SALT MANAGEMENT

WINTER MAINTENANCE PLAN

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1. *Introduction*

The purpose of this document is to lay out strategies and guidelines for the effective use of road salt (sodium chloride) during winter operations in Baltimore County, Maryland. The aim is to reduce the negative environmental impact of road salt runoff.

These best practices for salt management cover every aspect from the delivery, storage, and handling of road salt to its application on roadways during winter storms, and the subsequent cleanup operations serve as the foundation of Baltimore County DPWT's efforts to minimize the environmental impact of salt.

Our primary objective is to establish a framework that enables our agency to provide safe, efficient roadway systems during winter storms in a manner that is both cost-effective and environmentally responsible. Additionally, this plan seeks to consolidate Baltimore County DPWT's existing practices and documents into a single, comprehensive guidance document.

2. *Objectives*

This salt management plan articulates the fundamental principles that guide DPWT in providing public services while upholding our department’s mission. The primary objectives are as follows; Ensuring public safety during winter events, which directly affects the safety of both road users and maintenance personnel.

Safety is the foremost consideration in the development of this plan along with environmental impacts, as the high concentration of salt used can have adverse effects on the roadside environment and receiving waters.

This plan encompasses best management practices aimed at minimizing salt usage and mitigating environmental impact.

3. *Safety*

The Baltimore County Department of Public Works and Transportation (DPWT) strives to provide safe travel along the county's roadways during winter storms in a cost-effective manner while minimizing environmental impacts. In reality, achieving this objective presents challenges as certain priorities may conflict.

The level of service expected by residents typically determines the hierarchy in these conflicts; however, it may not always be the most appropriate measure during winter operations.

Consequently, DPWT considers a passable roadway as the suitable measure during winter events, taking into account weather conditions, available resources, and environmental concerns.

During winter storm events, the Department of Public Works and Transportation (DPWT) also must ensure that emergency responders maintain adequate response times and transport individuals to emergency facilities within Baltimore County.

4. *Roadway Conditions*

A passable roadway is defined as a roadway surface that is clear of snow drifts, ridges, and as much ice and snow as is practical, enabling safe travel at a reasonable speed considering the conditions. It should be noted that a passable roadway differs from bare pavement, which is completely free of ice, snow, and moisture. Bare pavement conditions may only be achieved after weather conditions have improved and plows have removed all snow and slush from the pavement.

A reasonable speed should be one at which a vehicle can travel without losing traction, and this may be lower than the posted speed limit during and immediately after a winter storm. Residents and the traveling public should always anticipate some inconvenience and adapt their driving practices to suit road conditions.

The management of roadway conditions requires a strategic approach to snow and ice control. It is essential to prioritize the timely removal of snow and the application of salt or brine to prevent ice formation.

Following a winter storm event, the objective is to achieve passable road conditions and ultimately clear pavement. This process begins by treating priority roads, followed by secondary roads and neighborhood streets. Cul-de-sacs and dead-end roads receive attention as the final phase. Some pre-treatment of select roadways with salt brine serves to prevent the adherence of frozen precipitation to the road surfaces is also used.

5. *Roadway Treatment Order*

Priority roadways with high traffic volumes make it necessary to focus on more than just the driving lanes during the winter storm. These roads during certain events require continuous plowing to keep the snow from packing on the driving, turn, and acceleration/deceleration lanes during the winter storm events with enough road salt re-applied to keep the precipitation from bonding to the roadway surface.

Secondary roadways receive the same treatment once all priority roadways have been treated and plowed once priority roadways are considered passable.

Lastly cul-de-sacs and dead-end roadways get treated once both priority and secondary roadways are deemed passable.

With this we are also reminded that each winter storm is unique and may even be followed by subsequent storms occurring so frequently that it is not possible to achieve passable roadway conditions and bare pavement between events. The severity of each storm, roadway temperatures, and available resources will determine how quickly passable roadway conditions and bare pavement can be achieved.

6. *Salt Reduction*

The primary method most winter maintenance agencies use to ensure safe, passable roadways is the traditional practice of plowing and salting. While this plan doesn't delve into the specifics of salt and other deicing materials or the potential damage they can cause, it begins with the recognition that winter materials can harm the environment.

Salt is the primary snow and ice control material used by Baltimore County and most jurisdictions throughout the country. It is used because it is effective for winter storms, inexpensive, easily stored, and readily available. Granular road salt is used primarily during storms when precipitation has already begun to fall.

Over the past few decades, research into other materials has been conducted, but none have been able to replace salt in benefit/cost effectiveness and reliability. While it will continue to be the primary material for fighting winter storms, Baltimore County will continue to look for ways to minimize its use.

This plan outlines ways to use salt and other winter materials in a manner that benefits the citizens and business community while minimizing environmental impact, and it details the best practices for salt management to reduce the impact of winter materials in Baltimore County.

Currently Baltimore County DPWT tracks and reports all salt usage after winter events, the department strives to use less than 500lbs of salt per lane mile per inch of precipitation. This usage is not set as a goal since setting an annual quantity goal for salt reduction is not practical due to the dynamic nature of winter storms that vary in number, timing, intensity, duration, type of precipitation and roadway riding surface needs.

By adhering to a 500lb or less plan, long-term goals can be established to lessen the usage of salt and reduce its impact while maintaining the safety and mobility of our residents.

7. *Salt Storage*

In Baltimore County salt is stored within salt barns and salt domes at seventeen different sites with a total capacity to store over ninety-one thousand tons.

These structures are frequently inspected for potential problems during the summer and fall seasons along with general housekeeping throughout the year.

Both the salt barns and domes are loaded within their design capacity with entrances blocked by berms (or straw bales) to deter or prevent leaching before and after all winter events which falls within DPWTs required Stormwater Pollution Prevention Plan.

At no time during loading of these storage sites or winter operations is salt allowed to left exposed to the weather.

When spills occur at sites, they are addressed using equipment such as a front-end loader, while small amounts being addressed with a shovel and broom.

In either case, the material should be returned to the salt structure as soon as possible. These storage practices are covered at DPWT's yearly winter training of employees.

