The Corporation of the
City of Sault Ste. Marie

C O U N C I L R E P O R T

March 20, 2023

TO:	Mayor Matthew Shoemaker and Members of City Council
AUTHOR:	Susan Hamilton Beach, P. Eng.
DEPARTMENT:	Public Works and Engineering Services
RE:	Audit and Accountability Fund – Waste Collection Options Study

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Purpose

The purpose of this report is to provide Council with an update regarding the Waste Collection Options Study conducted by AECOM with funding by the Audit and Accountability Fund.

Background

On 2021 10 25 Council approved submitting an expression of interest that a Waste Collection Options Study be the municipality's third intake submission for the Audit and Accountability Fund. The City was successful in receiving this funding and entered into an agreement effective March 4, 2022.

On June 21, 2022, we entered into a contract with AECOM to complete the study.

Analysis

As reported on 2021 10 25, in an effort to arrive at the best collection system for Sault Ste. Marie given that the municipality will have the responsibility of collecting curbside organics as of 2025. The study was to include:

- A review of collection options for similar municipalities;
- Alternatives to providing the collection service (waste/organics/recycling) (It should be noted that recycling is to be transitioned to a common collection system by the province by September, 2023 for Sault Ste. Marie);
- Consideration of bi-weekly collection service;
- Evaluation of the alternatives;
- Selection of the preferred option; and the
- Evaluation of implementation options of the preferred option (City vs. Contractor/Fleet options etc.).

Following consideration of all of the above, the preferred waste collection frequency option is Option No. 1 which includes of the following:

- Weekly collection of Organics;
- Bi-weekly collection of Garbage; and
- Bi-weekly Leaf and Yard waste throughout the growing season.

With the preferred waste collection implementation option (Option 3) including the following equipment:

- 3 split body vehicles - automated with single arm on right and cart tipper on left (note: split body collection vehicles cannot accommodate automated arms on both sides of the vehicle)
    - 1 duty truck (split body) for three routes/day
- 2 single body vehicles - automated with dual arms (left and right)
    - 1 Organics + L&Y (single body)
    - 1 Garbage + L&Y/spare (single body)

It should be noted that this recommended system is to be effective as of the regulated requirement (2025), although equipment must be purchased in advance of that deadline in order receive the equipment on time. The implementation of the organics curbside collection program is also pending the construction of the processing plant which may result in the start being in 2026.

This recommended system is for the City's geographical area only as the hybrid approach to collection is recommended to move forward and the contractor shall provide the service as they see fit.

A representative of AECOM is in attendance tonight to present their findings and answer any questions of Council.

The full study can be found on the City's website, with the presentation found as Appendix 1 to this Council report.

Financial Implications

There are not immediate financial implications. Cost was one of the criteria used to evaluate the collection implementation options. Equipment will be listed on the annual equipment list for Public Works at budget deliberations and funded through the Business and Implementation Plan established for the landfill and all collection operations. No additional staffing will be required as part of this implementation.

Strategic Plan / Policy Impact / Climate Impact

This is an operational matter not articulated in the corporate Strategic Plan, however, Service Delivery is a pillar of the Strategic Plan. This will be a regulated service that the City must provide.

The Waste Management By-law (No. 2022-24) will be amended in the future to include the curbside collection of organics.

As organics make up approximately 25% of the waste stream, and contribute to the production of methane gas at the landfill, reduction of the disposal of organics material will be beneficial in the long term to climate change and our corporate carbon footprint.

Recommendation

It is therefore recommended that Council take the following action:

Resolved that the report of the Director of Public Works dated March 20, 2023 concerning Waste Collection Study be received and that the AECOM report be referred to staff for report back to Council for approval and an implementation strategy.

Respectfully submitted,

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City of Sault Ste. Marie

C O U N C I L R E P O R T

March 20, 2023

TO:	Mayor Matthew Shoemaker and Members of City Council
AUTHOR:	Susan Hamilton Beach, P. Eng.
DEPARTMENT:	Public Works and Engineering Services
RE:	Audit and Accountability Fund – Winter Control - Budget and Operational Approach

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Purpose

The purpose of this report is to provide Council with an update regarding the Winter Control – Budgeting and Operational Approach Study with funding by the Audit and Accountability Fund.

Background

Following the completion of the Municipal Services Review in early 2020 one of the areas that was recommended for further study and potential savings was Public Works – Winter Control. The City was successful in receiving funding to conduct this review under the Audit and Accountability Fund and entered into an agreement effective March 4, 2022 for those funds.

A Request for Proposal was prepared with one submission received by Maclaren Municipal Consulting Inc. In June, 2022 a PO was issued and the project study commenced.

Analysis

The objective of the study as included in the Audit and Accountability Fund was to review the winter control budgeting processes and find opportunities to increase the use of digital data sources and analytics, with the goal of increasing effectiveness of operational approaches and practices, and identifying efficiencies.

The RFP defined the purpose of the Project as a review of the current operations and budgeting process with the work to be focussed on:

a) A more refined budgeting approach, integrating more objective data sources including weather, fleet, workforce, etc.;
b) A more refined operational approach ensuring the most efficient and effective use of City and third party service provision;
c) Summary of northern municipalities (a) and (b); and
d) A summary of risks and pitfalls experienced by other northern municipalities.

It should be noted that Council had approved the Level of Service for Winter Control with a Resolution dated July 12, 2021 after a Staff report was presented on that matter.

Representatives of Maclaren Municipal Consulting Inc. are in attendance tonight to present their findings and answer any questions of Council.

The full study can be found on the City's website with the Executive Summary as Appendix 1 to this report.

Financial Implications
There are no financial impact to this report. Further reports following a review by staff of the Maclaren report will identify specific financial implications.

Strategic Plan / Policy Impact / Climate Impact
This report and review is of an operational matter of service provision in a fiscally responsible manner and is articulated in the corporate Strategic Plan.

Recommendation
It is therefore recommended that Council take the following action:

Resolved that the report of the Director of Public Works dated March 20, 2023 concerning the Audit and Accountability Fund – Winter Control Budgeting and Operational Approach study be received and that the Maclaren report be referred to staff for review and report back to Council.

Respectfully submitted,

Susan Hamilton Beach, P. Eng.
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Executive Summary

Maclaren Municipal Consulting (Maclaren) was engaged by the City of Sault Ste. Marie to review the operational and budget approach to winter control used by the City. This report is the fourth in recent years to deal with winter control.

KPMG conducted a broad Service Review of the City and tabled a report December 12, 2019. That review noted potential cost savings in excess of $1M by adopting the lower levels of service used in other Northern Cities.

Council subsequently approved a $500,000 reduction in the budget for winter maintenance in the 2021 budget. It also requested a review of winter maintenance levels of service which might have led to service level reductions that could off-set the budget reduction. The service level report came to Council July 12th, 2021. It was approved with no reduction of service levels, and that approval was the lense for this review.

Sault Ste. Marie (SSM) is located at the downwind end of the third largest lake in the world, Lake Superior. Snowfall has averaged about 320 cm in recent years, more than other northern cities, and in fact more than most cities in Canada. The climate has tended to stay cold over the winter, but recent years have seen more swings between weather below zero and weather above zero. There is rain each month of the year, so freezing rain is an issue. There are three different microclimates within the city, with a need to respond to the different needs in those three areas.

The City organizes winter maintenance with 103 operators organized in two key groups, one group that has four shifts and handles salting and sanding requirements 24/7, and a second group that handles plowing and other activities with two shifts that work five-day weeks, plus overtime when weekend snow events occur. Sidewalk maintenance, snow removal, hand work, pothole patching and most other work is conducted by this crew.

The crews generally use City-owned vehicles, although there are a few graders and loaders that are leased as well. There are 8 sanders, 5 “combos” (plow trucks that also can sand, 10 plow trucks, 8 graders (one leased) and 11 loaders (4 leased). The sidewalks are maintained by “trackless” vehicles which can articulate (bend) in the middle. There are 18 road plow routes, some plowed by the trucks and some by the graders. The loaders focus on clearing bus stops, laneways and other tight spaces.

There are about 4,000 complaints per year, although the numbers have been lower for the last two winters. Snow removal, including complaints about windrows across driveways, are the largest source of complaints.

There are some opportunities to reduce costs, but most will require some time to realize. The most significant opportunity is to expand the combined plowing and salting/sanding of arterial and collector roads. Historically there were four sanders on duty 24/7 and 18 road maintenance routes (that include plowing) that were maintained by the two-shift crew. There are five of these road maintenance routes this winter that

use a “combo” to provide both the salting/sanding of arterials and the plowing of the same roads, so only one vehicle is required, not two. There are some opportunities to expand this concept in the future. There is some risk in adopting this approach, and the current routes can be seen as a pilot, with further consideration as equipment is replaced.

The development of an anti-icing program (salt or brine distribution before a storm) and a pre-wetting program (applying brine to salt or sand as it is released from a truck) reflects best practices, should reduce the volumes of salt and sand required, and may facilitate scraping snowpack off the roads. Short term the City could establish a brine making facility, acquire a tank trailer or a tank to mount on a plow truck to test the anti-icing approach on various types of roads and in various types of weather. In the short term it can also investigate the options to acquire calcium chloride or magnesium chloride which can operate these programs at lower temperatures. Medium term the city can acquire salt and sand trucks that have prewetting capacity and establish a storage facility for calcium or magnesium chlorides to be used in salt/sand trucks when temperatures are lower. It may take into the longer term before the fleet transitions to allow pre-wetting on all salt/sand trucks. Similarly, covering the sand pile with tarps is the lowest cost approach to ensuring the salt mixed with the sand does not leach out, and can be implemented in the short term.

Very few driveways are cleared as a result of the “two-foot rule” which provides that the City will clear a driveway if a snowpack scraping operation leaves a windrow more than two feet (.6 m) high. But every call requires a visit by supervisors to determine if the windrow is more than 2 feet high and is the result of snowpack scraping. This policy should be eliminated. However, some low-income elderly or disabled residents do have a challenge clearing their driveways. The City should identify the Red Cross or a similar third-party organization that would receive applications and make grants to individuals who are unable to buy services in the market and who are elderly or disabled and unable to clear the snow themselves. The City could provide the grant to a third-party organization which would be responsible for determining whether particular households qualify for assistance.

There are also opportunities to contain future cost increases. The City has an excellent policy that determines which sidewalks are maintained in the winter. Requests to extend coverage to new sidewalks are dealt with each fall. This approach should be continued and might be improved if required by identifying the actual level of foot traffic on sidewalks proposed for winter maintenance.

The City recently conducted a Fleet Review, and its recommendations need to be implemented, particularly the adoption of realistic internal vehicle charge out rates which allow more effective planning and analysis by vehicle users and avoid the year-end adjustments. These charge out rates are an internal accounting/financing mechanism used to reflect the cost of ownership. This approach would improve planning and control but would not reduce costs.

The financial records of winter maintenance are excellent and provide a good picture of costs. However, the budget has been determined to be inadequate. Winter maintenance is strongly influenced by weather conditions, with the result it is easy to blame an overage on some particular event or conditions – and most people accept that approach. However, there was only one year in the last nine when expenditures have been lower than budget, with a range from $10,000 under budget to $1.5M over budget. On average expenditures have been $580,000 over budget. It should be noted that the budget is developed assuming all positions are filled, all year. This has allowed the department to experience savings due to turnovers ('gapping'), the time required to fill vacancies and recently due to the recruitment challenges. Normally we would suggest the budget be based on the 10-year average plus inflation to provide an adequate budget for the future. If the budget continues to provide full funding for all established positions, future budgets need to be increased in some other amount. The budgets for winter maintenance of sidewalks and for hired equipment in particular need to be increased.

Despite deficits that ranged as high as $1.5 million in the past nine years, the winter maintenance reserve fund remains unchanged. The over expenditures in winter control have been absorbed corporately and reserve draws have not been required. Future budget adjustments may present the opportunity for this reserve fund to grow during years of favourable weather conditions.

Recommendations

The following section provides a summary of the recommendations provided in this report.

1. That a salt and sand pre-wetting program be piloted, understanding the full implementation will require some time.
2. That an anti-icing program be initiated.
3. That a brine station be installed as soon as possible. It will be required even if the lower temperature chemicals are eventually acquired.
4. That calcium-chloride or magnesium-chloride supplies and storage systems be investigated.
5. That new salt/sand trucks be ordered with pre-wetting capacity (and capacity to carry front plows and wings).
6. That the current and subsequent winters be used for experimentation when materials can be assembled, even if the program is limited to the use of brine. The test would look at the potential of pre-wetting by spraying materials before loading, and for anti-icing distribution before an event to improve service levels and make it easier to plow roadways. It may be possible to test the use of anti-icing application on residential streets with a view to improving the scraping process and easing the removal of snowpack.
7. That the approach to selection of sidewalks to be maintained be continued, and if pressure to increase sidewalk maintenance continues, be augmented by a criterion related to pedestrian volumes on the sidewalks of concern.
8. That the sand pile be covered with tarps, weighted to resist wind removal, and the tarps be removed to expose enough sand for the next event(s).

