



Snow and Ice Control Annual Report (2019/2020)

Executive Summary

The City of Calgary is committed to the provision of a safe, customer focused, efficient and sustainable transportation system that supports mobility choices. The Roads Business Unit, in partnership with Calgary Parks and Calgary Transit, is committed to a well-maintained road, transit, sidewalk and pathway system in Winter for all travel modes and is responsible for The City's Snow and Ice Control (SNIC) Program Plan, based on Council Policy TP004.

Beyond providing reasonable winter driving conditions for 16,257 lane kilometres of roadways, SNIC services were provided for 715 km of pathway, 958 km of sidewalk, 136 traffic calming curbs, 17.6 km of walkways and pedestrian bridges, 9.2 km of separated bike lanes, 2431 traffic islands and medians, 1200 bus stops and 500 wheelchair ramps

Spotlight on the 2019/2020 SNIC Program

Above Average Snowfall

- The total snowfall for the 2019/2020 SNIC season was 190.7 cm, which is well above the average snow accumulations from the past 4 winter seasons (129.4 cm)
- Snow event #1 of this winter season started early: September 27, 2019 at 6pm. 34.4 cm of snow fell in Calgary during this three-day storm

Performance

- Roads achieved targets by completing SNIC on Priority 1 routes within 24 hours and Priority 2 routes within 48 hours for every snow event
- No snow route parking bans had to be activated during the 2019/2020 SNIC season
- From October 2019 to April 2020, Roads received 6,840 SNIC service requests (SRs)
 - 96.45% of all SRs were resolved at the first request
 - 99.43% of all SRs were completed on-time

Budget

- The 2019/2020 SNIC expenditures for roadways and various mobility infrastructure totalled \$49.8 million. The budget was \$38.9 million.
- The SNIC Reserve was reduced to \$0 during the 2019/2020 season, as \$1 million was withdrawn to help offset expenditures. Previously, \$4.4 million was withdrawn in 2018/2019, and \$8.1 million withdrawn in 2017/2018.
- For the 2020 fiscal year, the SNIC operation expenditures for the first half of the year were at projected levels: \$24 million. This leaves \$25 million for SNIC operations for the remainder of 2020.
- Council approved a one-time \$9 million commitment from the Fiscal Stability Reserve through the One Calgary process for the period of 2020 January to 2021 April for enhanced SNIC Services for pedestrians. \$3.9 million was spent in the first half of 2020.

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Introduction

The annual Roads SNIC Program Plan (Program Plan) provides detailed plans and strategies to meet the expectations set out in Council's SNIC Policy TP004 (SNIC Policy). The SNIC Policy and the Program Plan continue to evolve to stay ahead of changing weather patterns, funding levels, innovation, best practices and lessons learned. The SNIC Policy and Program Plan are established to address normal winter weather conditions, with strategies to address "extreme winter conditions" and "snow emergencies". Trained personnel and the required resources are deployed to provide safe mobility on city infrastructure during the SNIC season.

Background

The aim of the SNIC Policy is to provide reasonable winter driving conditions for vehicles/cycles that are properly equipped for winter driving; and are operated in a manner consistent with good winter driving habits. Council and Administration remain committed to the delivery of excellent SNIC services within a policy framework that is efficient, effective and fiscally responsible. Extreme winter conditions and snow emergencies that occurred in the 2013/2014 winter season are addressed in the plan as they are likely to occur again in the future. Council and Administration are aware that response to extreme winter weather conditions requires a systematic approach with stakeholder awareness and collective commitment to a safe and well-maintained road system for all travel modes.

In July 2018, Council directed Administration to enhance the SNIC services through a one-time \$9.5 Million budget commitment from the Fiscal Stability Reserve for each of the 2018-2019 and 2019-2020 SNIC seasons. The enhanced services are as follows:

- Provide SNIC services to additional 100 km of pathway
- Clear all sidewalks adjacent to City property within 24 hours
- Plow windrows away from high priority wheelchair ramp locations
- Communications campaign to advise residents of new fines and new responsibilities for each winter season (TV, Web, Radio, Print)

Seven Day Plan

The SNIC response is broken down into a Seven Day Plan. This plan allows us to quickly address the impact of any snow event on the mobility of our citizens and communicate the level of service. The plan is a systematic response that addresses high volume and high-risk transportation assets first and then moves to lower volume and lower risk assets. If another snow event occurs prior to completing the plan, our response resets back to Day One. Figure 1 provides additional details on the Seven Day Plan. The response timeframe was updated to include the enhanced service approved by Council in July 2018.