8. *Equipment*

DPWT has 182, 8-ton dump trucks available during winter events with 60 of these trucks equipped with computerized controls which run independent hydraulic systems to control the amount of salt distributed.

Crews currently use this technology in the Northern part of Baltimore County outside of the URDAL where wells are the main source of water for residents. These spreading systems are also specified on each new piece of snow-fighting equipment, with over a quarter of the fleet outfitted with this new technology already.

Salt spreader calibrations are checked yearly and employees receive a refresher course prior to the winter season during DPWT's yearly winter training. This ensures spreading volumes are maintained (for every inch of snow) at 500lbs or less of salt for each lane mile which is the common practice throughout the Country.

All trucks and winter accessories are inspected twice a year.

9. *Salt Brine*

Salt Brine (liquid sodium chloride) is used on over 600 miles of selected roadways within Baltimore County during anti-icing operations prior to storms. It is sprayed on roadways through direct liquid application from two hours to two days prior to the onset of frozen precipitation to prevent snow and ice from bonding to pavement.

Salt brine has several attributes. It is easily manufactured using a brine maker, dry salt is dissolved in fresh water and brought to a concentration of 23.3% sodium chloride, this brine is then pumped to storage tanks where it is available for application on roads. Whereas salt begins to lose its effectiveness at 20 degrees, brine has a freeze point of 6 degrees, and will work when road salt is ineffective.

Baltimore County, currently has 6 trucks equipped with slide in brine tanks and plans to order more as funding becomes available along with an additional portable brine mixer and storage tank. As with salt storage to ensure brine is properly stored and not exposed to stormwater, routine inspections are conducted by facility personnel.

Liquid brine is stored in well maintained and labeled storage tanks. Because of the corrosive nature of these substances, routine maintenance must be performed on the storage tank fittings, valves and pumps to keep them in good working order.

Additionally, the storage structure itself should be checked for bulging, expansion, leaking or dripping and any findings should be corrected as soon as possible.

10. *Hired Snow Removal Contractors*

Baltimore County hires upwards of 214 supplemental contract equipment to support DPWT's workforce for any given winter event to maintain prescribed levels of service. Hired equipment must be equipped with well-maintained plows and spreaders to assure effective and efficient snow removal and salting operations.

Poorly equipped and maintained contract equipment can lead to excessive salt use.

Baltimore County DPWT inspects all hired equipment prior to the winter season with periodic inspections throughout individual events to ensure best practices are being followed. Along with this inspection our best salt practices are included within their contracts.

11. *Staff Training*

Baltimore County DPWT provides training in salt management to all employees on a yearly basis. The training focuses on best practices that stress the importance of using the least amount of material as possible to provide safe, passable roadways for the traveling public.

Frontline employees receive yearly training in the art of snow removal operations, effective winter storm management, winter materials management, storage of salt and other winter materials, pre / post events housekeeping, and needed data collection.

DPWT's training presentations are located at the end of this document.

12. *Public Education and Outreach*

The Baltimore County Department of Public Works and Transportation (DPWT) makes every effort to keep the public informed about its winter operations and activities during winter storms. It conducts media briefings to update local radio stations, television, and print media, as well as various social media outlets. For instance, DPWT may hold a briefing to emphasize the importance of safe driving during winter storms.

During major events, the Baltimore County Emergency Operations Center is activated to coordinate and communicate with various departments, local utilities, and the state of Maryland. It also provides live interviews with media representatives and updates events on social media to keep the public informed about the current status of operations and the overall condition of the roadways.

Baltimore County DPWT offers customer service for residents during and after winter storm events via telephone and the Internet. DPWT Highways and 311 staff respond directly to residents' needs in real-time on a localized basis. General questions about operations can be

addressed through the BaltCoGo mobile app, Baltimorecountymd.gov/stormfighter's "Report Now" feature, or by calling the Bureau of Highways at 410-887-3560.

DPWT also uses social media for outreach throughout the winter months to provide information on various activities, such as snow shoveling tips and advice on residential salt usage to minimize negative impacts from over-salting.

13. *Weather and Pavement Condition Forecast*

Weather and pavement condition forecasting is a key component of effective winter storm management. This is true 24 to 72 hours prior to a storm when planning is taking shape, during a storm, as forces react to changing conditions, and during post-storm operations when effective cleanup actions prevent potential safety issues.

DPWT relies on targeted forecasts from a weather consultant along with the national weather service, pavement condition forecasters, as well as partners at the Maryland State Highway Administration. for winter storm management.

While the national weather service provides a strategic forecast, alerting of the potential for storms well in advance of their arrival. As a storm nears, the national weather service does provide forecasts for approximate starting times and snowfall amounts over generalized areas of a state. Our consult report provides more enhanced localized, site specific, information.

DPWT contracted services not only forecast when snow will begin to fall and how much is anticipated to fall, but also forecast the anticipated pavement temperatures which play a large part in how much snow will actually accumulate on roadways.

14. *Pre-Storm Planning*

Pre-storm planning is done to effectively manage salt usage in a storm and a best practice in winter operations. Effective planning prior to storms will equate to better performance during a storm including more efficient usage of salt. Baltimore County’s pre-storm planning begins as early as 72 hours prior to any winter event.

DPWT begins resource planning well in advance of any forecasted winter event. This planning includes when anti-icing should be performed if appropriate for the storm. Personnel and hired contractors, if applicable, are told when to report to their assigned locations with enough lead time to thoroughly inspect plow trucks. This way all equipment reporting to winter event operations shows up in effective, working condition.

The DPWT Bureau of Highways holds a pre-storm meeting with management staff. These meetings provide managers with an opportunity to alert personnel about the latest weather and road forecasts, emphasize the need for effective plowing, reiterate the need for sensible salting, identify appropriate salt application rates, and recommend the use for additives such as salt brine.

It also allows for information exchange and a sharing of opportunities for improvement.

Additionally, our fleet manager meets with our Highways management to ensure appropriate support staff for the Bureau are available. The equipment is pre-positioned on its snow route prior to the start of the event.

Pre-positioned snow equipment speeds up the response time of the Bureau. This is particularly important if the forecasted start time of the storm could affect morning or evening rush hour traffic. If snow fighting equipment becomes trapped by traffic congestion, it might not be able to get to its snow route in an acceptable time.

