



## Winter Maintenance Program Follow-Up

### Status of Previous Auditor General's Recommendations & Processes to Hold Contractors Accountable to New Contract Terms

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Tara Anderson, CPA, CA, CIA, BAcc  
Auditor General

**AUDITOR  
GENERAL**  

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# Executive Summary

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## Status of recommendations from Auditor General's previous reports on winter maintenance contracts

This report provides the status of recommendations from two previous Auditor General's reports on the City's winter maintenance program, including Transportation Services' processes to hold winter maintenance contractors accountable to the new contract terms.

1. [Audit of Winter Road Maintenance Program - Phase One: Leveraging Technology and Improving Design and Management of Contracts to Achieve Service Level Outcomes](#) (October 2020)

The 22 recommendations included in the Phase 1 audit report were aimed at modernizing Transportation Services' management of winter operations and improving the efficiency and effectiveness of the winter road maintenance program, resolving contract management and contractor performance issues, and measuring and meeting the Council-approved service levels.

2. [Winter Road Maintenance Program - Phase 2 Analysis: Deploying Resources](#) (June 2021)

The Auditor General's Phase 2 report contained four recommendations and highlighted that based on the 2015-2022 contractor rates and unit-priced contract model in use at the time of the report, contracting for winter maintenance services provided the City better value for money than an in-house solution<sup>1</sup>. The Phase 2 report also identified that based on historical daily fleet utilization under the 2015-2022 contract model, there were opportunities for savings that could have been gained by reducing the fleet size and adjusting fleet deployment to more closely align with historical fleet usage.

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<sup>1</sup> The report noted that, should the contract prices in the next contract cycle increase significantly, this conclusion would need to be re-evaluated in light of the higher costs to determine if the contracted service model would still be more cost-effective, or if it would be better to gradually bring various winter maintenance services in house, to save money.

**10 of the Auditor General’s 26 previous recommendations were verified as fully implemented by the end of the 2022/23 winter season**

As at May 5, 2023, management reported that 18 of the 26 recommendations from the two reports were fully implemented. Through this follow-up review, and as summarized in Table 1 below, we determined that 10 recommendations have been fully implemented and one recommendation we verified to be no longer applicable. Management is still working to implement 15 recommendations (in the context of the new winter maintenance contracts).

**Table 1: Implementation Status of Auditor General Recommendations from Phase 1 and Phase 2 Winter Maintenance Reports**

<b>Report</b>	<b>Verified as fully implemented</b>	<b>In progress (not yet fully implemented)</b>	<b>No longer relevant / applicable</b>	<b>Total</b>
Audit of Winter Road Maintenance Program – Phase One: Leveraging Technology and Improving Design and Management of Contracts to Achieve Service Level Outcomes (October 2020)	9	13	0	22
Winter Road Maintenance Program – Phase 2 Analysis: Deploying Resources (June 2021)	1	2	1	4
<b>Total</b>	<b>10</b>	<b>15</b>	<b>1</b>	<b>26</b>

**4 new recommendations to improve how Transportation Services administers winter maintenance contracts**

The recommendations from the two earlier Auditor General reports were made in the context of the previous (2015-2022) winter maintenance contracts. In our current follow-up review, we assessed whether management’s actions, in the context of the new (2022-2032) contracts, addressed the intent of the previous recommendations – to improve the efficiency and effectiveness of contract management and divisional processes designed to hold contractors accountable to the contract terms. The intent of this report and the four new recommendations contained herein are to highlight areas for continuous improvement when administering the current contracts going forward.

**Progress made since the 2020 and 2021 audits**

Progress has been made since the 2020 and 2021 audits to improve the clarity in the contract language for the new contracts, and as shown in Table 1 above, we verified that management has fully implemented 10 recommendations. Exhibit 1 to this report contains a list of the 10 recommendations that we verified management has fully implemented.

**Recommendations and action plans are listed in Exhibits**

Exhibit 2 to this report contains a list of the 15 recommendations not yet fully implemented, together with management’s comments on the current status, as well as their action plans and timelines to address the related recommendations. Exhibit 3 to this report contains the one recommendation that is no longer applicable.

**Transportation Services experienced several challenges this first winter season including global supply chain issues due in part to the COVID-19 pandemic**

Transportation Services management advised that they experienced several challenges this first winter season (2022/23) as they implemented the new performance-based winter maintenance contracts. Of particular significance, was the global supply chain issues due in part to the COVID-19 pandemic, which impacted the timely arrival of new equipment prior to the start of the winter season and subsequent challenges installing GPS devices. Management also indicated that they experienced delays and challenges implementing a new technology system and technology solutions and tools to support contract management.

**In February / March 2022, contractors and staff discussed modifying equipment requirements. These conversations continued through the summer of 2022**

As noted in the Auditor General’s report<sup>2</sup> on the procurement and award of the winter maintenance contracts, supply chain issues were well known, with potential suppliers raising concerns during the pre-solicitation and procurement process, about their ability to source equipment by the dates specified in the contract. In the [Supplementary Report - Award Report for Various Suppliers for the Provisions of Winter Maintenance Services \(toronto.ca\)](#), management highlighted that if the contracts were not awarded in December 2021, there would be insufficient time for contractors to procure equipment. These contracts are a part of the City’s snow and ice management plan that is designed to prioritize the safety and mobility of all road, sidewalk, cycle, and path users. Shortly after the contract awards, in February / March 2022, contractors and staff discussed modifying equipment requirements. These conversations continued through the summer of 2022 and resulted in Transportation Services agreeing to some substitutions of equipment.

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<sup>2</sup> The results of the Auditor General’s review of the City of Toronto’s Negotiated Request for Proposals to Various Suppliers for the Provision of Winter Maintenance Services are detailed in a separate report titled “A Review of the Procurement and Award of the Winter Maintenance Performance-Based Contracts” that will also be considered by Audit Committee on July 7, 2023.

**Contractors and Transportation Services (in-house operations) experienced supply chain and labour challenges**

As part of this follow-up review, management advised us of the following continuing effects and consequences from the COVID-19 pandemic:

- manufacturers communicated to the winter maintenance contractors that they would not be able to deliver purchased equipment on time
- Transportation Services' in-house operations also experienced delivery delays, with some winter maintenance equipment purchases not yet having arrived at the time of our follow-up review
- labour shortages experienced by both the contractors and Transportation Services impacted the number of operators available to operate winter equipment for certain winter activations<sup>3</sup>

Thus, for this first winter season of the new contracts, management's priority and focus was on working with contractors to ensure salting and snow clearing equipment was ready and available to support the safety and mobility of users on Toronto's roads, sidewalks, and bike lanes.

**Management implemented a new manual and standard operating procedures**

Management also made some progress on our previous report recommendations. During this first winter season, management prepared a Winter Maintenance Contract Administration Manual which included 32 standard operating procedures and forms/checklists, and provided training on the manual and how technology can be used to assist staff in overseeing winter maintenance activities under the new contracts. Management has advised that the manual and training will continue to be reviewed and updated heading into the second winter season, with additional training to be provided to staff. Further, Transportation Services also piloted a purpose-built GPS dashboard in February 2023 for monitoring service levels and contractor performance.

**Delays in implementing technology systems and solutions**

However, management advised that, due to resource and staffing challenges, administrative setbacks and technology gaps, there were significant delays in implementing the Enterprise Work Management System (EWMS), installing GPS devices, and configuring the GPS dashboard to support efficient contract management and monitoring of performance metrics.

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<sup>3</sup> An activation refers to instructions issued by City staff to contractors to commence mobilizing their equipment for a winter activity such as salting, de-icing, plowing, etc.

**Continuous improvement of the efficiency and effectiveness of contract management is needed**

As was first highlighted in the Auditor General’s October 2020 report, and also in this follow-up report, there continues to be a need to improve the efficiency and effectiveness of contract management and divisional processes designed to hold contractors accountable to the contract terms.

**Key processes and controls to hold winter maintenance contractors accountable to the new contract terms**

**Ensure technology, GPS reporting, and processes are fully operational in time for the next winter season**

Based on our interviews with management and staff, and our review of available documents and records, we found that by the end of the first winter season, planned technology, relevant GPS reporting, and robust verification processes were not yet fully in place to support effective and efficient monitoring of contracted winter maintenance services and to ensure Council-approved service levels had been met for each winter event under the first year of the new contracts.

**Limitations to our follow-up review**

The findings and estimates in this report rely on the information and documents that were readily available at the time of our follow-up review. We found that there were issues with the consistency, completeness, and accuracy of these records, which limited the scope of what we could review<sup>4</sup>. This is further explained through our findings in this report.

**Three key areas of findings**

Our findings are summarized into the following three areas:

- A. Strengthening processes to consistently **enforce payment criteria and apply liquidated damages.**
- B. Ensuring robust **monitoring of contractor performance.**
- C. **Continuing to implement systems and tools** to improve efficiency and effectiveness of contract management.

**Using GPS to more effectively and efficiently monitor contractor performance**

The effective and efficient use of GPS data (including timely exception reporting and the GPS dashboard), as well as enhanced use of EWMS functionality to monitor performance, is key to better managing the new winter contracts and holding contractors accountable to the contract terms.

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<sup>4</sup> Records and documents made available by Transportation Services staff did not provide a sufficient basis to conclude whether: contractors delivered all required pieces of equipment by the contracted mobilization dates; all pieces of equipment were on site at the Depots throughout the winter season; contractors completed the routes as directed; and contractors met the service levels (i.e., maximum operating time and pavement outcome requirements).



**2020 audit highlighted that GPS technology was only being used in a limited capacity**

The Auditor General's October 2020 report noted that Transportation Services already had GPS technology in place to modernize contract management, but it was only being used in a limited capacity. At that time, staff primarily used GPS information to address 311 service requests and verify claims from members of the public for damage to personal property and bodily injury caused by unsafe road conditions during the winter. Transportation Services staff were generally not using the GPS data available to verify the contractors' services or to measure route completion and service levels.

**Better use of GPS data can strengthen payment verification processes**

The 2020 report also highlighted that Transportation Services could further digitalize and modernize its processes by eliminating manual records/processes and integrating its GPS and contractor payment system. The report noted that using GPS information effectively could reduce the work required to verify contractor reported information.

**Division is continuing to develop and test the GPS dashboard**

Through this follow-up, we continue to highlight that Transportation Services staff need to use GPS data more effectively to monitor contractor performance in an efficient manner. The Division is working towards better integrating GPS data by developing and testing the dashboard to monitor adherence to contract service levels, which can help improve the efficiency and effectiveness of contract management processes that have historically been manual and labour intensive.

**A. Strengthening processes to consistently enforce payment criteria and apply liquidated damages**

Processes to verify daily rate payments

**Over \$100 million of annual contract award value are for daily rates**

At the time the contracts were awarded, the total contract award value for the 2022/23 winter season was estimated to be \$128 million. The daily rate<sup>5</sup> component represented approximately \$101.5 million (or 79 per cent) of the total contract award value for the season.

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<sup>5</sup> The daily rate is defined as a daily fixed cost associated with a piece of equipment that represents costs associated with providing services under the contract, including investment in equipment, licensing, maintenance, insurance, and availability of an operator. In the previous contracts, this rate was referred to as a "standby charge".



**Criteria for daily rate payment**

The contracts state that the City will pay a daily rate for equipment that meets all of the following criteria. The equipment must:

- be available in proper repair at a Depot
- be installed with a properly functioning GPS device
- have a mechanical fitness certificate by a Licenced Automotive Technician
- be properly calibrated to City standards
- have proof of age in accordance with contract requirements
- have a qualified operator available to operate the vehicle

**Some daily rate sheets do not accurately reflect the status of GPS devices**

During our follow-up, we reviewed all daily rate sheets for December 1, 2022, a key milestone date for the contracts, as it was the date all equipment was required to be at a Depot and ready for operations. For this date, we observed that to varying degrees in most contract areas, the information listed on daily rate sheets was not accurate. The daily rate sheet stated a GPS device was working, but when we reviewed information tracked in the GPS system, the system showed those GPS devices were not reporting any data / signal (i.e., the device was likely not installed or not working). Given the issues with reliability of information on daily rate sheets, we cannot confirm that the daily rates paid were appropriate.

**Delays in installing GPS devices**

Staff advised us that there were delays in installing GPS devices. By the end of the first winter season, 1,139 of 1,244 pieces (92 per cent) of equipment had a GPS device installed. Management indicated to us that there was not always conclusive evidence to determine who was at fault for GPS installation delays<sup>6</sup>.

**Daily rates were paid even though some contractual requirements were not met**

Based on records maintained by Transportation Services staff, we estimate that Transportation Services paid almost \$18 million<sup>7</sup> for daily rate payments from October 15, 2022, through March 31, 2023, for equipment where some of the express terms of the contract were not fully met. We describe this in more detail in section A.1.

**Transportation Services decided to pay daily rates as long as the equipment was able to be deployed**

The Division's internal meeting minutes from December 2022 indicate a decision was made that if the equipment was at a Depot and operational (able to be deployed to effectively provide winter maintenance services), but was still missing GPS, it was still eligible for the daily rate. Management further advised us that given the large volume of ongoing GPS installation delays, this decision was made to ensure that equipment could still be utilized for services.

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<sup>6</sup> The contracts state that the daily rate will apply if a malfunction is due to the City's third-party GPS provider.

<sup>7</sup> This estimate is subject to the limitations noted in this report.

Processes to verify operating rate payments:

**Each piece of equipment activated during a winter event is paid for based on contracted operating rates**

Transportation Services pays for operations based on the operating rate for each piece of equipment activated during a winter event. Where a maximum operating time is specified in the contract for specific operations (e.g., salting or plowing), for each activated piece of equipment, contractors are paid the maximum operating time at the operating rate, regardless of the actual time a contractor spends to complete the activity<sup>8</sup>. Contractors are eligible to receive payment for the maximum operating time based on each round of activation.

**\$20 million of annual contract award value are for operating rates – actual amounts will vary depending on equipment activations**

At the time the contracts were awarded, the operating rate component for the first winter season was estimated to be approximately \$19.8 million (or 15 per cent) of the total contract value. The total amount paid for operating rates will vary from season to season depending on actual winter activity / equipment activations.

**Extent of procedures to verify operations varied between staff and across the 11 contract areas**

It is important that Transportation Services have consistent processes in place across all 11 contract areas to verify whether contractors completed all the required activities on all their routes within the mobilization and maximum operating times specified in the contracts. Based on staff interviews, the extent of procedures performed varied. Staff advised that, to varying extents, they:

- checked parts of a sample of routes completed by physically inspecting roads, sidewalks, bicycle lanes, etc.
- reviewed call-out times and approximate departure times for a sample of equipment
- attempted to verify route completion by using GPS information to track the path of a sample of equipment

However, the records retained and readily available during our follow-up were not sufficient to confirm that all activated equipment met mobilization<sup>9</sup> time requirements and all the related routes were fully completed in accordance with the expected services levels.

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<sup>8</sup> In circumstances where there is not a defined maximum operating time associated with a specific activity, then the operating rate for that piece of equipment can be paid the actual operating hours utilized. For example, spot salting, additional clearing required due to on-street parking, and additional clearing where private property owners pushing snow on to the street are paid based on actual operating hours.

<sup>9</sup> Mobilization refers to getting equipment ready to leave a Depot. This can include amongst other things, equipment warm-up, loading trucks with salt, etc.

**Highly manual and time-intensive process to verify operating rate payments**

During our follow up, we found that the processes to verify completed operations using data captured by GPS devices were manual and labour intensive. Due to delays in implementing the GPS dashboard, Transportation Services staff needed to manually go into the GPS system to review the GPS data for each piece of activated equipment, which can potentially be over 1,000 pieces of equipment for a significant winter storm event, in order to check when the activated equipment left the Depot and what route it followed. Transportation Services indicated that they are continuing to work on implementing the GPS dashboard.

**Management did not apply liquidated damages for the first half of the winter season**

**2020 recommendation for Transportation Services to clarify liquidated damages provisions in the contract has been implemented**

Recommendation 10d in the Auditor General's 2020 audit report recommended that Transportation Services clarify liquidated damages provisions in the new contract. The report noted that the provisions for liquidated damages in the previous contract were difficult to understand and can be cumbersome to enforce. In the new winter maintenance contracts, we found that management had addressed our recommendation and clarified the contract language on liquidated damages to make it easier to enforce.

**Liquidated damages were not applied from October to January**

Transportation Services management advised us that they decided not to apply any liquidated damages provisions for the first half of the winter season (from October 2022 to January 2023). Management explained that liquidated damages (LD) were not applied because a number of the liquidated damages were tied to equipment requirements (e.g., not placing signage on equipment, not providing calibration certificates, mechanical fitness certificates, not having a working GPS device installed on the equipment). These "*were not performance-based issues*" but global supply chain and labour market issues, and "*it would be unfair and unjust to apply a repercussion on any company where they tried....but because of circumstances beyond their control couldn't get the equipment.*"

**Safety weighed heavily on the decision not to apply liquidated damages**

Management stated that they made "*a business decision weighing on the safety of residents of Toronto...*" and strongly believed "*that if we'd issued LDs, of that size, these companies may not have been able to be financially viable...*" Management advised that the City "*would not have had contractors to clear the snow and would put at risk the health and safety of residents.*"

**Two of the ten liquidated damages clauses were applied**

Management decided to start applying liquidated damages from February 1, 2023, onwards, but chose to apply only two of the ten liquidated damages clauses (i.e., leaving a Depot late, and not properly correcting contractor deficiencies within two hours of being notified) as these two issues are performance related and can impact desired performance outcomes. Management advised that the rationale for applying only two of the liquidated damages beginning in February was to start a phased approach by implementing the damages directly related to performance during a winter storm event.

Sections A and B of this report describe the areas where Transportation Services did not apply liquidated damages.

**2020 audit recommended Transportation Services standardize processes for assessing liquidated damages**

The Auditor General's 2020 audit report recommended that Transportation Services standardize processes and forms for monitoring contractor performance and for assessing and charging liquidated damages.

While Transportation Services developed standardized templates during the first winter season, management acknowledged that continuous review and refinement is needed.

**Approach to determining potential liquidated damages was inconsistent across all 11 contract areas**

We noted that the way liquidated damages amounts were determined was not consistent across all 11 contract areas. Some of the quantifications provided by staff only focused on certain time frames (e.g., from February 1, 2023, onwards) while others tracked liquidated damages from the start of the contract. Some staff provided quantifications for only two of the ten liquidated damages clauses (Refer to item #6 and #8 in Table 7, Section A.3), while others tracked more liquidated damages categories.

