

Environmental Quality Commission meeting

Diesel Engine Emissions in Oregon

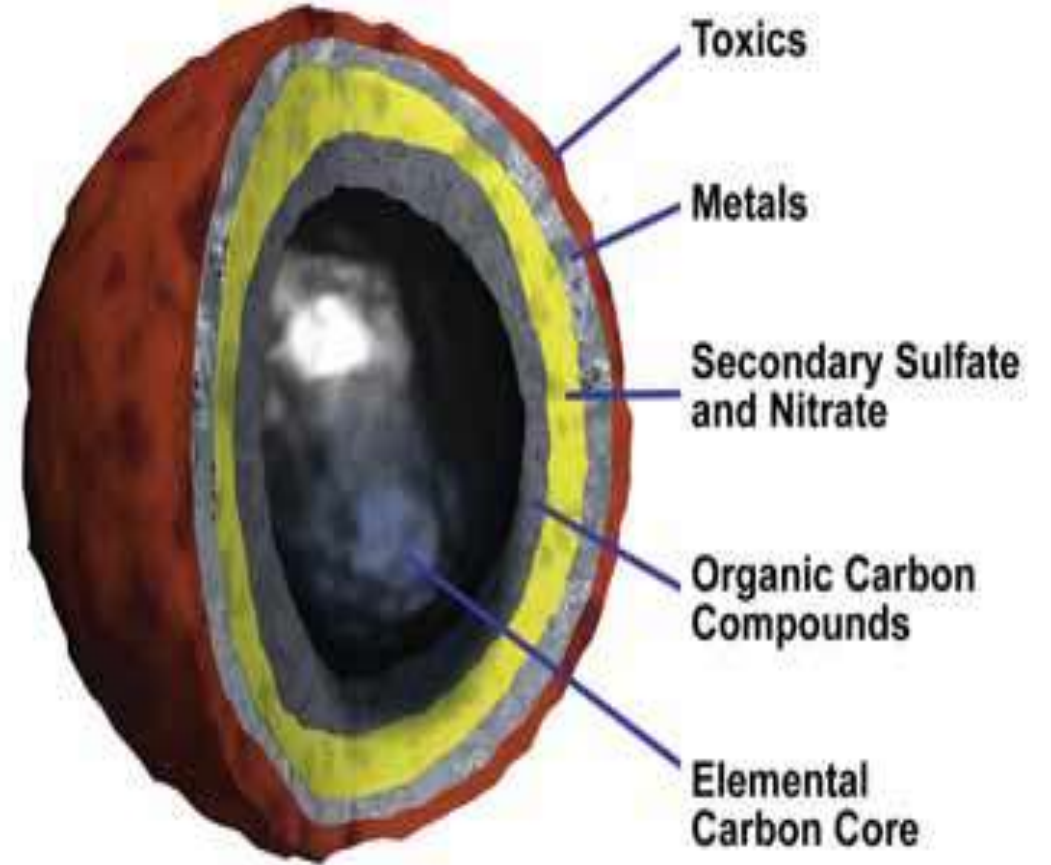
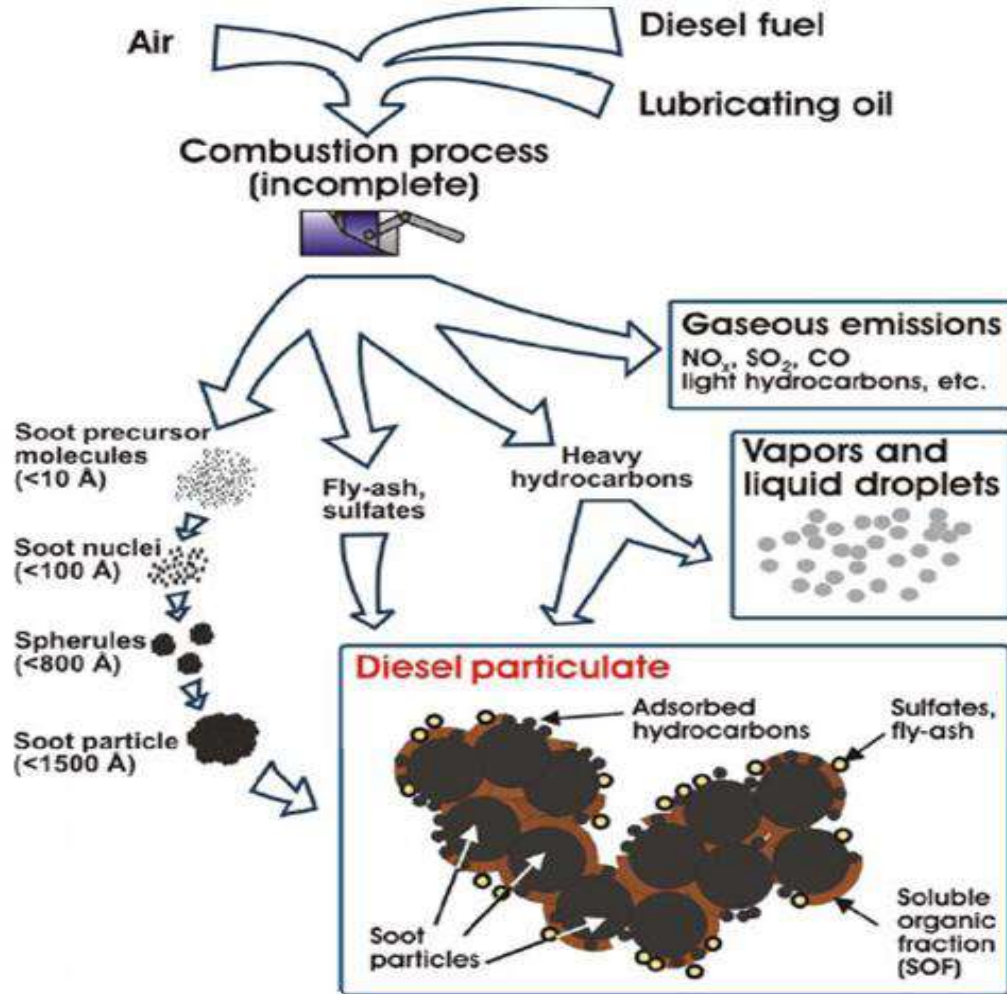
Item F: Informational Item
July 16-17, 2020

Purpose and overview

- Environmental and Public Health Impacts
- Sources of Emissions
 - Onroad
 - Nonroad
- Level of Diesel Particulate Matter in the Air
- Next Steps

