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STAYING ACTIVE IN THE SNOW

Results and Analysis: Active Transportation Winter Maintenance Survey

February 2021

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City of Ottawa*

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Prologue

The winter of 2018-2019 was arduous for Ottawa residents. The city experienced multiple extreme weather events that created barriers and hazards to city residents for days and weeks on end. Residents felt left behind by the snow clearing standards that had been set nearly 20 years earlier.

It was in this context that the councillor offices for the city's five urban wards—Catherine McKenney (Somerset Ward), Jeff Leiper (Kitchissippi Ward), Mathieu Fleury (Rideau-Vanier Ward), Shawn Menard (Capital Ward) and the office of Rideau-Rockliffe Ward (which was without a councillor at the time)—held a public forum on urban snow clearing, attended by residents and city staff.

Something had to change.

Each year, winter weather brings significant and diverse challenges to residents of Ottawa—including: *how can I get around the city?*

The City of Ottawa is currently in the process of updating its Winter Maintenance Quality Standards (WMQS)—policies that determine how snow and ice is cleared from our streets, sidewalks, pathways and bicycle lanes. These standards guide the efforts of city staff as they conduct daily maintenance of our streets during the winter months.

If we are to get this right—if we are to develop WMQS that properly and sufficiently support our residents—we must listen them, and we must amplify their voices.

As Ottawa is such a diverse city, both demographically and geographically, there are many voices to be heard. Too often, the experiences of pedestrians and bicyclists are under-represented in research regarding winter snow clearance; hence, as the city's review of WMQS began, our office reached out to the public, asking residents to share their unique experiences getting around in Ottawa winters while walking, rolling, running, sliding or riding.

This subsequent report, *Staying Active in the Snow*, focuses on their experiences and is meant as a supplement to our broader document on snow clearance released last year, *Getting Around in the Winter: Winter Operations and Snow Clearing Report*. Both reports will be submitted to city staff to inform the WMQS refresh.

Executive Summary

Ottawa is a winter city. The weather dictates that we must endure months of snow, ice and cold temperatures. While the city and residents may acknowledge this, we can do more to embrace it.

If we are to be the most prosperous, sustainable city we can be during the winter months, we should enact policies that will let residents live full, rewarding lives during winter. We must remain devoted to mobility, health and wellbeing, as well as the environment.

Current city standards do not put a priority on winter mobility, or on mental health, safety or economic activity during winter months. The survey showed that many residents don't feel safe on our sidewalks, paths or bicycle lanes. They don't feel as secure as they could going outside in the winter.

Winter maintenance of pedestrian and bicyclist infrastructure is not just an issue of transportation; it is a matter of the social, economic and physical wellbeing of our community. Winter maintenance determines whether social connections are made in the cold winter months; whether local shops are frequented as much; whether residents feel isolated, or alone; whether they feel safe; or whether they are at risk of injury when they try to go outside.

The decades-old standards of winter maintenance need an update to better serve the needs of our residents, our community or our city. Residents are at a regular risk of slipping and falling on poorly maintained sidewalks, paths and bicycle lanes. This hazard deters them from going out, reducing trips, dampening economic activity and increasing social isolation. Residents may risk their physical health using the city's active transportation network, and their mental health if they choose not to go out much at all.

Residents who can avoid using active transportation often do. Residents are forced to drive, causing more pollution. And when they drive, they are less likely to shop at local businesses, hurting our economy.

Of course, not everyone has the choice to drive or to stay home. While many residents consider the risk of the city's active transportation network and make an informed decision to use it, others have no other options and venture out onto our sidewalks, paths and bicycle lanes, no matter what.

Women are more likely to use sidewalks than men. They are also more likely to walk to a bus stop than men. People with lower incomes are less likely to drive and are more likely to use active transportation.

Poor winter maintenance of our active transportation network is a cost that is disproportionately imposed on the most vulnerable and marginalized people in our communities. Without an eye towards equity, our winter maintenance standards will further perpetuate this.

The Purpose of Winter Maintenance and Snow Clearing

To properly develop winter maintenance standards that will bring the greatest benefit to residents, we should understand the purpose of winter maintenance and snow clearing. Winter maintenance should support residents' mobility needs. It should help people get from one place to another, quickly and efficiently, and it must allow people to get outside for the benefit of their mental and physical health.

Decisions on winter maintenance require the application of an equity lens. Policies must be developed to help all people, regardless of physical ability, gender, income or location. Explicitly stating the goals and purpose of winter maintenance would help guide policy-makers and staff as they develop and implement the new, updated WMQS. Such a statement could read:

Winter Maintenance Quality Standards should ensure that all residents are able to move about the city safely and comfortably using their preferred mode of transportation. The WMQS should support the city's goals for transportation, modal share, and fighting climate change. The WMQS should facilitate greater winter mobility, enhance mental and physical health, and foster economic activity and financial wellbeing.

If the city wishes to truly realize these goals and create a more accessible, sustainable and livable city for all residents throughout the entire year, then winter maintenance operations must be focused on achieving the following *Five Principles of Urban Snow Clearing*:

- **Accessibility:** WMQS and WMO should be structured to ensure our city is accessible to residents with mobility issues. Sidewalks, crosswalks, pathways and bus stops must be sufficiently cleared and maintained so that all residents can access them.
- **Equity:** City operations must be modernized so that they are equitable. Decisions must be made as to which sidewalks, bicycle lanes, pathways, laneways and roads get priority snow clearance, but those decisions must be made in a way that ensures residents are treated equitably, regardless of gender, age, income level or mode of transportation.
- **Sustainability:** Our current WMO foster and encourage car dependence, as roads—even those without bus routes—are given a higher level of service than sidewalks, bicycle lanes and pathways. As the city has declared a climate emergency and will be seeking to reduce or eliminate our contribution to climate change, city operations must support and encourage efforts to reduce our carbon footprint. Further, operations should be conducted in the most environmentally-friendly way possible. This includes using less salt and incorporating more electric vehicles into the city fleet.
- **Climate Change Resiliency:** The city and residents understand that anthropogenic climate change has drastically and irreparably changed Ottawa weather patterns. Paradoxically, unpredictability is now predictable. We cannot expect winter seasons to reflect past winter weather, and our WMO must be prepared to change and adapt

with this new reality. Sufficient resources, quicker response times and service delivery flexibility must underpin changes to the WMQS.

- **A Healthy and Livable City:** Ottawa is going through a transformation. The need to create a healthier and more livable city is acknowledged in recent changes to city planning and policies. This new dedication cannot be confined to just three seasons a year. Residents need to be able to get outside, be active, avoid social isolation and live in community with other Ottawans throughout the entire year. Winter Maintenance Operations must allow for active lifestyles and vibrant communities.

These five principles will help to ensure that all residents are treated fairly, and that Ottawa can be a lively, healthy and prosperous winter city.

About this Report

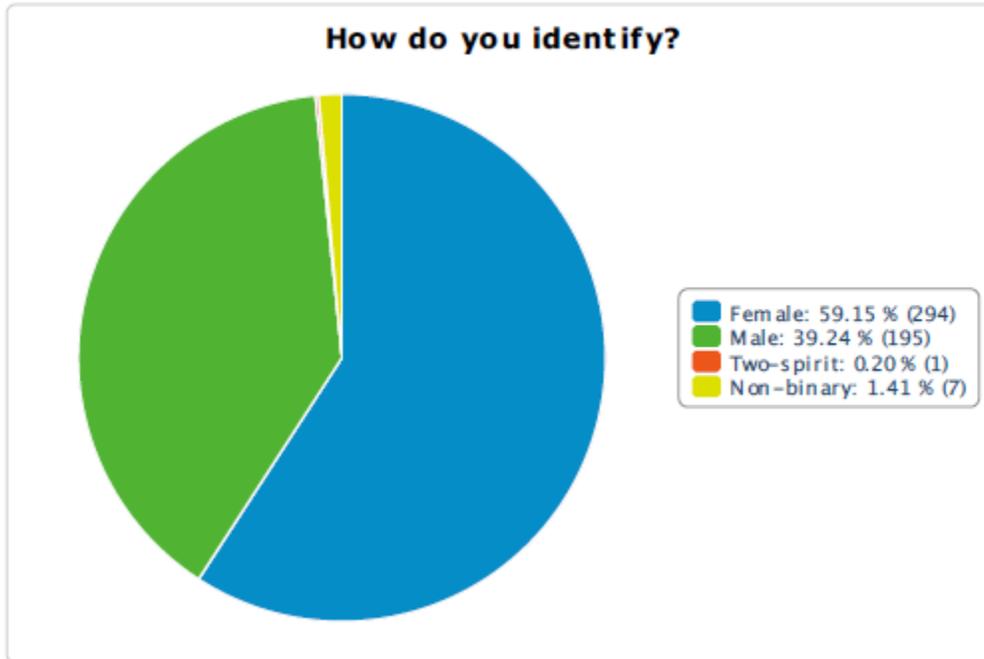
In November 2020, the office of Capital Ward Councillor Shawn Menard launched a survey seeking feedback from pedestrians and bicyclists on Ottawa’s winter maintenance operations and, specifically, the winter maintenance of the city’s active transportation network—sidewalks, Multi-Use Pathways (MUPS), bicycle lanes and paths.