9. That the “two-foot rule”, and any associated policy or program to remove windrows after scraping or after plowing be eliminated.
10. That funding be considered to provide a grant be provided to a suitable third party to be distributed to low-income persons incapable of removing windrows.
11. That the Fleet Department initiatives of implementing an FMIS, changing the charge-out approach and advancing the purchase of replacement vehicles be implemented, with implementation over time as required.
12. That enough combos be acquired with the capacity to distribute materials in front of the rear wheels, pre-wet the materials, mount front plows and wings and serve as dump trucks for snow removal and summer use be acquired, and that all new salt trucks have pre-wetting capacity.
13. That trucks (with operators) continue to be rented for snow removal when economic, and part of the increased budget be allocated for this purpose, based on average expenditures before COVID.
14. That the Department work with corporate Human Resources to improve and accelerate the hiring process.
15. Fleet budgeting should be revised to have Fleet target a break-even status and charge realistic rates for the use of equipment. This may require some time to achieve.
16. The Winter Control Reserve Fund should remain in place. It should be recognized that winter control expenditures relate strongly to weather conditions, which are unpredictable.
17. The budget for winter control activities (including street-sweeping in the spring) should be increased recognizing the average deficit of $580,000 in the past 9 years. It should be adjusted each future year to recognize inflation, and any further increase in the lane kms of roads and sidewalks maintained, unless they are maintained on a cost-recovery basis.
18. Within this amount, allocations should be realistic, particularly the allocation of costs to sidewalk clearing and hired equipment.

City of Sault Ste. Marie
Waste Collection Options Study

Municipal Council Presentation

March 20, 2023

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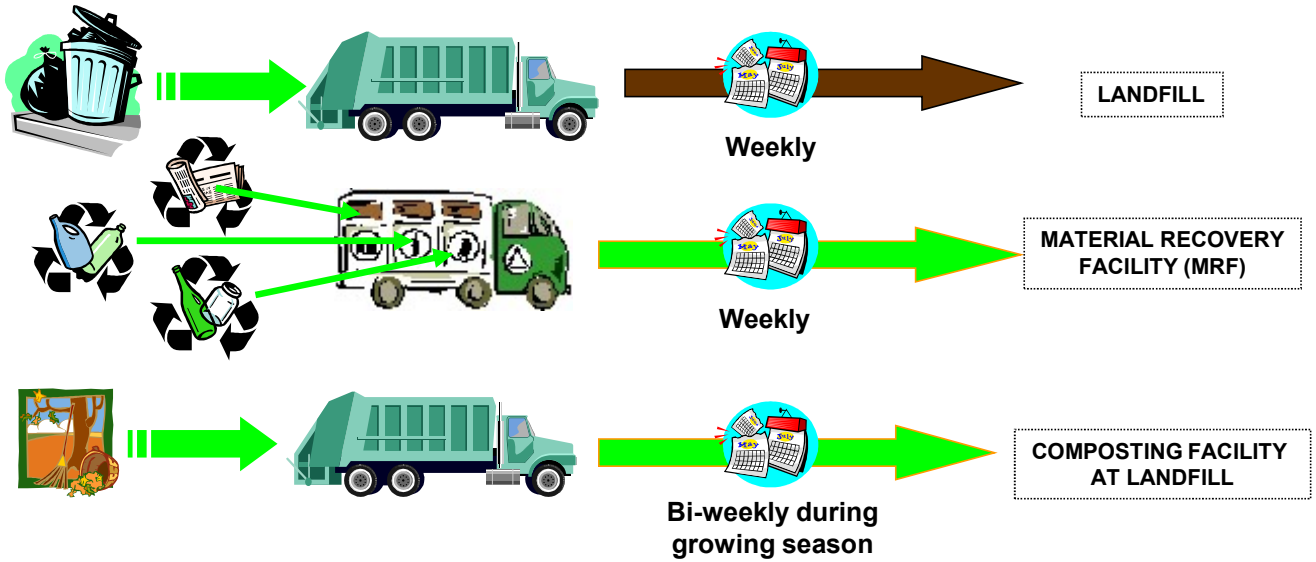
Agenda

1. Existing Residential Waste Collection System
2. Collection System Changes
3. Other Municipal Waste Collection Systems
4. Waste Collection Frequency Options and Evaluation
5. Waste Collection Implementation Options and Evaluation
6. Other Collection System Considerations
7. Conclusions

Existing Residential Waste Collection System



Waste Stream Collected	City/Contractor Collection Forces	Week 1 Collection			Week 2 Collection		
		No. of Trucks per Stop	Vehicle Type	Type of Collection	No. of Trucks per Stop	Vehicle Type	Type of Collection
Garbage	City/Contractor	Truck #1	Single Body	Automated	Truck #1	Single Body	Automated
Recycling	Contractor	Truck #2	Split Body[2]	Automated	Truck #2	Split Body[2]	Automated
Leaf & Yard[1]	City	-			Truck #3	Single Body	Manual

Notes:

1. L&Y collection during growing season only.
2. Split body trucks are used for dual-stream recycling collection only and not for different waste streams.

Existing Residential Waste Collection System

- City's current waste collection fleet and estimated retirement year.

Vehicle Description	Vehicle Load Capacity	Year Acquired	Estimated Retirement Year
2010 Freightliner M2 106V	27,216 kg	2010	2023
2010 Freightliner M2 106V	27,216 kg	2010	2023
2011 Freightliner M2 106V w/Auto Arm[1]	27,216 kg	2011	2024
2012 International 7400	28,000 kg	2012	2024
2016 Freightliner 108SD w/Auto Arm[1]	28,000 kg	2016	2025
2020 Freightliner 108SD w/Auto Arm	28,000 kg	2019	2029
2020 Freightliner 108SD w/Auto Arm	28,000 kg	2019	2029

Notes: 1. Labrie automated arm retrofit.

Collection System Changes

Blue Box Recycling Program Transition

- Blue Box programs in Ontario transitioning to full producer responsibility between July 1, 2023 and December 31, 2025 under the Resource Recovery and Circular Economy Act (RRCEA) and the Blue Box Regulation (O. Reg. 391/21).
- City of Sault Ste. Marie transitioning September 2023 and has been working with Circular Materials Ontario (CMO), a national not-for-profit Producer Responsibility Organization (PRO), to assist with Sault Ste. Marie's recycling program transition.
- Sault Ste. Marie's recycling program details will remain the same until at least December 31, 2025:
  - GFL will remain the collection Contractor.
  - Collection will remain weekly.
  - Collection will remain as two-stream using existing curbside split-body carts.

Food and Organic Waste Policy Statement (2018)

- City mandated to provide curbside collection of food and organic waste for single family dwellings with the expectation that they will achieve a 50% waste reduction and resource recovery of food and organic waste by approximately 2025.

Other Municipal Waste Collection Programs

- Also surveyed several waste collection programs with manual collection.
- Most popular collection frequency approach:
  - Weekly collection of organics
  - Bi-weekly collection of garbage
  - Bi-weekly collection leaf & yard waste
- Split body collection vehicles are the most popular vehicle type among the programs studied.

Municipal Waste Collection Program Information (Automated Collection)

Municipality	Collection Type	Waste Stream Collected	Vehicle Type	
			Week 1	Week 2
Guelph, City of	Automated[5]	Garbage	Truck 1 - Split	
		Organics	Truck 1 - Split	Truck 1 - Split
		Recycling		Truck 1 - Split
		Yard Waste	Truck 2 - Single	
Peel, Region of (Program No. 1)[1]	Automated[5]	Garbage	Truck 1 - Single	
		Organics	Truck 2 - Single	Truck 1 - Single
		Recycling		Truck 2 - Single
		Yard Waste		Truck 3 - Single
Peel, Region of (Program No. 2)[1]	Automated[5]	Garbage	Truck 1 - Single	
		Organics	Truck 2 - Split and Single	Truck 1 - Split
		Recycling		Truck 2 - Single
		Yard Waste		Truck 3 – Split and Single
Simcoe, County of[2]	Automated[5]	Garbage	Truck 1 - Split	
		Organics	Truck 1 - Split	Truck 1 - Split
		Recycling		Truck 1 - Split
		Yard Waste	Truck 2 - Single	
Thunder Bay, City of[3]	Automated[5]	Garbage	Truck 1 - Split	
		Organics	Truck 1 - Split	Truck 1
		Recycling		Truck 2
		Yard Waste	4x per Year	
Toronto, City of[4]	Automated[5]	Garbage	Truck 1 - Single	
		Organics	Truck 2 - Single	Truck 1 -Single
		Recycling		Truck 2- Single
		Yard Waste	Truck 3 - Single	

Notes:

1. Region of Peel has two separate collection programs.
2. County of Simcoe collection information obtained from Municipal website.
3. City of Thunder Bay information is based on a recommended collection program beginning in 2025 (City of Thunder Bay – Development of an Organics Diversion Program Implementation Plan, EXP Services Inc., May 2022).
4. City of Toronto collection information obtained from Municipal website.
5. Automated collection excludes yard waste collection.

- All but one Municipality collects organics weekly.
- Most Municipalities that collect organics, collect garbage bi-weekly.
- Most Municipalities with bi-weekly garbage collection have set-out limits of 2-3 bags or containers.
- Larger organics cart sizes (i.e., 80L-120L) typically associated with automated collection and smaller cart sizes (i.e., 46L) associated with manual collection.

Summary of Organics and Garbage Collection Frequency, Cart Sizes and Set-Out Limits

MUNICIPALITY	ORGANICS CART SIZE (LITRES)	ORGANICS COLLECTION FREQUENCY	GARBAGE CART SIZE (LITRES)[2]	GARBAGE COLLECTION FREQUENCY	GARBAGE SET-OUT LIMIT[3]
Barrie, City of	46	Weekly	-	Bi-weekly	2 Bags/Containers
Dufferin, County of	46	Weekly	-	Weekly	1 Bag/Container
Durham, Region of	46	Weekly	-	Bi-weekly	4 Bags
Greater Sudbury, City of	46	Weekly	-	Bi-weekly	2 Bags/Containers
Guelph, City of	80	Weekly	240, 360	Bi-weekly	-
Halton, Region of	46	Weekly	-	Bi-weekly	3 Bags/Containers
Hamilton, City of	46, 120	Weekly	-	Weekly	1 Bag/Container
Kingston, City of	46, 80	Weekly	-	Weekly	1 Bag/Container
Markham, City of	46	Weekly	-	Bi-weekly	No Limit
Newmarket, Town of	46	Weekly	-	Bi-weekly	3 Bags
Niagara, Region of	46	Weekly	-	Bi-weekly	2 Bags/Containers
Northumberland, County of	46	Weekly	-	Weekly	2 Bags
Orillia, City of	46	Weekly	-	Bi-weekly	20 Bags Annually[4]
Ottawa, City of	46, 80	Weekly	-	Bi-weekly	6 Bags/Items
Peel, Region of	100	Weekly	120, 240, 360	Bi-weekly	-
Richmond Hill, City of	46	Weekly	-	Bi-weekly	3 Bags/Containers
Simcoe, County of	120	Weekly	120, 240	Bi-weekly	-
St. Thomas, City of	240[1]	Bi-weekly	-	Weekly	2 Bags/Containers
Thunder Bay, City of[5]	46, 80	Weekly	-	Bi-weekly	2 Bags/Items
Toronto, City of	100	Weekly	75, 120, 240, 360	Bi-weekly	-
Vaughn, City of	46	Weekly	-	Bi-weekly	3 Bags/Containers
Waterloo, Region of	46	Weekly	-	Bi-weekly	3 Bags/Containers

Notes:

1. City of St. Thomas comingles organics and leaf & yard waste in 240L organics cart (Fall has separate collection of leaf & yard waste) AND is the only Municipality that collects organics bi-weekly.
2. Garbage cart sizes apply to automated collection programs only.
3. Set-out limits include “free” items. Additional bags/items may be set-out with the purchase of bag tags for most Municipalities.
4. City of Orillia provides each household with 20 free bag tags annually. Additional bags may be set-out with the purchase of tags.
5. City of Thunder Bay information is based on their proposed collection program beginning in 2025 (City of Thunder Bay – Development of an Organics Diversion Program Implementation Plan, EXP Services Inc., May 2022). Recommended organics cart size for manual collection is 46L and 80L for automated collection.