SNIC RESPONSE TIME FRAMES – SNOW EVENT START TO END

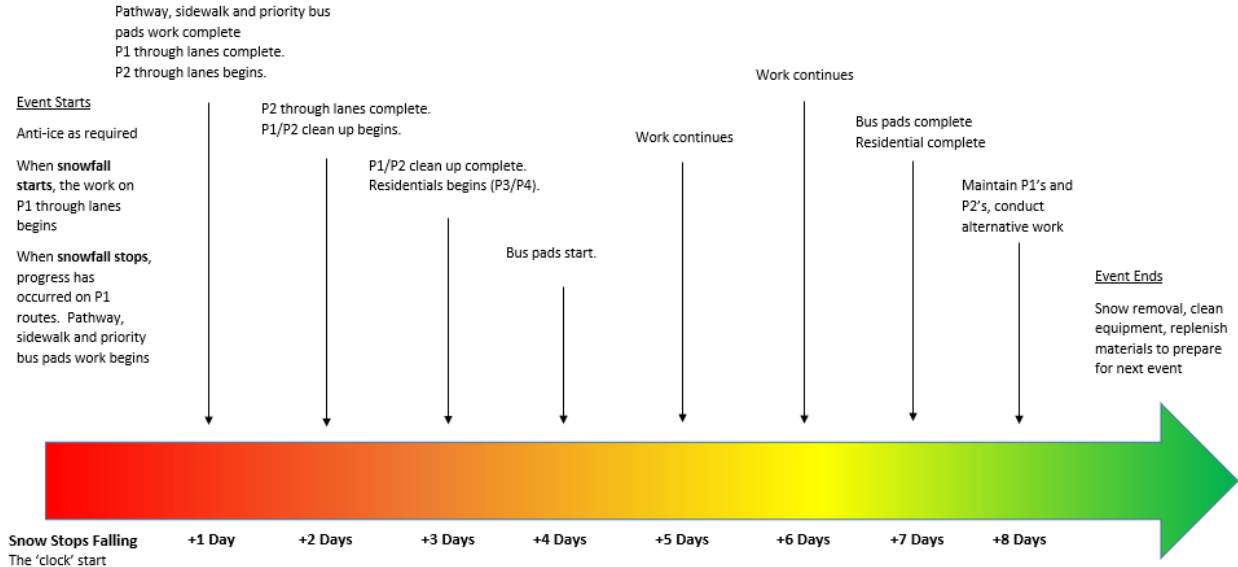


Figure 1: Seven Day Plan

During the 2019/2020 SNIC season it snowed 190.7cm, the highest amount of snow accumulations seen in the past 5 years. Maintenance activated the Seven Day Plan thirty-eight times in 2019/2020, beginning with a three-day storm from September 27-30 that deposited over 34cm of snow. Table 1 shows the snow fall comparison for the last five SNIC seasons.

SNIC Season					
Month	2015/16	2016/17	2017/18	2018/19	2019/20
	(cm)	(cm)	(cm)	(cm)	(cm)
September	0	0	0	1.8	34.4
October	3	4.4	1.4	48.4	15.8
November	11.6	2.9	27.4	27.9	43.4
December	24.1	26.1	32.2	14.9	20.5
January	15.3	14.5	11	10.2	3.9
February	1.8	35.8	43.3	33.8	21.5
March	2.4	16.7	41.9	8.2	28.8
April	0	7.2	24.6	16.9	22.4
May	0.2	0	0	7.7	0
Totals	58.4	107.6	181.8	169.8	190.7

Table 1: Season comparison 2015-2020

3-1-1 Service Requests

During the 2019/2020 SNIC season, Roads Maintenance received 6,840 service requests (SR). The top three SR types were Sand and Salt requests at 2789, Snow Plowing requests at 1702 and Snow and Ice causing flooding at 709. Table 2 shows the historical data from the past five six seasons.

Historical 3-1-1 Data					
	2015/16	2016/17	2017/18	2018/19	2019/20
Total SNIC SRs	5,529	14,308	27,710	8,787	6,840

Table 2: SRs from 2015-2020

Roads was able to adhere to our 3-1-1 service level completion agreement 99.43 per cent of the time. This is derived from ONTIME data (SR on time/SR count).

In addition, 96.45 per cent of all SRs were resolved at the first request, without the need to be re-opened.

The average response time of a SNIC SR open to close was 9.07 days (the average response time between SR created date to the date it was last closed for all SRs, excluding duplicates).

Snow and Ice Control Materials

Our Maintenance team uses four main SNIC materials in its operations: road salt (sodium chloride), sanding chips, calcium chloride brine and sodium chloride brine. Sanding chips are six-millimetre rock particles which contains with up to three per cent salt. The liquid brines help the material stick to the road surface and are also used as an anti-icing agent applied directly to the road surface. As an anti-icing agent, sodium chloride brine and calcium chloride brine perform over different temperature ranges. The sodium chloride brine is used during warmer winter temperatures whereas calcium chloride brine is used during colder winter temperatures.

