

VERMONT AGENCY OF TRANSPORTATION



SNOW AND ICE CONTROL PLAN

FOR STATE AND INTERSTATE HIGHWAYS

A. PURPOSE AND NEED

The purpose of this plan is to define levels of service, operational procedures, and best management practices (BMPs) for performing winter maintenance activities on Vermont's Highways. It supports VTrans' mission and goals to provide for the safe and efficient movement of people and goods; and to preserve, maintain, and operate the transportation system in a cost effective and environmentally responsible manner.

Since storms vary, this Snow and Ice Control Plan (SIC Plan) is designed to be flexible. It is structured to fit typical conditions but provides leeway to adapt to the wide variety of conditions that will be encountered.

B. LEVEL OF SERVICE – GENERAL INFORMATION

VTrans Maintenance District snow and ice control operations are limited by the budget, personnel, equipment and materials available for winter maintenance. Consequently, VTrans' SIC Plan calls for "safe roads at safe speeds", and not "bare roads". This means that roads are maintained to allow safe travel at reduced speeds, but that drivers should expect to see snow on the roadway during a storm. Most travel takes place during the day, so the majority of VTrans resources are focused on those hours. Motorists should anticipate reduced coverage and varying road conditions at night and should drive accordingly.

C. CORRIDOR PRIORITIES

Four color-coded levels of service have been established and are shown on the attached "Corridor Priority Map". Priorities are based on winter traffic volumes, roadway classification, and expected truck traffic. Materials noted under Section E will be applied to keep the roads open for traffic and provide a safe surface on which to operate, though road surface may be snow covered at times during the storm. Intersections, sharp curves, and steeper hills may get higher rates of material application to maintain safety and mobility. Note that typical plow routes take approximately 2 hours to complete; some may take as long as 4 hours. A truck may not return to a given location for some time.

Hours of operation and routes may be adjusted to accommodate weather conditions and traffic demands. During overnight hours, resources may be shifted to prioritize coverage on higher priority routes.

1. CORRIDOR PRIORITY 1 – INTERSTATE AND LIMITED ACCESS HIGHWAYS (ORANGE ROADS)

These are the highest volume and highest speed roads. Plowing and material application will be performed during storm events, with reduced coverage between 8 p.m. and 4 a.m. After the storm has subsided, bare

travel lanes will be provided as soon as practical and on these roads before all others. In most cases, this will occur within 4 daylight hours. Bare pavement, shoulder-to-shoulder, will be provided as soon as practical. Travelers are reminded to reduce speed and drive according to conditions.

2. CORRIDOR PRIORITY 2 – HIGH TRAFFIC HIGHWAYS & TRUCK ROUTES (BLUE ROADS)

These are high volume roads. Plowing and material application will be performed during storm events, with reduced coverage between 8 p.m. and 4 a.m. The road surface may be snow covered at times during the storm. After the storm has subsided, bare pavement, shoulder-to-shoulder, will be provided as soon as practical. Travelers are reminded to reduce speed and drive according to conditions.

3. CORRIDOR PRIORITY 3 - MEDIUM TRAFFIC HIGHWAYS (GREEN ROADS)

These are medium volume roads. Plowing and material application will be performed during storm events, with reduced coverage between 8 p.m. and 4 a.m. The road surface may be snow covered at times during the storm. During the next regular working day after the storm has subsided, bare pavement, shoulder-to-shoulder, will be provided as soon as practical. Travelers are reminded to reduce speed and drive according to conditions.

4. CORRIDOR PRIORITY 4 – LOW TRAFFIC HIGHWAYS (YELLOW ROADS)

These are lower volume roads. Plowing and material application will be performed during storm events, with significantly reduced coverage between 8 p.m. and 4 a.m. The road surface may be snow covered during and immediately following the storm. During the next regular working day after the storm has subsided, one third bare pavement, in the middle of the road, will be provided as soon as practical. As soon thereafter as practical, a bare pavement shoulder-to-shoulder will be provided. Travelers are reminded to reduce speed and drive according to conditions.

D. PERFORMANCE MEASUREMENT: HOW ARE WE DOING AND HOW DO WE KNOW?

VTrans monitors its snow and ice control performance and continually seeks improvements. Activities are reviewed relative to the weather experienced and roadway conditions delivered to travelers. The goal is to most effectively provide safe roads at safe speeds, within our constraints of personnel, equipment, and budget.

