

Winter Control and Spring Cleanup Update 2024

Presented To:	Operations Committee
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Report Summary

This report provides a summary of winter maintenance activities for the 2023-2024 season including the 2024 street sweeping program.

Relationship to the Strategic Plan, Health Impact Assessment and Climate Action Plans

This report refers to operational matters and has no direct connection to the Community Energy & Emissions Plan.

Financial Implications

This report provides the estimated financial results for the period ending June 30, 2024. The estimated result for June 2024 is a surplus of approximately \$2,908,000 when compared to the 2024 year-to-date budget. The actual year-to-date result may differ from these estimates as certain estimates were necessary to account for outstanding invoices.

Background

This report is intended to provide a summary of winter maintenance activities for the 2023-2024 season including the 2024 street sweeping program, along with a final financial position.

The City of Greater Sudbury maintains approximately 3,600 lane kms of roadway and 350 kms of sidewalk which are to be cleared and passable within 24 hours after the end of a winter storm. To accomplish this, the City deploys over 80 pieces of City owned and contracted equipment during a storm.

In the spring the City sweeps approximately 1,175 lane kms of curbed road, and 950 lane kms of curbless road. The City also sweeps approximately 425 kms of sidewalk for a total of 2,550 kms of sweeping. This sweeping is typically completed over an eight-week period and the City utilizes over 60 pieces of City owned and contracted equipment to complete this program.

During the 2023-2024 winter control season there were six winter events that required the full deployment of City crews and subcontractors.

This report provides financial results for the entirety of the 2023-24 winter control season including the 2024 street sweeping program. The results for the 2023-2024 winter control period are a surplus of approximately \$5,204,000. The estimated result for the period ending June 30, 2024, is a surplus of approximately \$2,908,000 when compared to the 2024 year-to-date budget.

Weather Statistics

Overall, the 2023-2024 winter control season had less snow than the 10-year average as well as higher than average temperatures as compared to the 1991-2020 climate normal, with the exception of November 2023.

Climate normals, as described by Environment Canada, are used to summarize the average climatic conditions of a particular region. These climate normals are calculated at the completion of each decade using climate data from stations with at least 15 years' worth of data.

Figure 1 depicts the statistical information for the 2023-2024 winter season, including the 10-year average (2013-2022) for snowfall. This winter season had approximately 30 per cent less snow than the 10-year average of 3.1 metres or 10.1 feet.

Figure 1 – Winter Control Snowfall Statistics (June 2023 through May 2024)

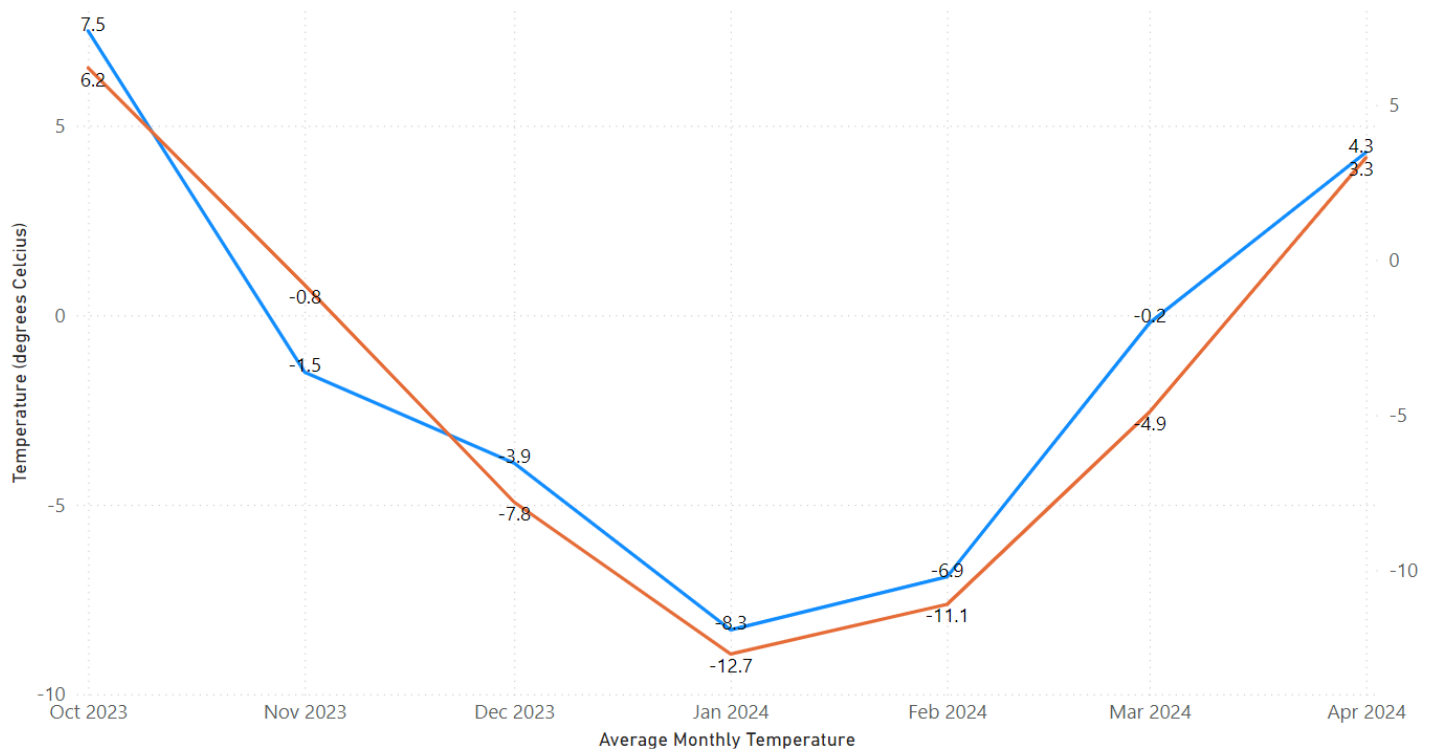
Month	Snow Accumulation (cm)	10 Year Average (cm) (2013-2022)	Percentage Increase/Decrease Compared to 10-Year Average	Snow Events	Rain/Freezing Rain Events
Oct	8.8	6.0	46.7%	0	0
Nov	26.3	40.3	-34.8%	1	0
Dec	16.3	65.1	-75.0%	0	0
Jan	74.9	72.1	3.9%	2	0
Feb	33.1	66.7	-50.4%	2	1
Mar	19.3	35.1	-45.0%	0	0
Apr	37.7	23.6	59.5%	0	0
Totals	216.4	309.0	-30.0%	5	1