Transportation Services has not quantified the full value of liquidated damages that might be applicable based on the express terms of the contract from the beginning of the contract term.

**\$17.4 million in liquidated damages**

For the 2022/23 winter season, Transportation Services staff communicated \$17.4 million in liquidated damages for select contract clauses to the contractors as of June 1, 2023. Refer to section A.3 for further discussion.

**Contractors have disputed the liquidated damages**

Management advised us that contractors for all 11 contract areas have disputed the liquidated damages notices issued to them. At the date of this report, management are continuing to work with the contractors to resolve the disputes in accordance with the contract dispute provisions.

## B. Ensuring robust monitoring of contractor performance

**2020 audit recommended developing clearly defined performance measures to monitor contractor performance**

In the Auditor General's 2020 report, we found that Transportation Services did not have clearly defined performance measures under the old contracts and did not have consistent processes to monitor contractor performance against service levels. At the time, the Auditor General recommended Transportation Services develop performance metrics for the next contract cycle to measure and monitor contractor performance and improve processes and documentation to have relevant and readily available information to measure the key performance indicators (KPIs).

**2020 audit also recommended working with the City's GPS vendor to develop reports to help monitor performance**

In addition, the Auditor General recommended that Transportation Services work with the City's GPS vendor to:

- configure the route completion report to provide accurate information, and
- develop other GPS reports for measuring contractor performance and service levels.

**Planned methods for measuring and evaluating contractor performance under the new contracts**

When the contracts were awarded, in response to questions from City Council on accountability and reporting metrics, the Division advised that staff would measure performance through real-time GPS reporting on start times, completion times, routes travelled, and the amount of salt applied. Further, that staff would carry out field audits to evaluate contractor performance and use that data to verify contract payments.

Management responses to Council questions can be viewed at: <https://www.youtube.com/live/ucwlgRfYLTw?feature=share&t=25562>

**Consistent processes for monitoring and measuring performance need to be implemented across all contract areas**

The contracts and the Division's Winter Maintenance Contract Manual specify that the City will verify route completion, completion times, and achievement of desired pavement conditions using GPS tracking and random inspections or field audits.

While staff were provided training and reference materials (including the manual and standard operating procedures) and met regularly with management throughout this first winter season, we found that the processes used to monitor whether contractors met the contract requirements and Council-approved service levels varied from staff to staff and contract area to contract area.

**Required sample of field audits to assess route completion and achievement of service levels were not always carried out**

We also noted that there were insufficient records to demonstrate consistent compliance with the policies and procedures outlined in the Division’s manual. For example, we found that staff did not always carry out the required sample of field audits, and when they did, the results were not always properly and completely documented on the required form. Management indicated that, in some instances, the required field audits couldn’t be completed because of limited time and staff resources.

**Records were not sufficient to determine if price adjustment clauses have been enforced to the fullest extent possible**

Without the required number of field audit reports being completed and/or being completed in sufficient detail, during this follow up review, we could not assess or confirm whether Transportation Services had sufficiently assessed whether contractors were meeting the required service levels and pavement conditions, whether the Division was appropriately applying positive/negative price adjustments, and whether the Division was enforcing those clauses to the fullest extent possible in the first winter season.

**Two separate workflows for contractor deficiencies related to winter maintenance services**

Contractor deficiencies<sup>10</sup> related to winter maintenance services (e.g., failure to plow a section of a street or not achieving the desired pavement conditions as specified in the contract, etc.) follow two different paths or workflows in EWMS, depending on the originating source:

- All complaints received by 311 are sent to EWMS and tracked through ‘Service Requests’ and associated ‘Work Orders’
- EWMS also has a separate ‘deficiencies functionality’ built into the system that allows staff to record contractor deficiencies and create associated Work Orders that did not originate from 311.

It is important to note that Service Requests received through 311 are not automatically considered contractor deficiencies until staff have first investigated the complaint and then determine next steps.

**40% of all winter related service requests originating from 311 were for contract areas servicing Scarborough**

Contract areas TOA 1-1 and TOA 1-2 servicing Scarborough (Wards 20 to 25) logged nearly 40 per cent of winter-related service requests to the City’s 311 service from October 29, 2022 to April 30, 2023. Over 30 per cent of the \$17.4 million in liquidated damages communicated to the contractors (as of June 1, 2023) were for contract areas TOA 1-1 and TOA 1-2. In addition, these were the only two contract areas where negative price adjustments had been communicated (as of June 1, 2023).

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<sup>10</sup> Contractor deficiencies (referred to as ‘deficiencies’ throughout the report) are any deficiencies in a contractor’s work or a failure by a contractor to meet the service level requirements stated in the contract. (e.g., failure to plow a section of a street or not achieving the desired pavement conditions as specified in the contract, etc.) These deficiencies must be corrected within two hours of notification. If a contractor fails to correct a deficiency within two hours of notification, liquidated damages of \$400 per hour are applied starting two hours after the notification.

**Service request data used by management for analysis should include contractor deficiencies**

Transportation Services staff we interviewed advised us that they were not consistently using the deficiencies functionality in EWMS to record contractor deficiencies that did not originate in 311. Going forward, it is important to ensure that EWMS data captures all contractor deficiencies and that any trend analysis performed by management includes contractor deficiencies from all sources, including those identified by staff.

**C. Continuing to implement systems and tools to improve efficiency and effectiveness of contract management**

**2020 audit recommended modernizing processes and integrating GPS data**

Under the previous winter maintenance contracts, Transportation Services had access to GPS data, but it was only being used in a limited capacity. During our follow-up review, we found that while Transportation Services staff were using GPS data for more purposes than they had during the 2020 audit, staff could not fully leverage the GPS data in a manner that supported their ability to effectively monitor contractor performance in a timely and efficient manner.

**2020 recommendation for Transportation Services to clarify in the contract the contractor's obligations to detect and report GPS device malfunctioning has been implemented**

Recommendation 10a in the Auditor General's 2020 audit report recommended that Transportation Services clarify in the new contract the contractor's obligations to detect and report GPS device malfunctioning within a set timeframe. In the new winter maintenance contracts, we found that management had addressed this recommendation.

The Auditor General's 2020 report also made recommendations for management to develop plans to modernize processes and integrate technology solutions with the existing data from GPS devices. In other words, use GPS data to help staff more efficiently monitor contractor performance. During our follow-up review, we found that while newer GPS devices have been implemented and Transportation Services staff have access to GPS data through an updated portal, more work is needed to ensure that this data is available in a format and is used in a manner that helps make monitoring contractor performance easier.

**GPS dashboard to help staff more efficiently monitor contractor performance was not ready to use in the first winter season**

By the end of the first winter season, the planned GPS dashboard to assist staff and management in overseeing contractors, had not yet been fully developed and implemented in practice. Management indicated that they piloted the dashboard at the end of February 2023, however, while testing out the dashboard, Transportation Services determined that improvements were needed.



**Manually confirming route completion is labour intensive and time consuming**

Without the GPS dashboard and/or exception reports, the existing GPS reporting tools do not enable staff to easily verify whether contractors performed the assigned activity on a given street (i.e., completed all the assigned routes within the maximum allowable time and to the expected pavement outcome). Staff have indicated that the steps needed to use GPS data to manually confirm route completion is labour intensive and time consuming. No exception reports were available to automatically flag instances where contractors did not complete their routes. Staff manually look up each vehicle ID in the GPS system, one piece of equipment at a time, to see where that piece of equipment went, and to map out its route.

It can be impractical to look up anywhere from 30 up to over 170 different plows and trucks for a given contract area during each winter event. This can be further complicated because contractors can decide the routes and equipment to use, meaning that they have discretion to make changes as they feel necessary. Our team independently attempted to do the same time-intensive exercise for two winter dates, and we were not able to confirm whether routes had been fully completed.

**GPS sensor data can be helpful when staff are not able to physically inspect each route completed**

Without real-time physical observation, staff have no way of verifying if the contractors just drove down a given street or if they lowered the plows and/or completed the required work. It may not be feasible for Transportation Services staff to go out and physically inspect every road, bike lane, and sidewalk to confirm that contractors met the defined service level outcomes after each winter activation. Data from GPS sensors can be a helpful tool when staff are not able to physically inspect each route completed.

**GPS sensors were not yet installed on some equipment**

The contracts require that GPS devices be connected with sensors that track when a vehicle's plow is down or when salt is being applied. However, during our follow-up, staff advised that not all equipment had sensors installed or there were issues with the sensors, therefore, GPS sensor data was not available in those cases. Management indicated that as of April 15, 2023, there were 367 GPS sensor installations still outstanding. Once GPS sensors have been installed, management should monitor and address any potential issues with their reliability as they arise.

**Transportation Services continues to improve their internal processes so they can be integrated into EWMS**

Although Transportation Services started using the Enterprise Work Management System (EWMS) in the 2022/23 winter season, staff indicated that they experienced challenges transitioning and updating business processes and practices to conform with the system's capabilities. There were delays in using the full functionality planned for the system. For example, while EWMS was being used to track service requests and process payments, Transportation Services advised that they were continually trying to improve and enhance their own processes and integrate them into EWMS over the course of the first winter season. In addition, operating records continued to be collected through manual processes and forms, as opposed to contractors electronically inputting this information directly into EWMS.

**Conclusion**

Management advised there were many challenges to work through during this first winter season of the new performance-based contracts including global supply chain issues, challenges installing GPS devices, delays implementing the GPS dashboard, labour and staff recruitment and retention issues, and needing to adapt to the new EWMS system.

While the purpose of this review was to assess management's implementation of recommendations from the Auditor General's Phase 1 and Phase 2 reports, we identified four new recommendations that can help management in measuring performance using technology to modernize and improve efficiency of processes, holding contractors accountable, and ensuring Transportation Services pays contractors in accordance with the express terms of the contracts.

We express our appreciation for the co-operation and assistance we received from Transportation Services management and staff. We commenced our follow-up work at the beginning of the first winter season under the new winter maintenance contracts. We believe management and staff made best efforts to accommodate our requests for information, while carrying out their operational requirements to keep Toronto roads, sidewalks, and bike lanes safe during the winter season.

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## Background

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### **Council motion to review processes to monitor the new winter maintenance contracts**

In December 2021, City Council adopted a motion<sup>11</sup> to add the following reviews to the Auditor General's 2022 Work Plan:

- a. a review of the City of Toronto's Negotiated Request for Proposal process;
- b. a review of the terms of the winter snow maintenance contracts against previously provided winter maintenance Auditor General recommendations; and
- c. a review of Transportation Services' contract management process, to ensure internal processes are sufficient to hold winter maintenance contractors accountable to the contract terms.

The results of the Auditor General's review of the City of Toronto's Negotiated Request for Proposals process for Winter Maintenance Services (part a. above) are detailed in a separate report titled "A Review of the Procurement and Award of the Winter Maintenance Performance-Based Contracts" that will also be considered by Audit Committee on July 7, 2023.

### **Status of Auditor General's previous recommendations and current contract management processes**

This report summarizes the Auditor General's review of the terms of the winter maintenance contracts against previously provided winter maintenance Auditor General recommendations and the Auditor General's review of current Transportation Services' contract management processes to hold winter maintenance contractors accountable to the contract terms (parts b. and c. above).

These reviews were completed in the context of the Auditor General's follow-up of the implementation status of recommendations from two previous reports on the City's winter maintenance program:

1. [Audit of Winter Road Maintenance Program - Phase One: Leveraging Technology and Improving Design and Management of Contracts to Achieve Service Level Outcomes \(October 2020\)](#)
2. [Winter Road Maintenance Program - Phase 2 Analysis: Deploying Resources \(June 2021\)](#)

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<sup>11</sup> [Agenda Item History - 2021.IE26.4 \(toronto.ca\)](#)

## Operational and Financial Highlights for the 2022/23 Winter Season

**First year of the contract award value is approximately \$128 million**

At the time the contracts were awarded, it was estimated that contracted winter maintenance services for the 2022/23 winter season (October 15, 2022 – April 15, 2023) would cost the City approximately \$128 million. As of June 15, 2023, Transportation Services has paid approximately \$103.4 million for contracted services during the first winter season under the new winter maintenance contracts. Management indicated there are still more invoices related to the first winter season to be processed.

**150 winter events during the 2022/2023 winter season**

There were 150 winter events<sup>12</sup> between October 15, 2022, to March 31, 2023. Management advised that March 4, 2023 was considered a significant event, due to the intensity and short timeframe of more than 25 centimetres of snow accumulation.

### Transportation Services Division's Responsibilities

**Transportation Services is accountable for monitoring performance and measuring outcomes**

Transportation Services is accountable for monitoring contractor performance and measuring service level outcomes (i.e., bare pavement, safe and passable, centre bare, etc.).

**Division developed a manual to guide staff in managing their assigned contracts**

The Division's Winter Maintenance Contract Administration Manual ("manual") and standard operating procedures provide staff with their roles and responsibilities in overseeing winter maintenance activities. The manual states that staff need to be familiar with the manual and their assigned contracts, contract addendums, change orders, and the Salt Management Plan. All managers and staff were given training on this manual in December 2022 / January 2023.

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<sup>12</sup> A winter event is defined as any City initiated activation for work to be completed by the contractor, including salting, plowing, de-icing, etc.

## **Transportation Services' responsibilities**

According to the manual, staff are responsible for:

- tracking and resolving issues, deficiencies, and damages
- activating winter operations based on weather conditions
- verifying operations via GPS dashboard<sup>13</sup>
- reviewing and verifying the contractors' submissions for daily rate and operating hours before authorizing payments
- chairing meetings with the contractors such as monthly progress and other ad-hoc meetings
- ensuring contract or project files are maintained and are complete with all relevant documentation
- procuring weather contracts and overseeing weather reporting
- procuring salt and other winter related materials
- coordinating between other City Divisions, 311, and communicating to the public

## **Contractor's Responsibilities**

**Contractors are responsible for servicing all infrastructure types and performing all activities within a geographic region**

Under the new winter maintenance contracts, contractors are expected to service all<sup>14</sup> infrastructure types (e.g., expressways, bike lanes, arterials, collectors, local roads, sidewalks, and multi-use trails) within their awarded contract area. They are also expected to perform all winter activities (e.g., anti-icing, de-icing, salting, plowing, stockpiling, storing, loading, hauling, spreading salt and salt mixtures, making salt brine, removing snow) within their assigned contract areas. Exhibit 4 provides a contract area map by ward and Exhibit 5 lists the contractors that service each ward.

Under the new performance-based contracts, the contractors are responsible for determining the quantity and types of equipment required to perform all necessary work. They are also responsible to plan the routes of the equipment to ensure services are completed in accordance with the contracted service levels.

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<sup>13</sup> By the end of the first season, the planned GPS dashboard to assist staff and management in overseeing contractors, had not yet been fully developed and implemented in practice.

<sup>14</sup> Transportation Services perform some services in-house, such as clearing sidewalks not identified for contractors, steps, pedestrian bridges, some walkways, and paved trails.

**Contractor’s responsibilities**

According to their contracts, contractors are responsible for:

- supplying all equipment, labour, and materials to provide the services required for their respective contract area
- performing services within the required service levels resulting in the desired pavement outcomes
- ensuring all equipment is equipped with working GPS devices at all times
- providing proof of age and mechanical fitness records for each piece of equipment
- properly calibrating salting and liquid application equipment
- placing signage for all equipment
- repairing or replacing any damage to public and or private property as a result of their services

**Service levels are defined in the contracts and are communicated on the City’s website**

**Service Level Requirements for Winter Maintenance Activities**

Contractors are required to achieve certain desired pavement outcomes within the number of hours specified (Maximum Operating Time). These service level expectations are specified in the contracts, as shown in Figure 1 below. These service levels are also communicated on the City’s website so that residents are aware of what to expect throughout the winter season<sup>15</sup>.

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<sup>15</sup> [City of Toronto winter road operations - direct mail](#)

Contracted service levels

Figure 1: Service Level Table Excerpted from the New Winter Maintenance Contracts

Infrastructure Type or Activity	Initiation Level <sup>1</sup> (cm of snow accumulation)	Maximum Operating Time	Desired Pavement Outcome
<b>Salting Operations</b>			
DLA Expressways/ Arterials/Collectors	N/A	6 hours	Visible salt residue per lane
Expressways	Up to 2.5 cm	2 hours	Bare Pavement
Arterials	Up to 5 cm	4 hours	
Collectors	Up to 8 cm	4 hours	Centre Bare
Local Roads		8 hours	Safe and Passable
On-road Cycle Lanes	Adjacent roadway accumulation	Same as Maximum Operating Time for the adjacent roadway <sup>2</sup>	Safe and Passable
<b>Plowing Operations</b>			
Expressways <sup>3</sup>	2.5 cm	2 hours	Bare Pavement
Arterials <sup>3</sup>	5 cm	6 hours	
Collectors <sup>3</sup>	8 cm	8 hours	Centre Bare
Local Roads	8 cm	14 hours	Safe and Passable
Windrow Clearing	Windrow height exceeds 25 cm	Maximum Operating Time for the adjacent roadway plus 2 hours	Safe and Passable
On-road Cycle Lanes	Adjacent roadway accumulation	Same as Maximum Operating Time for the adjacent roadway <sup>2</sup>	Bare Pavement
<b>Combined Salting &amp; Plowing Operations</b>			
Sidewalks	2 cm	12 hours	Safe and Passable
Bus Stops & Pedestrian Crossovers	2 cm	12 hours	Safe and Passable
Separated Cycle Tracks & Multi-use Paths	2 cm	8 hours	Bare Pavement

1. The City may initiate salting or plowing earlier than the indicated standard.
2. On-road cycle lanes must be cleared by the Vendor as part of adjacent roadway Operations at no additional cost to the City.
3. When plowing Operations are carried out by the Vendor on expressways, arterials, collectors, and locals; the Vendor is required to provide salting as part of plowing Operations at no additional cost to the City.



**Definitions of desired pavement outcomes**

**“Bare Pavement”**

The Division’s manual defines each of the desired pavement outcomes and provides examples as follows:

**Bare Pavement:** Pavement conditions whereby 90 per cent of all pavement is free of snow, slush, and ice.

**Figure 2: Example of Bare Pavement Conditions**



**“Centre Bare”**

**Centre Bare:** Pavement conditions whereby 90 per cent of all pavement on the lanes adjacent to the centre line are free of snow, slush and ice, and any remaining lanes, must be Safe and Passable, however, all loose snow, slush and ice on pavement must be pushed as close to the curb as possible and in no circumstances can any loose snow, slush and ice be more than 75cm from the curb.