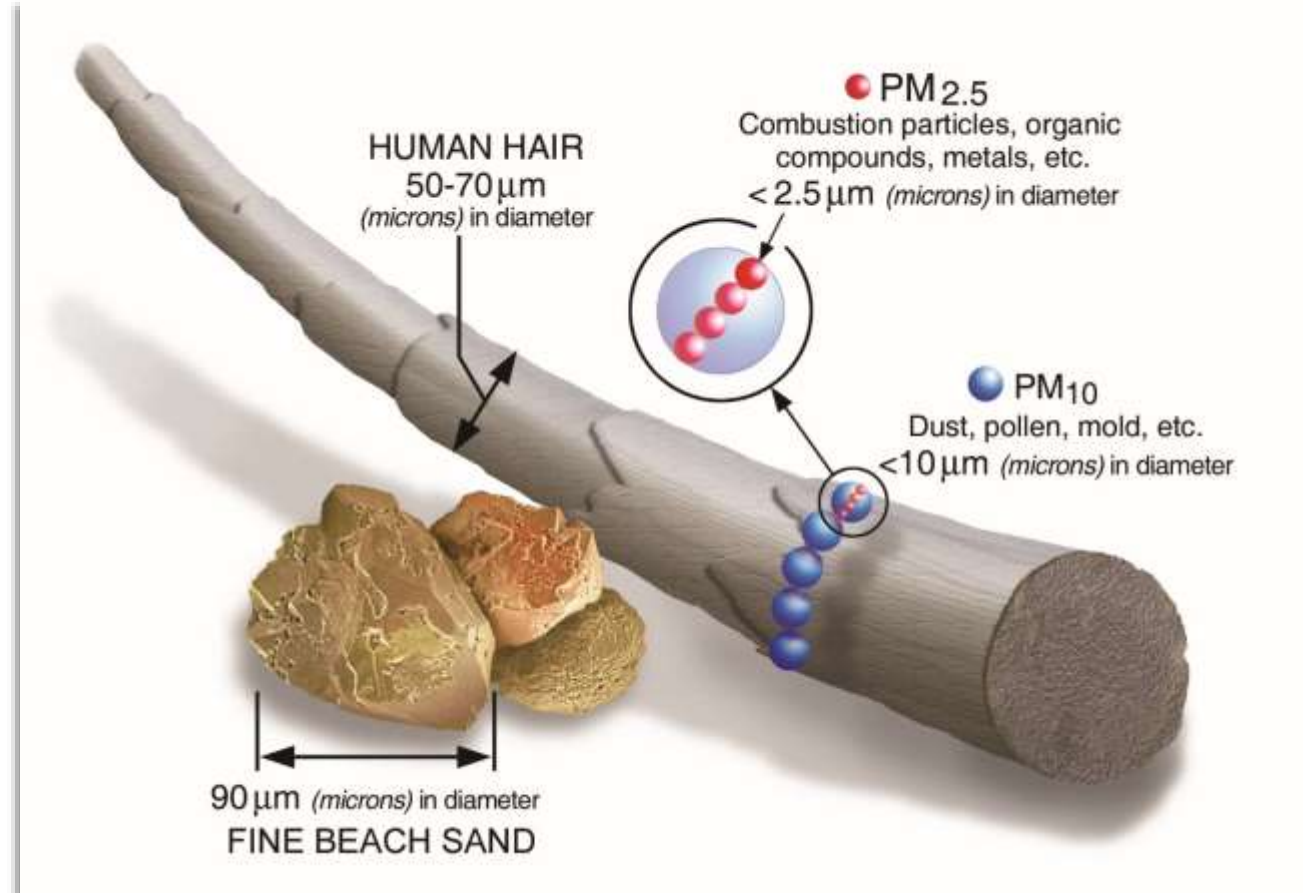


Anatomy of diesel particle



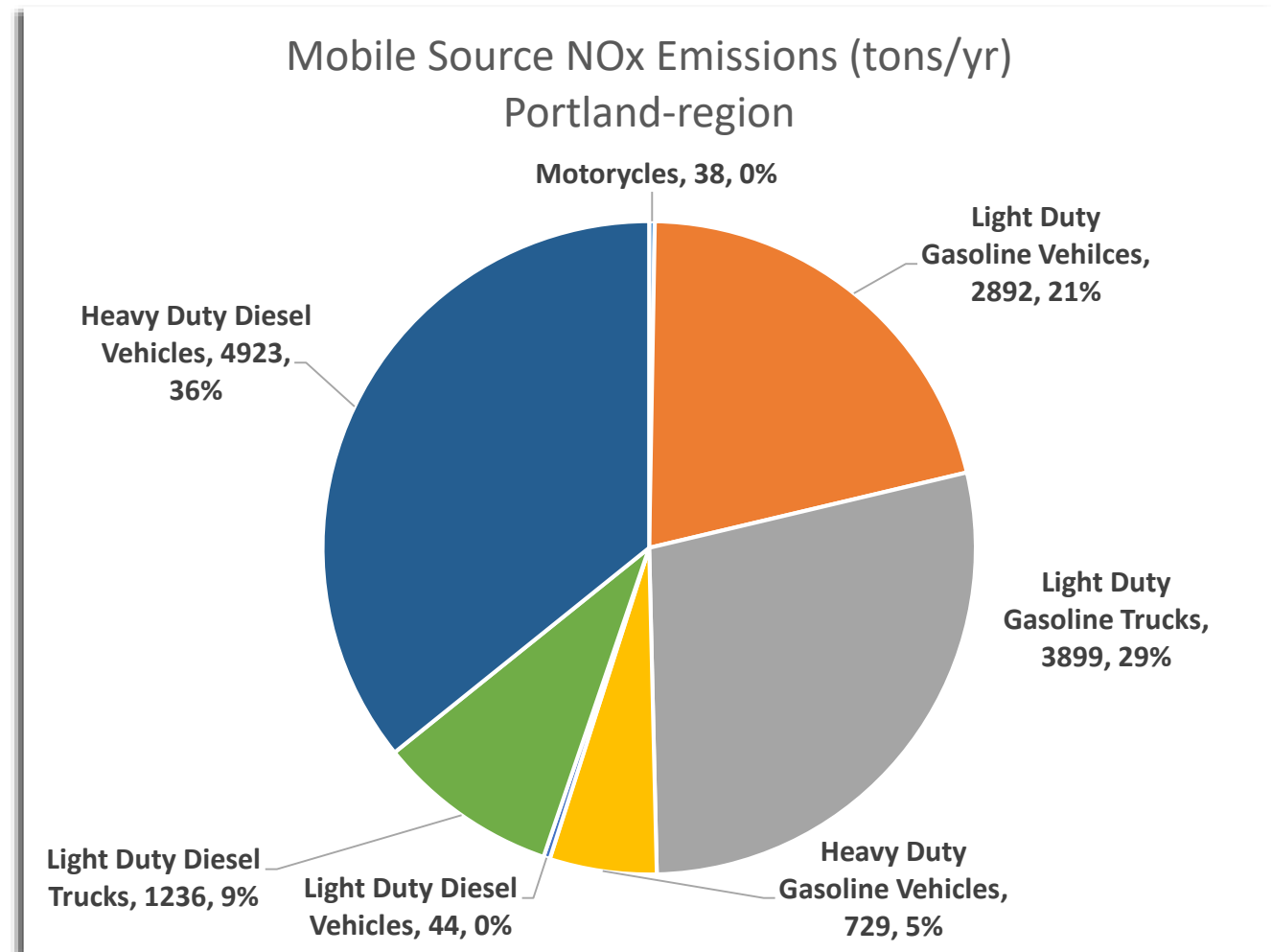
Health Effects of Diesel Particulate Matter

- Increased risk of certain cancers; including lung, breast, and blood system cancers.
- Cardiovascular effects including an increased risk of heart attacks.
- Pulmonary effects, such as upper respiratory system irritation and decreased lung functions.
- Neurodevelopmental and prenatal effects including decreased cognitive function and decreased birthweight.

