

- 3. UPDATE TO THE REVIEW OF WINTER OPERATIONS ON ROADWAYS
REPORT**
- MISE À JOUR DU RAPPORT EXAMEN DES OPÉRATIONS HIVERNALES
CONCERNANT LES ROUTES**

COMMITTEE RECOMMENDATION

That Council receive this report for information.

RECOMMANDATION DU COMITÉ

Que le Conseil reçoit le présent rapport à titre d'information.

DOCUMENTATION / DOCUMENTATION

1. Director, Roads Services, report dated 31 May 2017 (ACS2017-PWE-GEN-0017)

Rapport du Directeur, Services des routes, daté le 31 mai 2017
(ACS2017-PWE-GEN-0017)
2. Extract of draft Minutes 25, Transportation Committee, 7 June 2017.

Extrait de l'ébauche du procès-verbal 25, Comité des transports,
le 7 juin 2017.

Report to
Rapport au:

Transportation Committee
Comité des transports
7 June 2017 / 7 juin 2017

and Council
et au Conseil
14 June 2017 / 14 juin 2017

Submitted on May 31, 2017
Soumis le 31 mai 2017

Submitted by
Soumis par:
Luc Gagné, Director / Directeur, Roads Services/Services des routes

Contact Person
Personne ressource:
Quentin Levesque, Manager / Gestionnaire, Technology, Innovation and
Engineering Support Services / Soutien ingénierie, innovation & technologie
613-580-2424 ext. 15135, Quentin.Levesque@ottawa.ca

Ward: CITY WIDE / À L'ÉCHELLE DE LA File Number: ACS2017-PWE-GEN-0017
VILLE

SUBJECT: Update to the Review of Winter Operations on Roadways Report

OBJET: Mise à jour du rapport Examen des opérations hivernales concernant
les routes

REPORT RECOMMENDATIONS

That the Transportation Committee recommend Council receive this report for information.

RECOMMANDATIONS DU RAPPORT

Que le Comité des transports demande au Conseil de recevoir le présent rapport à titre d'information.

EXECUTIVE SUMMARY

The City of Ottawa operates and maintains a large and complex transportation network. During the winter months, snow and ice control services are deployed along the transportation network in accordance with the Council's approved Maintenance Quality Standards (MQS).

The annual budget for winter operations is based on a number of factors, including average snowfall and freeze-thaw cycles, the City's MQS, the type and volume of infrastructure to be cleared, the fleet and the personnel needed to meet the MQS, the cost of materials, and the previous year's actual spending. With Council's addition of \$4.5 million into the winter operations base budget as part of the 2017 budget process, the winter operations budget is now over \$63 million per year. To address winters that are worse than average, Council has a Winter Operations Reserve Fund, which currently has a balance of approximately \$4.28 million.

To help contain costs overall, staff undertook a review of winter operations on roadways, with the assistance of KPMG, to identify savings and efficiency initiatives that staff could undertake to reduce winter roadway operations expenditures and reduce the impact of weather variability on the overall budget. It was determined that sidewalks and multiuse pathways would need to be the subject of a subsequent review to permit this review to be completed in a timely manner.

On July 13, 2016, Council approved the [Review of Winter Operations on Roadways report](#) (ACS2016-COS-PWS-0026), based on the results of the review by staff and KPMG, which identified cost containment strategies for winter roadway operations that staff would phase in over several winter seasons, with the aim of achieving \$2.7 million in efficiencies upon full implementation.

The major strategies undertaken were to identify a "right-size" approach to the deployment model, with a focus on finding the optimal ratio of internal to contracted services, and "beat optimization", where salting and plowing routes would be adjusted to be more efficient and still meet maintenance quality standards. As well, staff worked

with CUPE 503 to identify other service delivery enhancements and operational adjustments. Several pilot projects were also established for review, namely alternate (reverse) plow beats, one-sided parking in suburban areas and a plow-equipped garbage truck.

As noted in the [Review of Winter Operations on Roadways report](#) (ACS2016-COS-PWS-0026), staff would be undertaking benchmarking and data-gathering over the 2016/2017 winter season, with full implementation beginning in the 2017/2018 winter season and an expected completion in 2018/2019. At the July 13, 2016 meeting, Council directed staff to report back in the spring of 2017 with an update on how successful they have been or what issues they have experienced along the way to implementing the recommendations outlined in the Council-approved report.