15. *Post Storm Operations*

Post Storm Operations include a variety of tasks including cleaning equipment, cleaning inlets, spillage checks on snow routes, stockpile maintenance, and operation reviews.

The cleaning of snow plows and trucks occur immediately after operations are complete, when possible. These cleaning operations should occur inside the wash bays at a shop's facility.

Cleaning of salt spreaders and plow blades that have been removed from vehicles should occur in a manner whereby wastewater does not discharge into stormwater systems or onto the ground in accordance with our stormwater pollution prevention plan which outlines protocols, inspections, documentation and reporting requirements related to potential pollution sources as with our salt storage facilities.

16. *Winter Event Operations*

Once an event begins and precipitation starts to accumulate on roadway surfaces, agencies begin salting operations. If it is a typical winter storm which begins with light snowfall, a light coat of salt should be applied. For a winter storm beginning with moderate to heavy snowfall, applications should be adjusted accordingly.

The key is to get the material onto the roadway as early as possible to prevent snow or ice from bonding to the roadway surface. This will allow for effective plowing and lighter salt applications throughout the remainder of the storm.

As the storm continues, forces need to react to changing conditions. As the initial application of salt begins to lose effectiveness and snow continues to build on roadways, forces should begin plowing operations. If the initial application was successful, the buildup will be slushy and easy to remove with proper plowing techniques. The plow operator should reapply just enough salt to keep subsequent snowfall from bonding to the pavement. This process may have to be repeated multiple times during a winter storm.

If a winter storm is associated with very cold pavement temperatures, granular salt should not be applied until temperatures begin to rise. The DPWT considers varying the level of service provided to the traveling public during storms based on resource availability, type, and intensity of the storm, location, and time of day. For example, if a storm occurs during the overnight hours, some snow can build up on roadways. If it is not allowed to become snow-packed, the

roadway remains passable and is in a reasonably safe condition. In this case, less salt can be used than it would otherwise.

Conversely, if the same amount of snow falls on the same roadway prior to or during periods of heavy traffic, such as rush hour, more salting will be necessary to keep the road at a higher or the same level of service.

Severe winter events present specific challenges for a salt management plan. DPWT must be ready to enhance their response throughout the event, from pre-planning operations to final storm cleanup. They will be tasked with ensuring passable roadways, particularly for emergency response, while contending with heavy accumulations of snow, freezing rain, or blizzard conditions.

The DPWT Bureau of Highways has dealt with severe winter storms in recent years and has gained valuable insights from the process. During heavy snowstorms, DPWT focuses on plowing operations and minimizing salt usage. Plow trucks should still spread a small amount of salt to prevent snow from packing on the road, but the primary focus should be on continuous plowing.

As the storm winds down and most of the snow has been removed, an appropriate amount of salt will help remove the remaining frozen precipitation from the surface. Salt applications should always be as efficient as possible.

Freezing rain storms also pose unique challenges. If left untreated, freezing rain will coat roadways with ice, causing significant safety and mobility issues for motorists. The best approach is to apply salt at a reduced rate and re-apply as needed.

Winter events during rush hour traffic present significant challenges to effective salt management. It is crucial to place salt on roadways prior to heavy traffic, if possible, as once traffic builds up, plow and salt trucks cannot effectively address snow buildup.

Severe winter events, such as blizzards or back-to-back storms, create additional challenges to effective salt management. In these events, agencies may or may not apply salt, at a reduced rate, during each plow cycle to prevent snowpack or icepack. Rest breaks for employees are critical to ensure operators remain fresh and can make good decisions while plowing and salting, and for fleet staff to keep the equipment operational.

In some cases, the Governor may declare a State of Emergency, allowing the use of additional resources, such as the National Guard, and authorities have the option to limit the amount and type of vehicle travel. During a State of Emergency, Baltimore County prioritizes its roadways to focus on priority roadways, ensuring passable primary roadways for emergency equipment.

17. *Operations Review*

After every winter event, it's crucial to conduct a review of operations and salt management practices. Post-storm reviews should focus on three key elements: identifying what went well, what didn't work well, and most importantly, opportunities for improvement.

18. *Concussion*

This salt management best practice document undergoes regular updates to ensure it reflects the most current information. As more information becomes available, it will be added to the plan.

This resource is crucial for providing as much safety as possible to the traveling public in Baltimore County during winter storms in a cost-effective and environmentally sustainable manner.

19. ***Passable Roadway***

20. ***Sample of Resident Salt Reduction Tips***

21. ***Baltimore County DPWT Salt / Snow Management Training***

- BALTIMORE COUNTY AND IT'S EMPLOYEES HAVE A VITAL ROLE IN PROTECTING THE ENVIRONMENT. ONE WAY WE CAN ALL BE BETTER STEWARDS OF THE LAND IS BY HAVING A MORE SUSTAINABLE WINTER MAINTENANCE PROGRAM.
- I KNOW YOU'VE HEARD ABOUT SALT USAGE AND SOME MIGHT HAVE WONDERED WHY, SINCE SALT IS A NATURAL SUBSTANCE .
- THE TRUTH IS THAT SALT IS NATURAL BUT IN HIGH CONCENTRATIONS IT HAS A NEGATIVE IMPACT ON THE ENVIROMENT AND ACTUALLY CAN DESTROY LAND AND AQUATIC HABITATS AND SPECIES .
- ONE THING TO REMEMBER IS WHEN SALT MELTS IT CAN NOT BE RECOVERED. IT GETS ABSORBED INTO SOIL OR WATER WHICH CAN REACH HIGH LEVELS OF CONTAMINATION.
- THESE CONTAMINATED AREAS CAN EFFECT DRINKING WATERS, INHIBIT WILDLIFE HABITATS, AND INHIBIT THE ESTABLISHMENT OF VEGETATION OR CROPS.