Note: All weather data taken from Environment Canada website for weather station Sudbury A.

This winter season was also warmer by an average of 2.71 degrees Celsius (monthly) as compared to the 1991-2020 climate normal. Figure 2 portrays the average monthly temperature taken from the 1991-2020 climate normal and compares that to the average monthly temperature experienced during the 2023-2024 winter season. As depicted, warmer than average temperatures were experienced in every month with the exception of November 2023 which experienced below average temperatures. Focusing on the months which are on average the coldest; December, January and February the data shows that these months were approximately 4 degrees Celsius warmer when compared to the average. The month of December was warmer on average by approximately 3.9 degrees Celsius, January was warmer on average by approximately 4.4 degrees Celsius and February was warmer on average by approximately 4.2 degrees Celsius. This warmer weather also extended into March as it was warmer by approximately 4.7 degrees Celsius compared to the average.

Figure 2 – Winter 2023-2024 Average Temperature vs 1991-2020 Climate Normals

● Winter 2023-2024 ● Avg 1991-2020

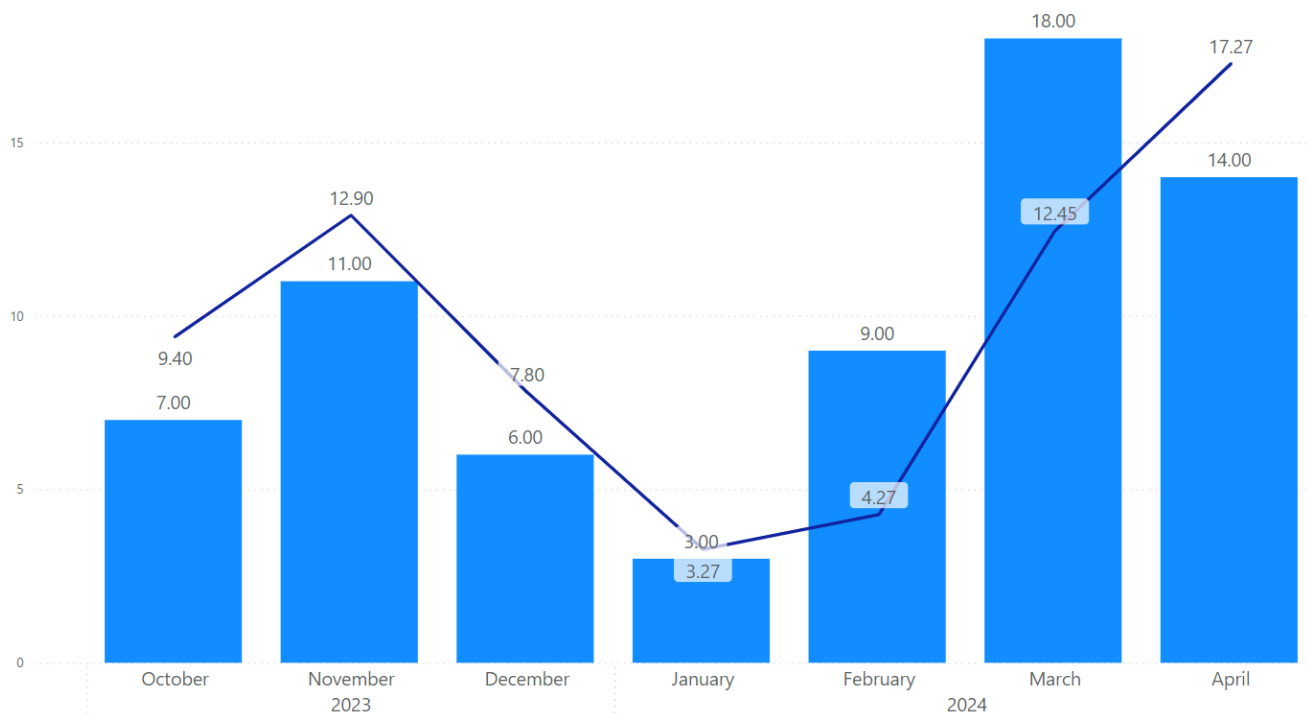


Note: Climate normal from Environment Canada website for station Sudbury

Staff also summarized data on the number of freeze thaw cycles compared to the 10-year average. For the purposes of this report a freeze thaw cycle is defined as having a daily minimum temperature below 0 degrees Celsius and a daily maximum temperature above 0 degrees Celsius. Figure 3 depicts the 2023-2024 winter season freeze thaw events per month as compared to the monthly average over the last 10 years.