The Maintenance and Operations Bureau publishes winter maintenance data in the VTrans Fact Book each spring, summarizing the previous winter's performance.

E. MATERIALS

The materials and typical application procedures described in this section are those used by VTrans for snow and ice control. Choice of materials and their application depends on consideration of pavement temperature, nature of the particular snow and ice event, forecast storm conditions, air temperature and wind velocity, traffic volume, time of day/year, and the availability of resources.

1. Road Salt

Road salt (Sodium Chloride) is the primary snow and ice control material. Road salt prevents snow and ice from bonding to the pavement surface and melts snow and ice that cannot be removed by plowing. Unless combined with other chemicals, sodium chloride is only effective down to approximately 15 degrees F.

Application Rates shall normally be selected from the attached “Salt Application Quick Reference Guideline” (Appendix A) and shall be based upon the pavement temperature, snow-ice conditions encountered, and forecasted weather.

2. Winter Sand

Winter sand is coarse, clean, sharp sand used to provide traction. It has no melting capabilities.

Sand may be appropriate for steep hills, sharp curves, and some intersections where temporary traction is needed or when pavement temperatures are too low for salt to work properly

Excessive use of sand can have detrimental impacts to the road and environment. Sand can insulate snow and ice and slow its melting. Sand can create roadway drainage issues, clog ditches and receiving waters, and is expensive to clean up in the spring. Accordingly, the use of winter sand is generally minimized.

3. Liquids (Brine)

Salt brine is road salt in dissolved in water. Brine, combined with commercially available deicing liquids, is a tool to melt snow and ice more effectively at lower temperatures. Deicing liquids typically include a corrosion inhibitor which makes them less corrosive than salt.

F. APPLICATION PROCEDURES

1. **Dry Material Applications** - Salt or sand is typically applied from a “spinner” on the truck which distributes the material evenly across the road surface. In some cases, the material is purposely applied in a windrow to be “worked” by traffic or run downslope. The application rate of materials is adjusted automatically to compensate for changes in a truck’s speed.
2. **Pre-wetting** - Liquids are typically sprayed on dry salt as it leaves the truck. Pre-wetting road salt this way significantly increases the proportion of salt that sticks to the road and accelerates the melting of snow and ice. If road salt is pre-wet with a brine blend including a chemical deicer, it will lower the road salt’s effective working temperature.
3. **Direct Application of Liquids** - In limited circumstances, liquids may be sprayed directly on the road surface. This may be done in advance of a storm to prevent snow and ice from bonding with the road surface, or to quickly “burn off” stubborn snow pack or ice.

G. EQUIPMENT

1. Washing Equipment

Trucks and equipment should be thoroughly washed as soon after use as practical. Particular attention should be paid to the areas in contact with sand, salt and liquid deicers.

2. Loads

Trucks should not be loaded in excess of their axle load ratings. This typically means no more than a “level load”. Unused material should be unloaded as soon as practical and the trucks washed clean.

3. Spreader system calibration

Each spreader system should be calibrated annually, and after any spreader or hydraulic maintenance, to ensure that selected rates of application are attained. Confirm that application rates are being transmitted by the truck's AVL system.

4. Brine maker calibration

Brine makers should be calibrated annually to ensure they are making brine at the proper salt concentrations. Proper salinity is important for compatibility with additives and for performance on the roadway.

H. OPERATIONS

1. Mailboxes and Other Structures Within the Highway Right-Of-Way

Mailboxes or other structures are occasionally damaged by snow plowing operations due to poor visibility, the mailbox being buried in a snow bank, or the weight/volume of the snow being plowed. VTrans is not responsible for damage and does not repair, replace or re-erect boxes that are located within the highway right-of-way unless they were physically struck by a VTrans plow truck. In these cases, VTrans will replace the mailbox at no cost to the property owner with a generic United States Post Office approved box and basic post, if necessary.

2. Widening or Pushing Back Snow Banks

Following storms with heavy snowfall, or when several storms result in substantial snow banks, VTrans may push back snow banks with truck wings or a motor grader. This provides room for future snow storage, reduces or prevents melted snow from running out onto the roadway pavement and creating icing conditions, and increases safe sight distance at intersections

There is no practical way to prevent depositing snow in previously cleaned driveways or walkways.

