

American Public Works Association

Excellence in Snow and Ice Control Award

Nomination Form & Supporting Data



THE VILLAGE OF
Buffalo Grove
ILLINOIS

Public Works Department

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Buffalo Grove, IL 60089
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February 1, 2016

Executive Summary

The Village of Buffalo Grove is a premier community located in the northern suburbs of Chicago, and is home to 41,761 residents. In 2014, Buffalo Grove was named one of the safest cities in America by NeighborhoodScout. Other recognitions included the Village being voted the #46 best community in the U.S. in which to live in by Money Magazine, and the only Illinois community to be included in the top 50. Buffalo Grove's ample green spaces, 800 acres of forest and parkland, more than 50 miles of walking and biking trails and two municipal golf courses were cited in the recognitions. The Village is home to the Siemens Industry's U.S. headquarters, and both Kraft Foods and CVS corporate offices are within a short drive.

The Village of Buffalo Grove Public Works Department became the 16th agency to receive APWA Accreditation in 2004, and has maintained this status ever since as an accredited agency through multiple reaccreditation processes.

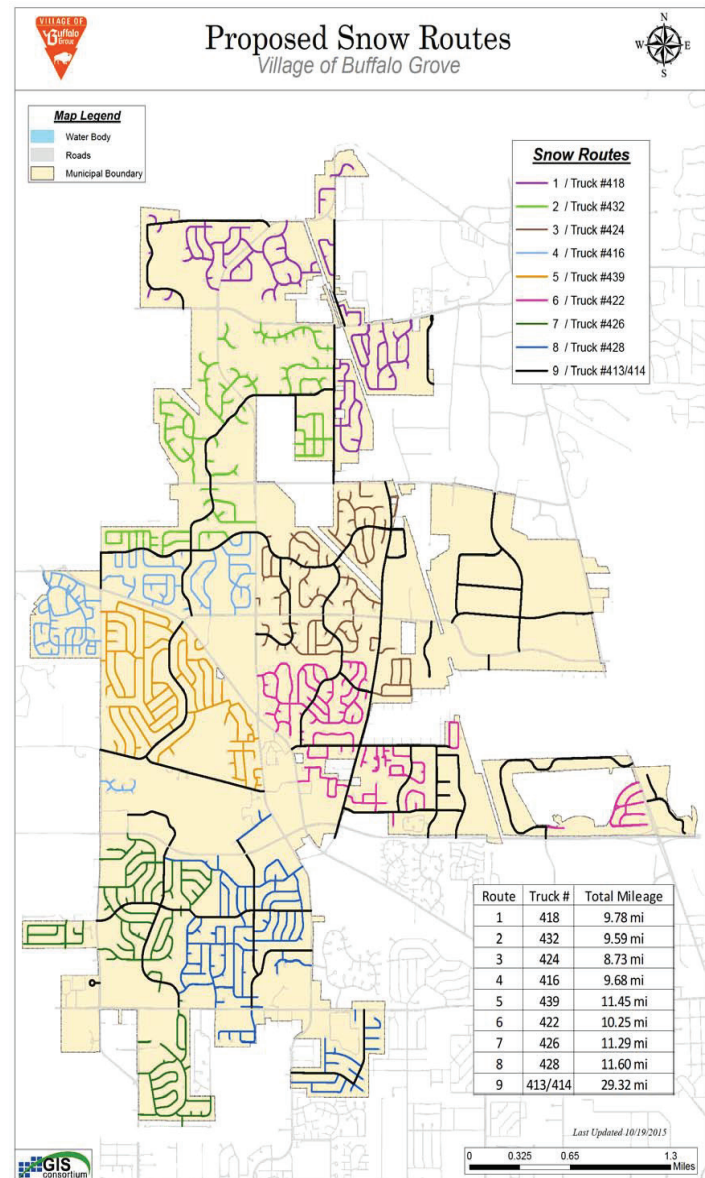
The Buffalo Grove Public Works Department consists of 50 full time employees, two part-time employees, seven seasonal employees and two contract employees. The Public Works Department provides a variety of basic services that maintain the infrastructure of streets and utilities for residents, and the many commuters traveling in and through Buffalo Grove. There are three primary areas of focus; Engineering, Utilities and Maintenance. These focus areas are supported by the following sections: 1) Street Section, 2) Forestry and Grounds Section, 3) Building Maintenance Section, 4) Central Garage Section, 5) Water Section, 6) Sewer and 7) Drainage Section and Engineering. All full-time employees support the Buffalo Grove winter maintenance plan in either a front line or back-up capacity.

The Village of Buffalo Grove is responsible for the winter maintenance on 114 center line miles of roads, requiring 522 plowing miles to effectively "curb" all streets. As Buffalo Grove is primarily a residential community, the Public Works Department is also responsible to complete winter maintenance activities on 369 cul de sacs. Winter maintenance activities are also completed on six municipal parking lots, and parking lot maintenance that services the mass transportation systems within the Village limits that include Pace Bus and the Metra Commuter Rail Station.