Waste Collection Frequency Options and Evaluation

Frequency Collection Option No.	Weekly Collection of Waste Stream	Bi-Weekly Collection of Waste Stream
1	Organics[1]	Garbage Yard Waste[2]
2	Organics[1] Garbage	Yard Waste[2]
3	Organics[1] Yard Waste[2]	Garbage
4	Garbage	Organics[1] Yard Waste[2]
5	Organics[1] Garbage Yard Waste[2]	-

Notes:

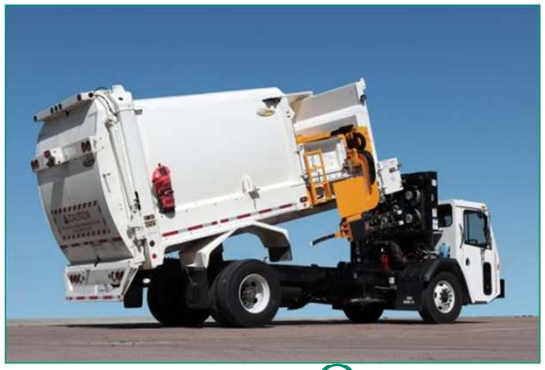
1. Option for bi-weekly organics collection during winter months.
2. L&Y waste collection during the growing season only.

- Most popular approach among Municipalities (i.e., approach used by 12/20 Municipalities reviewed).
- Weekly organics collection less likely to cause health/nuisance issues during summer months (i.e., insects, rodents, odours, etc.).
- Higher diversion participation rates proven with bi-weekly garbage collection.
- Bi-weekly garbage collection more cost efficient relative to weekly collection.
- Volume of garbage reduced with SSO collected separately.
- Existing garbage carts adequately sized for bi-weekly garbage collection.
- Garbage with organics removed should not generate significant nuisance impacts (eg. odours, pests) over the longer storage period.
- Bi-weekly L&Y waste collection more cost efficient relative to weekly collection. L&Y waste creates no significant nuisances over a two-week storage period.

Waste Collection Implementation Options and Evaluation

Collection Approach Option No.	Description	Trucks Required
1	Single Body Vehicles (Automated with Dual Arms)	8 Single Body Vehicles - 2 duty trucks for three routes/day - 1 L&Y - 1 spare
2	Split Body Vehicles (Automated with Single Arm and Cart Tipper)	5 Split Body Vehicles - 1 duty truck for three routes/day - 1 L&Y - 1 spare
3	Split Body Vehicles (Automated with Single Arm but can be equipped with cart tippers on the left side for added flexibility and redundancy) + Single Body Vehicles (Automated with Dual Arms) .	3 Split Body Vehicles + 2 Single Body Vehicles - 1 duty truck (split body) for three routes/day = 3 trucks - 1 Organics + L&Y (single body) - 1 Garbage + L&Y/spare (single body)

- All organic and garbage collection can be accomplished with automated arms which is more preferred.
- Option to co-collect organics and L&Y during slower growth period.
- More cost efficient with less collection vehicles required.
- Most cost efficient in terms of labour resource requirements.
- Fewer vehicles on the road relative to Option 1 resulting in less environmental impacts/GHG.



Other Collection Considerations

Additional collection implementation considerations that were evaluated as part of this study include the following:

- Hybrid collection approach using both City and Contractor forces preferred – redundancy of service, competitive environment, reduced risk of monopoly, less complacency/continued improvement and enhanced knowledge.
- Hybrid collection approach based on material division not preferred – more vehicles required, less efficient and more costly.
- Automated vs. manual waste collection – automated more efficient operationally and most importantly reduces worker injuries.
- Electric/alternative fuel collection vehicles – cost prohibitive, lack of supporting infrastructure and repair technicians.

Conclusions

Preferred Waste Collection Frequency Option

The preferred waste collection frequency option is Option No. 1 which includes:

- Weekly collection of organics
- Bi-weekly collection of garbage
- Bi-weekly leaf & yard waste throughout the growing season

Preferred Waste Collection Implementation Option

The preferred waste collection implementation option is Option No. 3 which includes:

- 3 split body vehicles – automated with single arm on right and cart tipper on left (note: split body collection vehicles cannot accommodate automated arms on both sides of vehicle)
    - 1 duty truck (split body) for three routes/day
- 2 single body vehicles – automated with dual arms (left and right)
    - 1 organics + leaf & yard (single body)
    - 1 garbage + leaf & yard/spare (single body)

Questions?

AECOM Delivering a better world

CITY OF SAULT STE. MARIE

WINTER CONTROL

BUDGETING AND OPERATIONAL APPROACH

Maclaren Municipal Consulting
March 20, 2023

Recent History

Service Review in 2019

- Found service levels were higher than other northern cities – but justified due to more severe conditions
- Led to $500K budget reduction

Service Levels Reviewed by Staff 2021

- Higher than standard residential plowing
- Council decided not to reduce service levels due to unique conditions

Current Review 2022

- Review of the operational and budgetary systems
- Review included
  - Collection and analysis of reports and data
  - Interviews with City staff, tour of site and equipment
  - Comparative analysis of other northern jurisdictions
- Important Factors
  - SSM has an average of 320 cm of snow – among the highest in Canada
  - Lake effect snow (and rain) at eastern end of Lake Superior
  - Three different “micro-climates” within the City, each with different requirements
  - SSM ranked one of most severe winter weather areas by Provincial Winter Weather Severity

Most Approaches are Appropriate

- Four shifts for sanders allows rapid response to events 24/7
- Two shifts for plows, with overtime for weekend events
- Sidewalks maintained, but only when criteria met
- Snow removal uses resources between events and 7 snow dumps is excellent
- 24 hr. switchboard takes complaints/calls and allows response to issues

Some Improvements Possible

- Reduce volumes of sand and salt by implementing:
  - Pre-wetting materials as dispersed
    - Phase in with new vehicles
  - Anti-icing (distribution before events)
    - Requires some new vehicle
    - Requires a brine station, and eventually other materials
  - Suggest sand pile be covered with tarps

Some Improvements Possible

- Combine salt/sand routes with plow routes
  - Phase in over time, biggest saving opportunity
- Continue to review sidewalks each fall, consider pedestrian volumes as well
- Abandon the “two-foot rule”
  - Biggest source of complaints, time to investigate
  - Results are inconsistent, unfair
  - May require a grant to support low-income elderly, handicapped residents

Some Improvements Possible

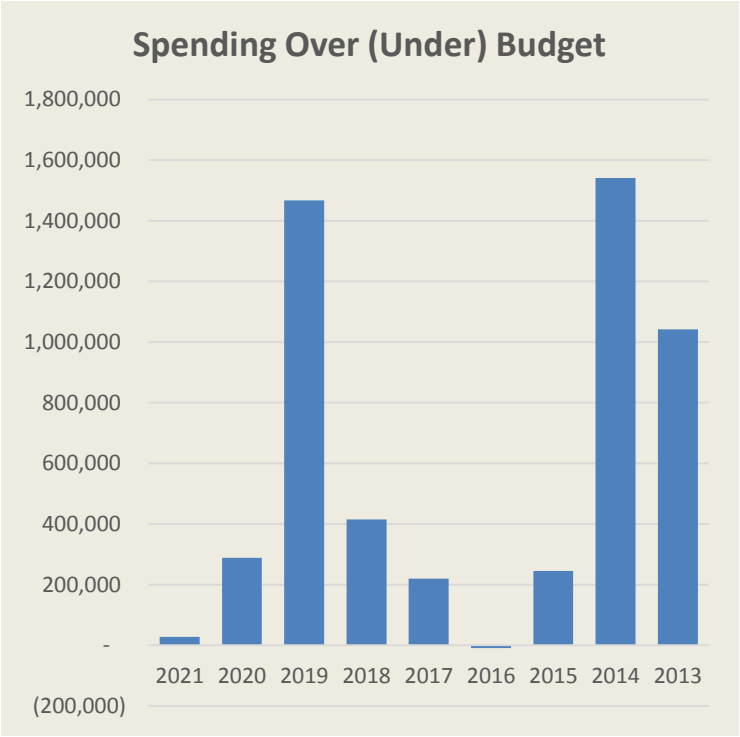
- Support fleet changes – FMIS, improved charge-out approach, quicker replacements
- Support use of hired trucks for snow removal
- Hiring process must be accelerated

Budget/Financial Processes

- Some excellent aspects
  - Captures expenditures both by activity (plowing, sanding, sidewalks, etc.) and by cost (wages, materials, vehicles, etc.)
- Some unusual aspects (though not savings)
  - Management and supervisory costs are not allocated to activities
  - Street sweeping is a “winter” activity
  - Budget for full staffing

Budget

- Spending was only less than budget once
  - low expenditures correlate to really good weather
- Spending was over budget from $30,000 to $1,540,000 in the other years
- Budgets averaged $6.9M over the last ten years, while expenditures averaged $7.5M – a difference of $580,000 on average



Actual Expenditures

	Average	Low	High
Salting/Sanding	1,771,880	1,414,842	2,024,990
Street Plowing	1,763,369	987,297	2,503,083
Sidewalks	823,983	540,436	1,094,204
Snow Removal	1,150,874	250,015	1,679,623
Potholes	569,491	390,557	809,106
Drainage/ditches	393,754	197,283	541,363
Sweeping	791,873	618,327	953,409
Other duties	226,810	52,733	500,127
Other items	134,109	70,111	280,980
Recoveries from Clients/Departments	(115,807)	(199,922)	(67,403)
Total Costs	**7,510,336**	**6,145,268**	**9,179,759**

Budget

- There is a Winter Control reserve - $900K – but it has never been used
- Expenditures vary based on the weather – which is never known when the budget is prepared
- The budget should be increased to the level of expenditure in an “average” winter.
- Future budgets should recognize inflation and any change in the number of lane kms maintained
- The Winter Control Reserve Fund should be used to Adjust actual expenditures

Thank you very much

- Maclaren Municipal Consulting has enjoyed working on this project
- Staff have been very co-operative and helpful in the process.

Waste Management Collection Options Study Report

The Corporation of the City of Sault Ste. Marie

60687313

January 2023

Delivering a better world

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Ms. Susan Hamilton Beach
Director, Public Works
The Corporation of the City of Sault Ste. Marie
99 Foster Drive
Sault Ste. Marie, ON P6A 5X6

January 16, 2023

Project #
60687313

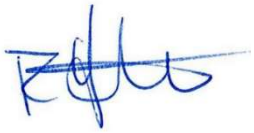
Subject: City of Sault Ste. Marie
Final Waste Management Collection Options Study Report

Dear Ms. Hamilton Beach:

We are pleased to provide you with the Final Waste Management Collection Options Study Report which has been updated to address comments received from City staff. This report has been prepared to address upcoming waste management changes which will impact curbside collected wastes and require optimization of the City's waste collection fleet. This study focuses exclusively on how best to collect the waste streams that are within the Municipality's care and control including, source separated organics (SSO), residual household garbage and leaf and yard waste. The requirement to collect SSO commencing in approximately 2025 is a new requirement that has emerged under Ontario's Food and Organic Waste Policy Statement (April, 2018).

Please contact the undersigned should you have any questions or concerns.

Sincerely,
AECOM Canada Ltd.



Rick Talvitie, P.Eng.,
Project Manager
rick.talvitie@aecom.com

:ta
Encl.

cc: Mike Blanchard, City of Sault Ste. Marie
Clark Findlay, City of Sault Ste. Marie
Spencer Lavergne, City of Sault Ste. Marie

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AECOM: 2015-04-13

Quality Information

Prepared by	Reviewed by
	
Tara Abernot, Project Manager	Rick Talvitie, P.Eng., Project Manager

Revision History

Rev #	Revision Date	Revised By:	Revision Description
0	November, 2022	TA	DRAFT for Client Review
1	January, 2023	TA	Final Report

Distribution List

# Hard Copies	PDF Required	Association / Company Name
	✓	The Corporation of the City of Sault Ste. Marie
	✓	AECOM Canada Ltd.

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Appendices

1. Introduction

AECOM Canada Ltd. (AECOM) was retained by the Corporation of the City of Sault Ste. Marie (City) to undertake a Waste Management Collection Options Study to address upcoming waste management changes which will impact curbside collected wastes and require optimization of the City's waste collection fleet. This study focuses exclusively on how to most effectively and efficiently collect the waste streams that are within the City's care and control including, source separated organics (SSO), residual household garbage (garbage) and leaf and yard waste (L&Y). The term "garbage" used throughout this report refers to residual waste that is landfilled. The terms "source separated organics" or "organics" refers to food and organic wastes including paper napkins, paper towels, cotton balls, soiled pizza boxes, microwave popcorn bags, corn stalks, house plants (soil removed), food scraps, fruit and vegetable peels, bones, meat and fish, coffee grounds and coffee filters. The term "leaf and yard waste" refers to seasonal outdoor organic waste consisting of leaves, grass clippings and garden waste.