The survey consisted of 47 questions focused predominantly on pedestrian and cyclist satisfaction with snow removal. Questions were both quantitative and qualitative in nature. The aim of the survey was to explore overall satisfaction of these demographics with winter snow clearance, and to see what impact winter maintenance, or a lack thereof, had on them. The survey contextualized satisfaction through the parameters of safety and overall accessibility of the city’s active transportation infrastructure.

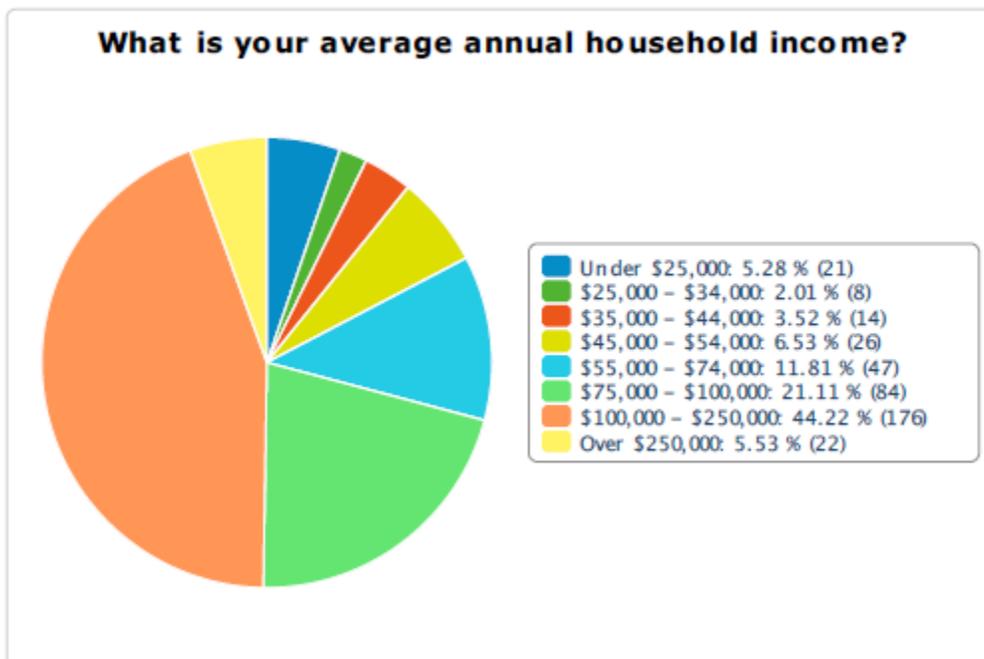
The survey ran for two weeks, and was advertised through social media, the councillor’s website and the Capital Ward Bulletin (emailed to over 10,000 recipients). The survey garnered 515 responses from residents who vary by age, gender, income and geographic location within Ottawa. Although most respondents resided within the urban core, responses were also received from parts of the west, east, and south ends of Ottawa, as well.



Most respondents identified as female (59%).



Respondents who disclosed annual household income skewed higher on the income ladder on average with almost half of respondents who disclosed income (49.8%) reporting an average annual household income of \$100,000 or above.



The survey and its results should not be considered rigorous consultation and data-gathering by the city. It serves as one means offered to residents to voice their opinions on city winter maintenance operations.

Survey Results

The findings of this survey demonstrate that leading up to the 2020-2021 winter, residents desired improvements to winter maintenance, especially for our active transportation network. Residents are concerned about safety. They are going out less, and they are unable to support local businesses as much as they otherwise would.

The new WMQS must reflect today's transportation reality, the lifestyle choices of city residents and the city's transportation future.

Findings & Analysis

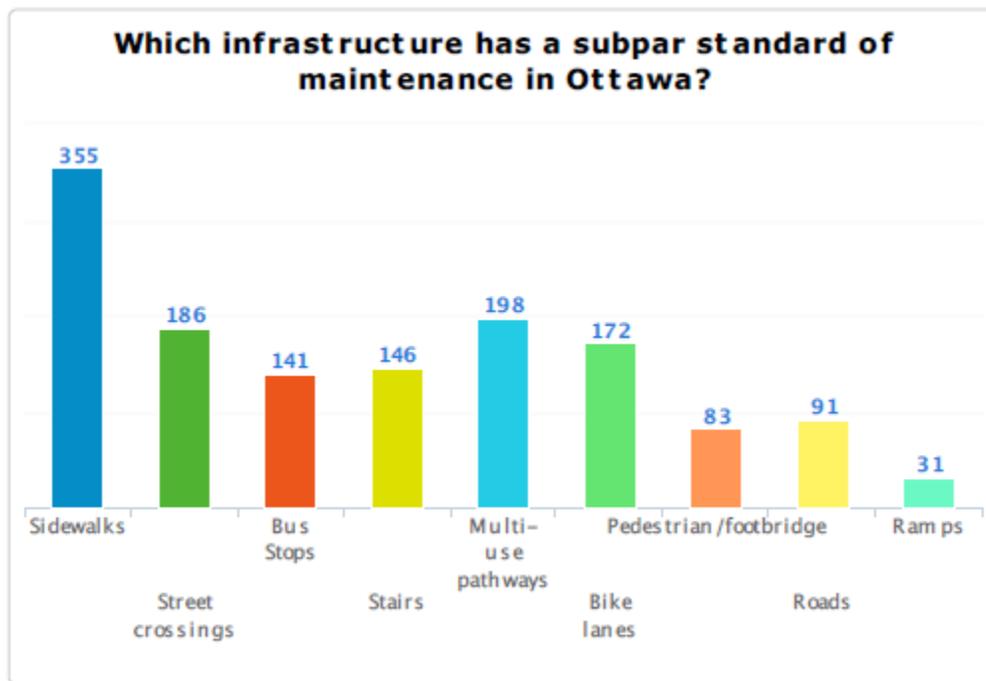
Barriers to Winter Mobility

In order to develop a proper strategy for winter maintenance and snow clearing, it is important to understand the current barriers residents face when attempting to move about the city during wintertime.

As the city updates its WMQS, it is imperative that it properly identify which infrastructure is critical for residents' safety and wellbeing, whether that infrastructure is currently being prioritized or neglected by current maintenance standards, and what the ramifications of those priorities are for residents and the city.

Main Barriers Identified

Ice was identified by respondents as the primary barrier that affected respondents' ability to safely use city sidewalks during the winter months. Ice was cited by 470 of the 515 total respondents as a main barrier to winter mobility. Judging from the quantitative data, the build-up of ice on sidewalks requires critical consideration as part of the upcoming WMQS update.



The qualitative data repeatedly showed concerns over the formation and accumulation of ice. Respondents expressed feelings of fear of slipping on ice, citing substantive slip-and-fall incidents experienced due to the buildup of ice.

Snowbanks were also cited frequently as a significant barrier to walking during winter, with 272 respondents identifying snowbanks as a main issue affecting their mobility.

Respondents frequently noted the issue of snowbanks growing so large that they become significant barriers to mobility, especially on residential streets. Many respondents voiced concerns that this issue is more pernicious in the context of the COVID-19 pandemic, citing that they do not feel able to safely socially distance themselves from other pedestrians due to the narrowing of sidewalks, and the inability to cross to another sidewalk or onto the street due to being blocked by a snowbank.

The inability to cross the road is an issue which was also flagged frequently by respondents in the qualitative data. When snowbanks get to these large sizes, constituents voiced concerns of being unable to travel over them, especially with a mobility device or stroller.

Sidewalk Design as a Barrier to Mobility

A significant recurring theme from the qualitative data is the problems posed by barriers built into and around sidewalks. These barriers can pose problems year-round, but the risk is amplified in winter months, creating extremely hazardous conditions for pedestrians.

The issue of slanted sidewalks (often designed to facilitate car access) was mentioned frequently in the survey results. Respondents expressed dissatisfaction and fear of such sidewalks. This issue posed a particular concern for residents using strollers and mobility aids, and residents with balance issues.

Ice accumulation on these sections of sidewalks are treacherous, and often resulted in respondents falling on the ice, or using the road to avoid slants in the sidewalks—many respondents noted they did not feel safe doing this.

The poor state of the city's sidewalks led to respondents voicing a desire for improved lighting along our streets and pathways. Residents worry that pedestrian facilities are not safe and/or are not clear of ice or other hazards, so many ask for greater visibility to identify potential hazards.

While improved lighting along our sidewalks and pathways may be desirable, residents should be able to trust that our infrastructure that is designed specifically for pedestrian use is, in fact, safe to use by pedestrians.

Further, increased lighting will only help a portion of sidewalk users, as people with vision impairments, people using mobility aids and people carrying parcels may not be able to see winter hazards in front of them, regardless of the lighting.

