



2015 APWA Profession Awards

City of Waconia's Winter Maintenance Activities

Developed by the City of Waconia, Minnesota





Introduction



Waconia is a growing community of 11,065 people located just 30 minutes west of the Twin Cities of Minneapolis and St. Paul in an area popular with visitors for the many lakes, streams and wetlands. The City's parks are enjoyable destinations within easy reach. The City is nestled next to scenic Lake Waconia, which is the metro area's second largest lake, and offers residents a healthy environment as well as growing economic development, strong schools and excellent health care facilities. Lake Waconia is not only a popular spot for visitors, but an integral part of the lives of its residents. In the summer, Lake Waconia hosts a multitude of recreational activities such as, sailing, boating, fishing, water-skiing, tubing, jet-skiing, and swimming. In the spring, late summer and fall, seasonal winds attract wind surfers and sailboarders. In the winter, snow accumulations amount to around 45 to 55 inches starting in early November and ending as late as early May, making it a haven for snowmobilers and Lake Waconia draws hundreds of ice-fishing houses forming a community of anglers.

City employees actively maintain and improve the City's environment and infrastructure. In the winter season, workers oversee approximately 48 center-lane miles of roadways, all municipal parking lots, and 27 miles of trail and sidewalks. The state of Minnesota has set forth high expectations for reducing chloride applications in effort of protecting the wetlands, streams, and lakes for recreational use. All the while maintaining a level of service allowing individuals to travel to and from work, and provide the business sectors commerce to meet customer expectations. In 2010 the City of Waconia made significant changes in winter maintenances practices to meet the State expectations. The City of Waconia was the first community in Carver County to utilize liquids in winter maintenance operations. Brine production and anti-icing were implemented into the community's winter maintenance practices. Increases in calibration, education, training, and community outreach were also added. As a result Waconia has been supplying liquids since 2011 to three neighboring communities, Carver County, cities



outside of the County, and private contractor's. Each entity is charge our material purchase price, costs associated with blending and staff time.

Materials & Handling

The City of Waconia maintains a hoop structure with a bituminous floor for salt (Sodium Chloride) storage. Low volumes of salt are maintained, through implementing "as needed" deliveries. Deliveries are unloaded directly into the salt storage structure. Each load is tested for moisture and consistency. Employees load their trucks inside the structure in effort to reduce spilling material outside of the storage area. Good housekeeping practices are in place, and monitored by Supervisory staff.



Public Services Salt Storage

The City of Waconia has 4,600 gallons of liquid storage. All storage units consist of dual-wall tanks for holding salt brine, Road Guard 8 (RG8), and blended brine and RG8. As the pavement temperature requires, staff blends RG8 at a mixture of 80% brine to 20% RG8. Inside the Public Services facility staff maintains storage of approximately 500 gallons of liquid Magnesium Chloride for sidewalk anti-icing and de-icing. Blending for bituminous trails occurs at a mixture of 90% brine to 10% Magnesium Chloride.



Liquid storage and production

The City of Waconia specifically utilizes salt (Sodium Chloride) with pre-wetted salt-brine for de-icing when pavement temperatures are above 15 degrees Fahrenheit, and salt (Sodium Chloride) pre-wetted with salt-brine blended with RG8 for pavement temperatures below 15 degrees Fahrenheit. All plow trucks apply pre-wet liquid material from tail-gate tanks with electric pumps at a target rate of 14 gallons per-ton. One-ton units utilize pre-treated salt (Sodium Chloride) prepared by our staff prior to storm events at a rate of 4 to 6 gallons per-ton.

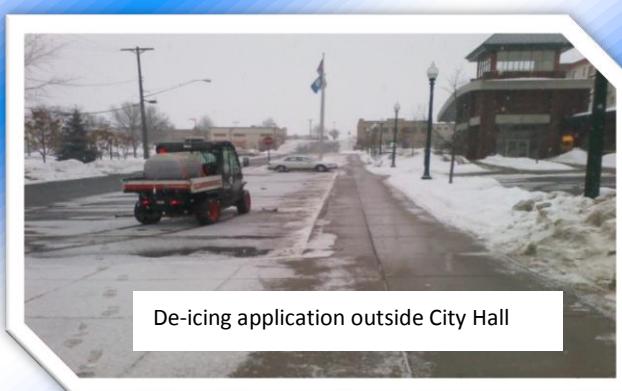


Since 2010 the City of Waconia has been active in anti-icing to prevent the bond of snow to the pavement surfaces. Applications occur as-needed prior to storm events. Staff prepared collector routes based upon traffic volumes, and prioritized business areas. Each municipal lot and those serving City facilities are anti-iced.

