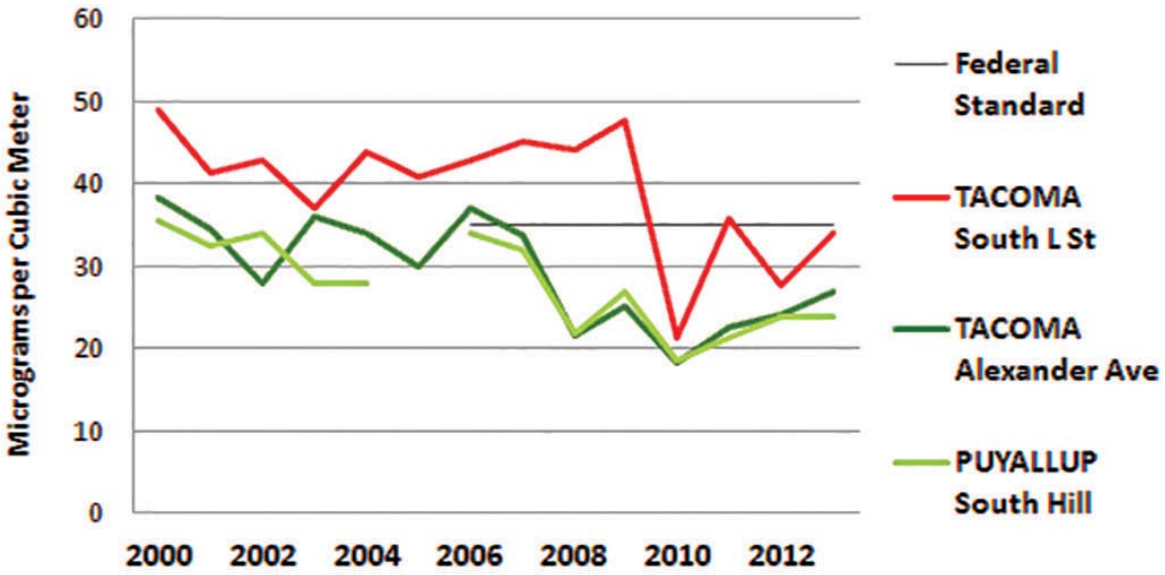
Air

Fine Particulate Matter ($PM_{2.5}$)



Data Source: Data Sources: Puget Sound Clean Air Agency and Washington State Department of Ecology (pie chart below).

Annual average fine particulate air pollution levels were below the federal standard in 2010 and 2012 due to good weather, and in 2013 despite the weather. These levels can still cause health impacts, especially in winter.

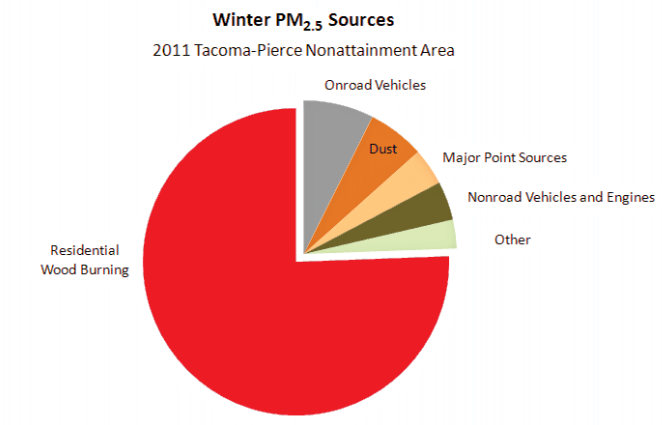
WHY CARE?

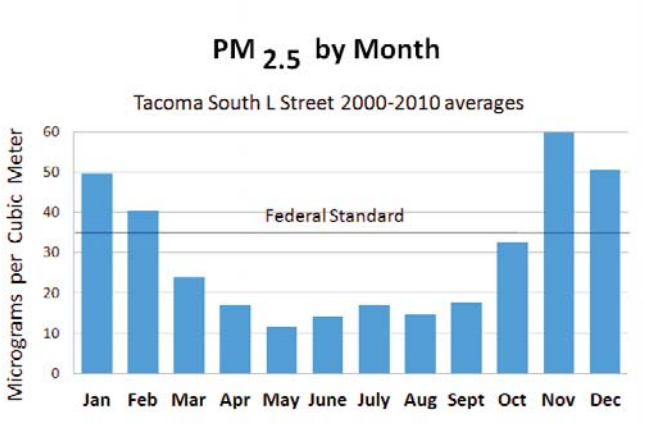
Hazards

- Fine particulate matter ($PM_{2.5}$): which are solid or liquid particles 2.5 micrometers or less in diameter, smaller than 1/30th the width of human hair.

Exposure

- Breathing air with $PM_{2.5}$ and air toxics, especially downwind from $PM_{2.5}$ sources such as woodstoves and busy roads.
- $PM_{2.5}$ transports air toxics that end up in the Sound and in seafood we eat.[1]
- Tacoma South L Street, Spanaway, Auburn, and Puyallup air quality monitoring stations had higher levels than Gig Harbor and Tacoma Alexander stations. Areas with lower elevations and economically challenged communities had higher levels also.[2]
- As the chart below shows, $PM_{2.5}$ is worse in the winter when more people burn wood and air inversions trap cold air and air pollution.