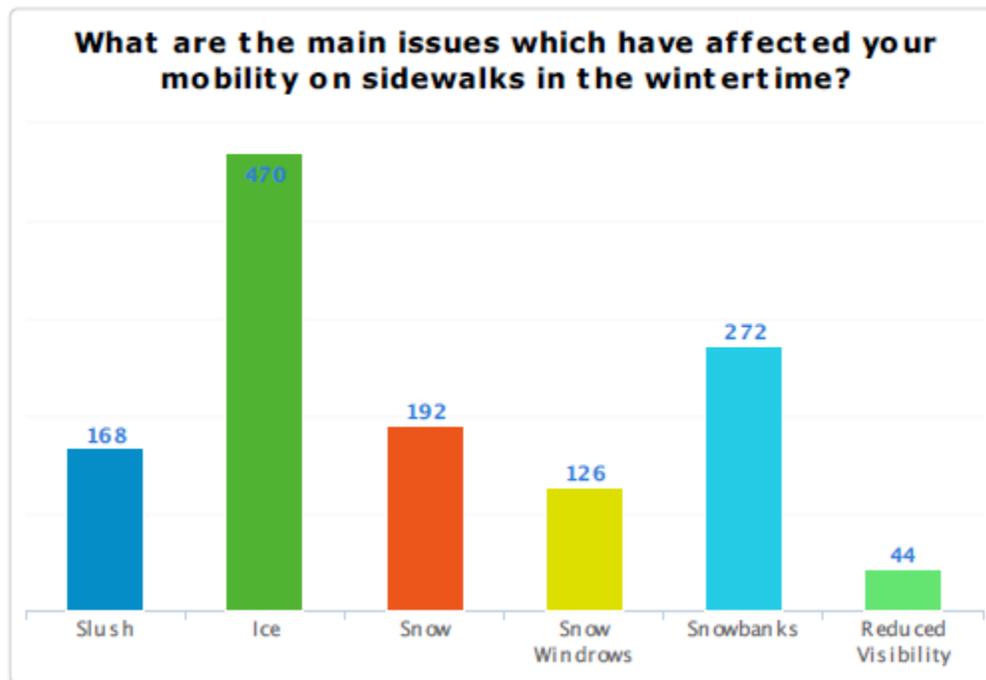
Coping Mechanisms

The onus of dealing with mobility barriers tends to be placed on the resident, often leading to changes in behaviour—people alter their mode of transportation, change their routes and avoid going out, altogether.

These behavioural changes have an impact on the health, quality of life, environment and economy of our city.

When asked, over 90% of respondents indicated that they have individual strategies for dealing with poorly-maintained sidewalks.

- 68% exercise more caution when using sidewalks;
- 61% avoid poorly-maintained areas;
- 55% use ice grips;
- 46% go out less often; and
- 44% change their mode of transportation.



Interestingly, 22% of respondents indicated that they would use transit more if sidewalk and bicycle lane infrastructure were better maintained, with about as many (23%) saying that this would lead them to use transit less. Further research would be needed to adequately explain these divergent responses, but one explanation could be that those who must rely on either transit, bicycling or walking use transit more when they do not feel secure on bicycle lanes or sidewalks; whereas those who have access to a vehicle choose to use transit less in order to avoid pedestrian and bicycling facilities, altogether.

The qualitative data supported the quantitative data, as residents consistently reported either switching from walking to other modes of transportation, or reducing and eliminating trips, in general.

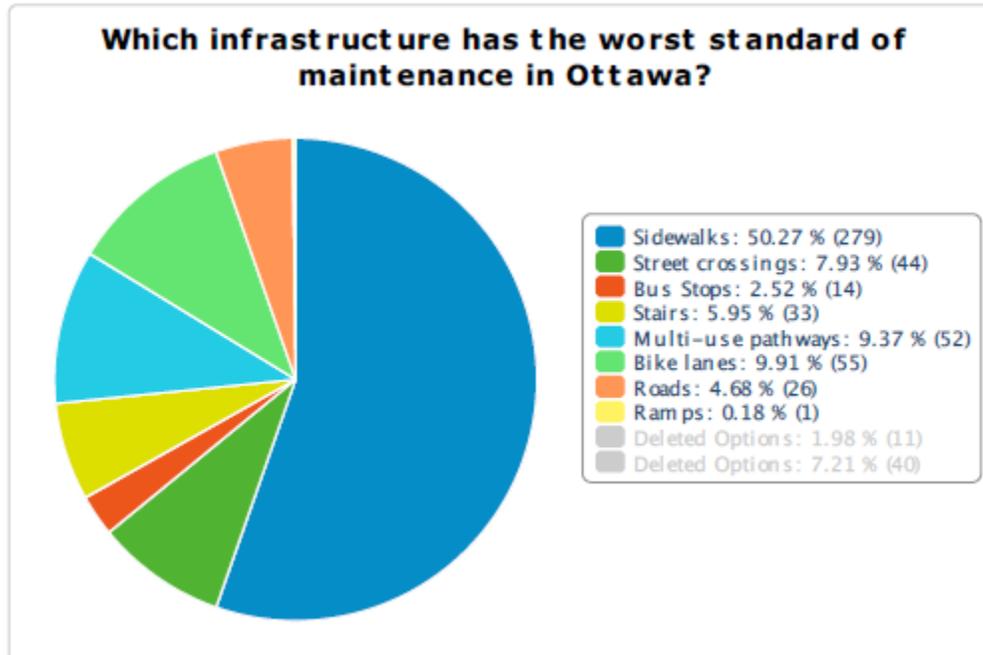
These results uncovered an issue relating to overall equity, as well. Some respondents indicated that walking is their only viable form of transportation, as they did not have access to an automobile and may experience barriers using public transit. In such cases, residents are forced to choose between their personal safety and making essential trips outside.

The degree to which residents feel they must change their behaviour is an indictment of our Winter Maintenance Quality Standards. Winter maintenance is meant to facilitate mobility in the winter, but the results of the survey indicate that it is not fulfilling that purpose.

Safety on Our Sidewalks

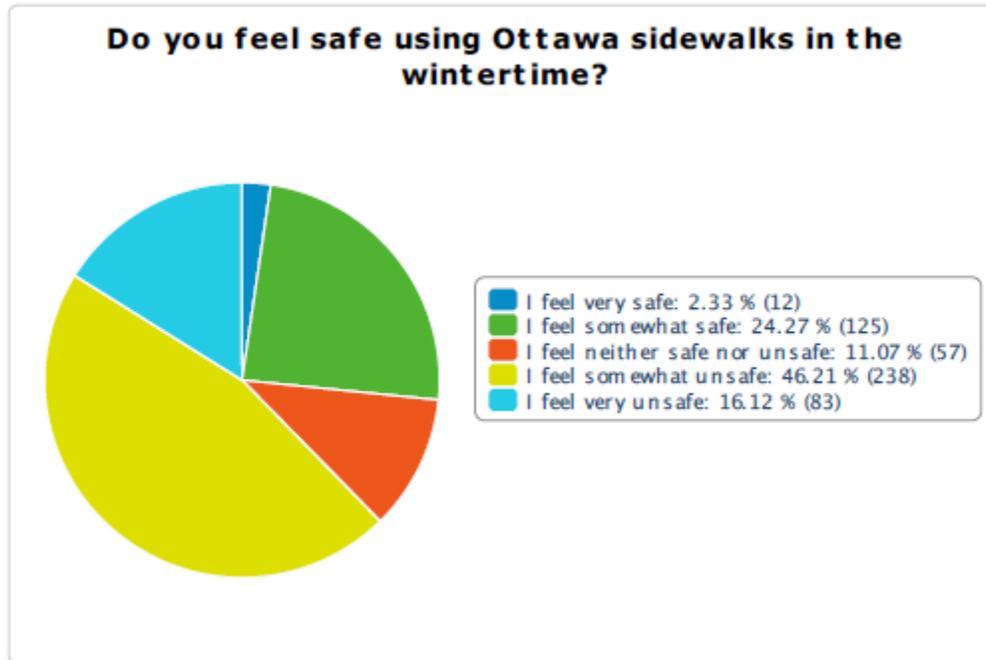
Sidewalks serve an integral purpose to the overall functioning of the city, especially during winter. Sidewalks are used by all modal share groups. Pedestrians rely on sidewalks exclusively; transit riders rely on sidewalks to access bus and train stops; bicyclists and motorists rely on sidewalks to walk to and from their bicycles and automobiles.

Despite sidewalks being so essential to the city's transportation network, they do not consistently receive the same attention as roadways. When asked, more than half of all respondents identified sidewalks as having the worst standard of winter maintenance in Ottawa, with none of the other seven infrastructure options listed receiving over 10%.