A five-season comparison of SNIC material consumption is shown in Table 3. Road salt usage during the 2019/2020 SNIC season was 79,857 tonnes, which is approximately 19 per cent higher when compared to the past five seasons averages. Sanding chip consumption during the 2019/2020 SNIC season was 21,585 tonnes, which is approximately 51 per cent lower compared to the past five season average. Calcium chloride brine usage was also much lower (52%) than the average season, at only 345,942 litres.

Studies have shown that without pre-wetting, only 46 per cent of the material applied to a roadway will stay in the middle third of the roadway. However, if the material is pre-wet, 78 per cent will stay in the middle third of the roadway. This practice increases the efficiency of the sanders, reduces costs and helps minimize our impact on the environment.

SNIC Material Consumption					
SNIC Season	Road Salt/NaCl (tonnes)	Sanding Chips (tonnes)	Calcium/Sodium Chloride Brine (litres)	Snow Days	Snowfall (cm)
2015/16	45,082	24,891	491,230	25	58.2
2016/17	43,215	59,550	647,520	66	107.6
2017/18	84,286	67,322	1,033,869	62	181.8
2018/19	70,177	46,477	1,144,593	62	169.4
2019/20	79,857	21,585	345,942	69	190.7
Average	64,523	43,965	732,631	57	142

Table 31: Five-year comparison of SNIC materials consumption, snow days and total snow fall

Roads have conducted a trial using Beet 55 as an anti-icing and de-icing agent on pedestrian cycling infrastructure, Priority 1 and Priority 2 routes. Beet 55 is a trademarked liquid organic accelerator alternative to other anti-icing and de-icing products. When this is blended with salt brine at 65% salt brine and 35% Beet 55, the freezing point will be lower than by using pure salt brine but higher than by using calcium chloride at 30% concentration. Roads may broaden the scope of the trial.

Snow Storage Sites

The City retains three snow storage sites to manage snow removed from roadways. These sites are identified in Table 4 below:

Site	Address	Capacity (cubic metres)
Highfield	1320-50 Ave. S.E.	~600,000
Spring Gardens	1025-32 Ave. N.E.	494,100
Pumphouse	2140 Pumphouse Ave. S.W.	55,805

Table 4: Snow Storage sites

During the 2019/2020 winter season, snow removal activities were conducted where required on Priority 1 and Priority 2 routes, plus some residential roadways. \$1.4 million was spent on snow removal during the 2019/2020 SNIC season. This is significantly lower than in previous years: \$4 million in 2018/2019 and \$5.9 million in 2017/2018 SNIC seasons.

In 2018, the Highfield snow storage size was reduced by approximately 10% due to land required by Green Line LRT Project.

As an alternative to removing and storing snow, Roads Maintenance reviewed the effectiveness of Mechanical Snow Melter equipment. However, it was determined that the resulting water from the melting process would not meet environmental guidelines for discharging into the storm water system.

Budget Review 2019/2020

The graph in Figure 2 shows our SNIC budget and actual expenditures compared to snow fall and snow days for the past 5 seasons.

During the 2019/2020 SNIC season, 190.7cm of snow was reported to have fallen in the City of Calgary over 69 snow days. This amount of snow was 32 per cent higher when compared to the average of the previous 4 years.

Budget expenditures for the 2019/2020 winter season totalled \$49.8 million. Expenditures by category were as follows: Equipment (36.5 per cent), Labour (46.7 per cent) and Materials (16.8 per cent). Equipment and labour costs are the main costs and don't change proportionally to the snow fall. When crews aren't working on SNIC, they'll work on environmental control, winter sweeping, depot maintenance and pothole repairs.

The current balance in the SNIC Reserve is \$0. At the fiscal end of 2019, Transportation withdrew \$1 million to help offset SNIC expenditures. Previously, \$4.4 Million had been withdrawn from the SNIC Reserve in the second quarter of 2019, and \$8.1 million had been withdrawn in 2017/2018.