This report outlines the progress made over the 2016/2017 winter season as well as newly identified service delivery enhancements, operational adjustments and pilot projects.

Given that the 2016/2017 season has been a year for benchmarking, it is important to note that Ottawa experienced the second largest snowfall in 30 years in this season – over 310 cm. From January to March, 2017, Ottawa received 172.9 cm of snow accumulation, 95.2 mm of rain over a total of 50 winter events, well above the 20-year average of 137.82 cm and the 5-year average of 147.96 cm.

Ottawa also experienced 78 freeze-thaw cycles from October through April that generated stress on road pavement, which created ideal conditions for potholes and led to ice buildup. Additional pressures came from some significant winter storms experienced by Ottawa this winter, such as the one between February 12 and February 15, 2017, where the city received 50 cm of continuous snow, and the 14-hour freezing rain event on January 18, 2017.

Overall, the results of year one have highlighted early indications of success in a number of areas while uncovering areas for improvement. Specifically, staff efforts towards beat optimization were generally positive, but staff's ability to right-size deployment was made difficult by the intensity of the winter season.

Staff are on track to realize approximately \$600,000 in savings this year for winter road operations, even with the significant challenges of the amount of snow, rain and freeze-

thaw cycles. While this is only 22% of the overall target, these early savings are promising, as staff did not anticipate savings until years two and three of the overall implementation of beat optimization and right-sized deployment.

Staff continue to gather lessons learned from the operational adjustments, continuous improvement ideas, and pilot projects in order to adjust the approach to the next winter season.

Assumptions and Analysis

Staff have spent the last year analyzing data and training staff, piloting new ways of doing business, leveraging partnerships to improve service delivery, and implementing continuous improvement initiatives all aimed at increasing efficiency and resident satisfaction. While the first year was focused heavily on stakeholder consultation and engagement, research and analysis, and the development of baseline data to benchmark improvement in subsequent seasons, many initiatives were implemented that demonstrated value for service and cost savings.

Overall, the results of year one have highlighted successes while uncovering areas for improvement. Specifically, while staff efforts towards beat optimization were generally positive, the ability to right-size deployment was hindered by the intensity of the winter season as many of the 78 winter events in the 2016/2017 season required all available equipment and resources to respond. Staff continue to gather lessons learned from the operational adjustments, continuous improvement ideas, and pilot projects in order to adjust the approach to the next winter season.

Financial Implications

Staff are on track to realize approximately \$600,000 in savings this year, despite experiencing the second largest snowfall in 30 years and a significant increase in rain, freezing rain and freeze-thaw cycles. While this is only 22% of the overall target, it accounts for early savings as staff did not anticipate savings until years two and three of the overall implementation of beat optimization and right-sized deployment.

Consultation

Roads Services has reached out to key stakeholders, such as CUPE Local 503, By-law and Regulatory Services, Water Services, Parks, Forestry, and Stormwater, Fleet

Services, Traffic Services, Transportation Planning, Transitway and Parking Services in an effort to foster positive relationships and gain insights into how to improve service while finding operational efficiencies.

BACKGROUND

The City of Ottawa covers a geographic area measuring 2,790 km². It spans over 90 km from west to east and has one of the largest municipal transportation networks in Canada, consisting of the following:

- 5,705 km of roads
- 2,233 km of sidewalks
- 40 km of winter maintained cycling lanes
- 233 km of dedicated Transitway and Highway 174
- 7,500 parking spaces
- 15 Park and Ride lots

This complex transportation system is bounded within an urban area surrounded by a heavily populated and growing suburban community with an extensive rural countryside consisting of villages, farms, industry, and some more isolated homes.

The entire network must be maintained appropriately for each season and weather is the single largest variable with respect to predicting how much budget is needed in any given year to provide residents and businesses with service that meets the City's Maintenance Quality Standards (MQS).

Situated in the lower Ottawa Valley, the city experiences high levels of variability from year-to-year with respect to snowfall and winter rainfall amounts. Ottawa averages 223 cm of snow per year (30-year average), and 76 freeze-thaw cycles, based on Environment Canada's daily weather observation data taken from the McDonald-Cartier International Airport. Freeze-thaw cycles are important to note because even though they are not considered a winter event related to snow accumulation or rain, they require the application of salt and/or other abrasives to address icy roads and sidewalks and other potential safety issues along the transportation network.

