

Proper Road Maintenance for Dust Suppression

The **long-term performance** of a dust suppressant depends on the condition of the road to which the suppressant is applied.

Rural community representatives can enlist assistance of an Alaskan registered professional engineer or consult the Alaska Tribal Technical Assistance Program (TTAP-AK, <http://www.uaf.edu/attap/>) to help identify the causes of unpaved road structural failures and evaluate the options for resolving deficiencies. The ADOT&PF Local Technical Assistance Program (LTAP) may assist as well. The [Road Design Resources](#) page identifies many other sources of information. Many communities also have local expertise in road building and maintenance.

Road condition goals

Keep the fines:

If the road surface is not well drained, water puddles on the road surface or in nearby low spots. Standing water floats soil "*fines*" (fine particles) to the surface where they can later dry and blow away. Standing water next to a roadway may saturate the road sub-base, resulting in structural failures such as potholes.

Gravel, broken stone, and sand used in road construction (called *aggregate*) reduces the force of tires on the fines, decreasing the release of dust from a roadway. When fines are lost from the road surface the aggregate is left loose, or unanchored. Unanchored aggregate gets pushed to the side of the road by tire forces.

Maintain good drainage:

The success of palliatives to reduce dust depends on maintaining good drainage on and adjacent to the road.

Road condition can be improved before using a palliative.

Preparing the road can improve dust suppression by a palliative. Steps *sometimes* include:

- Mechanical stabilization, including the addition, grading, mixing, and compaction of fresh aggregate materials.
- Blade away ruts, potholes, washboards, and loose excess surface material to expose a hard surface.
- Blade fines from road shoulders onto surface.
- Shape the road surface into a proper crown that makes water drain away from the road.
- If needed, add moistened aggregate or fines to ensure proper compaction.

- Normal traffic may adequately compact the road, or other equipment can be used.
- Reshape road shoulders to promote runoff, clean ditches for good drainage, and clean and repair culverts.
- Some palliatives require *scarifying* (roughing up the road surface) before they are applied. Others palliatives will be need to be re-applied each time after the road is graded.

Other considerations in road preparation for long-term performance:

- **The type and gradation of the road materials.** (What percent are very small particles, or medium, or coarse? Is there a good mix of sizes? Is there dust in the gravel?)
- **The type and intensity of traffic.** (Is traffic 4-wheelers or heavy equipment? Is it when the road is flooded or dry? Is traffic turning off paved or unpaved roads?)
- **The type of dust suppressant used**
- **Road drainage and thermal stability.** Does the road flood during breakup? Does the road buckle and break apart when it freezes or thaws?
- **Available maintenance resources.**