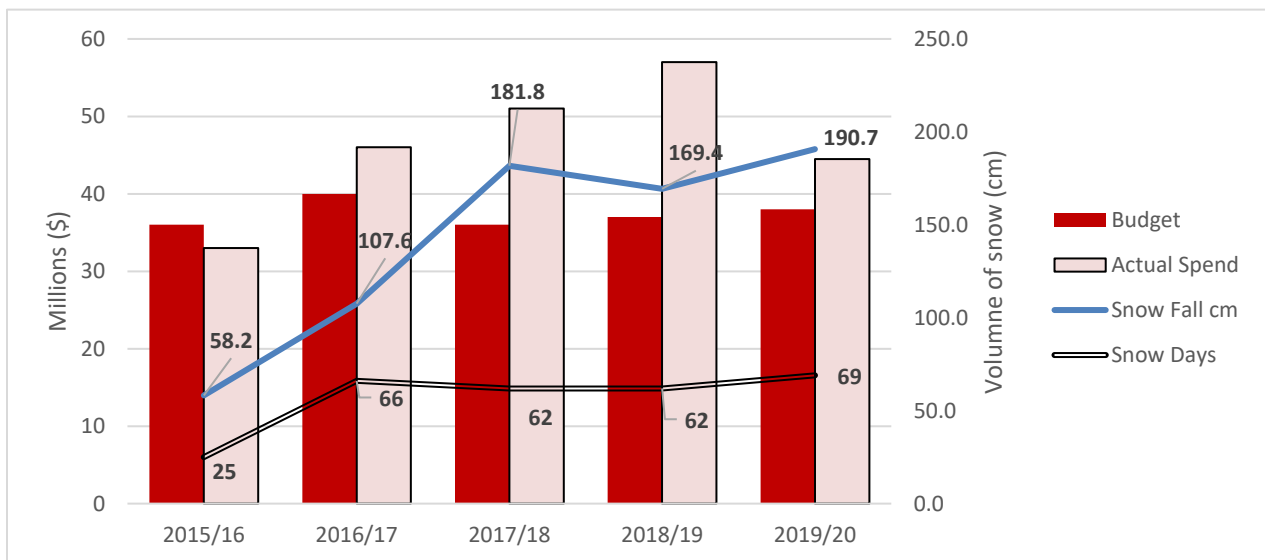


Figure 2: Expenditures and snow days 2014-2019

SNIC Budget Details

The tables below show the annual SNIC budget and actual cost for the winter season of 2019/2020.

Line #	Activity	For the period of October 2019 to December 31 2019	
		Budget	Actual
1	Snow Removal P1 and P2	232,077	1,050,356
2	Snow Removal Residential	570,393	1,238
3	Ploughing P1 and P2	617,340	698,227
4	Sanding and Salting P1 and P2	8,035,000	11,970,578
5	Residential Sanding and Ploughing	1,140,888	2,160,918
6	Transit SNIC LRT Stations*	-	379,586
7	Transit SNIC Bus Zones*	-	1,123,793
8	Snow Dump Site Maintenance	47,718	-
9	Separate Bikeways	138,816	93,926
10	Snow Fencing	69,872	76,521
11	Anti Icing	157,676	216,288
12	Material Handling and Storage	90,457	79,177
13	Sidewalk SNIC Clearing	1,082,217	1,924,501
14	Winter Supplementary Work**	1,694,649	2,102,812
15	Winter Operation		21,877,922
16	SNIC Reserve ***		(1,059,318)
17	2019 TOTAL	13,877,102.41	20,818,604.45

*The Calgary Transit budget and expenditure details are noted in Table 7 below

**Includes environmental control, sweeping, depot maintenance, pothole repairs.

***This transfer was for SNIC 2019

Table 5: 2019 SNIC expenditures and budget

Line #	Activity	For the period of October 2019 to December 31 2019	
		Actual	Recovery
1	Transit SNIC LRT Stations	379,586	364,459
2	Transit SNIC Bus Zones	1,123,793	1,080,479

Table 6: Calgary Transit-2019 SNIC activity expenditures versus recovery

Line	Activity	Year to Date – For the period of January 2020 to April 30 2020		Variance	Fiscal Year 2020
		Budget	Actual	Per cent	Budget
1	Snow Removal P1 and P2	370,016	324,373	49	574,549
2	Snow Removal Residential	1,750,939	35,164	98	2,273,703
3	Ploughing P1 and P2	531,377	463,650	7	1,555,343
4	Sanding and Salting P1 and P2	15,089,860	14,095,220	19	24,049,846
5	Residential Sanding and Ploughing	2,946,269	3,140,905	(7)	3,709,547
6	Transit SNIC LRT Stations*	0	454,634	0	0
7	Transit SNIC Bus Zones*	0	1,127,605	0	0
8	Snow Dump Site Maintenance	39,843	187	100	119,529
9	Separate Bikeways	156,309	139,227	11	342,851
10	Snow Fencing	42,570	25,952	39	174,320
11	Anti-Icing	131,655	232,450	(77)	394,964
12	Material Handling and Storage	178,724	50,538	72	476,124
13	Sidewalk SNIC Clearing	1,174,836	1,546,715	(32)	11,743,971
14	Winter Supplementary Work**	1,815,755	2,045,415	(40)	4,066,438
15	Winter Operation	24,228,153	23,682,037		49,481,184
16	SNIC Reserve Fund Transfer		371,879		
17	2020 Total	24,228,153	24,053,916		49,481,184