3. Sidewalks

The maintenance of the sidewalks, including snow removal, is the responsibility of local communities. In addition, in communities where on-street parking is permitted, snow removal from the parking areas, including plowing and or hauling away, is a local responsibility.

I. BEST MANAGEMENT PRACTICES, TRACKING AND REPORTING

Best management practices for winter maintenance activities include, but are not limited to:

1. VTrans shall disseminate the SIC Plan statewide to employees involved in the application and storage of winter snow and ice control materials and train such employees in the proper performance of these standards. The Maintenance and Operations Environmental Program Manager will ensure that this information is posted on the VTrans Web Site, kept current, and made available to ANR.
2. Low salt and no salt roads (zones) will be signed in the field accordingly.
3. Weekly internal reporting of salt/sand usage will be completed by Maintenance and Operations Bureau staff commencing on the first week of November and terminating 26 weeks later, typically with the last week of April. VTrans shall make note of any single de-icing salt application in excess of 800 pounds per two-lane mile and report such incidents as part of the weekly reporting. The Director of Maintenance and Operations will make this information available to ANR upon request.

4. VTrans shall fully cover with impervious material all bulk salt storage areas under their control to reduce the amount and concentration of salt to the runoff of stormwater from these storage areas. All bulk salt storage shall be situated on an impervious material so as to minimize leaching of salt-laden runoff into the ground.
5. VTrans shall locate sand piles at District Maintenance Facilities in areas that will not result in sediment-laden runoff into surface waters. If sand piles are located in close proximity to surface waters then VTrans shall install adequate erosion prevention and sediment control practices to ensure sediment-laden runoff will not impact surface waters.
6. When it is desirable to charge sand piles with salt to prevent freezing (resulting in mixes or blends), the percentage of salt in the pile shall not exceed 5%.
7. Nothing in this SIC Plan shall preclude the Agency from utilizing experimental and new technologies to achieve higher efficiency in a cost effective and environmentally sensitive manner. VTrans actively supports innovation and promotes the idea of finding new and better ways to reach our goals.

Approved: _____
Date

By: _____
Joe Flynn, Secretary of Transportation

Attachments:

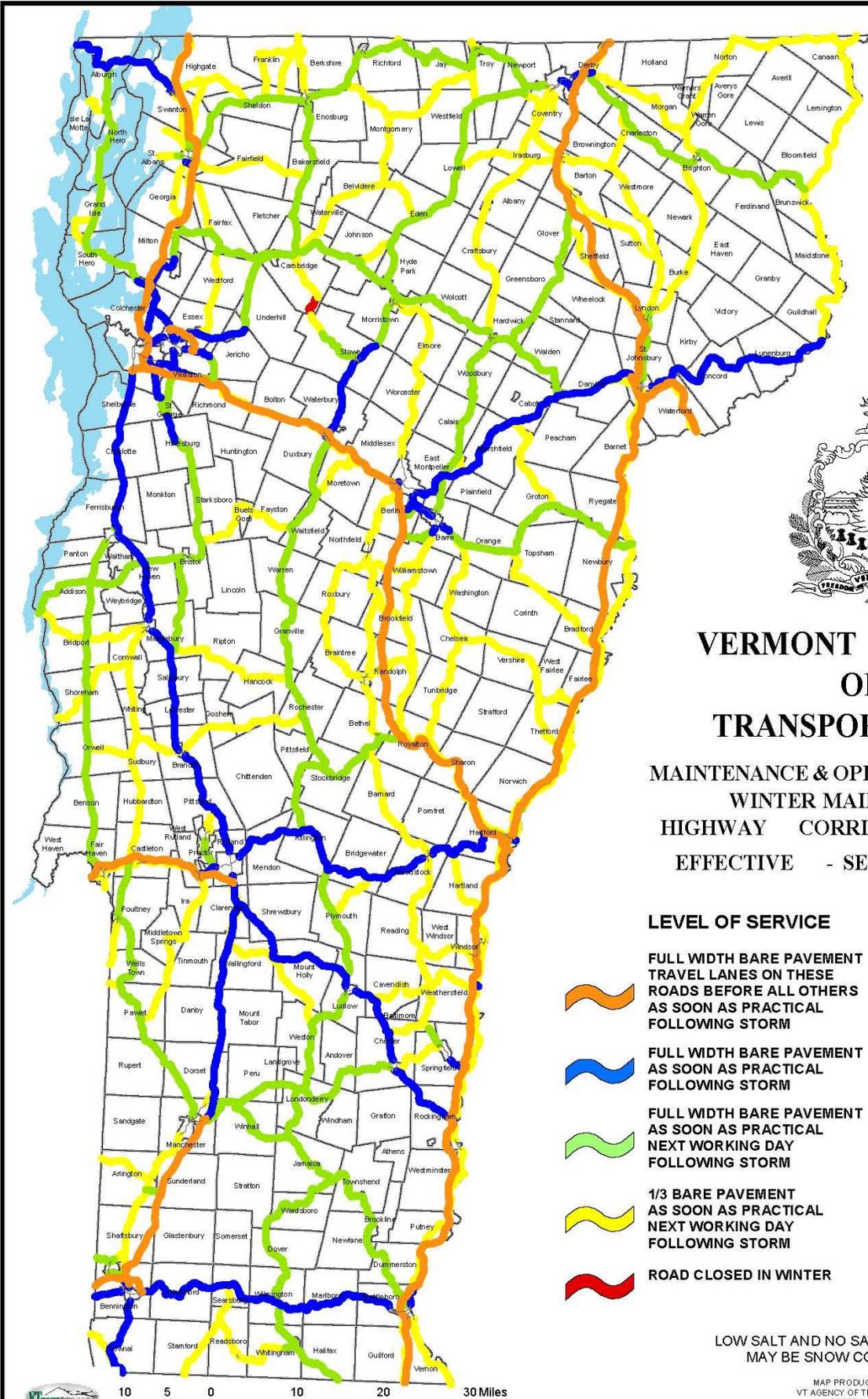
- APPENDIX A – Salt Application Quick Reference Guideline
- Corridor Priority Map