- FOR US TO ACHIVE A SUSTAINABLE WINTER PROGRAM WE NEED TO IMPLEMENT A FEW BEST MANAGEMENT PRACTICES OR BMP'S IN THE USE AND HANDLING OF DE-ICING MATERIALS
- THESE BMP'S NOT ONLY DEFINE OUR WINTER MAINTENANCE ACTIVITIES BUT WILL SOON BE REQUIRED FOR BALTIMORE COUNTY TO CONTINUE TO HOLD VARIOUS STORM WATER PERMITS WHICH ARE ISSUED THROUGH THE MARYLAND DEPARTMENT OF THE ENVIRONMENT
- THE FOLLOWING PAGES COVER SOME BEST MANAGEMENT PRACTICES WHICH DEFINE OUR ROLE IN SALT MANAGEMENT ALONG WITH OUR WINTER MAINTENANCE DUTIES

STORAGE OF MATERIALS

SALT STORAGE

BALTIMORE COUNTY CARRIES OVER 90,000 TONS OF SALT ON HAND THROUGHOUT THE YEAR AT 17 DIFFERENT LOCATIONS

ALWAYS MAKE SURE WHEN SALT IS DELIVERED, ALL INLETS AND DRAINAGE STRUCTURES ARE PROTECTED AND THAT ALL SALT IS UNDER COVER BY THE DAY'S END

ONCE SALT HAS BEEN STORED YOU MUST MAKE SURE ALL EXCESS IS CLEANED OFF BY SWEEPING THE LOT.

LOADING OF A SALT DOME

FILL BOTH FRONT SIDES TOWARD THE DOME ENTRANCE

FILL BOTH SIDES AND THE REAR OF THE DOME

FILL THE CENTER AT AN EQUAL HEIGHT

BUILD A RAMP INSIDE THE DOME

REPEAT THIS OVER UNTIL YOU REACH THE DESIRED HEIGHT

REMEMBER TO ALWAYS KEEP THE SALT BELOW THE MAXIMUM SALT HEIGHT LINE

LOADING OF A SALT BARN

THE LOADING OF A BARN IS MORE STRAIGHT FORWARD THEN A DOME SINCE VERY LITTLE LOADER ARTICULATION IS NEEDED AND REQUIRES A LONGER RAMP WITH LESS INCLINE.

YOU STILL MUST BE MINDFUL NOT TO FILL THE BARN BEYOND THE MAXIMUM SALT HEIGHT LINE.

SAFETY FIRST…ALWAYS REMOVE SALT FROM THE ENTIRE FACE OF THE PILE…NEVER DIG A STRIAGHT NARROW PATH INTO A SALT PILE!

SALT BARN/DOME ENTRANCE

ALWAYS BLOCK THE ENTRANCE OF BARNS AND DOMES AFTER LOADING OR ANY EVENT.

THIS IS DONE BY THE USE OF ENVIRONMENTAL SLEEVES, SAND BERMS, OR HAY BALES TO PREVENT SALT FROM CONTAMINATING THE SURROUNDING ENVIRONMENT.

EVENT CALL OUTS

The Weatherdata Network

Monday Dec 30th 2019 1:00pm Forecast Meteorologists : ccca

Monday	6am-6pm	Cloudy – Light Rain/Drizzle
Mon Night	6pm-6am	Variable Cloudiness – Areas of Fog
Tuesday	6am-6pm	Fog 10 8am…. Variable Cloudiness – Some Breaks
Tues Night	6pm-6am	Partly Cloudy
Wednesday	6am-6pm	Partly Cloudy – Breezy

© WDN Copyright 2010	Monday 8am-4pm	Mon Night 4pm-8am	Tuesday 8am-4pm	Tues Night 4pm-8am	Wednesday 8am-4pm
Air Temp	Max: 54-56F	Min: 37-39F	Max: 48-51F	Min: 33-35F	Max: 45-47F
Pavement Temp	54F	41F	52F	35F	48F
Humidity %	86%	80%	86%	67%	65%
Wind Direction	W	W	SW	W	W
Wind Speed	10 mph	5 mph	12 mph	7 mph	13 mph
Wind Gusts			28 mph		24 mph
Precip Prob %	80%	0%	8%	0%	0%
Precip Type	See Above				
Precip Amount	.85 in				
Precip Begin					
Precip Change					
2" Accum By					
Precip End	3pm-5AF				
Visibility	1-10 mi	1 mi	1-10 mi	10 mi	10 mi

24/48hr Watches/Warnings/Advisories

*** None ***

Forecast Discussion

Low Pressure over the Great Lakes will lift into SE Canada today with the main core of moisture lifting north of Idaho County over the next 1-2hrs bringing an end to the rain. Weak pressure gradient tonight into Tues AM allows for light winds and with ground moisture on the high side from the past 2-the rainfall, look for patches of Fog restricting visibilities under 1 mile.

Dry with above normal temps to follow Tuesday-Thursday.

Next disturbance scheduled for Friday into Saturday with another rain maker

EXTENDED OUTLOOK

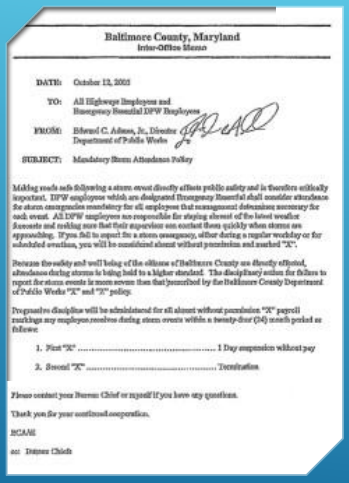
Day	Date	Weather	Max	Min
Thursday	01/02	Partly Cloudy	49F	36F
Friday	01/03	Cloudy - Rain	52F	40F
Saturday	01/04	Variable Cloudy - Breezy	54F	45F
Sunday	01/05	Partly Cloudy - Windy	45F	29F
Monday	01/06	Partly Cloudy - Snow Cold	42F	24F

Next Updated Forecast Will be Issued - Monday Dec 30th 2019 @ 5:00pm

MAKING THE CALL

BALTIMORE COUNTY HAS A SEPARATE WEATHER REPORTING SERVICE ON CONTRACT THAT IS SPECIFIC TO THE COUNTY. ALONG WITH THIS SERVICE THE LOCAL NEWS CHANNELS ARE MONITORED ALONG WITH STATE AND OTHER LOCAL JURISDICTIONS.

