

Road Dust

Introduction

- ▶ Tribal Air Quality Program
 - ▶ Air Quality Consultation
 - ▶ Technical Assistance
 - ▶ Air Monitoring Support
 - ▶ Mini-grants



Introduction

- ▶ What we've found
 - ▶ Road dust is #1 air quality concern in rural Alaska
 - ▶ Air monitoring can be useful to determine if there is a problem and how bad it is
 - ▶ Partnerships and collaboration are key to success
 - ▶ Biggest limitation is \$\$\$



Sources of dust in rural AK

- ▶ Dirt roads
- ▶ Unpaved airport runways
- ▶ Exposed riverbeds/shorelines
- ▶ Un-vegetated lots
- ▶ Gravel pits and stockpiles

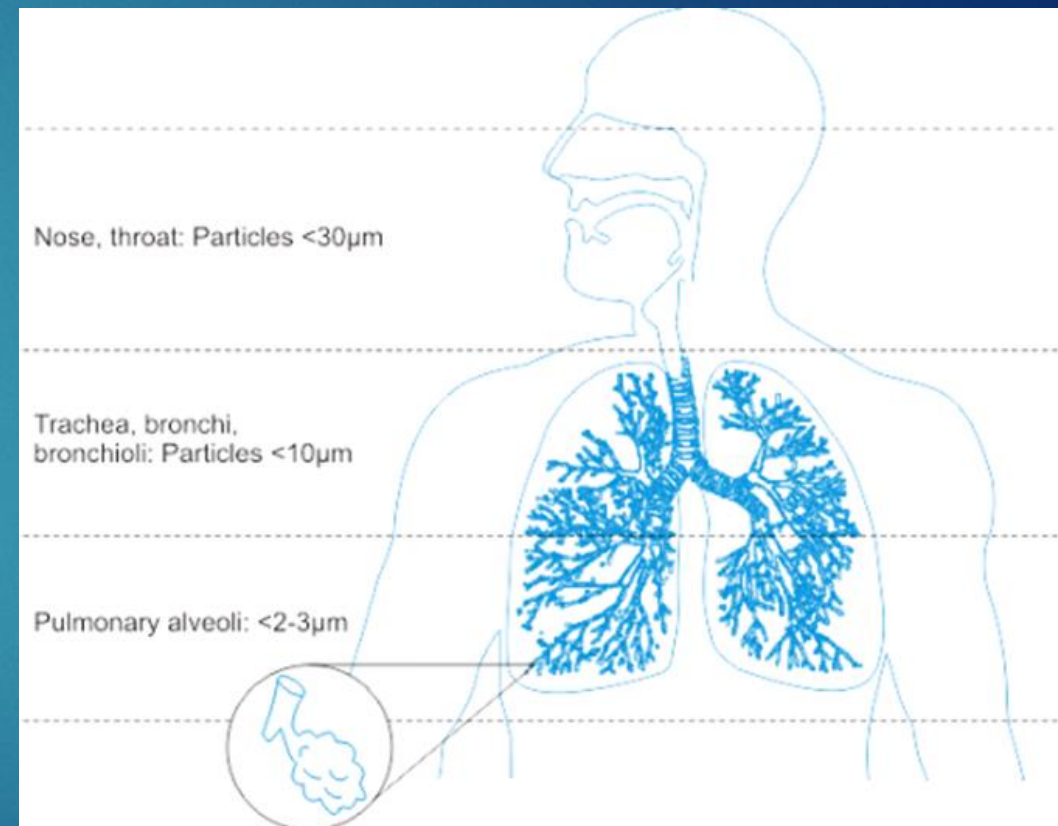
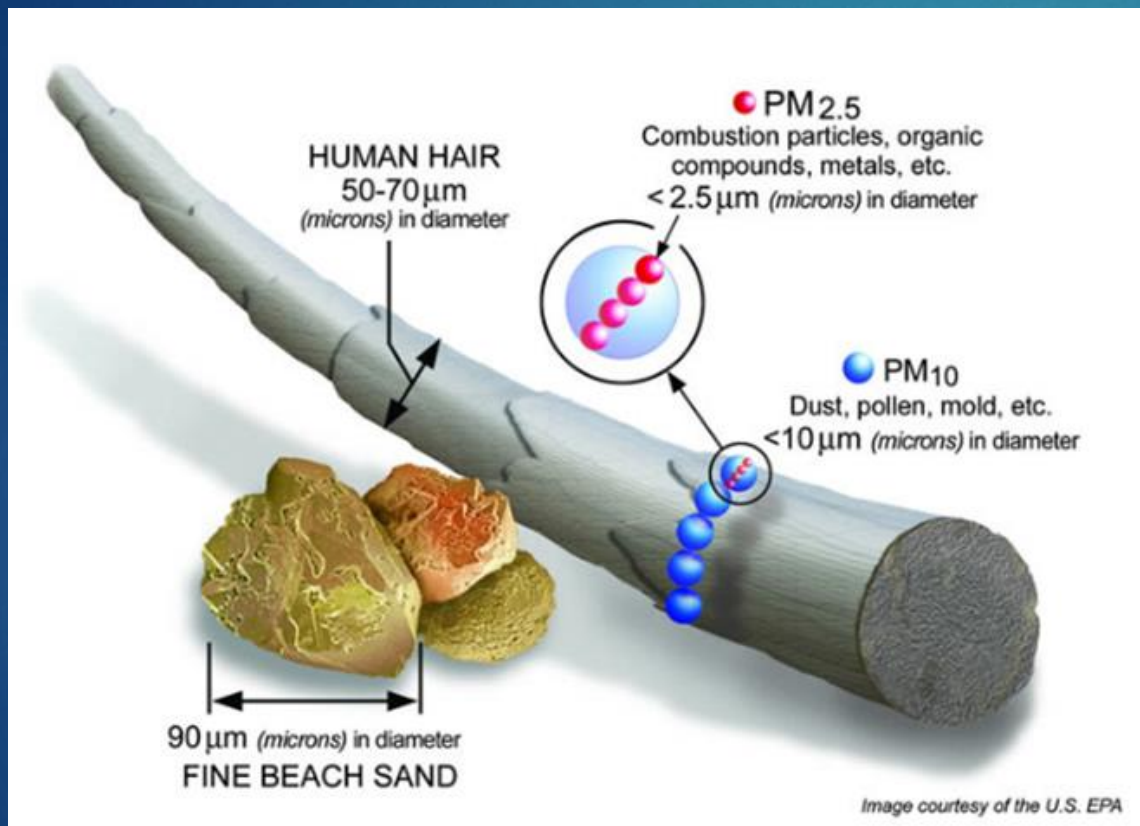


