CONFIDENTIAL ATTACHMENT 1

CONFIDENTIAL RECOMMENDATIONS

The Auditor General recommends that:

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.

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).

CONFIDENTIAL INFORMATION OR ADVICE

See attached confidential portions of Project at a Glance and Report "Winter Road Maintenance Program – Phase 2 Analysis: Deploying Resources".

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AUDITOR GENERAL TORONTO

PROJECT AT A GLANCE (Confidential Portions of Report)

Winter Road Maintenance Program – Phase 2 Analysis: Deploying Resources

BY THE NUMBERS

- **1,130:** contracted fleet size during peak months (maximum never used on a single day in past 5 years)
- **50%** of contracted fleet not used during most winter events
- **$5 - $12M** paid per year to maintain surge capacity of contracted fleet for rare events
- **Minimum $35M** in savings could have been achieved over the current 7 year contract cycle by reducing fleet size and adjusting fleet deployment, particularly during the shoulder seasons (Oct/Nov Mar/Apr)

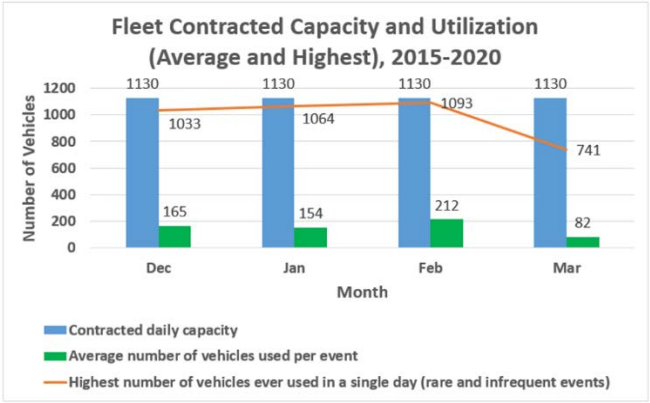
WHAT WE FOUND

A – Cost Benefit Analysis

- Based on 2015-2022 contractor rates, the contracted services model provides better value for money to the City than an in-house solution
- Should the contract prices in the next contract cycle increase significantly, this conclusion will need to be re-evaluated

B – Adjusting the Fleet Size and Fleet Deployment

- Contractor standby costs are significant and are driven by the fleet size
- There is unused capacity in the shoulder seasons, particularly November and March
  - Substantial savings could have been achieved by adjusting the fleet size and deployment in line with historical use, especially during the shoulder seasons
  - Important to have the right equipment at the right time – e.g. local road plows generally not needed as much during shoulder months
  - Flexibility needed in the future contracts to control the fleet size, deployment timing, and type of vehicle



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Winter Road Maintenance Program– Phase 2 Analysis: Deploying Resources (confidential portions)

Transportation Services Division

June 22, 2021

Beverly Romeo-Beehler, FCPA, FCMA, CFF, ICD.D, JD, B.B.A.
Auditor General

AUDITOR GENERAL TORONTO

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Executive Summary

Well-managed contracts provide good value for money

We concluded that the contracted services model which is based on the 2015-2022 contractor rates currently provides better value for money to the City than an in-house solution. We did not see value in returning the winter road maintenance program to City employees and City owned equipment at this time.

Our analysis and conclusion are based on the inflation-adjusted contract prices in effect for the current contract cycle 2015-2022. **Should the contract prices in the next contract cycle increase significantly, this conclusion will 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 such as local road plowing in-house, to save money.

Adjustments needed to size and deployment timing of fleet

We further concluded that over the past seven years operating efficiencies could have been obtained by adjusting the fleet size and deployment timing of the contracted services fleet to make deployment more closely aligned to historical weather patterns, while considering the impact of "once-in-a-decade" weather events.

Estimated $35 to $86 million could have been saved over the current 7-year contract cycle by adjusting fleet size and deployment

The Division could have saved an estimated $35 to $86 million[1] over the full term of the current seven-year contract cycle if it had actively managed and adjusted the fleet size and deployment. Most of the potential efficiencies could occur in the off-peak season when ground temperatures are warmer and using salting equipment is preferable to plowing equipment. With proper data collection and analysis, the Division has the opportunity going forward to carefully consider the timing, fleet size and type of equipment deployed to realize savings.

Although the City has tendered the new contract in May 2021, we shared our findings from this report with the Division before the tender and it has incorporated language in the Negotiated Request for Proposal to provide the City with flexibility to adjust fleet size and deployment when needed. The Division should consider the findings from this report to realize the savings and efficiencies to the degree it can in the next contract cycle.

