



## **Controlling Road Dust in Rural Alaska: Practical Questions for Communities,**

### **Part 1**

How do we decide what methods of dust control are best to use? Every community is different. Methods that are best for one community might be impossible for another community. One community might choose to apply water to roads. Applying water is relatively easy, needs to be re-done often, and is non-toxic. Another community may choose to apply a dust palliative which costs more, lasts for years, reduces dust very effectively, contains a mixture of chemicals, and is non-toxic.

Here are some practical questions that go into deciding what method to use to reduce dust. Once you answer all these questions, and then read about different dust palliatives, you may find that the perfect dust palliative for your community does not exist. Only a few kinds of palliatives have been tested in rural Alaska. The perfect combination of characteristics might not exist anywhere, but very good palliatives exist. You may need to compromise on some aspects. In making decisions, be sure to remember the health impacts of road dust on people in your community.

#### **Important questions:**

**Is the community willing to enforce speed limits?**

**Is there a vehicle that will always be available for putting water on a road?**

**Are vehicles creating dust by driving in non-road areas?**

Could non-road areas be put to other uses that will not contribute dust? Within the village, could you keep vehicles on the roads?

**What materials (aggregate) do you have for road construction or repair? At what cost?**

**How far will you need to transport it?**

- Can roads be resurfaced before applying a dust palliative? Some palliatives work best only after the roadbed is upgraded first. If money is not available to provide aggregate, perhaps a different kind of palliative should be chosen.
- Can dust be controlled by correcting drainage, adding road aggregate, or preventing loss of fine particles from the road surface, instead of using a dust palliative?
- If paving is considered, how far is it to an asphalt plant? Paving lasts longer than other methods, but is extremely costly, and does not last forever.

## **Could geotextiles be used to support specific sections of roads or trails?**

Geotextiles are fabrics which, when used with soil, can reinforce, protect, filter, or drain a ground surface. Geotextile composites such as geogrids, nets and meshes are also used sometimes on deep organic soils that need to be more rigid.

## **How frequently could the community pay for road treatments?**

Different treatments have very different costs. Besides the costs, how easy will it be to pull together people and equipment for repeat treatments? How long do treatments last?

## **How far will you have to ship a suppressant?**

Shipping can be the most expensive part of using a palliative. Dry palliatives that can be diluted with water after shipment may be better for some communities; shipping will be cheaper.

## **For each type of palliative, are the required application temperatures, and drying times reasonable?**

Some palliatives need warm conditions for application; others actually work better with cool conditions. Which months are warm enough to apply the palliative? Are those months usually dry or wet? Will you be able to keep traffic off the roads during the required drying time?

## **Can a palliative freeze if it doesn't get applied the first year?**

If it is remixed after freezing, will it be as good as new?

## **Will any routine road maintenance damage the palliative application?**

Will the road surface be re-workable after a treatment? Some palliatives work by creating a hard crust. It might last several years, but the crust can be broken by grading or scraping the road surface. Other palliatives work by making soil particles stick to each other, but leave the soil "plastic" (able to be shaped or squeezed into different shapes). Depending on how often roads get graded or how prone they are to potholes, a community may choose one type of palliative or another. Watering can be done anytime, and can be done again cheaply after any maintenance.

## **Can you upgrade the road, fill potholes, or add aggregate before applying a palliative?**

This means grading the road, screening, filling potholes, or adding aggregate and re-grading or rolling before applying a palliative. If the palliative you prefer works by forming a hard crust, you will want the road to be in good condition before you use the palliative. Road grading will destroy a hard crust.

## **Can you rough up the surface of the road before application?**

Some palliatives work best if the road surface is roughed up (scarified) first.

## **Does it matter if the treatment changes the freezing properties of the road?**

Some treatments make roads freeze at lower temperatures. The roads will thaw earlier.

## **Does a palliative work with the soil type and road grades you have?**

Soils and roads have different mixes of coarse particles (gravel, sand) and fine particles (silt, clay, dust). It's important to keep fine particles in the road surface, rather than having them fly away as dust, or wash away with the rain. Fine road particles are bad to breathe. They also prevent a road surface from breaking down into potholes or washouts.

Some dust palliatives work best with specific mixes of coarse and fine particles on a road.

## **Is a road treatment corrosive to metal (and does it matter)?**

Runways have different requirements from roads. Corrosive treatments may not be used on runways.

## **How well will each treatment handle the rainfall or the wind you have?**

Knowing what has been used elsewhere in your region will help with this.

## **How far is the road from bodies of water and food sources?**

Some palliatives can be applied anywhere, but some require that they be applied a distance away from water, food, or some types of vegetation. Wind direction might matter also. Where does water runoff from the road end up?

## **What are the effects of road dust treatments or palliatives on nearby vegetation, food, air, and water?**

Do they dissolve, run off or break down? If so what do they break down into, and is it harmful? Are the chemicals the palliative breaks down into harmful? Do they persist or bioaccumulate in animals? Do the chemicals stay near the treated road?

**Other practical issues will be addressed in Part 2, such as:** how to apply palliatives, what state agencies have experience, where to get funding, what equipment is available, what are the costs of palliatives, what the results of different palliatives in Alaska, and what is the progress of ongoing research at ADOT and UAF on controlling road dust.