

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

Executive Summary

- Port pursuing aggressive environmental goals
 - › Limited regulatory authority
 - › Innovative programs and initiatives with multiple benefits
- Existing studies
- Tracking emerging science
 - › Ultrafine particulates (UFPs)
 - › Reductions in PM from climate strategies

Air Goals and Directives

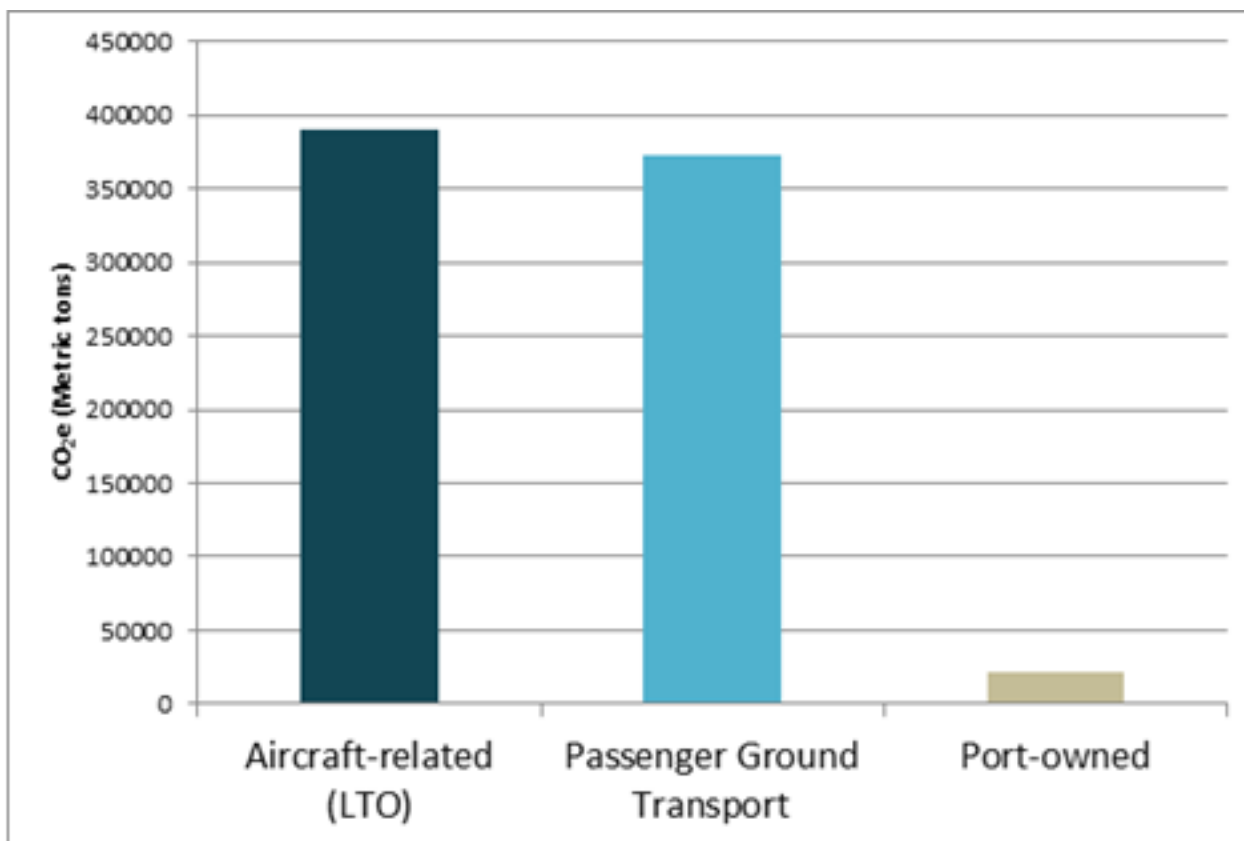
- Century Agenda
 - › Reduce air pollutants and carbon emissions, specifically:
 - Greenhouse gas from Port owned or controlled sources:
 - › 15% below 2005 levels by 2020
 - › 50% below 2005 levels by 2030 and carbon neutral by 2050
 - GHGs where the Port has influence:
 - › 50% below 2007 levels by 2030 and
 - › 80% below 2007 levels by 2050
 - Air pollution by 50% by 2034



