

# Maryland State Highway Administration

## Winter Operations Facts And Figures

### 2010-2011 Winter Season

The Maryland State Highway Administration, (SHA) maintains most interstate, U.S. and numbered state routes. The Maryland Transportation Authority (MDTA) maintains Maryland's seven toll facilities such as the Bay Bridge 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. Each Maryland county and Baltimore City maintain local roads that are not under SHA's jurisdiction, such as I-83 (Jones Falls Expressway) in Baltimore City.

**Lane Miles Maintained by SHA and MDTA** **Nearly 17,570**  
 (Length of roadway times the number of lanes, including service roads/ramps)

**Number of People Available to Fight Winter Storms** (Including SHA, MDTA and contract forces) **Up To 2,700**

**Pieces of Equipment Available to Fight Winter Storms** (Including SHA, MDTA and contract forces) **Up To 2,400**

### 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** **12/5/2002**

**Date of Latest Metro Area Winter Storm Since 2000** **4/9/2000**

### Winter Operations Expenditures and Salt Usage

<u>Fiscal Year</u>	<u>Expenditures</u>	<u>Salt Used</u>
FY 2000	\$36,570,963	229,884 tons
FY 2001	\$35,404,738	238,948 tons
FY 2002	\$20,235,025	94,301 tons
FY 2003	\$73,399,067	427,112 tons
FY 2004	\$49,965,910	316,879 tons
FY 2005	\$47,743,201	291,388 tons
FY 2006	\$34,897,741	157,508 tons
FY 2007	\$48,372,623	252,840 tons
FY 2008	\$46,400,013	201,401 tons
FY 2009	\$52,897,496	222,230 tons
FY 2010	\$124,841,364	368,854 tons
<b>Budgeted For FY 2011</b>		<b>\$31,000,000</b>
<b>Salt available for FY 2011</b>		<b>340,000 tons</b>

Please note: Expenditures and salt usage varies from year to year due to the number and intensity of storms.

## Strategies for Winter Operations

- **Anti-icing** - proactive preventive winter maintenance strategy of applying materials prior to or at the onset of precipitation in order to prevent snow and ice from bonding to 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. SHA is expanding its anti-icing operations in an attempt to lessen its overall salt usage.

## Materials Available for 2010-2011 Winter Season

- **Salt, rock and solar** (sodium chloride) is the principal winter material used by SHA. It is effective at pavement temperatures of 20° F and above.
- **Treated salt** is salt coated with magnesium chloride and/or sugar beet molasses. The additives allow salt to work at lower temperatures, extending its range of effectiveness.
- **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.
- **Calcium chloride** is a solid (flake) winter material used during extremely cold winter storms. SHA uses a limited amount of calcium chloride.
- **Salt brine** (liquid sodium chloride) 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 nine 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.
- **Potassium acetate** is a costly, environmentally friendly, liquid material used at SHA's automated bridge anti-icing system in Allegany County.
- **Geo-Melt 55 (De-sugared sugar beet molasses)** is an organic material that is blended with salt brine. The beet molasses lowers the freezing point of brine, and allows it remain on bridge and road surfaces for longer periods of time, extending its effectiveness.

### 2009-2010 Approximate Snowfall Totals at a Glance

Baltimore and Harford	93 inches
Montgomery and Prince George's	72 inches
Anne Arundel, Charles, Calvert and St. Mary's	76 inches
Howard, Frederick and Carroll	98 inches
Cecil, Kent, Queen Anne's, Caroline and Talbot	90 inches
Allegany, Garrett and Washington	156 inches
Worcester, Wicomico, Somerset and Dorchester	43 inches
MdTA-Bay Bridge	67 inches
I-95 (Kennedy Highway) including Ft. McHenry Tunnel	73 inches
Baltimore Harbor Tunnel	73 inches

## Quantities of Materials Available for 2010-2011 Winter Season

• Rock and Solar Salt in 96 Salt Domes/Barns	340,000 tons
• Abrasives (statewide) – sand, etc.	35,000 tons
• Calcium Chloride (various locations)	60 tons
• Salt Brine at 66 Sites	675,000 gallons
• Magnesium Chloride at 15 Sites	50,000 gallons
• Ice Bite (De-sugared Sugar Beet Molasses)	30,000 gallons
• Potassium Acetate	4,500 gallons

## Technology Available for 2010-2011 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.
- **69 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.
- **8 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).
- **11 salt brine machines:** SHA has added three additional salt brine machines and has increased salt brine storage to 66 locations throughout Maryland. Salt brine machines produce brine for themselves and surrounding facilities.
- **Automated bridge anti-icing system:** SHA's automated bridge anti-icing system is located on Interstate 68 in Allegany County. This technology is used to spray a liquid chemical (potassium acetate) on the bridge decks prior to the occurrence of frost or frozen precipitation. The spraying occurs automatically, based on weather data captured by pavement and atmospheric sensors at the sites. The technology reduces the need for after-hour emergency callouts and has reduced the occurrence of winter-related incidents.