The Public Works and Environmental Services Department and staff from the Finance Department use a number of factors to establish an annual budget for winter operations, including average snowfall and freeze-thaw cycles, the City's MQS, the type and

volume of infrastructure to be cleared, the most of the fleet and the personnel needed to meet the MQS, the cost of materials, and the previous year's actual spending.

Given the increasing unpredictability of winter weather in Ottawa, Council infused \$4.5M into the winter operations base budget as part of the 2017 budget process. This adjustment grew the winter operations budget from approximately \$59M to over \$63M.

While the base budget adjustment aligns to the expenditures of an average winter season, it cannot account for anomalous winter weather, which is why Council invests in an established Winter Operations Reserve Fund to help mitigate the risks associated with over expenditures caused by exceptional weather conditions in a given year. The current Reserve has a balance of approximately \$4.28M.

On July 13, 2016, Council approved the [Review of Winter Maintenance Operations on Roadways Report](#) (ACS2016-COS-PWS-0026). The report brought forward recommendations identified by KPMG for cost containment strategies that could be phased in over several winter seasons with the aim of achieving \$2.7 million in efficiencies upon full implementation. Two key recommendations were:

- Investigating and implementing a “right-size” approach to the deployment model, with a focus on the appropriate ratio of internal to contracted services; and,
- Adjusting salting and plowing routes (beat optimization) to meet maintenance quality standards.

This report outlines the progress made over the 2016/2017 winter season as well as newly identified service delivery enhancements, operational adjustments and pilot projects.

DISCUSSION

The update provided in this report represents the achievements and lessons learned from year one of a three-year implementation of cost savings initiatives, operational improvements, and service-enhancing pilot projects. The program anticipated that the 2016/2017 winter season would be focused on benchmarking and data-gathering. That said, some savings in winter roadway operations were experienced. The overall deficit in operations, due to the unusual and intense winter season, further highlights the need

for staff to continue these initiatives, along with the data-gathering, in order to realize the full savings over time.

In order to provide context to the information in this update, it is important to understand the 2017 winter operations budget and associated weather factors that were experienced during the benchmarking exercise and that have contributed to expenditures to date.

Ottawa experienced the second largest snowfall in 30 years. From January to March, 2017, Ottawa received 172.9 cm of snow accumulation, 95.2 mm of rain over a total of 50 winter events, well above the 20-year average of 137.82 cm and the 5-year average of 147.96 cm.

Ottawa also experienced 78 freeze-thaw cycles from October through April that generated stress on road pavement, which created ideal conditions for potholes and led to ice buildup. Freeze-thaw cycles can be a significant contributor to increased expenditures as they require the application of salt and/or other abrasives to address icy roads and sidewalks despite not generally being connected to winter storm events in of themselves.

Additional pressures come from the significant winter storms Ottawa experienced, such as the one between February 12 and February 15, 2017, where the city received 50 cm of continuous snow, and the 14-hour freezing rain event on January 18th. During these types of events, resources are deployed 24/7 over a number of days. Additionally, once the event has concluded, significant work is still required to remove snow and ice from the sides of roads and sidewalks to address sightline issues, open up on-street parking spaces, and increase snow storage capacity for upcoming winter storm events.

The Q1 2017 expenditures currently demonstrate a \$9.3 million deficit. The main drivers of the Q1 2017 deficit are sidewalk plowing and application of materials and snow removal. Snow removal for the first three months of 2017 accounts for \$5.15M of the deficit. In Q1 of 2017, snowbanks were removed 2.5 times. The annual budget allows for removal of the snow banks 1.5 times per year. The demand for snow removal is substantially higher in high density/infill developments as well as in areas with an increased demand for on-street parking.

Due to the large number of winter events and the significant increase in freeze/thaw cycles this year, staff were required to plow, salt and grit sidewalks on a regular basis all season. As a result, sidewalk plowing and application of materials accounted for \$4.15M of the budget deficit. For example, the 50 cm storm required the City's sidewalk equipment to be retrofitted with blowers as standard plow blades were unable to manage the heavy weight of the snow. This resulted in substantially slower sidewalk clearing operations as the blowers require 50% longer to complete the same operation as standard plow blades, which increase costs as it takes longer for operations to be completed.