Pedestrian Safety

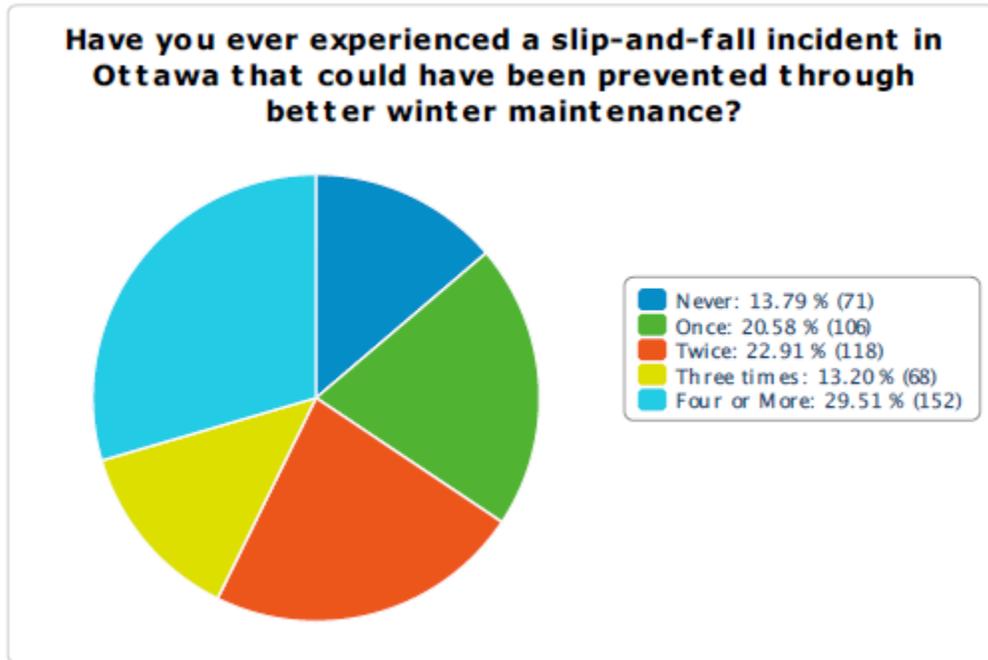
In general, respondents to the survey do not feel safe on Ottawa sidewalks. Over 62% of respondents reported feeling somewhat unsafe or very unsafe while using Ottawa sidewalks, while only 2% felt very safe.



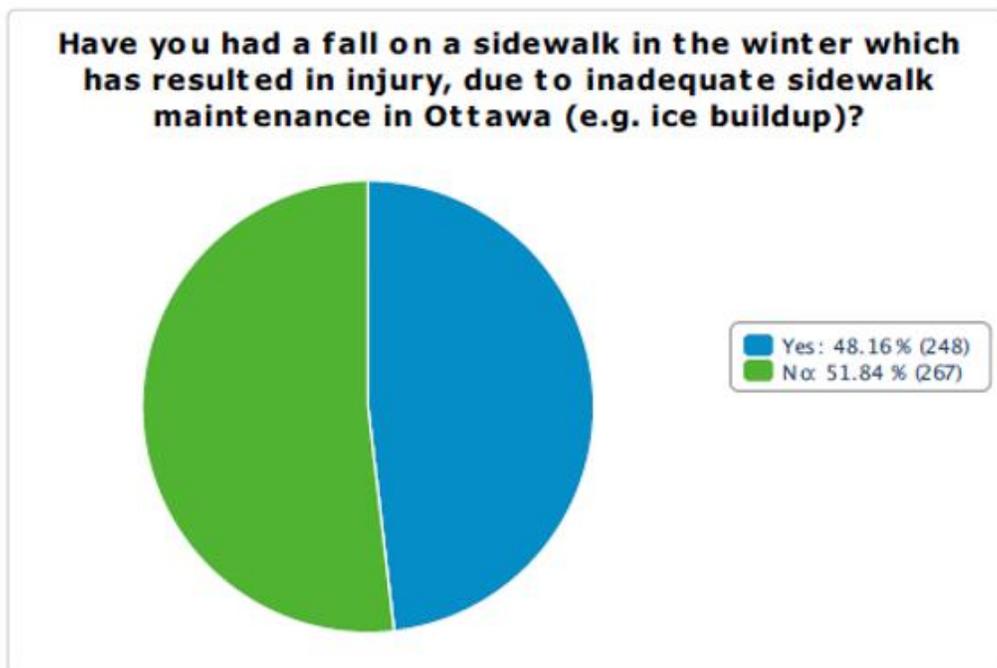
Fears of falling on sidewalks tended to be based on previous falls and injuries respondents experienced. Further, respondents identified the following hazards as contributing to safety fears:

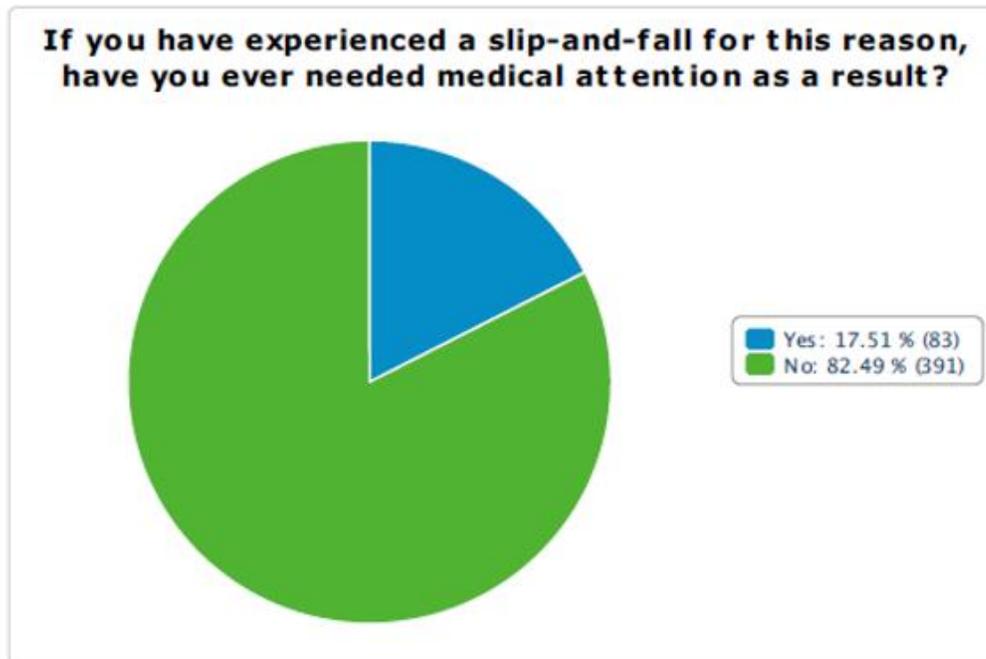
- Overall ice proliferation;
- Ice on slanted sidewalks;
- Possible over-crowding this winter on sidewalks with the pandemic;
- Climbing over large snowbanks;
- Uneven clearing resulting in icy patches;
- Infrequent clearing resulting in overall poor sidewalk conditions;
- Ice at intersections; and
- Pooling water in thaw season.

The hazardous state of Ottawa sidewalks is not merely a matter of perception. Safety concerns are backed up by the experiences of residents trying to use pedestrian facilities—86% of respondents told us they have experienced at least one slip-and-fall incident that could have been prevented with better winter maintenance, and 34% said they have experienced falls four or more times.



Nearly half of all respondents reported suffering injuries from a slip-and-fall caused by poor winter maintenance, with 18% saying the injury required medical attention.





The qualitative data derived from the survey underscore the severity of this issue. A substantial number of respondents shared their own accounts of getting injured on sidewalks in the wintertime. Some ranged from minor injury, such as bumps or bruises, while others were more severe, resulting in broken bones or concussions.

The number of falls experienced by residents attempting to use Ottawa sidewalks should be a serious concern to the city. These incidents cause direct harm to residents, deter a healthy and active lifestyle, and can have financial consequences for residents, as serious injuries can lead to lost work and increased medical expenses.

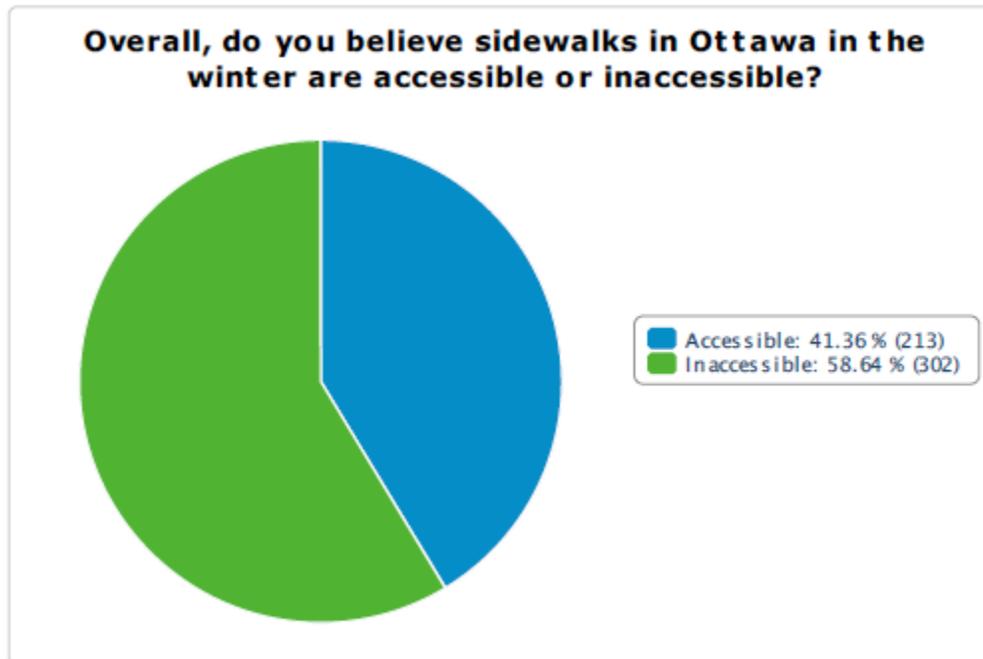
Further, falls and injuries have financial consequences for the city. Ottawa pays out millions of dollars per year in lawsuits related to personal injuries suffered during the winter, while also devoting employee time and resources to dealing with such claims.