**Figure 3: Example of Centre Bare Pavement Conditions**



**“Safe and Passable”**

**Safe and Passable:** Pavement conditions whereby (i) all lanes are substantially cleared and have visible salt and/or windrow present from salting and/or plowing activities; (ii) all lanes must have less than 8cm of remaining snow cover; and (iii) all lanes may have remaining loose snow, slush, and ice.

**Figure 4: Example of Safe and Passable Pavement Conditions**



**Contract Clauses to Hold Contractors Accountable to Performance**

**Liquidated damages are meant to compensate the City for loss or damage because of a contractor’s failure to perform required services**

Transportation Services can apply liquidated damages when a contractor does not comply with certain terms and conditions. Liquidated damages are intended to compensate the City for the loss or damage the City would sustain due to the contractor’s failure to perform services in an expedient manner and to comply with the terms and conditions of the contract. Figure 5 below is a table of the liquidated damages clauses included in the current winter maintenance contracts.

**Figure 5: Liquidated Damages Clauses Excerpted from the New Winter Maintenance Contracts**

<u>Item</u>	<u>Section number in Part 3</u>	<u>Event</u>	<u>Liquidated Damages Paid by Vendor</u>
<u>1</u>	<u>2.7.2</u>	<u>Failure to calibrate all Equipment seven (7) days prior to the Winter Season; or failure to calibrate all Equipment on a monthly basis</u>	<u>\$1,000.00 per day per piece of Equipment that is not calibrated in accordance with the Contract</u>
<u>2</u>	<u>2.6.10</u>	<u>Failure to provide verification to Contract Administrator that a GPS/AVL device is working</u>	<u>\$400.00 per day per piece of Equipment</u>
<u>3</u>	<u>2.10</u>	<u>Failure to submit CVOR abstract in accordance with the Contract</u>	<u>\$400.00 per day per piece of Equipment</u>
<u>4</u>	<u>3.1</u> <u>3.2</u>	<u>Failure to apply any required signage on a piece of Equipment</u>	<u>\$1,000.00 per day per piece of Equipment</u>
<u>5</u>	<u>4.3.3</u>	<u>Failure to provide shift schedule to Contract Administrator in accordance with the Contract prior to October 15 each Winter Season</u>	<u>\$100.00 per day</u>
<u>6</u>	<u>5.4.4</u>	<u>Failure to leave a Depot within the applicable Mobilization Period</u>	<u>\$200.00 per minute per piece of activated Equipment in the Depot after the expiry of the Mobilization Period</u>
<u>7</u>	<u>5.7</u>	<u>Failure to spread salt or pre-treated salt in accordance with the Contract</u>	<u>\$360.00 per failure</u>
<u>8</u>	<u>5.11</u>	<u>Failure to correct a deficiency within 2 hours of notification by the Contract Administrator</u>	<u>\$400.00 per hour starting two hours after notification</u>
<u>9</u>	<u>5.12</u>	<u>Failure to repair damages to property prior to May 31 annually</u>	<u>\$1,600.00 per day</u>
<u>10</u>	<u>7.2.7</u>	<u>Failure to submit a Depot plan in accordance with Contract</u>	<u>\$100.00 per day</u>

**Price adjustments are meant to incentivize contractors to meet service level requirements**

To encourage optimal contractor performance, the contracts include positive or negative price adjustment clauses. Section B.2 of our report (and Figure 6 below) further describes how these price adjustments are calculated and outlines how Transportation Services will determine contractor compliance with service level requirements.

**Figure 6: Thresholds for Evaluating Price Adjustments Excerpted from the New Winter Maintenance Contracts**

Performance Metric per Contract Area	Formula for Determining Compliance with Service Level Requirements	Threshold Per Winter Event
Routes Completed within Maximum Operating Time	(cumulative number of kilometres of infrastructure requiring service for which Operations were activated) <b>minus</b> (cumulative number of kilometres of infrastructure serviced by Vendor within Maximum Operating Time)	Less than or equal to 1 kilometre
Compliance with Desired Pavement Outcome	(cumulative kilometers of roadways inspected by City) <b>minus</b> (cumulative kilometers of infrastructure inspected by City that meet the Desired Pavement Outcome)	Less than or equal to 1 kilometre

## Follow-up Results and Findings

**This report summarizes our findings from our follow-up review**

This section of the report contains the results of our follow-up work on the implementation status of recommendations from our two previous reports on the City’s winter maintenance program.

**We assessed how past recommendations would apply to the new contracts and divisional processes**

While the recommendations from the two earlier Auditor General reports were made in the context of the 2015-2022 winter maintenance contracts, our current follow-up review assessed management’s actions with a view of how the previous recommendations would apply to the new 2022-2032 contracts and Transportation Services’ processes to hold contractors accountable to the new contract terms. Refer to Exhibit 1, 2, and 3 for a listing of recommendations made in the 2020 and 2021 audit reports.

**26 recommendations from two past Auditor General reports**

Table 2 below summarizes the status of the 22 recommendations from the [Audit of Winter Road Maintenance Program – Phase One: Leveraging Technology and Improving Design and Management of Contracts to Achieve Service Level Outcomes](#) and four recommendations from the [Winter Road Maintenance Program – Phase 2 Analysis: Deploying Resources](#).

**Table 2: Implementation Status of Auditor General Recommendations from Phase 1 and Phase 2 Winter Maintenance Reports**

Report	Verified as fully implemented	In progress (not yet fully implemented)	No longer relevant / applicable	Total
Audit of Winter Road Maintenance Program – Phase One: Leveraging Technology and Improving Design and Management of Contracts to Achieve Service Level Outcomes (October 2020)	9	13	0	22
Winter Road Maintenance Program – Phase 2 Analysis: Deploying Resources (June 2021)	1	2	1	4
<b>Total</b>	<b>10</b>	<b>15</b>	<b>1</b>	<b>26</b>

**4 new recommendations to administering the new contracts**

Management advised there were many challenges to work through during this first winter season of the new performance-based contracts including global supply chain issues, challenges installing GPS devices, delays implementing the GPS dashboard, labour and staff recruitment and retention issues, and needing to implement and adapt to the new EWMS system. The intent of this report and the four new recommendations contained herein is to highlight areas for continuous improvement when administering the winter maintenance contracts in future years.

**Progress on previous recommendations included clearer contract language**

Progress has been made since the 2020 and 2021 audits, and as shown in Table 2 above, we verified that management has fully implemented 10 recommendations. Some of this progress was to improve the clarity in the contract language for the new contracts.

**Procedures and training on contract management expectations have been developed**

Transportation Services also developed a Winter Maintenance Contract Administration Manual (“manual”) for staff which included 32 standard operating procedures and forms/checklists relating to winter maintenance activities (e.g., weather monitoring, winter event activations or call-outs, continuous monitoring of contractor performance, patrolling, verification of work, payments, etc.). Staff also received training on this manual in December 2022 / January 2023. Management has advised that these will continue to be reviewed and updated heading into the second winter season, with additional training to be provided to staff.

**Consistent processes and critical technology and tools were not fully implemented at the start of the first winter season**

Still, we found that key technology and tools (e.g., EWMS functionality, GPS device installation, the GPS dashboard and/or exception reports, and an electronic application that tracks activations, etc.) were not as far along as they needed to be at the start of the first winter season, and in some cases throughout the season, due to labour, administrative, technology and operational challenges noted above.

We also found that the processes used to monitor whether contractors met the contract requirements and Council-approved service levels varied from staff to staff and contract area to contract area. While staff were provided training on the manual, they did not consistently retain adequate records to demonstrate that they complied with the required policies and procedures.



**Limitations to our follow-up review**

This limited the scope of what we could confirm and quantify during our follow-up. We were unable to conclude whether:

1. contractors delivered all required pieces of equipment by the contracted mobilization date
2. all pieces of equipment were available for operations throughout the winter season
3. contractors completed all the required routes and services / activities
4. contractors met the contracted service levels (i.e., maximum operating time and pavement outcome requirements)

The findings and estimates in this report rely on the information and documents that were readily available at the time of our follow-up review. We found that there were issues with the consistency, completeness, and accuracy of these records, which limited the scope of what we could review. This is further explained in the relevant sections on our findings in this report.

**15 previous recommendations remain outstanding and this report also includes 4 new recommendations**

It is the Auditor General's view that implementing the remaining 15 recommendations from our previous reports, along with the four new recommendations in this report, will be critical in helping management to efficiently and effectively monitor contractor performance, and enforce the express terms of the new winter maintenance service contracts.

**A. Strengthening Processes to Consistently Enforce Payment Criteria and Apply Liquidated Damages**

**2020 audit highlighted the need to enforce the express terms of contracts**

The Auditor General's previous reports on winter maintenance included a number of recommendations for Transportation Services to implement processes aimed at ensuring the express terms of contracts are more effectively enforced.

**Further work needed to address 2020 audit recommendations that support more effective review of payments and liquidated damages**

During this follow-up, we observed that further work is still needed to consistently implement, across all 11 contract areas, the recommendations from the 2020 audit report including:

- ensuring **payment for services** is consistent with the express terms of the contract [Recommendation 18]
- completing the installation of **functioning GPS devices** in all contractor vehicles (including spares), tracking all GPS devices and monitoring them regularly to ensure devices are functioning, and periodically reconciling GPS billings [Recommendation 13a, 13b, 13c, and 13d]



- fully **utilizing available GPS technology**, including **real-time exception reports**, notifications, and route completion and performance reports to better monitor contractor performance and using GPS information and reporting to **monitor route completion, late starts, and vehicle locations** for operational as well as standby (now called daily rate) purposes [Recommendation 1 and 5]
- improving documentation of **assigned and completed routes** by contractors, ensuring explanations are documented when routes are not fully completed and evaluating the reasons when there are cases where routes do not appear to be completed [Recommendation 9]
- ensuring the rationale for **liquidated damage amounts are fair and supportable** and **standardizing processes and forms** for monitoring contractor performance and assessing and **charging liquidated damages**, and ensuring staff **verify and review contractors' operating and standby logs (daily rate sheets)**, using **GPS data**, for accuracy of timing and services provided before approving payment [Recommendation 11, 14b and 14c]

Recommendations that are not yet fully implemented, together with management's action plans, can be found in Exhibit 2.

**2020 audit highlighted importance of leveraging available GPS data**

It is important to note that during our 2020 audit, we found that GPS devices were installed on many winter maintenance vehicles (although more needed to be installed and fully functioning). Although GPS data was available, it was only being used in a limited capacity. Effectively leveraging GPS technology and data is very relevant for the new performance-based contract model. It is perhaps even more important now for Transportation Services to be able to leverage GPS data in ways that contractor performance can be efficiently and effectively monitored.

**A. 1. Verifying Daily Rates and Applying Equipment-Related Liquidated Damages**

**Ensure payments to contractors are as per the express terms of the contract**

Staff should accurately track the arrival of each piece of equipment at the designated Depot at the beginning of the season<sup>16</sup>, as well as its continuous availability, and related operating activity during winter events, to ensure that Transportation Services only pays when a contractor meets the express terms of the contract.

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<sup>16</sup> The contracts specify the mobilization dates where winter maintenance equipment must have arrived at the Depots (i.e., for direct liquid application equipment: October 15; for salting equipment: November 8; for all other equipment: December 1). Equipment must remain at Depots until their demobilization dates. Each winter season, all equipment must have arrived at the Depots by December 1<sup>st</sup>.

**Contracts include daily rate and operating rate payments**

Under the new winter maintenance contracts, the City pays an operating rate and a daily rate for each piece of equipment, as agreed in the contract.

- **Daily Rate** is paid for each piece of equipment available and in proper repair at the contract area’s Depot. The equipment must have a properly functioning GPS device and a qualified operator available to operate the equipment.
- **Operating Rate** is paid for each piece of equipment activated for operations during a winter event.

**Daily rates have a significant impact on total cost of contracted services**

In the Auditor General’s 2020 audit report, we noted that the daily rate (referred to as ‘standby charge’ in previous contracts) has a significant impact on the total cost of the contract. As mentioned earlier in this report, for the 2022/23 winter season, the daily rates represented \$101.5 million (or 79 per cent) of the \$128 million total contract award value. The number and type of equipment kept available for the season is the main driver of this cost.

**Equipment must meet several conditions for contractors to receive daily rates**

The contracts set out the daily rate to be paid for each piece of equipment when the equipment meets the conditions summarized in Table 3. It follows that, where any one or more of the conditions are not met, the daily rate should not be paid. The contract also specifies where the City can apply liquidated damages when certain requirements are not met.

**Table 3: Equipment Requirements that have Daily Rate Payment or Liquidated Damages Impacts**

Equipment requirements	Impacts daily rate payment	Impacts liquidated damages
Available at a Depot	Yes	No
Installed with a properly functioning GPS device	Yes	Yes
Evidence of mechanical fitness	Yes	No
Properly calibrated	Yes	Yes
Licensed operator available	Yes	No
Proper signage	No	Yes
Proof of age of equipment	Yes	No

**Areas to address to ensure Transportation Services enforces the express terms of contracts**

The subsections that follow provide further details on areas needing attention or improvement to ensure Transportation Services enforces the express terms of contracts when approving daily rate payments and/or applying liquidated damages to its contractors:

- Limited records to demonstrate contractors delivered equipment by the annual mobilization dates in the contract
- Equipment did not always have a functioning GPS device installed, the required signage, and/or available operators
- Daily rates on substitute equipment were different than the originally priced equipment

**a) Limited records to demonstrate contractors delivered all contracted equipment as per the contracted mobilization date**

**2020 Auditor General report recommended daily physical verification of contractor vehicles**

Recommendation 8b from the Auditor General's 2020 report recommended that Transportation Services conduct daily physical verification of contractor vehicles on standby, including spares, and document and compare the observations to contractor standby logs (daily rate sheets).

Given the global COVID-19 pandemic supply chain issues causing equipment delivery delays, we expected management to maintain an up-to-date list to track equipment arrival dates to Depots, to ensure contractors would have the equipment they needed by the annual mobilization dates in the contract and would be ready for the start of the first winter season.

**Maintain reliable records to evidence staff have verified equipment arrived at a Depot on time**

Transportation Services staff indicated that they physically verified required equipment was on site on the key contracted mobilization dates (i.e., for direct liquid application equipment: October 15; for salting equipment: November 8; for all other equipment: December 1). During our follow-up review, some Transportation Services staff we interviewed indicated they did not consistently retain sufficient records to evidence that they verified equipment arrived by the contracted mobilization date.

**Some criteria are tracked on daily rate sheets**

Contractors are required to submit daily rate sheets<sup>17</sup> to track the following information needed to determine whether the contractor is eligible to receive the daily rate:

- description of the vehicle
- infrastructure type it services (e.g., local roads, arterial roads, sidewalks, collectors, etc.)
- activity type (e.g., plowing, salting, etc.)
- equipment identification number
- estimated start date (i.e., contracted mobilization date)
- estimated end date (i.e., contracted demobilization date)
- vehicle identification signage
- availability of functioning GPS (indicated as Yes or No)
- eligibility for receiving daily rate (indicated as Yes or No)

Not all requirements for daily rate payment are included / tracked on the daily rate sheet (e.g., mechanical fitness certificate, age of equipment, operator name and availability, etc.).

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<sup>17</sup> According to the contract, contractors are required to fill out each daily rate sheet and then submit it to Transportation Services staff so that they can verify the information reported on the daily rate sheet.

**Requirement to verify accuracy of equipment details on the daily sheets**

According to the Division’s manual, Transportation Services staff must verify the information recorded on the daily rate sheet provided to them by the contractor. The manual also indicates that if the equipment is not eligible for the daily rate (because it wasn’t on site, didn’t have a GPS device installed, didn’t have a licenced operator available, etc.), staff must document the reason on the daily rate sheet with any supporting information (e.g., photo evidence, operator logs, etc.).

Daily rate sheets require staff to indicate ‘Yes’ or ‘No’ for whether the listed piece of equipment should receive the daily rate. If a daily rate sheet indicated ‘Yes’ for daily rate and does not include any other comments, it could be inferred that Transportation Services staff confirmed that the piece of equipment met all of the requirements to be eligible to receive the daily rate, including being available at a Depot.

**Discrepancies between what was reported on daily rate sheets and the GPS system**

However, we noted that in some cases the information listed on daily rate sheets was not accurate. For example, we found some daily rate sheets indicated GPS was working, when the GPS system showed those GPS devices were not reporting any data / signal (i.e., the device was likely not installed or not working) on the date noted on daily rate sheets.

**191 pieces of equipment incorrectly reported as having a functioning GPS device**

More specifically, we compared information reported on the daily rate sheets with GPS data for December 1, 2022<sup>18</sup> and found 191 pieces of equipment where daily rate sheets incorrectly indicated ‘Yes’ for the availability of a functioning GPS device. There were no indications on the daily rate sheets that staff identified this discrepancy. Transportation Services paid the daily rate for 178 of these pieces of equipment.

**Daily physical verification of equipment can be time consuming**

A contract area can have anywhere from 30 to upwards of 170 pieces of equipment. Therefore, we can appreciate that daily walkarounds to physically inspect each piece of equipment are time consuming and can compete with other daily responsibilities. This highlights the importance of making sure GPS devices are installed (and functioning) on every piece of equipment as soon as it arrives at a Depot (as it can help to confirm the equipment is where it should be on any given date and time). Where a GPS device is not installed or not working, physical verification should occur.

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<sup>18</sup> All equipment must be at the Depots by December 1<sup>st</sup>, the last of the three annual mobilization milestone dates specified in the contract.

**GPS reporting tools can help staff confirm physical location**

As previously noted in the Auditor General's 2020 report<sup>19</sup>, there are benefits of modernizing and integrating processes with better use of GPS technology to improve how the Division enforces the express terms of the contracts. GPS exception reporting will help Transportation Services staff to efficiently and effectively identify which pieces of equipment are not located at the appropriate Depot sites. This quickly identifies to staff where extra attention should be paid when verifying whether equipment is eligible for daily rates.

**Financial implications when equipment is not on site by the dates specified in the contracts**

Contractors are not eligible to receive the daily rate if a piece of equipment is not on site at the designated Depot. The contract is not clear what liquidated damages may apply when equipment is not actually on site by the date set out in the contracts. For example, the contract allows Transportation Services to apply liquidated damages of \$1,000 per day for failure to apply required signage on a piece of equipment. However, if a piece of equipment has not arrived at a Depot by the annual mobilization date in the contract, it may be unreasonable to apply this charge (since there is no equipment to attach signage to).