Table 7: 2020 SNIC expenditures and budget

Line	Activity	Year to Date – For the period of January 2020 to April 30 2020	
		Actual	Recoveries
1	Transit SNIC LRT Stations	454,634	235,960
2	Transit SNIC Bus Zones	1,127,605	638,868

Table 8: Calgary Transit 2020 YTD expenditures and recoveries

Enhanced SNIC Services

Council directed Administration to enhance the SNIC services through a one-time \$9 million budget commitment from the Fiscal Stability Reserve for 2019 and 2020. The funds were added into the SNIC Reserve. The enhanced services are as follows:

- Provide SNIC services to additional 100 km of pathway
- Clear all sidewalks adjacent to City property within 24 hours
- Plow windrows away from high priority wheelchair ramp locations
- Communications campaign to advise residents of new fines and new responsibilities for 2018/19 winter season (TV, Web, Radio, Print)

With the enhanced SNIC services, the pathways and sidewalks snow clearing must be completed 24 hours after snow stops. The City provide services to 715 km of pathway, 958 km of sidewalk, 136 traffic calming curbs, 2,431 traffic islands and medians, 17.6 km of walkways and pedestrian bridges, and 165 miscellaneous locations (including stairs).

500 wheelchair ramp locations were selected for enhanced windrow clearing. During the clearing of traffic islands and medians, the windrows in front of crosswalks are cleared. In addition, the windrows will be cleared if any pathway and sidewalk snow clearing route goes through a wheelchair ramp.

Roads received feedback from the Advisory Committee on Accessibility. Below are the highlights of the comments received:

- *Lane aprons continue to be unaddressed*
- *Yes, I believe the extra funding and focus has helped to improve the snow clearing for pedestrians. While additional funds may help with addressing more locations, training and understanding mobility challenges can help City staff/contractors take better care when clearing areas. This awareness has started and will hopefully continue to improve.*
- *Challenges continue with sidewalk areas that have been cleared, then snow clearing vehicles come afterward and create issues. This highlights the need for vehicle drivers to also understand the mobility challenges faced by pedestrians, and for a coordinated approach to snow clearing.*
- *Can some of the additional funding be used for an awareness campaign that is focused on public education rather than punitive measures?*
- *Private sidewalks continue to be a challenge. While notices and fines have helped, again awareness and understanding are critical. Since becoming more involved with accessibility, I have become much more diligent in clearing my own snow - I now have an attitude that I am doing it for my neighbours and commuters, rather than I have to do it to avoid fines.*

With the knowledge gained after the first season with Enhanced SNIC Services, Roads will continue to work with stakeholders to improve the experience for pedestrians during the winter seasons.

Roads will continue to identify efficiencies for Enhanced SNIC Services to reduce the cost of providing this service.

Table 9 below shows the SNIC expenditures on pathways and sidewalks during the 2019/2020 winter season.

For the period of October 2019 to December 31 2019				
Sidewalk SNIC Clearing	Department	Budget	Expenditures	Recovery from Enhanced Budget
	Roads	1,082,217	1,924,501	842,284
	Parks	337,824	1,753,347	1,415,523
	2019 Total	1,420,041	3,677,848	2,257,807
For the period of January 2020 to May 31 2020				
Sidewalk SNIC Clearing	Department	Budget	Expenditures	Recovery from Enhanced Budget
	Roads	1,174,836	1,546,715	371,879
	Parks	1,017,856	3,268,089	2,250,233
	2020 Total	2,192,692	4,814,804	2,622,112
2019/2020 Season Total		3,612,732.85	8,492,652.33	4,879,919.14

Table 9: SNIC expenditures on pathways and sidewalks during the 2019/2020 SNIC season

SNIC to Improve Access for those with Mobility-Challenges

In the One Calgary Budget, \$2 million was allocated to improve accessibility for citizens with mobility challenges during the SNIC season. This funding was initially allocated in the 2015 to 2018 Action Plan. During the spring of 2015, the mobility-friendly program focused on bus pads and bare pavement bus stops with large windrow accumulation. These locations included bus stops with high numbers of transit ramp deployments (to assist citizens with mobility challenges), including hospitals, senior homes, and locations where mobility-challenged individuals frequently visit. Snow clearing would begin during the snow event and continue until all the identified locations were clear following the snow event. Calgary Transit and CN worked together to provide a list of priority locations. Calgary Transit controlled funding for this program. Roads have a contract in place that would allow this work to be completed as on-demand SNIC work.

During the 2019/2020 SNIC season, Roads' contractor provided service to over 1200 bus stop locations and 5.15 km of sidewalk.

