NORTHERN VIRGINIA WINTER WEATHER BRIEFING

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Northern Virginia District Background
• Fairfax, Loudoun, Prince William, and Arlington*
  * Arlington maintains own network (secondary roads)
• Population: 2.2 million
• Commuter lots: 24
• Bridges/large culverts: 2,000
• Traffic signals: 1,400
• VDOT employees: 866
Total lanes miles: 13,585
- Interstate: 727 • Primary: 1,736 • Secondary: 11,046
- Gravel: 318 • Frontage: 78
- Subdivision streets: 16,000
18 maintenance headquarters
Arlington: 1 • Fairfax: 9 • Loudoun: 4 • Prince William: 4
2017-2018 Snow removal budget $84.8 million
Pieces of equipment: 4,500
(mostly contracted)
Materials at start of season
Salt: 120,000 tons • Sand: 25,000 tons
Brine: 250,000 gallons
Contractor vehicles are inspected and fitted for A-frames and spreaders.
The district is divided up into 626 snow maps
Planning for winter weather
• **Forecast reviews** with National Weather Service (weather.gov/washington/winter) and Iteris
• **Mobilization plan** determined, including if incident command will be activated
A few days before a storm
• Applied when pavement temps are above 20 degrees, and event does not begin as rain
• Anti-icing treatment most effective during first hour of weather event
• 2,150 lane miles of interstates and major roads including bridges, ramps, and overpasses are treated with brine and/or liquid magnesium chloride.
Mobilization begins
• Contractors report, load, and stage trucks in the assigned areas before predicted storm arrival
• If 2”+ are forecasted, residents may see trucks begin to stage in neighborhoods.
- **Small events**: 12-18 hours before forecasted start
- **Large events**: 18-24 hours before forecasted start
Residents should:
• **Monitor forecasts** closely
• **Plan to telework** and adjust commutes
• **Stay off roads to give plows room**
• **Ensure enough gas, wiper fluid, proper tires, food, water and medicine**
• **Park in driveways** or on odd-numbered side of the street
• **Please be patient**
Stay informed:
• virginiadot.org/novaemergency One-stop shop for links to news releases, Twitter feed, status updates, VDOT Plows, customer service, FAQs and other resources
• @vadotnova for updates
• 511virginia.org for road conditions and traffic cameras
• vdotplows.org for status of subdivisions once 2” have fallen
The storm begins
Crews work interstates, major roads and main subdivision roads in priority order.
Interstates (66/95/395/495)
High-volume routes (Routes 1, 7, 28, 50, etc.)
Made passable, then bare pavement where possible
Subdivisions
Main roads made passable, then remaining streets and cul-de-sacs
What does “passable” mean?
• **An 8- to 10-foot path** cleared for emergency vehicle access
• **Drivable with extreme caution**
• **Road remains snow-packed, will not be curb-to-curb or bare pavement**
Passable lane goals:
• 2-4" of snow: 24 hours
• 4-6" of snow: 48 hours
• 6"+ of snow: 72+ hours
• One pass for typical storms; multiple passes and heavy equipment needed for major storms
• Hills, curves, intersections sanded to help provide traction
• Driveways, mailboxes, and hydrants: crews asked to be mindful but blocking can be an unintended consequence
Additional priorities:
• Getting the roadways as safe as possible
• Shoulders, ramps, turn lanes, intersections
• 12,000 park-and-ride spaces
- **Monitors:** Staff inspect routes for quality control and customer calls
- Maps marked complete when a **driver reports back and monitors have spot-checked**
- Once roads are made passable, call center logs inquiries to investigate
- **AVL plow-tracking can help verify**, provide data for inquiries
Sidewalks and Trails

• Crews asked to be mindful, but often limited room to pile snow from roads
• Special care is requested near schools and emergency facilities
• Residents and businesses are asked to clear near their property
• Check with localities for ordinances
After the storm
• Demobilization takes hours
• Trucks must be **offloaded** of materials and spreaders removed
• Residents may see **trucks queued around area headquarters**
Area headquarters crews restock materials continuously.
Customer Service Center