**Over 30% of equipment did not transmit a GPS signal until at least 30 days after the equipment's contractual start date or did not have a GPS signal by the end of the winter season**

As noted previously, given the issues with reliability of information on daily rate sheets, we cannot confirm that the daily rates paid were appropriate. What we were able to determine during this follow-up was that over 30 per cent of equipment<sup>20</sup> did not transmit a GPS signal until at least 30 days after the equipment's contractual start date or did not have a GPS signal by the end of the first winter season.

While the first signal might not indicate the actual arrival date of the equipment (because of delays with installing GPS devices), this was the only independent piece of information we could use to provide a general indication of the date when each piece of equipment was on site. We provide more details and quantify the amount of the daily rate paid for equipment that did not have a functioning GPS device in the next subsection.

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<sup>19</sup> Recommendations 1, 5, 13, 14, and 21 from the Auditor General's 2020 report highlighted leveraging GPS technology; these recommendations were not fully implemented.

<sup>20</sup> The contractors provide over 1,300 pieces of equipment in total. We excluded equipment that does not require GPS or, according to the contracts, will not be paid a daily rate (e.g., nurse trucks and equipment for Depot operations) and focused our analysis on the 1,244 pieces of equipment where a GPS device was required.

**b) Equipment did not always have a functioning GPS device installed, the required signage, and/or available operators**

**2020 audit recommended using GPS data to verify standby (daily rate) logs**

Recommendations 5 and 14 in the Auditor General’s 2020 report highlighted using GPS information and reporting:

- to monitor vehicle locations for operational as well as standby (daily rate) purposes, and
- to verify and review contractors’ operating and standby logs (daily rates) using GPS data, for accuracy of timing and services provided, before approving payment.

We found that the Division needs to do more work in this area as described further below.

**633 vehicles where daily rate were paid without evidence of a working GPS**

We noted 633 vehicles where the Transportation Services paid the daily rate before that piece of equipment transmitted a GPS signal. Across the entire winter season, we estimate Transportation Services paid almost \$18 million for equipment where the contractor daily rate sheets indicate the equipment had a functioning GPS device installed but where we observed that such device did not appear to be active in the GPS system. Table 4 provides a summary by contract area where the Transportation Services made daily rate payments for equipment that did not have evidence of a working GPS.

**Almost \$18 million in daily rates were paid for equipment without a GPS signal**

**Table 4: Estimated Daily Rate Payment for Equipment Without GPS Signal**

Contract Area	# of equipment where daily rate was paid before a GPS signal*	Potential daily rate payments to contractor for the days without GPS signal
DVP-FGGE	2	\$109,300
TOA1-1	94	\$1,753,800
TOA1-2	83	\$1,858,400
TOA1-3	34	\$2,967,700
TOA1-4	32	\$959,800
TOA1-5	25	\$1,375,600
TOA2-1	78	\$2,115,800
TOA2-2	56	\$518,600
TOA2-3	59	\$2,096,400
TOA2-4	52	\$857,400
TOA2-5	118	\$3,248,000
<b>Total</b>	<b>633</b>	<b>\$17,860,800</b>

*\*Our quantification assumes daily rates were paid from the date the equipment was required to be on site according to the contract (i.e., October 15, November 8, December 1 forward). We excluded equipment that did not require GPS or, according to the contracts, will not be paid a daily rate (e.g., nurse trucks and equipment for Depot operations).*

**Retain appropriate documentation to support daily rate payments where contract requirements are not met**

While these payments may not necessarily be overpayments, what these payments highlight is the importance of consistently retaining sufficient and appropriate documentation to support the rationale for making daily rate payments even though the contract requirements for equipment are not met.

**GPS devices were available for installation prior to the start of the winter season**

The contracts include clauses to continue paying the daily rate if GPS installation delays are caused by the City's third-party GPS vendor. During this follow-up, Transportation Services staff advised us that Fleet Services placed their order for GPS devices for all new equipment with the City's GPS vendor in May/June 2022 and that the vendor shipped all the GPS devices to the contractors' respective corporate offices by August/September 2022, in advance of the start of the winter season. Although initial orders were placed in May/June 2022, management advised that throughout the installation period there were a number of additional cables, brackets and sensors that arrived at various times resulting in additional delays.

**Reasons why GPS devices were not installed**

Management indicated that many GPS devices could not be installed because of the unavailability of the contractors' equipment prior to the start of the winter season (due to the global supply chain challenges) and then scheduling challenges across multiple contract areas when the equipment arrived right before the contracted mobilization dates.

While staff advised us that there were delays in installing GPS devices, management indicated to us that there was not always conclusive evidence to determine who was at fault for GPS installation delays<sup>21</sup>.

**Division decided to pay daily rates even if equipment was missing GPS**

The Division's internal meeting minutes from December 2022 indicate a decision was made that if the equipment was in the yard and operational (able to be deployed to effectively provide winter services), but was still missing GPS or signage, it was still eligible for the daily rate. Management further advised us that given the large volume of ongoing GPS installation delays, this decision was made to ensure that equipment could still be utilized for services.

By the end of the first winter season, 1,139 out of 1,244 pieces (92 per cent) of equipment had a GPS device installed.

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<sup>21</sup> The contracts state that the daily rate will apply if a malfunction is due to the City's third-party GPS provider.



**Transportation Services can apply liquidated damages if GPS delays or malfunctions were caused by the contractor**

**Contracts contain liquidated damages clauses where equipment requirements are not met**

The contracts include events related to equipment requirements where Transportation Services can apply liquidated damages under certain circumstances, as shown in Figure 7.

**Figure 7: Liquidated Damage Clauses Excerpted from the New Winter Maintenance Contracts**

<u>Item</u>	<u>Section number in Part 3</u>	<u>Event</u>	<u>Liquidated Damages Paid by Vendor</u>
1	2.7.2	Failure to calibrate all Equipment seven (7) days prior to the Winter Season; or failure to calibrate all Equipment on a monthly basis	\$1,000.00 per day per piece of Equipment that is not calibrated in accordance with the Contract
2	2.6.10	Failure to provide verification to Contract Administrator that a GPS/AVL device is working	\$400.00 per day per piece of Equipment
3	2.10	Failure to submit CVOR abstract in accordance with the Contract	\$400.00 per day per piece of Equipment
4	3.1 3.2	Failure to apply any required signage on a piece of Equipment	\$1,000.00 per day per piece of Equipment

**No liquidated damages related to equipment requirements were applied during the first winter season**

For the first winter season, Transportation Services did not apply any liquidated damages for items #1 through #4 (see Figure 7 above).

When we asked Transportation Services staff to provide their existing files / lists of potential liquidated damages they had been maintaining as at the date of our request:

- one contract area provided their estimate for all four items
- one contract area estimated potential liquidated damages for two of the items
- two contract areas estimated potential liquidated damages for one of the items.

**Liquidated damages were only applied for two operational matters – failing to mobilize on time and not resolving deficiencies promptly**

Some staff advised that they only tracked and calculated liquidated damages for failure to mobilize equipment on time and failure to resolve deficiencies promptly, because management directed that no other liquidated damage clauses would be applied for this winter season. These liquidated damages are further discussed in section A.2.

**Time-consuming to go back and assess all other potential liquidated damages**

Staff we interviewed indicated that although records are available to go back and calculate potential liquidated damages for the other items, this would be very time-consuming and not operationally feasible. Given the limited tracking and records readily available during our follow-up, we focused on item #2 out of items #1 to #4, because information to be able to assess whether GPS devices were working was available through the GPS system.

**Transportation Services paid daily rates for 633 pieces of equipment without a GPS signal**

Based on our review of GPS records, as summarized below in Table 5, 802 pieces of equipment did not have a working GPS signal by the date the equipment had to be at the designated Depot, as specified in the contract. Nearly half of the 802 pieces of equipment did not have a GPS signal within a month of when the equipment was required to be at the Depot, and for some, more than four months have passed without a GPS signal. Transportation Services paid daily rates for 633 of these vehicles.

As indicated in Figure 7 above, the contracts allow Transportation Services to apply liquidated damages of \$400 per day per piece of equipment if a contractor fails to provide verification to the Division that a GPS device is working. Based on the number of days it took (from the contracted date the equipment had to be at the designated Depot to the date that equipment’s GPS device transmitted a signal or March 31<sup>st</sup> for equipment without a GPS signal), we estimated \$11.1 million in liquidated damages could potentially be applied on the 633 pieces of equipment where Transportation Services paid a daily rate. The business and operational reasons for why management decided not to enforce liquidated damages is discussed in section A.3.

**Table 5: Number of Days Before Equipment Transmitted a GPS Signal**

**285 vehicles/equipment took 1 to 4+ months before a GPS signal was emitted**

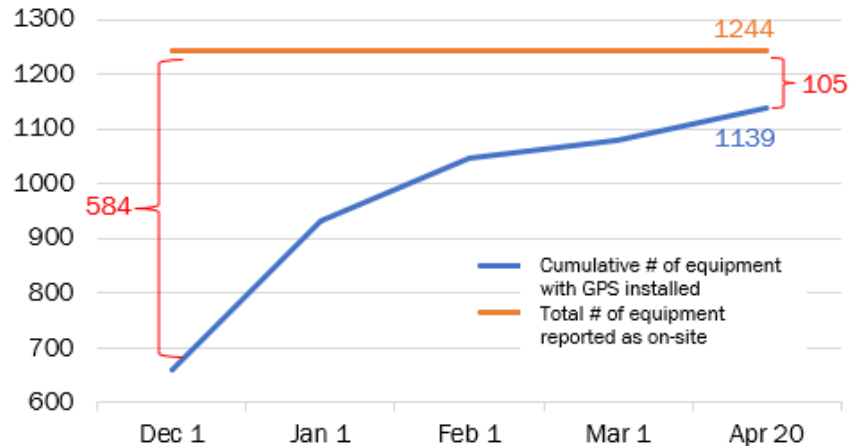
**105 did not have a GPS signal at end of 2022/23 winter season**

<b># of days it took to have a GPS signal</b>	<b># of vehicles</b>	<b># of vehicles where a daily rate was paid</b>
1-7 days	151	124
8-30 days	261	206
31-60 days	123	112
61-90 days	86	80
91-119 days	61	51
120+ days	15	13
120+ days and <i>no GPS signal</i>	105	47
<b>Total</b>	<b>802</b>	<b>633</b>

**105 pieces of equipment were not yet transmitting a GPS signal by the end of the first winter season**

On December 1, 2022<sup>22</sup>, there were 584 pieces of equipment without a GPS signal. As shown in Figure 8, at the end of the first winter season, approximately 105 pieces of equipment, or about eight per cent of the fleet, did not have a GPS signal.

**Figure 8: Number of Equipment (including spares) with GPS Signal**



**Reasons why there were delays in installing GPS devices**

Management indicated that the delay in GPS installation was related to equipment availability and the following factors:

- winter equipment being delivered to a Depot immediately prior to the required dates in the contracts
- supply chain issues with winter equipment and GPS spare parts (i.e., cables and brackets)
- some confusion about the roles and responsibilities of Transportation Services staff, contractors, and the City's GPS vendor for ensuring the installation of GPS devices
- scheduling challenges between the contractors and the City's GPS vendor
- winter equipment was performing operations when scheduled for GPS installation

In some cases, while GPS devices were available for installation, the sensors for plows were not.

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<sup>22</sup> According to the contracts, December 1st is the date that all equipment must be available at the designated Depots each winter season.

**Records are needed to support causes of delays in equipment having a working GPS device**

As noted previously, management indicated to us that there was not always conclusive evidence to determine who was at fault for GPS installation delays<sup>23</sup>.

Given the potential for significant liquidated damages and to help in enforcing them, management should have consistent processes across all 11 contract areas to ensure that appropriate documents and records are obtained and retained when contractors fail to ensure working GPS devices are on their equipment.

Availability of an operator to operate a piece of equipment

**Procedure needed to verify that licensed operators are available to operate each piece of equipment**

At the time of our follow-up review, Transportation Services also did not have processes in place yet to verify and document that operators were available each day to operate each piece of equipment.

The contract states that contractors are not eligible for the daily rate if they do not have an operator available to operate that piece of equipment on a given day. For example, one staff we interviewed indicated that the City was paying for 10 skid steers to clear bus stops and sidewalks. The staff person indicated that during one winter event *“We went in there after deployment and found only 4 went out. When [we] asked [the] contractor his answer was “I can’t get staff”... when it comes to deployment, the equipment was available, the operator is [was] not. The routes aren’t getting done until they get people in those machine[s]...”*

Transportation Services should develop a standard operating procedure to address this before the start of the next winter season.

**c) Daily rates on substituted equipment were different than the originally priced equipment**

**Equipment delays**

The global supply chain issues, due in part to the COVID-19 pandemic, impacted the availability and timely arrival of new equipment prior to the start of the winter season. Management advised that contractors reached out to them in the summer 2022 to inform them that their equipment orders from their manufacturers would be delayed or the originally proposed equipment could not be acquired.

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<sup>23</sup> The contracts state that the daily rate will apply if a malfunction is due to the City’s third-party GPS provider.

**Contractors substituted 204 pieces of equipment**

Contractors provided options to Transportation Services for alternative equipment instead of the equipment that contractors had originally agreed to provide in their proposals (and executed contracts). The majority of substitutions (143 pieces) were by the joint venture (JV), who had to acquire all of the equipment it proposed (i.e., it had no existing equipment it could use).

A summary of the equipment provided in place of those originally proposed by the contractors is included in Table 6. For the 2022/23 winter season, 204 pieces of equipment were substituted. Change orders have been approved for 134 pieces of equipment. There are 70 pieces of equipment where the change orders are still being negotiated and have not yet been finalized.

**Change orders for some substituted equipment still need to be finalized and approved**

Going forward, it is important that management and staff follow the Division's manual which requires that any changes to the contract be done by written amendment via change orders approved by the appropriate signing authority.

**Daily rates charged for substituted equipment were different than the daily rates originally set out in the contracts for the same type of equipment**

Based on Transportation Services' daily rate payment files (and files for approved change orders), we noted that most substituted equipment were paid at the same rate as the originally proposed pieces of equipment, instead of the (lower) pricing for that type of substituted equipment in the contractor's original pricing form included in the contract. More specifically,

- The daily rates charged for substituted equipment, as agreed by management, was often higher than the daily rate for the same type of equipment in the contractor's original pricing form included in the contract.
- For equipment where a daily rate for the same type of equipment was not specified in the contractor's original pricing form (for that specific contract area), the rate agreed by management was higher than daily rates in other contracts (including those of the same contractor but for other contract areas) for that same type of equipment.

**Contractors proposed higher unit pricing for substitutes because cost to obtain equipment had increased**

In most cases, contractors proposed maintaining the same (but higher) daily rates of the originally proposed equipment for the substituted equipment because the costs of obtaining equipment had increased.

For example, in a letter sent to the City, one contractor requested to charge the higher daily rate for the triaxle item originally proposed (bid item#11) rather than the lower daily rate of the substituted tandem axle trucks (bid item#10).

*“Due to limited availability and global supply chain issues, we request to substitute eighteen (18) new triaxles with eighteen (18) new tandem-axle trucks. Both vehicles have the same function and can carry more salt than is required to spread on any road class. The quoted cost of a 2022 Tandem truck has increased to the price of a 2021 Tri-axle truck. Therefore, we request that tandem axle bid item #10 maintain the same price as submitted for triaxle bid item #11.”*

Ultimately, for this request, Transportation Services approved replacing the 18 tri-axle trucks with 18 single-axle trucks (not tandems), at the same prices as originally submitted for the triaxle bid item. The single-axle trucks had a lower daily rate on the original pricing form than the tandem axle trucks (bid item#10) in the contractor request quoted above.

We quantified the potential impact of paying the higher daily rates of the original equipment, rather than existing contracted daily rates for the substituted equipment type, to be \$1.3 million over the first winter season (120 days). This figure is conservative as we only included dollar values where daily rates for the type of substituted equipment provided already existed in the contracts, The potential financial impact of specific substitutions, by contractor and contract area, are summarized in Table 6.

**Legend for Table 6**

	Truck – Tri-axle with plow blade
	Truck – Tandem Axle with plow blade
	Truck – Single axle with plow blade
	Tractor – 4-wheel drive bi-directional with plow blade
	Grader with plow blade
	Front end loader – Articulating with driveway blade
	Backhoe with driveway blade
	Grader with driveway blade
	Tractor – 4-wheel drive bi-directional with driveway blade

**Table 6: Summary of the Equipment Provided in Place of Those Originally Proposed by the Contractors**

Contractor	Contract Area	Original Equipment	Substituted Equipment	# Replaced	Potential \$ Impact Per Winter Season	Change Order Approved	
JV	TOA1-2	Truck – Tri-axle with plow blade	Truck – Tandem Axle with plow blade	32	\$38,938	Yes	
		Front end loader – Articulating with driveway blade	Backhoe with driveway blade	16	No daily rate for contract area*	Yes	
		Truck – Single axle with plow blade	Grader with driveway blade	2	No daily rate for contract area*	Yes	
	TOA1-3	Front end loader – Articulating with driveway blade	Backhoe with driveway blade	3	No daily rate for contract area*	Yes	
	TOA2-1	Truck – Tri-axle with plow blade	Truck – Single axle with plow blade	10	\$49,200	No	
		Truck – Single axle with plow blade	Grader with driveway blade	2	No daily rate for contract area*	No	
		Truck – Single axle with plow blade	Tractor – 4-wheel drive bi-directional with plow blade	2	No daily rate for contract area*	No	
	TOA2-3	Truck – Tri-axle with plow blade	Truck – Single axle with plow blade	18	\$35,662	Yes	
		Truck – Single axle with plow blade	Grader with driveway blade	1	No daily rate for contract area*	Yes	
		Truck – Single axle with plow blade	Tractor – 4-wheel drive bi-directional with plow blade	2	No daily rate for contract area*	Yes	
	TOA2-4	Truck – Tri-axle with plow blade	Truck – Single axle with plow blade	22	\$55,546	Yes	
		Truck – Single axle with plow blade	Grader with driveway blade	2	No daily rate for contract area*	Yes	
		Truck – Single axle with plow blade	Tractor – 4-wheel drive bi-directional with plow blade	2	No daily rate for contract area*	Yes	
	TOA2-5	Truck – Tri-axle with plow blade	Truck – Single axle with plow blade	19	\$72,960	No	
		Truck – Single axle with plow blade	Grader with driveway blade	5	No daily rate for contract area*	No	
		Front end loader – Articulating with driveway blade	Backhoe with driveway blade	5	No daily rate for contract area*	No	
	A&F	TOA1-4	Truck – Tandem axle with plow blade	Truck – Single axle with plow blade	7	\$189,386	Yes
		TOA1-5	Truck – Single axle with plow blade	Grader with plow blade	3	\$82,562	Yes
			Truck – Tandem axle with plow blade	Truck – Single axle with plow blade	10	\$134,220	Yes



Contractor	Contract Area	Original Equipment	Substituted Equipment	# Replaced	Potential \$ Impact Per Winter Season	Change Order Approved
IML	TOA1-1	Grader with driveway blade	Tractor – 4-wheel drive bi-directional with driveway blade	5	\$75,000	No
		Truck – Tandem axle with plow blade	Truck – Single axle with plow blade	20	\$600,000	No
		Truck – Tri-axle with plow blade	Tractor – 4-wheel drive bi-directional with plow blade	2	No daily rate for contract area*	No
Maple Crete	TOA2-2	Truck – Tandem axle with plow blade	Truck – Tri-axle with plow blade	14	\$0	Yes
<b>Change orders have been approved</b>				<b>134</b>	<b>\$536,314</b>	
<b>Change orders still being finalized</b>				<b>70</b>	<b>\$797,160</b>	
<b>Total</b>				<b>204</b>	<b>\$1,333,474</b>	

\* Although not reflected in the numbers above, for equipment where there was no daily rate provided in the respective contracts (for that specific contract area) for the type of substituted equipment, the daily rate charged was higher than the daily rate in other contracts (including those of the same contractor but for other contract areas) for that same type of substituted equipment.