Figure 3 – Winter 2023-2024 Freeze Thaw Events Compared to Average

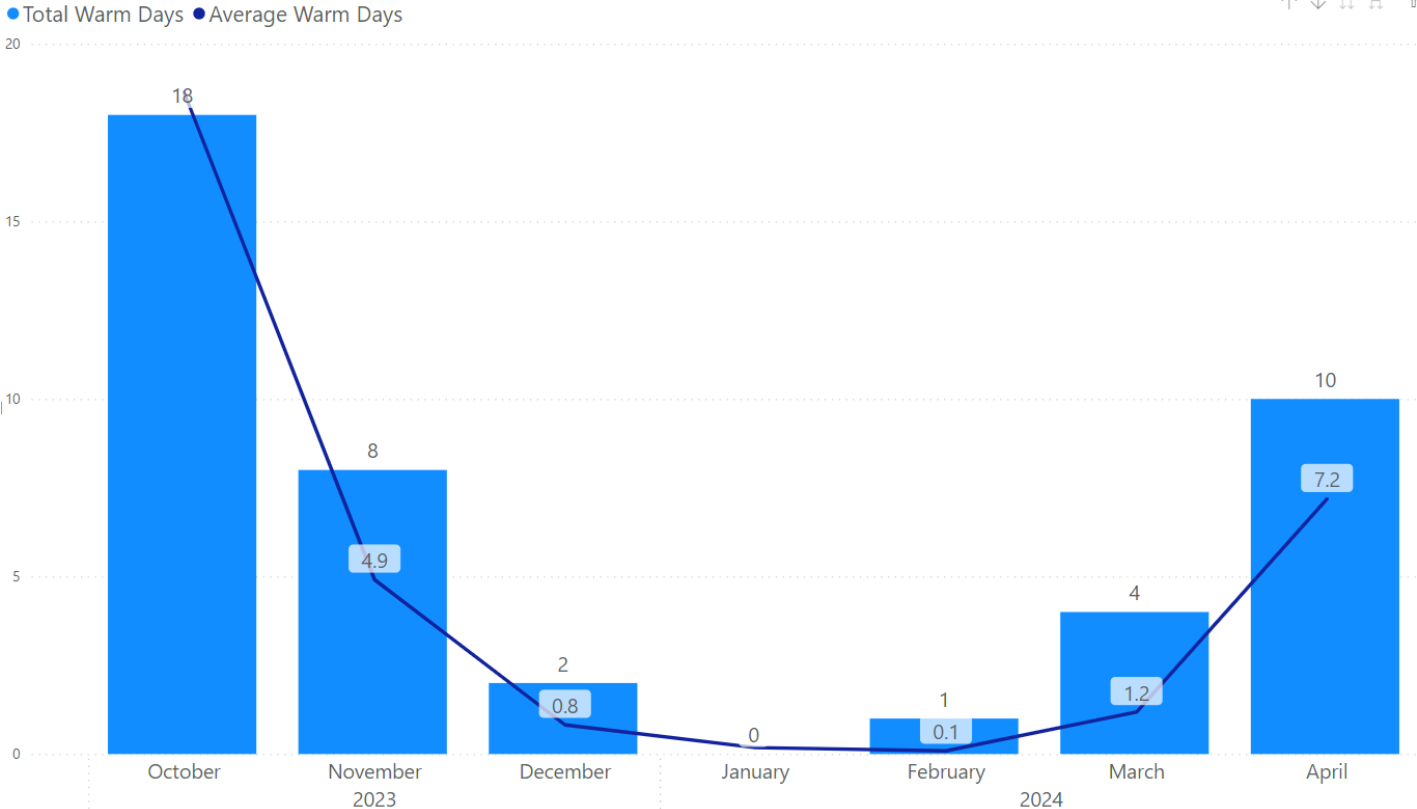
● Total Freeze Thaw Events ● Average Freeze Thaw Events



Note: All weather data taken from Environment Canada website for weather station Sudbury A.

Staff also reviewed temperature data to determine the number of warm days compared to the 10-year average. For the purposes of this report a warm day is defined as having a daily minimum temperature above 0 degrees Celsius and a daily maximum temperature above 0 degrees Celsius. In other words, a “warm day” is a day where the temperature never drops below 0 degrees Celsius. Figure 4 depicts the 2023-2024 winter season warm days per month as compared to the monthly average over the last 10 years.

Figure 4 – Winter 2023-2024 Warm Days Compared to Average



Note: All weather data taken from Environment Canada website for weather station Sudbury A.

All this weather information will prove useful for the remainder of the report. With reduced snowfall in the majority of the winter months coupled with higher-than-average monthly warm days all lead to a reduction in number of 311 calls, a reduction in material used to maintain the roads and sidewalks as well as a financial surplus which will be further explained.

General Callouts

For the 2023-2024 winter season there were six general callouts. Five of these events were snow events totaling approximately 83 cm of snow. One of the events was due to freezing rain for which we had approximately 12 mm of rain.

This winter season also had the declaration of three significant weather events. Two snow events received greater than 20 cm of snow and the freezing rain event received approximately 12 mm of rain. As a comparison, over the last ten years, the City has an average of 16 general callout events per winter season.