[1] The potential savings of $35 million would have minimal or no impact on service levels. Higher than $35 million in potential savings would have some impact on service levels although not significant.

As part of our Phase 2 project, we compared the historical daily vehicle utilization for all service types and contracts for the past five winter seasons against the contracted capacity. Our analysis indicates that there was an excess capacity in the existing contracts. For example, while the existing contracts provide for 1,130 fleet vehicles from December to March, the highest number of vehicles ever used on a single day in the past five winter seasons was 1,093. As the following table shows, typically only about 50 per cent or less than 565 of the 1,130 contracted vehicles are used during most winter events.

Less than 50% of fleet used during most winter events

Daily Fleet Utilization (2015 to 2020)

Number of vehicles used on a single day	Number of days in the last 5 years						
	Nov	Dec	Jan	Feb	Mar	Apr	Total
1-550*	58	105	131	112	85	50	541
551-700	1	4	3	3	1		12
701-800		2	4		1		7
801-900		1	1	2			4
901-1000		3	1	2			6
>1000		1	1	4			6
Contracted Capacity	232	1,130	1,130	1,130	1,130	232	

Less than 50% of 1,130 vehicles (the contracted fleet capacity) used during most winter events.

More contracted capacity than required based on historical use

There appears to be more capacity than required based on historical utilization patterns. As such, there was an opportunity to reduce fleet size, in some cases, without an impact on service levels. This would have required controlling the fleet size.

Significant unused local roads fleet capacity for month of March

As another example, the following table shows that there exists a significant unused capacity within the local roads fleet for the month of March over the past five winter seasons.

Unused Local Roads Fleet Capacity in March (2015-2020)

Year	Number of vehicles		
	Contracted capacity	Maximum-ever single day use	Unused capacity
2016	367	221	146
2017	367	0	367
2018	367	0	367
2019	367	41	326
2020	367	0	367

Critical to have the right equipment at the right time, with no more equipment than is necessary

It is critical to focus on having the right equipment at the right time, with no more equipment than is necessary. One consideration to achieve this would be to reduce deployment during the shoulder seasons of October/November and March/April, and to re-consider the core season in the next contract cycle, with the flexibility to add additional weeks at an additional cost, as required and depending on the weather.

Program Background

The City's 7-year winter maintenance contracts are nearing the end of their term

This could include fleet reduction and delayed fleet deployment, to better align with the historically demonstrated use of the winter service program.

Results

A. Cost Benefit Analysis

A. 1. Background

Division hired a consultant to conduct cost-benefit analysis

During the course of our analysis, we also examined a consultant's report that had been commissioned by the Division to consider the first question above. We did not rely on the consultant's work and our analysis was independent from the work performed by the consultant.

The consultant used the winter activities performed in the Scarborough West area over the 2018 / 2019 as a test case to determine whether it would be more cost-effective to bring the contracted winter maintenance services in-house. The consultant found that in-house provision of winter maintenance services would not be more cost-effective when compared to contracting out.

Our approach to cost-benefit analysis

As part of our cost-benefit analysis, we used the historical data from winter maintenance operations. Our approach included the following:

- We looked at all four districts (Scarborough, Etobicoke, North York and Toronto East York),
- We used the actual payment records, trip lengths and durations for the past five years from the Toronto Maintenance Management System (TMMS) database to calculate labour and operating costs,
- We estimated legal claims faced by the sidewalk contractors that the City will have to now pay,
- We estimated annual training costs to develop a pool of skilled winter equipment operators, and
- We used Transportation Services' historical life-cycle repairs and maintenance costs for similar vehicles, as provided by the City's Fleet Services Division.

A. 2. Finding

Our analysis considered all winter program activities across all districts using historical data over the past five winter seasons.

The following table shows the activities that the City would be responsible for if all winter program operations were brought in-house:

City's responsibilities under contracted compared to in-house model

Activity	City's Responsibility Under	
	Contracted Services Model	In-house Model
Winter equipment	X	✓
Equipment operators	X	✓
Equipment repairs and maintenance	X	✓
Operator training	X	✓
Legal claims (where contractor is negligent)	X	✓
Salt and anti-icing material	✓	✓
Program administration	✓	✓
Deployment decision-making	✓	✓
Facilities and equipment housing	✓	✓
GPS equipment and service	✓	✓

Significant initial capital investment

Under the in-house winter service solution, the Division would need to invest significant initial capital for purchasing winter equipment. Alternatively, the City could spread the cost of equipment over the useful life through lease financing or borrowing. In either case, there would be an annual financing cost to consider.

