



# Dust Control for Unpaved Roads and Runways in Rural Alaska

Tech Brief #001

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## Research Program Title:

*Dust Control for Unpaved Roads and Runways in Rural Alaska*  
(Multiple projects)

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## Study Timeline

July 2008-Present

## Type of Report

AUTC#RR 10.03; 410036; 510019;  
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## Funding Source/s

U.S. DOT: RITA  
Alaska DOT&PF  
Alaska Department of Environmental Conservation  
Midwest Industrial Supply Inc.

## Project Partners

Alaska DOT&PF; Alaska DEC;  
Fairbanks North Star Borough; UAF  
College of Engineering and Mines;  
U.S. DOT (RITA); multiple commercial  
palliative manufacturers

## More Information

<http://ine.uaf.edu/autc/>

## Summary

Alaska DOT&PF and AUTC have partnered to reduce dust on Alaska's roads, streets, and airports. To date, this partnership has:

- Tested and compared non-corrosive palliatives in 21 different regional sites;
- Developed cost-effective options for Alaska DOT&PF and local governments;
- Created and deployed a portable testing instrument and repeatable methodology;
- Tested palliative solutions that reduce 90% of fugitive dust for 1-2 years;
- Implemented results into new state dust-reduction requirements and FAA airport bidding specs; and
- Developed new dust management guidelines.

## Problem/Objective

Fugitive Dust (defined by the U.S. Environmental Protection Agency as PM10 or PM 2.5) poses threats to public health in Alaska's rural communities and costly infrastructure repair needs for the Alaska Department of Transportation and Public Facilities. It is also a significant safety hazard by limiting driver visibility.



*Dust causes both public health and infrastructure repair risks. Pictured: a typical dust plume in rural Alaska.*

More than 50% of Alaska's state-owned roads are unpaved—as are nearly all other private and local roads. Traffic can remove as much as 750 tons of gravel per mile in a single year. At this rate, expenses for replacing the lost road surface can reach \$15,000 per mile annually, based on a \$20 per-ton unit cost of gravel. Dust reducing palliatives like Calcium Chloride cost roughly \$8,000 per mile, yielding a savings of \$7,000 per mile over untreated roads. About 82% of Alaska's communities are outside the state road system, and rely on local unpaved roads and 255 state-owned airports—many with unpaved runways—notable sources of fugitive dust. Dust brings health risks, impairs quality of life, and imposes costly maintenance needs on limited local budgets.

## Outcomes and Products

AUTC researchers created a non-stationary dust monitoring system, called the DUSTM. Mounted to an ATV, the portable system has an air intake, opacity measurement device, and data logging capabilities—all in a device that has proven the first repeatable methodology of its size for fugitive dust. AUTC has deployed this versatile monitoring system on unpaved roads and runways in 23 communities in Alaska.

Expanding this work, AUTC also partnered with research counterparts in California, Montana, and Nevada to form the Road Dust Institute (RDI). RDI Works with industry and government to develop uniform dust-management standards, performance measures, and testing procedures.

## What's next?

This program of research has been extended by partners at the Alaska DOT&PF to include continued monitoring and testing activities at 11 rural Alaska airports through 2014.



*Pictured: The DUSTM—a portable, versatile instrument that can attach to an ATV.*