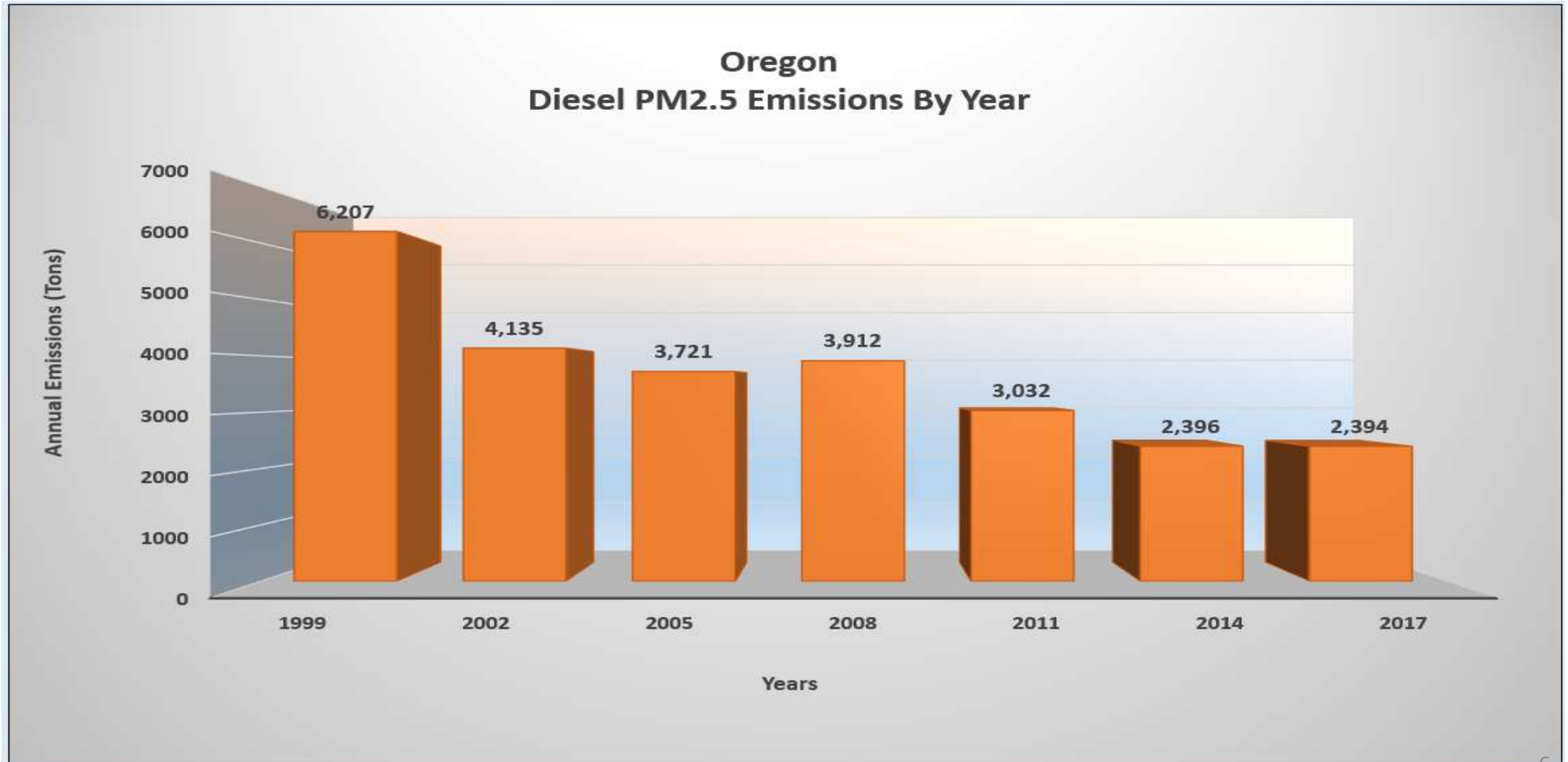


Other Environmental Impacts - Ozone

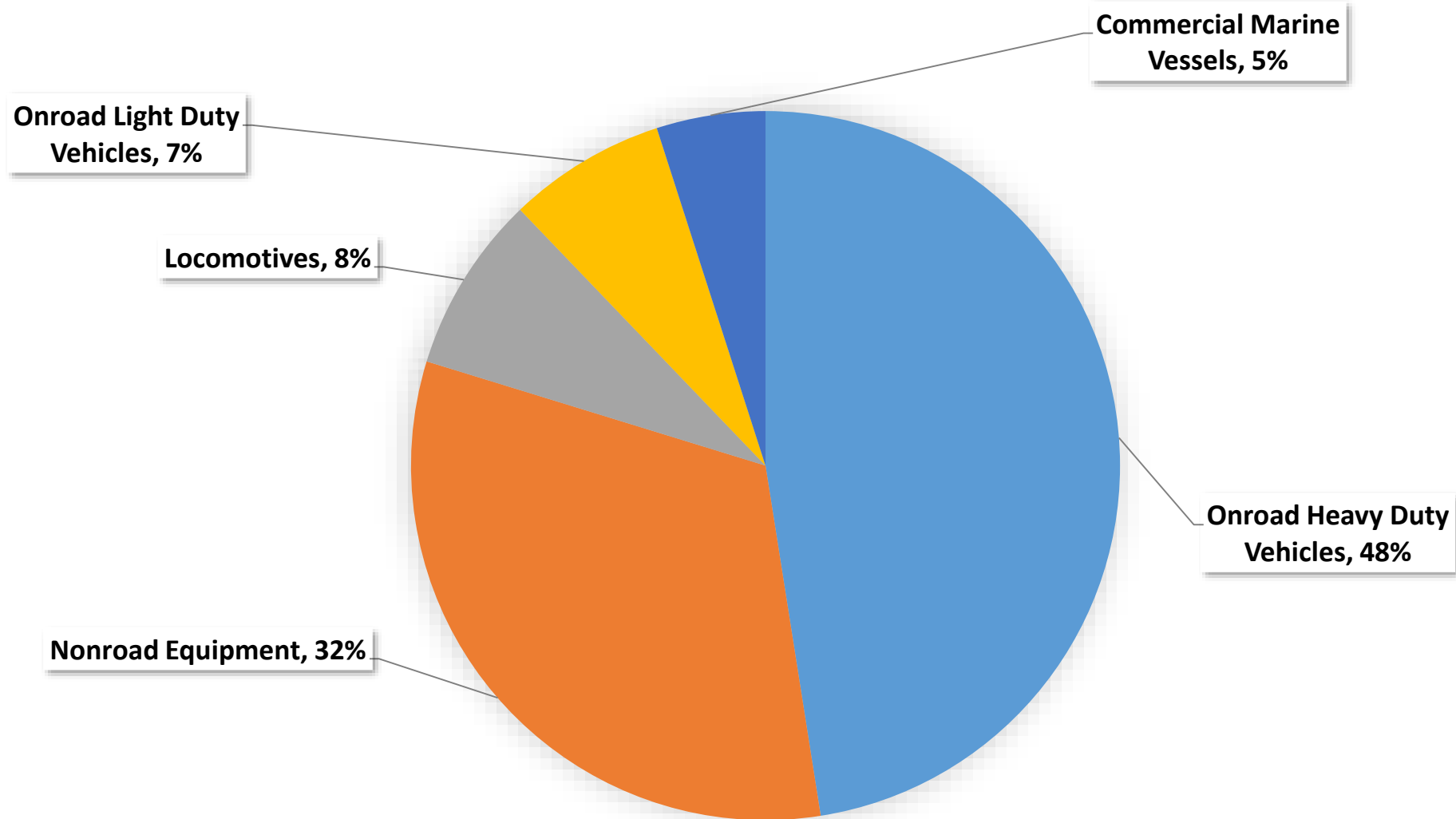
- Increasing Ozone in air-sheds across Oregon
- Diesel combustion accounts for half of all mobile-source NOx emissions in Portland and Medford
- Approaching violations of the National Ambient Air Quality Standard
- Risks of nonattainment



