

SIDEWALK SNOW REMOVAL IN QUÉBEC CITY'S CENTRAL NEIGHBORHOODS: FOCUS ON PEDESTRIAN SAFETY AND ACCESS

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ABSTRACT RÉSUMÉ

Sidewalk snow removal in Québec City's central neighborhoods is challenging for a number of reasons.

Winter in Québec City is characterized by frequent, heavy snowfalls. Snow piled up on the side of the street awaiting removal to a snow dump poses an obstacle for pedestrians, particularly those with mobility impairments.

Many sidewalks in central areas are narrow, rife with utility poles and steps, and bordered by building façades on one side and parked vehicles on the other. As a result, snow removal vehicles have little or no access to sidewalks.

In these densely populated neighborhoods, the needs of vehicle owners who want free street parking close to home must be weighed against the needs of pedestrians who want safe sidewalks to walk on.

This paper discusses the City of Québec's efforts to address the situation through a continuous improvement process, with the final objective being pedestrian safety.

1. QUÉBEC CITY

Québec City is the capital of Québec, a province in eastern Canada. The city was founded in 1608 and is the birthplace of French America. Because of its historical character, it is a major North American travel destination. In 2010, it hosted the World Road Association's International Winter Road Congress. Its population as of 2011 was 516,620.



Photo 1 – Geographic location of Québec City (Source: Wikipedia)



Photo 2 – Québec City in winter. View from the south shore of the St. Lawrence River. (Source: Wikipedia)

1.1. Snow Removal Overview

The City removes snow from 2,286 kilometers of two-lane streets and 1,160 kilometers of sidewalks. Almost all streets in the central neighborhoods have sidewalks. Each winter, between November and April, large amounts of snow fall on the city (about 300 cm on average). The annual snow removal budget is around C\$60 million and varies by total snowfall.

2. MAIN SIDEWALK SNOW REMOVAL ISSUES

2.1. Sidewalk Width, Obstacles, and On-Street Parking

The sidewalks in central neighborhoods were not originally designed for mechanized snow removal. Before the City took over responsibility for sidewalks in the 1970s, residents maintained the stretch of sidewalk in front of their property. Utility poles, steps, and other obstacles were not a problem when snow was cleared with shovels, but many sidewalks are simply not wide enough for today's mechanized snow removal. Cars parked on the street and other sidewalk obstacles aggravate the problem. Many residents depend on the street for parking because it's free. Photograph 3 shows a sidewalk that can't be cleared mechanically all the way along because of the utility poles blocking the snow clearing equipment. Photograph 4 shows a situation where sidewalk width is insufficient because of the parked cars. This means the sidewalk simply won't get cleared as long as the cars are there.



Photo 3 – Sidewalk snowplows have to go around obstacles



Photo 4 – Steps and parked cars can prevent snowplows from getting through

2.2. Snowmelt from Roofs

Many buildings adjacent to the sidewalk have roofs that slope towards the street. Some have no gutters, while others have downspouts that drain right onto the sidewalk. When rooftop snow melts in the sun, the water ends up on the sidewalk and freezes in the shade. The ice builds up each day and becomes a walking hazard. This occurs between snowfalls when snow has already been removed. **The ice is difficult to remove because it is so thick.** Photographs 5 and 6 show sidewalks rendered unusable by ice. Pedestrians have to walk on the road, which is not a safe alternative.



Photo 5 – Downspout draining directly onto the sidewalk



Photo 6 – Ice formed by water dripping from a roof onto the sidewalk

2.3. Curbside Snow Buildup

Street plowing can hinder sidewalk snow removal. Whenever streets are plowed, snow is piled up along the curb. Pedestrians then have to climb over the snow when they cross the street. Since snowfalls are frequent and heavy, this is particularly troublesome. Persons with reduced mobility find it difficult or impossible to cross the street.