Material Usage

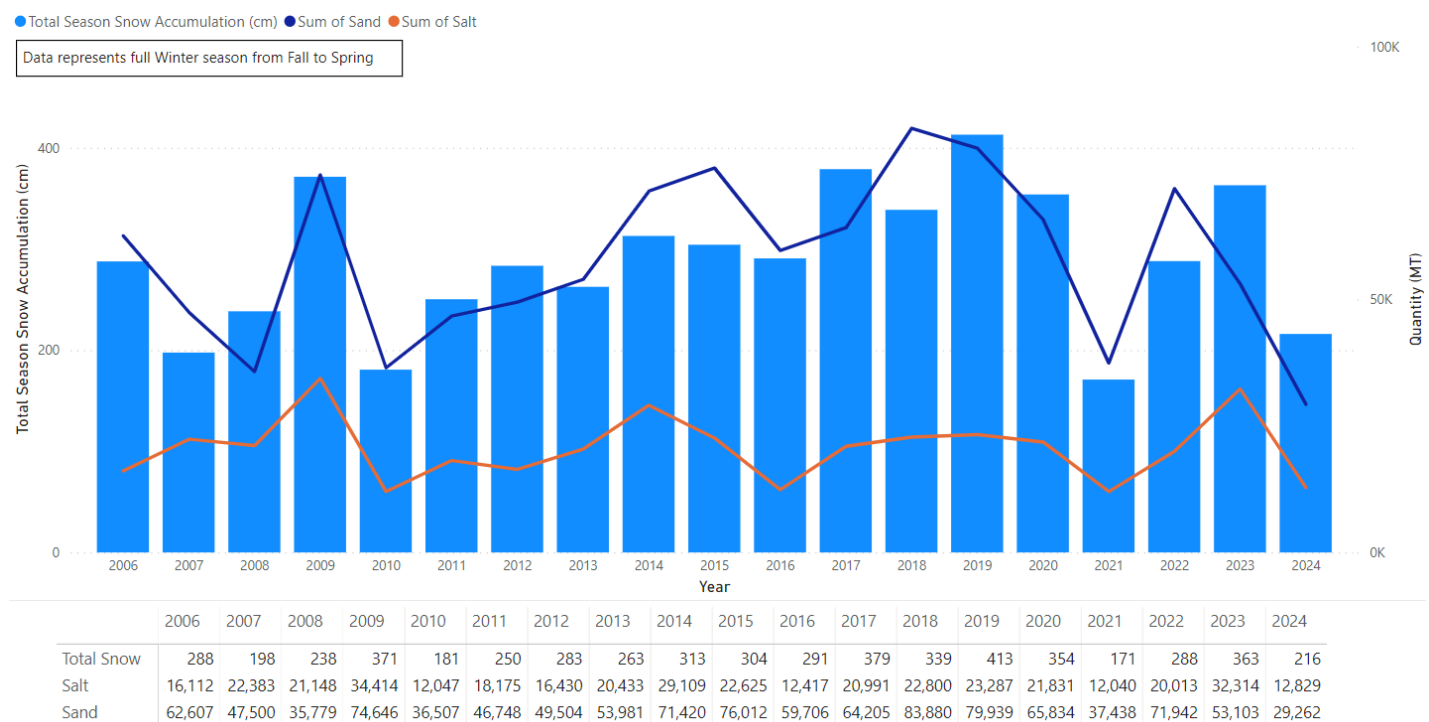
To maintain the road and sidewalk infrastructure during the winter months the City utilizes both sand and salt (sodium chloride). The application of sand and salt is intended to reduce slippery conditions on both roads and sidewalks. The determination of when to use salt or sand is based on weather conditions and road classification. When the temperature is between zero to -12 degrees Celsius, salt is utilized. When the temperature falls below -12 degrees Celsius sand is utilized since salt is no longer effective. This is also dependent on road classification. Roads classified as Class 1-3 receive salt and sand depending on weather conditions mentioned above, while Class 4-6 roads only use sand. Further information can be found on the city's website (<https://www.greatersudbury.ca/live/transportation-parking-and-roads/road-maintenance/salting-and-sanding/>).

As depicted in Figure 5, lower than average snowfall and milder weather conditions resulted in a reduction in the use of both salt and winter sand usage. The 2023-2024 winter control season had a reduction of salt usage by 40 per cent and sand usage of 51 per cent as compared to the average usage from 2006-2023.

This winter approximately 73 lane kms were changed from salt routes to sand routes as outlined in the "Winter Maintenance Salt Routes Review 2023" report that was presented to the Operations Committee on August 14, 2023. It was anticipated that the conversion of these 73 lane kms to sand routes would result in an eight per cent reduction in salt usage over the winter season. Although the theoretical numbers were predicting an approximate eight per cent reduction in salt usage, the greater reduction this year can be attributed to the warmer than average temperatures experienced this winter season.

While the overall sand usage for the year was lower than average due to the weather conditions and reduced snowfall, the usage of sand during a general callout as compared to last year was higher by approximately 3.5 per cent. This can be attributed to the changes from salt to sand routes mentioned above.

Figure 5 - Snow Accumulation (cm), Total Salt and Sand Quantities (MT)



Figures 6 and 7 provide a monthly breakdown of salt and sand usage respectively. Figure 6 shows below average salt usage for all months with the exception of April. Figure 7 shows below average sand usage for all months with the exception of October.

Figure 6 – Salt Usage (MT) by Month for the 2023-2024 Winter Season Compared to Average Since 2016