**Recommendation:**

- 1. City Council request the General Manager, Transportation Services Division to ensure all substituted equipment have been approved through the appropriate change order process, and ensure in future years, where the contractor requests the use of substitute equipment, that the Division ensures that the proposed rate is reflective of existing contract pricing, or if no existing contract pricing is applicable, comparable contract pricing for what the equipment can deliver.**

## A. 2. Verifying Operating Rates and Applying Operations-Related Liquidated Damages

### Operating rate paid when equipment is performing a winter activity

Transportation Services pays for operations based on the operating rate for each piece of equipment activated during a winter event.

Where a maximum operating time<sup>24</sup> is specified in the contract for specific operations (e.g., salting or plowing), for each activated piece of equipment, contractors are paid the maximum operating time at the operating rate, regardless of the actual time a contractor spends to complete the activity<sup>25</sup>. Contractors are eligible to receive payment for the maximum operating time based on each round of activation.

The contract is clear that contractors will not be paid for any additional hours above the maximum operating time (including time required to correct any non-compliance issues with respect to the required desired pavement outcomes).

### Extent of procedures to verify operations varied between staff and across the 11 contract areas

It is important that Transportation Services have consistent processes in place across all 11 contract areas to verify whether contractors completed all the required activities on all their routes within the mobilization and maximum operating times specified in the contracts. Based on staff interviews, the extent of procedures performed varied. Staff advised that, to varying extents, they:

- checked parts of a sample of routes completed by physically inspecting roads, sidewalks, bicycle lanes, etc.
- reviewed call-out<sup>26</sup> times and approximate departure times in the GPS system for a sample of equipment
- attempted to verify route completion by using GPS information to track the path of a sample of equipment

However, the records retained and readily available during our follow-up were not sufficient to confirm that all activated equipment met mobilization<sup>27</sup> time requirements and all the related routes were fully completed in accordance with the expected services levels.

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<sup>24</sup> "Maximum Operating Time" means the maximum time required to perform Operations to meet the applicable Service Level requirement as set out in the contract (see Figure 1 for contracted service levels).

<sup>25</sup> In circumstances where there is not a defined maximum operating time associated with a specific activity, then the operating rate for that piece of equipment can be paid the actual operating hours utilized. For example, spot salting, additional clearing required due to on-street parking, and additional clearing where private property owners pushing snow on to the street are paid based on actual operating hours.

<sup>26</sup> During a winter event, Transportation Services staff call contractors to activate equipment by indicating what winter maintenance services must be provided. This is referred to as a call-out. A call-out time refers to the exact time when a call-out is made.

<sup>27</sup> Mobilization refers to getting equipment ready to leave a Depot. This can include amongst other things, equipment warm-up, loading trucks with salt, etc.

**GPS exception reports and the GPS dashboard can support more efficient verification of operations**

**2020 audit recommended staff verify contractors' operating times and logs using GPS data**

The Auditor General's 2020 report highlighted that a properly functioning GPS device on each contracted piece of equipment helps in monitoring contractor performance. Recommendation 5 addressed using GPS information and reporting to monitor route completion, departure and return times, late starts, and vehicle locations for operational purposes. Recommendation 14c addressed verifying and reviewing contractors' operating and standby logs (daily rate sheets), using GPS data, for accuracy of timing and services provided before approving payment.

Based on our follow-up review, there is further work needed for staff to be able to effectively and efficiently use GPS data to verify the accuracy of timing and services provided before approving payments.

**Highly manual and time-intensive process to verify operating rate payments currently**

During our follow up, we found that the processes to verify completed operations using data captured by GPS devices were manual and labour intensive. Due to delays in implementing the GPS dashboard, Transportation Services staff needed to manually go into the GPS system to review the GPS data for each piece of activated equipment, which can potentially be over 1,000 pieces of equipment for a significant winter storm event, in order to check when the activated equipment left the Depot and what route it followed. Additionally, to verify route completion, staff needed to manually compare the GPS "breadcrumbs" (dotted lines on the GPS map indicating the path traveled) to contract area maps<sup>28</sup> (which are currently not tracked in the GPS system). Doing so is a time-intensive process without a GPS dashboard and/or exception reports available.

**Staff indicated it is not feasible to check every beat**

*According to one staff, "it's a full-scale operation, we cannot feasibly check every beat – that would take too long. I do random spot checks, and even that would take me a couple days to verify one event. And that's if someone's savvy with computers. Each month is different, Dec was very bad and took me about 50 hours to verify (a whole work week) .... I would say it takes 20-50 hours to verify 1 month of OP sheet".*

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<sup>28</sup> Under the new performance-based contract model, the contractor has the flexibility to design their own routes, so they are not necessarily the exact same for each winter event.

**No easy way to use GPS data to verify route completion without the GPS dashboard and/or exception reports**

During our follow up, we attempted to review vehicle movements during winter activations on two days when it snowed more than five centimetres: one snowfall earlier in the winter season (December 15, 2022) and one later in the season (March 3, 2023). While the GPS system showed when a vehicle left a Depot, there was no easy way to determine whether the vehicles performed the required activity or to verify that all the required infrastructure (e.g., roads, sidewalks, and bike lanes) were completed.

**Sensor data can provide information to help verify whether required activities were performed**

While sensors on GPS devices can provide the capability to track whether a piece of equipment's plow was up or down, staff advised that in general, sensors and the related data were not used during the first winter season. Staff advised that the sensor devices are very sensitive and need to be installed correctly and with precision, to record when a plow is down or when salt is being applied.

**Some sensor installations are outstanding**

Management subsequently indicated that, as of April 15, 2023, there were 367 GPS sensor installations still outstanding. Without sensor data, it was difficult to assess without physical observation whether the equipment completed the assigned work (e.g., plowed snow or spread required salt). Sensor information would also help to efficiently identify instances where liquidated damages would apply because of a failure to spread salt in accordance with the contract (Item #7 in Figure 9).

**GPS dashboard is being developed and piloted**

Transportation Services advised that they are still working towards implementing the GPS dashboard to enable staff to more easily identify whether routes have been completed in real time. The GPS dashboard are expected to pull GPS data into a format that will help identify kilometers completed, routes completed, rounds completed, and the number of active and delayed equipment. The GPS dashboard is expected to provide performance metrics in real time. It will be important for the GPS system to be configured with the expected plowing and salting routes for the equipment for which the GPS device is installed and for this information to flow through to the dashboard.

Management advised that they are continuing to develop, pilot, and implement the GPS dashboard to more efficiently and effectively use GPS data to verify whether contractors completed the assigned routes.

Section C.1 of this report further explains the importance of using technology to modernize contract management processes.

**Automated methods would make it more efficient to identify instances where liquidated damages may apply**

**Liquidated damages provisions related to activations for winter operations**

Transportation Services can apply liquidated damages related to winter operations activations under certain circumstances, as shown in Figure 9.

**Figure 9: Liquidated Damage Clauses Excerpted from the New Winter Maintenance Contracts**

<u>Item</u>	<u>Section number in Part 3</u>	<u>Event</u>	<u>Liquidated Damages Paid by Vendor</u>
<u>6</u>	<u>5.4.4</u>	<u>Failure to leave a Depot within the applicable Mobilization Period</u>	<u>\$200.00 per minute per piece of activated Equipment in the Depot after the expiry of the Mobilization Period</u>
<u>7</u>	<u>5.7</u>	<u>Failure to spread salt or pre-treated salt in accordance with the Contract</u>	<u>\$360.00 per failure</u>
<u>8</u>	<u>5.11</u>	<u>Failure to correct a deficiency within 2 hours of notification by the Contract Administrator</u>	<u>\$400.00 per hour starting two hours after notification</u>

**Liquidated damages were applied for two operational matters**

As noted previously, some staff advised that they only calculated liquidated damages for Item #6 (failure to mobilize equipment on time) and Item #8 (failure to resolve deficiencies promptly), because management directed that no other liquidated damage clauses would be applied for this winter season. Transportation Services staff did not estimate the amount of liquidated damages relating to Item #7.

We discuss the need for staff to closely track and maintain sufficient documentation on the timely resolution of contractor deficiencies to determine whether liquidated damages (Item #8) can be applied in section B.1.

**Liquidated damages of \$200 per minute per activated piece of equipment that left a Depot late**

Where an activated piece of equipment does not leave the Depot within its required mobilization period, which ranges from 45 minutes for expressways to 2.5 hours for local roads, Transportation Services can apply \$200 in liquidated damages for each minute the activated piece of equipment left the Depot late (Item #6).

**\$17.4 million in liquidated damages communicated to contractors for failing to mobilize on time**

Based on information provided by staff (as summarized in Table 7 in Section A.3), Transportation Services staff identified \$37.6 million in potential liquidated damages for failing to leave a Depot within the applicable mobilization period. Transportation Services subsequently communicated to contractors that they would be applying \$17.4 million of the identified liquidated damages.

**Approach for estimating liquidated damages was not consistent across the 11 contract areas**

However, as noted previously, the way liquidated damages were determined was not consistent across all 11 contract areas. For example:

- some of the quantifications provided by staff only focused on certain time frames (e.g., from Feb 1, 2023, and onwards)
- some staff estimated liquidated damages from the start of the contract (October onwards).

Therefore, the amounts provided by staff during our follow-up may not represent the full value of liquidated damages that might be applicable from the beginning of the contract term.

Given the limitations related to the consistency, accuracy and completeness of available records noted previously, we did not verify the accuracy of the Division's liquidated damages estimates and whether they included all appropriate liquidated damages.

**A. 3. Establishing Consistent Processes for Determining Liquidated Damages that Should be Applied**

**Auditor General's 2020 report recommended documenting the rationale for liquidated damages amounts**

Recommendation 11 in the Auditor General's 2020 report highlighted that Transportation Services should reassess and document the rationale for liquidated damages amounts in the next contract cycle taking into account past claims against the City and other potential losses, to ensure that the liquidated damages amounts are fair and supportable.

Contracted winter maintenance services are part of the City's snow and ice management plan that is designed to prioritize the safety and mobility of all road, sidewalk, cycle, and path users. Thus, the winter maintenance services that contractors provide have a direct impact on the safety of pedestrians, cyclists and motorists. The Contract provides that where there is a failure by the Vendor to perform Services in an expedient manner and to comply with the terms and conditions of the Contract, loss or damage will be sustained by the City. It is impracticable to determine the actual loss or damage sustained by the City and what the City will suffer as a result of such failure, therefore, the Vendor will pay the liquidated damages as identified within the Contract.

**Documentation supporting liquidated damages can be strengthened**

Still, as noted in the Auditor General's 2020 report, for liquidated damages to be enforceable, the pre-estimated amounts included in the contracts must be reasonable and must represent the fair estimate of actual damages to avoid being deemed as punitive. While management provided explanations for how they came up with the liquidated damages amounts in the new winter maintenance contracts, we found Transportation Services could further strengthen the supporting documentation retained on file.

**2020 report recommended standard forms and guidelines for assessing and charging liquidated damages**

Recommendation 14a and 14b from the Auditor General's 2020 report was for Transportation Services to:

- a. develop a policy and procedure manual for winter operations, including best practices for contract management, and best practices for assessing and charging liquidated damages
- b. standardize processes and forms for monitoring contractor performance and for assessing and charging liquidated damages

While management has taken action on this recommendation, based on our follow up review, further work is needed for this recommendation to be considered fully implemented. We discuss further action steps management can take below.

**Manual prepared at the beginning of the season did not provide details on how to track and document liquidated damages**

Specifically, the Division's manual currently does not provide details and/or standardized forms on how to track all potential liquidated damages. The procedures manual only says, *"the Contract Administrator, in consultation with the Contract Supervisor, shall track and document Liquidated Damages....and provide all the necessary supporting documentation..."*

**The manual is currently being updated to reflect processes and templates developed during the season**

There are no guidelines in the manual on what type of documentation or evidence staff should retain to support Transportation Services' application of liquidated damages. Management advised that they developed templates for staff to use when calculating certain liquidated damages. We noted that all staff used these templates when determining liquidated damages (for items #6 and #8 as discussed in Section A.2). Management advised that they are currently working on updating the Division's manual to ensure that staff continue to use these templates.

**Liquidated damages estimates prepared by Transportation Services staff took a significant amount of time to prepare**

Table 7 below summarizes the preliminary estimate of \$68.7 million in liquidated damages that staff prepared for the 2022/23 winter season<sup>29</sup>. It is important to note that these amounts were preliminary estimates prepared by staff and are not final.

To prepare these estimates, Transportation Services staff we interviewed advised that they used a combination of methods, such as manually checking GPS data one piece of equipment at a time, physical observation, patrolling, and reviewing old email correspondence. Staff advised that they spent a significant amount of time preparing the liquidated damages estimates.

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<sup>29</sup> Section A.1 includes discussion of items #1-4, section A.2 includes discussion of items #6-8, and section B.1 includes discussion of items #8-9.



**Table 7: Liquidated Damages Identified by Staff vs. Communicated to Contractors as at June 1, 2023**

Liquidated damage clauses	Staff estimate (Oct – Jan)	Staff estimate (Feb – Apr)	Total	Amount communicated to contractors
1. Failure to calibrate all Equipment seven (7) days prior to the Winter Season; or failure to calibrate all Equipment on a monthly basis	16,409,000	-	16,409,000	-
2. Failure to provide verification to Contract Administrator that a GPS/AVL device is working	993,200	-	993,200	-
3. Failure to submit CVOR <sup>30</sup> abstract in accordance with the Contract	4,170,000	-	4,170,000	-
4. Failure to apply any required signage on a piece of Equipment	4,713,000	3,653,000	8,366,000	-
5. Failure to provide shift schedule to Contract Administrator in accordance with the Contract prior to October 15 each Winter Season	10,800	7,400	18,200	-
6. Failure to leave a Depot within the applicable Mobilization Period	8,387,000	29,242,600	37,629,600	17,300,960
7. Failure to spread salt or pre-treated salt in accordance with the Contract	-	-	-	-
8. Failure to correct a deficiency within 2 hours of notification by the Contract Administrator	6,900	1,110,800	1,117,700	112,531
9. Failure to repair damages to property prior to May 31 annually	-	-	-	-
10. Failure to submit a Depot plan in accordance with Contract	10,800	7,400	18,200	-
<b>Grand Total</b>	<b>\$34,700,700</b>	<b>\$34,021,200</b>	<b>\$68,721,900</b>	<b>\$17,413,491</b>

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<sup>30</sup> Commercial Vehicle Operator's Registration

**Consistent approach to determining liquidated damages across all 11 contract areas is needed**

As noted previously in Section A.2, the approach used to determine liquidated damages was not consistent across all 11 contract areas. Some of the quantifications provided by staff only focused on certain time frames (e.g., from Feb 1, 2023) while others tracked liquidated damages applicable from the start of the contract. Some staff provided quantifications for only two of the ten liquidated damages clauses (item #6 and #8), while others tracked more liquidated damages categories. Therefore, it is unlikely that Table 7 represents the full value of liquidated damages that might be applicable from the beginning of the contract term.

**Examples of additional liquidated damages not assessed**

For example, as noted in Section A.1., we estimated \$11.1 million in liquidated damages (#2) that could be potentially applied related to the GPS devices not functioning on over 630 pieces of equipment where daily rates had been paid. Only one contract area calculated potential liquidated damages for Items #5 and #10, where staff estimated that the maximum number of liquidated damages (\$18,200 each) could potentially be applied.

Of the \$68.7 million in potential liquidated damages identified by Transportation Services staff, \$17.4 million in liquidated damages was communicated to the contractors as of June 1, 2023.

**Management advised they didn't apply all possible liquidated damages because of circumstances beyond anyone's control**

During the course of our follow-up review, Transportation Services management advised that they did not apply liquidated damages for the period from October 2022 to January 2023. Management explained that liquidated damages (LD) were not applied because a number of the liquidated damages were tied to equipment requirements (e.g., not placing signage on equipment, not providing calibration certificates, mechanical fitness certificates, not having a working GPS device installed on the equipment). These *"were not performance-based issues"* but global supply chain and labour market issues, and *"it would be unfair and unjust to apply a repercussion on any company where they tried....but because of circumstances beyond their control couldn't get the equipment."*

**Safety weighed heavily on the decision not to apply liquidated damages**

Management advised us that applying the full value of liquidated damages could cause the contractors to go out of business and thereby paralyze the City for the rest of the winter season. Management stated that they made *"a business decision weighing on the safety of residents of Toronto..."* and further, *"...we strongly believe that if we'd issued LDs of that size, these companies may not have been able to be financially viable..."*. Management advised that *"...we would not have had contractors to clear the snow and would put at risk the health and safety of residents."*

**Liquidated damages were not applied for the first half of the winter season**

According to Transportation Services' internal meeting minutes from February 2023, staff were directed to start applying liquidated damages from February 1, 2023 (February invoices). Prior to that, staff were directed by senior management to not apply any liquidated damages from the start of the winter season (October 15, 2022) through January 31, 2023. Management decided to start applying liquidated damages from February 1, 2023, onwards, but chose to apply only two of the ten liquidated damages clauses (i.e., leaving a Depot late, and not properly correcting deficiencies within two hours of being notified) as these two issues are performance related and can impact desired performance outcomes. Management advised that the rationale for applying only two of the liquidated damages beginning in February was to start a phased approach by implementing the damages directly related to performance during a winter storm event.