The Village of Buffalo Grove averages more than 38 inches of snow each year. The Public Works Department utilizes ten primary winter maintenance routes with dedicated snow plows, all with pre-wetting systems integrated into the truck for salt applications. These ten units are supported by ten back up plowing units depending on the severity of a given

snow event. Buffalo Grove also utilizes one front end loader with a box plow, two combination back hoe units with 2.5 yard buckets, two skid loaders with multiple attachments and an MT Trackless with multiple attachments for snow removal.

In 2015 Buffalo Grove constructed a new 82 ft. diameter / 3,700 ton capacity salt dome, replacing the 80 ft. diameter / 1,800 ton low profile dome structure for the storage of all road salt to increase the Village's ability to be prepared for any and all needs during a snow event. Annually, the Village of Buffalo Grove uses approximately 3,500 tons of road salt to complete winter maintenance activities. This is supported with a three tank, 18,000 gallon liquid storage farm that holds salt brine, concentrated beet juice product and a blend of materials targeted for an approaching snow event.

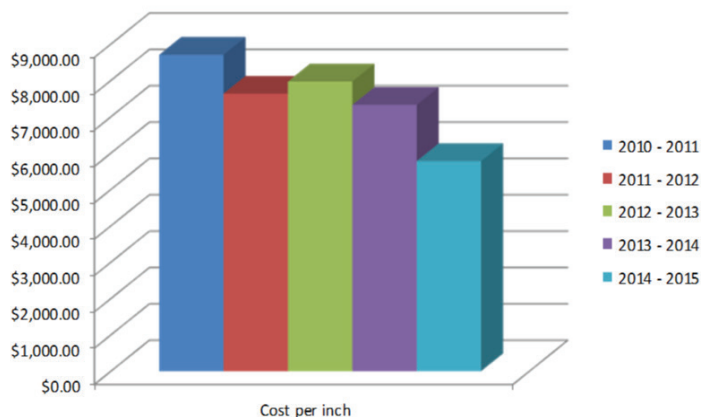


Introduction & History

Winter maintenance is a fundamental activity of the Buffalo Grove Public Works Department and our Management. Winter maintenance conducted by Public Works activity affects every resident and business in our community on an annual basis, and is the most highly visible function of the Public Works Department. As such, the Village of Buffalo Grove Public Works Department takes winter maintenance very seriously, and strives to continue to improve this service for our community on a yearly basis.

Since 1990, the Village of Buffalo Grove has consecutively received the “Excellence in Storage Award” and/or the “Safe & Sustainable Snowfighting Award” from the Salt Institute.

The Village of Buffalo Grove prepares an annual winter maintenance plan designed to provide efficient and timely snow and ice control measures to our community, our residents and to the motoring public proceeding in and around Buffalo Grove. The plan incorporates the needs of our community, the capabilities of our staff and equipment, and the expectations of all who are affected by our efforts. The goals of our plan includes the reduction of life threatening and injury producing conditions during a snow event, damage to property, interruption to commerce, and a limited environmental impact associated with winter maintenance activities.

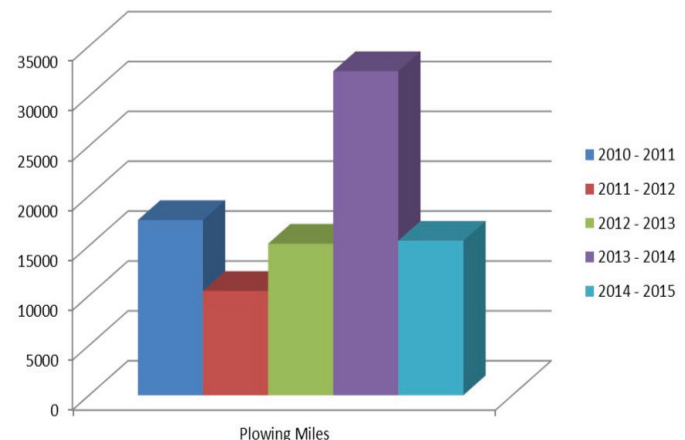
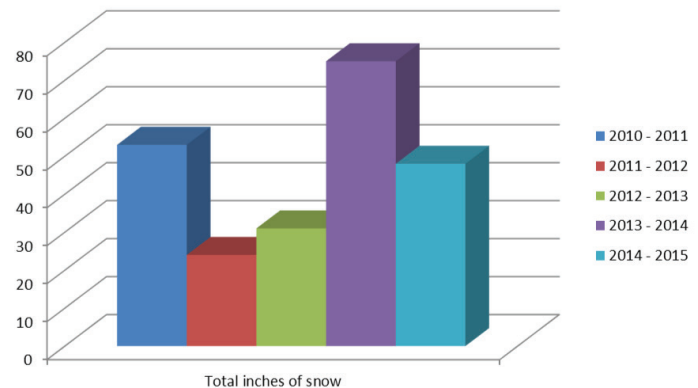
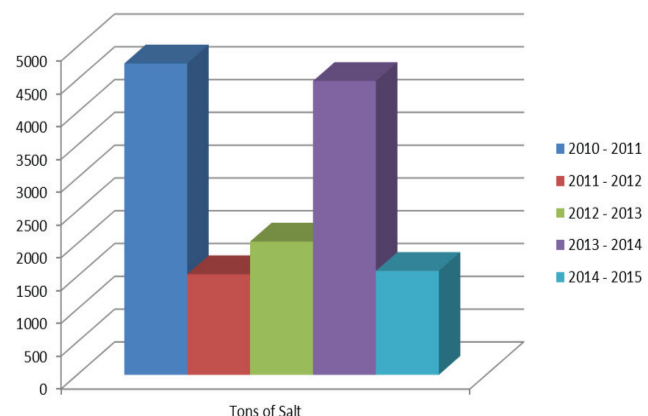