1.1 Background

The City of Sault Ste. Marie will be mandated to implement residential curbside collection of SSO waste by approximately 2025. In April 2018 the Province introduced, among other related documents (see Section 3.0 for further information on Provincial waste reduction legislation), Ontario's Food and Organic Waste Policy Statement (FOWPS) which includes a mandate for the City of Sault Ste. Marie to initiate a residential curbside organics collection program by approximately 2025. Based on the terms of the FOWPS (i.e., a Northern Ontario Municipality with a population greater than 50,000 residents and having a population density greater than 300 persons/km^2), the City is mandated to provide curbside collection of food and organic waste to single-family dwellings with the expectation that they will achieve a 50% waste reduction and resource recovery of food and organic waste by approximately 2025[1].

In response to this mandate, the City proactively initiated modifications to a planned Biosolids Management Facility to also accept and process 5,000 wet tonnes of SSO annually. The Biosolids/SSO processing facility, which will be located at the City's municipal landfill site, is scheduled to become operational by late 2025 or early 2026. This facility will be the processing destination for the SSO collected curbside under the newly mandated collection program.

1.2 Study Objectives

The overall purpose of this study is to review the City's current waste collection system, solicit input from other Municipalities to identify industry best practices, and recommend a preferred collection system to collect all residential curbside waste streams under the management and control of the City of Sault Ste. Marie (i.e., SSO, garbage, leaf and yard). The specific tasks and activities undertaken during this study include:

- Review of the City's existing waste collection services;
- Examination of the City's current waste collection fleet;
- Review of current waste reduction legislation and/or policies;
- Analysis of the City's future collection requirements;
- Collection and analysis of existing waste collection system information for similar Municipalities;
- Identify and evaluate collection frequency options for the municipally controlled waste streams (i.e., SSO/garbage/leaf and yard);

[1] *Currently the FOWPS mandates that the Municipality is to achieve this organic waste diversion target by 2025; however due to supply chain challenges including long lead times to source relevant collection and processing equipment, it is anticipated that there will be some flexibility with the implementation timeline.*

- Identify and evaluate implementation options (i.e., number and types of collection vehicles);
- Select the preferred collection frequency and implementation options; and
- Summarize the results of the study in this report.

2. Existing Residential Waste Collection Services

The City's existing residential waste collection services have been inventoried and summarized within the following subsections.

2.1 Existing Residential Curbside Waste Collection Services

Existing residential curbside waste collection services within the City of Sault Ste. Marie consist of weekly garbage collection, weekly Blue Box recyclables collection and bi-weekly collection of leaf and yard waste throughout the growing season (i.e., May-November).

2.1.1 Weekly Garbage Collection

Weekly curbside garbage collection services are currently provided in part by City Public Works and in part by a Contractor, GFL Environmental Inc. (GFL). The garbage collection service area is generally divided into a central core area with collection undertaken by City forces and a perimeter area where collection is undertaken by GFL. Mapping identifying City versus contracted collection areas is included in Appendix A.

Garbage collection is generally undertaken using automated collection vehicles with mechanical arms that tip 240-litre (single-family households) and 360-litre (multi-family less than 4 units) waste carts. In the downtown core the City also utilizes mechanical cart tippers together with mechanical arms to accommodate garbage collection on one-way streets. The City transitioned to automated garbage collection using waste carts in July 2019.

Within their collection area, the City typically uses three collection vehicles for garbage collection and maintains a fourth as a spare. The four trucks are typically rotated as service vehicles on a regular basis (refer to Section 2.2 for further information on the City's current waste collection fleet). Total average daily collection quantities from both City and GFL collection is approximately 60 tonnes/day. Typical City collection quantities are in the range of 30-35 tonnes of garbage per day which is accommodated with a single trip to the landfill on most days for each collection vehicle.

2.1.2 Weekly Blue Box Recycling Collection

Although collection of blue box recyclables is not included in the scope of this study, information has been included to provide a full understanding of the curbside collection program in Sault Ste. Marie.

Weekly curbside blue box recycling collection services are currently provided by a Contractor, GFL, throughout the entire city. Contracted recycling collection is also undertaken using automated collection with mechanical arms that tip a 360-litre split body recycling cart used for dual-stream collection of fibres and containers. Recycling collection in Sault Ste. Marie transitioned to using split body recycling carts in 2012 and Sault Ste. Marie remains the only Municipality in Ontario that utilizes split body carts for automated dual-stream recycling collection.

The current extended recycling contract between the City and GFL ends in September 2023 at which time recycling collection services will again be contracted to GFL through the individual producer responsibility regulatory framework under the Resource Recovery and Circular Economy Act (2016), in lieu of the City. Under this new system, producers will be responsible for managing and financing the collection and recycling of waste generated from their products and packaging. The purpose of this legislation is to encourage waste reduction, advance innovation, and lower costs for Municipalities. Refer to Section 3.1.1 for additional information on Blue Box program legislation and the collection program transition.

2.1.3 Bi-Weekly Leaf and Yard Waste Collection

Unlimited bi-weekly curbside leaf and yard waste collection services are provided by City Public Works throughout the entire city during the annual growing season (i.e., May to November). The City manually collects leaf and yard waste in compostable paper bags. Collected leaf and yard waste material is transported to the City's landfill site where it is composted in open windrows and used throughout Sault Ste. Marie on City landscaping projects.

The City currently uses two collection vehicles for leaf and yard waste collection during the more active spring and fall periods when volumes are higher (approximately 12 weeks per year), and one collection vehicle for the remainder of the growing season (refer to Section 2.2 for further information on the City's current waste collection fleet).

A private sector leaf and yard waste depot, active in Sault Ste. Marie for many years, recently closed on October 1, 2022. This depot was open to the public with expanded hours of operation to allow residents flexibility and convenience in disposing of leaf and yard waste. With this closure, it is expected the City will receive much larger quantities of leaf and yard waste collected curbside and self-hauled to the landfill. In late October/early November 2022 the City incorporated a third collection vehicle in its daily routes to manage the larger curbside leaf and yard waste quantities. In the coming months, the City plans to assess the quantities received in the Fall of 2022 and develop and review options to manage the larger quantities. No specific provisions for the increased quantities have been incorporated into this study.

2.1.4 Current Waste Collection Approach

The City currently uses single body waste collection vehicles for garbage and leaf and yard waste collection. GFL uses single body waste collection vehicles for garbage collection and split body waste collection vehicles for recycling collection to accommodate the dual-stream collection of fibres and containers. During a typical two-week period in the spring, summer and fall months this collection approach results in two waste collection vehicles per stop during week 1 (garbage and recyclables), and three waste collection vehicles per stop during week 2 (garbage, recyclables and leaf and yard). During the winter months it results in two waste collection vehicles per stop for both weeks as leaf and yard waste is not collected.

Table 1 below summarizes Sault Ste. Marie's current waste collection approach including the frequency of collection and the number of trucks that visit each property during alternating collection weeks.

Table 1: Existing Collection Frequency and Approach

Waste Stream Collected	City/Contractor Collection Forces	Week 1 Collection			Week 2 Collection		
		No. of Trucks per Stop	Vehicle Type	Type of Collection	No. of Trucks per Stop	Vehicle Type	Type of Collection
Garbage	City/Contractor	Truck #1	Single Body	Automated	Truck #1	Single Body	Automated
Recycling	Contractor	Truck #2	Split Body[2]	Automated	Truck #2	Split Body[2]	Automated
Leaf & Yard[1]	City	-			Truck #3	Single Body	Manual

Notes:
1. L&Y collection during growing season only.
2. Split body trucks are used for dual-stream recycling collection only and not for different waste streams.

City forces are currently responsible for garbage collection in the downtown core of the city which includes the use of single body trucks with mechanical cart tippers on the left side of the vehicle together with mechanical arms on

the right side of the vehicle to accommodate collection on one-way streets and laneways. Most of the one-way streets are included in the Tuesday collection routes and two operators are required to jockey carts as needed and to operate the cart tipper located outside of the vehicle cab.

2.2 Current Waste Collection Fleet

The City currently owns and operates a total of seven automated waste collection vehicles which includes three in-service refuse collection vehicles, one leaf and yard waste collection vehicle, one spare which is typically used when other collection vehicles are out of service for maintenance, and two contingency vehicles. Given the age and unreliability of the waste collection fleet, the City has maintained two aging trucks for use as contingency vehicles when more than one collection vehicle is out of service. The spare collection vehicle is also used as a second leaf and yard waste collection vehicle for approximately 12 weeks per year during the more active spring and fall collection period. The City's current waste collection fleet is summarized in Table 2.

Table 2: Current Waste Collection Fleet

Vehicle Description	Vehicle Load Capacity	Year Acquired	Estimated Retirement Year
2010 Freightliner M2 106V	27,216 kg	2010	2023
2010 Freightliner M2 106V	27,216 kg	2010	2023
2011 Freightliner M2 106V w/Auto Arm[1]	27,216 kg	2011	2024
2012 International 7400	28,000 kg	2012	2024
2016 Freightliner 108SD w/Auto Arm[1]	28,000 kg	2016	2025
2020 Freightliner 108SD w/Auto Arm	28,000 kg	2019	2029
2020 Freightliner 108SD w/Auto Arm	28,000 kg	2019	2029

Notes:

1. Labrie automated arm retrofit.

The typical service life of a waste collection vehicle is in the range of 7-9 years. The retirement age will vary based on use and vehicle make/model as some vehicle manufacturers have proven to provide more robust equipment. As identified in Table 2, the City has maintained several waste collection vehicles for use well beyond their typical service life (i.e., 12-13 years) due to the unreliability of their existing overall fleet.

For the purposes of this report, we have adopted a typical service life of 7 years which takes into consideration increased waste collection vehicle usage with the addition of organics collection and the potential significant increase in leaf and yard waste collection volumes with the recent closure of the private leaf and yard waste depot.

3. Provincial Legislation and Future Waste Collection Requirements

Provincial waste reduction legislation and the City's future waste diversion collection requirements are summarized in this Section.

3.1 Provincial Waste Reduction and Diversion Legislation

3.1.1 Blue Box Recycling Program Transition

In 2016, the Provincial government passed the Waste-Free Ontario Act (WFOA) which also included the passage of the Resource Recovery and Circular Economy Act (RRCEA) and Waste Diversion Transition Act (WDTA). This legislation provides a resource recovery and waste reduction road map for Ontario with a pronounced shift to producer responsibility for Ontario's waste diversion programs.

The WDTA is focused on promoting the reduction, reuse and recycling of waste and converting end of life material to a resource rather than waste. It is also intended to provide guidance on the operation of Ontario's waste diversion programs and to legislate a smooth transition to the producer responsibility model.

The RRCEA provides the framework for individual producer responsibility and designating the materials collected under Ontario's current recycling programs (Blue Box, tires, hazardous waste, etc.). Blue Box Regulation (O.Reg. 391/21) was adopted under the RRCEA which requires producers to operate and pay for the collection and reuse, refurbishment and recycling of Blue Box materials.

Under the RRCEA and the Blue Box Regulation (O.Reg. 391/21), all existing Blue Box programs in Ontario will transition to full producer responsibility between July 1, 2023 and December 31, 2025, with the City of Sault Ste. Marie scheduled to transition September 30, 2023. Under the new legislation, Municipalities continue to have the option of being a collection service provider (eg. collecting recyclables under contract) and/or administering collection contracts with service providers (eg. administer GFL collection contract). Furthermore, there is a commitment by Stewardship Ontario to ensure that the current Blue Box program as seen by residents will not change during the transition period (i.e., July 1, 2023 to December 31, 2025). This implies that the recycling collection program in Sault Ste. Marie will continue as weekly, two-stream collection using existing curbside split-body carts. However, the collection approach and collection frequency within Sault Ste. Marie may change post-transition (i.e., January 1, 2026 and beyond) as Municipal collection services will be procured through competitive Request for Proposals processes.[2]

The City has been working closely with Circular Materials Ontario (CMO), a national not-for-profit Producer Responsibility Organization (PRO) working on behalf of producers, to assist with Sault Ste. Marie's Blue Box recycling transition. Through this process GFL has been selected as the Blue Box recycling collection Contractor for Sault Ste. Marie during the transition period.

Currently, the City is responsible for administering the recycling collection and processing contract with GFL. The City has opted to have no future involvement in the management of Sault Ste. Marie's recycling collection program once the transition to extended producer responsibility occurs in September 2023 (refer to Council Report Re: Blue

[2] *Circular Materials, Initial Report, July 1, 2022, Filed with the Resource Productivity and Recovery Authority pursuant to s. 50.1 (2) of Ontario Regulation 391/21 BLUE BOX under the Resource Recovery and Circular Economy Act 2016.*

Box Transition - Municipal Involvement Decision, July 11, 2022 in Appendix B). At that time the City will have no responsibility for collecting recyclables and therefore recycling collection has been excluded from this study.