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

Sources of Greenhouse Gases at Sea-Tac Airport



Comparing Sources of Air Pollution at Sea-Tac Airport

- PM2.5
 - › Aircraft engines
 - › Ground support equipment
 - › Passenger vehicles
 - › Stationary sources (boilers, diesel generators)
- Greenhouse Gases
 - › Aircraft engines
 - › Passenger vehicles
 - › Ground support equipment
 - › Stationary sources



Reducing Aircraft Emissions

- **Pre-Conditioned air**
 - Saves airlines 5 million gallons fuel per year
 - Reduces ~40,000 tonnes GHGs per year

- **Electric Ground Support Equipment**
 - Installing airport-wide
 - Reduce ~10,000 tonnes GHGs per year

- **Gate Improvement Projects**
 - Install gate electrification at all gates



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



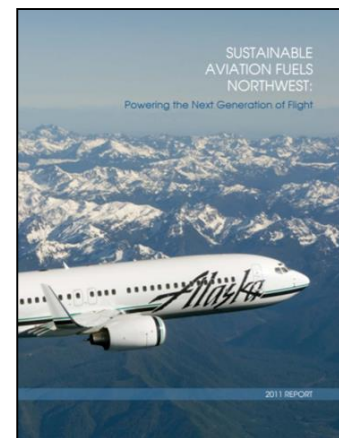
Passenger Vehicles

- 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?



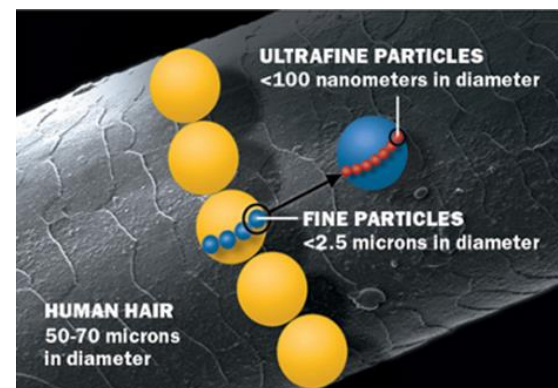
Sea-Tac's Aviation Biofuel Program

- 2008-2014
 - › Support research & development
 - › Chart a path to commercial scale biofuels
- 2015-present
 - › Support fuel integration & infrastructure
 - › Help with incremental cost of fuel
 - › Incentivize biofuel production in WA



Emerging Science: Ultrafine Particles (UFPs)

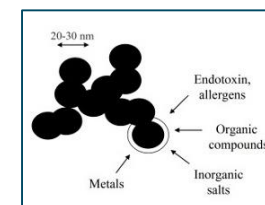
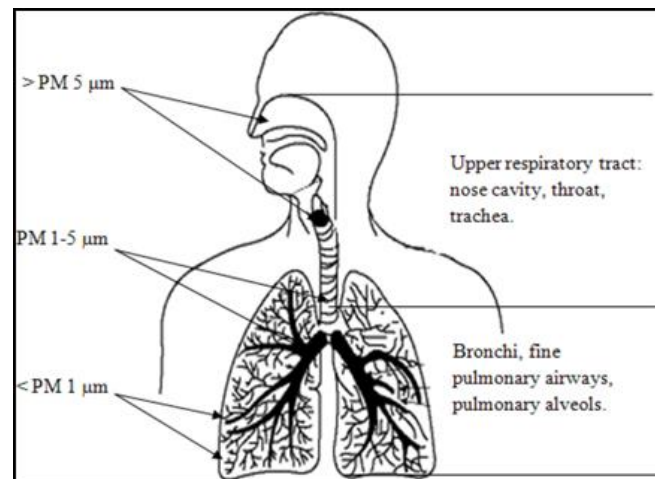
- UFPs penetrate deep into the lungs
- Emerging literature suggests health impacts similar to PM2.5
- UFP studies at LA, Atlanta and other airports show UFPs from airports
- No clear connection between exposure levels and adverse health impacts



(<https://ehp.niehs.nih.gov/1408565/>)

Health Effects of Air Pollution

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



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 NO_x 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 on-road vehicles and diesel soot.

Emerging Science: PM and Biofuels

- **ASCENT: FAA Center of Excellence for Alternative Jet Fuels & Environment**
 - › Research collaborative
- Published research since 2015 shows ***significant reductions in PM from aviation biofuels***



Next Steps

- Strongly support additional research into exposures and health impacts of UFPs
 - › Includes state-funded UFP health study to be conducted by UW
- Continue to implement strategies that reduce GHGs and other air pollutants
- Continue to track research on PM reductions from biofuels