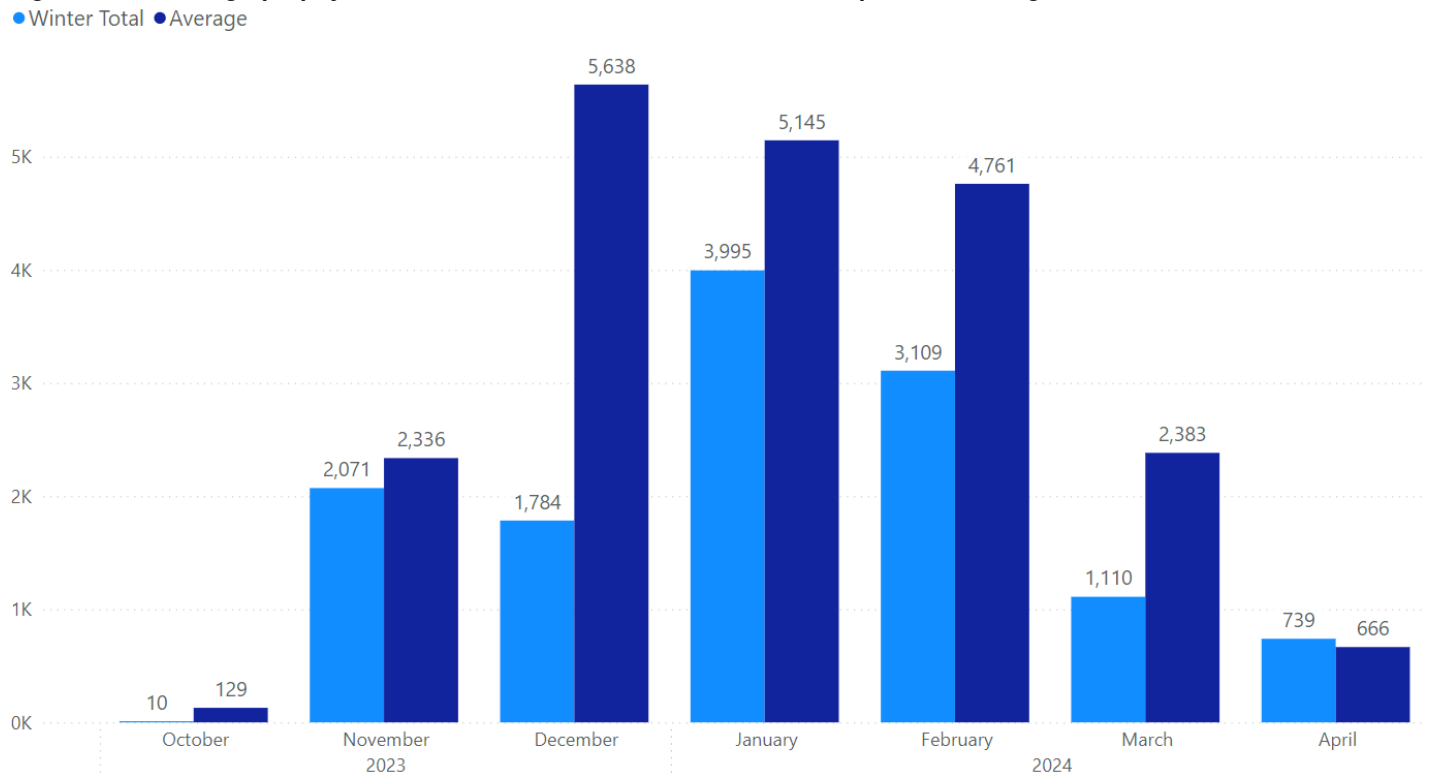
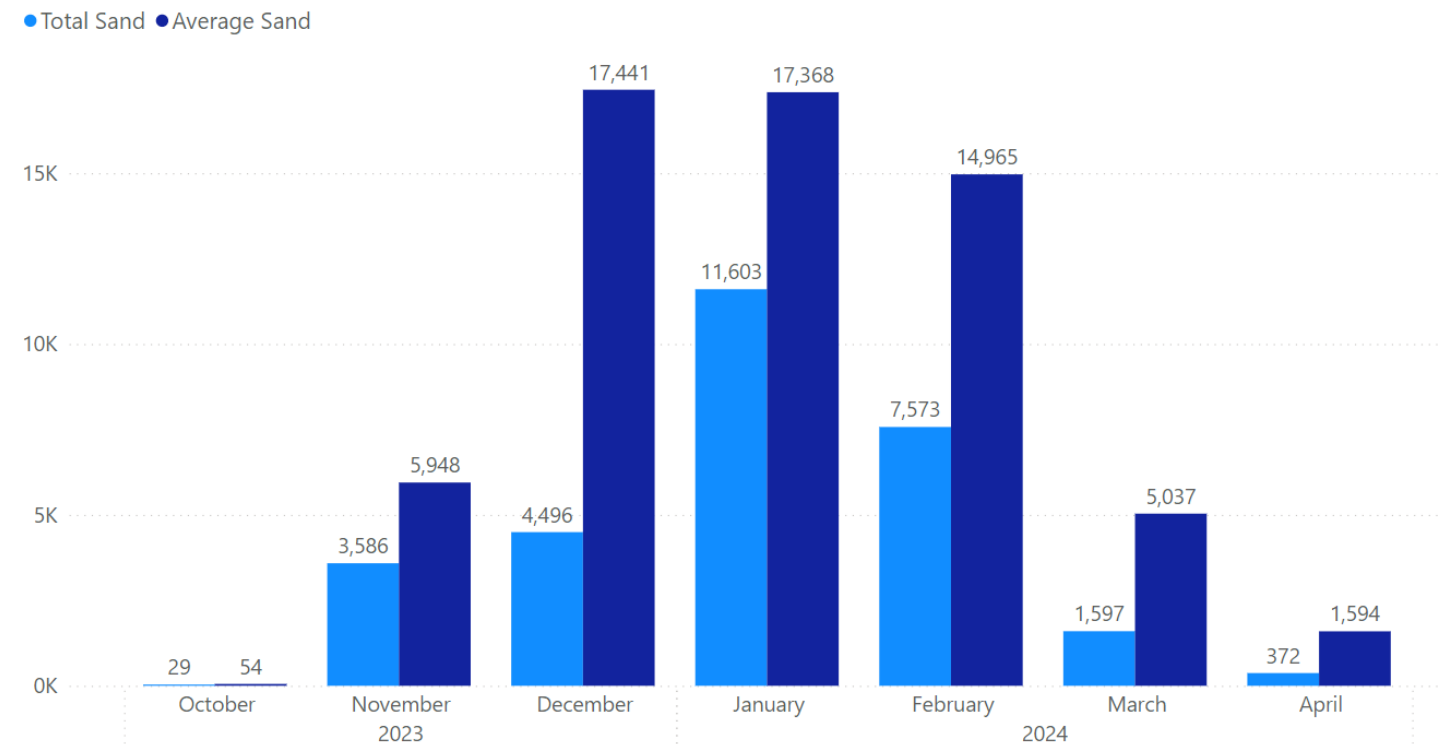


