

December 12, 2019

To: Members
Public Works and Infrastructure Committee

Re: Safe Sidewalks

RECOMMENDATION

1. That MN19-9 be removed from the List of Outstanding Items for the Public Works and Infrastructure Committee.
2. That this report be received and filed.

CONCLUSION

Administration reviewed the process for reinstating concrete and changes were implemented in 2019 due to the increase in watermain breaks in the last two years. The changes allowed crews to improve efficiency productivity throughout the construction season, and the current improved process will facilitate more timely sidewalk repairs in summer months. During winter months, there are challenges in ensuring sidewalk restoration within one month due to weather, quality, material availability, contractor availability and cost.

Further engaging contractors in repairing planned excavations and eliminating the backlog would allow City of Regina (City) crews to focus efforts in completing emergency unplanned repairs within the one-month target for new repairs.

The cost implications of utilizing other construction materials to ensure walkability for temporary repairs were examined and while using hot-mix asphalt in the summer could be used, there are cost implications in carrying out that work.

BACKGROUND

At the June 24, 2019 meeting of City Council *Motion MN19-9* was passed:
That Administration prepare a report for the Public Works and Infrastructure Committee Q3 of 2019 that:

1. *Identifies the costs and implications of guaranteeing sidewalk replacement within one month of the completion of work related to the sidewalk's initial excavation.*
2. *Identifies the costs of short-term mitigation efforts guaranteeing walkability (i.e., asphalt capping) to be completed immediately after sidewalk demolition when underground work is not being conducted, and in advance of a full replacement.*

DISCUSSION

Sidewalk Replacement Timelines

Watermain breaks have increased over the years and are difficult to predict as they vary seasonally depending on soil moisture levels, changes in the soil conditions, and temperatures (see Appendix B for the history of watermain breaks). The repairs necessary are referred to as emergency work, and unplanned due to the unpredictable nature of the conditions that contribute to the infrastructure failures. Depending on the severity of the break, there are often several concrete structures impacted at each location, including the sidewalk, curb/gutter, and driveways.

Due to the increased frequency of watermain breaks, Administration undertook a process review to identify efficiencies and enhancements to eliminate the backlog of repairs and improve repair timelines. As watermain break excavation repairs are completed by internal City crews, these process changes were implemented at the start of the 2019 construction season and the backlog was reduced from 751 to 504 concrete structures awaiting repairs (see Appendix A for a history of excavations and repairs). Although the number of repairs completed in 2019 was considerably higher than the five-year average, the backlog remains. At the current rate of excavation and repairs, the backlog would be eliminated within four years, upon which time future repairs would be completed in a more preferred timeline.

As the current backlog will inhibit timely repairs in the short term, Administration has the option to procure external contractors to help eliminate the backlog of repairs in 2020. The estimated cost for repairing 504 concrete structures would be approximately \$1.16 million and is already allocated in the water utility, therefore no additional funding would be required. Allocating the backlog of repairs to a contractor would allow internal City crews to prioritize and focus efforts on new repairs during the construction season, completing repairs within one month with existing budgets and resources.

It should be noted that similar to Regina, many municipalities allow several months to pass between the initial excavation to the permanent repairs. For example, permanent repair work in the City of Calgary typically allow for one full freeze/thaw cycle (winter season) to allow for settlement of the backfilled material and to ensure a stabilization of the soil structure around the excavation. The City of Saskatoon typically complete repairs during the construction season only, therefore several months would transpire when an excavation takes place in the winter. However, Saskatoon does target a 30-day timeline for excavated sidewalks on priority locations (see Appendix D for a summary of other municipality practices). The risk in completing repairs within one month of the initial excavation is that settlement occurs at the repair location, creating issues such as cracking, ponding water, and trip hazards. The average reinstatement time in the city of Regina is 221 days, or just over seven months, including the winter season. However, when considering summer months only, repairs take place on average within 120 days, or four months.

An additional component to concrete structure excavations and repair is associated with planned enhancements or upgrades to underground infrastructure, including infill development, connection replacements (lead connections and other material types) and hydrant replacements. This represents 38 per cent of all excavations in the City (see Appendix B for history of planned

excavations). Concrete repairs that result during planned work is more predictable, which allows project managers to engage external contractors in advance of the excavation to perform the repairs.

Currently, 34 per cent of all planned work repairs are carried out by external contractors, with the remaining repairs completed by internal City crews. Expanding on the use of contractors to perform all planned excavation repairs is an option that would expedite planned repairs, as well as allow internal City crews to concentrate efforts on emergency repairs. The current unit cost for repairs performed by external contractors during the summer is approximately \$360/m². This is similar to the City's internal repair costs and within existing budgets, therefore no additional funding would be required. Contracts would also be altered to complete the repairs within one month of excavation.