SNIC for Bike Lanes

The City's cycle track, bike lanes, multi-use pathways, neighbourhood greenways (bicycle boulevards), shared lanes, and signed bicycle routes all contribute to mobility choices. The City has approximately 8 km of cycle track that is cleared within 24 hours after snow stops falling. All 44 km of marked, on-street bike lanes are swept within 48 hours after snow stops falling.

- Cycle Track **9.2 km**
(SNIC clearing priority the same as all downtown roadways, within 24 hours)
- Bicycle Lane: **46.2 km**
(SNIC Clearing within 48 hours)
- Shared Lane: **19.5 km**

- (SNIC Clearing same as the Priority as the road it is on)
- Neighbourhood Greenway: **16.0 km**
(SNIC Clearing same as the Priority as the road it is on)
- Signed On-Street Bikeway: **328.1 km**
(SNIC Clearing same as the Priority as the road it is on)

P1 Route Collision Data

One of the goals of SNIC activities is to provide for safe movement of citizens. Comparison of collisions during the last five calendar years of complete collision data (Figure 3) shows that Priority 1 SNIC routes generally have 4 per cent fewer collisions attributed to ‘Slush/Snow/Ice’ road surface conditions than other routes, resulting in approximately 750 prevented collisions per year. In 2019, the number of ‘Slush/Snow/Ice’ related collisions decreased compared to 2018 for all metrics, including Priority 1 routes, all roads, and for population rate on Priority 1 routes.

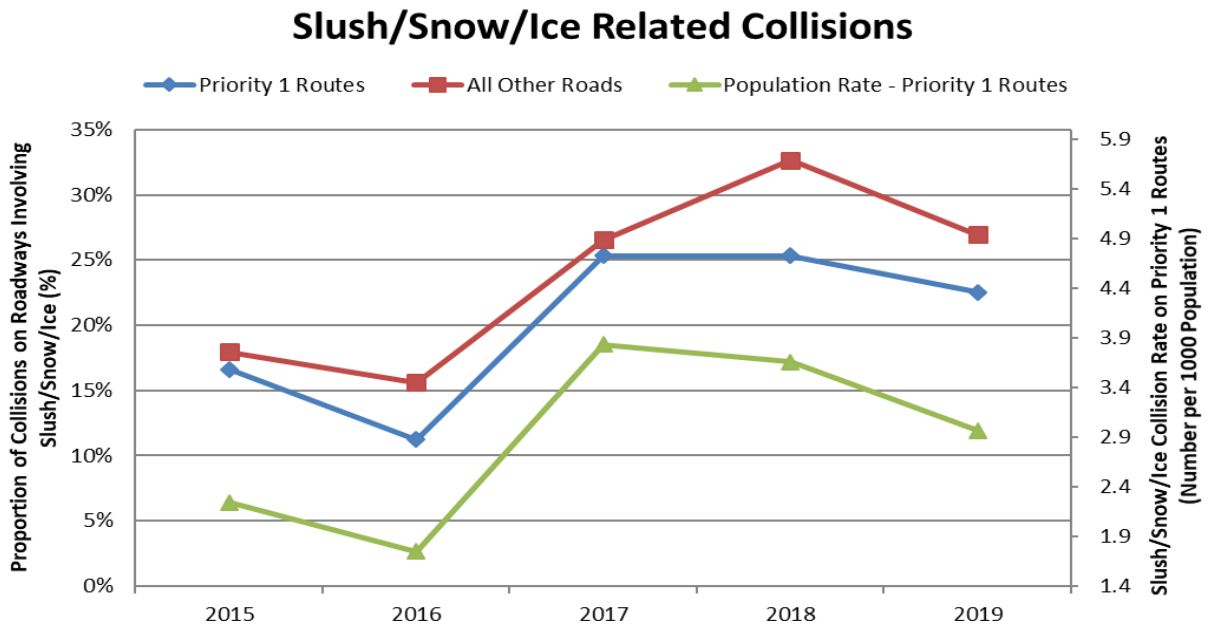


Figure 3: Snow Related Collisions

SNIC Policy Metrics

The SNIC program service levels are based on the Council-approved SNIC Policy. The purpose of the policy is to:

- Maintain reasonable conditions on roadways and sidewalks to minimize hazards and economic loss to the community
- Ensure safe access for emergency vehicles providing Fire, Police and Emergency Medical Services
- Provide guidelines for management and operating personnel to handle winter maintenance operations

- Outline citizens' responsibilities regarding sidewalk snow and ice control on private property

To align with the approved SNIC service levels outlined in the SNIC Policy, three Key Performance Indicators (KPIs) were identified (See Figure 4: Roads Maintenance KPIs and Performance Achieved).