Efforts to improve service to bituminous trails and sidewalks were initiated in 2011. Staff struggled with compaction due to snowmobiles, and pedestrian use prior to removal. Great strides have taken place with the anti-icing of trails and sidewalks. Application rates to maintain trails and walks have been reduced by 70% through the use of liquids.

The City has found that the pre-wet salt stays in place when applied creating efficiencies for de-icing purposes. Our blended liquids work well in lower temperatures and respond quickly in effort of maintaining our level of service while reducing chloride impacts.

All sidewalks and trails are anti-iced, and de-icing with liquids as-needed. Dry pre-treated de-icing chemicals are applied at City Facilities only if we experience ice conditions.



Equipment

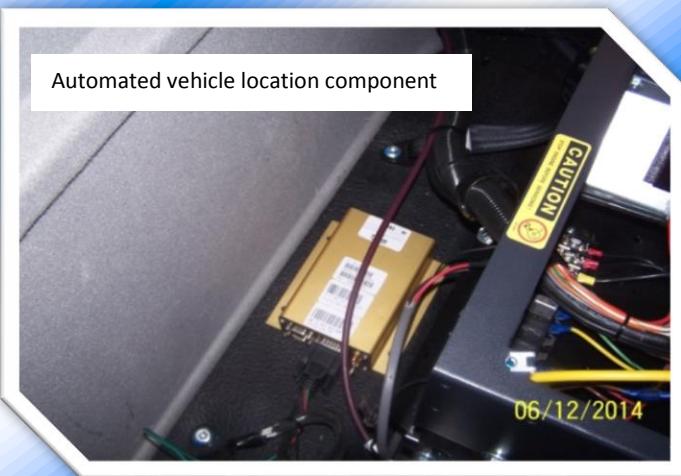
The City of Waconia continues to equip and research the latest technologies in winter maintenance. In 2014 Public Services created a "Green Fleet Team". The emphasis of this group is to discuss equipment needs, improve route optimization, and reduce Green House Gas (GHG) emissions. The group discusses all equipment uses, and recommends equipment purchases to improve and maintain service delivery for all divisions of Public Services. The City continues to improve efforts towards chloride reduction and data acquisition by upgrading one-ton unit application equipment and controls scheduled for 2015, and the proposed 2016 automation of brine and blending production.



Most dump trucks are equipped with a front plows, underbody plows, front, or rear mounted wings. All dump trucks received application controls up-grades to allow consistent ground speed applications. Each unit has received a new salt special tailgate applicator, pre-wet tanks, and Automated Vehicle Location devices utilized for tracking route processes, dry, and liquid applications per-lane-mile. The City currently is in the process of converting our front plows to Black Cat Yoma carbide blades, and upgrading our controllers in our one-ton units to allow improved material application control and tracking. We have a place holder in our Capital Improvement Plan for 2016 to purchase an automated on-demand brine production, blending, and dispensing system. This will allow neighboring agencies and private contractor's access to materials as needed, and reduce staff time for preparing and supplying liquid materials.



Staff members have customized forms for tracking storm events which include data retrieved from the Automated Vehicle Location equipment. The process includes anti-icing applications, plowing applications, and snow removal from the Business District.



