



Department of Transportation
Department of Environmental Conservation

Adirondack Road Salt Reduction Pilot Program Summary Report



August 30, 2024

This Pilot Summary Report has been prepared by the NYSDOT and NYSDEC as mandated by Chapter 313 of the Laws of 2020 (Randy Preston Road Salt Reduction Act). It presents the findings and results of the Adirondack Road Salt Reduction Pilot Program, including the identification of effective and ineffective techniques for winter road maintenance and revised levels of service in the Adirondack Park.

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Executive Summary

Background

The Adirondack Road Salt Reduction Task Force, which was established in 2020 by the Randy Preston Road Salt Reduction Act, submitted its initial report to the Governor and the Legislature in September of 2023. The Task Force was charged with conducting a comprehensive review of road salt contamination and roadway, parking lot, driveway, and sidewalk management best practices within the Adirondack Park. As required by the legislation, the Task Force Report contained a range of recommendations for potential operational enhancements for winter maintenance management programs.

While the Task Force's operational enhancement recommendations are encouraged for all winter maintenance practitioners (State, municipal, commercial, private), the legislation specifically charged the New York State Department of Transportation (NYSDOT) with developing a road salt pilot program for the Adirondack Park. It also charged the NYSDOT and New York State Department of Environmental Conservation (NYSDEC) with summarizing the findings of this pilot program in a report to the Governor and Legislature by August 30, 2024.

Pilot Plan and Findings

NYSDOT has been conducting salt reduction/salt management pilot projects within the Adirondack Park continuously since 2018. These pilots, which explore the use of existing best management practices, are located on Route 9N in Warren County and Route 86 in Essex County. An additional pilot project, which explores the use of salt brine in lieu of granular rock salt, has been in place on Route 5 in Herkimer County (just outside the Adirondack Park) since 2022. In support of the Task Force pilot recommendations, the NYSDOT continued its analysis of best management practices (BMPs) within these existing pilots. The Report recommended additional studies, so NYSDOT added another salt brine-only pilot. This new pilot is located on Route 9/9N/373 in Clinton County (within the Adirondack Park).

Control segments of roadway were identified near each pilot project to help assess the effectiveness of the pilots. Salt use and road surface conditions were compared between the pilot segments and adjacent control segments, with the goal of maintaining consistent road surface conditions and noting differences in salt usage. Safety is the prime directive for DOT snow and ice operations, so all pilot activities needed to be able to meet the level of service expectation of providing a safe and passable roadway.

The data shows that close management of snow & ice operations, paired with full utilization of industry-accepted best management practices, can realize salt reductions of 7% to 30% while still maintaining an appropriate level of service. The benefit of this winter maintenance management approach is that it primarily relies on existing technology and equipment, which means it can be expanded to larger areas with minimal investment. The development of additional training and technology/equipment enhancements will serve to further refine this management approach.

The utilization of a brine-only strategy (i.e. no use of granular road salt) has demonstrated the potential to realize salt reductions of 16% to 50% while still maintaining an appropriate level of service. The potential salt reductions for this approach are greater than those for traditional best management practices, but much more still needs to be learned about this practice before large scale implementation can be performed. Additional challenges associated with a brine-

only approach to winter maintenance management relate to essentially all aspects of operations – driver training, manager/supervisor training, facility infrastructure, equipment, and weather severity.

DEC Actions to Implement TF Report Recommendations

Following submission of the Task Force report to the Governor and Legislature in 2023, the NYSDEC began implementing programs to act on the recommendations of the Task Force. These programs include close collaboration between NYSDEC and NYSDOT to help reduce road salt applications while ensuring safe roads and a healthy environment. Recent examples of the work NYSDEC is engaged in, with support from NYSDOT, include expansion of Water Quality Improvement Project (WQIP) funding to support best management practices (BMPs) for road salt use and storage and initiating a review of water quality standards that may help reduce the impacts from road salt on the environment and public health. Both actions represent important progress toward implementation of the Task Force recommendations.

