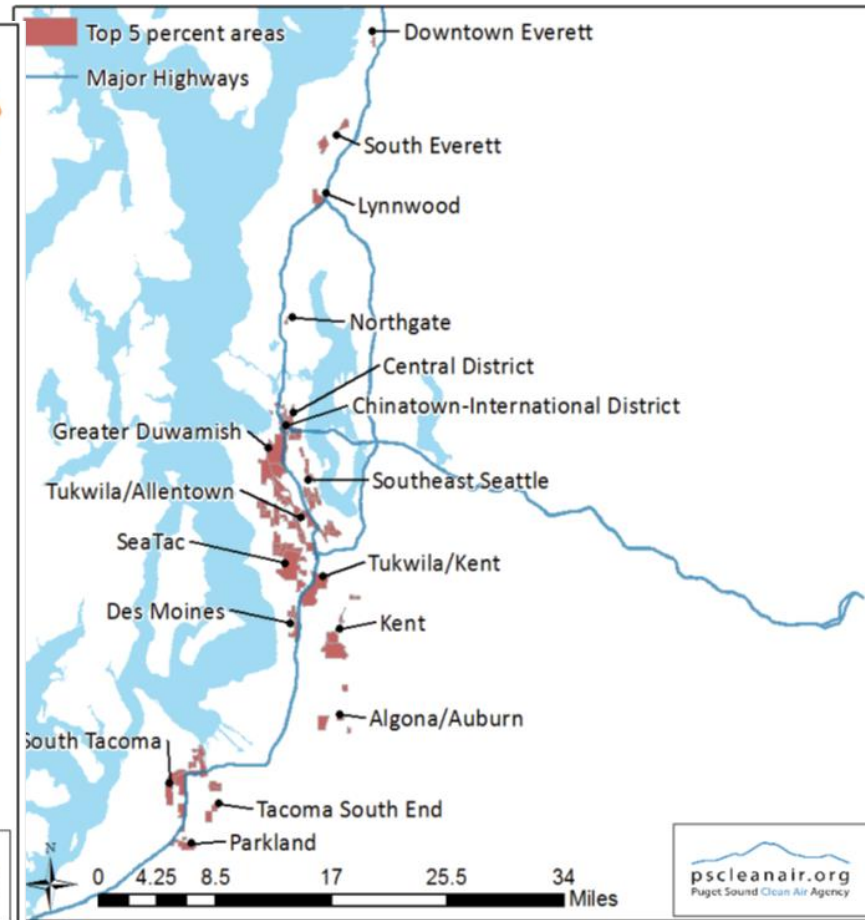
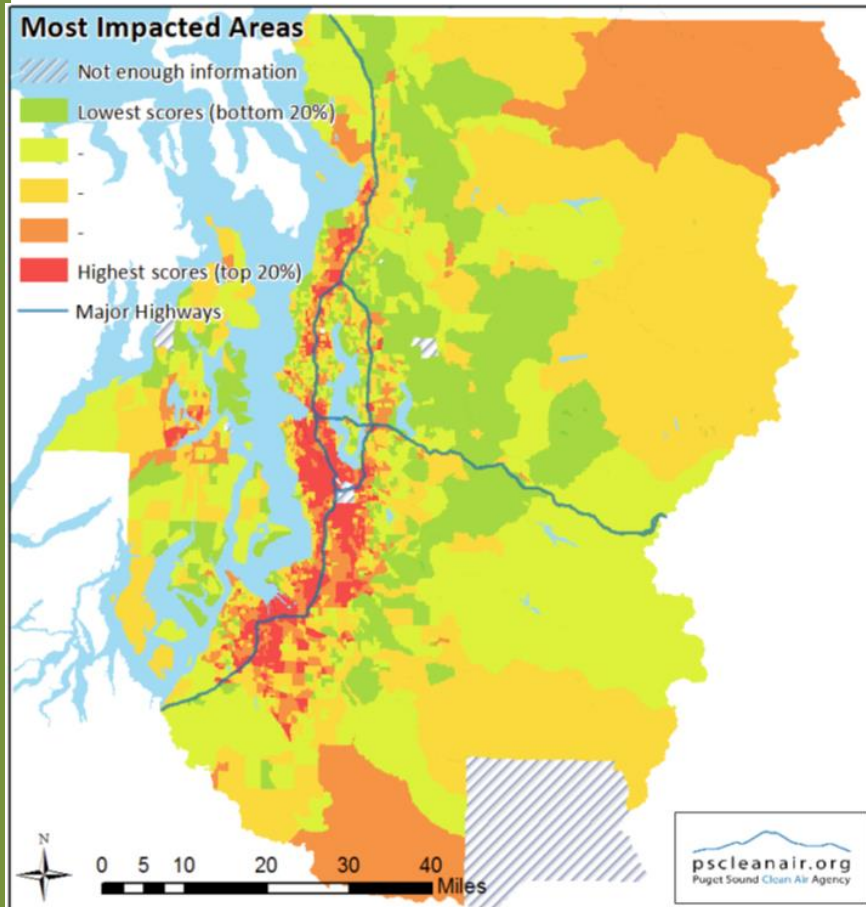
*PSCAA 2009 Air Toxics Study*