Labour Cost is a key cost driver

For the in-house option, the key cost driver for the Division would be the labour costs. The Division would have to maintain a one-to-one equipment to operator ratio and hire additional support staff to service the full fleet of vehicles. This would include full-time seasonal employment and related overtime costs for approximately 1,130 or more staff, which would require quite a large outlay of financial resources.

In terms of cost-effectiveness, having on-call equipment and operators, and paying them only for the hours they worked would likely be the most cost-effective in-house option. However, this option presents practical challenges and risks, as it can be difficult to ensure a steady supply of qualified and well-trained equipment operators in such a large number on short notice.

At the current contract prices for 2015-2022, contracting out winter services would be more cost effective than performing winter maintenance service in-house.

Cost-Benefit Analysis Scenarios

We considered the following scenarios for our cost-benefit analysis:

<table>
<tr><th>Scenario</th><th>Fleet</th><th>Staffing</th><th>Staff Deployment</th><th>Labor cost and incentives</th></tr>
<tr><td>Seasonal Full-time</td><td rowspan="6">City owned</td><td rowspan="6">1,100 Operators plus 10% support staff</td><td>180 days</td><td rowspan="2">Regular Salary, 7.5 hours/day @ COT rates</td></tr>
<tr><td>Full-time</td><td>365 days with staff redeployed to other duties in off-season</td></tr>
<tr><td>Seasonal with no standby</td><td rowspan="3">As needed (on-call)</td><td>Operating time @ hourly COT Rate</td></tr>
<tr><td>Seasonal with standby</td><td>Operating time @ hourly COT Rate
Standby time for non-operating hours @ EI Equivalent Wage (maximum 7.5 hours/day)</td></tr>
<tr><td>Seasonal with fixed incentive</td><td>Operating time @ hourly COT Rate Plus Incentive of $10,000/Year/Operator</td></tr>
<tr><td colspan="5">Other assumptions: (1) 25-year amortization,(2) $750,000 incremental legal claims, (3) historical life cycle Repairs & Maintenance cost for Transportation Services medium, heavy, and off-road units @ 8.33% of total cost per year (source: Fleet Services), (4) Training cost of $1,500/ operator/ year, and (5) 10% provisional allowance on all expenses</td></tr>
</table>

We have not presented the quantitative results of our cost-benefit analysis in this report for two reasons. The results contain confidential operational information and the final numbers are not important as all scenarios point to the same conclusion as noted in the section below.

A. 3. Conclusion

Contracting out is currently the most cost-effective option and provides better value based on 2015-2022 contractor rates

Our conclusion is that at this time, the contracted services model currently provides better value for money to the City than an in-house solution, based on the 2015-2022 contractor rates. The Division's consultant also reached this same conclusion based on their analysis. We did not rely on the consultant's work and our analysis was independent from the work performed by the consultant.

Our analysis and conclusion are based on the inflation-adjusted contract prices in effect for the current contract cycle 2015-2022. Should the contract prices in the next contract cycle increase significantly, this conclusion will 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 such as local road plowing in-house, to save money.

Labour cost is the most significant cost driver

Our conclusion is mainly due to the high labour cost from having to maintain a large pool of full-time winter equipment operators. Given the practical constraints and difficulties that the City would face in getting on-call operators on short-notice, we did not see value in returning the winter road maintenance program to City employees and City owned equipment at this time.

That being said, if contractor prices increase significantly for the next seven-year contract cycle, in-house service delivery could become a viable and preferred solution. If this happens, the City could consider developing a sustainable staffing model using the existing City staff from Transportation Services and other divisions, through temporary redeployment on an as-needed basis, without affecting other services. To achieve this, the City would need to perform an HR study of current job roles to identify staffing redundancies and opportunities to temporarily redeploy staff from other areas to winter maintenance.

We performed additional work to identify savings and improvements using contracted services

As a result of our conclusion above, we extended our work to examine if, based on the historical data analysis, there are efficiencies and improvements to consider in the next round of contracts.

In part B of this report, we suggest a few improvements that the City should consider when contracting for winter maintenance going forward, to ensure services are obtained as cost-effectively as possible.

B. Adjusting the Fleet Size and Fleet Deployment

B. 1. Background

Analyzed historical fleet utilization data

We analyzed historical fleet utilization data to determine whether Transportation Services could have reduced its contracted fleet size and adjusted its fleet deployment (particularly during the winter shoulder seasons of October/November, March/April) to be more cost-effective without significantly affecting service levels.

