

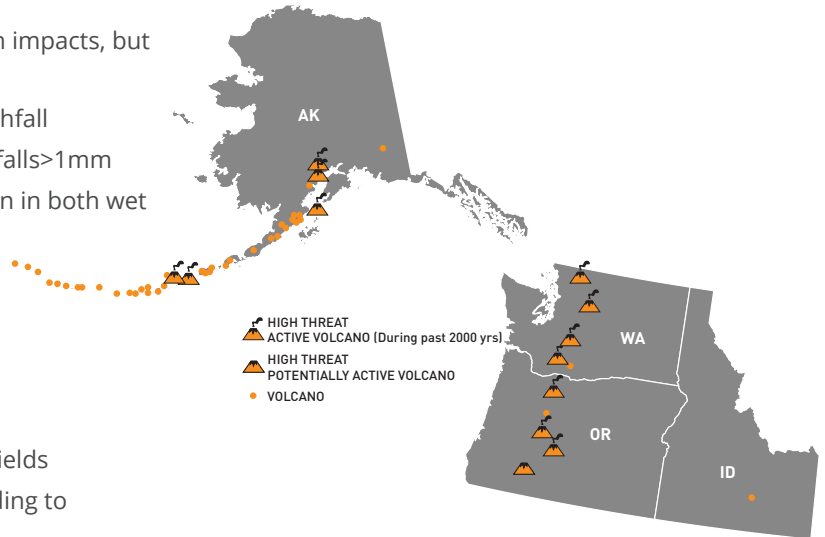
# Advice for ROADWAY MANAGERS

## Impacts on roadways and vehicles

### Impacts on roadway networks

Road networks are vulnerable to ash impacts, but can be kept operational.

- > Poor visibility during and after ashfall
- > Road markings covered with ashfalls > 1 mm
- > Slippery surface: Reduced traction in both wet and dry conditions
- > Very thick ashfall may create extra loading on bridges, especially when wet. Ash remobilized in rivers may create risk of mud-flows (lahars)



### Impacts on vehicles

- > Abrasion of surfaces and windshields
- > Clogging of air and oil filters, leading to overheating and engine failure
- > Abrasion of moving engine parts
- > Corrosion of exposed metal surfaces
- > Abrasion damage to paintwork



## WHERE TO FIND WARNING INFORMATION (ASH CLOUD FORECAST)

The Volcano Ash Advisory Centre (VAAC) or the USGS Volcano Observatories will issue volcanic advisories and graphics forecasts on ash in the atmosphere affecting aviation.

Current Volcanic Ash Advisories – Washington VAAC <http://www.ssd.noaa.gov/VAAC/messages.html>

Current Volcanic Ash Advisories – Alaska VAAC <http://vaac.arh.noaa.gov>

Current Alerts for U.S. Volcanoes - USGS <https://volcanoes.usgs.gov/vhp/updates.html>



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# Advice for ROADWAY MANAGERS

## HOW TO RESPOND

### If operating machinery or vehicles

- > Check, clean and replace air and oil filters regularly.
- > Wash windscreens, painted and metals surfaces rather than wiping, to avoid abrasion damage. Avoid using windscreen wipers.
- > Apply lubricant/grease more frequently and check for wear.

### Management of roadway network

- > Advise public to reduce non-essential travel.
- > If ashfalls cause traction or visibility problems, implement safety measures such as reduced speed advisories, one-way rules, headlights on and ensuring a safe following distance.

### Clean up

- > Ash cleanup can be expensive and time-consuming. It can be complicated by ongoing volcanic activity producing further ashfalls, or by wind remobilization of deposited ash. See 'Advice for ash cleanup' poster in this series for more specific guidance.

### General principles are to:

- > Clean roads as soon as possible, to reduce remobilization problems and to make safe;
- > In urban areas, take steps to prevent ash from entering storm drains or sewers, as it can block underground pipework and be extremely difficult to remove, and can cause severe damage to wastewater treatment plants;

- > Ensure that field crews wear appropriate protective clothing (long-sleeved clothing, approved face masks and goggles) when operating in ashy environments;
- > Dispose of ash in appropriate sites;
- > Communicate work schedule with other stakeholders and the public.



## HOW TO PREPARE

At-risk regions should develop operational plans for volcanic ashfall. These should include:

- > Identification of a hierarchy of roads for priority of cleanup;
- > Road closure protocols;
- > Equipment and labor requirements for cleanup operations;
- > Identification of ash disposal sites;
- > Coordination of plans with local and regional emergency plans.

## ADDITIONAL INFORMATION

- > [https://volcanoes.usgs.gov/volcanic\\_ash/aviation.html](https://volcanoes.usgs.gov/volcanic_ash/aviation.html)
- > <http://www.ivhnn.org>
- > U.S. National Volcanic Ash Operations Plan for Aviation, 2007, <http://www.ofcm.gov/p35-nvaopa/fcm-p35.htm>
- > International Civil Aviation Organization, 2015, Manual on volcanic ash, radioactive material and toxic chemical clouds. Document 9691-AN/954, 2015, third edition.
- > <http://www.caa.govt.nz/>