While the Public Works Department strives continuously to achieve higher levels of service to our community at the lowest possible cost. The pursuit of winter maintenance proficiency has always been, and will continue to be a goal of the department. For this reason, the winter maintenance plan is reviewed on an annual basis and targeted changes are made in pursuit of program efficiency.

Changes in technique, technology, staffing, equipment, expectations overtime requires our department leaders to take a fresh look at our approach. Despite our program

success over the years, the Buffalo Grove Public Works Department revised the Village's plan in 2014 – 2015 to achieve the highest level of service possible. The new plan was created and assembled by a team comprised of veteran snow fighters, and Public Works management with an overarching goal to best serve the needs of our community, improve program efficiency, utilize existing and emerging technologies, and demonstrate environmental sensitivity.

The following supportive information outlines the new winter maintenance program, and compares it to the previous program. This information will explain the question of “why” our program was revised and improved, and demonstrate our progression as an agency working towards the highest level of winter maintenance possible.



Materials / Handling

The Village of Buffalo Grove Public Works Department has an 82 ft. diameter salt dome which was constructed and finished in 2015 by Dome Corp of America. This dome nearly doubles previous storage capacity with a design capacity of 3,700 tons and better equips the Public Works Department to have amply salt supplies for any snow event. Two thirds of the dome is surrounded by grass and trees that shield the view from the frontage street, while one third is surrounded by asphalt and a concrete pad in front of the dome entrance. During winter maintenance activities, road salt is loaded into trucks in front of the dome entrance. When all trucks have been loaded, any road salt that has spilled onto the concrete or asphalt is pushed back into the dome. Following every salt loading event, staff utilizes a high speed mechanical broom to finish any salt or salt residue cleanup. This is done to preserve the maximum amount of road salt for future use, and to prevent any unnecessary salt from entering into the storm sewer system.

The Village of Buffalo Grove Public Works Department utilizes three (3) liquid storage tanks for winter maintenance. Tank #1 is an 8,000 gallon chemically resistant tank that is designated for a concentrated product that blends beet juice, and various chlorides. This product is purchased in its concentrated form from a distributor in Ohio and shipped in bulk to our location. Tank #2 is a 5,000 gallon chemically resistant tank that is designated for salt brine that is made by our staff. Tank #3 is a 5,000 gallon chemically resistant tank designated for a blend of products from tanks #1 & #2. This liquid de-icer/anti-icer is a targeted blend based on pavement temperatures, air temperatures, and anticipated precipitation and quantity of precipitation.

“The ability to target our liquid response to a specific event allows us to reduce the quantity of road salt applied during an event, without sacrificing the quality of our roads or the expectation of our community. In turn this provides an overall program cost savings as we use the minimum amount of materials during a given event.”

The previous winter maintenance plan incorporated only the use of liquid calcium chloride, which was applied in the same concentration and the same quantity during every event.

The Village of Buffalo Grove performs all vehicle maintenance including the post snow event washing of all equipment inside our Public Service Center. This facility has a series of floor drains that capture any and all soap, salt, chemical and water run-off during cleaning procedures. The drainage system of the facility flows through a triple catch basin within the structure before any flow exits to the sanitary

sewer system. All equipment is cleaned after each use in this manner prior to going through a visual examination and post trip inspection by Public Works staff. This process remains the same in comparison with the previous plan.

The Village of Buffalo Grove Public Works Department has received the Excellence in Storage and/or Safe & Sustainable Snowfighting award since 1990.



Equipment

The Village of Buffalo Grove Public Works Department utilizes ten primary plow units for snow removal on Village streets. Two of these units are new for 2015 – 2016 and are outfitted to maximize efficiency. These two units are single rear axle 5-Ton dump trucks fitted with 12 ft. nose blades, 10 ft. wing blades and twin 150 gallon liquid tanks. These two units are responsible for winter maintenance on the 33 center line miles of Village streets that are 32 ft. in width. The combination of the nose plow and wing plow allows staff to curb these streets with a single pass in each direction. The remaining eight primary units are single rear axle 5-Ton dump trucks fitted with single 100 gallon liquid tanks, 11 ft. nose blades & 10 ft. undercarriage scraper blades.