GENERALLY WE TRY AND CALL COUNTY FORCES IN AT A MINIMUM OF 2 HOURS BEFORE THE START OF ANY EVENT AND IF NEEDED CONTRACTORS WITHIN AN HOUR AFTER WE REPORT.



Baltimore County, Maryland
Inter-Office Memo

DATE: October 12, 2005

TO: All Highways Employees and Emergency Essential DPW Employees

FROM: Edward C. Adams, Jr., Director
Department of Public Works

SUBJECT: Mandatory Storm Attendance Policy

Making roads safe following a storm event directly affects public safety and is therefore critically important. DPW employees which are designated Emergency Essential shall consider attendance for storm emergencies mandatory for all employees that management determines necessary for each event. All DPW employees are responsible for staying abreast of the latest weather forecasts and making sure that their supervisor can contact them quickly when storms are approaching. If you fail to report for a storm emergency, either during a regular workday or for scheduled overtime, you will be considered absent without permission and marked "X".

Because the safety and well being of the citizens of Baltimore County are directly affected, attendance during storms is being held to a higher standard. The disciplinary action for failure to report for storm events is more severe than that prescribed by the Baltimore County Department of Public Works "X" and "Y" policy.

Progressive discipline will be administered for all absent without permission "X" payroll markings any employee receives during storm events within a twenty-four (24) month period as follows:

1. First "X" ..... 1 Day suspension without pay
2. Second "X" ..... Termination

Please contact your Bureau Chief or myself if you have any questions.

Thank you for your continued cooperation.

ECA/SE

cc: Bureau Chiefs

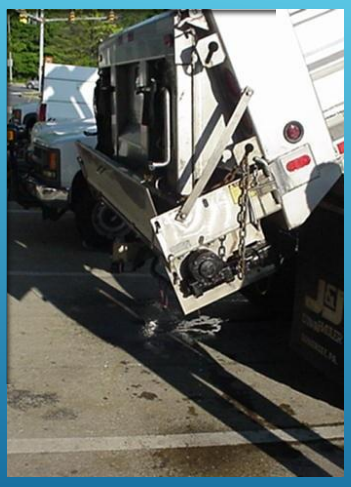
MANDATORY STORM ATTENDANCE

EVERYONE SHOULD KNOW THAT WHEN YOU WERE HIRED YOU ARE EMERGENCY ESSENTIAL AND WHEN NEEDED YOU MUST REPORT TO WORK. THE POLICY IS AVAILABLE SHOULD THIS EVER COME INTO QUESTION.

CALL OUT PHASES

- **Phase 1 -** (0 – 1 inch forecast or <0.1 inches of freezing precipitation) includes only County trucks, Utilities, BCPS trucks, and any additional drivers needed such as BCFD or any other agency to fill trucks. EM will provide skeleton crews at the Glen Arm and at satellite shops.
- **Phase 2 -** (1 – 3 inch forecast or 0.1 to 0.2 inches of freezing precipitation) includes Phase 1 trucks, personnel, and contract trucks which have a designated BC snow route.
- **Phase 3 -** (3 – 6 inch forecast or >0.2 inches of freezing precipitation) includes Phase 2 trucks, personnel, and additional contract trucks to supplement BC forces during heavier snowfalls. EM will be fully staffed and additional staff from fire maintenance.
- **Phase 4 -** (>6 inch forecast or major freezing precipitation) includes all Phase 3 trucks, personnel, and contract trucks and equipment needed to supplement BC forces as roadway conditions warrant. EM will be fully staffed along with fire maintenance.

SPREADING MATERIAL



SET YOUR TAILGATE

MAKE SURE YOUR TAILGATE CHAINS ARE PROPERLY SET. NOT ONLY WILL THIS PREVENT DAMAGE TO THE SALT SPREADER BUT WILL KEEP EXCESS MATERIAL FROM FALLING ONTO THE ROADWAY.

CHAINS SHOULD BE ADJUSTED SO THE TAILGATE IS NOT TOUCHING THE SPREADER LID.

CHECK YOU SPINNER

MAKE SURE YOUR SPINNER IS LEVEL AND PROPERLY ALIGNED WITH THE SPREADER OPENING

MAKE SURE YOUR TRUCK IS PROPERLY CALIBRATED

TRUCKS ARE TO BE CALIBRATED YEARLY TO ENSURE THE CORRECT AMOUNT OF MATERIAL IS BEING APPLIED.

THE FOLLOWING SLIDE EXPLAINS HOW TO CALIBRATE MOST OF OUR TRUCKS.

HOW TO CALIBRATE

- Determine what RPMs each truck operated at 20, 25, 30, and 35 MPH in DRIVE on level ground and record it.
- Load the truck with one scoop of salt and pull it into the shop after raising the body and shifting the load to rear of the truck. It is important to keep the auger box full during the test.
- Remove the salt spinner from the auger box leaving the hydraulic hoses attached. It is important to keep the spinner motor/assembly attached to the hydraulic system. It can affect the results otherwise.
- Place the scale and drum under the auger box. The operator would engage the auger and spinner with the control lever when signaled. The operator will hold the engine RPMs at the recorded engine speed for the MPH reading for each test.

CALIBRATION

THE FOLLOWING PAGES GIVE SOME GUIDANCE ON WHAT AMOUNT OF MATERIAL SHOULD BE USED DURING VARIOUS TYPES OF EVENTS

MODERATE / HEAVY SNOW

Temperature is 32 and rising:

- Monitor pavement temps closely
- Treat areas as needed on at 250 – 300 lbs. per mile
- Plow as needed

Temperature is 32 and dropping:

- Make initial round of salting at around 250 - 300 lbs. per lane mile. These rates should be increased when frequency of treatment can not be increased due to long operational cycles
- Do not apply salt onto heavy snow accumulation or packed snow
- Plow as needed

LIGHT SNOW

Temperature is 32 and rising:

- Monitor pavement temps closely
- Treat areas as needed on a low setting per mile

Temperature is 32 and dropping:

- Make initial round of salting at around 250 - 300 lbs. per lane mile.
- Plow as needed based on accumulation amounts

ICE / SLEET

Temperature is 32 and rising:

- Monitor pavement temps closely
- Treat areas as needed at 100 -200 lbs. per mile

Temperature is 32 and dropping:

- Make initial round of salting at around 250 - 300 lbs. per lane mile
- Re-salt areas as needed
- Plow if needed

DON'T OVERLOAD YOUR TRUCK!