Diesel PM Emissions Over Time

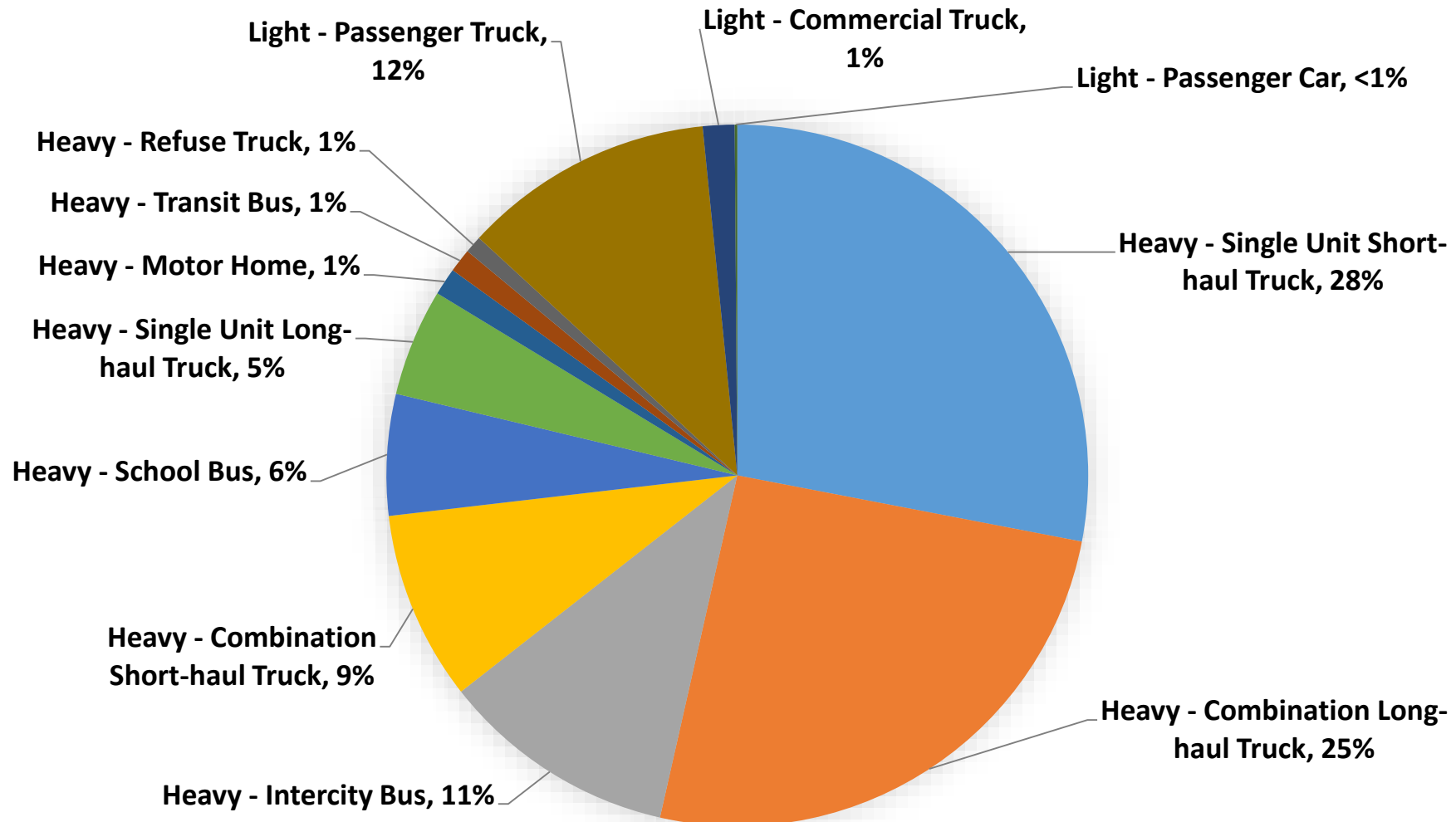


Oregon
2017 Percent Contribution to DIESEL-PM_{2.5} Emissions By Mobile Sector

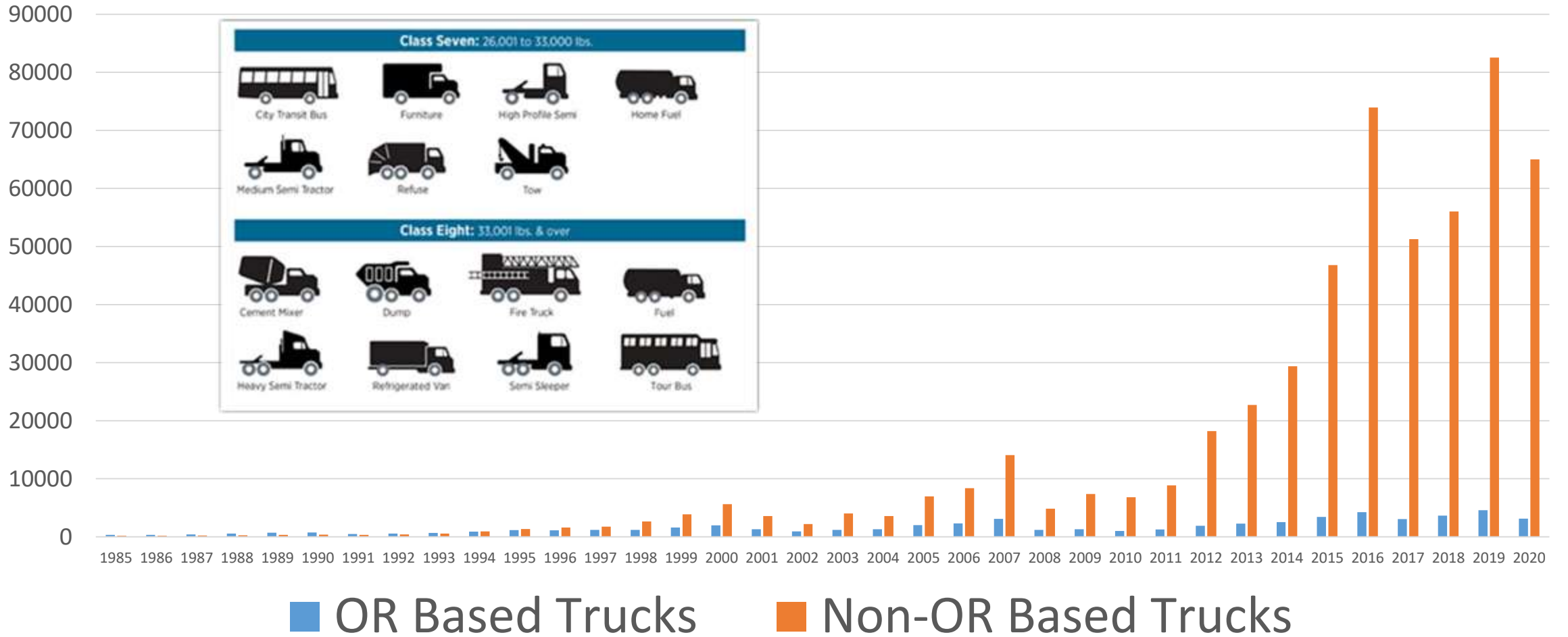


Emissions Inventory for Diesel PM - Onroad

DIESEL-PM_{2.5} Emission Contribution By Onroad Subsector



Heavy Duty Diesel Truck Registration in Oregon