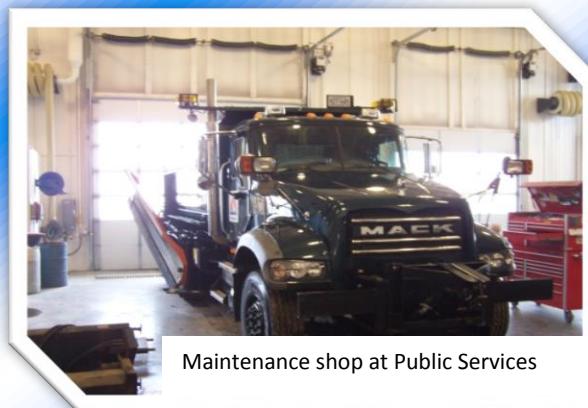


Access Based Snow Event Tracking

Snow Event Record			Date:	Storm #					
Time	AM	PM	Day of Week		Storm Action:	All	Procedures:	Removal	
Storm Started					<input type="checkbox"/>	Collector	<input type="checkbox"/>	Plowing	
Storm Ended					<input type="checkbox"/>	Call-out	<input type="checkbox"/>	Liquids Applied	
Road Cleared					<input type="checkbox"/>	Dry Snow	<input type="checkbox"/>	Salt Applied	
Description	Avg (in)	Drifts (ft)			<input type="checkbox"/>	Freezing Rain	<input type="checkbox"/>	Excellent	
Depth of Snow					<input type="checkbox"/>	Sleet	<input type="checkbox"/>	Good	
Description	Direction	Velocity	MPH		<input type="checkbox"/>	Wet Snow	<input type="checkbox"/>	Poor	
Wind					Visibility:	<input type="checkbox"/> Good	Comments:		
Description	Maximum	Minimum			<input type="checkbox"/> Fair				
Pavement Temperature					<input type="checkbox"/> Poor				
Completed By: _____									
Personnel	Req Equip Hrs. 1	Req Equip Hrs. 2	O/H Equip Hrs. 1	Total	Miles Applied	Equip #	Salt (Lbs)	Abrasives (Lbs)	Liquids (Gal)
Total									

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Winter maintenance equipment removed each spring is reviewed for needs, or repair, and documented. Items requiring repair or replacement are addressed for budgetary purposes. Each attachment is treated with a chloride inhibitor product and sealed for storage for the summer. Winter preparations include placement of the equipment, a second inspection, and calibration of both the dry and liquid material applications. Calibrations are documented, and charts are prepared for each vehicle for the operators use based upon pavement temperature, and condition. All of these efforts support the target goals established by the Public Service team. Fleet Maintenance staff worked with an outside fabricator to create an internal pre-wet fixture for applying liquids prior to delivery of de-icing material. The internal boom is made of stainless steel with varied eighth-inch holes for applying liquids as the auger operates.





Training

The City of Waconia encourages training for its winter maintenance staff. Most staff members are certified with the Minnesota Pollution Control Agency (MPCA) for either roadway or parking lot and sidewalk winter maintenance. Four staff members are certified with the APWA Winter Maintenance Supervisor Certificate. Annually, staff members attend the Freshwater Society's Road Salt Symposium to gain a perspective on local and national winter maintenance activities. One staff member assists in teaching the MPCA Roadway Winter Maintenance and Winter Parking lot and Sidewalk Maintenance programs, and is a member of the MPCA Task Force for creating a winter maintenance tool for Supervisor's with emphasis for tracking and improving organizational winter operations.

Each Fall staff and local representatives from the School District and County Sheriff's Department go over the Winter Maintenance Policy, discuss plow routes, service delivery, and new roadway systems. Route maps are prepared through the use of GIS, and discussed with staff members to create the greatest efficiencies. After this meeting staff drive their routes to mark obstructions, or small utility boxes that may become an issue for winter maintenance service delivery.

Efforts to switch winter maintenance activities from Sand/salt to straight salt at lower rates have improved storm water quality at the outlets to the ponds and lakes. For the efforts in winter maintenance the City was recognized by the Freshwater Society for an Environmental Leadership award in 2013. Through proper equipment upgrades application rates were reduced and a cost savings of \$1.80 per-lane-mile were recognized for a yearly savings of \$8,600.00





Community Outreach

Waconia utilizes numerous community outreach items. The City's Winter Maintenance Policy is annually provided to the City Council for review and approval. The policy is hosted on the City website at www.waconia.org. Each spring Public Services open's its facility for an Open House event where winter maintenance is a popular topic for the residents and the children attending. Resident have the opportunity to be educated on services provided and touch the equipment utilize by Public Services. Fall/Winter open house events are held occasionally to promote winter maintenance or projects proposed for winter construction.