In May, 2024, NYSDEC made \$15 million in Clean Water Infrastructure Act funding available to support best management practices for road salt use and storage as part of the WQIP program, a competitive, statewide reimbursement grant program that supports implementation projects that directly improve water quality or habitat, promote flood risk reduction, restoration, enhanced flood and climate resiliency, or protect a drinking water source. Additional funding was also made available through NYSDEC's Non-Agricultural Nonpoint Source Planning Grant (NPG) focused on planning for BMP implementation by creating community-led winter road maintenance plans.

In addition to the funding opportunities, NYSDEC initiated a review of water quality standards that may help reduce the impacts from road salt on the environment and public health, such as that for chloride. NYSDEC is reviewing existing water quality standards regulations as part of its required Triennial Water Quality Standards Review under the Clean Water Act. As part of the Triennial Review, DEC recently released an Advanced Notice of Proposed Rule Making (ANPRM) to solicit public feedback on priority updates to water quality standards. The ANPRM provides a 180-day public input period as an opportunity to provide input on the need for new chloride standards, among others, building on the recommendations from the Task Force. Information gathered during the ANPRM public input period will assist NYSDEC in making recommendations for future rule makings which may result in changes to water quality standards and limits on pollutants in surface and groundwaters.

Leading into the Future

Building upon the successes of the ongoing Pilot Plan and to further its salt management capabilities, NYSDOT proposes to make further investments in its training programs, develop additional salt management policies, expand the use of all-liquid pilots to additional regions of the State, and further invest in its equipment and technology:

- NYSDOT currently has a very robust training program to support its winter maintenance operations, with a specific training program for supervisors/managers and a training/certification program for all snow & ice operators. Additional training modules will be developed for each of these programs to highlight the successes of this pilot plan and provide updated guidance on the benefits of brine use.
- In addition to enhancing training programs on the benefits of best management practices, NYSDOT is taking steps to strengthen its policies toward salt management. NYSDOT is currently developing an equipment calibration policy for salt spreading equipment and a salt use performance review policy for post-event reviews. Issuance of

these policies will ensure consistent statewide implementation of these best management practices.

- NYS DOT is expanding its use of all-liquids pilots to additional regions of the State. While this innovative approach to winter maintenance management has shown a high potential for salt reduction, it has also presented several challenges which are detailed later in this report. By expanding all liquids pilots to other areas of the State, it will allow the Department to better assess the challenges of wide-scale implementation and to develop an action plan for eliminating/mitigating them.
- NYS DOT made a significant investment in its plow truck technology in 2023 to support its commitment to improved salt management. The Department installed Samsara, which is a fleet management platform, in all of its heavy plow trucks. In addition to providing typical GPS information such as speed and location, this platform is able to provide real-time data regarding salt application rates and road conditions. Managers and supervisors can monitor salt applications in real time, plus through the use of an integrated forward-facing camera, they can observe roadway conditions and visually evaluate the effectiveness of those applications. This will result in enhanced salt management while helping to ensure roadway safety. Work with the vendor is ongoing to develop a means to transmit this information into the Department's maintenance management system (MMS), which will revolutionize salt management record-keeping in the industry.
- NYS DEC will continue to refine funding opportunities to ensure support for communities in implementing road salt reduction BMPs to improve water quality while maintaining safe roads, and improve road salt storage. NYS DEC will also continue to review the current science and impacts associated with road salt applications to determine the most effective and appropriate standards for the protection of water quality.

Purpose and Overview

In July of 2020, legislation was signed establishing the Adirondack Road Salt Reduction Task Force (Task Force). The legislation authorized the Task Force to complete a comprehensive review of road salt contamination and snow and ice removal best management practices on roadways, parking lots, driveways, and sidewalks within the Adirondack Park, and to provide recommendations to reduce salt usage and its impacts on human health and the environment, while giving due consideration to public safety and the safety of travelers in the Adirondacks.