Update on the Winter Maintenance Operations on Roadways Initiatives

RIGHT-SIZING DEPLOYMENT

Roads Services committed to enhancing its deployment model with the appropriate ratio of internal and contracted services as part of a phased-in approach as contracts come up for renewal. Once fully implemented, right-sizing the deployment model to ensure the right response for the right storm, while using a balance of internal and external resources across the City, is estimated to save approximately \$1.5M.

Given the intensity of the 2016/2017 winter season, it was impractical for staff to implement right-sized deployment as most of the 78 winter events experienced this season required all resources to respond.

Moving forward, staff will continue to work towards developing deployment models based on the various winter events that ensure the right response for the right storm using a balance of internal and external resources. While the current model provides an appropriate number of resources for winter events, as the network expands, deployment models will be reviewed under a cost-benefit analysis lens to augment and supplement with contractors where feasible and appropriate.

During the evaluation of service delivery models, staff identified an opportunity to adjust incidental after-hours work. Traditionally, incidental after-hours work, such as responding to emergencies (for example, motor vehicle accidents and dead animals on the road) would be the responsibility of the on-call staff in each geographical area (east, west, south). There is an opportunity for costs savings by centralizing this procedure to the core out of the Hurdman Works Yard, which is staffed 24 hours a day, 7 days a

week. This change reduces the requirement for on-call and overtime and provides a potential cost savings of \$380,000.

Recognizing how dependant achieving savings within the winter operations budget is on weather variability, particularly for right-sizing deployment, Roads Services is committed to identifying alternate cost saving measures to achieve its commitment to saving \$1.5M.

WORKING WITH THE UNION

On July 6, 2013, during consideration of the Review of Winter Operations on Roadways report, Transportation Committee directed staff to meet with representatives of CUPE 503.

In response to this direction, a joint working group consisting of Roads Services management staff and members of CUPE Local 503 was established. This joint working group looked at additional options to find cost savings that would have minimal impact on the current compliment of internal resources.

One of the ideas brought forward was to develop a business cases to determine the savings associated with high performance cold patch asphalt for pothole filling vs. hot mix asphalt. During the 2016/2017 winter season, cold patch was tested to determine its effectiveness and potential for savings.

High Performance Cold Patch Asphalt

High performance cold patch asphalt adheres better to the pavement in wet conditions. Given the significant increase in winter rain this past season, it was the perfect time to test the efficacy of the product.

Over the past several years, staff have primarily used hot mix asphalt to fill potholes during the winter months as it was meant to adhere better in Ottawa's cold climate. However, staff have realized that it did not provide the benefits intended and it cost slightly more than regular pothole mix as it requires a hot box and for asphalt plants to remain open during winter months when they would otherwise be closed.

As a result, Roads Services has discontinued the use of Winter Hot Mix Asphalt material this past winter season as significant price increases for the material over the last 6 years have made it considerably less economical.

Increased material costs were not the only determining factor in this decision. Winter hot mix asphalt materials are produced using a batch plant resulting in inconsistent material quality. Roads Services worked with the supplier to improve the products suitability for winter application; however, these efforts have not proved successful.

During the time staff have used hot mix asphalt, technology and techniques in the field of pothole patching have improved. One of the main improvements is with high performance cold patch asphalt. The main difference between hot mix and high performance cold patch is the way in which it adheres to the pavement in wet conditions. When experiencing wet conditions, cold patch has been seen to be more effective for repairing potholes in winter months. Hot mix requires a relatively dry surface to create the proper bond – too much water can cool the hot mix before it can achieve that bond.

Additionally, improvements in the technology of the City's hot box fleet allows staff to regulate the temperature at an operating range capable of "warming up" the High Performance Cold Patch material. This warming of the material improves its performance during winter use, an option which was not previously viable. The supply of High Performance Cold Patch is also much more flexible in that staff have the ability to store the material on-hand at its maintenance yards which reduces pick-up/transportation costs and allows staff to be more responsive to requests.

Overall, the results of the switch to cold patch were positive and staff estimate savings of approximately \$212,000 with the use of high performance cold patch.

With over 118,760 potholes patched during the 2016/2017 winter season, a 48% increase from 2015 when the city experienced colder conditions and less freeze/thaw cycles, the ability to adjust operations to ensure the best result possible is imperative to keeping potholes filled as long as possible.