We examined historical daily vehicle utilization for all winter road maintenance service types and contracts to assess whether there was excess capacity or redundancies in the fleet size. We also looked at the frequency and the extent of vehicles used during peak and off-peak months (shoulder seasons) to see if vehicles could be deployed later in October/November and withdrawn earlier in March/April.

Extensive data analysis

We conducted an extensive analysis of the operational data collected by the Division's system. It took significant effort and resources to correct the errors and make the data useable for analytical purposes.

We conducted a number of scenario-based exercises to contemplate what reductions in the fleet size would have made it more cost-effective and would have still allowed for surge capacities for the shoulder seasons when needed.

B. 2. Finding

The following section demonstrates estimated savings that could have been gained by adjusting the fleet size and deployment to more closely align with the demonstrated historical fleet usage.

Important consideration for contracted fleet size is the directly related cost impact of standby payments ($332M over 7 years)

The following table provides the daily contracted capacity for the winter season. An important consideration is that the cost of deployment includes the standby cost of contractors' vehicles standing by, ready to respond to a call to action. In other words, on any given day, there may be hundreds of inactive vehicles being paid to wait for a call if the weather dictates. As mentioned above, standby cost of contractors accounts for 57 per cent of total costs of the winter maintenance program and is significant ($237 million over five years or $332 million over seven years). Based on our analysis,

Highest risk of unused vehicles is during shoulder seasons

the most risk of unused vehicles on standby would be in the "shoulder periods" in the fall when the operations are just starting up and in the spring when the operations are beginning to wind down.

	Contracted Daily Capacity (# of Vehicles Available)				
	Local Road Salting	Local Roads Plowing	Sidewalk	Depot	All Services
October 15-31	0	0	0	16	16
November	42	0	0	190	232
December	42	367	378	343	1130
January	42	367	378	343	1130
February	42	367	378	343	1130
March	42	367	378	343	1130
April 1-7	42	0	0	190	232
April 1-15	0	0	0	16	16

Estimated savings of $35M to $86M could have been achieved by adjusting fleet size and deployment

Approximately $35 million to $86 million[2] in savings could have been achieved over the full term of the current seven-year contracts by reducing the fleet size and adjusting the timing of fleet deployment. This was particularly important in the off-peak season when ground temperatures are warmer and using salting equipment may be preferable to plowing equipment.

The Division should carefully consider the timing, fleet size and type of equipment in the next round of contracts. Our analysis of the current contracts indicates that the fleet could have been reduced by 16 to 640 vehicles per month, depending on the weather events typical for that month. Therefore, it is important that the next round of contracts build in the flexibility to allow for the optimum fleet level and avoid redundant capacity, to ensure the contracted winter maintenance services are cost-effective.

Comparison of Historical Fleet Usage to Contracted Capacity

Peak contracted capacity of 1,130 vehicles has never been used

We compared the number of vehicles used daily in each of the past five winter seasons against the daily contracted capacity. We found that Transportation Services has more contracted capacity than needed based on historical utilization patterns. For example, while the contracted fleet capacity at the peak is 1,130 vehicles in January to March, the winter operations has never used full-capacity on any single day during the entire contract period.

More than 900 vehicles used only 12 times in past 5 years

Based on the historical fleet utilization, the highest number of vehicles used on a single day in the past five winter seasons was 1,093, used during the winter storm on February 12, 2017. Only on twelve days in the past five years have more than 900 vehicles been used in a single event during the peak winter season against the peak contracted capacity of 1,130 vehicles. This indicates that there is an excess fleet capacity that requires adjusting in the future contracts.

Only 50% of the fleet used on most days when it snows

As the following table shows, only about 50 per cent or less than 565 of the 1,130 contracted vehicles are used during most winter events.

[2] The potential savings of $35 million would have minimal or no impact on service levels. Higher than $35 million in potential savings would have some impact on service levels although not significant.