The Task Force was co-chaired by the New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Transportation (NYSDOT), with representation by the New York State Department of Health (NYS DOH), Adirondack Park Agency (APA), and 10 additional Governor-appointed members. The appointed members represented various areas of expertise related to the understanding of environmental impacts, management, and the application of road salt. Academia, law, private industry, county and local governments, and environmental advocacy were represented on the Task Force.

The Task Force began its important work in January 2022 and submitted its final report to the Governor in September 2023. As required by the legislation, the Task Force Report contained a range of recommendations for potential operational enhancements for winter management programs. While these recommendations were encouraged for all winter maintenance practitioners (State, municipal, commercial, private), the legislation specifically charged the NYSDOT with developing a road salt pilot program for the Adirondack Park. It also charged the NYSDOT and NYSDEC with summarizing the findings of this pilot program in a report to the Governor and Legislature by August 30, 2024.

Description of Pilot Plan

Existing Pilots

NYSDOT has been conducting salt reduction/salt management pilot projects within the Adirondack Park continuously since 2018. The Task Force Report recommended these pilots be continued and incorporated into an overall Pilot Plan.

The existing Adirondack Park pilots, which explore the use of existing best management practices (BMPs), were initiated by NYSDOT as part of its response to the growing awareness and concern for the amount of road salt being applied to State roadways. The two original pilot segments, which were chosen because they exhibit an array of challenging terrain and experience significant winter weather, are as follows:

- **Route 9N BMP Pilot, Warren County:** This segment of Route 9N runs from the Village of Lake George northerly to Padanarum Road in the Town of Bolton. This segment of road is approximately 17 miles long (34 lane-miles) and runs along the western side of Lake George. This study was initiated in February of 2018 (the middle of the 2017-2018 snow & ice season).
- **Route 86 BMP Pilot, Essex County:** The segment of Route 86 selected for this pilot begins near Old Military Road in the Town of North Elba. It proceeds easterly through the Village of Lake Placid to the Hamlet of Wilmington. The study segment is approximately 16 miles long (32 lane-miles). This study was initiated at the beginning of the 2018-2019 snow & ice season.

These existing pilots leverage all of the current BMPs for snow & ice operations, and also evaluate the degree of salt reduction that can be implemented without negatively affecting roadway level of service. The best management practices being utilized within these pilots are:

- The use of brine for pre-storm anti-icing.
- The use of a plow truck with an innovative plow (2-stage plow or live-edge plow) in order to mechanically remove as much snow and ice from the pavement as possible.
- The use of treated salt, which is more effective at colder temperatures.
- The use of GPS (automatic vehicle locating equipment) that can track salt application rates.
- Closely monitoring salt use during events. Performing post-storm evaluations to review application rates and the performance of those rates.
- Leveraging other maintenance program areas (drainage, pavement, environmental) to see how they can be used to facilitate snow and ice operations, and subsequently reduce the dependence on road salt.

Another existing pilot project, which is located just outside the Adirondack Park, is also included in the Pilot Plan because it has demonstrated promising results and warrants further evaluation. This pilot has been in place on Route 5 in Herkimer County since 2021. It explores the exclusive use of salt brine in lieu of granular rock salt for snow and ice control. This all-brine strategy to snow & ice control is commonly referred to as Direct Liquid Application, or DLA. This existing DLA pilot performs snow & ice control similarly to a normal operation, except the plow truck applies liquid salt brine to the road surface instead of granular road salt.

- **Route 5 DLA Pilot, Herkimer County:** The segment of Route 5 selected for this pilot begins at the eastern city line for the City of Utica and proceeds easterly to the Village of

lition. The study segment consists of approximately 19 lane-miles of roadway. This study was initiated at the beginning of the 2021-2022 snow & ice season.