3.1.2 Food and Organic Waste Diversion

Several policy, discussion and guidance documents have also been produced to support Ontario's waste reduction legislation including the Made in Ontario Environment Plan (MOEP) (2018), Reducing Litter and Waste in Our Communities (RLWOC) (2019) and Food and Organic Waste Policy Statement (FOWPS) (2018).

The MOEP is an overview of Ontario's commitment to address climate change, protect the air, lakes and rivers, reduce litter and waste, keep the land and soil clean and conserve land and greenspace through a number of action initiatives. The plan is intended to generate a province wide commitment to protect the environment and take action on climate change.

The RLWOC is a discussion paper which addresses the waste reduction initiatives outlined in the MOEP. It identifies the following waste diversion targets; 30 percent diversion by 2020; 50 percent diversion by 2030; and 80 percent diversion by 2050. A number of proposed initiatives are addressed in the discussion paper in order to meet these targets including:

- Harmonizing the list of materials accepted in Blue Box programs across the province;
- Transitioning the existing Blue Box Program to individual producer responsibility (as previously noted Sault Ste. Marie is scheduled to transition in September 2023);
- Designating new materials that are currently not covered under any provincial diversion programs (i.e., small and large appliances, power tools, rechargeable batteries, fluorescent bulbs and tubes, mattresses, carpets, clothing and other textiles, furniture and other bulky items);
- Develop guidance to increase diversion participation in multi-residential buildings;
- Reducing the amount of food and organic waste sent to landfill;
- Reducing plastic waste being sent to landfill; and
- Managing compostable products and packaging.

The FOWPS also addresses some of the waste reduction initiatives outlined in the MOEP and focuses on limiting the amount of food and organic waste that is disposed of in Ontario's waste disposal sites. The province wants to achieve this by implementing the Ontario Food Recovery Hierarchy which consists of preventing or reducing food and organic waste at the source, safely rescuing and redirecting surplus food before it becomes waste and recovering food and organic waste to develop end-products for beneficial use.

The FOWPS also establishes a number of municipal waste reduction and resource recovery targets. For example, Northern Ontario Municipalities such as the City of Sault Ste. Marie that service a population greater than 50,000, have a population density greater than 300 persons per square kilometer and who do not currently have an existing food and organic waste collection program are expected to target 50% waste reduction and resource recovery of food and organic waste generated by residential households by approximately 2025. Municipalities are expected to achieve this target through waste reduction and resource recovery efforts of the following waste types:

- food waste;
- organic waste resulting from food preparation;
- soiled paper;
- leaf and yard waste;
- seasonal outdoor wastes; and
- flowers and houseplants.

Municipalities are also encouraged to include the following waste types in their waste reduction and recovery efforts:

- personal hygiene wastes;
- sanitary products;
- shredded paper;
- additional paper fibre products;
- compostable products and packaging; and
- pet food and wastes.

The principal impact of this policy is that the City will be mandated to provide curbside collection of food and organic waste for single family dwellings with the expectation that they will achieve a 50% waste reduction and resource recovery of food and organic waste by approximately 2025[3]. In response to this mandate, the City proactively initiated modifications to a planned Biosolids Management Facility to also accept and process 5,000 wet tonnes of SSO annually. The Biosolids/SSO processing facility, which will be located at the City's landfill site, is scheduled to become operational by late 2025 or early 2026. This facility will be the processing destination for the SSO collected curbside under the newly mandated collection program. SSO quantity estimates and the material types that are expected to be processed at the Sault Ste. Marie processing facility are included in AECOM Technical Memorandum (March, 2020) found in Appendix C.

The City is also currently working with Stewardship Ontario to obtain recent waste audit data that may better inform available SSO quantities in the curbside residential waste stream.

3.2 Future Waste Collection Requirements

Based on the foregoing, this study focusses on the curbside collection of three waste streams that will be under the care and control of the City of Sault Ste. Marie consisting of organics (commencing in 2025 or 2026), garbage, and leaf and yard waste. Specifically, options are identified and evaluated for the collection frequency for each waste stream (eg. weekly vs bi-weekly) and the collection approach for each waste stream (eg. collect each waste type in a single body truck vs collection of two waste types in a split body truck). As noted in Section 3.1.1, the collection of Blue Box recyclables in Sault Ste. Marie will become a producer responsibility in 2023 and has been excluded from consideration in this study.

[3] *Currently the FOWPS mandates that the Municipality is to achieve this organic waste diversion target by 2025; however due to supply chain challenges including long lead times to source relevant collection and processing equipment, it is anticipated that there will be some flexibility with the implementation timeline.*

4. Ontario Municipal Collection Information

There are a number of Municipalities across Ontario currently collecting organics in their curbside waste collection programs. One of the first steps undertaken in this study was to inventory some of those collection programs to better inform the potential waste collection options that should be considered for the City of Sault Ste Marie. The process included data gathering through municipal websites together with solicitation of additional input to provide a detailed summary of collection approaches and possible best practices.

4.1 Current Waste Collection Program Information

The principal input solicited from other Ontario Municipalities included frequency of collection for each waste stream, number of waste collection vehicles per stop each week, types of trucks used (single body versus split body trucks) and automated versus manual collection. The results of this data gathering exercise are summarized in Table 3 and included in AECOM Memorandum (September 2022) found in Appendix D. Although recycling was removed from further analysis in this study, it has been included in the table as part of the Municipal data collected. The information in Table 3 also reflects collection during the growing season and incorporates leaf and yard waste.

Table 3: Summary of Municipal Waste Collection Information

Municipality	Collection Type	Waste Stream Collected	Vehicle Type	
			Week 1	Week 2
Greater Sudbury, City of[1]	Manual	Garbage	Truck 1 - Single	
		Organics	Truck 2 - Split	Truck 1 - Split
		Recycling	Truck 2 - Split	Truck 1 - Split
		Yard Waste	Truck 3 - Single	
Guelph, City of	Automated[8]	Garbage	Truck 1 - Split	
		Organics	Truck 1 - Split	Truck 1 - Split
		Recycling		Truck 1 - Split
		Yard Waste	Truck 2 - Single	
Halton, Region of	Manual	Garbage	Truck 1 - Single	
		Organics	Truck 2 - Split	Truck 1 - Split
		Recycling	Truck 2 - Split	Truck 1 - Split
		Yard Waste	Truck 3 - Single	
Kingston, City of[2]	Manual	Garbage	Truck 1- Split	Truck 1 - Split
		Organics	Truck 1 - Split	Truck 1 - Split
		Recycling	Truck 2 - Single	Truck 2 - Single
		Yard Waste	Truck 1 - Split	Truck 1 - Split
Orillia, City of	Manual	Garbage	Truck 1 - Split	
		Organics	Truck 1 - Split	Truck 1 - Split
		Recycling	Truck 2	Truck 2
		Yard Waste	Truck 1- Split	Truck 1 - Split
Peel, Region of (Program No. 1)[3]	Automated[8]	Garbage	Truck 1 - Single	
		Organics	Truck 2 - Single	Truck 1 - Single
		Recycling		Truck 2 - Single
		Yard Waste		Truck 3 - Single

Municipality	Collection Type	Waste Stream Collected	Vehicle Type	
			Week 1	Week 2
Peel, Region of (Program No. 2)[3]	Automated[8]	Garbage	Truck 1 - Single	
		Organics	Truck 2 - Split and Single	Truck 1 - Split
		Recycling		Truck 2 - Single
		Yard Waste		Truck 3 – Split and Single
Simcoe, County of[4]	Automated[8]	Garbage	Truck 1 - Split	
		Organics	Truck 1 - Split	Truck 1 - Split
		Recycling		Truck 1 - Split
		Yard Waste	Truck 2 - Single	
Thunder Bay, City of[5]	Automated[8]	Garbage	Truck 1 - Split	
		Organics	Truck 1 - Split	Truck 1
		Recycling		Truck 2
		Yard Waste	4x per Year	
Toronto, City of[6]	Automated[8]	Garbage	Truck 1 - Single	
		Organics	Truck 2 - Single	Truck 1 -Single
		Recycling		Truck 2- Single
		Yard Waste	Truck 3 - Single	
Vaughn, City of	Manual	Garbage	Truck 1 - Single	
		Organics	Truck 2 - Split	Truck 1 - Split
		Recycling	Truck 2 - Split	Truck 1 - Split
		Yard Waste	Truck 3 - Single	
Waterloo, Region of (Program No. 1 - Townships)[7]	Manual	Garbage	Truck 1 - Split	
		Organics	Truck 1 - Split	Truck 1 - Split
		Recycling	Truck 2 - Single	Truck 2 - Single
		Yard Waste		Truck 1 - Split
Waterloo, Region of (Program No. 2 – Kitchener, Waterloo, Cambridge)[7]	Manual	Garbage	Truck 1 - Single	
		Organics	Truck 2 - Split	Truck 1 - Split
		Recycling	Truck 2 - Split	Truck 1 - Split
		Yard Waste		Truck 2 - Single

Notes:

1. City of Sudbury collection information obtained from Municipal website and Municipal resident.
2. City of Kingston collection information obtained from Municipal website.
3. Region of Peel has two separate collection programs.
4. County of Simcoe collection information obtained from Municipal website.
5. City of Thunder Bay information is based on a recommended collection program beginning in 2025 (City of Thunder Bay – Development of an Organics Diversion Program Implementation Plan, EXP Services Inc., May 2022).
6. City of Toronto collection information obtained from Municipal website.
7. Region of Waterloo has two separate collection programs.
8. Automated collection excludes yard waste collection.

Of the programs summarized in Table 3, weekly collection of organics together with bi-weekly collection of garbage and leaf and yard waste is overwhelmingly the most popular collection frequency approach among Municipalities. Split body collection vehicles are the most popular vehicle body type used in Municipal programs regardless of the co-collection configuration (i.e., garbage/organics, recycling/organics, etc.). Manual waste collection is still the standard collection type among most Municipalities; however, more Municipalities are considering moving to automated collection when their existing collection contracts end or as their collection fleet is replaced.

4.2 Garbage Collection Frequency and Set-Out Limits

Municipal garbage collection frequency and set-out limit data was also gathered as part of this study. Lower garbage set-out limits and less frequent garbage collection (i.e., bi-weekly) have proven to drive participation in diversion programs particularly organics diversion programs. Most Ontario Municipalities that provide curbside organics collection also provide bi-weekly garbage collection and many have garbage set-out limits of 2-3 bags or containers bi-weekly. Collection programs with automated collection typically allow a set-out limit equivalent to the capacity of the cart with the lid fully closed.

Table 4 provides a summary of the garbage collection frequency and garbage set-out limits for some Ontario Municipalities that also provide organics collection.

Table 4: Summary of Garbage Collection Frequency and Set-Out Limits

Municipality	Collection Type	Garbage Collection Frequency	Garbage Set-Out Limit[1]
Barrie, City of	Manual	Bi-Weekly	2 Bags/Containers
Dufferin, County of	Manual	Weekly	1 Bag/Container
Durham, Region of	Manual	Bi-Weekly	4 Bags
Greater Sudbury, City of	Manual	Bi-Weekly	2 Bags/Containers
Guelph, City of	Automated	Bi-Weekly	240L, 360L Cart[2]
Halton, Region of	Manual	Bi-Weekly	3 Bags/Containers
Hamilton, City of	Manual	Weekly	1 Bag/Container
Kingston, City of	Manual	Weekly	1 Bag/Container
Markham, City of	Manual	Bi-Weekly	No Limit
Newmarket, Town of	Manual	Bi-Weekly	3 Bags
Niagara, Region of	Manual	Bi-Weekly	2 Bags/Containers
Northumberland, County of	Manual	Weekly	2 Bags
Orillia, City of	Manual	Bi-Weekly	20 Bags Annually[3]
Ottawa, City of	Manual	Bi-Weekly	6 Bags/Items
Peel, Region of	Automated	Bi-Weekly	120L, 240L, 360L Cart[2]
Richmond Hill, City of	Manual	Bi-Weekly	3 Bags/Containers
Simcoe, County of	Automated	Bi-Weekly	120L, 240L Cart[2]
St. Thomas, City of	Manual	Weekly	2 Bags/Containers
Thunder Bay, City of[4]	Automated	Bi-Weekly	2 Bags/Items
Toronto, City of	Automated	Bi-Weekly	75L, 120L, 240L, 360L Cart[2]
Vaughan, City of	Manual	Bi-Weekly	3 Bags/Containers
Waterloo, Region of	Manual	Bi-Weekly	3 Bags/Containers

Notes:

1. Set-out limits include “free” items. Additional bags/items may be set-out with the purchase of bag tags for most Municipalities.
2. Cart sizes are for Municipalities with automated collection. The set-out limit is typically cart capacity with a fully closed lid.
3. City of Orillia provides each household with 20 free bags tags annually. Additional bags may be set-out with the purchase of tags.
4. City of Thunder Bay information is based on their recommended collection program beginning in 2025 (City of Thunder Bay – Development of an Organics Diversion Program Implementation Plan, EXP Services Inc., May 2022).