Roads Designation	Response Time
Priority 1 Routes	Through lane ploughed and sanded completed within 24 hours of the end of snowfall (100% sanded/salted and 90% ploughed)
Priority 2 Routes	Through lane ploughed and sanded; completed within 48 hours of the end of snowfall (100% sanded/salted and 90% ploughed)
Priority 3 Routes	Within 4 days after Priority 2 routes complete (sanded and ploughed when temperature conditions allow)
Priority 4 Routes	Within 4 days after Priority 2 routes complete (sanded and ploughed when temperature conditions allow)

Figure 4: SNIC service levels

Performance Indicators	2019-2020 Achieved
Percent of time Roads completes SNIC on Priority 1 through lanes within 24 hours. (100% sanded/salted and 90% ploughed)	100%
Percent of time that Roads completes SNIC on Priority 2 through lanes within 48 hours. (100% sanded/salted and 90% ploughed)	100%
Satisfaction with road travel conditions due to Snow and Ice Control.	*77%

*The Roads Annual Survey conducted by NRG Research Group. was completed in 2018.

Figure 5: Roads Maintenance KPIs and Performance Achieved

2019/2020 Snow Route Parking Bans

A Snow Route parking ban may be considered when a snow accumulation of five centimetres or greater is forecast. Snow routes include major roadways and most bus routes. A major advisory is issued when a snow event is expected in the forecast. This advisory is meant to serve as a warning that parking bans may soon be in effect on snow routes. Vehicles should be moved as quickly as possible following the notice. Vehicles that remain parked on these roads during the ban are subject to enforcement, up to and including a parking tag and tow. Business Improvement Areas (BIAs) and the downtown core have overnight bans (9 pm. to 6 am.).

However, during the 2019/2020 winter season, no snow route parking bans were activated.

Personnel, Equipment and Infrastructure

The Roads Business Unit commits personnel, material, equipment, infrastructure, capital and operational funds to SNIC operations as follows:

- 430 personnel working rotating shifts, available 24/7 throughout the season
- Material, including equipment consumables (i.e. plough blades) and snow remediation substances (salt, de-icing liquids and abrasives).

The various machinery and equipment include:

- 78 City owned tandem trucks and 15 leased trucks equipped to plough and apply materials
- 27 graders
- 9 snow blowers
- 11 smaller single axle trucks equipped to plough and apply materials in residential areas such as cul-de-sacs where tandems are unable to work
- 9 front-end loaders

SNIC Contractors and Hired Equipment

The City retains the service from contractors to augment City personnel and equipment for SNIC operations. Our Maintenance Division and Parks, in conjunction with the Supply Management Division, has contracts to provide the following SNIC services:

- Transit Trouble Spots: 219.53 lane-km
- District Trouble Spots: 503.81 lane-km
- 1247 Priority bus pads
- 958.4 km of sidewalks
- 715.3 km of pathways
- 2431 traffic islands and medians
- 17.6 km of walkways and pedestrian bridges
- 165 miscellaneous locations, including stairs.
- 136 traffic calming curb locations

Our Maintenance Division also engages the Fleet Services business unit. Fleet Services maintains a rental equipment tender and hired truck contract that is reviewed every two and six years respectively. In 2019, a hired graders contract was issued to the market and the City was unable to obtain enough bids from contractors to meet the number of hired graders requested.

Roads infrastructure includes nine district depots and three snow storage sites, as well as the right-of-way infrastructure. The 2019/2020 SNIC season budget provided the maintenance operations support for the right-of-way infrastructure shown below:

Infrastructure Right-of-Way				
Description	Lane-km	Linear-km	SNIC Service	Quantity
Expressways	1,604	404	Yes	-
Arterial Roadways	2,273	652	Yes	-
Collector Roadways	4,129	1,305	Yes	-
Residential Streets	9,452	3,387	Yes	-
Gravel Roadways	297	125	Yes	-
TOTAL	17,755	5,873	-	-
Back Lanes Paved	1,092	509	As required - WRS*	-
Back Lanes Gravel	2,066	1,196	As required - WRS*	-
Separated Bike Lanes		9.2	Yes	-
Bicycle Lane		44.6	Yes	-
Shared Lane		18.8	Yes – same priority as adjacent roadway	-
Neighbourhood Greenway		16		-
Signed On-Street Bikeway		327.9		-
Sidewalks (Roads)	-	5,749	Yes – 958	-
Engineered Walkways	-	-	No	2078
Vehicle Bridges	-	-	Yes	194
Pedestrian Bridges	-	-	Yes	149
Park Bridges	-	-	Yes	132
LRT Bridges	--	--	Yes - select locations	33
LRT Stations	--	--	Yes - select sidewalks	47
Bus Zones	--	--	Yes	6,144
Stairs/Steps	--	--	Yes	2,947