Daily fleet utilization trends 2015-2020

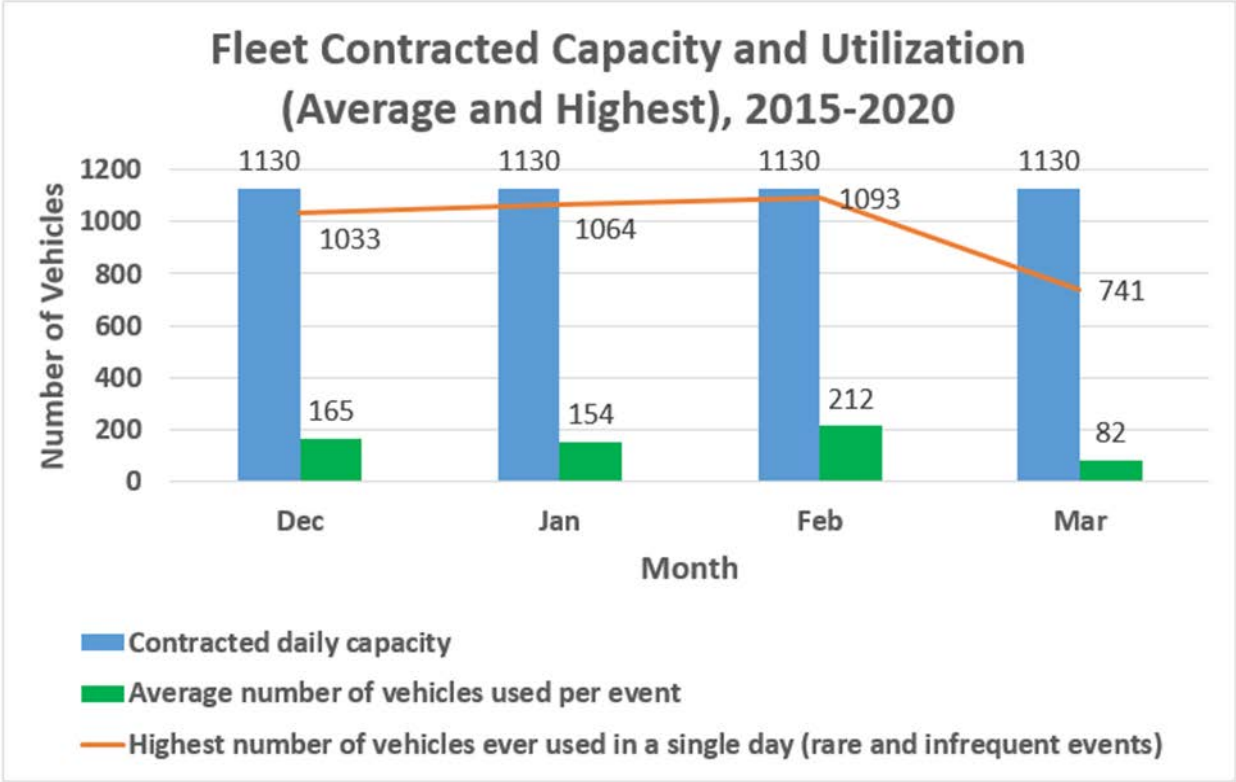
Daily Fleet Utilization (2015 to 2020)

Number of vehicles used on a single day	Number of days in the last 5 years						
	Nov	Dec	Jan	Feb	Mar	Apr	Total
1-550*	58	105	131	112	85	50	541
551-700	1	4	3	3	1		12
701-800		2	4		1		7
801-900		1	1	2			4
901-1000		3	1	2			6
>1000		1	1	4			6
Contracted Capacity	232	1,130	1,130	1,130	1,130	232	

Less than 50% of 1,130 vehicles (the contracted fleet capacity) used during most winter events.

Although it is difficult to predict the weather and there is an expectation that service levels be maintained, in our view the low historical vehicle use did not justify the excess capacity.

The following chart shows the average number of vehicles used per winter event from December to March, compared to the contracted daily capacity.



High Cost of Maintaining Surge Capacity for Shoulder Seasons

Having a fleet size beyond what is necessary is very expensive due mainly to the high cost of standby

To understand why reducing fleet size is important, one must consider the high cost of standby that the City incurs to maintain the surge capacity for the shoulder seasons. Over the life of seven-year contracts, the standby for just one vehicle can cost on average $297,000 to a maximum of $1,040,000. Due to the high standby cost, the City should avoid a fleet size beyond what is necessary to provide the desired level of service.

Estimated $5M to $12M per year to maintain surge capacity for rare snow events

The surge capacity of fleet size being contracted for rare winter events comes at a high cost. By our calculations, it costs between $5 million to $12 million per year to maintain a surge capacity for those rare events when the full fleet might be used. It should be noted that such an occasion has not arisen in the past five years.

Unused capacity for the month of March costs $26.5M over the full 7-year contract cycle

To illustrate the high cost of maintaining surge capacity, we can take an example of the winter storm that occurred on March 1, 2016. Environment Canada issued a winter storm warning for Toronto forecasting up to 25 cm of snow. While the contracted capacity for the month of March is 1,130 vehicles, only 741 vehicles were used on March 1, 2016 for this rare snow storm of this magnitude. **This was the only occasion in the last five years when the City used more than 700 vehicles on a single day in March.** This unused capacity suggests the March winter season could have been managed more effectively.