In the fall, approximately 300 fourth grade students attend the Public Services facilities for education on winter maintenance, storm water, and drinking water supply. These target areas coincide with our initiatives for educating those most impacted by the services we provide daily.



City staff have assisted and promoted reduction of chloride use throughout the County and Metro area. Staff members have assisted outside organizations in proper calibration efforts and control settings when preparing equipment for liquid applications. Several organizations have visited the community to gain a perspective on how Waconia staff members have implemented new winter maintenance applications.



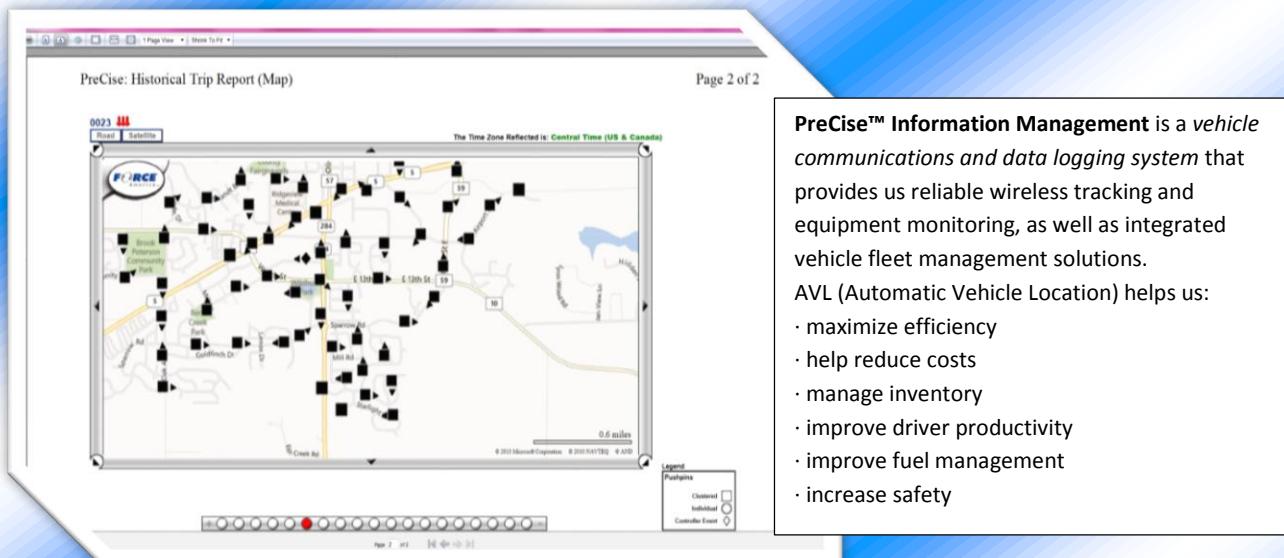
Waconia has taken education to the next level by adding quotes to its equipment which provide services at a slower production rate. The community street sweeper was dotted with sayings that promote education.



Technology

The City monitors weather activities through many forms. Free weather services are monitored along with Road Weather Information Services (RWIS) provide on the web from the State of Minnesota Department of Transportation. These interactive avenues allow staff to prepare operations as necessary based upon our Winter Maintenance Policy.

In 2013 the City installed Automated Vehicle Locations equipment in each of its mobile equipment. As part of this process integration staff now receive vehicle locations, route information, material applications both dry and liquid, plow activities, and information on efficiencies. Data gathered is placed in our city network for information tracking and documentation.





Environmental

With the City of Waconia residing on the metro areas second largest lake efforts are in place to assist in keep Lake Waconia from being impaired by Chlorides. Providing winter maintenance with an environmentally sensitive approach is critical to Public Services operations. Reductions in chloride application rates due to education of staff, liquid uses, and equipment improvements will hopefully provide a positive approach.

Governor fishing opener, Lake Waconia



View of Lake Waconia from Cedar Point Park



Summer on Lake Waconia