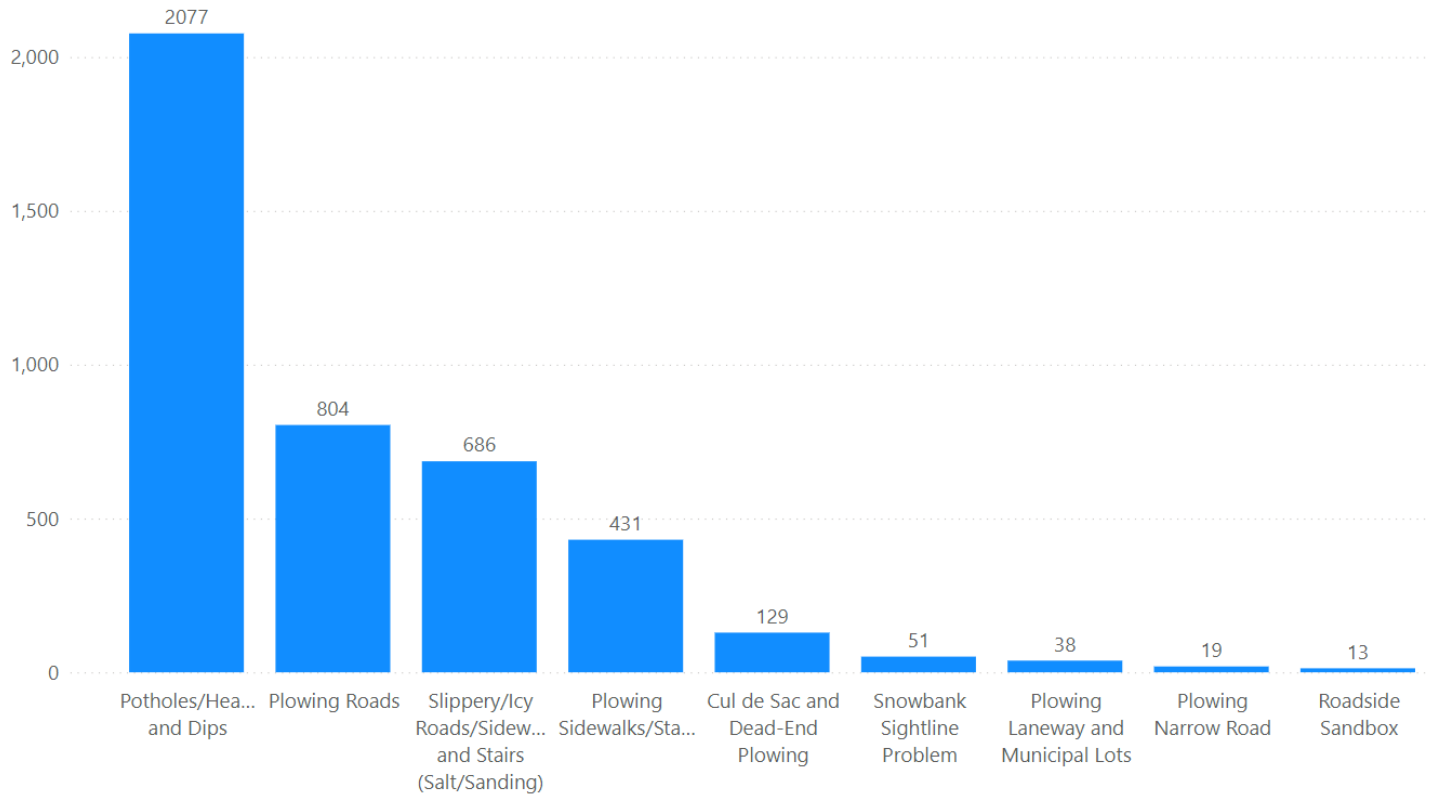
Figure 7 – Winter Sand Usage (MT) by Month for the 2023-2024 Winter Season Compared to Average Since 2016