**Communications with contractors about liquidated damages**

We noted that meeting minutes with one contractor in January 2023 indicated that staff advised the contractor that they would begin applying liquidated damages in February 2023. In January 2023 meeting minutes with another contractor, we noted that staff advised the contractor the liquidated damages were not being applied at this time *"as the City of Toronto is committed to working with their winter service contractors during the progression and development in year 1 of a 7 year contract, but they will be applied at some time of the future."* At a subsequent meeting in February 2023, staff advised the contractor that they would be starting to apply liquidated damages.

## **B. Ensuring Robust Monitoring of Contractor Performance**

**2020 audit highlighted the need for consistent processes to monitor contractor performance against service levels**

The Auditor General's 2020 report highlighted that Transportation Services did not have clearly defined performance measures under the old contracts and did not have consistent processes to monitor contractor performance against service levels. At the time, the Auditor General recommended Transportation Services develop performance metrics for the next contract cycle to measure and monitor contractor performance and improve processes and documentation to have relevant and readily available information to measure the KPIs.

**Transportation Services planned on measuring performance using GPS data and field audits**

When the contracts were awarded, in response to questions from City Council on accountability and reporting metrics, the Division advised that staff would measure performance through real-time GPS reporting on start times, completion times, routes travelled, and the amount of salt applied. Further, that staff would carry out field audits to evaluate contractor performance and use that data to verify contract payments.

Management responses to Council questions can be viewed at: <https://www.youtube.com/live/ucwlgRfYLTw?feature=share&t=25562>

During the follow-up, we found that more work was needed to track, measure, and monitor contractor performance under the new contracts.

**B. 1. Analyzing Complaints Data and Tracking Contractor Deficiencies**

**2020 audit recommended analyzing service requests to understand contractor performance issues**

Recommendation 22 from the Auditor General’s 2020 report was for Transportation Services to analyze legal claims information and 311 service requests on a regular basis to provide additional indicators of where contractor performance needs closer monitoring. While progress has been made by implementing EWMS and creating dashboards to view service request data, further work is needed for Recommendation 22 to be considered fully implemented.

**Service requests generally come through three main sources**

Service requests (City’s customer service tickets) for winter maintenance services come through three main sources:

1. Complaints to 311 (which are triaged and then sent to the Division’s Enterprise Work Management System)
2. Direct phone calls from Transportation Services patrollers as they drive around to monitor their routes
3. Direct phone calls to contract supervisors/administrators from City Councillors and residents

**Service requests tracked in EWMS starting in November 2022**

In November 2022, Transportation Services started tracking all service requests in the newly implemented EWMS, also known as Maximo. EWMS replaced the Division’s former information system, Transportation Maintenance Management System (TMMS).

**Two separate workflows for contractor deficiencies related to winter maintenance services**

Contractor deficiencies<sup>31</sup> related to winter maintenance services (e.g., failure to plow a section of a street or not achieving the desired pavement conditions as specified in the contract, etc.) follow two different paths or workflows in EWMS, depending on the originating source:

- All complaints received by 311 are sent to EWMS and tracked through ‘Service Requests’ and associated ‘Work Orders’
- EWMS also has a separate ‘deficiencies functionality’ built into the system that allows staff to record contractor deficiencies and create associated Work Orders that did not originate from 311.

It is important to note that service requests received through 311 are not automatically considered contractor deficiencies until staff have investigated the complaint and then determine next steps.

**40% of all winter related service requests originating from 311 were for contract areas servicing Scarborough**

Contract areas TOA 1-1 and TOA 1-2 servicing Scarborough (Wards 20 to 25) logged nearly 40 per cent of winter related service requests to the City’s 311 service from October 29, 2022 to April 30, 2023. Over 30 per cent of the \$17.4 million in liquidated damages communicated to the contractors (as of June 1, 2023) were for contract areas TOA 1-1 and TOA 1-2. In addition, these were the only two contract areas where negative price adjustments were communicated (as of June 1, 2023).

**Contractor deficiencies identified through patrolling or proactive inspections are not consistently tracked in EWMS**

Transportations Services staff we interviewed advised us that they are not consistently using the deficiencies functionality in EWMS to record potential contractor deficiencies that did not originate in 311. Consequently, the EWMS data is incomplete in respect of contractor deficiencies.

In addition, staff advised that they typically notify the contractor of any deficiencies identified through patrolling or proactive inspection via email. Staff do not always subsequently enter these into EWMS in the deficiencies functionality. As a result, management does not have a consolidated tracking of contractor deficiencies for assessing and analyzing overall contractor performance. This issue is discussed in further detail below.

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<sup>31</sup> Contractor deficiencies (referred to as ‘deficiencies’ throughout the report) are any deficiencies in a contractor’s work or a failure by a contractor to meet the service level requirements stated in the contract. (e.g., failure to plow a section of a street or not achieving the desired pavement conditions as specified in the contract, etc.) These deficiencies must be corrected within two hours of notification. If a contractor fails to correct a deficiency within two hours of notification, liquidated damages of \$400 per hour are applied starting two hours after the notification.

**Service request data used by management for analysis is incomplete**

It is important to note that the service request data that management uses for trend analysis, for example, heatmaps, Service Request dashboards, etc. does not include any contractor deficiencies that were not reported to 311 or were not tracked as service requests (e.g., those contractor deficiencies that were entered by staff in EWMS using the deficiencies functionality, or those that were resolved by staff directly with contractors without subsequently entering in EWMS).

In addition, clearly identifying whether a service request provides evidence of contractor’s non-compliance is important because liquidated damages and/or price adjustments may apply as further described below and in Section B.2.

**Improve information tracked for contractor deficiencies to better support whether liquidated damages can be applied**

**Contractors are required to resolve deficiencies promptly and repair damages timely**

It is important that Transportation Services have consistent processes in place across all 11 contract areas to track identified contractor deficiencies, as well as damage to public and/or private property as a result of the winter maintenance services, through to their resolution. This information is important because, as shown in Figure 10, liquidated damages can be applied when deficiencies are not corrected within 2 hours after notification by Transportation Services staff (for Item #8) and when damage is not repaired by May 31 of each year (for Item #9).

**Liquidated damages may be applied where deficiencies and damage are not resolved within contracted time frames**

**Figure 10: Excerpt of Liquidated Damages Clauses from the New Winter Maintenance Contracts**

<u>Item</u>	<u>Section number in Part 3</u>	<u>Event</u>	<u>Liquidated Damages Paid by Vendor</u>
8	5.11	Failure to correct a deficiency within 2 hours of notification by the Contract Administrator	\$400.00 per hour starting two hours after notification
9	5.12	Failure to repair damages to property prior to May 31 annually	\$1,600.00 per day

**Inconsistent approach to tracking contractor deficiencies and their resolution**

Based on staff interviews, tracking and procedures performed to verify the resolution of deficiencies and damage varies from contract area to contract area. As discussed above, we found that based on how service requests are tracked in EWMS, as well as the inconsistent use of the deficiencies functionality in EWMS, that not all contractor deficiencies are recorded in EWMS. Staff were manually tracking deficiencies and damages outside of EWMS (e.g., in their own Excel spreadsheets or through emails or on operating sheets). Furthermore, because of the challenges with EWMS service request data, and because staff in each contract area track deficiencies in a different manner, there was no central tracking of when staff notified a contractor about a deficiency and how long it took to resolve it. Management advised that they are continuing to work towards developing alternate processes to track resolution of contractor deficiencies.

Staff we interviewed also advised that due to the short 2-hour turn around time allowed in the contract for the contractor to fix deficiencies and avoid liquidated damages, combined with a lack of supporting information provided by the contractor within that time, it is not always currently feasible for staff to verify the resolution of contractor deficiencies in real-time.

**Evidence should be retained to demonstrate whether contractors fixed the identified deficiencies**

The contract requires the contractor to accurately record all required information related to work completion as work and operations are completed. The recorded information should include photos of work completed as required.

**Processes need to be enhanced to ensure contractors correct deficiencies**

Some staff we interviewed also indicated that they did not always obtain or retain records or documentation demonstrating that contractors corrected deficiencies promptly and to staff's satisfaction. It may not always be possible for staff to physically visit the specific site to verify that the contractor resolved the issue(s) within the specified time frame.

**Stronger records can help Transportation Services apply liquidated damages**

Transportation Services should ensure consistent processes are in place and records are retained to demonstrate the timely resolution of contractor deficiencies. To support the Division's ability to apply liquidated damages, it should ensure that contractors are adhering to contract requirements to provide alternative forms of verification like photos or videos. Where evidence has not been received, staff should promptly notify contractors of their non-compliance.



**Consistent processes needed to ensure contractors repair damage**

Similarly, to be able to apply liquidated damages, it is also important to evaluate each service request related to property damage and whether contractor is contractually responsible for remediating/ repairing/ fixing the respective issue by May 31<sup>st</sup> of each year. Transportation Services should have consistent processes in place to track their resolution. Based on Transportation Services' internal meeting minutes on June 1, 2023, for the 2022/23 winter season, the Division agreed to extend this deadline for certain contract areas that requested an extension.

**B. 2. Monitoring Contractor Performance to Determine Applicable Performance-Based Price Adjustments**

**Price adjustments based on performance**

In addition to receiving payment of daily rates and operating rates, contractors may receive positive or negative price adjustments depending on whether they meet the following criteria:

- (a) Completing routes within the specified Maximum Operating Time
- (b) Achieving the desired pavement outcome (e.g., bare pavement, safe and passable, etc.)

**Positive price adjustments**

These criteria are based on the contracted service levels as shown in Figure 1 (in the Background section).

According to the contract, contractors will receive a positive price adjustment equivalent to one day of the Daily Rate for that contractor's entire fleet if they meet both of the contracted service level requirements over ten consecutive winter events.

**Negative price adjustments**

Failure to meet one of the service level requirements constitutes a significant non-compliance event, which is to result in a negative price adjustment. According to the contract:

- The first occurrence of a significant non-compliance event in a winter season will result in a negative price adjustment valued at 50 per cent of one day of the Daily Rate for that contractor's entire fleet.
- The second occurrence of a significant non-compliance event in the same winter season will result in a negative price adjustment valued at 75 per cent of one day of Daily Rate for that contractor's entire fleet.
- Any subsequent significant non-compliance events in the same winter season will each result in a negative price adjustment for the full day of Daily Rate for that contractor's entire fleet.

**Price adjustments were applied for two contract areas in the first winter season**

To provide a sense of magnitude, the total daily rate payment for a typical fleet can range from \$20,000 to \$110,000 for each day of the winter season, based on the prices agreed for the respective contract areas. As of June 1, 2023, Transportation Services has calculated about \$300,000 in negative price adjustments for two contracts, representing a total of two to three occurrences of a significant non-compliance event for each of the two contract areas.

**2020 audit recommended measuring achievement of Council-approved service levels**

In the Auditor General’s 2020 audit report, Recommendation 20 emphasized the need to develop and be able to have readily available information to measure performance as well as service levels. Management indicated to us that they are still working towards implementing this recommendation.

**Contract indicates how City will monitor compliance**

The contract specifies that the City will monitor compliance (i.e., route completion, completion times, and achievement of desired pavement conditions) through a variety of means, including tracking the GPS start and completion times, GPS verified streets completed, and a field audit of 20 random samples of street segments and varied infrastructure types for compliance.

**Field audits are one way to identify non-compliance with contracted service levels**

As noted throughout this report, management is working towards implementing the GPS dashboard that will monitor route completion and service levels. The GPS dashboard is not the only source for identifying non-compliance with contracted service levels. There are other means, such as winter event field audits.

**Ensuring Winter Event Field Audits are Performed to Evaluate Contractor Performance**

**Fewer than expected field audit forms were prepared**

During our follow-up, we found that the specified number of field audit reports were not completed. According to staff, this past winter season, there were 150 winter events spread over 54 winter event days (listed in Table 8 below). Plowing was activated on 33 of the 54 winter event days.

**Table 8: Winter Events During the 2022/2023 Winter Season**

Type of Activation	Number of Winter Events (Activations)
Anti-icing	17
Salting - Arterial and Collector Roads	41
Salting - Local Roads	40
Plowing - Arterial and Collector Roads	11
Plowing - Local Roads	8
Sidewalks	33
<b>Total Winter Events</b>	<b>150</b>
<b>Total Winter Event Days</b>	<b>54</b>
<b>Total Winter Event Days when Plowing was Activated</b>	<b>33</b>

At a rate of 20 random samples<sup>32</sup> of street segments for each of the 11 contract areas for each of the 33 winter event days when plowing was activated, we conservatively estimated that staff would have completed a minimum of 7,260 field audit reports.

**Average of 3 field audit reports prepared per contract area, per winter event day**

Based on records retained in the Division's central file repository, for the 2022/23 winter season, approximately 1,135 field audit reports were prepared, or an average of three winter event field audit reports per contract area, per winter event day<sup>33</sup>, each field audit report representing one street segment.

One patrolling staff we interviewed indicated they had not received instructions to prepare field audit reports.

**Key information needs to be recorded in each field audit report**

In our review of the winter event field audit reports available, we noted that approximately:

- 50 per cent of the 1,135 field audit reports did not have supporting documents, such as photographs, to indicate pavement outcomes were achieved.
- 12 per cent of the 1,135 field audit reports did not indicate the number of kilometers assessed or the number of kilometers where deficiencies were found.

This information is crucial for assessing price adjustments when the desired pavement conditions are not achieved.

**Field audit reports could be improved to capture more observations**

Figure 11 below is an example of a field audit report that staff retained but was missing information that would inform whether the contractor had met the City's service level requirements.

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<sup>32</sup> We noted that the contract language is unclear on whether 20 random samples are required for each winter event, each activation, each day, or each operating activity. According to staff, any equipment activation resulting from snow accumulation exceeding the service level thresholds is considered a winter event. For example, an equipment activation resulting from 2 cm of snow accumulation on a sidewalk is deemed a winter event.

<sup>33</sup> In 2022-2023, Transportation Services initiated 150 winter events (i.e., anti-icing, salting, plowing, and sidewalk activations) spread over 54 winter event days. On 33 out of 54 winter event days, plowing was activated. Given that there were 33 winter events where plowing was activated, we expect staff would have prepared a minimum of 7,260 field reports (20 reports X 11 contracts X 33 days when plowing was activated). Staff completed a total of 1,135 winter event field audit reports during the 2022-2023 winter season, averaging about 3 reports per contract per plowing event day (1,135/ 11 contracts/ 33 plowing event days).

Example of a field audit report that was missing important information to document contractor performance

Figure 11: Example of Field Audit Report

**TORONTO**  
Transportation Services

**Appendix A.4 - Winter Event Field Audit Report**

Distance/ Kilometers Assessed and found non-compliant not documented

Report # number not documented

Infrastructure Audit #:	Report #	Out of
		20
Overall Distance Inspected (km):	Overall Distance in Non-compliance (km):	
Contract Number:	Inspection Date: 11/22/2022	Inspection Time: 11:09
Contractor Name:	Contract Area:	Ward:
Street Name:	Time Snow Event Completed:	Time snow event completed not documented
From:	To:	
Kilometers Assessed on this Report:	Total Kilometers in Non-compliance:	
Infrastructure type:	<input checked="" type="checkbox"/> Sidewalks	
<input type="checkbox"/> Expressway <input type="checkbox"/> Arterial	<input type="checkbox"/> Collector <input checked="" type="checkbox"/> Local	<input type="checkbox"/> Cycling <input type="checkbox"/> Bus Stops/PXO

Salting Conditions			
Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>	Salt is present at the centreline of the road when travelling in one direction
Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>	Salt does not extend beyond the travelled portion of the infrastructure
Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>	Excessive accumulation of salt at standing points are not present in the area including at intersections
Plowing Conditions			
Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	Snow does not encroach more than 0.5-0.75m from the curb onto pavement
Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	Salt is applied while plowing of a road
Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	Salt is applied while plowing of a sidewalk
Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	Windrows at intersections have been cleared of snow including cycling infrastructure
Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	Snow has been pushed to the end of the rear laneway
Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	Residential Driveway Windrow Clearing has been completed at all locations
Damage to Infrastructure			
Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>		Visible damage to grass or encroachments
Comments (include any non-compliance communicated to the Contractor) :			
Photos Taken: <input checked="" type="checkbox"/> Yes [Number of Photos Taken]			
Inspection Official (print name):		Signature:	

Although each contract area has four to five patroller / inspection staff assigned, management advised that all field audits couldn't be completed because of "limited staffing resources and the amount of time to perform 20 inspections. After an event the winter team was busy responding to customer service complaints and issues which created capacity challenges for completing field audits."

**Records were not sufficient to determine whether Transportation Services was enforcing price adjustment clauses to the fullest extent possible**

Without the required number of field audit reports being completed and/or being completed in sufficient detail, during this follow up review, we could not assess or confirm whether Transportation Services had sufficiently assessed whether contractors were meeting the required service levels and pavement conditions, whether the Division was appropriately applying positive/negative price adjustments, and whether the Division was enforcing those clauses to the fullest extent possible in the first winter season.

Given the performance-based nature of the contracts and price adjustment clauses based on achievement of service levels, Transportation Services needs to have robust tools available to measure whether contractors are meeting the service levels as agreed in the contract.

**Recommendation:**

- 2. City Council request the General Manager, Transportation Services Division to make the necessary updates to the Winter Maintenance Contract Administration Manual, provide additional training, and ensure consistent and ongoing compliance over the duration of the contracts to ensure:**
  - a. Staff verify that equipment is at the designated City Depot in accordance with the contracted mobilization and demobilization dates for every winter season and retain sufficient and appropriate records of such verification**
  - b. Staff appropriately determine instances where liquidated damages should apply and retain sufficient and appropriate records to support the Division's application of liquidated damages**
  - c. Staff perform the required field audits and retain sufficient and appropriate documentation of their observations to support the Division's application of price adjustments**

**C. Continuing to Implement Systems and Tools to Improve Efficiency and Effectiveness of Contract Management**

**2020 audit recommended modernizing processes and integrating technology better** The Auditor General’s 2020 report made recommendations for management to develop plans to modernize processes and integrate technology solutions with the existing GPS tools. Although management made progress in implementing the technology, in our view, more work is needed to ensure the optimal use of GPS technology for monitoring contractor performance and to fully implement these recommendations.