Less frequent garbage collection and strict set-out limits have proven to successfully drive diversion program participation. As an example, the Region of Peel saw a 15% increase in their organics program participation rate

which increased from 35% to 50% within the first month of moving from weekly to bi-weekly garbage collection in 2016. Other Municipalities who have transitioned to bi-weekly garbage collection from weekly collection have also experienced positive increases in diversion program participation including:

- City of Greater Sudbury – 16% increase in organics diversion program participation after transitioning in 2021;
- Region of Waterloo – 150% increase in organics diversion program participation, 26% increase in yard waste diversion participation and a 5% increase in Blue Box recycling participation after transitioning in 2017; and
- Niagara Region – 24% increase in organics diversion program participation and 8% increase in Blue Box recycling participation after transitioning in 2021[4].

Bi-weekly garbage collection has increasingly become an acceptable standard in combination with organics collection as a significant proportion of household waste consists of organic material. Weekly collection of organics significantly reduces residual garbage volumes and also addresses the more odorous fraction of the waste stream, thereby making bi-weekly garbage collection more practical.

4.3 Organics Collection Frequency and Cart Sizes

Municipal organics collection frequency and organics cart size data was also collected and reviewed in this study. Almost all Ontario Municipalities collect organics every week and cart sizes typically vary based on the collection method (i.e., manual or automated). Note: all Municipal curbside organics programs use carts for curbside set-out in order to minimize nuisances such as odours, pests and wildlife.

Table 5 provides a summary of the organics collection frequency and cart sizes for some Ontario Municipalities that offer curbside collection.

[4] *EXP Services Inc., City of Thunder Bay: Development of an Organics Diversion Program Implementation Plan, May 9, 2022*

Table 5: Summary of Organics Collection Frequency and Cart Sizes

Municipality	Collection Type	Organics Collection Frequency	Organics Cart Size (Litres)
Barrie, City of	Manual	Weekly	46
Dufferin, County of	Manual	Weekly	46
Durham, Region of	Manual	Weekly	46
Greater Sudbury, City of	Manual	Weekly	46
Guelph, City of	Automated	Weekly	80
Halton, Region of	Manual	Weekly	46
Hamilton, City of	Manual	Weekly	46,120
Kingston, City of	Manual	Weekly	46,80
Markham, City of	Manual	Weekly	46
Newmarket, Town of	Manual	Weekly	46
Niagara, Region of	Manual	Weekly	46
Northumberland, County of	Manual	Weekly	46
Orillia, City of	Manual	Weekly	46
Ottawa, City of	Manual	Weekly	46,80
Peel, Region of	Automated	Weekly	100
Richmond Hill, City of	Manual	Weekly	46
Simcoe, County of	Automated	Weekly	120
St. Thomas, City of	Manual	Bi-Weekly	240[1]
Thunder Bay, City of[2]	Automated	Weekly	46,80[3]
Toronto, City of	Automated	Weekly	100
Vaughan, City of	Manual	Weekly	46
Waterloo, Region of	Manual	Weekly	46

Notes:

1. City of St. Thomas co-mingles organics and yard waste in 240 L organics cart (fall has separate collection of L&Y waste) AND is the only Municipality that collects organics bi-weekly.
2. City of Thunder Bay information is based on a recommended collection program beginning in 2025 (City of Thunder Bay – Development of an Organics Diversion Program Implementation Plan, EXP Services Inc., May 2022).
3. City of Thunder Bay's recommended organics cart size for manual collection is 46L and 80L for automated collection.

As shown in Table 5, Municipalities with manual organics collection typically use a smaller cart size of 46 litres. Cart sizes for Municipalities with automated collection range from 80 litres to 120 litres primarily to accommodate automated collection using mechanical arms. Cart sizes also vary based on the materials accepted within the cart as some programs allow for collection of limited amounts of leaf and yard waste within the organics cart.

The City of St. Thomas uses the largest organics cart size, 240 litres, and is the only Municipality that collects organics every other week. The larger cart size accommodates both the increased volume of organics from bi-weekly collection and the co-mingling of organics and leaf and yard waste. St. Thomas also has a separate leaf and yard waste collection in the fall to accommodate larger volumes.

5. Waste Collection Options and Evaluation Criteria

5.1 Waste Collection Frequency

5.1.1 Waste Collection Frequency Options

The approach taken to identify collection frequency options for each waste type was to initially develop a comprehensive list of options for consideration. As previously identified, the collection of blue box recyclables will become a producer responsibility in 2023 and has been excluded from consideration in this study.

Following the gathering of Municipal collection information, a screening level assessment of the comprehensive list was completed by AECOM and City staff which ultimately resulted in a final list of two options for detailed evaluation. The comprehensive list of options together with the results of the screening level assessment is summarized in Table 6 (note: shaded screening assessment values indicate a more favourable result).

Table 6: Comprehensive List of Waste Collection Frequency Options

Collection Frequency Option No.	Weekly Collection of Waste Stream	Bi-Weekly Collection of Waste Stream	Screening Assessment
1	Organics[1]	Garbage Yard Waste[2]	• Most popular approach among Municipalities (i.e., approach used by 12/20 Municipalities reviewed).
			• Weekly organics collection less likely to cause health/nuisance issues during summer months (i.e., insects, rodents, odours, etc.).
			• Higher diversion participation rates proven with bi-weekly garbage collection.
			• Bi-weekly garbage collection more cost efficient relative to weekly collection.
			• Volume of garbage reduced with SSO collected separately.
			• Existing garbage carts adequately sized for bi-weekly garbage collection.
			• Garbage with organics removed should not generate significant nuisance impacts (eg. odours, pests) over the longer storage period.
			• Bi-weekly L&Y waste collection more cost efficient relative to weekly collection. L&Y waste creates no significant nuisances over a two-week storage period.
2	Organics[1] Garbage	Yard Waste[2]	• Approach used by 1/20 Municipalities reviewed.
			• Weekly organics collection less likely to cause health/nuisance issues during summer months (i.e., insects, rodents, odours, etc.).
			• Lower diversion participation rates proven with weekly garbage collection.
			• Weekly garbage collection less cost efficient relative to bi-weekly collection.
			• Bi-weekly L&Y waste collection more cost efficient relative to weekly collection. L&Y waste creates no significant nuisances over a two-week storage period.

Collection Frequency Option No.	Weekly Collection of Waste Stream	Bi-Weekly Collection of Waste Stream	Screening Assessment
3	Organics[1] Yard Waste[2]	Garbage	• Approach used by 3/20 Municipalities reviewed.
			• Weekly organics collection less likely to cause health/nuisance issues during summer months (i.e., insects, rodents, odours, etc.).
			• Higher diversion participation rates proven with bi-weekly garbage collection.
			• Bi-weekly garbage collection more cost efficient relative to weekly collection.
			• Volume of garbage reduced with SSO collected separately.
			• Existing garbage carts adequately sized for bi-weekly garbage collection.
			• Garbage with organics removed should not generate significant nuisance impacts (eg. odours, pests) over the longer storage period.
			• Weekly L&Y waste collection less cost efficient relative to bi-weekly collection of L&Y waste.
4	Garbage	Organics Yard Waste[2]	• Approach used by 1/20 Municipalities reviewed.
			• Bi-weekly organics collection more likely to cause health and nuisance issues during summer months (i.e., insects, rodents, odours, etc.).
			• Lower diversion participation rates proven with weekly garbage collection.
			• Weekly garbage collection less cost efficient relative to bi-weekly collection.
			• Bi-weekly L&Y waste collection more cost efficient relative to weekly collection. L&Y waste creates no significant nuisances over a two-week storage period.
5	Organics[1] Garbage Yard Waste[2]	-	• Approach used by 2/20 Municipalities reviewed.
			• Weekly organics collection less likely to cause health/nuisance issues during summer months (i.e., insects, rodents, odours, etc.).
			• Lower diversion participation rates proven with weekly garbage collection.
			• Weekly garbage collection less cost efficient relative to bi-weekly collection.
			• Weekly L&Y waste collection less cost efficient relative to bi-weekly collection of L&Y waste.

Notes:
1. Option for bi-weekly organics collection during winter months.
2. L&Y waste collection during the growing season only.

The option to shift to bi-weekly organics collection during the winter months was presented to City staff for Option No's. 1, 2, 3 and 5 as some northern communities with colder climates collect organics on a weekly basis during the warmer months and bi-weekly during the winter months. Calgary and Edmonton are two examples of northern communities that collect organics weekly from April to October and bi-weekly from November to March each year. The City of St. Thomas is the only Ontario Municipality reviewed in this study that currently collects organics bi-weekly for the entire calendar year. Bi-weekly organics collection during the winter months was excluded by City staff citing resident complaints and possible confusion with an alternate collection schedule.

Based on the results summarized in Table 6 and further vetting with City staff, collection frequency Options No.1 and No. 2 were carried forward for further evaluation. Although collection frequency Option No. 3 had more favourable results in the screening assessment than Option No. 2, it was agreed that weekly collection of leaf and yard waste was not a suitable option due to low collection volumes during the summer months. Option No. 3 was therefore excluded from further review.

5.1.2 Waste Collection Frequency Evaluation Criteria

Evaluation criteria were identified and vetted with City staff and the criteria adopted. The results of the evaluation are summarized in Table 7 (note: more favourable evaluation results received a score of 1 and less favourable evaluation results received a score of 0).

Table 7: Collection Frequency Evaluation

Criteria	Description	Evaluation Results	
		Option No. 1	Option No. 2
Health and Safety	Consideration of the Health and Safety of residents.	• Less potential to attract insects, rodents, wildlife, etc. with weekly organics – ***Score 1*** • Fewer waste carts to set out curbside over a two-week period – ***Score 1*** • Larger volume of bi-weekly garbage to set out curbside – ***Score 0***	• Less potential to attract insects, rodents, wildlife, etc. with weekly organics – ***Score 1*** • More waste carts to set out curbside over a two-week period – ***Score 0*** • Smaller volume of weekly garbage to set out curbside – ***Score 1***
Convenience/ Nuisance/ Acceptability	Consideration of nuisances, convenience and acceptability of ratepayers.	• Less potential to cause offensive odours with weekly organics – ***Score 1*** • Bi-weekly L&Y creates no significant nuisances – ***Score 1*** • More convenient to set out fewer waste carts curbside over a two-week period – ***Score 1*** • Change to existing garbage collection schedule and less acceptance from residents – ***Score 0*** • More potential for illegal dumping of garbage with bi-weekly garbage – ***Score 0*** • More potential for cart overflow with bi-weekly garbage – ***Score 0***	• Less potential to cause offensive odours with weekly organics – ***Score 1*** • Bi-weekly L&Y creates no significant nuisances – ***Score 1*** • Less convenient to set out more waste carts curbside over a two-week period – ***Score 0*** • No change to existing garbage collection schedule and more acceptance from residents – ***Score 1*** • Less potential for illegal dumping of garbage with weekly garbage – ***Score 1*** • Less potential for cart overflow with weekly garbage – ***Score 1***

Criteria	Description	Evaluation Results	
		Option No. 1	Option No. 2
Environmental Impact	Potential impacts to the environment from collection vehicles.	• Potential for fewer collection vehicles on the road[1] which reduces Green House Gas (GHG) emissions – ***Score 1***	• Potential for more collection vehicles on the road[1] which increases Green House Gas (GHG) emissions – ***Score 0***
Participation Rates/ Diversion Targets	Potential impacts to participation in the diversion programs (i.e., organics, recycling) and meeting Provincial diversion targets.	• More likely to increase participation in the organic's diversion program with weekly organics – ***Score 1*** • More likely to increase participation in all diversion programs with bi-weekly garbage – ***Score 1*** • More likely to help City meet Provincial diversion targets with bi-weekly garbage – ***Score 1***	• More likely to increase participation in the organic's diversion program with weekly organics – ***Score 1*** • Less likely to increase participation in all diversion programs with weekly garbage – ***Score 0*** • Less likely to help City meet Provincial diversion targets with weekly garbage – ***Score 0***
Existing Norms	Consideration of what other Municipalities are doing and how it's working.	• Most popular approach among Municipal programs reviewed (i.e., 12/20 Municipalities) - ***Score 1***	• Less popular approach among Municipal programs reviewed (i.e., 1/20 Municipalities) – ***Score 0***
Labour Resources	Challenges in attracting and retaining labour resources.	• Fewer operations staff required with fewer collection vehicles in use (i.e., drivers)[1] – ***Score 1***	• More operations staff required with more collection vehicles in use (i.e., drivers)[1] – ***Score 0***
Costs	Capital, operating and maintenance cost considerations.	• Trucks on road for a shorter period of time during week 2 resulting in a modest O&M cost savings – ***Score 1*** • Bi-weekly L&Y waste is more cost efficient relative to weekly collection – ***Score 1***	• Trucks on road for a longer period of time during week 2 resulting in modestly higher O&M costs – ***Score 0*** • Bi-weekly L&Y waste is more cost efficient relative to weekly collection – ***Score 1***

Notes:
1. Will depend on collection implementation approach.