Sidewalk Accessibility

The City of Ottawa has espoused a commitment to design and maintain our city so that it is accessible for all residents, embracing the principles of *universal design*. The City of Ottawa Accessibility Design Standards (ADS) were developed to support diversity, barrier removal, changing demographics and provincial directions. In addition, all city streets and infrastructure should be designed in accordance with the Accessibility for Ontarians with Disabilities Act (AODA).

From our findings, winter maintenance of sidewalks and other active transportation facilities fail to meet up to the accessibility goals of the City of Ottawa.

When asked about the accessibility of Ottawa sidewalks in winter, 59% of respondents declared the sidewalks were not accessible.



The qualitative data from the survey further demonstrate the accessibility issues relating to the city's winter maintenance of sidewalks.

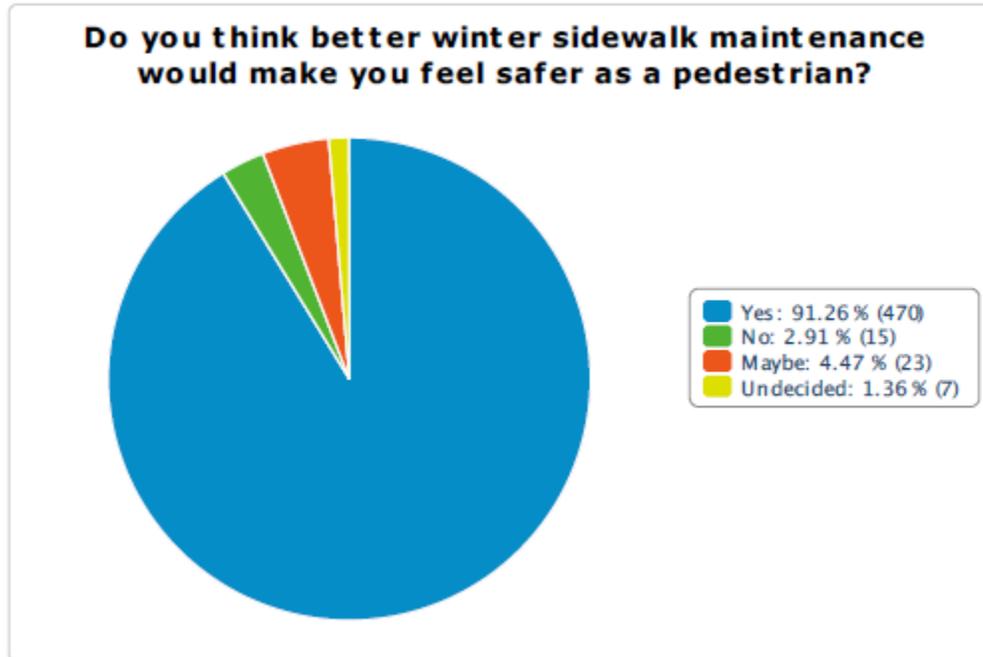
- Respondents with mobility devices cited serious mobility barriers during winter. Ice, snow windrows (ridges of snow left along the side of a snow plow's path), slush and slanted sidewalks greatly hindered mobility of these respondents. This assessment was echoed by respondents who push strollers or use rolling utility carts;
- Older respondents and those using mobility devices spoke to large snowbanks that could not be crossed;
- The build-up of snow around pedestrian push-buttons ("beg buttons") further created barriers to equal access for sidewalks in the winter; and
- Respondents with vision impairments or conditions affecting balance also cited issues with access to sidewalks in the winter.

While winter maintenance standards can have deleterious effects on the mobility, health and quality of life of all residents, the negative impact is particularly acute for residents living with existing mobility issues.

If the city is to live up to its legal and moral responsibility regarding accessibility, it must develop new winter maintenance standards that truly allow all residents to get around during winter.

Improving Pedestrian Comfort and Sense of Security

As frustrated as respondents were with the state of sidewalk winter maintenance, they did not see this as an inevitable outcome of Ottawa winters. When respondents were asked if they felt better sidewalk maintenance would improve their feelings of safety using sidewalks in the winter, 91% of respondents indicated it would, and only 3% said it would not.



Improving both the perception of safety and the actual safety of our sidewalks would allow more residents to partake in walking and other forms of active transportation during the winter—something many wish to do. In turn, this would help improve the overall health of residents; it would lead to more economic activity; and it would help support city goals to reduce greenhouse gas emissions and increase the modal share of active transportation.

Improving pedestrian comfort and security would lead to tangible benefits, making Ottawa a more livable, sustainable and prosperous city.

Winter Bicycling

As the city's overall bicycling modal share has increased in recent years, so, too, has the popularity of winter bicycling—and along with it, increasing calls for improving winter maintenance of bicycling routes and facilities in the city.

The city currently has approximately 40 km of winter bicycling facilities, much of it in Capital Ward. Unfortunately, not all sections of the winter bicycling network are maintained to a standard that facilitates winter bicycling.

Bicycle lanes along the winter network are also used for snow storage, with some routes only being cleared once or twice during a winter season. Further, snow clearing standards

can vary greatly between bare pavement and snow-pack, posing a challenge for bicyclists, as different bicycles and different tires are better suited to different terrains.

Finally, Ottawa's winter bicycling network does not always connect with neighbourhoods, residential streets or popular destinations. The lack of connections and various missing links decrease the utility and accessibility of the winter bicycling network, and, by extension, the ability of residents to participate in winter bicycling.

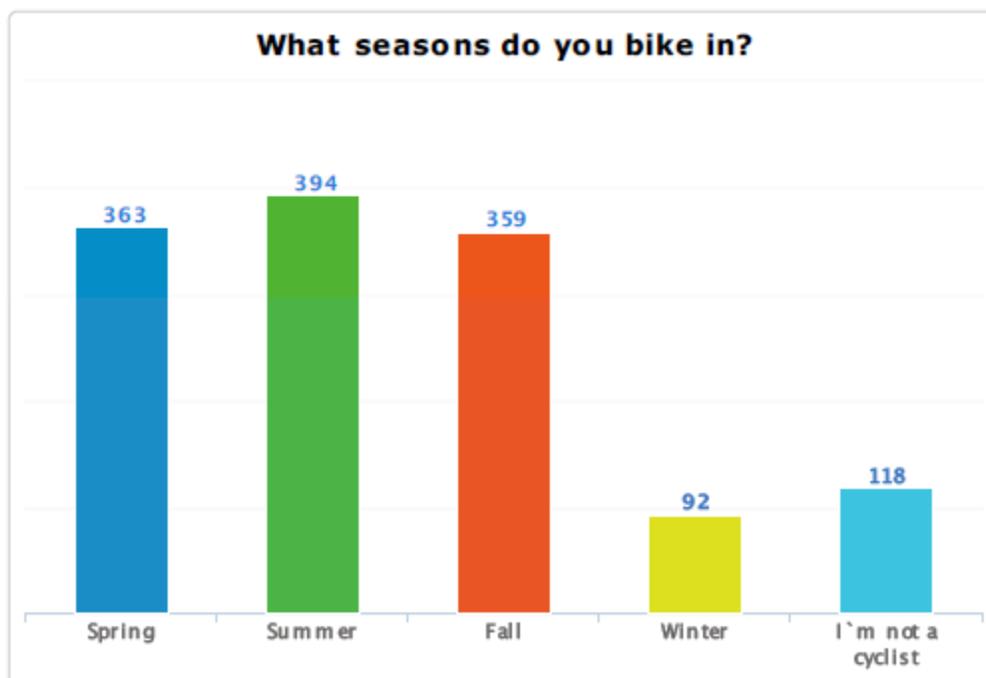
There is a tangible desire among Ottawa residents to either begin bicycling in the winter or to increase the amount of winter bicycling they do. However, concerns about safety, comfort and accessibility artificially reduce the overall participation rate for winter bicycling.

Seasonal Popularity of Bicycling

The vast majority of respondents to our survey indicated that they were bicyclists at certain points during the year. Summer is the most popular time for bicycling and winter is, predictably, the least popular. Of the 515 respondents to the survey:

- 363 respondents bicycle in spring;
- 394 bicycle in summer;
- 359 bicycle in autumn;
- 92 bicycle in winter; and
- 118 do not bicycle.