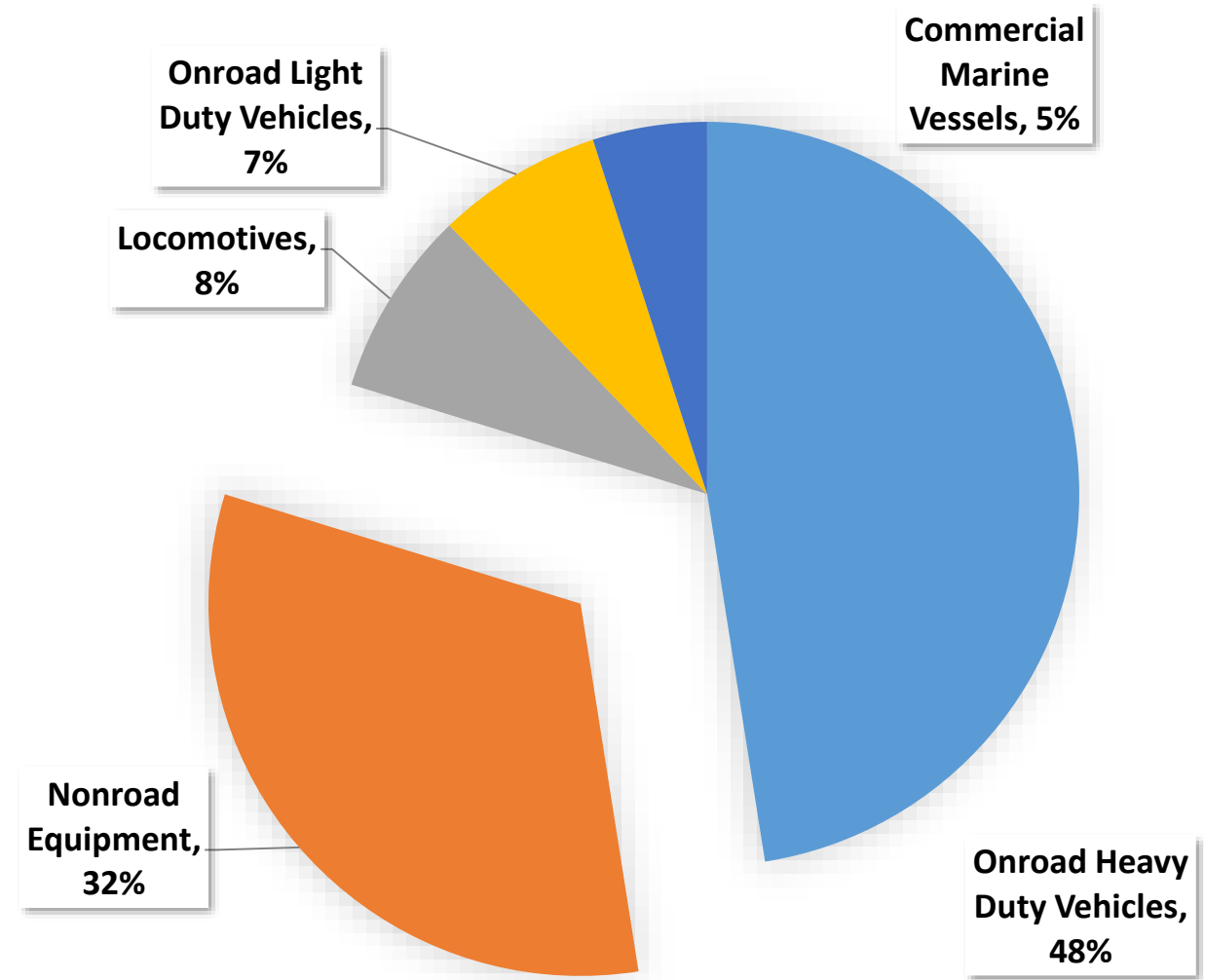
Emissions Inventory for Diesel PM - Nonroad

Estimate non-road diesel equipment emissions for Oregon

- Improve upon EPA default inputs
- Improve accuracy

Characterize equipment owners/operators

- Help determine sectors or equipment types where policies/programs would have the most impact on emission reductions