## CONTACTING SHA

*Citizens can call 1-800-327-3125 for general winter highway conditions during winter storms. Citizens can also log onto [www.roads.maryland.gov](http://www.roads.maryland.gov) and click "Contact us." There is an online submission form to report any issues pertaining to SHA-maintained highways.*

## Biodiesel Facts

*SHA will push the white stuff off the roads using a little green stuff. SHA's has been using a five percent mixture of biodiesel fuel, depending upon market availability. When compared to petroleum diesel fuel, the use of biodiesel fuel yields significant environmental benefits, such as reduction of particulate matter, unburned hydrocarbons, carbon monoxide and carbon dioxide.*

**What is biodiesel fuel?** Biodiesel fuel is a clean burning alternative fuel that is produced from renewable resources, such as soybeans. Biodiesel fuel can be blended with standard diesel fuel in different percentages ranging from 5 percent to 100 percent.

**When did the State Highway Administration (SHA) begin using biodiesel fuel?** SHA began blending biodiesel fuel with standard diesel fuel in October 2005.

**Does converting to a biodiesel fuel blend require retrofitting existing engines with expensive upgrades?** Biodiesel fuel blends can be used in diesel engines with little or no modifications. SHA uses a blend of 5 percent Soybean Oil. The higher concentration of biodiesel fuels, above 20 percent, may require some minor engine retrofitting, including fuel system heaters.

**How does biodiesel fuel benefit the environment?** Biodiesel fuel is derived from natural, renewable resources. Studies indicate that biodiesel results in lower vehicle emissions compared to standard petroleum diesel fuel. Biodiesel fuel is less toxic than ordinary table salt and is biodegradable. In fact, biodiesel degrades as fast as sugar.

**Does biodiesel fuel work in extremely cold weather?** Biodiesel fuel blends work in virtually all weather however; a 5 percent biodiesel is SHA's preferred blend and is effective in temperatures as low as -30 degrees.

**Why use biodiesel fuel?** Biodiesel fuel is a renewable resource of energy that is derived from commodities such as soybeans, which are plentiful and renewable.

**Does biodiesel fuel cost the same as conventional diesel fuel?** Although biodiesel fuel is produced from plentiful resources such as soybeans, the technology is still in its infancy when compared to 100 percent petroleum products; therefore biodiesel costs SHA approximately three cents per gallon more to purchase.

**What is SHA's next step in "greening" the fuel?** SHA will continue to use a 5 percent biodiesel fuel blend during winter 2010/2011. SHA continues to research the possibility of moving to higher percentage blends in the future.

*Sources: The National Biodiesel Board and the Maryland Department of Transportation's State Highway Administration.*



Figure 1 Dried Soybean

## Sugar Beet Molasses

**What:** Sugar beet molasses is an agricultural product created when sugar beets are processed to make commercial grade sugar. The product is mixed with salt brine and be applied to roadway surfaces, bridges and elevated areas in advance of winter weather. The brand name of the product is **Geo Melt 55** and is manufactured by SNI Solutions, Inc of Geneseo, IL.