Data obtained from The City's ArcGIS. *WRS – Waste and Recycling Services business unit

Table 10: Infrastructure Right-of-Way

Common Fleet Operating System (CFOS)

The City has 663 units equipped with the CFOS. 118 units are cellular, meaning real time data; 491 are WIFI units, which will upload recorded data when at a WIFI hotspot (located in most depots near certain building and/or fuel pumps); and 54 of the Global Positioning System (GPS) units are mobile (can be moved from truck to truck) in order to accommodate our growing rental fleet, as well as outfit short term City contractors. Using this GPS data, Roads is now able to automatically update the public facing SNIC maps, displaying our progress status to the public. Sanding routes change color automatically to show their maintenance status. The SNIC Road Conditions map can be found at Calgary.ca.

Calgary Road Conditions Map

Roads continues to use the public map that shows live updates on the snow and ice maintenance status on our roadways. This map also shows the current location of the snow ploughs.

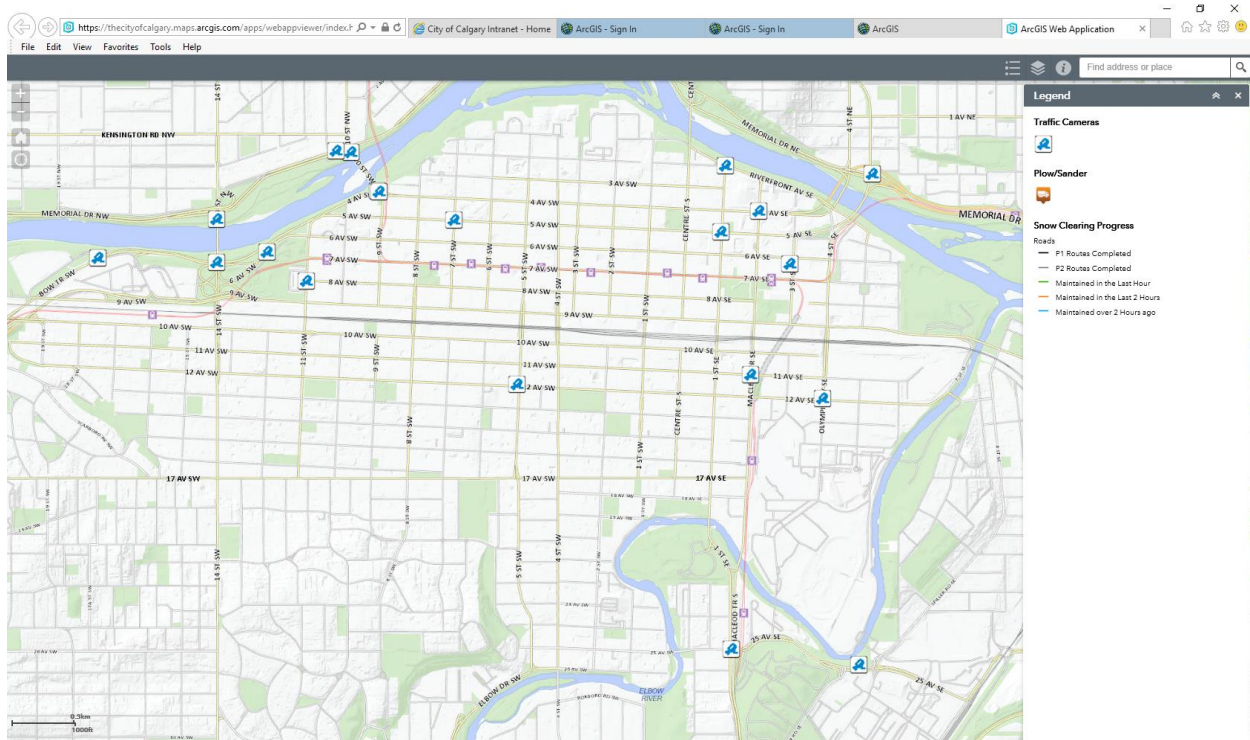


Figure 6: Calgary.ca Road Conditions Map

Additional Information

Please visit The City's Snow and Ice Control webpage at Calgary.ca for more information on the Seven-day Snow Plan, SNIC clearing updates and Snow Route parking bans

Glossary

BIA	Business Improvement Area
CFOS	Common Fleet Operating System
CN	Calgary Neighbourhoods
CPS	Calgary Police Service
CSC	Customer Services & Communications
GPS	Global Positioning System
KPI	Key Performance Indicator
LRT	Light Rail Transit
SNIC	Snow and Ice Control
SR	Service Request