A GOOD RULE OF THUMB IS NOT TO LOAD YOUR TRUCK ABOVE IT'S SIDE BOARDS.

OVER LOADING THE TRUCK ONLY CAUSES UNNESSECARY SPILLAGE OF MATERIALS

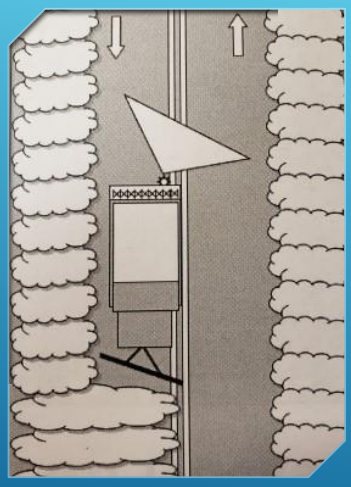
WHERE SHOULD THE SALT GO?

- FIRST THING TO REMEMBER IS SALT IS MEANT TO CREATE A BOND BETWEEN THE ROAD SURFACE AND THE SNOW SO THE INITIAL SALT APPLICATION SHOULD BE MADE AS SOON AS SNOW OR ICE BEGINS TO ACCUMULATE.
- SECOND IS SALT ISN'T EFFECTIVE UNTIL IT BEGINS TO MELT WHICH CREATES THE BRINE EFFECT WE'RE LOOKING FOR SO PLOWING CAN BE MORE EFFICIENT, THIRD IS THAT YOU NEED TO REMEMBER MOST OF OUR ROADS ARE BUILT WITH A CROWN IN THE MIDDLE WHICH KEEPS WATER FROM SITTING/PONDING.
- NOW THAT WE UNDERSTAND THESE 3 FACTS IT'S SAFE TO SAY WE DON'T NEED TO BLANKET THE ROADWAY FROM CURB TO CURB TO BE EFFECTIVE AND BY SIMPLY SALTING TOWARDS THE ROADWAY CENTER AT THE RECOMMENDED SETTING CAUSES THE DESIRED EFFECT.
- ALWAYS RETURN UNUSED SALT…NEVER SPREAD SALT JUST TO GET RID OF IT!

SOME MORE THINGS TO KNOW

- SALT LOSES IT'S EFFECTIVENESS AT TEMPERATURES BELOW 20 DEGREES.
- SALT STOPS WORKING ALTOGETHER AT MINUS 6 DEGREES.
- IF YOU ADD MORE SALT TO AN ALREADY SALTED ROADWAY IT WILL ACTUALLY CAUSE THE EXISTING BRINE SOLUTION TO FREEZE.

PLOWING

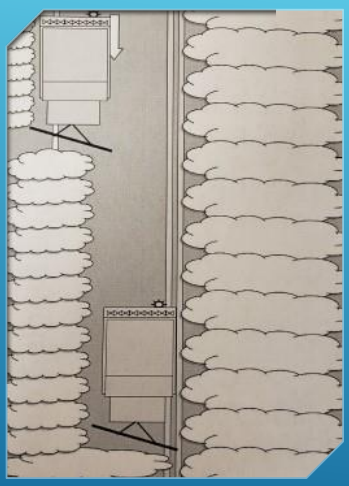


BASIC 2 LANE ROADWAY PLOWING

ONCE IT'S DETERMINED TO START PLOWING OPERATIONS;

START FROM THE CENTER LINE AND WORK YOUR WAY OVER…FROM ONE SIDE TO THE NEXT.

DURING YOUR LAST PASS YOU SHOULD BE SALTING BOTH LANES.



4 LANE ROADWAY PLOWING

AGAIN START FROM THE CENTER LINE AND WORK YOUR WAY OVER…FROM ONE SIDE TO THE NEXT.

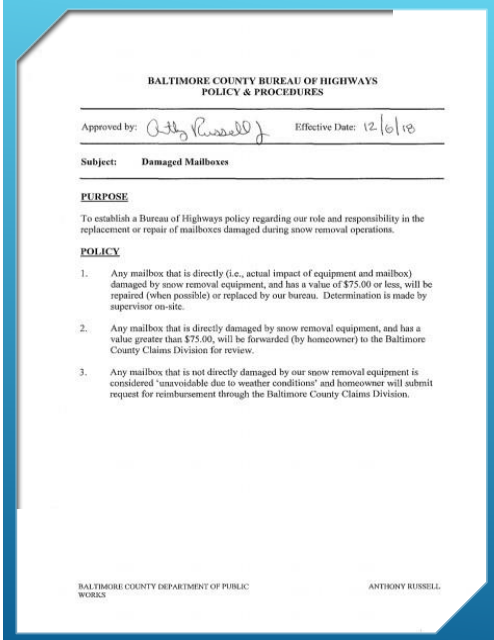
DURING YOUR LAST PASS YOU SHOULD BE SALTING TWO LANES.

HAZARDS TO ALWAYS BE MINDFUL OF:

- RAISED MANHOLE COVERS.
- STEEL PLATES. A LIST IS GENERATED WHEN ACCUMULATION IS PREDICTED AND GIVEN TO EACH SHOP.
- OVERHEAD OBSTRUCTIONS SUCH AS BRIDGES, TREES, WIRES, AND OF COURSE THE TRAVELING PUBLIC ESPECIALLY WHEN LIFTING THE BED TO REFILL THE SALT BOX.
- TRAFFIC CALMING DEVICES. LOTS OF THESE OUT THERE AND MOST HAVE OFFSET CURBS SO MAKE SURE YOU ARE FIMLAIR WITH WHAT'S ON YOUR SNOW ROUTE.