Unfortunately, the unusually severe weather over the winter was followed by an unusually wet spring that saw over 276.2 mm of rain fall in April and May (up to May 24th). In fact, Ottawa experienced the most rain it has ever seen in a 5-month period in over 35 years with 371.6 mm of rain falling between January and May (the 20-year average is 202.4 mm). This rain was followed by continued cold weather and led to damaging asphalt repairs that were made over the winter. This contributed to considerably more potholes and other asphalt damage this year than in previous years.

As a result, staff advised Council that additional road work was necessary to keep the City's asphalt overlay from deteriorating further. On May 24th, 2017, Council approved the addition of \$400,000 into the roads services operating budget to address concerns in severely impacted areas. Concurrently, Council also approved an additional \$2.5 million in capital funding for 2017 Road Resurfacing program which is in Planning, Infrastructure and Economic Development department's capital program.

In total, both the change in service delivery models for incidental after-hours work and the introduction of high performance cold patch account for savings of approximately \$600,000. Staff are committed to continuing to right-size deployment and to working with their union partners and other stakeholders to determine alternate cost savings measures to achieve the remaining savings.

Staff will keep Council apprised of its progress with an update in the spring of 2019.

BEAT OPTIMIZATION

One of the report recommendations was to review and redesign winter maintenance routes (beats) for arterial and collector roads within the MQS with potential savings of \$1.2M once fully implemented. Given the complexity of beat optimization, staff committed to phasing-in this recommendation over the two winter seasons. Staff indicated that the 2016/2017 winter season would be used to analyze and map existing beats with the implementation of its optimized beats, and resulting savings achieved, in the 2017/2018 winter season. All while keeping in mind the nuances of Ottawa's four distinct geographical locations: Downtown, Urban, Suburban and Rural.

Staff were able to develop new target lengths for its priority beats faster than anticipated, which allowed for some trial runs during year one of this initiative. Management also consulted its operators as part of this process to leverage their knowledge of how these beats run during actual winter events. With this information, trial runs of the new beats were completed in the fall and tested during actual winter events during this season.

The results were generally positive as most of the trial beats met the MQS. However, some beats did not and operators immediately switched to their old beat sequences to ensure roads were cleared and Maintenance Quality Standards were achieved.

Safe and passable roads are a top priority and staff will not implement changes if they negatively impact the ability for residents, visitors, and emergency personnel to navigate the priority transportation network during the winter. In advance of the 2017/2018 winter season, staff will review the successes of their trial runs as well as those areas that need to be improved in order to ensure, where feasible, the successful implementation of beat optimization across the city.

Staff will keep Council apprised of its progress towards beat optimization with an update in the spring of 2019.

OPTIMIZING RESIDENTIAL BEATS

The clearing of residential streets is a top priority for Council and the residents of Ottawa. Based on the discussion that took place at Transportation Committee around residential beat lengths and the availability of new technology, staff began to analyze data to determine how often it was achieving the MQS.

Despite an intense and extreme winter season with 78 winter events and over 310cm of snow falling between October, 2016 and March, 2017, Roads Services achieved an average of 91% compliance with MQS on its residential beats. The 9% of the time that MQS was not met can generally be attributed to unique circumstances, such as an extreme winter event or vehicle breakdowns. In all cases, residential beats were completed well before the provincially-mandated standards for roadway clearing.

Now that staff have the data to support its understanding of the times when the MQS are not met, they will continue to work toward solutions to ensure this percentage gap closes, recognizing it may never be able to meet 100% compliance in every year due to the variability of weather and the potential for equipment breakdowns and other obstacles that prevent plows from clearing streets (e.g.: parked vehicles). Optimizing residential beats is one of the ways in which staff can get as close to 100% as possible, and Roads Services will continue to adjust beats as part of the broader optimization initiative to ensure residents receive the same or better service for their residential roads.

SALT MANAGEMENT

Staff continue looking at new and innovative technologies and processes to manage the application of salt, and regularly connect with industry experts and other municipalities

to be at the forefront of salt management practices. Discussions around salt management here began in earnest after Ottawa hosted a Smart About Salt Summit on November 29, 2011. Staff have continued the momentum that began with that summit by implementing salt tracking technology on its salt (combo) plows which allows operators and supervisors to see how much salt is actually being applied to the roadway vs. how much is planned based on the appropriate event response.