3. ADAPTING SNOW REMOVAL AND MAKING IT BETTER

Over the years, the City of Québec has developed, and continues to develop, approaches and guidelines to improve sidewalk snow removal and help pedestrians get around safely.

3.1. The Snow Removal Policy [1]

The City of Québec's Snow Removal Policy contains the snow removal authorization criteria, which focus primarily on pedestrian safety. The policy also sets out the levels of service and time frames for snow removal. In central neighborhoods, snow removal, including hauling, is done quickly (usually overnight) in order to clear sidewalks for pedestrians as quickly as possible. This may seem like a fast turnaround, but it is essential given how often and how heavily it snows. Snow buildup in the streets is a serious obstacle for pedestrians when it is not removed expeditiously before it snows again.

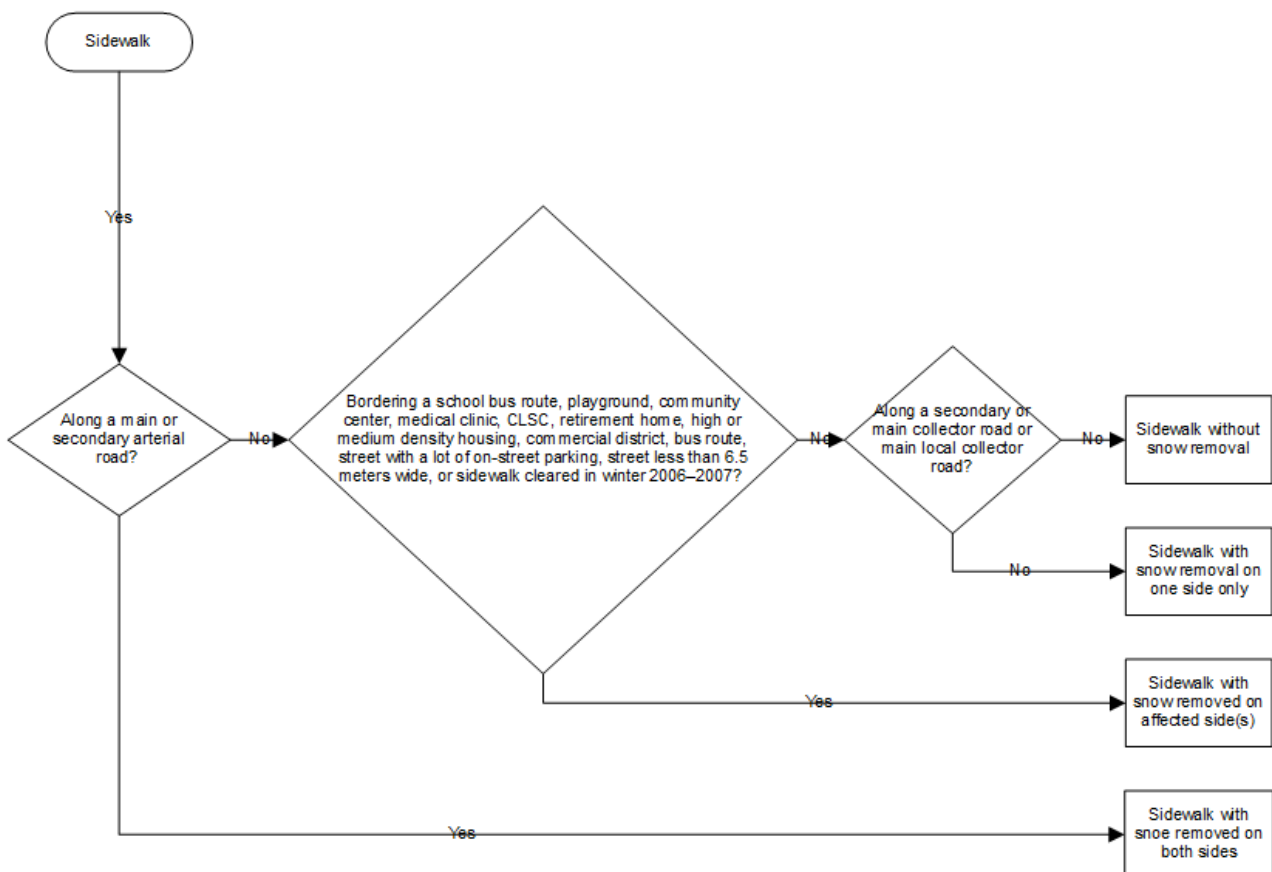


Figure 1 – Chart depicting the sidewalk snow removal authorization criteria (Source: City of Québec Snow Removal Policy)