SOME TIPS AND TECHNIQUES:

- CHARTS AND PICS ARE GREAT BUT ROAD WIDTH ALONG WITH EVENT CONDITIONS WILL ULTIMATELY DETERMINE HOW MANY PASSES YOU'LL NEED TO MAKE.
- KEEP YOUR SPEED FAST ENOUGH TO REMOVE THE SNOW FROM THE ROADWAY BUT SLOW ENOUGH NOT TO CAUSE DAMAGE TO WHATEVER IT HITS. STAYING AROUND 20 MPH IS A GOOD RULE OF THUMB.
- LOWER SPEEDS WHEN PLOWING OVER BRIDGES
- WHEN PLOWING A LARGE ROADWAY WITH SEVERAL TRUCKS…PLOWS SHOULD OVERLAP NO LESS THAN 2 FEET AND THE DISTANCE BETWEEN TRUCKS SHOULD BE AROUND 100-150'.
- WATCH BACKING UP! DURING SNOW OPERATIONS THIS IS ONE OF THE MOST OFTEN BUT DANGEROUS THINGS WE DO SO BE MINDFUL OF POSSIBLE OBSTRUCTIONS ALONG YOUR ROUTE.
- EMPTY YOUR PLOW BEFORE CROSSING ANY INTERSECTION.
- TRY TO AVOID LARGE SNOW BANKS WHICH OBSTRUCT DRIVER SIGHT DISTANCES OR TRAFFIC SIGNS.



BALTIMORE COUNTY BUREAU OF HIGHWAYS
POLICY & PROCEDURES

Approved by: Anthony Russell Jr. Effective Date: 12/6/18

Subject: **Damaged Mailboxes**

PURPOSE

To establish a Bureau of Highways policy regarding our role and responsibility in the replacement or repair of mailboxes damaged during snow removal operations.

POLICY

1. Any mailbox that is directly (i.e., actual impact of equipment and mailbox) damaged by snow removal equipment, and has a value of $75.00 or less, will be repaired (when possible) or replaced by our bureau. Determination is made by supervisor on-site.
2. Any mailbox that is directly damaged by snow removal equipment, and has a value greater than $75.00, will be forwarded (by homeowner) to the Baltimore County Claims Division for review.
3. Any mailbox that is not directly damaged by our snow removal equipment is considered 'unavoidable due to weather conditions' and homeowner will submit request for reimbursement through the Baltimore County Claims Division.

BALTIMORE COUNTY DEPARTMENT OF PUBLIC WORKS

ANTHONY RUSSELL

DAMAGED MAILBOX POLICY

IF YOU NOTICE A MAILBOX HAS BEEN KNOCKED DOWN TAKE THE TIME TO WRITE DOWN THE ADDRESS

IF YOU HAVE AN ACCIDENT IN THE MIDDLE OF THE NIGHT AND THERE IS NO INJURY AND YOU CAN NOT LOCATE THE OWNER - REMEMBER:

1. CONTACT YOUR CREW CHIEF A.S.A.P.
2. LEAVE A WRITTEN NOTE WITH YOUR NAME, SHOP LOCATION, REGISTRATION NUMBER, AND YOUR SHOP CONTACT INFO.
3. MAKE SURE YOU ALSO NOTE THE EXTENT OF DAMAGE AND TAKE A PICTURE IF POSSIBLE.
4. FOLLOW THE NORMAL ACCIDENT POLICY AT THE END OF THE EVENT.

WE DO HAVE LAMINATED HANGERS WITH OUR INFO WHICH CREW CHIEFS SHOULD HAVE AVAILABLE

POST STORM MAINTENANCE

CHECK YOUR ROUTE

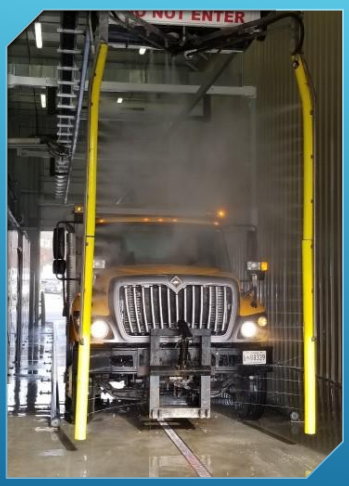
THE FOLLOWING DAY AFTER EACH EVENT YOU MUST RE-RIDE YOUR ASSIGNED SNOW ROUTE AND LOOK FOR ANY EXCESS MATERIAL WHICH NEEDS TO BE CLEANED UP.

CLEANING TRUCKS AND EQUIPMENT

AFTER EACH EVENT, TRUCKS AND EQUIPMENT MUST BE CLEANED OF ANY EXCESS MATERIAL.

ONCE THE EXCESS IS REMOVED THE TRUCK OR EQUIPMENT MUST BE THOROUGHLY WASHED WITHIN A WASH BAY.

BY USING A WASH BAY EQUIPPED WITH AN OIL/WATER SEPARATOR, THE INTRODUCTION OF SALT AND OTHER SEDIMENT ARE MINIMIZED



CLEANING TRUCKS

ALSO KEEP IN MIND THAT THE FULLERTON TRUCK WASH IS AVAILABLE BUT MAKE SURE THAT ALL BULK MATERIALS ARE REMOVED FIRST.

FLUID SYSTEM CHECK AND GREASING

AFTER WASHING YOUR TRUCK OR EQUIPMENT BE SURE TO RE-GREASE, REFILL, AND CHECK FOR ANY TYPE OF FLUID LEAK THAT MIGHT DISCHARGE ANY PETROLEUM BASED PRODUCTS ON TO THE ROADWAY OR YOUR SHOP LOT.

CONTRACTOR SUPPORT

WHAT TO KNOW:

- BALTIMORE COUNTY HAS OVER 6,700 LANE MILES WHICH WE ARE RESPONSIBLE FOR THE MAINTENANCE. WHICH IS BROKEN DOWN INTO 164 SNOW ROUTES.
- TO HELP SUPPORT THIS TASK BALTIMORE COUNTY CAN REACH OUT TO 317 CONTRACTED TRUCKS AND PIECES OF EQUIPMENT DURING ANY GIVEN EVENT.
- CONTRACTORS ARE HELD TO THE SAME HIGH STANDARDS AS COUNTY EMPLOYEES.
- THESE STANDARDS ARE WRITTEN WITHIN THEIR CONTRACT WITH BALTIMORE COUNTY ALONG WITH THE FOLLOWING POLICY.