What's in the dust?

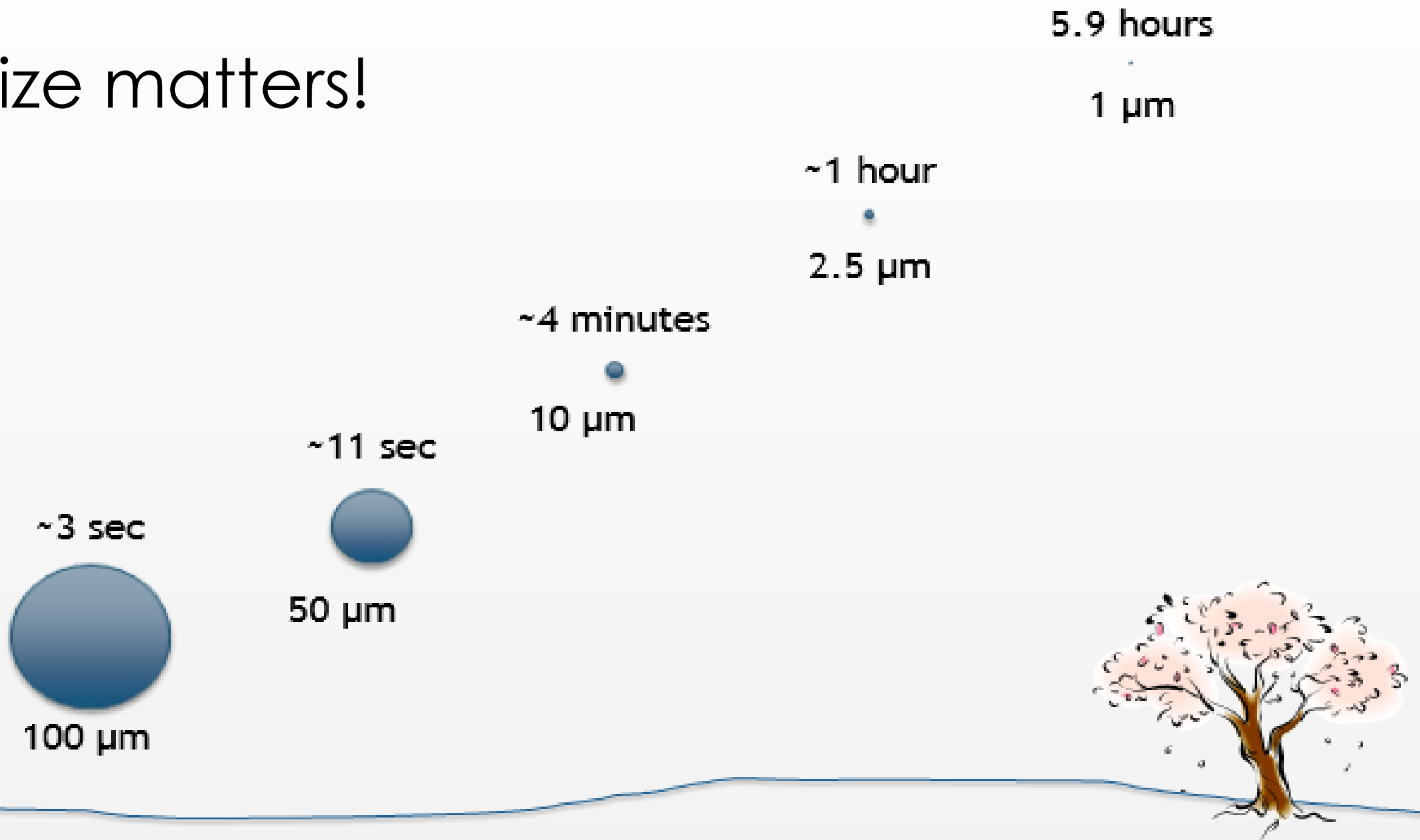


- ▶ Chemicals
- ▶ Bacteria
- ▶ Fungi
- ▶ Heavy metals

Size matters!



Size matters!



Health effects

- ▶ Aggravates existing heart and lung disease
- ▶ Damages lung tissue
- ▶ Mostly impacts children, Elders, people with asthma, people with heart conditions



The dose makes the poison!

- ▶ Size, time, amount exposed to, source, what's attached to the dust, etc.



What's safe?

- ▶ As little as possible
- ▶ Below 24 hr standard set by EPA's National Ambient Air Quality Standards
 - ▶ $PM_{10} \leq 150 \mu\text{g}/\text{m}^3$
 - ▶ $PM_{2.5} \leq 35 \mu\text{g}/\text{m}^3$



What can we do?