# Where is diesel highest? Trend is downward/improving



# Where do we focus? Highly impacted communities

combines air pollution risk, socioeconomic barriers, and poor health outcomes



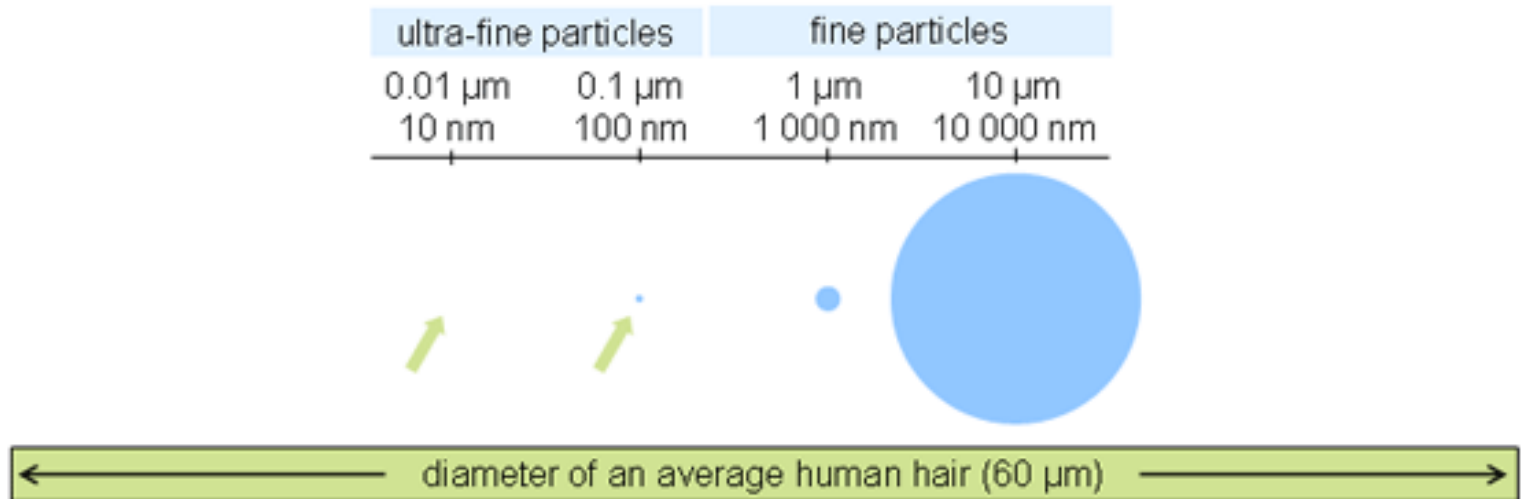
*We're working with communities in Greater Duwamish, Seattle Chinatown-International District, Tukwila Allentown, and Algonia/Auburn*



# 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 scrappage program

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



*“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

January 2013

Insights from HEI's research

Understanding the Health Effects of Ambient Ultrafine Particles

HEI Review Panel on Ultrafine Particles

- We focus on PM<sub>2.5</sub> pollution, and specifically diesel PM<sub>2.5</sub> because of their established health impacts.
- Improvement in PM<sub>2.5</sub> levels leads to improved health outcomes.
- PM<sub>2.5</sub> and diesel trends and new technology encouraging; legacy fleets remain a challenge – many grants and programs target these
- Health effects of ultrafine pollution are not yet well understood; we look forward to learning more about local levels with UW research study

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[www.pscleanair.org](http://www.pscleanair.org)

Strategic plan: <http://www.pscleanair.org/documentcenter/view/445>.

Annual Data Summary: <http://www.pscleanair.org/DocumentCenter/View/2294>.

Highly Impacted Communities Report:  
<http://www.pscleanair.org/DocumentCenter/View/2323>.

2009 Toxics Study: <http://www.pscleanair.org/DocumentCenter/View/2361>.