BALTIMORE COUNTY, MARYLAND
CONTRACTOR SNOW POLICY
2018-19 SNOW SEASON

PLEASE NOTE THIS IMPORTANT INFORMATION:

All invoices for regular snow removal AND retainer bonuses must be submitted by **April 30, 2019**. There will be NO EXCEPTIONS TO THIS DEADLINE. RETAINERS WILL NOT BE PAID IF INVOICES ARE NOT RECEIVED BY THE DEADLINE.

A. Retainers – to qualify to receive the end-of-year retainer, the following guidelines must be met:

1. There is a fully-executed contract in place by November 1, 2018.
2. Equipment or equivalent replacement is available and reports for every snow event.
3. Contractor must perform to Baltimore County's satisfaction/expectations at each event.
4. **Invoices for retainer bonus must be submitted by April 30, 2019.**

B. County Employees performing maintenance on Contractor's equipment:

1. County Employees (mechanics) may work on Contractor-owned equipment if the District Superintendent determines that it would be beneficial to the snow removal operations in their respective area(s).
2. Only minor repairs will be considered for maintenance
3. Any cost for materials will be reimbursed to Baltimore County from the Contractor.
4. Down time of equipment will not be included in the total hours paid at the end of the event.
5. Significant or repeated down time may be cause for loss of year-end retainer
6. Bureau Chief of Highways will be notified ASAP by Superintendent of any Contractor-owned vehicle repairs.

C. Contractors using Baltimore County fuel:

1. The use of Baltimore County fuel is at the discretion of the District Superintendent.
2. County fuel will be used only if there is no other option to keep vehicle operations.
3. Any fuel used by the Contractor will be reimbursed to Baltimore County after the event.
4. When possible, the Bureau Chief of Highways should be notified prior to issuing fuel.

D. Travel Policy and Inspection:

1. Two hours will be paid per event for each piece of equipment used. The two hours will be added to the total time based on approved sign-in/sign-out log.
2. The two hours that are paid include: travel to and from shop, mobilization and demobilization.
3. Vehicle inspections performed in the fall prior to snow season must be completed by November 30, 2018. Inspections are paid at a rate of four (4) hours for each vehicle inspected.

E. Negotiated Items:

1. Any equipment that needs to be negotiated during an event must have terms documented in writing prior to beginning any work.
2. Any negotiated equipment must be authorized by the Bureau Chief of Highways or designee in writing.

F. Contractor Sign-in/Sign-out Forms:

Revised 12/7/2018

1. Each driver must sign-in on designated line prior to the onset of any operations on behalf of Baltimore County. At NO time is a driver to sign-in (or out) for another driver!
2. If an Emergency Contractor is called in and subcontractors are working for the Emergency Contractor, the subcontractor's employees must sign in indicating he is working with the Emergency (prime) contractor, NOT their full time employer. It is essential that we be able to connect the subcontract driver with the Emergency Contractor on the sign-in form.
3. Driver is to sign-out once operations are complete and all salt has been dumped from truck on same designated line.
4. District Superintendent or designee shall inspect each truck, confirm that all salt has been emptied from bed of vehicle and initial on the appropriate form line.
5. At no time is the Contractor authorized to "wash-out" vehicles/equipment within a Baltimore County-owned facility.

G. Invoices:

1. The contract requires that invoices be sent to the Office of Budget and Finance, Disbursements Section.
   a. You can your invoices via US mail and the address is: Baltimore County – Office of Budget and Finance, Disbursements Section, 400 Washington Avenue, Room 148, Towson, Md. 21204

   OR

   b. You can send your invoices via e mail to: Disbursement@baltimorecountymd.gov. If you e-mail you invoices, please be sure to put your company name in the Subject line of your e mail.

2. Payment terms for invoices is Net 30 days but sometimes we can pay them sooner. To facilitate timely payment:
   a. Contractors must use invoice numbers on any invoices submitted to the County. In case you have to contact us, this helps us identify the specific invoice you are calling about.
   b. Please indicate the Delivery Order number (shown as the **Order ID)** and Shop Number on your invoice.
   c. Equipment and/or truck type and dates of service must be on the invoice.

H. Insurance

1. Insurance verification must be obtained before Purchasing can send your Delivery Order authorizing you to provide Snow Removal Services for Baltimore County for the upcoming snow season that starts November 1, 2018. Please ask your agent to prepare the Acord form showing Baltimore County as the additionally insured. Acord forms may be e mailed to the Buyer, Dayle Deemer at ddeemer@baltimorecountymd.gov.

Additionally insured should be shown as follows:

Baltimore County, MD
400 Washington Ave.
Towson, MD 21204

2. In addition to your insurance verification (Acord form) sent by your agent, our Law Office is now requiring an endorsement from the insurance carrier showing Baltimore County as the additionally insured.

I. And last but not least, please review the information below regarding Salt Usage.

1. Practical Salt Usage:

a. It is important to know how much salt is needed to maintain the safety of the traveling public.
b. Remember that more is not better in this case, using too much salt can create more problems.
c. DO NOT allow the truck to be filled past capacity. This will cause the salt to spill into Baltimore County facilities and/or the roadways.
d. All trucks are to travel at a reasonable rate of speed to ensure proper application of the salt.
e. Salt loads should always be covered.
f. Drivers should only apply salt to roads that have not been previously salted unless otherwise directed by Baltimore County supervisors.
g. Drivers should only salt their assigned snow route, as directed by Baltimore County supervisors.
h. Make sure you and your drivers are following all directions of Baltimore County supervisors as to the amount of salt to be applied.

BRINE FACTS

- BALTIMORE COUNTY PURCHASED A BRINE MAKING MACHINE ALONG WITH SIX 1,000 GALLON SPRAY TANKS THAT SLIDE INTO THE BACK OF OUR TRUCKS.
- THESE SPRAY TANKS BRINE JUST OVER 600 MILES AND HOPEFULLY MORE WITHIN EACH DISTRICT OVER THE NEXT 5 YEARS.

OUR GOALS FOR THIS SEASON:

BETTER TRACK WHAT WE PUT OUT

STAY WITHIN THE INDUSTRY STANDARD OF 500 LBS PER LANE MILE OR LESS!