3.2. Snow Removal Specifications

To address the problem of piled-up snow blocking crossings at intersections, the snow removal specifications require that contractors keep sidewalks free of snow at intersections when they clear them. This also applies in areas where the City performs its own snow removal. Photograph 7 shows a crossing cleared by the sidewalk plow.



Photo 7 – Sidewalk snow clearing at an intersection

The City's specifications also address the issue of snowmelt that falls from roofs and freezes on sidewalks. Contractors must be on the lookout for this ice and adjust their operations to keep sidewalks safe.

3.3. Street Parking Bylaws

Sidewalk snow removal is often impossible when cars are allowed to park on the street, either because there are obstacles in the way or not enough room is left for sidewalk snowplows to get through. The City installed a warning system throughout the central area in 1988 to address this issue. Residents know to prepare for snow removal and deicer and abrasive spreading when they see the lights flashing, minimizing the time cars have to be off the road. The system has been very effective. Car-free roads mean that snow can be removed efficiently; one night is generally all it takes. The system was updated in 2011 to allow computer activation of any lights either individually or in groups. Photograph 8 shows one such light. Lights in central neighborhoods are placed so that they can be seen from each block. They are orange in color to make them easier to distinguish from other light sources.



Photo 8 – A snow removal flasher

To improve sidewalk snow removal when parking bans are not in effect, Public Works is putting together a list of streets where the parking ban could be applied to the side of the street with no utility poles or other obstacles. That way one sidewalk could be kept completely snow-free at all times. Note that the unobstructed sidewalk in photograph 9 is a no-parking area so that snow can be removed anytime.



Photo 9 – Parking arrangement conducive to single sidewalk snow removal

3.4. Standards for Streets and Sidewalks

Public Works has teamed up with other departments responsible for streets and sidewalks to ensure that snow removal requirements are taken into account. There must usually be two meters of unobstructed sidewalk width for snow removal to take place when cars are parked on the street. Sidewalks may be as narrow as 1.75 meters at certain points if utility poles and steps are present, but because of built structures and parking and traffic requirements, sidewalks are sometimes even narrower. Innovative or compromise solutions are then devised, often with input from local residents. Photograph 10 shows an innovative share-the-street initiative where the narrow sidewalks alongside the buildings are not served by City snow removal but may be cleared by residents. Pedestrians walk in the middle of the street. The advantage here is that the middle of the street is always

plowed, whether cars are parked on the street or not. Pedestrians were walking in the middle of the street before the system was brought in for that very reason.



Photo 10 – Share-the-street system with markings showing pedestrian walkway

Whenever work is done on streets and sidewalks, downspouts are connected to the storm drain system if possible. This is a gradual fix to the problem of roof snowmelt.

4. CONCLUSION

The aforementioned initiatives are all part of a process of continual improvement to make sidewalks more accessible and pedestrians safer. Nevertheless, these objectives and the proposed improvements often conflict with other needs, including on-street parking, sidewalk greening, and aesthetic beauty. It is always difficult to reach a consensus, and solutions often entail some degree of compromise. Those responsible for snow removal must therefore make it clear that making snow removal more effective and efficient will enhance pedestrian safety as well.

REFERENCES

City of Québec Snow Removal Policy (2009),
http://www.ville.Québec.qc.ca/publications/docs_ville/politique_deneigement.pdf (French only)