New Pilots

The Task Force Report recommended additional studies be performed within the Adirondack Park, so NYSDOT added the following pilots:

- **Route 9/9N/373 DLA Pilot, Clinton County:** This segment of Route 9N runs from Au Sable Forks northerly to Route 9 in Keeseville, and then along Route 9 to Route 373 in Ausable Chasm, and then along Route 373 to Port Kent. This segment of road is approximately 18 miles long (36 lane-miles) and runs along the Ausable River. This pilot is being performed as a DLA pilot.
- **Pre-Storm Brining Decision Log:** The use of brine for pre-storm anti-icing is an established best practice to prevent the bonding of ice or snow on the road surface. Brining is included as a BMP in NYSDOT's existing salt management pilots on Route 9N and Route 86. To address previous feedback from the local community suggesting these pilots may not be applying pre-storm brine to the extent they could, NYSDOT established a brining decision log feature to both of these BMP pilots. This pilot feature requires managers to maintain a log of the pre-storm brining that has occurred along this pilot, including documentation of the decision and rationale for not performing pre-storm brining for a given event.

Level of Service Considerations

This Pilot Summary Report has been prepared as prescribed by the Randy Preston Road Salt Reduction Act. In addition to a summary of effective and ineffective winter maintenance management techniques, the legislation also required this report to discuss revised levels of service for roadways within the Adirondack Park.

NYSDOT's winter maintenance operational goals (i.e. level of service) have been developed based on Section 12 of the NYS Highway Law, which states: "*The maintenance of state highways shall include the control of snow and ice...*". This section also states the Department shall "*provide reasonable passage and movement of vehicles over such highways.*" Further, Courts have held that the State has a non-delegable duty to maintain its roadways in a reasonably safe condition. Department engineers have interpreted this to mean that under normal snowfall conditions:

- There should be no more than 2" of snow on urban interstates; and no more than 2.5" of snow on all other roadways.
- There should be no snow or ice bonding to the pavement surface (hardpack).
- The wheel paths/centerline of the roadway should generally be clear.
- The travel lanes should be cleared of snow/ice within two hours from the end of the event.

NYSDOT's snow & ice operational guidelines are developed to support this legal requirement and to satisfy the operational goals outlined above. Given the statutory requirement to perform this duty and given the legislation's recommendation not to jeopardize the health and safety of the traveling public, NYSDOT is not proposing a reduced level of service for state highways in the Adirondack Park. In fact, the ability to satisfy these operational goals and maintain roadway safety is a critical performance indicator of the individual pilot projects within the overall Pilot Plan.

The state highways within the Adirondack Park must maintain a consistent level of service. These state highways are vital, as they connect communities, sustain commerce, support tourism, and allow for emergency response. State highways are generally the higher volume roadways in any region or area. It is worth noting that these operational goals apply only to the state highways that fall under the purview of the NYSDOT. Every municipality (county, town, village) with public roadways under its jurisdiction should have a set of operational goals to guide its winter maintenance operations.

Findings of Pilot Plan

Effective Techniques

To help assess the effectiveness of the individual pilot projects, control segments were established for each location. To the extent practical, the control segments contained similar roadway geometric characteristics, traffic volumes, and experienced similar weather patterns. Salt use and road surface conditions were compared between the pilot segments and adjacent control segments, with the goal of maintaining consistent road surface conditions and noting differences in salt usage. The ability to effectively satisfy the prescribed operational goals was a key performance indicator for each pilot.

From a public safety standpoint, pilot activities were temporarily curtailed in any location where it was determined or reasonably anticipated that the operational goals would not be consistently maintained during a specific event. Conditions that could cause a pilot to be temporarily paused would be severe cold, rain/freezing rain, or intense snowfall rates (2+ inches per hour).