**C. 1. Continue to Implement GPS Tools to Better Support Winter Maintenance Contract Monitoring**

**2020 audit emphasized the importance of modernizing processes** The Auditor General’s 2020 report highlighted that Transportation Services could further digitalize, modernize and integrate the GPS system to reduce the work and manual processes required to verify contractor reported information.

**GPS technology was in place under the previous contracts but could have been used more effectively** While GPS technology was in place for the previous contracts, as noted previously, it was only used in a limited capacity. Recommendation 1 of the 2020 report was for Transportation Services to utilize the GPS technology available, which includes real-time exception reports, notifications, and route completion and performance reports, to better monitor contractor performance. Additionally, Recommendation 21a suggested Transportation Services work with the GPS vendor to configure the route completion report to provide accurate information and develop other GPS reports for measuring contractor performance and service levels.

Management reported that they were still working on addressing this recommendation at the time of our follow-up.

**Use GPS data more efficiently to monitor contractor performance** In this follow-up review, and as we highlighted through this report, Transportation Services is working towards better integrating GPS data into its contract management practices by developing the GPS dashboard which will help to modernize its historically manual and labour-intensive contract management processes. These tools were not available to support monitoring contractor performance during the first winter season of this new contract cycle.

**Staff manually look up GPS data one piece of equipment at a time** During the 2022/23 season, to use GPS to verify daily rates and completion of required operations, Transportation Services staff had to manually key in each vehicle ID, one piece of equipment at a time, which staff advised is time-consuming and impractical, especially during a winter event.

Developing and deploying tools to support staff is essential to more effectively and efficiently monitor that contractors have completed the contracted work within the maximum operating times, met the Council-approved service levels, and to support the Division's ability to identify instances where price adjustments or liquidated damages should be applied.

**Use GPS exception reports and dashboard to track contractor performance against service expectations**

The following examples of exception reports could be developed, or alternatively information could be made readily available through the GPS dashboard:

- a consolidated list of winter equipment that left a Depot after the mobilization period ended (i.e., left the Depot late)
- a consolidated list of winter equipment that did not complete a route within the maximum operating time
- a consolidated list of winter equipment that were not located at the designated Depot on any given day during the winter season except for when out for winter operations (e.g., to check when to withhold daily rates)
- a consolidated list of winter equipment that did not comply with the salt application rates as directed by the Transportation Services staff
- a consolidated list of GPS devices that are malfunctioning or not sending signals, or have sensors not working, etc.

**The new GPS dashboard is expected to provide real-time reporting on performance metrics**

Management has advised that they are working with the City's external consultant to configure the GPS dashboard to be ready before the next winter season (2023/24). Management advised that they released a pilot version of the dashboard, however, during testing, it was found that improvements were needed. It was not operationally available this first winter season. As illustrated in Figure 12 below, management advised that the new GPS dashboard will capture the following metrics:

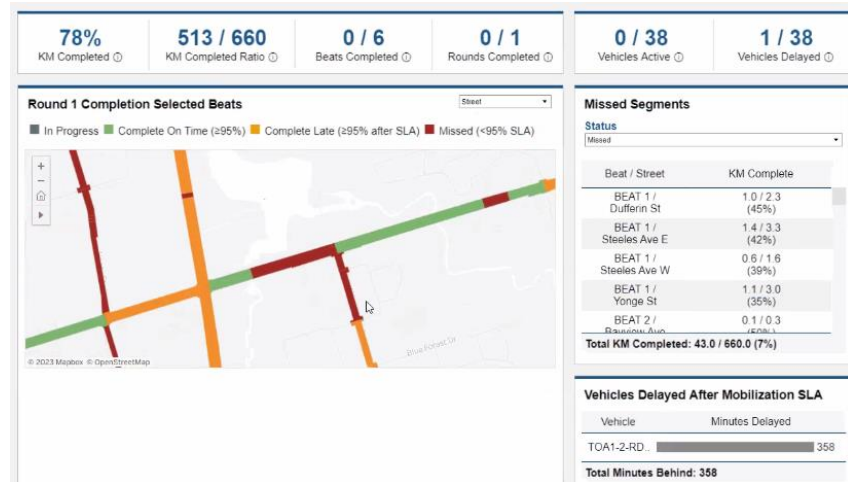
- percentage of routes completed relative to the maximum operating time
- percentage of routes where plow was down / salt spreading took place
- expected start and end times based on call-out time and maximum operating time
- live updates every three minutes showing, in different colours, routes completed and outstanding

Management also advised that the GPS dashboard would allow the staff to view individual street segments for the status of a particular winter activity (e.g., salting, plowing, sidewalks, and cycling, if applicable).



Potential GPS dashboard report template

Figure 12: Future GPS Dashboard Report Template



**C. 2. Increase Use of Enterprise Work Management System Functionality to Enable Robust Data Analysis**

Full functionality of EWMS has not yet been operationalized

Transportation Services started using the Enterprise Work Management System (EWMS) during the 2022/23 winter season. However, there have been delays in implementing the full functionality planned. Management advised that during the user acceptance testing phase in August 2022, staff found that the system was not working as expected, and expressed the following concerns:

- High volume of manual entries and steps required to complete work. In the interim, staff developed manual processes outside the system
- Compressed timelines for implementation
- Challenges developing role-based processes and implementing training
- Confusion about how to manage sign-offs and verify payment entries against work orders
- Issues with using existing hardware tablets in the field

Once fully implemented and fully functional, staff advised that the system is designed to perform the following functions:

- Track the time when Transportation Services notifies a contractor to perform an activity (this is critical for ensuring contracted mobilization times and maximum operating times are met)
- Track all incoming service requests and the resolution of each service request (this is critical for ensuring that contractor deficiencies are promptly resolved)
- Contain operating rate and daily rate sheet information (this is to support invoice payment processing and other relevant data analysis)

### **Call-out application to help track activation and mobilization**

**Staff manually record activation times in patroller logs and emails**

During our follow-up, management and staff also advised us that as part of the GPS dashboard development, a digital application was being developed to track activations (i.e., notification times to begin salting, plowing, etc.). The digital application is required to provide the necessary inputs (start times) for the dashboard and route completion. Management advised that they evaluated if the digital application could also be integrated with EWMS to automatically create a work order in the system. However, Transportation Services staff indicated that this application could not be integrated with EWMS because of the technical complexities and challenges.

Since the application was not ready, staff resorted to calling a contractor directly, writing it down in their patroller logs, and then emailing the contractor and Transportation Services staff to notify them of the time that they initiated a call-out to initiate a winter activity. Similarly, this was how they tracked when they notified a contractor to remediate a service request.

Management advised that they are working towards implementing the call-out application and integrating it with the GPS dashboard. In the meantime, staff will continue to rely on emails and phone calls to communicate, manage, and track call-out times.

### **Recommendations:**

- 3. City Council request the General Manager, Transportation Services Division to ensure activations for each winter event are accurately captured electronically to support monitoring contractor compliance with contract requirements on equipment activations and mobilizations.**

4. **City Council request the General Manager, Transportation Services Division to implement a process to ensure all contractor deficiencies related to winter maintenance services are captured in a timely manner in a central system that facilitates monitoring effective contractor performance.**

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## Conclusion

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### **4 new recommendations in the context of the new winter maintenance contracts**

The lessons learned from the first winter season of this new contract cycle and areas for continuous improvement identified during this follow-up are aimed at helping Transportation Services to continue working on implementing more robust processes, tools, and reporting, in advance of the second winter season.

Together with the recommendations from the Auditor General's Phase 1 and Phase 2 reports, there are four new recommendations in this report that can further help management in monitoring contractor performance using technology to increase the efficiency and effectiveness of contract management processes that hold contractors accountable and ensure Transportation Services pays contractors in accordance with the express terms of the contracts.

We express our appreciation for the co-operation and assistance we received from Transportation Services management and staff. We believe management made best efforts to accommodate our requests for information, while carrying out their operational requirements under the first winter season of the new winter maintenance contracts.

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# Follow-up Scope and Methodology

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**Follow-up reviews of previous Auditor General recommendations are regularly included in the Auditor General’s Work Plan**

**Management is required to review the outstanding recommendations and provide information on their implementation status**

**Management is required to provide supporting documentation for recommendations reported as fully implemented**

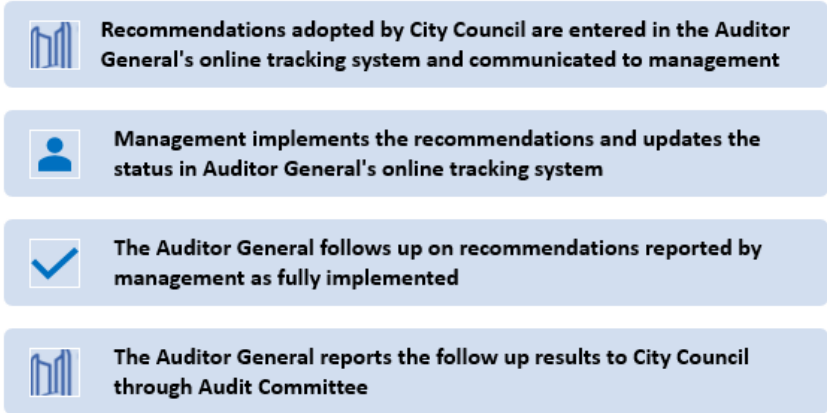
### Process for Following Up Previous Auditor General Recommendation

The follow-up of outstanding recommendations is required by Government Auditing Standards. The process is important as it helps to ensure that management has taken appropriate actions to implement the recommendations from previous Auditor General reports.

Follow-up reviews of previous Auditor General recommendations are regularly included in the Auditor General’s annual Work Plan, including the [Auditor General's Office 2023 Work Plan \(toronto.ca\)](#).

The Office’s normal process for following up previous Auditor General recommendations, as summarized in Figure 13, requires management to review the outstanding recommendations and provide information on their implementation status.

**Figure 13: Key Steps in the Recommendation Follow-up Process**



For recommendations that management has reported as fully implemented or no longer applicable, management is required to provide an explanation as well as sufficient and appropriate supporting documentation. The Auditor General's Office conducts work to verify the status of these recommendations.

Where management is continuing to take actions to address recommendations and has reported the recommendation as not yet fully implemented, we typically do not conduct further work.

**Council motion to review processes to monitor the new winter maintenance contracts**

In December 2021, City Council adopted a motion<sup>34</sup> to add the following reviews to the Auditor General's 2022 Work Plan:

- a. a review of the City of Toronto's Negotiated Request For Proposal process;
- b. a review of the terms of the winter snow maintenance contracts against previously provided winter maintenance Auditor General recommendations; and
- c. a review of Transportation Services' contract management process, to ensure internal processes are sufficient to hold winter maintenance contractors accountable to the contract terms.

The results of the Auditor General's review of the City of Toronto's Negotiated Request for Proposals to Various Suppliers for the Provision of Winter Maintenance Services (part a. above) are detailed in a separate report titled "A Review of the Procurement and Award of the Winter Maintenance Performance-Based Contracts" that will also be considered by Audit Committee on July 7, 2023.

**Status of Auditor General's previous recommendations and current contract management processes**

To address City Council's request for the Auditor General to review the terms of the winter snow maintenance contracts against previous recommendations and to review current Transportation Services' contract management processes to hold winter maintenance contractors accountable to the contract terms (parts b. and c. above), we have performed additional procedures when conducting our follow-up of the 26 recommendations from the two previous Auditor General's reports on the City's winter road maintenance program:

1. [Audit of Winter Road Maintenance Program - Phase One: Leveraging Technology and Improving Design and Management of Contracts to Achieve Service Level Outcomes](#) (October 2020)
2. [Winter Road Maintenance Program - Phase 2 Analysis: Deploying Resources](#) (June 2021)

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<sup>34</sup> [Agenda Item History - 2021.IE26.4 \(toronto.ca\)](#)

## **Our methodology**

To validate whether management fully implemented our recommendations and to address part b. and c. of Council's motion, our procedures included, but were not limited to the following:

- conducting site visits of certain Depots that stored contractors' equipment and vehicles
- reviewing Transportation Services' Winter Maintenance Contract Administration Manual
- walkthroughs of systems that staff and management currently use, including the GPS system, the new dashboard reporting tool, and the newly implemented Enterprise-wide Management System
- interviews with and inquiries of 20 management and staff in the Transportation Services Division that directly oversee the operations under the new winter maintenance service contracts, across 11 contract areas covering 4 contractors, to obtain a broad understanding of how winter operations contracts are currently managed
- reviewing minutes from internal Transportation Services' staff meetings
- reviewing a sample of daily rate sheets and operating rate sheets against information in the City's GPS system
- reviewing examples of other available documentation (both in hard copy and electronically available) including, but not limited to, contractor meeting minutes, field audit reports, payment packages, GPS reports, etc.

## **Our scope**

Our review focused on management's practices and processes around managing the new contracts in the first year of the new contracts. Our samples focused primarily on December 1, 2022 (the date specified in the contract when all equipment must be available at the designated Depots each winter season) and two winter events, one near the beginning of the winter season (December 15, 2022) and one closer to the end of the winter season (March 3, 2023).

## **Limitations of follow up process**

It should be noted that this follow up was not an audit of the implementation and enforcement of the new contracts. Rather, this follow-up focused on the implementation status of prior recommendations in the context of the new contracts. We did not review all processes to enforce every contract clause or whether contract terms were sufficient. We only reviewed those that were relevant to the implementation of our prior recommendations.

The Auditor General's follow-up of outstanding recommendations does not constitute a performance audit conducted in accordance with Generally Accepted Government Auditing Standards (GAGAS). However, we believe that we have performed sufficient work to validate management's assertions on the implementation of recommendations.



## Exhibit 1: Recommendations Fully Implemented (Status Determined by the Auditor General)

### Report: 19-TRS-01 Audit of Winter Road Maintenance Program - Phase One: Leveraging Technology and Improving Design and Management of Contracts to Achieve Service Level Outcomes

Rec #	Recommendation
#3	City Council request the General Manager, Transportation Services Division, to prepare a plan with specific deliverables and timelines to modernize processes and integrate technology solutions with its GPS system.
#4	City Council request the City Manager to work together with the Heads of Divisions using GPS technology and the Chief Information Officer, to prepare plans with specific deliverables and timelines to modernize processes and integrate technology solutions with the GPS system.
#6	City Council request the General Manager, Transportation Services Division, to develop clear guidelines and allowances for acceptable stop times, break times, and the valid operational reasons for taking these stops and breaks.
#10	City Council request the General Manager, Transportation Services Division, to clarify wording in future winter maintenance contracts concerning: a. contractor's obligation to detect and report GPS device malfunctioning within a set timeframe, b. reasonable stop and break times, c. preventing vehicle swapping between routes and locations to ensure GPS device information is accurate, and d. provisions for the assessment and enforcement of liquidated damages including clarifying the expectation for when the work commences.
#12	City Council request the General Manager, Transportation Services Division, to coordinate with the City Manager to discuss and make improvements to the contract with the GPS vendor related to GPS repairs and turn-around time for devices.
#15	City Council request the General Manager, Transportation Services Division, to provide additional training to ensure staff have an up-to-date and clear understanding of their roles and responsibilities, as well as strong knowledge of winter maintenance contract management policies and procedures.
#16	City Council request the General Manager, Transportation Services Division, to consult Legal services in relation to the approach to take on the definition and charging of standby payments for the remainder (two years) of the current contract cycle.
#17	City Council request the General Manager, Transportation Services Division, to work together with Legal services on a detailed review of the contract documents and Request for Quote for the next contract cycle, and make the necessary improvements to ensure internal consistency, consistent use of terminology and defined terms, and simplification for implementation.
#19	City Council request the General Manager, Transportation Services Division, to perform a cost-benefit analysis of in-house versus outsourced delivery of its winter road maintenance program, to determine whether it would be beneficial or not to increase the level of in-house delivery.

**Report: 19-TRS-01A Winter Road Maintenance Program – Phase 2 Analysis: Deploying Resources**

<b>Rec #</b>	<b>Recommendation</b>
Confidential Rec #2	City Council request the General Manager, Transportation Services Division, to include flexibility in the Negotiated Request for Proposal and contracts for the next contract cycle to be able to control the fleet size by type of vehicle and the deployment, particularly during the shoulder season (October/November, March/April).

## Exhibit 2: Recommendations Not Fully Implemented (Status Determined by the Auditor General)

### Report: 19-TRS-01 Audit of Winter Road Maintenance Program - Phase One: Leveraging Technology and Improving Design and Management of Contracts to Achieve Service Level Outcomes

Rec #	Recommendation	Management Response
#1	City Council request the General Manager, Transportation Services Division, to fully utilize the GPS technology available, which includes real-time exception reports, notifications, and route completion and performance reports, to better monitor contractor performance.	The majority of the Contractor's equipment has GPS devices installed. (Approximately 90%). Due to the global shortage of equipment and ongoing supply chain management issues caused by the Pandemic, there were significant challenges with the equipment delivery schedule. The remainder of equipment is scheduled to be received and fully equipped with GPS devices in Summer 2023. The Transportation GPS dashboard was piloted in February 2023 and when fully deployed, it will be able to provide reports on route completion, notifications, and other tools to better monitor contractor performance. Staff will be trained and ready to fully use the features of the Transportation Dashboard for the start of the 2023/2024 winter season.
#2	City Council request the City Manager, to: a. coordinate with Heads of Divisions for those using GPS technology, including Transportation Services, to ensure the contract with the City's GPS vendor meets the needs of the Divisions and City. b. forward this audit report to all other Heads of Divisions for those using GPS technology and centrally oversee that the City's Divisions are fully utilizing GPS technology and letting go of inefficient manual processes.	The Fleet Services Division (FSD), on behalf of the City Manager, continues to support divisions using telematics (GPS technology) to modernize processes through the use of telematics data, through a centre led approach to oversight and facilitation of business transformation.  Planned full implementation by December 2024.
#5	City Council request the General Manager, Transportation Services Division, to ensure staff use GPS information and reporting to monitor route completion, departure and return times, late starts, excessive stop times, and vehicle locations for operational as well as standby purposes, and assess liquidated damages where applicable.	The Transportation GPS dashboard was piloted in February 2023 and when fully deployed, it will be able to provide reports on route completion, departure and return times, late starts, excessive stop times, and vehicle locations for operational as well as daily rate purposes. The GPS portal can also provide information that can be used to assess liquidated damages as/when required. Staff will be trained and ready to fully use the features of the Transportation Dashboard and GPS portal for the start of the 2023/2024 winter season.