In preparation for the 2016/2017 winter season, a training program was developed to refresh the Salt Application Policy for supervisors and operators. This training reached over 600 staff. The main objective was to demonstrate how applying the appropriate amount of salt to the road is as effective as over-applying salt in preventing the bond of snow and ice to the roadway.

Staff defined the success of this training by comparing what was actually applied to the road and what was planned by the supervisors based on the impending winter event and corresponding surface temperature (temperature of the road).

The baseline compliance rate prior to the enhanced training was 80%. With the new training, there was an average increase of approximately 20%, demonstrating a significant increase in operator adherence to the planned salt application rates. Given that salt beats are usually run for every winter event, staff consider this increase a success as it can attribute to potential financial benefits. However, further analysis is required in order to quantify these benefits and staff continue to work towards this.

CONTINUOUS IMPROVEMENT

Achieving successful winter operations is one of the City's top priorities. It impacts the daily lives of Ottawa's residents, businesses, visitors, and emergency responders.

While Roads Services is accountable for ensuring safe and accessible roads, sidewalks and cycling lanes, winter operations is a City-wide responsibility, and staff continue to leverage the resources and expertise of its partners to support many winter operations activities. Staff regularly engage key stakeholders, such as CUPE Local 503, By-law Services, Transitway and Parking Services, Traffic Services, and Transportation Planning in an effort to foster positive relationships and gain their insights into how to improve service while finding operational efficiencies.

As a result of these engagement activities, staff have been able implement a number of innovative strategies that help to reduce the burden of winter in Ottawa. Two of these strategies have become integrated into ongoing operations with significant success.

Free Overnight Parking in City Parking Garages

In the winter of 2015/2016, the City of Ottawa began offering free overnight parking in all six municipally-owned public parking garages. With the specific intent to remove as many parked vehicles from the streets as possible to allow for more effective snow plowing activities. Over the two winter seasons this has been in place, staff have seen a consistent increase in uptake for each event where a Winter Overnight Parking Ban is put in place.

The most successful uptake occurred during the overnight parking ban of February 13, 2017 which saw the greatest number of people take advantage of this program with 605 vehicles parking in the City's 6 parking garages. This success can be attributed to the promotion of these options by local councillors and the cooperation of city staff, including those in the Transitway and Parking Unit, By-law and Regulatory Services, and Public Information and Media Relations.

Staff are encouraged by this uptake and the trend that shows an increase in parking within this initiative on a year-to-year basis. Staff will continue to monitor the utilization in the garages during overnight parking bans in future.

Leveraging Departmental Resources

One of the benefits of engaging with internal stakeholders is being able to leverage their resources when all Roads Services equipment and vehicles are deployed for major storm events. Working with Fleet Services and Parks, Forestry and Stormwater, staff are testing different units (such as agricultural tractors equipped with plows) to determine if they are able to supplement the existing equipment complement during significant events, ensuring that all roads, including rural and residential roads, achieve the Maintenance Quality Standards to allow for the flow of people and goods across the city.

Additionally, staff in Water Services have redeployed five heavy equipment operators and vehicles to Roads Services to help manage peak demands during the winter season. They have primarily focused on supporting snow removal efforts after major

storms to open up lanes and remove large snow banks in preparation for the next winter event. The added value of this arrangement is that these staff could be deployed back to Water Services throughout the season based on operational needs.

The value of engaging with stakeholders to leverage their strengths to support winter operations cannot be understated as it allows the City to continuously improve the service provided to address pain points shared by Councillors and residents as a result of winter in Ottawa.

DOING WORK DIFFERENTLY

Not only does Roads Services look at ways it engages with its stakeholders to implement continuous improvements, it also seeks out opportunities to do work differently. During the 2016/2017 winter season, Roads Services undertook a number of pilot projects to determine the effectiveness and value of new and innovative ways of doing business. These pilots included the following:

- Alternate (Reverse) Plow Beats
- One-Sided Parking in Suburban Areas
- Plow-Equipped Garbage Truck

Alternate Plow Beats

For many years, Councillors and residents have asked staff for ways to adjust residential beats for a more equitable share of the benefits and drawbacks of snow plowing in Ottawa. Whether its requests to share the snow load on both sides of the street rather than just one or seeking ways that residents at the end of a beat can see a plow come by earlier, staff have historically told Councillors and residents that they are unable to make these adjustments.