Based on the above noted evaluation, collection frequency Option No. 1 received a score of 13 and Option No. 2 received a score of 9. Therefore, the preferred waste collection frequency option is Option No. 1 which includes weekly organics collection and bi-weekly garbage and leaf and yard waste collection.

5.2 Waste Collection Implementation

5.2.1 Waste Collection Implementation Options

The approach taken to identify collection implementation options for each waste type was to initially develop a comprehensive list of options for consideration based on the preferred collection frequency option. Following the gathering of Municipal collection information, a screening level assessment of the comprehensive list was completed by AECOM and City staff which ultimately resulted in a final list of two options for detailed evaluation.

The comprehensive list of options together with the results of the screening level assessment is summarized in Table 8 (note: shaded screening assessment values indicate a more favourable result).

Table 8: Comprehensive List of Waste Collection Implementation Options

Collection Approach Option No.	Description	Trucks Required	Week 1 Collection	Week 2 Collection	Screening Assessment
1	Single Body Vehicles (Automated with Dual Arms)	8 Single Body Vehicles - 2 duty trucks for three routes/day - 1 L&Y - 1 spare	**Winter (6 Trucks)** • Truck A – Organics – 3 Trucks; • Truck B – Garbage – 3 Trucks **Spring/Summer/Fall (8 Trucks)** • Truck A – Organics – 3 Trucks; • Truck B – Garbage – 3 Trucks; • Truck C – L&Y – 2 Trucks (includes supplementary truck for L&Y for busy spring/fall period)	**Winter (3 Trucks)** • Truck A – Organics – 3 Trucks **Spring/Summer/Fall (5 Trucks)** • Truck A – Organics – 3 Trucks; • Truck B – L&Y – 2 Trucks (includes supplementary truck for L&Y for busy spring/fall period)	• Same vehicle/body type for all collection vehicles which is more preferred. • All organic and garbage collection can be accomplished with automated arms which is more preferred. • Option to co-collect organics and L&Y during slower growth period. • Less cost efficient with more collection vehicles required. • Less cost efficient with more labour resources required. • More vehicles on the road relative to Option 1 resulting in more environmental impacts/GHG emissions. • No spare collection vehicle during busy L&Y collection period in the spring and fall (i.e., approx. 12 weeks annually).
2	Split Body Vehicles (Automated with Single Arm and Cart Tipper)	5 Split Body Vehicles - 1 duty truck for three routes/day - 1 L&Y - 1 spare	**Winter (3 Trucks)** • Truck A – Organics/Garbage – 3 Trucks **Spring/Summer/Fall (5 Trucks)** • Truck A – Organics/Garbage – 3 Trucks; • Truck B – L&Y – 2 Trucks (includes supplementary truck for L&Y for busy spring/fall period)	**Winter (3 Trucks)** • Truck A – Organics/empty – 3 Trucks **Spring/Summer/Fall (5 Trucks)** • Truck A – Organics/empty – 3 Trucks; • Truck B – L&Y – 2 Trucks (includes supplementary truck for L&Y for busy spring/fall period)	• Same vehicle/body type for all collection vehicles which is more preferred. • Collection on left side of one-way streets requires use of cart tipper which is less preferred. • Option to co-collect organics and L&Y during slower growth period. • More cost efficient with less collection vehicles required. • Less cost efficient with additional staff resources required (i.e., two staff required on one-way streets).

Collection Approach Option No.	Description	Trucks Required	Week 1 Collection	Week 2 Collection	Screening Assessment
					• Fewer vehicles on the road relative to Option 1 resulting in less environmental impacts/GHG emissions.
					• No spare collection vehicle during busy L&Y collection period in the spring and fall (i.e., approx. 12 weeks annually).
3	Split Body Vehicles (Automated with Single Arm but can be equipped with cart tippers on the left side for added flexibility and redundancy) + Single Body Vehicles (Automated with Dual Arms) .	3 Split Body Vehicles + 2 Single Body Vehicles - 1 duty truck (split body) for three routes/day = 3 trucks - 1 Organics + L&Y (single body) - 1 Garbage + L&Y/spare (single body)	**<u>Winter (likely 3-4 Trucks)</u>** <u>Tuesday Collection:</u> • Truck A – Organics – 1 **Single** Body Truck (one-way streets or just left side of one-way streets); • Truck B – Garbage – 1 **Single** Body Truck (one-way streets or just left side of one-way streets); • Truck C – Organics/Garbage – 2 **Split** Body Trucks (two-way streets) <u>All Other Collection Days:</u> • Truck A – Organics/Garbage – 3 **Split** Body Trucks **<u>Spring/Summer/Fall (5 Trucks)</u>** <u>Tuesday Collection:</u> • Truck A – Organics + L&Y – 1 **Single** Body Truck (just left side of one-way streets AND return after dumping to collect L&Y all routes); • Truck B – Garbage + L&Y – 1 **Single** Body Truck (just left side of one-way streets AND return	**<u>Winter (3 Trucks)</u>** <u>Tuesday Collection:</u> • Truck A – Organics – 1 **Single** Body Truck (one-way streets or just left side of one-way streets); • Truck B – Organics – 2 **Split** Body Trucks (two-way streets) or use combination single and split body trucks <u>All Other Collection Days:</u> • Truck A – Organics/empty – 3 **Split** Body Trucks or use combination single and split body trucks **<u>Spring/Summer/Fall (5 Trucks)</u>** <u>Tuesday Collection:</u> • Truck A – Organics + L&Y – 1 **Single** Body Truck (just left side of one-way streets AND return after dumping to collect L&Y all routes); • Truck B – Organics – 2 or 3 **Split** Body Trucks (two-way streets right side of one-way streets);	• Different vehicle/body types required which is less preferred. • All organic and garbage collection can be accomplished with automated arms which is more preferred. • Option to co-collect organics and L&Y during slower growth period. • More cost efficient with less collection vehicles required. • Most cost efficient in terms of labour resource requirements. • Fewer vehicles on the road relative to Option 1 resulting in less environmental impacts/GHG emissions. • No spare collection vehicle during busy L&Y collection period in the spring and fall (i.e, approx. 12 weeks annually).

Collection Approach Option No.	Description	Trucks Required	Week 1 Collection	Week 2 Collection	Screening Assessment
			after dumping to collect L&Y all routes) • Truck C – Organic/Garbage – 2 or 3 **Split** Body Trucks (two-way streets and right side of one-way streets) *No spare on Tuesdays if 3 split body trucks are in use. <u>All Other Collection Days:</u> • Truck A – Organics/Garbage – 3 **Split** Body Trucks • Truck B – L&Y – 2 **Single** Body Trucks (includes supplementary truck for busy spring/fall period)	• Truck C – L&Y – 1 **Single** Body Truck *No spare on Tuesdays if 3 split body trucks are in use. <u>All Other Collection Days:</u> • Truck A – Organics/empty – 3 **Split** Body Trucks or use combination single and split body trucks; • Truck B – L&Y – 2 **Single** Body Trucks (includes supplementary truck for busy spring/fall period)	

Notes:

1. Assumes automated collection of organics and garbage and manual collection of L&Y for all options.
2. Assumes all vehicle types can accommodate manual collection of L&Y.
3. During the slow growth period (approx. mid-June to early to mid-October), L&Y waste may be co-collected/co-mingled with organics (consideration should be given to adding a right-hand cab conversion to any collection vehicles that are used for this purpose).
4. No spare collection vehicle for approximately 12 weeks during L&Y spring and fall collection. Periodic overtime may be required.

The option to shift to co-collection of leaf and yard waste with organics within the core City collection area during the slow growth period (i.e., mid-June to early to mid-October) for all three implementation options was presented to City staff. This would include mixing leaf and yard waste with organics in single body collection vehicles under Option No. 1 and mixing leaf and yard waste with organics or co-collecting in separate truck compartments for Option No. 2 and Option No. 3. A detailed evaluation of commingling leaf and yard waste and organics was not considered in this study as SSO processing typically involves controlling feedstock mix proportions at the processing facility in order to produce a quality compost product. It is recommended that the City complete a separate review or pilot study should they wish to consider commingling organics and leaf and yard waste in the future.

In addition, should the City choose to co-collect leaf and yard waste with organics and/or use a single staff person to collect leaf and yard waste during the slow growth period, consideration should be given to altering any collection vehicles that would be used for this purpose to a right-hand cab conversion which has a lower step of 16 to 18” and a right side bifold door for safer exiting.

Based on the results summarized in Table 8 and further vetting with City staff, collection implementation Options No. 2 and No. 3 were carried forward for a detailed evaluation. Option 1 was excluded from further consideration primarily based on the higher capital and operating costs and increased environmental impacts with more collection vehicles on the road.

At the time of implementation, the City should revise and optimize their waste collection routes based on the preferred implementation option, available equipment and staffing resources.

5.2.2 Waste Collection Implementation Evaluation Criteria

Evaluation criteria were identified and vetted with City staff and the criteria adopted. The results of the evaluation are summarized in Table 9 (note: more favourable evaluation results received a score of 1 and less favourable evaluation results received a score of 0).

Table 9: Collection Implementation Evaluation

Criteria	Description	Evaluation Results	
		Option No. 2	Option No. 3
Environmental Impact	Potential impacts to the environment from collection vehicles.	• Potential for fewer collection vehicles on the road which reduces Green House Gas (GHG) emissions – ***Score 1***	• Potential for more collection vehicles on the road which increases Green House Gas (GHG) emissions – ***Score 0***
Existing Norms	Consideration of what other Municipalities are doing and how it's working.	• Most Municipalities surveyed use split body vehicles for co-collection – ***Score 1*** • All Municipal programs surveyed utilize a combination of split body and single body collection vehicles – ***Score 0***	• Most Municipalities surveyed use split body vehicles for co-collection – ***Score 1*** • All Municipal programs surveyed utilize a combination of split body and single body collection vehicles – ***Score 1***
Labour Resources	Challenges in attracting and retaining labour resources.	• Potential for more staff resources required for collection in the downtown core using split body with cart tippers (i.e., two staff per vehicle) – ***Score 0***	• Potential for less staff resources required for collection in the downtown core during week 2 using single body with dual arms (i.e., one staff per vehicle) – ***Score 1***
Costs	Capital, operating and maintenance cost considerations.	• Similar capital expenditure for purchase of 5 split body vehicles compared to hybrid model of 3 split and 2 single body vehicles ($2.5M in 2023 $'s) – ***Score 0*** • Similar operating costs expected – ***Score 0***	• Similar capital expenditure for hybrid model of 3 split and 2 single body vehicles compared to 5 split body vehicles ($2.5M in 2023 $'s) – ***Score 0*** • Similar operating costs expected – ***Score 0***

For the purposes of assessing the various options, City staff contacted a waste collection vehicle manufacturer for budget pricing to assist with the evaluation of options. The values used are intended to allow comparisons of options and should not be used for future budgeting purposes as costs can vary based on various options and configurations selected.

Based on the above noted evaluation, collection implementation Option No. 2 received a score of 2 and Option No. 3 received a score of 3. Therefore, the preferred waste collection implementation option is Option No. 3.

5.3 Other Collection Considerations

Additional collection implementation considerations that were evaluated previously or as part of this study are summarized in the following subsections.

5.3.1 Hybrid Collection Approach (City and Contractor)

A curbside waste collection services cost comparison study was completed by AECOM in 2015 which concluded that there was a modest difference in cost between a hybrid collection model (combined City and Contractor collection) and full Contractor collection. In addition, the study also identified several other non-financial benefits that exist to using a hybrid collection model.

The estimated waste collection annual "true" cost per stop was estimated at $36.62 which compares to the 2015 contracted annual cost per stop being paid to the Contractor of $33.70 inclusive of the non-refundable portion of the HST. When considering the potential cost savings under a fully contracted model, the relevant City cost is $34.96 relative to the contract cost of $33.70 resulting in a potential modest savings of approximately $16,900 annually.

Although travel distances were not quantified for this comparison, it is evident that the total distance travelled per stop within the City collection area is less than the total distance travelled per stop in the contracted area. The increased travel distance may result in greater disparity between the City and Contracted costs as the increased distance per stop may impact operation and maintenance costs, capital costs and labour costs.