These eight units will be responsible for winter maintenance on the remaining 81 center line miles of Village streets that are 26 ft. in width. These units are capable of curbing their assigned streets with two passes in each direction. Furthermore, these eight units are capable of clearing snow from cul de sacs utilizing both the front nose blade and undercarriage blade. Traveling around cul de sacs clockwise and moving from the outer curb towards the inner curb, staff is successfully able to pull snow away from driveway aprons and deposit the snow on the island of the cul de sac. This function addresses years of expressed disappointment from our residents living in cul de sacs who disliked the large deposits of snow left at the foot of their driveways from traditional plowing moving from the inside out.



The primary plow fleet is supported by ten back up plow units comprised of 1-Ton to 1.5-Ton pick up & dump trucks fitted with nose plows. These units serve as back up units if a primary unit suffers a break down, and allows us to continue winter maintenance activities on every designated route until such time that the primary unit can be repaired. In the event of a large snow event, or snow event that continues for a long

duration these units are deployed as support vehicles to the primary fleet and assist in the designated routes.



Both primary and secondary units assigned to winter maintenance are calibrated prior to the beginning of the winter maintenance season. All units receive periodic recalibration during the season, and quantities of used material are compared following every storm event looking for any calibration issues. Any unit that appears to be using more material than the average is pulled aside and goes through the recalibration process again prior to going back into winter maintenance service.

The Village of Buffalo Grove also utilizes a variety of heavy equipment for winter maintenance activities, including front end loaders, skid loaders and MT Trackless. These pieces of equipment are fitted with front end attachments specific to their function. Attachments include snow boxes, snow blades, snow brooms and snow blowers. Activities for these pieces of equipment include parking lot snow removal, snow loading, sidewalk snow removal and pushing back heavy drifting.



Equipment

During the winter maintenance season of 2014 – 2015 the Village of Buffalo Grove purchased a salt brine maker. The unit is capable of producing approximately 800 gallons of salt brine every 15 – 20 minutes. Once a batch of salt brine has been mixed and tested for content the material is pumped from the brine maker directly into the salt brine storage tank, and a new batch is started. The ability to make our own salt brine has allowed the Public Works Department to effectively implement an anti-icing program.



During the 2014 – 2015 winter maintenance season Public Works staff repurposed a 300 gallon agricultural sprayer and retrofitted it to perform anti-icing. Given the limited capacity of the unit, staff identified specific “test zones” for anti-icing activities which were monitored during snow events. Based on the conditions of the forecasted snow event, staff blended anti-icing liquid and applied it in these areas. Without exception, the areas that were treated with the anti-icing materials took longer to cover over with new snow during a snow event, and prevented any bonding of the snow to the pavement. For the winter of 2015 – 2016, Buffalo Grove is expanding our anti-icing program to include all Buffalo Grove maintained streets and cul de sacs.



The Village of Buffalo Grove has purchased two anti-icing systems that have been fitted to our 5-Ton truck fleet. Unit 1 is a 1,300 gallon tank sprayer, and Unit 2 is a 1,030 tank sprayer. The first unit is fitted with a three lane spray bar, the second unit is fitted with a two lane spray bar, and each unit is equipped with a designated control valve. Both units are fully integrated into the existing cab control systems, allowing for targeted (speed sensitive) application rates on all Village streets.

All winter maintenance equipment goes through a rigorous pre-season inspection completed by our Street Maintenance & Fleet Maintenance staff. Winter maintenance equipment goes through the same post-season inspection program following the completion of the winter season. During these inspections, any/all maintenance needs are addressed. All winter maintenance equipment is stored inside the Public Service Center year round, and is not exposed to the weather except when in use.



Following every storm event, all winter maintenance equipment is washed and inspected for wear, damage, or problems and any issues identified are addressed immediately by staff. It is because of our attention to equipment maintenance that our winter maintenance fleet has a lifespan that far surpasses the average for our industry. The Village of Buffalo Grove averages between a 14 – 20 year service life for our primary plow fleet, with these units providing other necessary Public Works services during the off season.

The equipment replacements and changes are the direct result of our new winter maintenance plan. “Wing” trucks were not part of the old winter maintenance plan, but will drastically reduce the cycle times curbing these primary neighborhood

Equipment

streets, allowing the pre-existing fleet to perform interior neighborhood snow removal including cul de sacs.

The purchase of an MT Trackless machine for the 2014-2015 season reduced cycle time for sidewalk snow removal from approximately 40 man hours to 16 man hours. The ability to remove snow from all designated sidewalks in a shorter time frame provides great benefit to our community, and residents who utilize sidewalks during winter.