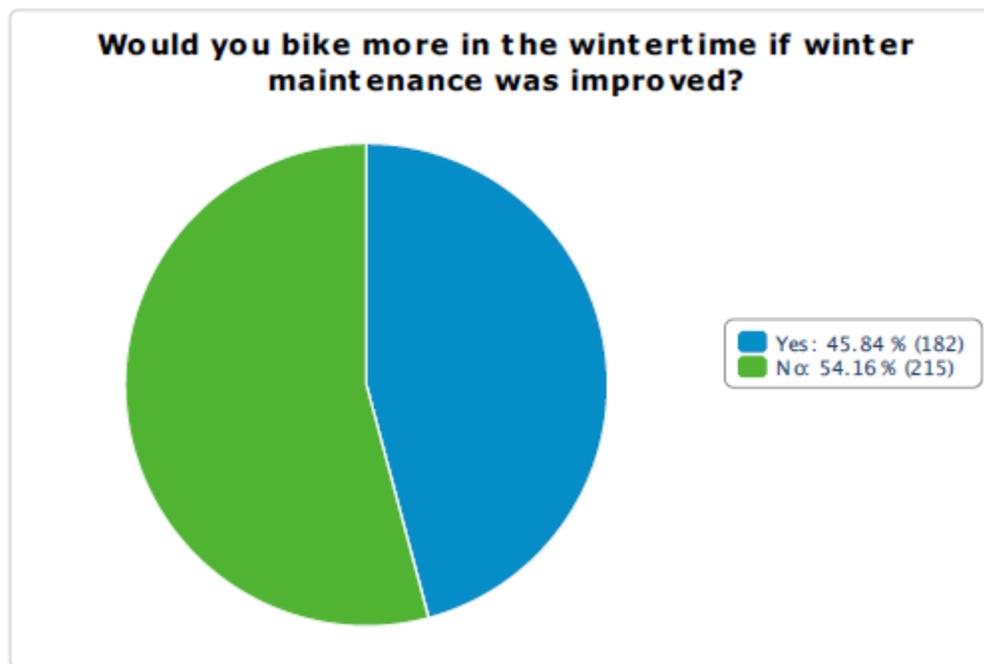
Of those who bicycle in winter, 66% do so frequently, while only 11% do so rarely or somewhat rarely.



Potential for Winter Bicycling

While approximately 400 of the respondents bicycle at some point during the year, only 92 bicycle in the winter. The question that arises from these findings is: *would it be possible to increase the number of winter bicyclists?*

In our survey, we asked respondents if improving winter maintenance of bicycling infrastructure would increase their desire to bicycle during the winter. Of those who responded, 51% said it would.



The city will never force people to ride bicycles during the winter, nor should it. However, when there is a latent desire among residents to bicycle during the winter, it is the duty of the city to remove all the barriers to winter bicycling that it reasonably can.

Just as the city should not force residents to bicycle during the winter, it should also not force residents to abandon their bicycles or to increase their driving, but that is what the City of Ottawa currently does with its approach to winter maintenance of the city's bicycling network.

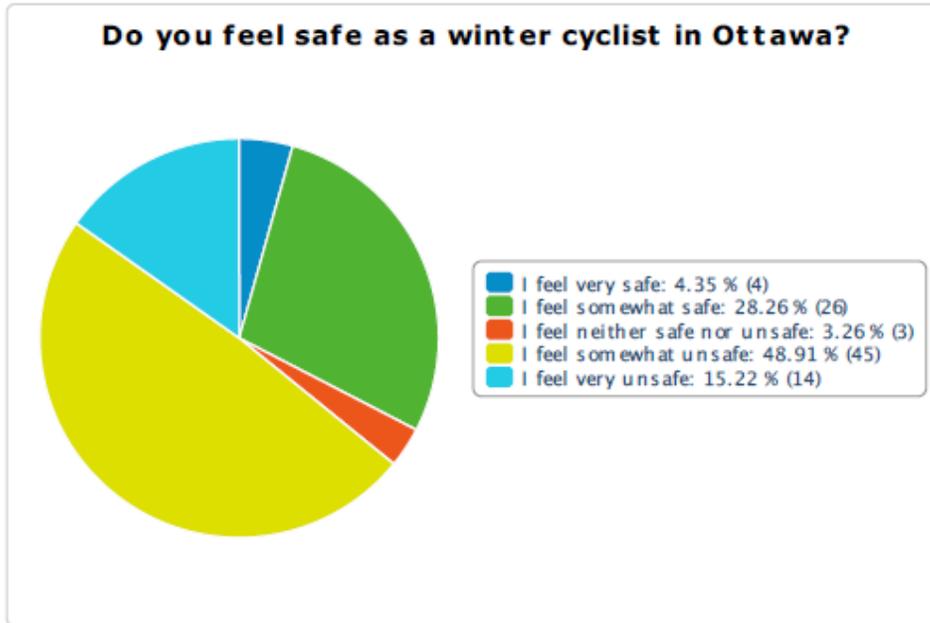
Comfort and Security

We know that more residents would bicycle during the winter if they felt they could—both city trends and survey results demonstrate this. Further, we understand that the city's winter maintenance of the bicycling network is deterring people from their preferred mode of transportation—a mode of transportation that is healthier, cheaper, more environmentally sustainable and that reduces traffic congestion.

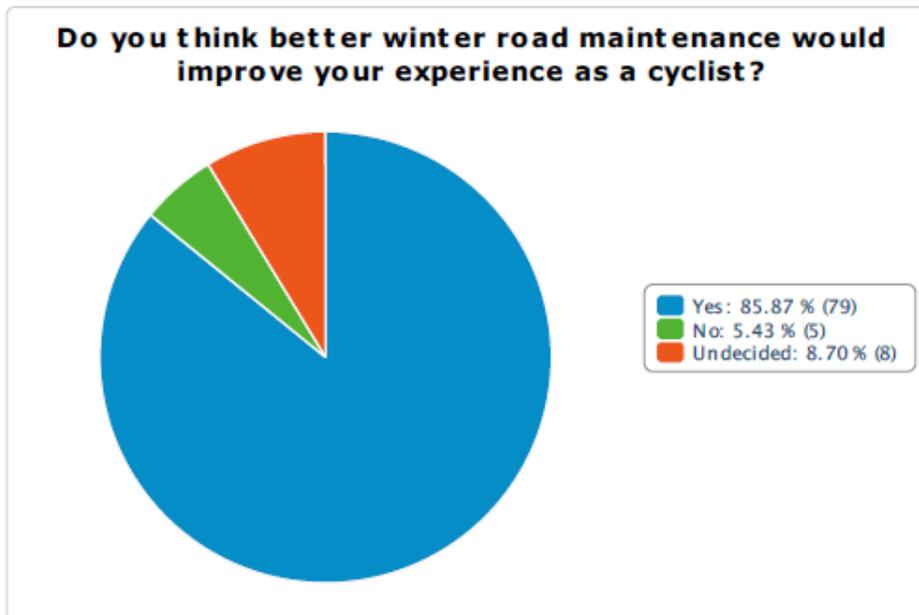
Safety

One of the biggest deterrents to bicycling is safety—both real and perceived. If residents do not feel safe or comfortable on our streets and bicycle lanes, they will choose a different way to get around.

We asked residents if they feel safe as a winter bicyclist in Ottawa. Of the respondents, over 64% said they felt very unsafe or somewhat unsafe.



Further, we asked respondents if better maintenance would improve their winter bicycling experience. More than 86% said yes.

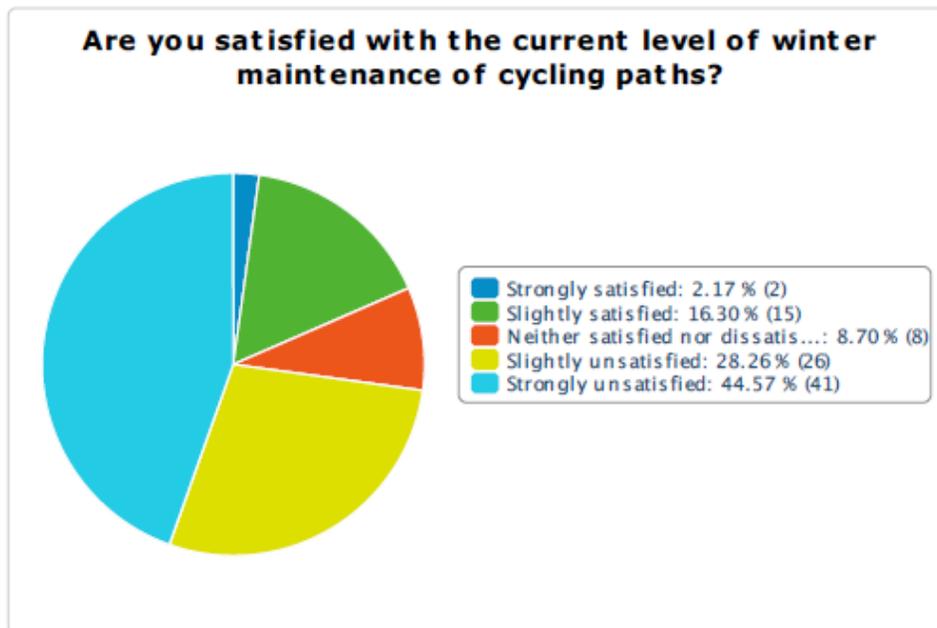


With so many of the trails, bicycle lanes and multi-use paths unusable during the winter months, a better understanding of the people's experience on our streets, mingling with motor vehicles, would help the city assess the need for better winter maintenance of bicycling facilities.