- ▶ Slow Down
- ▶ Reduce number of vehicles on road
- ▶ Improve road surface
- ▶ Spread water or dust palliatives

Slow Down

- ▶ The faster you go, the more dust you kick up
- ▶ Knobby ATV tires kick up more dust than cars/trucks
- ▶ Speed limit signs
- ▶ Install speed bumps



Reduce Number of Vehicles

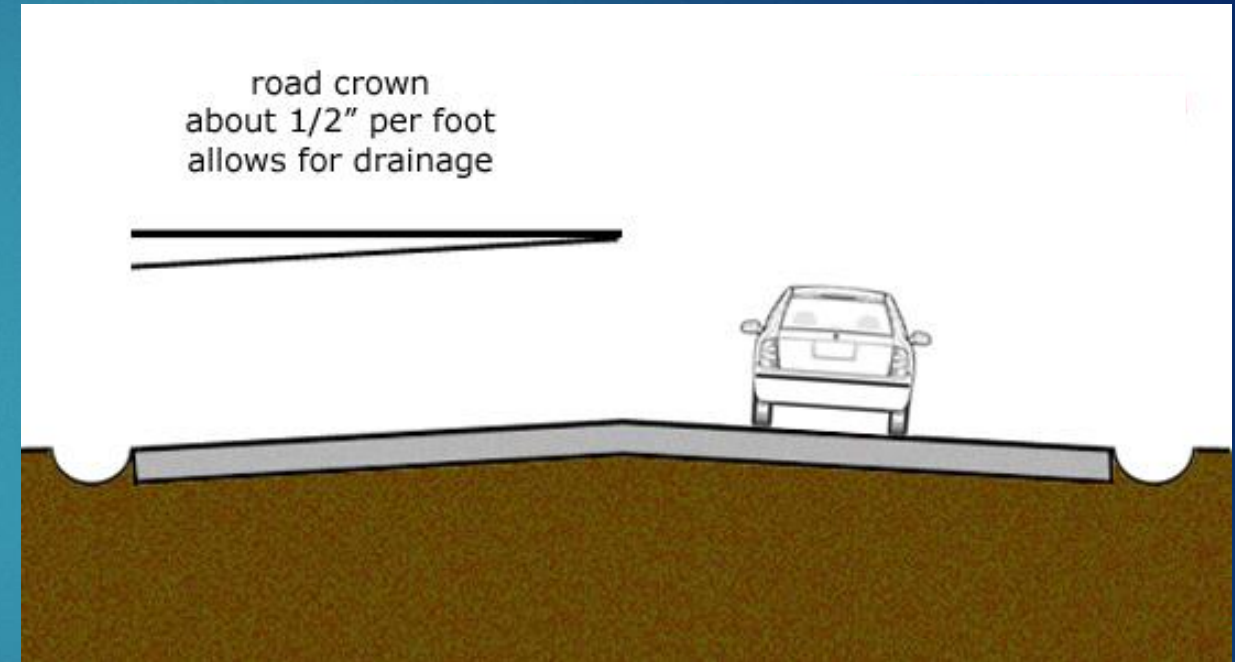
More vehicles = More dust



WALK!

Improve road surface

- ▶ Well graded and proper drainage
 - ▶ Reduces puddles
 - ▶ Fine particles float in water; when puddle dries these fine particles become dust
- ▶ Crowning
 - ▶ Too little of a crown = puddling
 - ▶ Too much of a crown = erosion
- ▶ Apply gravel to the road
 - ▶ Protects fine soils from vehicle wheels



Water or dust palliatives

Requires planning, coordination, equipment, training, and funding!!

- ▶ Water
- ▶ Water absorbing products
 - ▶ Calcium chloride
 - ▶ Magnesium chloride
 - ▶ Brine
- ▶ Binding dust particles together
 - ▶ Petroleum based binders
 - ▶ Organic nonpetroleum dust suppressants (vegetable oils, animal fats)
 - ▶ Electrochemical stabilizers
 - ▶ Synthetic polymer products



Things to consider

- ▶ How frequently must each product be spread
- ▶ Available equipment
- ▶ Cost of operating equipment (personnel, gas, maintenance)
- ▶ Cost of product
- ▶ Cost of shipping
- ▶ Environmental effects (water quality, subsistence, etc.)



A healthier environment =
healthier people



Thank You!

Contact Information:
ANTHC Tribal Air Quality Program
Email: air@anthc.org
Phone: 907-729-4043