Not only does this save money over the course of a winter season, but it also represents a focus on our environment because we are using only what is necessary during an event. The cost of liquid de-icer is also now reduced, so staff can apply a greater quantity of liquids, and reduce the application rate of road salt. In addition to saving money, these steps produce an enhanced environmentally friendly approach to winter maintenance.



Documented results (final year of 2013-2014 plan vs. year 1 of 2014-2015 new plan)					
Winter Season	Storm Event	Snow Total	Road Salt Used	Liquids Used	Material Costs
2013-2014	#20	32.25"	2,052.5 tons	23,385 gals	\$135,571.75
2013-2014	#28	46.75"	2,716.5 tons	32,200 gals	\$180,260.00
2014-2015	#20	48.00"	1,680.5 tons	32,055 gals	\$118,998.64

The addition of a salt brine maker for the 2014-2015 season, combined with additional storage tanks and a blending pump station has opened new doors for our staff in our winter maintenance efforts. Our ability to blend liquids allows us to dilute the concentrated product we purchase with salt brine, and apply a targeted mix equal to the conditions of the storm event.



These new purchases have served not only to reduce costs, but also to improve overall efficiencies in our new winter program.

As we compare these two winter seasons, the benefits of the new winter maintenance plan are self evident. If we compare the storm events alone, we were able to address 15"+ of additional snow, while reducing our material costs by more than \$17,000.

If we compare the total accumulated snow, we were able to address the relative same quantity while reducing our material costs by more than \$61,000. By increasing our liquid application rate from approximately 10 gallons per ton to 20 gallons per ton, we were able to reduce the application rate of road salt without compromising the quality of our road conditions, or the expectations of our community. The success of our first year has paved the way for our expansion of this program in year two.

Training

In-house winter maintenance training for staff takes place during the second half of the month of October, and lasts approximately one week. A training schedule is provided to all of the Section Managers, informing them of the training schedule for their respective employees. Each employee receives a copy of the updated winter maintenance plan, and is given time to review the plan and email questions to the Street Manager or Superintendent of Maintenance prior to the week of training. These questions are incorporated into the training, and answered for all employees.

As part of our new winter maintenance plan, the training schedule is broken down according to the assigned routes and/or winter maintenance duties. It is specifically designed so that each training session is unique to the route assignment, equipment assignment and driver assignment. Working with small groups on specific assignments allows individual questions and needs of the employees. Now in our second season of our new plan, this approach has served to substantially increase overall efficiency.

During a typical training day, staff is lead through the specifics of the winter maintenance plan. Employees are trained on the specific route and equipment assignments they will be working in during the winter maintenance season, as well as the overall function of the program.

Great emphasis is given to route efficiency, and staff reviews detailed maps outlining their assigned routes and discusses efficient route progression to minimize the cycle times completing their route assignment. When the classroom portion of training has been completed, staff moves to the equipment garage for the same detailed hands-on training of the assigned primary plow units. Employees are coached through all of the system controls, calibration settings, and general equipment controls for their assigned duties. Following classroom training and equipment training, all primary winter maintenance drivers perform pre-trip inspections on their assigned units and drive their complete route as a team. Drivers take notes on any route conditions that need special attention or pose potential problems.

At the conclusion of the training week, and individual training sessions, the Public Works Department gathered as a collective group to share and discuss any lingering questions. During this time, staff watches winter maintenance and related equipment maintenance videos. The Maintenance Superintendent and Street Section Manager review all related paperwork and necessary documentation with staff, and answer related questions.

As a result of this meeting, any employee that requires additional training, equipment or route familiarity, or those with general questions regarding the winter maintenance plan work one-on-one with the Street Section Manager so that they are ready for the winter maintenance season.



In addition to the in-house training that is completed each year, in 2015 the Buffalo Grove Public Works Department sent all of our front line winter maintenance staff to the Northeastern Illinois Public Safety Training Academy (NIPSTA) for “snow removal driver training”. This training program addressed the safe and efficient management of snow removal. This comprehensive program included both classroom and hands-on driver training in plowing simulators. Prior to the training schedule, a NIPSTA program coordinator conducted a site visit to Buffalo Grove to review applicable equipment, standing municipal procedures and review our winter maintenance plan with the Street Section Manager. The Street Section Manager also conducted a site visit at NIPSTA to assure that the scheduled training would provide significant benefit to our staff and meet the training expectations of our agency.



Training



APWA SNOW CONFERENCE

At various times throughout the year, selected staff is also sent to a variety of winter maintenance trainings and workshops. Over the past two years the Village of Buffalo Grove has sent six employees to the APWA Show for Snow in 2014 and completed the effective winter maintenance supervisor training and certification. Over the past six years, the Village of Buffalo Grove has sent more than 50 percent of our front line staff to the annual Lake County Division of Transportation Sensible Salting training and workshops.



Following every plowable snow event, senior winter maintenance staff, along with Public Works management, meet to discuss the storm event and effectiveness of the plan. Program efficiencies are measured against our expectations in an effort to achieve maximum overall program proficiency.