The contracted capacity of 1,130 vehicles for March appears to be aimed at meeting a once-in-a-decade storm. However, there has not been a single day in the month of March in the last five years when all 1,130 vehicles were used. The cost of maintaining this surge capacity for March alone, to meet a once-in-a-decade storm, would be $26.5 million over the seven-year contract cycle.

Dealing with rare major snow storms

In the worst-case scenario, if a once-in-a-decade storm does happen, the City has the following options to mitigate the risk:

- The City could adjust the fleet deployment by a few weeks based on the forecast if such a storm is expected to happen in an off-peak season. Typically, a reasonably accurate forecast is available up to 10 days in advance. The contract may include a provision for early deployment or late departure at the City's option at a cost.
- Another option could be to have the equipment perform multiple rounds of plowing and salting with minimal delays in service.
- The City could also have a small in-house fleet of combination vehicles (e.g. 10 per cent of total fleet size) which can be promptly deployed for such rare events. Combination vehicles are particularly useful in such situations as they can perform both salting and plowing activities. This in-house surge capacity could be gradually developed using the savings from reducing fleet size.

Type of vehicles is an important consideration for rare snow events during shoulder seasons

It is also important to note that generally the ground temperature is higher during the shoulder seasons and that the type of vehicles deployed matters just as much as the number. When the ground temperature is still warm, snow will generally melt more quickly and not accumulate on the ground, and it is more important to have salters available for roads/sidewalks and less important to have plows during this time period. Although this may not be the case for every rare snow event during the shoulder seasons, it is typical for the shoulder seasons.

Adjusting Fleet Size by Type of Vehicle and Timing of Deployment

Division needs flexibility to adjust not only the total fleet size, but also the type of vehicle and timing of deployment

As the following table shows, there has been significant unused capacity in the months of November and March, particularly for graders and plows. Therefore, it is important that Transportation Services has the flexibility to adjust not only the total fleet size, but also the type of vehicle and timing of deployment.

Unused Fleet Capacity (2015-2020)

Type	Contracted Capacity	Permanent Unused Daily Capacity[1] (number of vehicles)					Average number of vehicles used per event				
		NOV	DEC	JAN	FEB	MAR	NOV	DEC	JAN	FEB	MAR
DLA trucks	16						4	4	3	3	3
Depot graders	42	35		2		11	0	4	3	4	1
Salt trucks	60	4	4	4	4	4	7	16	17	21	8
Salt trucks (Comb.)	128	1				2	25	46	41	50	28
Driveway machines	76	n/a				26	1	5	4	6	1
Bus stop machines	112	n/a		6		16	0*	9	8	11	3
Depot driveway machines	52	n/a		1		25	0*	3	3	4	1
Depot plows (non-comb.)	65	n/a	4	4	3	25	1	5	4	5	1
Front-end loader	126	n/a				29	1	9	6	10	2
Hand crew trucks	37	n/a				0	1	7	7	11	5
Local road plows	161	n/a				54	2	11	8	12	3
Sidewalk plows	221	n/a	2	3	2	2	9	42	47	71	24
Other	34	n/a	4	5	4	7	2	4	3	4	2
Total	**1130**	**40**	**14**	**25**	**13**	**201**	**53**	**165**	**154**	**212**	**82**

**rounded down to zero*

[1]Permanent unused daily capacity refers to the number of vehicles that remained unused daily throughout that month (calculated as the difference of the contracted capacity and the maximum-ever single day use for a type of vehicle in that month, e.g. maximum-ever single day use of local road plows was 107 vehicles on March 2, 2016 against the contracted capacity of 161 local road plows. This means that on each day in March, there were at least 54 unused vehicles. Maximum-ever number of vehicles used in a single day indicate rare or infrequent events. As a result, the unused capacity is higher than indicated above.)

Local Road Fleet Needs Adjusting

Local road fleet is a type of vehicle needing adjustment in fleet size and deployment

The following table provides another example of the importance of managing and adjusting fleet size and deployment by the type of vehicle. The table shows that there has been significant unused capacity within the local roads fleet for the month of March over the past five winter seasons.