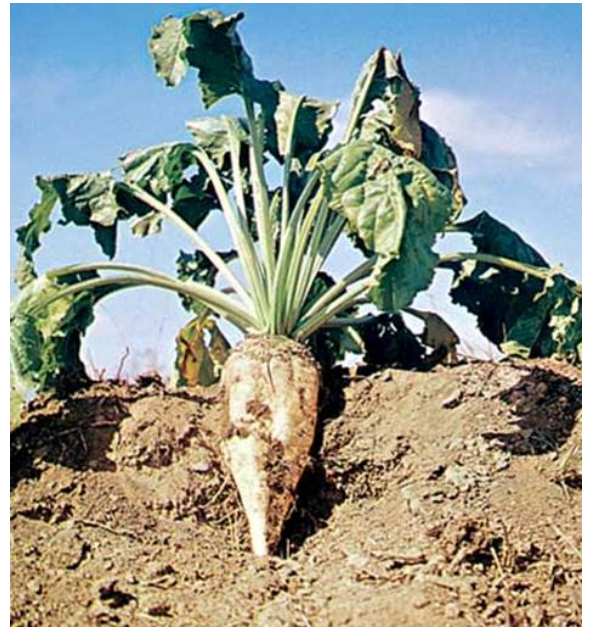
**Why:** Sugar beet molasses has been used for winter operations for nearly 10 years in other states including Virginia, New Jersey, Illinois, Ohio, Iowa and Washington D.C. It is environmentally safe, while being effective in conjunction with salt or salt brine. It is derived from natural, agriculturally-based products from sugar beets and is a renewable resource. Sugar beet molasses is light brown when mixed with salt brine and does not stain roadway surfaces.

**How:** Sugar beet molasses can be a useful tool to help keep roads clear during winter weather.

- Reduces corrosion of salt spreaders and other winter equipment;
- Enhances salt and salt brine effectiveness in colder temperatures. Salt is effective at pavement temperatures to 20 degrees and salt brine is effective to 6 degrees below zero.
- Lowers maintenance costs by reducing the re-application of salt, which also preserves salt reserves; and
- Allows better adherence to the pavement. Reduces salt scatter and helps salt brine adhere over a longer period to the road.

**Where:** SHA will use sugar beet molasses mixed with salt brine on roads and bridges in more counties across Maryland this winter, including Prince George's, Montgomery, Anne Arundel, Charles, Calvert, St. Mary's, Washington and Allegany. SHA will continue to use sugar beet molasses where it was piloted last year in Howard and Frederick counties. SHA has purchased 30,000 gallons for winter 2010/2011 and will work in unison with salt brine. The brine will be mixed as 85 percent salt brine and 15 percent sugar beet molasses. The cost for sugar beet molasses is \$1.60 per gallon.

**When:** The molasses/brine mixture will be used in many other counties to pre-treat roadways prior to the onset of winter storms that start with wintry precipitation (not as rain).





# Maryland Transportation Authority (MDTA)

The Maryland Transportation Authority (MDTA) was established by statute in 1971 to manage the State's toll facilities, as well as to finance new revenue-producing transportation projects on behalf of the Maryland Department of Transportation. The MDTA's Board Members are appointed by the Governor and confirmed by the State Senate. The Secretary of Transportation serves as Chairman. The MDTA's Executive Secretary administers the day-to-day business of the agency and its 1,700 employees, which includes the nationally accredited MDTA Police.

The MDTA does not use tax dollars; rather it relies solely on the revenues generated from the following transportation facilities:

- John F. Kennedy Memorial Highway (I-95).
- Fort McHenry Tunnel (I-95/I-395).
- Baltimore Harbor Tunnel (I-895).
- Francis Scott Key Bridge (I-695).
- William Preston Lane Jr. Memorial (Bay) Bridge (US 50/301).
- Governor Harry W. Nice Memorial Bridge (US 301).
- Thomas J. Hatem Memorial Bridge (US 40).
- Intercounty Connector (MD 200, coming soon).

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### Facts about the MDTA's snow-removal operations:

- Available personnel: 315 (includes office staff, mechanics, operators, etc.)
- Rock salt and liquid magnesium chloride
  - Total salt capacity: approximately 34,600 tons
  - Total liquid magnesium chloride and salt brine: 104,700 gallons
- Pieces of equipment: approximately 160 (includes all miscellaneous equipment used in storms, not just dump trucks)

## Public Information Contacts

**Division of Communications**  
**410-537-1017**  
(8 a.m. - 5 p.m. Monday through Friday except holidays)

Cheryl M. Sparks, Director

**After Business Hours**, please call the Authority Operations Center at 410-537-1234 and ask staff to contact the Public Information Officer on-call.

**For MDTA Police issues:**  
Sgt. Jonathan Green  
410-537-7724 (office), 410-977-5772 (cell)

**For current Bay Bridge traffic conditions 24/7, call 1-877-BAYSPAN (229-7726) or visit baybridge.com.**  
**For statewide traffic conditions, visit [www.traffic.maryland.gov](http://www.traffic.maryland.gov).**



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