Respondents were asked if there is sufficient space to maintain a safe distance from motor vehicles while bicycling in winter. Disturbingly, over 90% of respondents said there is not.



Overall, respondents are not satisfied with the winter maintenance of bicycling facilities, with 72% expressing dissatisfaction with the city's efforts.



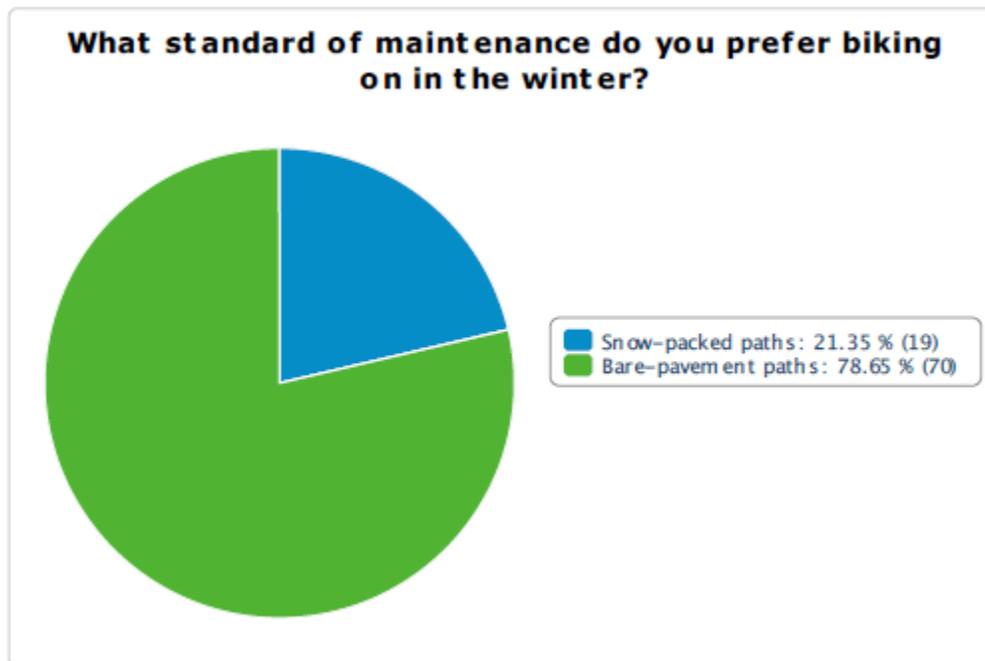
Improving Bicycling Safety

In the qualitative research, respondents expanded on the deficiencies of the city's winter maintenance of bicycling facilities, with many pointing to the unmaintained multi-use pathways and bicycling lanes as a significant impediment to winter bicycling.

Many respondents voiced their desire for an increase in separated, protected bicycling infrastructure. Proper segregation from motor vehicles would increase the sense of safety while bicycling through the winter, thus, addressing an issue highlighted by 90% of respondents: that there is not sufficient space on the road to maintain a safe distance from motor vehicles while bicycling.

A common comment from respondents was the desire for more consistent snow-clearing, as the unpredictable and irregular standards for snow-clearing (from bare pavement to snow-pack to uncleared) is a significant barrier to mobility, as respondents are not able to adequately plan their trip.

When asked for their preferred snow-clearing standard, 78% of respondents preferred bare pavement to snow-pack.



In addition, the over-reliance on salt was identified as an issue for winter bicyclists, as the excessive salt damages bicycles, shortening their lifespan and requiring a replacement bicycle sooner than would be desired or expected.

Behavioural Changes

It is foolish to expect residents to continue to use infrastructure that does not provide sufficient safety and comfort. The city—through our decisions regarding infrastructure and winter maintenance—has a high degree of power in changing the behaviours of residents. From the survey, we have learned that a majority of residents have changed their transportation choices, level of activity and lifestyle to avoid sidewalk hazards.

Reducing Trips Outside

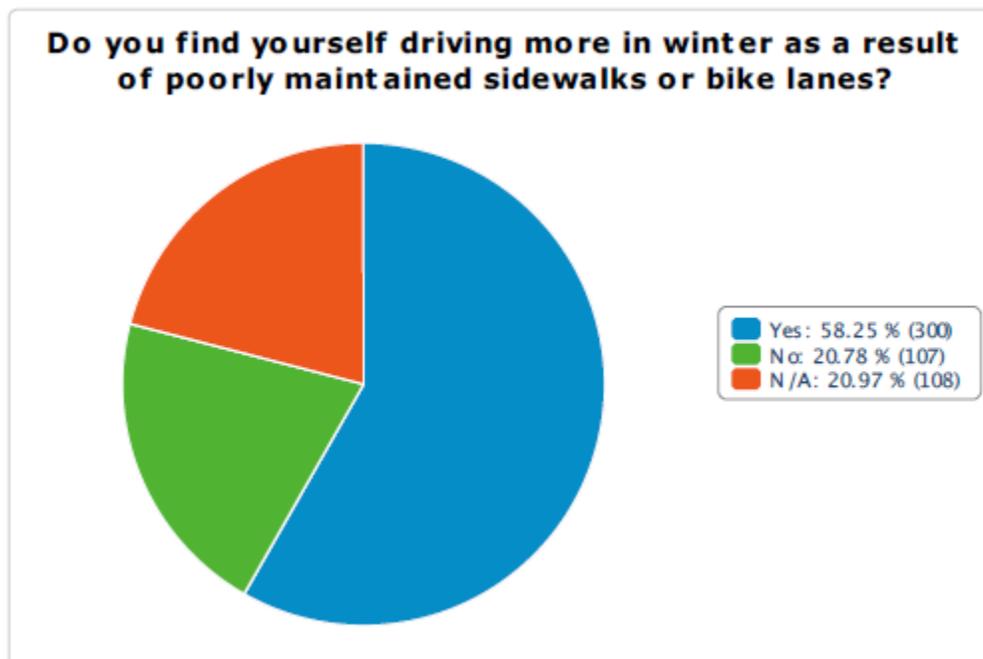
As noted above, 63% of survey respondents said that the conditions of sidewalks in winter have outright prevented them from going to a destination. A plurality of that group, 29%, said this happens somewhat frequently. This is a troubling finding, as reducing or eliminating trips outside can lead to social isolation and poor health outcomes for residents, as well as less economic activity at local businesses.

Altering Routes

While poor sidewalk conditions lead many residents to avoid going outside, at all, those conditions also lead to altered routes, with 61% of respondents avoiding more treacherous areas. Once again, these changes in behaviour can harm a resident's wellbeing and quality of life, while also hurting the local economy.

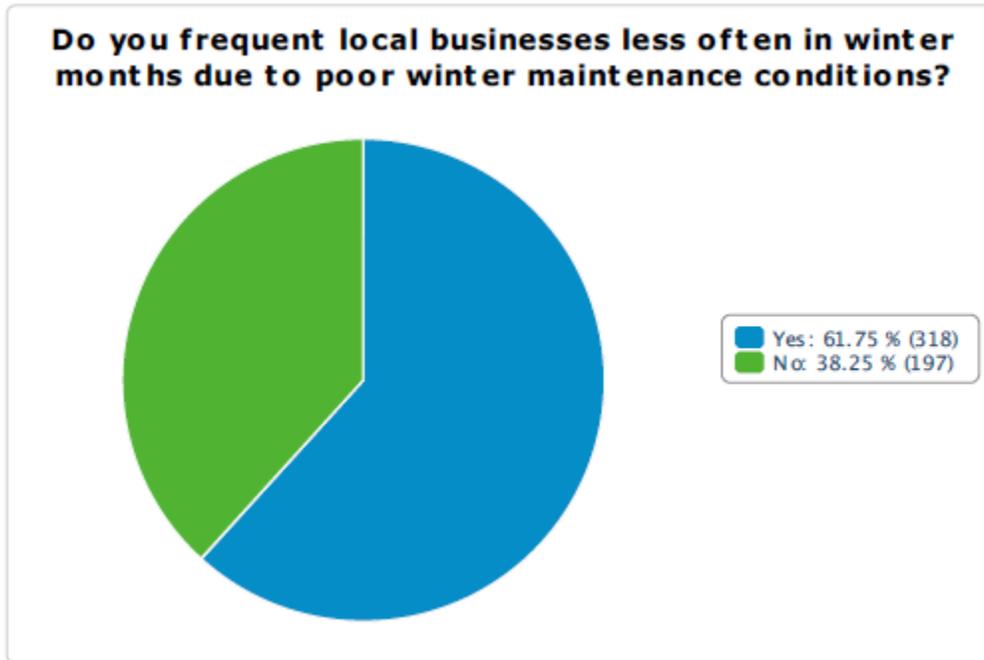
Increased Driving

Sidewalk and bicycle maintenance also changed residents' decisions on mode of transportation, with a majority of respondents driving more instead of using active transportation. When asked, 58% indicated that they drive more due to poor sidewalk and bicycle lane maintenance.