However, with the technological investments, such as GPS and real-time reporting, made in winter operations over the past several years, staff are now able to look at ways of plowing select residential routes in alternate directions, with the ultimate goal of balancing timing and snow load. For residents, this means that a plow may come by their home or business earlier in the beat and more snow would be dispersed to the opposite side of the road. The value in this process is that over the course of the winter, residents will receive more equitable service delivery across residential beats.

Recognizing that this would be a large undertaking for staff, only five residential snow plow beats were selected for the 2016/2017 winter season. These specific locations were chosen as they possessed the optimal criteria to ensure ease of implementation and a successful pilot. These criteria included little to no one-way streets and opportunities for right turns that still allowed for alternate routing along with volume of service requests in these areas.

Based on these criteria and a review of service request data, the following five beats were selected for the trial:

- Beaverbrook and Kanata Lakes in Ward 4 (Kanata North)
- Merivale Gardens, Grenfell Glen and Pineglen in Ward 9 (Knoxdale – Merivale)
- Barrhaven neighborhood in Ward 3 (Barrhaven)
- Crystal Beach in Ward 7 (Bay)
- Avalon in Ward 19 (Cumberland)

In these neighbourhoods, alternate plowing was completed every second full residential plow run. Staff reviewed the data collected during the pilot to determine the operational impacts of the alternative beats during different types of winter events.

Early results are extremely positive and feedback from Councillors, residents, and operators indicate agreement that this offered better distribution of snow and more equal timing of plowing residential streets while remaining within the MQS.

Over the summer months, staff will continue to review the data and gather lessons learned in order to expand the pilot in 2017/2018 to one residential beat per ward. Staff will begin consultations with Councillors in advance of the winter season to share their recommendations and potential limitations, depending on the make-up of the current beat (e.g: many one-way streets).

One-Sided Parking

In urban, suburban and rural villages, on-street parking can be a major deterrent to successful and efficient plowing operations. In the urban areas, staff have implemented free off-street parking options. However, staff have heard from Councillors and

residents alike of the same struggles in suburban and rural village neighbourhoods, particularly those in newly built areas where there are shorter driveways and less room for snow storage.

In order to find ways to reduce the impacts of on-street parking on winter operations while supporting residents that rely on parking on-street, Roads Services staff collaborated with Traffic Services and By-law and Regulatory Services to implement a one-sided parking pilot in a small suburban community in Barrhaven.

As part of the pilot, parking was limited to one side of the street for the winter season on five different residential streets. The goal was to enable better access for snow plows and more effective operations on these residential streets.

Roads Services worked closely with Traffic Services and By-law and Regulatory Services to provide a full analysis of data, which included on-street parking numbers and compliance issues. Furthermore, feedback from the residents was generally positive with some comments related to minor issues such as signage, which were easily addressed. Additionally, the analysis indicates that there continued to be ample on-street parking for residents in these areas.

Opting for one-sided parking provided residents with the ability to continue to park on-street while allowing the opportunity for plows to get down the streets and as close to the curb as possible on the unobstructed side. This offered multiple benefits for both the residents of the streets and the operators who serve the area as previously only a 4x4 plow could get through. With vehicles on only one side of the street, a full-sized plow can travel down the street providing a higher level of service and operational efficiencies.

Given the successful results, staff will expand one-sided parking pilots for the 2017/2018 winter season for those wards that are not able to rely on off-street options. Staff will work with its partners over the summer months, including ward councillors, to investigate options for additional priority areas where repeated issues occur.

Plow-Equipped Garbage Truck

One of the more unique pilot projects undertaken by Roads Services was the introduction of a garbage truck as a means to plow city streets. The idea came from

New York City, where plows are attached to garbage trucks during significant winter events.

New York City loaned the City of Ottawa one of its plow-equipped garbage trucks to evaluate the feasibility of future deployment of this type of vehicle to help manage significant winter events. Roads Services worked closely with Fleet Services to import the vehicle and identify training, safety and operational issues.

The New York City garbage truck did not collect waste while in Ottawa, and was only used for testing snow clearing. The truck arrived on February 1, 2017. Staff completed the required operator training and the vehicle was tested during select winter events. This type of plow was proven to be successful as a supplemental resource during large winter events in urban areas (25+ centimetres). However, it would not be used for day-to-day operations as it does not perform as effectively as dedicated snow clearing equipment. Staff are committed to reviewing the possibility of using garbage trucks to supplement operations during major events and will continue to investigate possible opportunities. The earliest PWES could expand this pilot using City resources would be in 2021, in alignment with the new tender for waste collection trucks as the current compliment of waste collection trucks are not suitable for plowing operations and future tenders would need to include the necessary specifications to allow for plow blades.

