

City of Aurora

Increased efficiency for Aurora winter road maintenance with WinterPlan/AutoPlan

The City of Aurora is approximately 14 miles due east of Denver. The Street Services Division of Public Works (Streets Division) maintains about 3,230 lane miles of road. They spread a liquid anti-icing solution before storms, and spread a solid de-icing chemical during severe weather events. They have on average 30-35 events per season of varying magnitude with an average snow accumulation of 2" per storm.

For winter operations, Streets Division has two operations facilities each supplied with snow plows, liquid distribution tank inserts, liquid anti-icing chemical storage and solid de-icing chemical storage. One facility is located near the northern City limits and the other is located near the south City limits. Because of this, the City has been split into two districts, North and South, along a major east-west arterial. Traditionally, maintenance and snow removal responsibilities fell along this arbitrary border.

Within each district, streets have been prioritized into four classifications for snow removal and grouped into areas or routes. There are 7 routes in North District and 8 routes in South District. Drivers are assigned to handle all high priority streets in a given route/area with the drivers' discretion and expertise determining how the routes were driven. Although the City has more than doubled in size since the routes were first developed nearly 30 years ago, a major revision in the route structure had not taken place.

For a typical storm, drivers would begin reporting approximately as much as 6 hours before the predicted start of snowfall. The first attack would require up to 8 tandem axel trucks and three tractor-trailer trucks fitted with liquid distribution equipment for anti-icing. After



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the storm hit and snow began to accumulate, a second fleet of 30-35 tandem and single axel trucks would be deployed to plow and de-ice the streets in priority order. Often only the first priority routes and a few high priority secondary routes would be serviced. Also, occasionally the storm would not materialize as predicted, which meant that expensive chemical had been applied unnecessarily. Faced with maintaining an ever-increasing area with a limited number of resources, the City turned to Winterplan/Autoplan to analyze, optimize and revise their snow removal routes.

In the first season, 2002, Winterplan was used only to construct and optimize routes for anti-icing operations. Roads normally covered by anti-icing routes were selected within the system, and AutoPlan was used to optimize routing from the two existing depots. It quickly became apparent that an east/west division of the City was more efficient than an a north/south division. The City settled on 8 tandem tanker routes, 5 deployed from South and 3 from North, and 3 tractor-trailer routes, 2 deployed from South and one from North.

The routes devised using AutoPlan were driven to assure that the route did not commit the truck to difficult turns, or impractical spots to turn around and to fine tune the program parameters to model actual conditions as closely as possible. Individual routes were then adjusted as needed.

The results of the dry run were dramatic. The revised routes shortened the time needed to cover the required streets from 4-6 hours to one and a half. Because of this, it would be possible to shorten the amount of time in advance of the storm that drivers were called in from six hours to three or less. The first couple of actual snow/ice events verified the experience of the dry run.

In the past, the second wave of spreading dry salt or plowing, drivers often had to treat portions of primary routes that had assigned to anti icing trucks, either because the effectiveness of the anti-icing chemical had diminished, or because the trucks had simply not been able to reach all the primary routes.

With AutoPlan, the anti-icing trucks were able to apply the chemical much closer to the actual event, making it more effective and reducing the possibility of applying



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chemical needlessly. Even though the call in had dropped from six hours to one and a half, the drivers were more confident that the entire network of primary routes would be completely treated by the onset of the storm. Since all the first priority routes are now treated with chemical before the storm begins, the de-icing trucks are now able to concentrate on the secondary priority streets.

Streets Division is looking forward to bringing the larger fleet of trucks sanding and plowing trucks to a similar level of efficiency for next season, and Winterplan/ AutoPlan will be the key.

Enera – the developers of WRMS – are leading suppliers of software tools for winter maintenance planning and automated communications. With head quarters in Gothenburg, Sweden, Enera's products are marketed and supported worldwide. The products in the WRMS segment – WinterPlan, AutoPlan, RapidReach, and Call&Report – are used for winter road maintenance in a number of cities and regions in Europe and the USA.