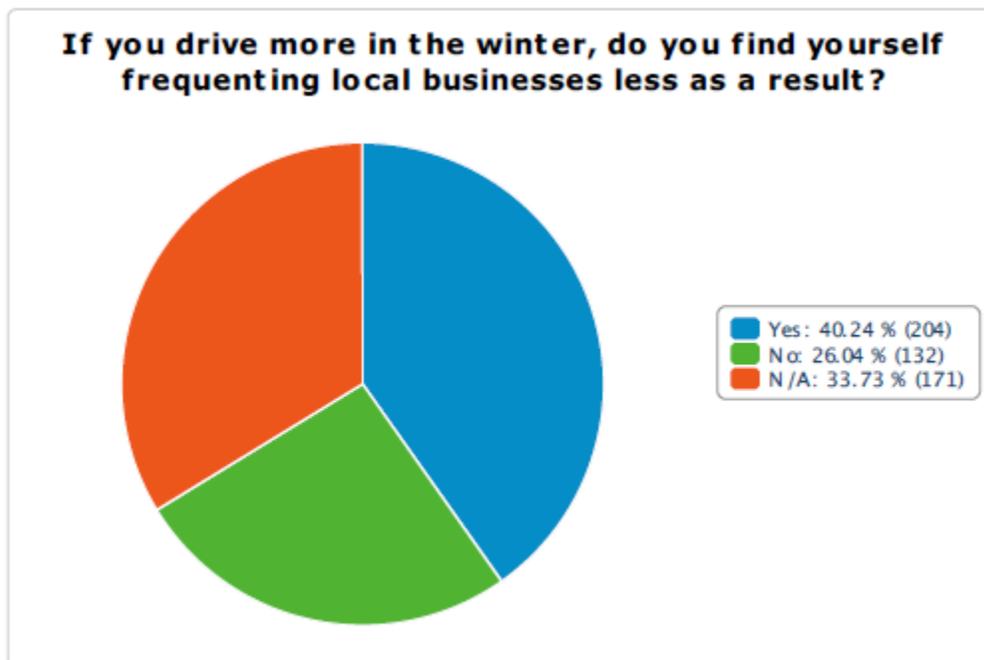


Shopping Less

Respondents also indicated that they frequented local businesses less as a result of poor winter maintenance, generally, with 61% of all respondents indicating such a change in their shopping behaviour.



Among respondents who were forced to drive more in the winter, 41% said that the increase in driving led them to shop at local businesses less.



This is an unsurprising result, as studies throughout Canada and North America have consistently shown that higher levels of pedestrian activity and bicycling tend to lead to higher commercial activity for local establishments. Essentially, drivers are, comparatively, bad for business.

Implications

The implications of insufficient winter maintenance standards cannot be diminished. It is more than a simple case of reduced or slower mobility. Winter maintenance operations have a direct effect on the environment, finances, and general health of residents and of the city, as a whole. We must take a broad, holistic look at winter maintenance in order to fully understand its importance to the overall livability, prosperity and sustainability of our city.

Pollution

Over half the respondents, 58%, chose to drive more in winter—but not due to personal preference; the increased driving was induced by the winter sidewalk maintenance. Essentially, the city's outdated WMQS forced residents to abandon a healthy form of transportation in favour of driving.

The use of personal automobiles is one of the largest emitters of greenhouse gases in the city. Further, the ever-expanding network of asphalt roads—and corresponding reduction in plants, trees and greenspace—further contributes to environmental degradation, climate change and the “heat-island effect” of urban areas during warmer seasons. The increased use of automobiles during the winter is a contributing factor to the city's greenhouse gas emissions.

Health & Wellbeing

The state of sidewalks, paths and bicycle lanes can take a toll on the physical wellbeing of Ottawa's population. More than 80% of respondents have experienced falls, and a third of respondents have experienced at least four falls. Worse, one fifth of residents have suffered injuries of such severity that they had to seek medical attention.

Those are a lot of injuries—both minor and major—that relate to the city's winter maintenance policy choices. The only thing that keeps the numbers from rising is the fact that so many residents avoid using city sidewalks—choosing either to drive, change their routes, or just cancel trips and not go outside.

These falls and injuries lead directly to a noticeable reduction in quality-of-life, and contribute to worse mental health outcomes.

Mental Health & Social Isolation

Ensuring that residents can move around during the winter is not only important for their physical health, but also for their mental health. Social isolation and reduced social interactions tend to lead towards worsened mental health outcomes. When respondents were asked if they felt that poor winter maintenance had a negative impact on their social life, 51% indicated they indeed felt a negative impact.

When this data was contextualized with the age of respondents, it was observed that the age group of 65-74 reported their social lives being impacted the most (proportionately) by poor winter maintenance. Although only 42 respondents over the age of 75 participated in the survey, over half of respondents in this age demographic (23) indicated that they felt their social life was negatively impacted by poor winter maintenance.

These findings are especially troubling in the context of the demographic changes Ottawa is undergoing. In the 1960s, 7% of Ottawa residents were seniors. Ten years ago, seniors represented 13% of the population. The city projects that in less than ten years, 20% of our population will be over the age of 65.

Basically, Ottawa is getting older. An issue that disproportionately impacts senior residents—such as winter sidewalk maintenance—will grow ever more acute as the city gets older.

Equity

There is also an equity component to winter maintenance, as 55% of all women respondents indicated they felt poor winter maintenance had a negative impact on their social lives. That number is 10% higher than their male counterparts.

This phenomenon is not exclusive to Ottawa. Studies throughout the world have found that there is a gender equity component to winter maintenance. Women tend to be more affected by lack of snow and ice clearance to key winter pedestrian and bicycling infrastructure, as they are found to be more likely than men to walk, cycle and use public transportation. These findings have led Stockholm, Sweden, to recognize winter snow removal as a gender equity issue, applying a gender equity lens to winter maintenance operations.

When examining the relationship between winter maintenance and income, the survey revealed that respondents with lower income were disproportionately impacted by poor winter maintenance.

It is important to note here that a significant number of respondents did not indicate their annual income, as this question was optional. However, with the data from those who did disclose income, a significant relationship can be observed. Of the 21 respondents whose average annual household income was under \$25,000 a year, 18 felt that poor winter maintenance had a negative impact on their social life—that represents 85.7 percent of people in that income bracket, which is far above the average from all respondents.

These findings reflect other academic research on the impact of winter maintenance by income. Consistently, those within lower income brackets have a greater reliance on proper sidewalk maintenance, and they suffer disproportionately when winter maintenance is lacking.

Commercial and Economic Impacts

The city's choices regarding winter maintenance of pedestrian and bicycling facilities have direct effect on the economic outcomes of local businesses. A significant majority of respondents, 61%, stated that they shop less during the winter due to poor winter maintenance.

Further, residents who suffer injuries from snow or ice risk time off work and increased medical costs, while businesses suffer due to reduced productivity and lost time of their employees.

Finally, the increased number of snow-and-ice injuries add costs to our public health care system.

Liability and Litigation

The city incurs both indirect (lower economic activity) financial costs due to poor winter maintenance, as well as direct financial costs—the millions of dollars paid out each year in legal claims against the city.

These costs are not included in the yearly snow-clearing budget, but they are a significant cost that stem directly from the winter maintenance standards the city has implemented.

Conclusion/Recommendations

The City of Ottawa's Winter Maintenance Quality Standards are failing to serve residents as best they could. This is the unmistakable conclusion that must be drawn from the results of the Capital Ward survey. The winter maintenance of our active transportation network—from sidewalks to pathways to bicycle lanes—is not facilitating winter mobility, and it is not providing needed safety and security to residents.

Respondents to the survey expressed a general discomfort when using city infrastructure. The design of the infrastructure, the clearing standards, and the hazards and barriers in winter stopped people from going outside. They forced people to drive more. Some residents experienced injuries, sometimes seriously.

Ottawa is a winter city, and it should be a great winter city, but city policy keeps it from becoming such. This needs to change.

Over the past two winters, change has begun. Equipment better suited to our weather and our infrastructure has been acquired. Staff, working within the confines of the WMQS, have devoted more attention to sidewalks, and certain paths and bicycle lanes.

We are seeing that improved winter maintenance is possible.

Staff, however, can only do so much on their own. They require the political support of city council and city management to bring active transportation winter maintenance up to a standard that residents desperately need and want.

The upcoming review of the WMQS is the perfect opportunity to this goal—to set proper winter maintenance standards for our active transportation network, and back it up with the money, staff and equipment necessary to the job properly and efficiently.

This will be realized if city council and city management implement updated WMQS that are built upon the Five Principles of Urban Snow Clearance: *Accessibility, Equity, Sustainability, Climate Change Resiliency, and a Healthy and Livable City*.

Winter does not have to be a time of hibernation, isolation and fear. We can design winter maintenance standards so that they support the mental and physical health of our residents, boost economic activity at local businesses, and ensure that everyone can get around when they want, the way they want.

If we listen to residents and give them what they need, we won't be forced to endure winter; we will be able to enjoy it.