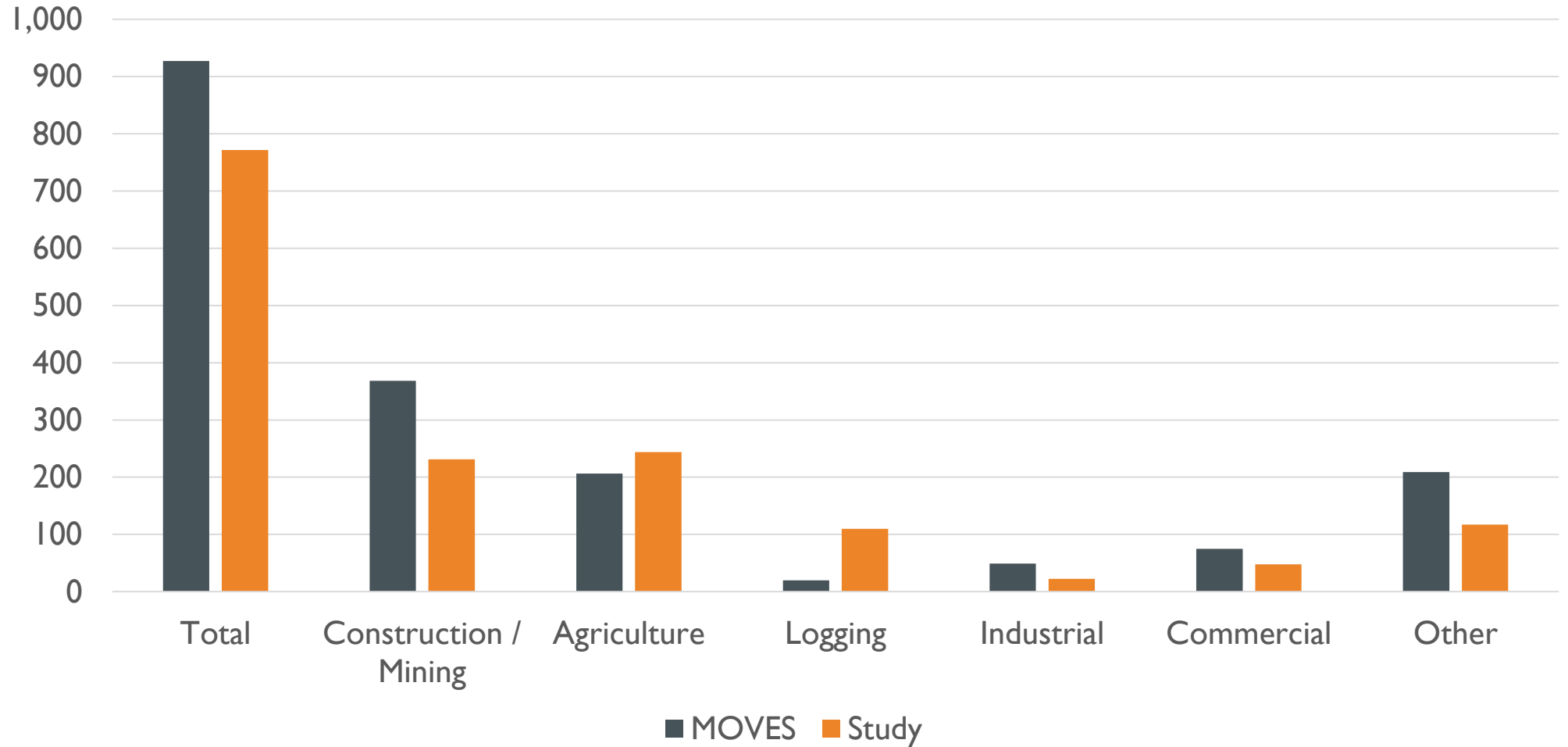


Data Collection Methods

- Three approaches based on industry category
 - Whole fleet surveys – Public Sector “census”
 - Random Sample Surveys – Ag, Logging, Surface Mining, Cranes
 - Industry Specific Profiles – Road and Building Construction, Utilities
- Industry profiles required:
 - Development of industrial task list and equipment productivity estimates
 - Input from industry experts in Oregon
 - Estimate hours of use and combine with engine age distribution to estimate emissions

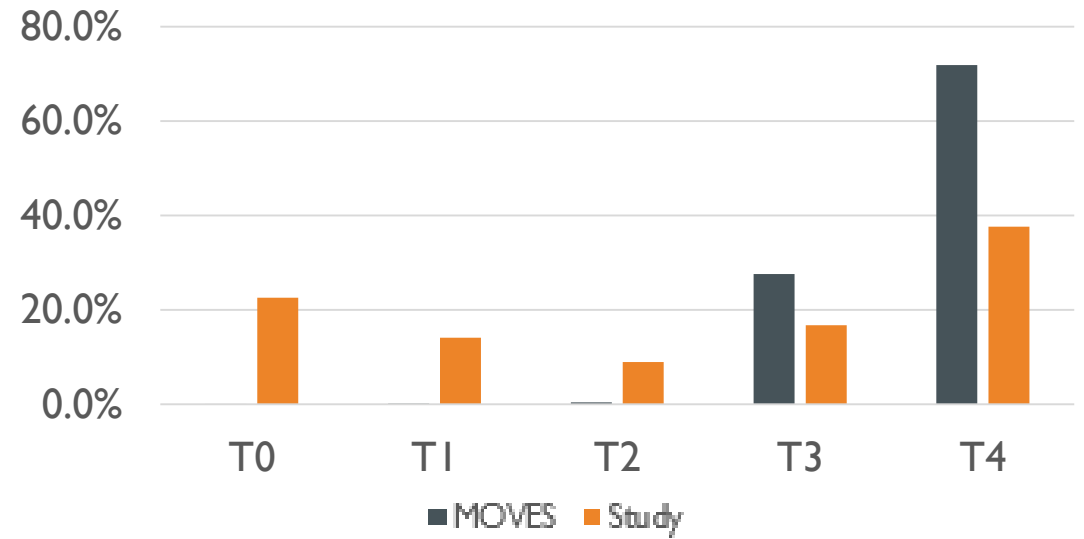
Findings

2017 Statewide Annual PM_{2.5} Emissions by Equipment Category (Tons)

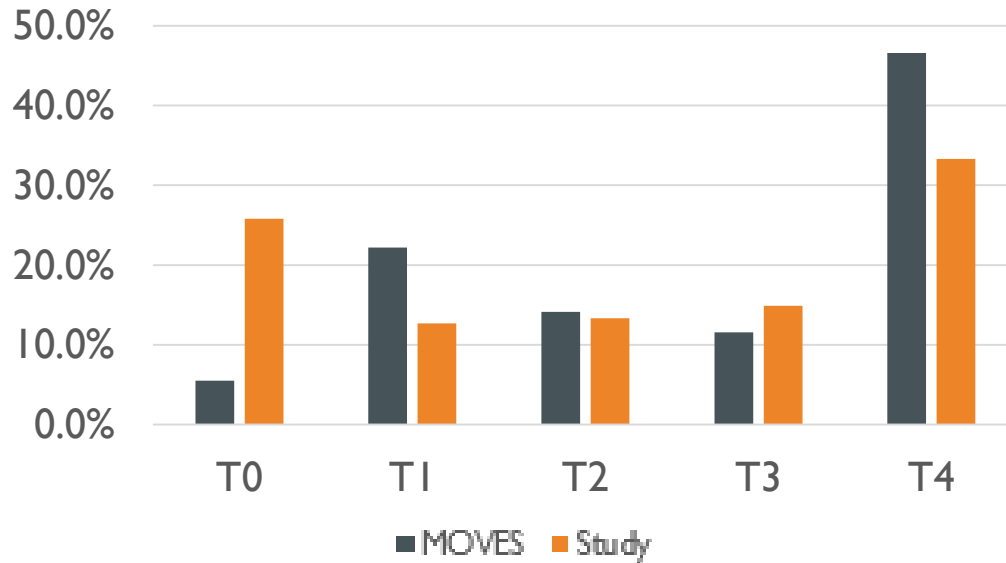


Findings (cont'd)