- [my.vdot.virginia.gov](http://my.vdot.virginia.gov) or 800-FOR-ROAD (367-7623) to report safety concerns
- **Please wait a few days after storm ends** to report roads as “missed.” Once drivers have completed maps, calls will be mapped and sent to local areas to revisit.
Questions?
BEST MANAGEMENT PRACTICES
Pollution Prevention and Salt Management

Marian Carroll, NOVA District NPDES Coordinator

May 24, 2018
Salt Management – Pollution Prevention

- Municipal Separate Storm Sewer System (MS4) Program
  - Stormwater Pollution Prevention Plan (SWPPP) at VDOT Facilities
  - Illicit Discharge Detection and Elimination (IDDE)
Best Management Practices – Salt Storage

Salt is stored and contained in buildings.

Liquid products, like brine, are stored with secondary containment.
Best Management Practices – Controlling Salt Runoff

Runoff is directed into underground storage tanks or above ground salt ponds.

Equipment washwater is controlled.
Questions?

Photo from New Zealand Ministry for the Environment
WINTER MAINTENANCE RESEARCH CONDUCTED BY VDOT

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Winter Maintenance Research Conducted by VDOT

- **Exploring Ways to Prevent Bonding of Ice to Pavement**  
  - Study performed back in 1998
  - VDOT’s first attempt to determine what other states and other countries were doing with respect to anti-icing
  - Recommended using liquid chemicals for anti-icing purposes

- **Environmental Implication of the Use of Ice Ban as a Pre-wetting Agent for Sodium Chloride**  
  - Examined the use of an agricultural by-product patented for use as deicing agent
  - Evaluated its effectiveness in removing snow and compared its impacts on the environment and highway infrastructure
  - It was recommended that VDOT not use Ice Ban as a pre-wetting agent as it showed no appreciable benefits

- **Characterization and Environmental Management of Stormwater Runoff from Road-salt Storage Facilities**  
  - Performed a complete chemical characterization of salt-laden stormwater captured at VDOT’s maintenance locations
  - Developed a thorough understanding of how this runoff is captured, stored, managed, and disposed
  - Methods of reducing the amount of runoff generated were recommended as well as potential treatment methods that required additional study
Winter Maintenance Research Published by VDOT (cont.)

- **Potential Use of Reverse Osmosis in Managing Saltwater Waste Collected at Road-salt Storage Facilities**  
  - A pilot study using RO was conducted to determine its feasibility for use by VDOT (in lieu of stormwater disposal)  
  - Primarily due to the extremely large volume of water VDOT collects, RO was not recommended as a treatment method  
  - The potential for using the stormwater for the purpose of brine generation was identified as a potential reuse option

- **Recycling of Salt-contaminated Stormwater Runoff for Brine Production at VDOT Road-salt Storage Facilities**  
  - Examined the use of stormwater captured at VDOT’s maintenance facilities to generate NaCl brine for the purpose of anti-icing  
  - Ensure that this source of water did not affect the quality of the brine, compromise brine generation equipment, and was economically feasible  
  - It was concluded that (1) the sediment levels in the stormwater were not so high as to negatively affect the brine quality or equipment; (2) a high percentage of the water that was requiring disposal (60 million gallons) could be reused; and (3) by avoiding disposal of this water, significant savings could be realized

- **Environmental Life-Cycle Assessment of Winter Maintenance Treatments for Roadways**  
  - Researchers performed an LCA for three winter maintenance treatments (granular NaCl, NaCl brine, and calcium magnesium acetate)  
  - CMA – long considered one of the most environmentally promising treatment chemicals – had higher total impacts than either salt alternative  
  - Brine was determined to be the best option available when considering all environmental burdens
Advantages of Using Brine for Anti-icing

- Significantly reduces the amount of NaCl needed to achieve equivalent level of service by preventing the formation of a bond between ice/snow and pavement
- This allows more complete mechanical removal (e.g., plowing) of ice/snow from the roadway
- Depending on a number of variables, including storm duration, temperature, and precipitation intensity, this practice can reduce total NaCl application volumes needed for a given storm by 30 to 65%