Unused Local Road Fleet Capacity in March (2015-2020)

Year	Number of vehicles		
	Contracted capacity	Maximum-ever single day use	Unused capacity
2016	367	221	146
2017	367	0	367
2018	367	0	367
2019	367	41	326
2020	367	0	367

The local road fleet has never been used after March 3rd in the past five years. The cost of maintaining this local roads surge capacity past the first week of March alone is $18 million over the current seven-year contract cycle.

Critical to focus on having the right equipment at the right time, with no more equipment than is necessary

It is critical to focus on having the right equipment at the right time, with no more equipment than is necessary. One consideration to achieve this in future contracts is to reduce deployment during the shoulder seasons of October/November and March/April, and to re-consider the core season in the next contract cycle, with the flexibility to add additional weeks at an additional cost, as required and depending on the weather.

Flexibility needed in next contract cycle to provide ability to control fleet size and deployment

Transportation Services needs to ensure they build flexibility in their next contract cycle to maintain the ability to control the fleet size and timing of deployment by type of vehicle, particularly during the shoulder seasons, to reduce standby charges to the extent they can.

Three Scenarios that Could Have Saved Between $35M to $86M

Estimated $35M to $86M could have been saved over the 7-year contract cycle by reducing fleet size and adjusting deployment to optimum levels based on historical use

The table below provides three scenarios that Transportation Services could have utilized to reduce its fleet size and adjust deployment to optimum levels based on historical use. This would have saved $35 million to $86 million[3] in costs over the current seven-year contract cycle.

Scenario 1, the most conservative scenario, could have saved $35 million without any additional risk of rare snow events. Based on historical data, reduced fleet size and adjusted deployment under scenario 1 would not have caused any vehicle shortfall or delays in service.

Scenario 2 and 3 would have provided significantly higher cost savings with minimal service delays. Scenario 2 would have resulted in an estimated $76 million in savings over the seven-year contract cycle with up to ten days in a winter season where there would have been a potential minor capacity shortfall. Historically, the capacity shortfall for these ten days could range from 1 to 174 vehicles. This shortfall could have easily been met by having the equipment perform multiple rounds with minimal service delays or by having a small reserve fleet to supplement contracted fleet.

Scenario 3 would have resulted in an estimated $86 million in savings with more fleet reductions and deployment adjustments. As demonstrated by historical data, any equipment shortfall caused by fleet reduction could have been managed without significant service impact.

[3] The potential savings of $35 million would have minimal or no impact on service levels. Higher than $35 million in potential savings would have some impact on service levels although not significant.

7-Year savings that could have been achieved with optimal fleet capacity

(based on historical fleet utilization data since 2015)

Month	Contracted Capacity	Optimal Capacity			7-Year Savings (Million $)			Avg. # of days in a year when there would have been a vehicle shortfall		
		Scenario 1	Scenario 2	Scenario 3	Scenario 1	Scenario 2	Scenario 3	Scenario 1	Scenario 2	Scenario 3
Oct	16	10	0	0	$0.3	$1	$1		0.6	1
Nov	232	230	185	160	$0.2	$5	$8	0.2*[2]	0.6	3
Dec	1130	1072	1020	980	$4	$8	$11		1.6	5.8
Jan	1130	1087	1020	995	$3	$8	$9		1.2	1.4
Feb	1130	1097	1030	1000	$2	$6	$8		2.6	3
Mar	1130	780	490	480	$24	$44	$45		1.8	2.2
Apr	248	165	70	65	$2	$4	$4		1.6	2
Total	**805*[1]**	**726*[1]**	**629*[1]**	**607*[1]**	**$35**	**$76**	**$86**	**0.2**	**10**	**18.4**
% Reduction in Fleet Size*		-10%	-22%	-25%						

**[1] Weighted Daily Average Capacity*

**[2] Represents one winter event in five years*

B. 3. Conclusion and Recommendations

Minimum of $35M in cost savings could have been achieved without any risk or reduction in service levels

In the next round of contracts, the City should consider the various alternatives presented above to realize savings and efficiencies.

Our analysis showed that the City could have saved a minimum of $35 million with virtually no risk or reduction in service levels. Savings from Scenario 2 or 3 or some combination between the three scenarios could have been used to build surge capacity for unusual snow events during the winter shoulder seasons (October/November, March/April). This would have helped to mitigate any risk of service delays from Scenario 2 and 3.

Savings from fleet reduction can be used to buy spare equipment for use in major snow storms

Going forward, the City could use some of the cost savings generated from fleet optimization to gradually develop in-house surge capacity by investing in its own fleet. It may be worthwhile for the City to maintain a limited in-house fleet so that the City has some back-up available in case of rare and off-peak winter events. It all depends on the new contract model that will be used going forward.