Rec #	Recommendation	Management Response
#7	City Council request the General Manager, Transportation Services Division, to improve how it documents and tracks vehicle breakdowns and the deployment of spare vehicles.	The tracking of vehicle breakdowns and deployment of spare vehicles was included in the Winter Contract Administration Manual form OM-SOP-W27. The form and Winter Contract Administration Manual will be updated to include how to document these events for the entire season for review. Staff will be re-trained to use the form and ensure proper documentation of these events in contract files for the start of the 2023/2024 winter season Transportation is working with the Winter Contractors over the summer 2023 on developing a communications protocol to communicate vehicle breakdowns and deployment of spare vehicles. This will also be in place by the start of the 2023/2024 winter season.
#8	City Council request the General Manager, Transportation Services Division, to: a. ensure all vehicles, including spares, are properly marked with vehicle identification numbers, b. conduct daily physical verification of contractor vehicles on standby, including spares, and document and compare the observations to contractor standby logs, and c. require the contractor to obtain prior approval from the contract administrator when a vehicle needs to go off-site for any reason and document the expected return date.	8 a) City-provided placards have been installed on all vehicles and spares and verified by staff. 8 b) Winter Contract Administration Manual will be updated before the start of the 2023/2024 winter season to show staff how to fully document the daily physical verification of contractor vehicles receiving daily rate, including spares, and how to compare to the contractor's records. We are developing a compliance review program to verify staff are completing their responsibilities under the terms of the Contract. 8 c) SOPs will be created documenting when vehicles will be allowed to move offsite, and these will be included in the Winter Contract Administration Manual. Staff will be re-trained on this prior to the start of the 2023/2024 winter season. These SOPs will specify the valid reasons for vehicles to be moved off-site.
#9	City Council request the General Manager, Transportation Services Division, to: a. improve documentation of assigned routes (and kilometers) and completed routes by contractor, as well as ensure explanations are documented for when routes are not fully completed, and b. examine the cases where routes do not appear to be completed for potential valid operational reasons and evaluate whether related issues need to be addressed.	a) The Transportation GPS dashboard was piloted in February 2023 and when fully deployed, it will be able to provide reports on route completion, notifications, and other tools to better monitor contractor performance. Staff will be trained and ready to fully use all the features of the Transportation Dashboard for the start of the 2023/2024 winter season. The Winter contract administration manual will be updated to ensure staff know how to document explanations for when routes are not fully completed. b) The procedure to evaluate impact on payments for not completing routes is detailed in section 18.5 of the winter contract administration manual. Staff will be re-trained to ensure it is documented in contract files for the start of the 2023/2024 winter season. Where routes are not completed, an appropriate explanation to support the chosen course of action will be documented in the contract files.

Rec #	Recommendation	Management Response
#11	<p>City Council request the General Manager, Transportation Services Division, to reassess and document the rationale for liquidated damages amounts in the next contract cycle taking into account past claims against the City and other potential losses, to ensure that the liquidated damages amounts are fair and supportable.</p>	<p>In writing the new contracts, Transportation reviewed past claims with Legal Services and implemented their comments. It was mainly related to sidewalks and bus stops as sent in their memo to us. A rationale for the liquidated damages was also provided. Transportation Services will further strengthen the supporting documentation retained on file.</p> <p>To improve the implementation and application of Liquidated damages staff will review and update the existing procedures and practices accordingly. Standardized templates will be developed for the tracking and substantiation of liquidated damages. Staff will be provided training on the explanations.</p>
#13	<p>City Council request the General Manager, Transportation Services Division, to establish a formal process to: a. ensure GPS devices are installed and functioning in all contractor vehicles, including spares; b. track all GPS devices and monitor them regularly to ensure the devices are functioning properly; c. periodically reconcile GPS billings; d. monitor and ensure GPS functionality issues are being reported to the GPS vendor and repaired on a timely basis; and e. monitor the calibration and functionality of salt spreaders.</p>	<p>(a) – (e) Processes created and staff will be re-trained to ensure records are documented in contract files for the start of the 2023/2024 winter season.</p> <p>We are implementing procedures to ensure staff check the GPS daily and document whether all are functioning.</p> <p>Consistency across all contract areas will be maintained with the continuation of the bi-weekly CA &amp; Manager meetings to discuss issues and provide direction.</p> <p>At the end of the 2022/2023 winter season, GPS devices were installed on over 90% of the vehicles. The outstanding vehicle installations and sensor installations are scheduled to be completed during summer 2023 and all GPS units are expected to be fully functioning before the start of the 2023/2024 winter season.</p>
#14	<p>City Council request the General Manager, Transportation Services Division, to: a. develop a policy and procedure manual for winter operations, including best practices for contract management, and best practices for assessing and charging liquidated damages; b. standardize processes and forms for monitoring contractor performance and for assessing and charging liquidated damages; and c. ensure staff verify and review contractors' operating and standby logs, using GPS data, for accuracy of timing and services provided before approving payment.</p>	<p>a) and b) Winter contract administration manual will be updated, and staff will be re-trained to ensure understanding and adherence for the start of the 2023/2024 winter season.</p> <p>c) Process created and staff will be re-trained to ensure review is documented in contract files for the start of the 2023/2024 winter season.</p> <p>For a and b) Division's manual will be updated to provide details and/or standardized forms on how staff should track all potential liquidated damages. The manual will also be updated to clearly indicate what type of documentation or evidence staff should retain to support the City's application of liquidated damages to support the City's application of all liquidated damages</p> <p>For c), management is working to have the GPS dashboard fully implemented and have GPS devices installed on all vehicles for the next winter season. The information will be used for payment verification.</p>

Rec #	Recommendation	Management Response
#18	City Council request the General Manager, Transportation Services Division, to ensure that the management and payment for services is consistent with the express terms of the contract for the next contract cycle.	<p>SOPs based on best practices will be developed and staff will be re-trained on them to ensure payment for services is consistent with the express terms of the contract for the start of the 2023/2024 winter season.</p> <p>Consistency across all contract areas will be maintained with the continuation of the bi-weekly CA &amp; Manager meetings to discuss issues and provide direction.</p>
#20	City Council request the General Manager, Transportation Services Division, to: a. develop meaningful Key Performance Indicators (KPIs) to measure the achievement of Council-approved service levels; b. develop performance metrics for the next contract cycle to measure and monitor contractor performance; c. improve processes and documentation to have relevant and readily available information to measure the KPIs; and d. publicly report on the KPIs on at least an annual basis.	<p>a) The KPIs developed to measure the achievement of Council-approved service levels are the maximum operating time and performance outcomes. These are measured through Transportation Dashboard and Service Request Dashboard.</p> <p>b) Transportation Dashboard developed to measure contractor performance</p> <p>c) Service Request Dashboard documents information to measure the KPIs</p> <p>d) Service Request Dashboard information available to be publicly reported as needed.</p> <p>In addition, the Division will also prepare a summarized KPI report on contractor performance and the achievement of service levels for the last season using information captured by the Transportation Dashboard for year-over-year comparison if warranted based on service deficiencies.</p>
#21	City Council request the General Manager, Transportation Services Division, to work with the GPS vendor to configure the: a. route completion report to provide accurate information, and develop other GPS reports for measuring contractor performance and service levels; and b. GPS system's geofencing feature to monitor contractors' adherence to their designated routes.	<p>a) The Transportation GPS dashboard was piloted in February 2023 and when fully deployed, it will be able to provide reports on route completion, notifications, and other tools to better monitor contractor performance. Staff will be trained and ready to fully use all the features of the Transportation Dashboard for the start of the 2023/2024 winter season</p> <p>b) This component of the recommendation is no longer applicable since monitoring the contractor's adherence to their designated routes is not necessary as the new winter contract allows the use of any vehicle to complete any beat.</p>
#22	City Council request the General Manager, Transportation Services Division, to analyze legal claims information and 311 service requests on a regular basis to provide additional indicators of where contractor performance needs closer monitoring.	<p>Heat maps and Service Dashboard have been created showing 311 service requests. They are reviewed to show where contractor performance needs closer monitoring.</p> <p>Once EWMS Maximo is operational that will assist in making the contractor aware of deficiencies with their work.</p>

**Report: 19-TRS-01A Winter Road Maintenance Program – Phase 2 Analysis: Deploying Resources**

Rec #	Recommendation	Management Response
#3	<p>City Council request the General Manager, Transportation Services to:</p> <p>a. identify and remediate data entry errors and omissions in the Toronto Maintenance Management System database for its winter maintenance program as part of an ongoing quality control process; and</p> <p>b. implement system-based controls such as data edit controls to validate data entry and protect key fields in the Toronto Maintenance Management System database.</p>	<p>TMMS was replaced by the new EWMS Maximo. Due to implementation issues, Maximo was not completely rolled out and staff are using duplicate procedures to verify contractor performance and invoice payments. Maximo may be implemented for the start of the 2023/2024 winter season based on resources and staffing impacts.</p>
#4	<p>City Council request the General Manager, Transportation Services to use the data from its Toronto Maintenance Management System database to measure and monitor contractor performance, analyze operational trends and inform decision-making.</p>	<p>This review process will be documented as part of regular contract management exercise using EWMS Maximo and the Transportation Dashboard. It is expected to be completely implemented for the start of the 2023/2024 winter season.</p>

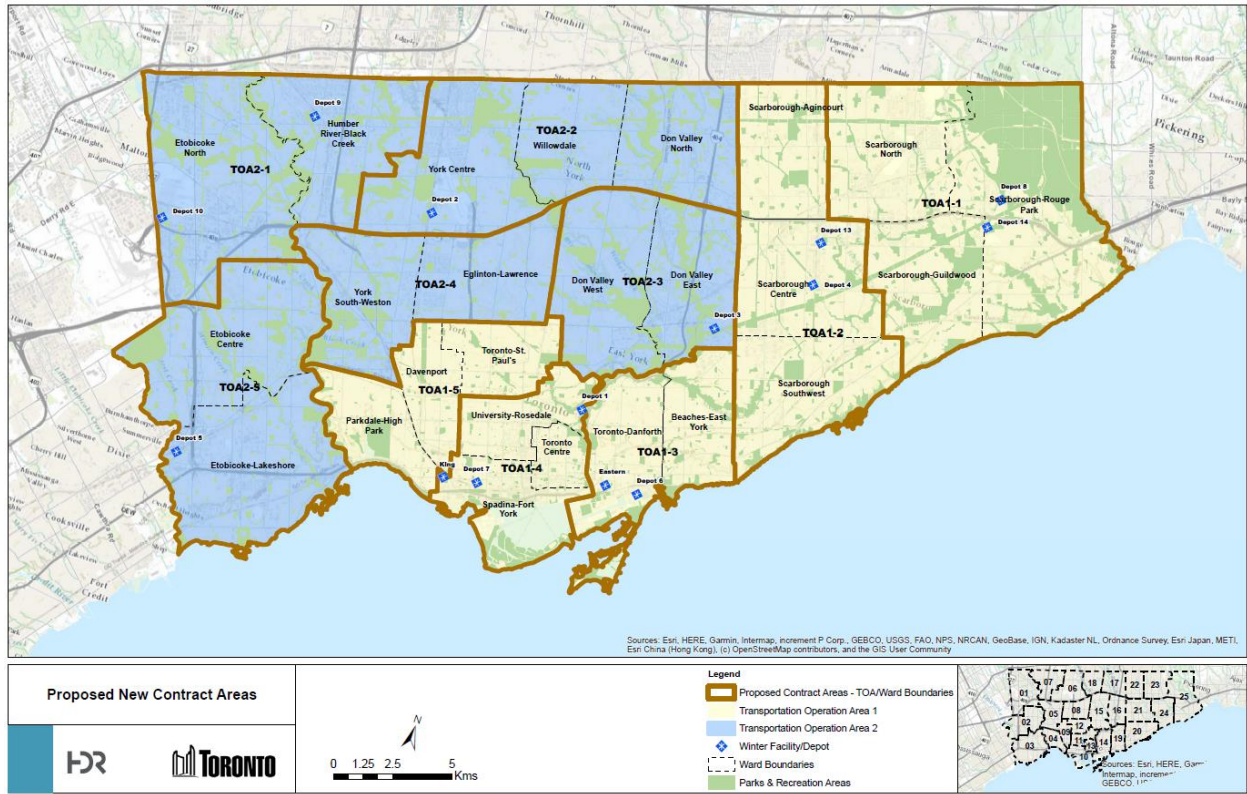


### Exhibit 3: Recommendations No Longer Applicable (Status Determined by the Auditor General)

Report: 19-TRS-01A Winter Road Maintenance Program – Phase 2 Analysis: Deploying Resources

Rec #	Recommendation
Confidential Rec #1	City Council request the General Manager, Transportation Services Division, to implement fleet reduction and deployment adjustments to achieve cost savings and make winter operations more cost-effective.

# Exhibit 4: Contract Area by City of Toronto Wards



## Exhibit 5: List of Contractors for Each Contract Area and City of Toronto Wards

Contractor	Contract Areas	Wards
Emcon Services Inc.	DVP/ Gardiner	N/A – Don Valley and Gardiner Expressways
Infrastructure Maintenance Ltd. (IML)	TOA 1-1	Scarborough North (23) Scarborough Guildwood (24) Scarborough – Rouge Park (25)
A&F Di Carlo Construction Inc. (A&F)	TOA 1-4	Spadina – Fort York (10) University – Rosedale (11) Toronto Centre (13)
	TOA 1-5	Parkdale – High Park (4) Davenport (9) Toronto – St Paul's (12)
2868415 Ontario Inc., a joint venture (JV) between Infrastructure Maintenance Ltd. and A&F Di Carlo Construction Inc.	TOA 1-2	Scarborough Southwest (20) Scarborough Centre (21) Scarborough – Agincourt (22)
	TOA 1-3	Toronto – Danforth (14) Beaches – East York (19)
	TOA 2-1	Etobicoke North (1) Humber River – Black Creek (7)
	TOA 2-3	Don Valley West (15) Don Valley East (16)
	TOA 2-4	York South-Weston (5) Eglinton-Lawrence (8)
	TOA 2-5	Etobicoke Centre (2) Etobicoke – Lakeshore (3)
Maple Crete Inc.	TOA 2-2	York Centre (6) Don Valley North (17) Willowdale (18)

**Appendix 1: Management’s Response to the Auditor General’s Report  
Entitled: “Winter Maintenance Program Follow-Up: Status of Previous Auditor  
General’s Recommendations & Processes to Hold Contractors Accountable to  
New Contract Terms”**

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**Recommendation 1:** City Council request the General Manager, Transportation Services Division to ensure all substituted equipment have been approved through the appropriate change order process, and ensure in future years, where the contractor requests the use of substitute equipment, that the Division ensures that the proposed rate is reflective of existing contract pricing, or if no existing contract pricing is applicable, comparable contract pricing for what the equipment can deliver.

<b>Management Response:</b> <input checked="" type="checkbox"/> <b>Agree</b> <input type="checkbox"/> <b>Disagree</b>
<b>Comments/Action Plan/Time Frame:</b>  If substituted equipment is used for any future winter maintenance operations appropriate change order processes will continue to be used to document the circumstances. If any substituted equipment is used for any future winter operations, staff will continue to factor existing contract pricing, purchase costs, manufacturing impacts, age of equipment, and usage to determine daily and operating rates.

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**Recommendation 2:** City Council request the General Manager, Transportation Services Division to make the necessary updates to the Winter Maintenance Contract Administration Manual, provide continuing training, and ensure consistent and ongoing compliance over the duration of the contracts to ensure:

- a. Staff verify that equipment is at the designated City Depot in accordance with the contracted specified delivery mobilization and demobilization dates for every winter season and retain sufficient and appropriate records of such verification
- b. Staff appropriately determine instances where liquidated damages should apply and to retain sufficient and appropriate records to support the Division’s application of liquidated damages
- c. Staff perform the required field audits and retain sufficient and appropriate documentation of their observations to support the Division’s application of price adjustments

<b>Management Response:</b> <input checked="" type="checkbox"/> <b>Agree</b> <input type="checkbox"/> <b>Disagree</b>
<b>Comments/Action Plan/Time Frame:</b>  Staff will review and revise any existing documentation related to staff conducting post-event field audits for enhanced description, clarity and compliance.  The winter maintenance contract administration manual was developed for staff usage in anticipation of the 2022-23 winter season, but is intended to be continuously updated annually to

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reflect staff feedback, operational changes and contract compliance. Ongoing staff training addressing roles, responsibilities, contract management and vendor performance evaluations will be administered in conjunction with updates to the aforementioned manual.

Management will also perform periodic checks to ensure documentation is in compliance with all procedures.

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**Recommendation 3: City Council request the General Manager, Transportation Services Division to ensure activations for each winter event are accurately captured electronically to support monitoring contractor compliance with contract requirements on equipment activations and mobilizations.**

**Management Response:**  Agree  Disagree

**Comments/Action Plan/Time Frame:**

City staff will use various communication methods, including electronic means, to initiate an equipment activation in response to winter event snow accumulation levels. For instance, the call out application will be used for staff to ensure the data, such as start times, are integrated into the newly developed Transportation Dashboard when activating a winter event. Moreover, staff will communicate directly with the winter maintenance contractors to activate winter equipment through the imminent EWMS - Maximo. Staff will be trained to effectively use electronic applications for winter activations.

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**Recommendation 4: City Council request the General Manager, Transportation Services Division to implement a process to ensure all contractor deficiencies related to winter maintenance services are captured in a timely manner in a central system that facilitates monitoring effective contractor performance.**

**Management Response:**  Agree  Disagree

**Comments/Action Plan/Time Frame:**

An electronic filing system for all documentation, including deficiency reports, has been developed for each winter contract zone for staff to utilize. The winter maintenance contract administration manual will include standardized reporting procedures to identify and document any deficiencies in a timely manner and electronically filed. Staff will continue to be provided training on how to complete the procedures in a timely manner.

Management will also perform periodic checks to ensure documentation is in compliance with all procedures.

**AUDITOR  
GENERAL**  

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**TORONTO**