The ongoing BMP pilot results demonstrate that close management of snow & ice operations, paired with maximum utilization of industry-accepted best management practices, can realize salt reductions of 7% to 30% while still maintaining an appropriate level of service. Specific results and observations from the individual BMP pilots are as follows:

BMP Pilots – Findings & Observations

- The **Route 9N BMP Pilot** results suggest average application rates were reduced 7% to 19%, depending on weather conditions.
- The **Route 86 BMP Pilot** results suggest average application rates were reduced 10% to 30%, depending on weather conditions.
- The ability to reduce application rates was heavily dependent on weather conditions, most notably the storm intensity, pavement & air temperatures, and precipitation type. The ability to reduce salt application rates appears to be indirectly related to weather intensity, with moderate/warm weather events yielding the greatest salt reduction results.
- Education and experience are critical for all staff in order to ensure success, but most notably with plow operators. The success of the pilots increased as operators gained experience with salt reduction practices and learned through first-hand experience that salt application rates can be reduced while still achieving good results.
- Empowering plow operators to be part of the decision-making process enhances buy-in and encourages reduced salt usage.
- The use of an innovative plow blade (live edge plow or 2-stage plow) was effective at maximizing the mechanical removal of snow and ice from the roadway, which subsequently allowed operators to reduce their application rates.
- Cold-spot/nuisance location management needs to be effectively incorporated into Summer Work Programs. The additional attention to salt applications in the BMP pilots has helped draw attention to nuisance locations – snow and ice managers need to look for summer work solutions to these issues and prioritize them accordingly.
- A BMP-focused approach to winter maintenance management primarily relies on existing technology and equipment. This means it can be expanded to larger areas with minimal investment. The development of additional training and

technology/equipment enhancements will serve to further refine this management approach and facilitate additional expansion.

The ongoing DLA pilot results demonstrate that close management of snow & ice operations, paired with the use of an all-brine strategy to applying salt in lieu of granular road salt, can realize salt reductions of 16% to 50% while still maintaining an appropriate level of service. Although the potential salt reductions for this approach are greater than those for traditional best management practices with granular salt, the associated challenges and risks have also proven to be greater. Specific results and observations from the individual DLA pilots are as follows:

DLA Pilots – Findings & Observations

- The **Route 5 DLA Pilot** results suggest salt application reductions of 40% to 50% can be achieved, based on weather conditions.
- The **Route 9/9N/373 DLA Pilot** results suggest salt application reductions of 16% to 50% can be achieved, based on weather conditions.
- Brine applications are much more sensitive to surface temperature conditions than granular rock salt. Although the effectiveness of granular road salt decreases with temperature, salt brine can have a detrimental re-freeze effect if applied at temperatures below 20 degrees Fahrenheit. Because of this concern, the **Route 9/9N/373 DLA Pilot** could be implemented only 1/3 of the time in the previous season. Temperatures on the **Route 5 DLA Pilot** were moderate enough to allow the pilot to be implemented nearly 100% of the time.
- Plow trucks need to be equipped differently when utilized for DLA. The traditional granular salt hopper and material spinner need to be removed, and a slide-in brine tank with spray bar is installed. It takes approximately 60 to 90 minutes to switch the DLA equipment back to granular operation (including calibration), which could be a significant vulnerability to operations in situations where conditions warrant switching back to granular salt.
- Brine storage capacities of the slide-in tanks used in NYSDOT's heavy plow trucks allow for only one DLA cycle to be performed before needing to be re-loaded with brine. Traditional granular salt trucks can complete two to three cycles before needing to be re-loaded. Further, re-loading a brine tank on a plow truck takes approximately 20 minutes compared to approximately 5 minutes with granular salt. The amount of lost time per cycle can be considerable for a DLA truck, based on how far the plow beat is from the re-load facility.
- A facility's need for a reliable brine supply and storage system is much greater with DLA plow beats compared to granular salt. Brine production, brine storage, and brine transfer/transport are all critical functions that can be easily interrupted with a frozen pipe or malfunctioning pump. Granular salt is ready for immediate use and does not need to be processed to be utilized.
- Bulk granular road salt, which is used to make salt brine, contains a small amount of naturally occurring impurities, which do not impact granular salt applications but are concentrated and collected in brine equipment during the brine making process. The need for increased brine production as a result of DLA plow beats results in more debris in brine equipment, which in turn results in additional downtime for cleaning. Alternative salt supplies (such as solar salt) that have fewer impurities are available but are incrementally more expensive and may potentially negate the cost savings of DLA.