The main difference and improvement from the previous plan compared to the new plan is the length of time devoted to training of operators relative to their specific route and the equipment used on the route. This focus has served to virtually eliminate inconsistencies so that operators are able to master and know specifically how the plowing is to be completed successfully under the new plan.



The change in how we perform our winter maintenance training has proven to be a huge benefit. Not only was this training necessary due to the new winter maintenance plan, but also necessary to improve our individual and overall success. This “personal” training that is targeted to the specific routes, equipment and employees has helped us standardize how maintenance is performed. Gathering in small groups for training makes the training intimate and personal. The intimacy allows us to “coach” exactly how we want routes driven, plowed, and maintained. Furthermore, by providing this detailed and specific training, we have created a culture of total accountability within our staff. Since everyone is expected to perform the same work, the same amount of work and in the same way, we are now able to assess all routes in a uniformed fashion. This has allowed us to develop cycle times for each route, and establish standardized expectations for the quality of work completed by the Public Works Department.



Efficiency

The Buffalo Grove Public Works Department winter maintenance plan is designed to maximize overall efficiency, and provide a consistent response to storm events regardless of the quantity of snow, or duration of the event.

The winter maintenance plan includes two primary crews of employees. Each crew is responsible for a 12 hour shift each day. Both crews are staffed equally, providing consistent coverage to the designated routes.

Crew #1	12:00 am - 12:00 pm
Crew #2	12:00 pm - 12:00 am

By providing a 24-hour consistent staffing response level, the peaks and valleys in road conditions that can sometimes develop have been eliminated as they were when staffing was inconsistent throughout a given storm event. As winter storm events already include a host of variables that are outside of our control, providing a consistent response level of staff and equipment eliminates a variable that is now under our control. Establishing 12- hour shifts for our staff provides sufficient down time for all staff members to take personal time for themselves, prior to returning to work for their next assigned shift. As staff is aware of their assigned call back window, they are able to prepare in advance for approaching storm events and an inevitable call out for winter maintenance.

The previous winter maintenance plan provided a 16-hour shift with all plow units on the street, followed by an 8-hour shift with minimal staffing on the street. Our observations were that all that was gained during the 16-hour shift was lost during the 8-hour shift. Additionally, the driving conditions on our streets throughout our community experienced peaks and valleys during these minimally staffed shifts, and the conditions of roads changed dramatically. Residents and motorists experienced very different driving conditions during alternate periods of the storm events. The previous winter maintenance plan did not include a call out window for staff, which created conditions where staff was unable to receive adequate rest prior to, or following winter maintenance activities.

Front line winter maintenance staff is assigned to only one winter maintenance route. Regardless of the storm conditions and regardless of the response activity (salting and/or plowing) staff is assigned to their one route. As conditions of the storm event change, staff simply changes the response

level. This allows staff to move from salting activities to plowing activities mid-stream during their assigned routes. This fluidity keeps all units on the street in their assigned routes for the duration of a storm event, without the need to change routes, equipment, or even progression through their routes. As the 12-hour shift ends, drivers communicate the condition and status of their routes, and what the response level is. Since drivers proceed through their routes in the exact same way, drivers coming off shift can quickly and competently communicate where the replacement driver should start. This greatly reduces the down time during shift changes, and gets the primary plow fleet back on the street in the shortest time possible. The addition of the GPS mapping system allows management to view route maps online, denoting what has been completed, and what is remaining to be completed in the assigned routes.

As winter maintenance route assignments remain consistent, the employees assigned to them become much more familiar with them. As route familiarity grows, so do route efficiencies. This effort is to eliminate one of the variables that is in our control, in an effort to improve productivity and the overall program success.

The previous winter maintenance plan was comprised of 20 designated plow units, which included ten 5-Ton units and ten 1-Ton dump trucks and pickup trucks. The larger units were designated to plow main streets within our community while the small units were primarily designated to plow cul de sacs. Staff members were assigned to salt routes that did not match up with plowing routes. Many staff members were assigned to salt units that were not their plow units. During response level changes, staff would often need to come back to the Public Service Center and get into another plowing unit, before proceeding into their assigned plow route.

In all cases, plow routes and salt routes were different and drivers would need to basically start over during response level changes. This resulted in substantial down time during response level changes, and additional peaks and valleys of road conditions. Furthermore, staff members had to become familiar with multiple winter maintenance routes, and multiple pieces of equipment to perform their assigned activities. Although seasoned employees did not struggle very much with this, new or relatively unexperienced employees did, and the results manifested themselves in decreased efficiency.

In addition to decreased efficiency, a culture without accountability was also created. Staff would perform winter maintenance in one area of the community, and then leave

Efficiency

that area to perform maintenance in another portion of the community as our response level escalated. Despite the commitment of our staff, often they would be working hard to clear an area that would then be given to someone else to continue and finish. The changes now implemented in the new plan have proven to eliminate these flaws.