APPENDIX A

Salt Application Quick-Reference Guideline (Double these rates for centerline applications)		
Pavement Temp. Range	Typical Application Rate (#/LM)	Comments
25° and Above	100 to 200	Salt is very effective here
20° to 25°	200 to 300	Salt effectiveness is dropping off in this range
15° to 20°	300 to 400	Salt effectiveness is further reduced in this range
15° or Below	300 to 400	Snow may be dry and blowing in this range. If no ice or pack exists, plow only – do not apply material. It may be appropriate to spot treat icy patches with abrasives.

General Notes:

1. Application rates should be on the lower end when temperatures are on the higher side of the range or remaining steady. Falling temperatures, and temperatures on the lower side of the range, will require applications on the higher side, and possibly in the next range if dropping rapidly.
2. Prewetting salt at the spinner should be the standard practice. The appropriate liquid blend will vary based on the current and predicted temperature.
3. In any of the ranges, if the snow is dry and blowing off the roadway, do not apply material.
4. This is a guideline only. Application rates will vary based on climatic conditions experienced in the field, corridor priority, and judgement.



VERMONT AGENCY OF TRANSPORTATION

MAINTENANCE & OPERATIONS BUREAU
WINTER MAINTENANCE
HIGHWAY CORRIDOR PRIORITY
EFFECTIVE - SEPTEMBER 2017

LEVEL OF SERVICE

-  FULL WIDTH BARE PAVEMENT
TRAVEL LANES ON THESE
ROADS BEFORE ALL OTHERS
AS SOON AS PRACTICAL
FOLLOWING STORM
-  FULL WIDTH BARE PAVEMENT
AS SOON AS PRACTICAL
FOLLOWING STORM
-  FULL WIDTH BARE PAVEMENT
AS SOON AS PRACTICAL
NEXT WORKING DAY
FOLLOWING STORM
-  1/3 BARE PAVEMENT
AS SOON AS PRACTICAL
NEXT WORKING DAY
FOLLOWING STORM
-  ROAD CLOSED IN WINTER

LOW SALT AND NO SALT ZONE ROADWAYS
MAY BE SNOW COVERED AND ICY



10 5 0 10 20 30 Miles

1:1,000,000

MAP PRODUCED BY THE
VT AGENCY OF TRANSPORTATION
SEPTEMBER 2017