Staff will provide members of Council with an update on the outcomes of expanding the one-sided parking and alternate plow beat pilot projects in spring 2018.

CONCLUSION

Staff are committed to providing superior services while achieving operational efficiencies. The outcomes of the efforts over the past year have highlighted success while uncovering areas for improvement.

While staff efforts towards beat optimization were generally positive, the ability to right-size deployment was hindered by the intensity of the winter season. Staff continue to gather lessons learned from the operational adjustments, continuous improvement ideas, and pilot projects in order to adjust the approach to the next winter season.

Working collaboratively with internal and external stakeholders, such as CUPE Local 503, By-law and Regulatory Services, Water Services, Parks, Forestry, and Stormwater, Fleet Services, Traffic Services, Transportation Planning, Transitway and Parking

Services, ward councillors and residents, provided an opportunity to do work differently with the ultimate goal of improving service delivery and keeping costs down.

Staff are on track to realize approximately \$600,000 in savings this year, despite experiencing the second largest snowfall in 30 years and a significant increase in rain, freezing rain and freeze-thaw cycles. While this is only 22% of the overall target, it accounts for early savings as staff did not anticipate savings until years two and three of the overall implementation of beat optimization and right-sized deployment.

Staff will continue to collect feedback and leverage the positive responses received to date. With so many new and innovative initiatives launched this past year, staff continues to learn as they move forward with their implementation plan.

The next steps of the overall plan will include touching base with all members of Council to expand existing pilots and discuss opportunities for improvements where operationally feasible while continuing to right-size deployment and optimize beats.

Staff are also aware of the need to address issues with sidewalk and bus stop clearing as well as snow removal. The Ottawa Pedestrian Plan already provides for a comprehensive recommendation to enhance sidewalk clearing within rapid transit corridors, and, upon completion of the current Winter Operations Review implementation, staff will use this information as a starting point to review the potential for changes to the way in which sidewalks are maintained. This will be a large undertaking requiring significant investment in these operations. Furthermore, staff continue to work internally to adjust snow removal operations within the MQS to ensure snow is only removed when and if needed.

RURAL IMPLICATIONS

There are no rural implications associated with the Recommendations contained within this report.

CONSULTATION

Roads Services has reached out to key stakeholders, such as CUPE Local 503, By-law and Regulatory Services, Water Services, Parks, Forestry, and Stormwater, Fleet Services, Traffic Services, Transportation Planning, Transitway and Parking Services in

an effort to foster positive relationships and gain their insights into how to improve service while finding operational efficiencies.

PWES staff have consulted with Roads Services operators and supervisors to discuss the pilot projects initiated as part of the winter operations review. PWES management provided training and consultation opportunities to Roads Services staff for salt management.

COMMENTS BY THE WARD COUNCILLOR(S)

This is a City-wide report

LEGAL IMPLICATIONS

There are no legal impediments to receiving this report for information.

RISK MANAGEMENT IMPLICATIONS

Risks have been identified and explained in the report and are being managed by the appropriate staff.

ASSET MANAGEMENT IMPLICATIONS

There are no asset management implications associated with this report.

FINANCIAL IMPLICATIONS

The budget pressures and efficiencies noted in the report have been reflected in the Roads Services' 2017 Operating Budget. Road Services is on track to realize approximately \$600,000 in efficiencies this year.

ACCESSIBILITY IMPACTS

Roads Services adheres to the Province of Ontario's minimum Maintenance Quality Standards for winter operations. Additionally, staff follow the City's Accessibility Standards and the Older Adult Plan.

ENVIRONMENTAL IMPLICATIONS

Roads Services adheres to the Province of Ontario's minimum Maintenance Quality Standards for winter operations.

TERM OF COUNCIL PRIORITIES

The recommendations of this report align to the 2015-2018 Strategic Priority of Financial Sustainability - FS1: Demonstrate sound financial management.

DISPOSITION

Roads Services will continue to analyze the pilot projects and initiatives identified in this report and work with stakeholders to achieve anticipated savings while implementing service delivery enhancements.