- Similar to the BMP pilots, training for operators and supervisors is critical to ensure success of the DLA pilots. The use of DLA represents a significant change in philosophy, so breaching the educational component is critical to ensure buy-in.

The use of a **Pre-Storm Brining Decision Log** has been found to be an effective technique to ensure this best management practice is being adequately considered. The use of brine for pre-storm anti-icing is an established best practice to prevent the bonding of ice or snow on the road surface. It allows for the immediate formation of a brine layer on the road surface at the onset of precipitation. Applying brine in advance of a winter weather event isn't always appropriate, as factors such as residual salt levels, temperature and humidity, and leading rainfall may preclude its safe/effective usage. This additional pilot feature required managers to maintain a log of the pre-storm brining that occurred along the Route 9N BMP pilot and the Route 86 BMP pilot. In addition to identifying times when brine was applied, it also required documentation of the decisions not to perform pre-storm brining for a given event. This decision log was determined to be beneficial in ensuring brine was being properly considered in advance of winter weather events.

Ineffective Techniques

In addition to the BMPs listed previously, the **Route 86 BMP Pilot** also explored the use of abrasive mixes for snow & ice control. A short segment in the middle of the Route 86 BMP Pilot was designated as an 'abrasives segment' for the evaluation of sand-salt mixes. Two different abrasive mix ratios were evaluated in successive years. The first sand/salt mix evaluated was a 50/50 mix and the next mix evaluated was 90/10. A seasonal 45 MPH regulatory speed limit was established for the Route 86 abrasives section. Supervisors reported this segment of roadway experienced frequent level of service challenges during the abrasives pilot. It required additional cycles during and after many events, frequently experienced hardpack, and required many more hours to return to normal service at the end of events compared to its adjacent segments. As a result of this pilot not aligning with minimum operational goals, the abrasives evaluation segment was discontinued at the end of the 21/22 snow and ice season.

Additional Observations & Lessons Learned

- Staffing Levels Matter –To make up for shortages of plow drivers in some areas, NYSDOT will put supervisors in plow trucks to keep the necessary number of plow trucks on the road during winter weather events. These pilot studies have highlighted the importance of having adequate supervision to help ensure effective salt management.
- Smooth Pavement Matters – A portion of the roadway segment within the Route 9N BMP pilot received an asphalt overlay in 2021 and a portion of the roadway segment in the Route 86 BMP pilot received an overlay in 2020. Supervisors in those areas acknowledge that the recently overlaid sections of roadway are easier to plow, require less salt to maintain, and clean up much more easily at the end of the storm.
- Success is contagious - NYSDOT has identified an interesting trend in locations that participated in the pilot studies. Crews working on adjacent roadways, or even in adjoining jurisdictional areas, see the success of the pilot program and have begun to more closely manage salt usage themselves. Upon seeing the effectiveness of the DLA pilot on Route 5 in Herkimer County, management for NYSDOT's Hamilton County crews began working their own DLA plow beats. NYSDOT sees this as a great opportunity for managers and supervisors to share their successes and to build upon the momentum.

- To operate a heavy plow truck with a slide in brine tank, CDL operators require a tanker endorsement from DMV. In 2023 NYSDOT added the tanker endorsement to its equipment certification policy in order to help increase the pool of candidates that can operate these vehicles.
- The severity of winter weather plays a significant role in salt reduction potential, so reductions in salt usage due to enhanced usage of BMPs or through the use of a DLA program are going to vary from season to season.
- NYSDOT made a significant investment in its plow truck technology in 2023 to support its commitment to salt management. The Department installed Samsara, which is a fleet management platform, in all of its heavy plow trucks. In addition to providing typical GPS information such as speed and location, this platform is able to provide real-time data regarding salt application rates and road conditions. Managers and supervisors can monitor salt applications in real time, plus through the use of an integrated forward-facing camera, they can observe roadway conditions and visually evaluate the effectiveness of those applications. Supervisors have indicated that this real-time access to salt spread rate information has been beneficial to help effectively monitor application rates. The forward-facing cameras have helped validate roadway conditions during winter weather events and have helped provide enhanced situational awareness during other types of events impacting roadway conditions.

