



VOLCANIC ASH IS:
HARD, HIGHLY ABRASIVE,
MILDLY CORROSIVE &
CONDUCTIVE
WHEN WET.

VOLCANIC ASHFALL

ADVICE FOR ROAD NETWORK OPERATORS

Ash Impacts On Road Networks

GENERAL IMPACTS

- Visibility can be severely reduced during and after an eruption due to ash suspended in the air.
- Traction on ash-covered roads is reduced in both dry and wet conditions.
- Road marking coverage can occur when ash is less than 1 mm thick.
- Accident rates will likely increase.
- Vehicle damage may consist of the clogging of filters, corrosion of metal surfaces, and abrasion damage to windscreens, paintwork and moving engine components.
- Roads may become impassable (to 2WD vehicles) when ash on the ground is around 100 mm thick.

REMOBILISATION

- Impacts can continue after eruptive activity has ended due to the remobilisation of ash by wind, water, traffic and/or other human activity.
- Ash remobilised in rivers and creeks can lead to lahars (volcanic mudflows) causing damage to bridges and other infrastructure.

ROAD CLOSURES

- Closures are not always necessary during and after volcanic ashfall.
- The decision to close roads may depend on many factors including: visibility, ash depth, particle size and colour, road type and gradient, types of vehicles using road, local weather conditions, and local policies and regulations.



Volcanic ash lifted by vehicle near Chaitén volcano, Chile



Reduced visibility and covered road markings in Kagoshima City due to ashfall from Sakurajima volcano, Japan (photo credit: Minami Nippon Shimbun, Kagoshima, Japan).

Recommended Actions

WHERE TO FIND WARNING INFORMATION

See <http://www.geonet.org.nz> for ashfall forecasts in the event of a volcanic eruption.

HOW TO PREPARE

Operational plans should be developed for volcanic ashfall, including provision for:

- Coordinating plans with emergency management groups and other infrastructure providers.
- Developing road closure and detour protocols.
- Identifying a hierarchy of roads for clean-up prioritisation.
- Rapid clearing of critical evacuation routes.
- Considering equipment and labour requirements for clean-up.
- Identifying potential disposal sites.

HOW TO RESPOND

VEHICLE AND MACHINERY OPERATION

- Avoid using wipers to clear ash from windscreens as this can cause abrasion damage. Rinse ash from windscreens and vehicle paintwork with water.
- Clean or replace air and oil filters regularly.
- Apply lubricant/grease more frequently and check for wear.

ROAD NETWORK MANAGEMENT

- Advise the public to avoid unnecessary travel.
- Implement safety measures. These may include:
 - » Advisories to use headlights.
 - » Warning information and reduced speed limits (e.g. through variable message signs).
 - » Implementation of new one-way systems.
 - » Ensuring sufficient vehicle spacing and stopping distances.
 - » Dampening road surfaces to reduce remobilisation and improve visibility.

ROAD CLEAN-UP

- A combination of methods such as sweeping, air blasting, suction and/or spraying may be necessary to remove all ash from roads.
- Clean high priority routes before markings are covered to maintain safety.
- Prevent ash entering storm drains and sewers to avoid blockage and surface flooding.
- Ensure that field crews are supplied with adequate personal protective equipment (long-sleeved clothing, heavy footwear, fitted goggles and properly-fitted P2 or N95 dust masks).
- If further ashfall or ash remobilisation is likely, consider delaying clean-up to avoid wasting resources.
- Coordinate clean-up schedule with other stakeholders and the public.
- See companion poster "Advice for Urban Clean-up Operations" for general guidance on clean-up.

FURTHER RESOURCES:

- <http://www.geonet.org.nz> (volcano monitoring information)
- <http://www.gns.cri.nz/volcano> (general information on volcanic hazards)
- http://volcanoes.usgs.gov/volcanic_ash (volcanic ash impacts and mitigation encyclopedia)
- <http://www.ivhnh.org> (information on volcanic health hazards)

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Accident damage in Junín de los Andes, Argentina following ashfall from Calbuco volcano, Chile. (photo credit: Junín de los Andes Fire Department, Argentina)



Heavy ash contamination of car air filter following 50 mm of ashfall from the 2011 eruption of Cordón Caulle volcano, Chile. (photo credit: Ailen Rodríguez, Jacobacci, Argentina)