As part of the new winter maintenance plan, staff is expected to perform snow removal on all streets assigned to their routes. This includes the snow removal of all cul de sacs assigned to their routes. Five-ton plow units equipped with fixed undercarriage plow blades proceed through their cul de sacs in a clockwise rotation, pulling snow from the outer curb and depositing it on the center island or along the inner curb. Cul de sac snow removal is completed simultaneously along with street snow removal as staff proceeds through

their routes. By doing this, we have effectively eliminated one of the largest concerns of our residents, who for many years voiced their objections to the large deposits of snow at the base of their driveway aprons.

The previous winter maintenance plan provided small, 1.0 to 1.5-ton plow units to come behind the primary plow fleet and clean up cul de sacs including plow passes along the bottom of the driveway aprons, in an effort to remove the deposits of snow. This effort did address the concerns of the residents, however it required a great deal of additional man-power, equipment and time. Additional costs related to these activities were also incurred. The addition of these small units addressed the concerns of residents, but added to the overall program expense and did not improve program efficiency.



Community Outreach

The Buffalo Grove Public Works Department prepares the annual winter maintenance plan and provides it to the Village Manager and Village Board for their review. This is typically done during a normal Village Board meeting which is open to the public. Board meetings are broadcast on the local cable television channel for those who wish to view them from their home. The winter maintenance plan is also made available to view on the Village web page.

The Village of Buffalo Grove utilizes three forms of social media for communication, including Facebook, Twitter and LinkedIn. All three can be utilized to advise our community of pending storm events, or to update conditions during storm events. Residents have the ability to post questions, concerns, complaints or compliments to the social media page, per the guidelines of the social media outlet.

During extreme weather conditions, Buffalo Grove has the ability to contact residents directly using our “Everbridge” call back system, which functions as a reverse 911 system. This system can be used to inform the community of extreme weather, or alerts and/or dangers of a given storm event.

In 2015 the Village of Buffalo Grove Public Works Department hosted its first annual winter maintenance “open house” prior to the beginning of the winter season.

The open house provides an opportunity for our community to become educated on the following topics:

- Explore the different equipment used for winter maintenance.
- Learn how to make salt brine.
- Receive a copy of the updated winter maintenance plan.
- Obtain information regarding Village ordinances pertaining to winter maintenance activities.
- Ask any questions related to our activities.

The open house served as a “touch a truck” event for children who are allowed to climb in to the various pieces of equipment used to perform winter maintenance. The event included lunch and drinks for the

guests, and even had raffle prizes for the children, including Lego plow trucks as prizes.

The event was posted on the Village social media pages in advance of the event, and on banners, posters and signs placed at locations within the Village inviting the community to attend.

The Village of Buffalo Grove Proudly Presents:



**INAUGURAL PUBLIC WORKS
WINTER MAINTENANCE
OPEN HOUSE**

Please join us in learning about the Public Works department's winter maintenance program. Get to see firsthand some of the various equipment used to clear the streets, sidewalks, and parking lots of the Village!

**When: Saturday October 24, 2015
10:00 AM to 2:00 PM**

**Where: Buffalo Grove Public Works
51 Raupp Boulevard
Buffalo Grove, IL 60089**

*BUFFALO GROVE
PUBLIC WORKS*

The previous winter maintenance plan did not include an open house or event to educate our community. The winter maintenance plan was available to the community upon request, but not provided proactively.

As a Village, the use of social media to communicate to our community was implemented in early 2015. Social media is now utilized as a medium to communicate Village activities and events.



Technical

The Buffalo Grove Public Works Department utilizes a variety of technology in our efforts to create a high functioning winter maintenance plan, and also to monitor and track the effectiveness of the plan during the winter season.

GIS route mapping was implemented during the 2015-2016 season, and has since been performed for all winter maintenance routes. These route maps have not only been divided so that each route has similar mileage, but also a similar cycle time given the individual route challenges. By utilizing our GIS team to assemble the route maps, our winter maintenance staff is capable of completing their assigned route cycle in approximately the same time frame as any other route assignment. This provides consistent service to every part of the community, and allows the residents to establish a performance expectation for the roads in and around their neighborhoods. As a result, tightening up the mileage and cycle time expectations for the individual route drivers creates a clearer understanding of the performance expectation for their assigned route.

Prior to utilizing GIS route mapping, individual routes were constructed using our best estimates based on historical documentation to establish similarly sized routes. Despite our best efforts and periodic adjustments, routes were not completed as consistently as they are now due to use of this mapping system.

DTN Weather Sentry is a weather forecasting and reporting service that is utilized by the Village of Buffalo Grove for winter maintenance activities. This service is provided to us by Schneider Electric, and offers multiple user interfaces for connection. The service also has a Smartphone app that allows our staff to access to the most current information during winter maintenance events. This service provides our community with pavement temperature information in real time to assist in determining application rates for anti-ice materials. If needed, the service also provides an on-call meteorologist who is available to answer specific questions related to the needs of our community.