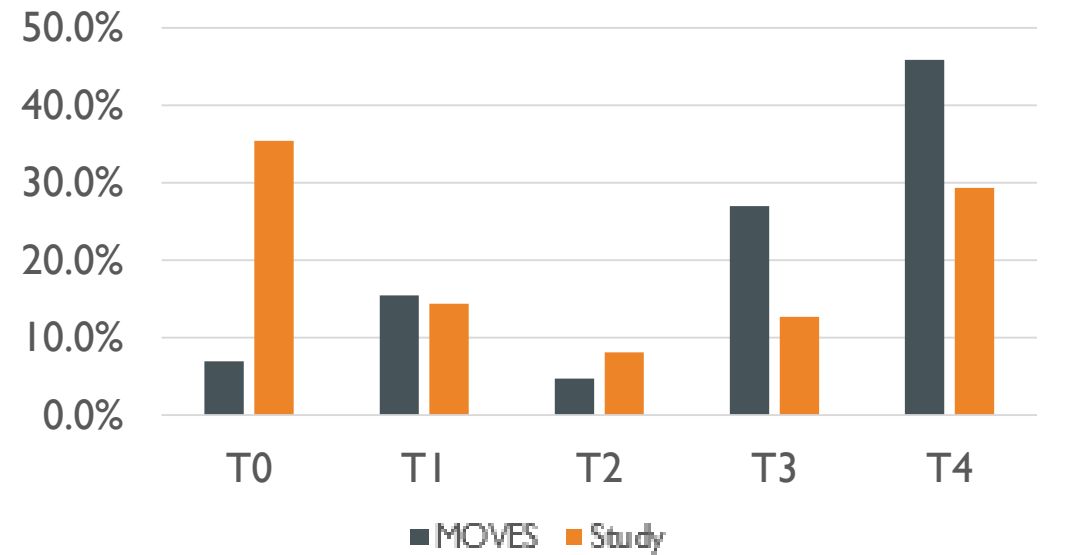
Logging Equipment



Construction/Mining Equipment



Agricultural Equipment



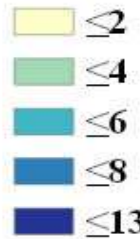


State of Oregon
Department of
Environmental
Quality

2014 Statewide Diesel Particulate Matter Risk By Census Tract

Legend:

Cancer Risk Per Million



References:

EPA 2014 National Air Toxics Assessment
OAR 340-246-0090(3)(r)



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Date: 07/2/2020








Data Location: \\deqhq1\EI_FILES\Area and Point Source Inventories\Presentations\EQC\DPM



State of Oregon
Department of
Environmental
Quality

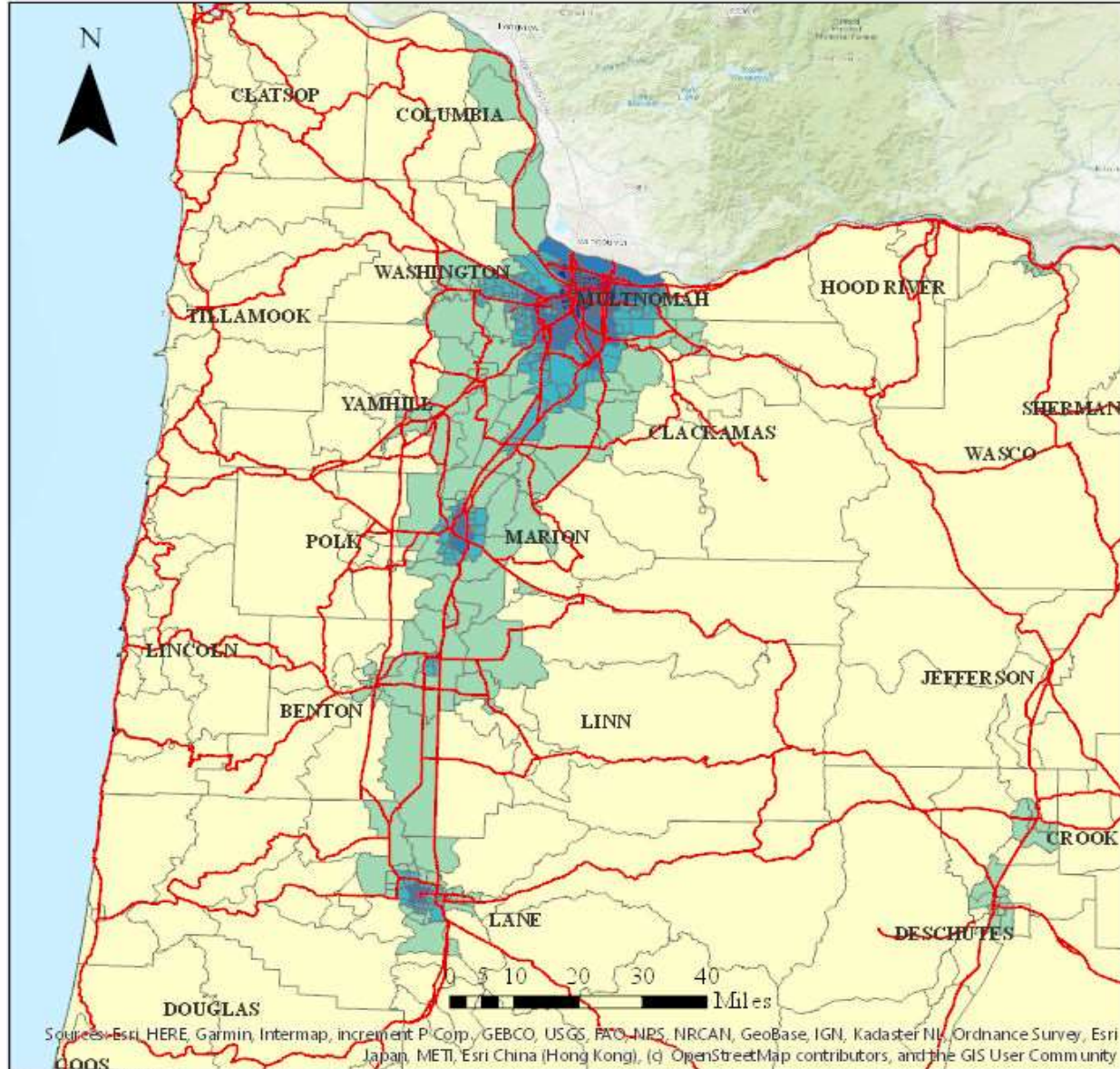
2014 Diesel Particulate Matter Risk in the Willamette Valley