Moving Forward

NYSDOT understands that managing a robust and effective snow and ice program is a year-round endeavor, with the off-season response to snow and ice being just as important as the in-season response. NYSDOT and NYSDEC intends to build upon the momentum afforded by the Task Force Report and the successes of the Pilot Plan to further enhance salt management capabilities.

- NYSDOT currently has a very robust training program to support its winter maintenance operations, with a training program for supervisors/managers and a separate training/certification program for all snow & ice operators. Experience from the pilot plan has demonstrated that successful enhancements to a salt management program rely heavily on the training provided to the operators and supervisors that are performing the daily operations. NYSDOT will be developing additional training modules for its training programs to highlight the successes of the pilot plan and to provide updated guidance on the benefits of brine use. Building on the concept that success is contagious, NYSDOT will be incorporating the operators, supervisors and managers that have been successful in the pilot plan into its training so attendees can hear first-hand accounts.
- NYSDOT believes that sound policy supports sound operations and is taking numerous steps toward strengthening its policies and guidance regarding salt management. Issuance of the following policies will ensure consistent statewide implementation of these salt management practices:
 - NYSDOT is developing an equipment calibration policy for salt spreading equipment. Salt spreading equipment is currently calibrated at the beginning of the season and then on an ad hoc basis throughout the season. Understanding that salt cannot be effectively managed if it cannot be effectively measured, a policy will be in place for the upcoming snow and ice season that prescribes minimum testing/calibration requirements for its equipment.
 - NYSDOT will be issuing a salt use performance review policy for post-event reviews. The best time to review performance and identify opportunities for improvement is when the event is still fresh in one's mind. This policy will establish minimum requirements for post-event reviews for winter weather events, which will include salt usage and implementation of BMPs.
 - NYSDOT will issue brine decision log guidance. In addition to ensuring pre-storm anti-icing applications of brine will be considered for events, the log will also serve as a record of the decisions and rationale for not applying brine.
- For the upcoming snow and ice season NYSDOT will be expanding its use of all-liquids pilots (DLA) to additional regions of the State, including the Catskill Park. This innovative approach to winter maintenance management has shown a high potential for salt reduction, but it also presents several challenges relative to training, equipment, and operations. By expanding these DLA pilots to other areas of the State, it will allow the Department to better assess the challenges of wide-scale implementation and to develop an action plan for eliminating/mitigating them. Operators, supervisors, and managers who are part of these initial successful DLA pilots will be given the opportunity to serve as trainers and also serve in peer-to-peer exchanges.
- NYSDOT is continuing to work with its GPS vendor Samsara to develop a means to transmit salt spread rate information into the Department's maintenance management system (MMS), which will revolutionize salt management record-keeping in the industry.
- The need for effective salt management is not limited to state roadways, so NYSDOT and NYSDEC will continue to engage local municipalities and public works departments

to help educate and share best practices through the NYS Local Technical Assistance Program (LTAP). NYSDOT and NYSDEC will also engage academia, technology, advocacy groups, municipal organizations, and the snow and ice practitioner community to look for ways to further the conversation regarding salt management.

- NYSDEC, in collaboration with NYSDOT, will continue to refine its community funding opportunities targeting road salt reduction BMPs that improve water quality, maintain safe roads, and improve road salt storage. NYSDEC will also continue to review the current science to determine the most effective and appropriate water quality standards or guidance for the protection of water quality from road salt pollution.