Human health impacts

- Long-term exposure to $PM_{2.5}$ contributes to heart disease, cancer, strokes, and chronic obstructive pulmonary disease.[3] About 140 deaths, 200 non-fatal heart attacks, 1800 asthma attacks, and 6000 respiratory illnesses each year are associated with fine particulate exposure in Pierce County.[4]
- Short-term exposures to high levels are also associated with increased risk of death due to stroke.[5]
- Diesel particulates cause more than 75% of total cancer risks from air toxics.[6]
- Exposure during fetal and infant development may contribute to weight gain, obesity, and increased diabetes later in life.[7]

Who's most vulnerable?

- Babies, very young children, teenagers and elderly.
- People with asthma, (about 10% of Pierce County adults and youth[8]) and others with respiratory or heart disease, diabetes, or are obese.[9] American Indians, Alaska Natives and Blacks have asthma rates much higher than Whites.[10]
- People who burn wood and people who live down wind from those who burn wood.
- People who live, work, or go to school near major roads.[11]

Economic impacts

- More than 23,000 lost work days each year are associated with $PM_{2.5}$ exposure in Pierce County.[12]
- Direct and indirect costs associated with $PM_{2.5}$ pollution in Pierce County are estimated at over $20 million each year for residents, businesses, and others.[12]

WHAT CAN YOU DO?

Policy actions

Federal, state, and local policies and programs continue to improve air quality.

- Wood smoke reduction programs and burn bans have decreased wood smoke.
- Better fuel efficiency, cleaner burning fuel and engines, hydropower, retrofits, and public transit have decreased vehicle emissions, including diesel emissions.[13]
- Port of Tacoma and businesses there are reducing air pollution from their ships, trucks, and rail by using ultra-low sulfur diesel, shore power, and anti-idling technologies.[14]

Particulate matter levels in much of Tacoma and Pierce County have not met federal health-based standards in the past. This is called "nonattainment."

- The federal Clean Air Act directs Environmental Protection Agency to review its fine particulate, ozone, and other air quality standards every five years to determine whether the standards should be revised.
- As directed by the federal Clean Air Act, Washington State Department of Ecology submitted a plan in 2012 for the Tacoma-Pierce County "nonattainment area" to meet federal standards and will submit a plan in late 2014 to redisignate the area to "attainment."

Personal actions

- Help get the word out about how to improve air quality. Find out more at www.airsafepiercecounty.org/resources.
- Don't burn during a burn ban! Find out about burn bans at www.pscleanair.org/signup, text "pierceburn" to 313131, call the burn ban hotline at (800) 595-4341, or get the Burn Ban 411 App.
- Never burn garbage—it's toxic and illegal.
- If you have a wood stove, replace it with a cleaner heat source. Call (253) 798-4540 or email woodsmoke@tpchd.org to find out if you qualify for a discount or other incentives.
- Weatherize your home to save energy and heating costs.
- Drive less—carpool, bus, bike, and walk more.
- Cigarette smoke has fine particulates and more than 250 toxic chemicals.
  - o Don't smoke or vape.
  - o If you must smoke, smoke outside at least 25 feet from windows, doorways, and play areas.

By removing more than 1700 woodstoves in our county, residents prevented the release of more than 180 tons of total fine particulate since 2008.

1 Puget Sound Toxics Assessment, Washington State Department of Ecology, November 2011; Study about atmospheric pollution and Puget Sound, Washington State Department of Ecology, January 2011.

2 2012-2013 Winter Monitoring Study, Puget Sound Clean Air Agency, May 2013.

3 Puget Sound Clean Air Agency Particulate Matter, www.pscleanair.org/airq/basics/criteria/particulate.aspx, 2011.

4 Washington State Department of Ecology estimates, December 5, 2011 correspondence; Health Effects and Economic Impacts of Fine Particulate Matter in Washington, Washington State Department of Ecology, 2009.

5 Brief Exposure to Dirty Air May Raise Stroke Risk, Reuters, Scientific American, September 22, 2006.

6 Focus on Health Risks of Air Toxics, Washington State Department of Ecology, March 2011.

7 Obesogens: An Environmental Link to Obesity, Environmental Health Perspectives, February 2012. Association Between Fine Particulate Matter and Diabetes Prevalence in the U.S., Pearson et al., Diabetes Care, October 2010.

8 The Burden of Asthma in Washington State, 2013 Update, Washington State Department of Health.

9 Air Quality Guide for Particle Pollution, U.S. Environmental Protection Agency, 2013.

10 Health of Washington State, Washington State Department of Health, June 2012.

11 The Role of Vegetation in Mitigating Air Quality Impacts from Traffic Emissions, US EPA, 2010.

12 Health Effects and Economic Impacts of Fine Particulate Matter in Washington, Washington State Department of Ecology, 2009.

13 Puget Sound Clean Air Agency Wood Stove Reduction Program and Diesel Solutions; The Health of Washington State, Outdoor (Ambient) Air Quality, Washington State Department of Health, 2002.

14 Port of Tacoma Air Quality, http://portoftacoma.com/community/environment/air; Northwest Ports Clean Air Strategy and Customer Initiative, 2012.