

Dust

1. **Lowering speed of vehicles** from 45 miles to 35 miles per hours on unpaved roads reduced Particulate Matter (PM - i.e. dust) by 22%
2. **How far does dust settle?** 1 mile of unpaved road with a vehicle going over 1 time per day for a year creates 1 ton of dust **500 ft out from the road**. (USFS study). *How far out does the dust go from Village roads? What signs are there?*
3. To estimate a contaminant **concentration in the air from an unpaved road**, use a dust loading factor of $8 \times 10^{-6} \text{ kg/m}^3$ to obtain the concentration in air in g/m^3 .
4. The current **dust emission factor for unpaved roads** is 2.0 lbs PM10/VMT (vehicle mile traveled).
5. **Dust emissions can be prevented or reduced** in just four basic ways:
 - ✓ Limiting the creation or presence of dust-sized particles. (e.g. reducing speeds, reducing PM sources or frequency of use)
 - ✓ Reducing wind speed at ground level. (e.g. barrier from 3 -5 ft along roads, reducing ATV speeds)
 - ✓ Binding dust particles together (dust adhesives for roads)
 - ✓ Capturing and removing dust from its sources. (e.g., better stoves, 4 stroke instead of 2)
6. **How are you breathing?** For PM larger than about PM3 - PM5, **how much and whether a particle is inhaled depends on breathing through nose or mouth**. Through the nose, less is ultimately inhaled into the airways and body. *More mouth breathing results in deeper lung penetration and more PM inhalation.*
7. **Asthma and Dust:** Exposure to motor traffic emissions can have a significant effect on respiratory function in children and adults. One study showed that children living within 100 meters of heavily traveled roadways have significantly higher rates of wheezing and diagnosed asthma. Among adults, a study of street cleaners in Copenhagen who were exposed to traffic-related air pollution found an odds ratio of 2.3 for asthma when the street cleaners were compared to a control group of cemetery workers in the same city.
8. **Global Dust effects:** Global dust is increasing all around the world. Circulation patterns are changing and getting stronger. As a result, dust from Asia is increasingly being swept up and deposited in Alaska in the Springtime. The air quality from this dust may not be noticeable then. But when the snow melts, that dust is added to what is already in the village. This dust has contaminants as well.
9. **Snowmelt Effects:** Not enough is known as to the amount of global dust to local village dust. But the global dust alone is enough to move up Breakup by 2 to 4 weeks. The dirtier the snow - meaning the more PM that is spread out on the snow, the faster the snow melts.
10. **Where do airborne contaminants settle?** You can visually assess where PM and its associated contaminants settle by using traditional knowledge and observation. Airborne particles flow with the air. When the airflow lessens, the larger particles begin to settle. At low or no wind speeds, the settleable particles will drift down. PM tends to get entrained in precipitation, including snowdrifts. A PM/Snowdrift study showed where the snowdrifts were highest, the highest total amount of PM and its associated contaminants was found - although the concentration in the snow was lower (more snow/water to dilute). Where in the village does dust settle the most? Those are the areas to have children avoid, move drying racks from, etc. OR determine what about that area is making the dust settle (are there tarps, connexes, old buildings that can be moved, or traffic redirected?).

