State Highway Administration (SHA) -- Winter Operations Facts And Figures
2012-2013 Winter Season

SHA maintains most interstate, U.S. and numbered state routes in Maryland's 23 counties. The Maryland Transportation Authority (MDTA) maintains Maryland's eight toll facilities such as the Bay Bridge, the Intercounty Connector and the Baltimore Harbor and Ft. McHenry tunnels. In addition MDTA maintains I-95 from Baltimore City to the Delaware line and I-395 in Baltimore City.

Budget for winter 2012/2013:	**$41 million**
Salt available for 2012/2012:	**360,000 tons**
Salt Barns/Domes in Maryland	**94 sites**
Lane Miles Maintained by SHA and MDTA **(**Length of roadway times the number of lanes, including ramps)	**17,818 miles**
Pieces of Equipment Available to Fight Winter Storms (Including SHA, MDTA and contract forces)	**Up To 2,400**
Number of People Available to Fight Winter Storms (Including SHA, MDTA and contract forces)	**Up To 2,700**

Almanac Data

Average Number of Winter Snow Storms per Year Since 2000 (Does not include the numerous maintenance shop activations for frost, black ice, and post-storm blowing and drifting snow)

Eastern Shore	**7**
Southern Maryland	**7**
Baltimore/Washington DC Metro Area	**8**
Western Maryland	**30**

Date of Earliest Metro Area Winter Storm since 2000	**10/29/2011**
Date of Latest Metro Area Winter Storm since 2000	**4/9/2000**

Winter Operations Expenditures and Salt Usage (5 year period)

Fiscal Year	Expenditures	Salt Used
FY 2008	**$46,400,013**	**201,401 tons**
FY 2009	**$52,897,496**	**222,230 tons**
FY 2010	**$124,841,364**	**368,854 tons**
FY 2011	**$70,449,052**	**258,923 tons**
FY 2012	**$37,620,642**	**85,150 tons**

Strategies for Winter Operations

- **Anti-Icing** - proactive preventive winter maintenance strategy of applying materials prior to or at the onset of precipitation to prevent snow and ice from bonding to pavement. SHA is expanding its anti-icing operations in an attempt to lessen overall salt usage throughout Maryland. Salt Brine is used in advance of a storm that is forecasted to begin as snow. Salt brine is produced at 14 SHA maintenance facilities. It is also transported to SHA facilities and stored in large tanks for rapid deployment. SHA cannot pre-treat highways with salt brine if a storm starts as rain as this will wash the salt brine solution off of the pavement.

- **Deicing** - traditional winter maintenance strategy of breaking the snow/ice/pavement bond after it has occurred. It requires more material to break the bond than to prevent it. Salt is the primary material used to treat pavement in snow or ice operations. In colder areas or for a thicker snow pack on the road, crews can switch to magnesium chloride or "Liquid Mag" that is highly effective in colder temperatures.

Materials Available for 2012-2013 Winter Season

- **Salt** is the principal winter material used by SHA. It is effective at pavement temperatures of 20° F and above.
- **Salt brine** is a solution that can be used as an anti-icer on highways prior to the onset of storms, or as a deicer on highways during a storm. SHA makes extensive use of this material. It has a freeze point of -6° F. and costs approximately seven cents per gallon to produce. Salt brine will be produced and used at SHA's 14 brine making facilities. In addition, salt brine will be transported to other maintenance shops throughout the state for their use.
- **Magnesium chloride** (mag) is a liquid winter material used by SHA in deicing operations. The material has a freeze point of approximately -26° F. It is used in the colder regions of the state, primarily in the northern and western counties.
- **Abrasives** including sand and crushed stone are used to increase traction for motorists during storms. Abrasives have no snow melting capability. SHA uses a limited amount of this material, concentrating its efforts on melting and plowing snow and ice from the pavement.

Quantities of Materials Available at Start of 2012-2013 Winter Season

Rock and solar salt in 96 salt domes/barns	**360,000 tons**
Abrasives (statewide) – sand and crushed stone	**40,000 tons**
Calcium chloride (various locations)	**60 tons**
Salt brine or salt brine at 77 sites	**900,000 gallons**
Magnesium chloride at 15 sites	**90,000 gallons**

Technology Available for 2012-2013 Winter Season

In addition to its fleet of salt spreading/snow plowing dump trucks, SHA will deploy:

- **550 truck-mounted saddle tanks:** This equipment is used to pre-wet salt with salt brine or liquid magnesium as the salt is spread on highways. Pre-wetting salt helps it adhere to the pavement (reducing waste), go into brine solution quicker (making salt more effective) and work at lower temperatures. Nearly all of SHA's fleet of single axle dump trucks is equipped with this technology.
- **205 wing plows:** A wing plow is an additional plow mounted on the right side of a plow truck or grader. The extra plow allows crews to clear more snow from the road and shoulder in one pass, increasing efficiency.
- **14 truck-mounted liquid applicator spray tanks:** These units are used for anti-icing operations (spraying salt brine or salt brine blended with beet molasses on roads and bridges prior to precipitation to prevent snow and ice from bonding to the pavement).
- **14 salt brine machines:** SHA will add two additional salt brine machines this winter to bring the total to14 brine makers and salt brine storage at 77 locations throughout Maryland.
- **2 tow plows:** A tow plow is a separate plow that is towed behind an SHA salt/plow truck and will clear an extra highway travel lane. Tow plows will be used in conjunction with snow plow trains (several trucks driving in tandem). The introduction of the tow plow into SHA's fleet will help enhance highway snow clearing operations with fewer passes and less trucks on the highway.

Salt Reduction

SHA maintenance personnel are very conscious of salt usage during winter storms. Equipment is carefully calibrated to control salt application rates to prevent over-salting and is uniform in distribution.

Through careful pre-storm planning, SHA can minimize salting and still provide a safe and efficient road surface for our customers. Crews continue anti-icing operations (pre-treating roads with salt brine) in advance of storms. The brine prevents snow and ice from bonding or "packing" on the surface of the highway, which helps SHA to more efficiently remove snow.

SHA is increasing its use of pre-wetted salt this winter. Pre-wetting salt with salt brine or magnesium chloride helps reduce salt better adhere to the road. It help prevents typical "bounce and scatter" of salt application. Studies have shown that pre-wetting can lead to a **30 percent reduction in salt usage**.

Contacting SHA

Citizens can also log onto www.roads.maryland.gov and click "Contact us." There is an online submission form to report any issues pertaining to SHA-maintained highways for non-emergencies. Free local traveler information can be obtained by calling 5-1-1. Go to md511.org. SHA also invites you to follow us on Twitter @MDSHA and "like" us on Facebook at http://www.facebook.com/MarylandStateHighwayAdministration.

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