As shown in the table below, enough savings can be generated from the fleet adjustments over the seven years to gradually purchase anywhere between 114 to 860 vehicles depending on the extent and nature of fleet adjustments. This can allow the City to maintain a mix of both contracted and in-house provisions for winter service delivery and be less dependent upon contractors and expensive standby costs, particularly for rare snow events during the shoulder season.

The following table provides the number of different vehicles that can be purchased by the City under each scenario discussed above.

Type of Equipment	# of equipment that can be purchased from the savings from		
	Scenario 1 $35M	Scenario 2 $76M	Scenario 3 $86M
Grader	114	248	281
Windrow machine or Combination truck	130	281	318
Front-end loader	139	303	343
Sidewalk Machine	350	760	860

Conclusion

In conclusion, it is our view that based on the current contract model, approximately $35 million to $86 million in savings could have been achieved with minimum to no service impact in the current seven-year contract cycle, by reducing the fleet size and adjusting fleet deployment. It is important for Transportation Services to find an optimal mix of fleet by considering these scenarios and adopting cost-effective strategies going forward, including reducing fleet size and adjusting deployment in future contracts where appropriate.

We understand that the Division plans to implement a performance-based model for its next winter contract cycle wherein the contractors will determine the fleet size and deployment timing. Although this is the model the Division plans to use, we believe it should still be able to control the fleet size and deployment (particularly during shoulder seasons) to minimize the standby costs and deliver the winter maintenance program more cost effectively.

Recommendations:

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.

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 seasons (October/November, March/April).

C. Collecting and Using Data – See Attachment 1

Conclusion

We have concluded that based on the 2015-2022 contractor rates, the contracted services model provides better value for money to the City than an in-house solution at this time. Our analysis and conclusion are based on the inflation-adjusted contract prices in effect for the current contract cycle 2015-2022. Should the contract prices in the next contract cycle increase significantly, this conclusion will 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 such as local road plowing in-house, to save money.

Our recommendations highlight the need for the Division to:

- based on the operational data and other factors, adjust the fleet size and deployment timing of the contracted services fleet by type of vehicle to make deployment more closely aligned to historical weather patterns, while considering the impact of "once-in-a-decade" weather events.

Objectives, Scope and Methodology

Methodology

For the cost-benefit analysis, we calculated the initial capital requirement for buying or leasing the fleet of 1,130 vehicles and their life cycle repairs and maintenance costs based on the information provided by the City's Fleet Services Division. We also looked at the cost of hiring winter equipment operators and support staff on both a full-time and temporary basis. We estimated legal claims faced by the sidewalk contractors that the City will have to now pay, and finally, the estimated annual training costs to develop a pool of skilled winter equipment operators.

We analyzed shift durations, days, and hours of activity by contractor and service type. Finally, we reviewed the snow advisories, fleet deployment schedule, and fleet utilization patterns in the peak and off-peak seasons to identify the excess or underutilized capacity.

APPENDIX 1: Examples of Data Issues – See Attachment 1

APPENDIX 2: Management's Response to the Auditor General's Report Entitled: "Winter Road Maintenance Program – Phase 2 Analysis: Deploying Resources"

Recommendation 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.

Management Response: ☒ Agree ☐ Disagree
Comments/Action Plan/Time Frame: Transportation Services proposes to incorporate updated contract terms, conditions and expectations within the new RFP for Winter Services that achieves cost savings through performance based contracts. The Division is also implementing measures to ensure that the service delivery is equitable and fair for all infrastructure types during the entire winter season by including earlier delivery of salting vehicles in the fall shoulder season. The deployments of winter vehicles during both shoulder seasons are flexible in the new contracts and will be managed to balance equitable service and cost savings. These actions will be completed when a new contract is awarded and executed, which is expected to be Q4 2021.

Recommendation 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 seasons (October/November, March/April).

Management Response: ☒ Agree ☐ Disagree
Comments/Action Plan/Time Frame: Transportation Services proposes to incorporate the flexibility to accelerate and taper fleet size by vehicle during the shoulder season. As stated in the response to Recommendation 1, the deployment of winter vehicles in the new contract will be flexible in timing for both fall and spring shoulder periods. The process and procedures on how staff are to implement the change in fleet deployment will be documented and will include a decision matrix and the notice period. Additionally, the procedures will identify who is responsible and/or accountable for this process and associated procedure(s). This will be complete by Q2 2022.

AUDITOR GENERAL TORONTO