Half of all sidewalk excavations occur in the winter. This is an average of 169 locations per year over a five-year period. Carrying out sidewalk reinstatement during winter months would require additional steps and resources required to ensure a high-quality product. Factors to consider include heating the ground before pouring concrete, heating the material on the truck and during delivery, heating the area surrounding the repair while crews are working, and insulating the location during the curing process. It is estimated that undertaking permanent concrete repairs during the winter months would cost approximately \$720/m², or double the current cost of repair. This additional cost equates to an approximate \$638,000 increase the water utility rate structure. The high costs, intensive efforts, and risk of poor quality due to settlement are typically barriers for winter concrete repairs in other municipalities as well. The City of Saskatoon and the City of Calgary follow similar strategies in avoiding permanent repairs in the winter as shown in Appendix D.

Walkability

The current practice to ensure sidewalk safety after an excavation consists of backfilling trenches with crushed concrete until permanent repairs can be completed. Although the process of backfilling with crushed concrete includes compaction, there is a reality that the temporary repair may inhibit accessibility.

Reinstating concrete excavations with a temporary asphalt patch may increase accessibility. The additional costs to place hot-mix asphalt as a temporary repair internally during construction season would be as follows:

- Hot-mix asphalt - \$65,000
- Additional seasonal staff - \$74,000
- Equipment purchase - \$375,000
 - This cost may be reduced based on the rental equipment availability.

Temporary reinstatement work with hot-mix asphalt undertaken by an external contractor would be approximately \$205,000 per year, based on current summer construction rates. Detailed information on the costs associated with the use of hot mix asphalt for temporary repairs during

summer months can be found in Appendix C.

Hot-mix asphalt is typically not available internally or externally in the City of Regina during the winter months from November to April. In reviewing other municipalities, the City of Calgary is the only known location where hot-mix asphalt is available during the winter. However, the plant does not run when temperatures reach -20 degrees or below, and premiums are being charged for orders under 500 tonnes as the costs to operate are substantial. In order to use hot-mix asphalt in the winter for temporary repairs, the City's asphalt plant would remain operational, incurring additional power and heating costs at the very least. The additional cost to operate the asphalt plant to produce limited quantity of hot-mix asphalt (approximately 900 tonnes total), costs beyond power and heat are unknown at this time as the asphalt plant is built in accordance with summer use specifications. When compared simply to the City of Calgary's rates of a similar asphalt product, additional costs may be approximately \$55,000. However, further analysis is required.

Additional implications in operating the asphalt plant on a continuous basis would limit the opportunities to enhance and upgrade the asphalt plant on an annual basis, which takes place in the winter months. Plant renewal is necessary to ensure the reliability and efficiency in the production of asphalt during the annual construction season.

Cold-mix asphalt is a material that is flexible and workable at colder temperatures and has been used to temporarily fill hazardous potholes and excavation repairs on major roads during the winter months. The additional costs to place cold-mix asphalt as a temporary repair during construction season would be as follows:

- Cold-mix asphalt - \$75,000
- Additional seasonal staff - \$74,000
- Equipment purchase - \$375,000
 - This cost may be reduced based on the rental equipment availability.

The additional costs to place cold-mix asphalt as a temporary repair during the winter would be as follows:

- Cold-mix asphalt - \$75,000
- Additional seasonal staff - \$74,000

Cold-mix material lacks structural strength and cohesiveness and crews often return to the repair locations to add more material as it displaces easily. There have been previous attempts to apply cold-mix asphalt on sidewalks and the results have not been satisfactory as it is not rigid enough to ensure accessibility and required continuous attention.

RECOMMENDATION IMPLICATIONS

Financial Implications

- Eliminate backlog of repairs; none as can be done within existing budgets.

- Complete repairs within one month in summer; none as can be done within existing budgets.
- Permanent concrete repairs in winter; Water Utility Costs - \$638,000.
- Temporary hot-mix asphalt repairs in summer (internal); Operating costs - \$139,000; Capital Costs - \$375,000; Total Costs - \$514,000.
- Temporary hot-mix asphalt repairs in summer (external); Contractor Cost - \$205,000.
- Temporary cold-mix asphalt repairs in summer (internal); Operating costs - \$149,000; Capital Costs - \$375,000; Total Costs - \$524,000.
- Temporary cold-mix asphalt repairs in winter (internal); Operating costs - \$149,000.

Environmental Implications

None to this report.

Policy and/or Strategic Implications

The current processes implemented to reduce the timeline for sidewalk reinstatement completion are consistent with the goals of the Transportation Master Plan, which aims to “Promote active transportation for healthier communities” as well as “Safe and Efficient Infrastructure”.

The contemplated approaches are also consistent with *The Official Community Plan, Bylaw No. 2013-48* (OCP), specifically:

- *Section D3, Goal 5- Active Transportation, “Develop a citywide pedestrian strategy to provide a continuous high-quality, connected, safe, and universally accessible walking experience.”*

Other Implications

None to this report.

Accessibility Implications

The improved process will ensure timely sidewalk reinstatement to better accommodate an accessible and safer pedestrian environment.

COMMUNICATIONS

None to this report.

DELEGATED AUTHORITY

As there are no recommendations to change the current process at this time, the Public Works and Infrastructure Committee has delegated authority to receive and file this report

Respectfully Submitted,



Chris Warren, A/Director, Roadways & Transportation

11/28/2019

Respectfully Submitted,



Kim Onra, Executive Director, Citizen Services

12/3/2019

Report prepared by:
Helby Cushicondor, Engineer