

Salt + Gravel Roads = Big Mess - What you may not know is that there's a BIG problem with using salt on a gravel road: it will cause severe damage to the road that is very expensive and time-consuming to fix. Some roads on High Knob have been damaged by people directly applying salt to the gravel roads to improve their ability to travel to and from their homes. This is also a problem when homeowners apply salt to their driveways and there is runoff onto the gravel roads.

So what are you to do if you need to come and go during the worst conditions? Get the Best Equipment Possible The ideal vehicle for traversing these gravel mountain roads in snowy/icy conditions is a 4wd with tire chains. The next best is a 4WD or AWD vehicle with studded tires. Simple 4WD or AWD without studded tires or chains are next, and 2WD vehicles are at the bottom of the list. Chains are available for 2WD vehicles as well, and residents who have a confirmed need to traverse the mountain in icy conditions should still have them if they are unable or unwilling to upgrade to a 4WD or AWD vehicle.

Keep some grit material (sand, gravel, non-clumping cat litter) in your car. Grit can help if you find yourself in a bind and need traction assistance. High Knob applies gravel to inclines and curves where needed once the precipitation stops. We also recommend keeping a shovel and warm clothing (including good walking shoes/boots) and blankets in the car during winter as a precautionary measure if you have to walk or end up waiting in your car. For additional suggestions on preparing for storms, please see our document titled [Winter Driving on the Mountain](#).

How Salt Damages Gravel Roads - While pure water freezes at 32 degrees Fahrenheit, adding salt (or, really, anything) to pure water creates a solution with a lower freezing point than pure water. The most popular types of salts used for melting ice are sodium chloride, calcium chloride, and magnesium chloride. Sodium chloride (NaCl) dissolves into separate sodium ions and chloride ions. Calcium chloride (CaCl<sub>2</sub>) separates into 1 calcium ion and 2 chloride ions, and is even more effective at melting ice than sodium chloride. Magnesium Chloride (MgCl<sub>2</sub>) is hygroscopic, which means that it absorbs moisture. This causes ice to melt even faster than Calcium chloride because it absorbs water from both the ice AND the air. For salt to melt ice, there must be at least a small amount of water available. In fact, VDOT mixes a low-concentration salt solution (a LITTLE salt with a LOT of water) and uses it to pre-treat roads in advance of expected winter storms. It can be effective (at certain temperatures) at keeping roadways safely passable during the early phases of a storm. The key points here are that (1) it's a LOW concentration solution and (2) it is only applied to HARD SURFACE roads, not gravel roads. So, why is it bad to use salt on gravel and dirt roads? Pouring a bag of salt directly on a gravel road is a HIGH concentration of salt (way more salt and way less water when compared to pre-treatment solutions applied to pavement). As the ice melts, it causes the solution of salt and water to penetrate the dirt surface of the road. After it's absorbed into the road, the water in the solution refreezes. Water expands when it freezes, which breaks up the road and loosens the previously hard-packed surface. The process can quickly progress beyond the road and into the base below it. In the best case (which is still bad), it creates a quicksand effect because the base or hard ground below the road acts as a bowl to contain the soupy water/mud mixture. Unfortunately, this condition will persist until all the salt is sufficiently diluted to a negligible concentration (a very long process) or until the road is fixed. The condition is made worse when there is traffic on the road because the traffic tends to sink into the road instead of riding on top of it and packing it down. Further damage can occur when vehicles become stuck and must be recovered or removed with heavy equipment. Fixing the road after this kind of damage is difficult and expensive. Permanently fixing it requires scraping off the muddy mess and rebuilding the road. Applying gravel to the area may be helpful in the short term, but even that must be done so frequently and in such a high volume that this is also very expensive in terms of both materials and labor. It's not a permanent solution. Expensive road maintenance translates into a need for more tax revenue from property owners, and no one wants that!