In the past, Buffalo Grove utilized a variety of local weather sources and news agencies to track winter weather conditions, but nothing that provided a targeted weather outlook that is now achieved with the above mentioned services. By moving forward with the DTN Weather Sentry in the 2014-2015 season, our community has been able to move away from a reactive approach to winter maintenance, and become far more proactive. As the plan is now designed, nearly 100-percent of our winter maintenance activities are proactive.

For the winter maintenance season of 2015 – 2016, the Village of Buffalo Grove has partnered with Precise Systems to provide live GPS tracking of our primary winter maintenance fleet. The system is a Cell over WiFi reporting system that

Snow Command Center



Technical

will provide accurate and up-to-date information for each unit. In addition to the GPS tracking, the system will also track ground speed, liquid and solid application rates (and totals), the position of all plows, and provide updated route maps denoting what has been completed and what is left to complete. The software incorporates the GIS-based route mapping, allowing for “color coded” visible displays of each route, or all the routes as a whole. The system will be utilized for all plow events, salting events, and anti-icing applications.

In addition to the tracking function of this system, there is also a fully functional documenting and reporting. The system provides storm reporting throughout the event, or in total at the end of the event.

The reports generated include the following:

- Driving miles.
- Plowing miles.
- Salting miles.
- Application rate settings.
- Tons of road salt.
- Gallons of liquid.
- Hours of operation.
- Hours of downtime.
- Operator identification.

This raw data will be pulled from the data report system and parsed into a spreadsheet that will add all material costs, equipment costs and manpower costs for each winter maintenance event. These storm reports are generated following every snow event and provided to upper level management along with monthly and seasonal totals.

Prior to the addition of the Precise GPS system, the Village did not utilize any GPS tracking for the primary winter maintenance fleet. During winter maintenance activities, management staff would drive through each of the routes to ensure that all streets included in the maintenance plan were cleared and/or treated. Each member of the winter maintenance team would complete written documentation for every storm event.

These written documents were collected by the Street Manager and manually entered into storm reports, which then would be added to monthly and seasonal total reports. The data collected and reported with the Precise system will be far more extensive, and provide more accurate and timely reporting.



Environmental

The largest and most environmentally impactful chemical that is used in any winter maintenance program is road salt. The Village of Buffalo Grove Public Works Department recognizes that truth, and has worked continuously to reduce the amount of road salt applied during our winter maintenance activities. Despite reducing our average application rate down to 300 lbs. per lane mile, we continuously look for ways to continue to reduce that quantity.

reflection of our concern for the environment, and our desire to be an agency that is not just “sensibly salting”, but aggressively looking for ways to lead our industry in this activity to reduce its presence whenever it is possible.

We have always taken great pride in the housekeeping aspect of our winter maintenance activities. The condition of our equipment is a reflection of the care given to wash and clean



The liquid beet juice product utilized during the past two winter seasons is a concentrated blend of multiple chlorides, mixed with food grade beet juice. The sugar (protein) count of the beet juice is much higher than the industry standard, and when combined with the multiple chlorides serves as a “high octane” liquid deicer. The Public Works Department is able to “cut” this product down with salt brine to a blend that is targeted towards the weather conditions of a given snow event, thereby only applying a level of chlorides equal to the need. Furthermore, when this product is applied in greater quantity our staff is able to target lower application rates of road salt without sacrificing the quality or conditions of our streets. By increasing the output of liquids from 10 gallons to 20 gallons, staff has been successful in decreasing application rates from 300 lbs. per lane mile to 200 lbs. per lane mile.

It is the goal and intention of our Public Works Department to plow off surface snow, and never to “burn” snow off using salt or liquids. The purpose of chemicals, as defined by our winter maintenance plan, is to prevent freezing (or bonding) of precipitation to the road surface. Our efforts in anti-icing, and subsequent road salt application are done to achieve that purpose. Snow that has accumulated on the surface of the street is plowed off the road, and only a minimal amount of chemical is used to prevent any refreezing.

Our efforts to reduce the application of road salt are a direct

any chemical residue from the equipment. As we have done in the past, all washing and cleaning is performed inside our facility which drains through a triple catch basin prior to discharge into a sanitary sewer. The housekeeping aspect extends to our salt loading and unloading area, as we have maintained “green space” surrounding 50-percent of our dome structure. Not only have we been able to maintain grass areas adjacent to our dome, but also successfully grow multiple trees adjacent to our structure. The care given to clean and maintain our salt loading and unloading area is reflected in the continued success of our green space.

In closing, the Village of Buffalo Grove Public Works Department has been diligent in obtaining ongoing education and certification from a wide variety of resources, consistent in improving and upgrading our training methods to provide the most effective services, and focused on refining our best practices to maximize cost and man power efficiency. We are all the while striving to serve Village residents and meet their expectations by providing maximized safety during snow events as we respect and work to minimize our impact on the environment.