Legend:

-  Highway Network
- Cancer Risk Per Million**
-  ≤2
-  ≤4
-  ≤6
-  ≤8
-  ≤13
-  County Boundary

References:

EPA 2014 National Air Toxics Assessment
OAR 340-246-0090(3)(f)





Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NRS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community








Date: 06/16/2020

Data Location: \\deqhq1\VEI_FILES\Area and Point Source Inventories\Presentations\EQC\DPM

PATS 2017 MODELING RESULTS DIESEL PARTICULATE MATTER ALL SOURCES

 PATS Study Area boundary
 Benchmark contour (0.1 µg/m³)

Annual average concentration

-  < ½X benchmark
-  ½X - 1X benchmark
-  1X - 2X benchmark
-  2X - 3X benchmark
-  3X - 5X benchmark
-  5X - 10X benchmark
-  > 10X benchmark

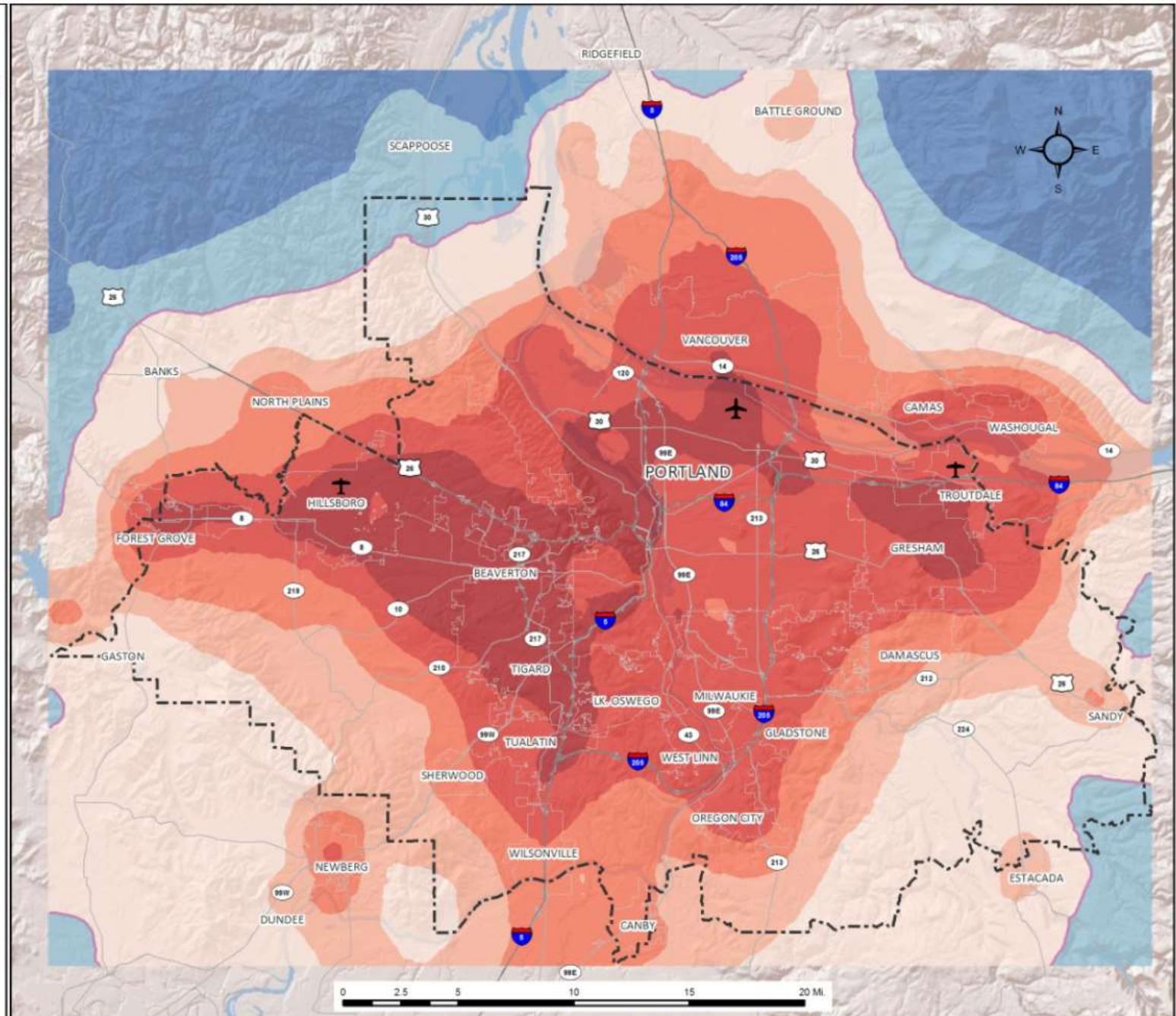


State of Oregon
Department of
Environmental
Quality

NOTE: Areas beyond the modeling domain (color-shaded region) are beyond the scope of this project.

REFERENCES:

Concentration data from DEQ Portland
 Air Toxics Study (PATS)
 Basemap from Metro and ESRI data.



Key Takeaways

- Diesel engine exhaust contributes to a wide-variety of health and environmental problems
- The major sources of diesel emissions are medium-duty and heavy-duty trucks, and nonroad equipment such as construction and agriculture machinery
- While newer engines are cleaner-burning, Oregon has a substantial fleet of older, high-emitting equipment still in use
- The use of diesel engines – and as a result diesel emissions – is ubiquitous
- Some communities experience much higher levels of diesel pollution than others

September Briefing

- Describe Federal, State and Environmental Quality Commission authorities
- Inventory existing program and policies
- Review proposed rulemakings on the horizon
 - Volkswagen Settlement Mitigation Fund Disbursement
 - Diesel Truck Registration and Retrofit Requirements
 - Voluntary Emissions Labeling for Construction Equipment
 - Medium and Heavy Duty low-NOx and ZEV standards
 - Extend and Expand Low Carbon Fuel Standards
 - Alternative Fuels Analysis for Heavy Duty Trucks

Questions

Eric Feeley

Clean Diesel Program Coordinator

Feeley.eric@deq.state.or.us

Matthew Davis

Senior Legislative and Policy Analyst

Davis.matthew@deq.state.or.us

Ali Mirzakhali

Air Quality Division Administrator

Mirzakhali.ali@deq.state.or.us