311 Calls

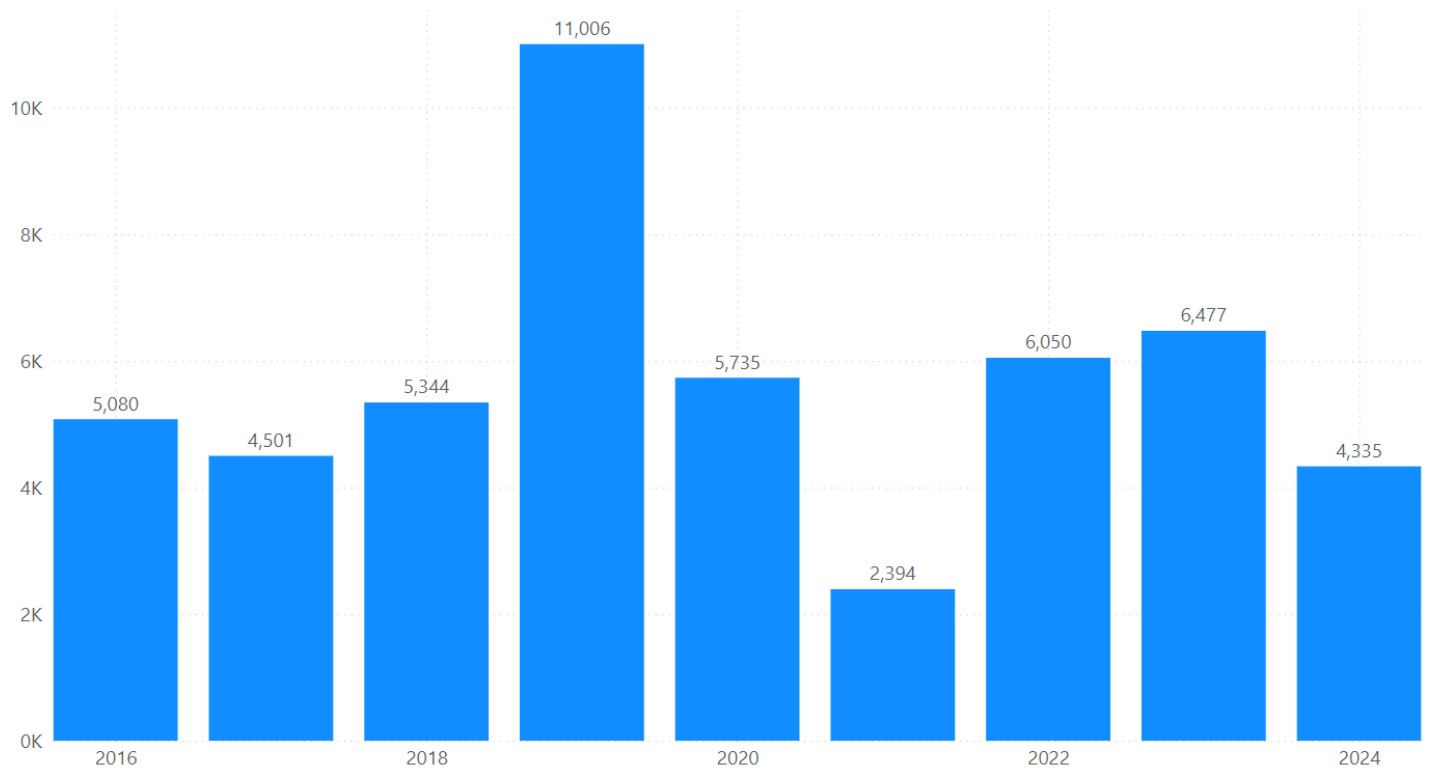
Figure 8 is a breakdown of the calls received by 311 throughout the 2023-2024 winter season. As depicted in the chart “Potholes/Heaves and Dips” had the greatest number of calls, followed by “Plowing Roads” and “Slippery/Icy Roads/Sidewalks and Stairs (Salt/Sanding)”. This ranking of 311 calls is fairly consistent throughout the years dating back to 2016.

Figure 8 - Winter 2023-2024 311 Calls



As depicted in Figure 9 depicts the 311 calls throughout a winter season. an overall lower amount of 311 calls received year-to-date for the 2024 season. There is a reduction in the number of calls in the 2023-2024 winter season when compared to the previous two winters. This can be attributed to the reduced amount of snowfall and milder weather experienced during the winter season.

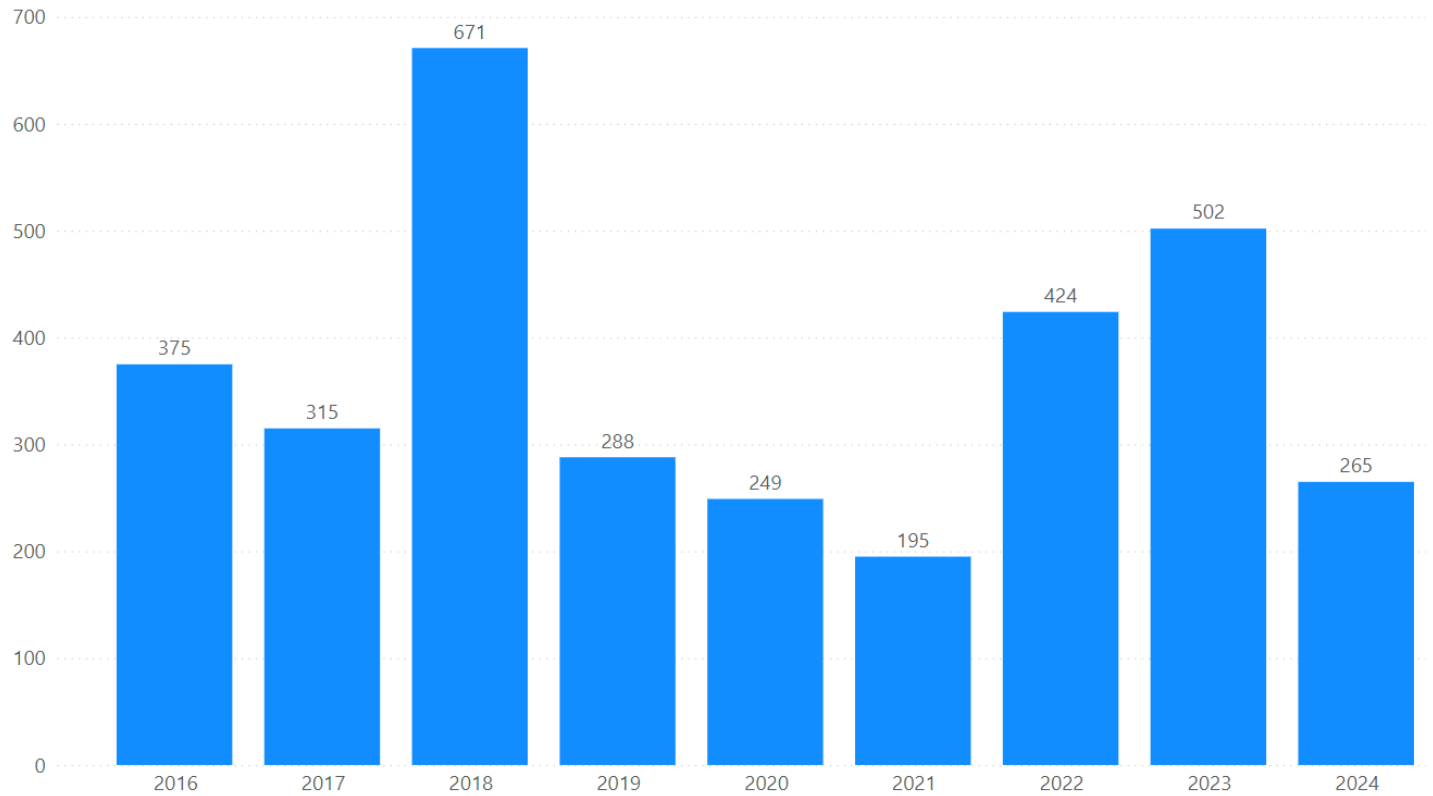
Figure 9 - Winter Control 311 Calls (Yearly Comparison)



Note: First Call Resolution tracking was introduced in May 2021. Data represents a full winter season from Fall to Spring.

The 2024 street sweeping program also had a reduction in the number of 311 calls recorded. There was an approximate 57 per cent reduction over the average of 317 calls per year. This can be attributed in part to the reduced amount of sand deposited on the sidewalks and roadways. A year-by-year comparison of 311 calls is depicted in Figure 10.

Figure 10 – Sweeping 311 Calls (Yearly Comparison)



Note: First Call Resolution tracking was introduced in May 2021

Financial Results

The estimated financial results for the period ending June 30, 2024, are summarized below. As shown in Figure 11, June 2024 is estimating a surplus of approximately \$2,908,000 when compared to the 2024 year-to-date budget. The winter control surplus/deficit will form part of the year-end position.

Figure 11 – Financial Results

2024 Winter Summary As of June 30, 2024					
	Annual	2024 YTD			
	Budget	Budget	Actual	Variance	% Spent YTD
Snow Plowing/Sanding/Salting	8,068,135	5,310,296	4,601,753	708,542	87%
Snow Removal	1,281,383	991,165	467,401	523,763	47%
Winter Sidewalk Maintenance	1,368,470	916,509	669,028	247,482	73%
Snow Plowing - Graders/Loaders/4x4s	1,866,543	1,329,905	453,367	876,538	34%
Winter Ditching/Spring Clean Up	3,751,462	3,689,799	2,854,479	835,320	77%
Miscellaneous Winter Maintenance	8,771,523	5,612,438	5,895,710	(283,272)	105%
Total	25,107,516	17,850,112	14,941,738	2,908,374	84%

Figure 12 portrays the end result for the 2023-2024 winter season which shows an under expenditure of approximately \$5,204,000.

Figure 12 – 2023-2024 Winter Season Financial Summary

2023/2024 Winter Season Summary As of June 30, 2024			
	Season Budget	Season Actual	Variance
Snow Plowing/Sanding/Salting	8,051,827	6,510,610	1,541,217
Snow Removal	1,253,792	548,971	704,820
Winter Sidewalk Maintenance	1,383,430	1,010,804	372,627
Snow Plowing - Graders/Loaders/4x4s	1,749,038	545,828	1,203,210
Winter Ditching/Spring Clean Up	3,734,741	2,921,719	813,022
Miscellaneous Winter Maintenance	8,838,745	8,269,122	569,623
Total	25,011,573	19,807,054	5,204,520

Summary

As depicted in the report, this winter season had lower than average snowfall and higher than average warm days. The reduced snowfall led to fewer general callout events than are generally anticipated throughout the winter season. This also resulted in less salt and sand being deposited to maintain the roads and sidewalks.

Overall, calls to 311 related to winter maintenance were reduced. The weather also played a factor in the reduction of 311 calls. The sidewalk pilot was also introduced this year which was another potential contributing factor in the reduction of 311 calls created for sidewalk maintenance activities. Less sand deposited throughout the winter season also led to a reduction in 311 calls concerning street sweeping.

The financial surplus is a direct result of the factors mentioned above. A warmer winter with a reduced amount of snow lead to a decrease in the majority of winter activities. Less snow means lower snowbanks, which in turn means less snow removal for sightlines and narrow roads. This in turn creates favorable conditions in the spring with less run-off and requires less effort to open up ditches, culverts and catch basins.

To summarize, warmer temperatures and a reduction in snowfall are contributing factors in the reduction of 311 calls, reduction in material usage and a financial surplus position.

Resources

1. Operations Committee Report dated August 14, 2023, titled "Winter Maintenance Salt Routes Review 2023"
<https://pub-greatersudbury.escribemeetings.com/filestream.ashx?DocumentId=50499>
2. Canadian Climate Normals 1991-2020 (SUDBURY)
https://climate.weather.gc.ca/climate_normals/results_1991_2020_e.html?searchType=stnName_1991&txtStationName_1991=sudbury&searchMethod=contains&txtCentralLatMin=0&txtCentralLatSec=0&txtCentralLongMin=0&txtCentralLongSec=0&stnID=203000000&dispBack=1

3. Operations Committee Report dated September 18, 2023, titled "Winter Sidewalk Maintenance Service Standards Options for Implementation During the 2023-2024 Winter Season"
<https://pub-greatersudbury.escribemeetings.com/filestream.ashx?DocumentId=50956>