Conversely, within the City collection area there are added complexities with collection particularly within the downtown core. There are challenges in gaining access to set-out areas which results in increased collection time. These complexities may offset, in part, the extra costs associated with the increased travel distances noted above. Under the current operating model, the Contractor collects approximately 54% of the total stops and the City collects approximately 46% of the stops. There is the potential that many of the estimated City cost items may not increase or may not increase substantially if there was a more even split in the number of stops made.

It is also recognized that there is some duplication of costs in having two organizations carry out the same service. If the entire service was contracted to a Contractor the overall cost per stop may decrease moderately as a result of economies of scale and operational efficiencies that may be achieved. For example, the supervisory costs would not likely double if the Contractor took on twice as many stops. As a further observation, under the current operating model, both the Contractor and City are required to stock and maintain a spare collection vehicle. Under a single service provider model there may only be a need for one spare vehicle for the entire service area.

In addition to cost considerations, an article published in Solid Waste and Recycling magazine identified the following potential non-financial benefits of maintaining both private and public waste collection services:

1. Redundancy of service provides for contingency planning. As an example the City would be well-positioned to address a labour disruption.
2. Establishes a competitive environment. Knowing the municipality can potentially expand its own services to collect within the entire service area may result in more competitive pricing from the private sector. Similarly, it also provides a cost control measure for the public sector in order to remain competitive.
3. The split model reduces the risk of a future private sector monopoly which may be more important in Sault Ste. Marie given our relative remote location and limited capable service providers.
4. Less complacency and encourages continuous improvement. The public service provider can learn best management practices from the private service provider and vice versa.
5. Municipal staff have a good understanding of the business which assists with its own collection services and also in administering the contract with the private sector.

Although the above evaluation was completed for the collection of the garbage waste stream only, the results would essentially be unchanged with the addition of the organics waste stream. It is recommended that the City continue using the hybrid waste collection model when curbside organics collection is implemented.

The City will be required to modify the existing contract with GFL to accommodate collection of the organics waste stream as the current waste collection contract is in effect until June 2027. The City has several options for the collection of organics within the contracted collection from the time that organics collection is initiated (i.e., 2025 or 2026) until the time that the existing waste collection contract comes to an end in June 2027. The options include the following:

1. Issue a contemplated change order to GFL to obtain pricing to add SSO collection to their existing collection area. If the pricing received is reasonable the City could elect to award the extra work to GFL as a change order to their existing contract.
2. If the pricing received from GFL is not reasonable the City could elect to issue a public tender for this work.
3. As a third option, the City could potentially collect organics across the entire City for the interim period until the next collection contract is tendered.

5.3.2 Hybrid Collection Approach Based on Material Division

A hybrid approach to collection based on material division was also reviewed by AECOM and City staff (e.g. full City collection of one waste stream and full Contractor collection of another waste stream). It was identified during the review that this approach would be similar to Implementation Option No. 1 (Table 8) where eight collection vehicles would be required by the City and would therefore be less cost efficient. This would also require both City and Contractor collection in the difficult downtown core (narrow alleys and one-way streets) which is less preferred.

Furthermore, the current garbage collection contract with GFL (ending in June 2027) does not align well with the implementation of curbside organics collection in 2025. It was agreed that a collection implementation option based on the division of materials would not be suitable and therefore was not considered in this study.

5.3.3 Automated vs. Manual Waste Collection

There are several benefits to employing automated waste collection including improved collection efficiency and operational cost savings. However, the most important benefit to implementing or maintaining automated collection is the significant reduction in worker injuries. Automated collection has proven to significantly improve the health and safety of collection workers by minimizing repetitive strain injuries, exposure to sharps (i.e., broken glass and needles), slips and falls, traffic incidents, etc. In addition, there is significant cost savings to Municipalities associated with reduced worker injuries (e,g, reduced WSIB claim costs, insurance costs, replacement labour costs, etc.).

As previously noted, the City successfully implemented automated recycling collection in 2013 and automated garbage collection in 2019. Early in this study, City staff confirmed their commitment to automated collection for garbage and organics, based on the numerous benefits noted above. Therefore, manual waste collection of garbage and organics was not considered in this study. It should be noted that continuing with a fully automated collection system will require the City to implement automated organics collection which will require the purchase of organics waste carts.

5.3.4 Automated Vehicle Equipment

Currently the City utilizes some waste collection vehicles with cart tippers on the left-hand side for collection on the left side of one-way streets. The City expressed concern with the safety of tippers as the 360 L multi-family waste collection bins occasionally fall from the cart tipper and can pose a danger to operations staff. City staff expressed a preference for mechanical arms on both sides in lieu of a mechanical arm on the right side and cart tipper on the left side. Based on input from equipment vendors, split body vehicles can only be equipped with cart tippers on the

left side and mechanical arms on the right side. Therefore, this study allows for dual arms on all single body collection vehicles and a single arm and cart tipper on all split body collection vehicles.

5.3.5 Electric/Alternative Fuel Collection Vehicles

The City has made a commitment to reduce its carbon footprint by reducing Green House Gas (GHG) emissions and achieve a goal of net zero GHG emissions by 2050. This goal is to be achieved through a staged approach beginning with a 10% corporate and 5% community reduction target between 2020 and 2030 and further increased reduction targets between 2030 and 2050.[5] The City's GHG Reduction Action Plan (FutureSSM, December 2020) includes the following zero-emissions transportation objectives:

- support transportation electrification infrastructure opportunities such as electric vehicles and charging stations;
- transition to only purchasing vehicles that are highly efficient and run on zero-carbon and renewable energy fuels;
- support transportation electrification opportunities such as electric vehicles, alternative energy vehicles, buses, etc.;
- develop and/or commission a community zero-emission vehicle strategy; and
- update the Green Fleet Plan (2011).

As electric and alternative fuel waste collection vehicles are in their infancy, the purchase cost is significantly higher than traditional diesel waste collection vehicles. The cost of a new electric waste collection truck is estimated to be in the range of 1.6 to 2 times greater than a diesel truck.[6] Based on the condition of its existing fleet coupled with the fleet changes required to accommodate SSO collection, the City will require five (5) new collection vehicles over the next three years totalling an investment of approximately $2.5M in 2023 $'s (assuming diesel trucks are purchased). Given this forthcoming sizable investment and the current disparity in vehicle pricing it is not likely practical for the City to pursue purchasing electric or alternative fuel vehicles for its next waste management collection fleet. In addition, the City has not yet fully outfitted it's facilities with the infrastructure required to support electric and/or alternative fuel vehicles which would be another significant added cost. Furthermore, specific technical expertise and specialized training is required to repair and maintain electric vehicles. The City does not currently have any trained electric vehicle technicians on staff.

Based on the City's commitment to reduce GHG emissions, the purchase of electric and/or alternative fuel waste collection vehicles was considered at a high level in this study. However, as the City is in the early stages of it's GHG emissions reduction efforts, supporting infrastructure (eg. charging stations) and repair technicians are not yet in place to maintain zero emissions vehicles, and the acquisition of electric/alternative fuel vehicles is currently cost prohibitive, procuring electric/alternative fuel waste collection vehicles should not be considered at this time. Since collection vehicles have a relatively short service life (i.e., approximately 7 years), it was concluded that further consideration should be given to transitioning to electric and/or alternative fuel vehicles through the City's next fleet replacement cycle. This will also align with the latter stages of the City's net zero GHG emissions reduction target efforts.

In the interim, the City has specifically focussed its preferred waste collection system to reduce vehicle trips/distance travelled by utilizing, where feasible, split body trucks to collect two waste streams concurrently with one vehicle. This contributes to fewer collection vehicles on the road and assists with reducing GHG emissions.

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[5] *FutureSSM, Sault Ste. Marie Community Greenhouse Gas Reduction Plan 2020-2030, December 14, 2020*

[6] *Cole Rosengren, Electric Refuse Trucks on the Road or on the way in Rising Number of States, WasteDive, March 6, 2020 updated March 9, 2020, https://www.wastedive.com/news/electric-refuse-trucks-byd-lion-mack-dsny-ecomaine/573352/*

6. Conclusions

6.1 Preferred Waste Collection Frequency Option

The preferred waste collection frequency option is Option No. 1 which includes of the following:

- Weekly collection of Organics;
- Bi-weekly collection of Garbage; and
- Bi-weekly Leaf and Yard waste throughout the growing season.

Weekly collection of organic waste is preferred as organic waste is odourous and creates the greatest nuisance challenges (i.e., pests and wildlife). Weekly organics collection not only reduces those nuisances but also helps increase participation in the program by reducing storage time between collection cycles. Furthermore, almost all Municipal organics collection programs reviewed in this study provide weekly collection to residents.

Bi-weekly collection of garbage is important to drive participation in the organics and Blue Box diversion programs as has been evidenced by other Municipalities. In 2019 when the City transitioned to automated garbage collection, the 240L garbage cart was specifically selected to accommodate bi-weekly collection of garbage in anticipation of the transition to curbside SSO collection. This cart size is consistent with other Ontario Municipal set-out limits where SSO is included in their waste management programs. Combined with organics collection there is less residual household garbage each week making bi-weekly garbage collection the preferred frequency option for this waste stream. In addition, with the organics fraction removed from the garbage a two-week storage period should not result in significant nuisances (i.e. odour, pests and wildlife).

Bi-weekly leaf and yard waste collection during the growing season (i.e., May-November) continues to be the most preferred frequency option for this waste stream as it is more cost efficient relative to weekly collection and curbside set-out volumes during the slow growth season (i.e., mid-June to early to mid-October) do not warrant weekly collection. Furthermore, leaf and yard waste creates no significant nuisances over a two-week storage period.

6.2 Preferred Waste Collection Implementation Option

The preferred waste collection implementation option is Option No. 3 which includes the following:

- 3 split body vehicles - automated with single arm on right and cart tipper on left (note: split body collection vehicles cannot accommodate automated arms on both sides of the vehicle)
    - 1 duty truck (split body) for three routes/day
- 2 single body vehicles - automated with dual arms (left and right)
    - 1 Organics + L&Y (single body)
    - 1 Garbage + L&Y/spare (single body)

Three automated split body vehicles are required for the co-collection of garbage and organics for three collection routes per day. Automated arms are required on the right-hand side of the collection vehicle for garbage and organics collection on both sides of all two-way streets and on the right side of one-way streets. Cart tippers are required on the left-hand side of each vehicle for collection of both waste streams on the left side of one-way streets in the downtown core. Although the single body vehicles will be the preferred collection vehicle for the one-way streets in the downtown core, the addition of cart tippers on the left-hand side of all split body vehicles will provide some redundancy to address down time for the single body vehicles.

Two automated single body vehicles with dual arms (i.e., one on each side of vehicle) are required for the independent collection of organics and garbage primarily on one-way streets in the downtown core. These vehicles will also be used for manual leaf and yard waste collection and as spare collection vehicles.

Staffing is expected to remain unchanged with one staff member required for organics and garbage collection for all routes except the downtown core where two staff are required. Staffing for leaf and yard waste collection is also expected to remain unchanged with two staff per collection vehicle.

The proposed two-week collection model for the preferred implementation option is noted below. It is recommended that the City revise and optimize waste collection routes based on the preferred implementation option, available equipment and staffing resources.

Week 1 Collection Model:

Winter (likely 3-4 Trucks)

Tuesday Collection:

- Truck A – Organics – 1 **Single** Body Truck (one-way streets or just left side of one-way streets);
- Truck B – Garbage – 1 **Single** Body Truck (one-way streets or just left side of one-way streets);
- Truck C – Organics/Garbage – 2 **Split** Body Trucks (two-way streets).

All Other Collection Days:

- Truck A – Organics/Garbage – 3 **Split** Body Trucks.

Spring/Summer/Fall (5 Trucks)

Tuesday Collection:

- Truck A – Organics + L&Y – 1 **Single** Body Truck (just left side of one-way streets AND return after dumping to collect L&Y all routes);
- Truck B – Garbage + L&Y – 1 **Single** Body Truck (just left side of one-way streets AND return after dumping to collect L&Y all routes);
- Truck C – Organic/Garbage – 2 or 3 **Split** Body Trucks (two-way streets and right side of one-way streets).

*No spare on Tuesdays if 3 split body trucks are in use.

All Other Collection Days:

- Truck A – Organics/Garbage – 3 **Split** Body Trucks;
- Truck B – L&Y – 2 **Single** Body Trucks (includes supplementary truck for busy spring/fall period).

Week 2 Collection Model:

Winter (3 Trucks)

Tuesday Collection:

- Truck A – Organics – 1 **Single** Body Truck (one-way streets or just left side of one-way streets);
- Truck B – Organics – 2 **Split** Body Trucks (two-way streets) or use combination single and split body trucks.

All Other Collection Days:

- Truck A – Organics/empty – 3 **Split** Body Trucks or use combination single and split body trucks.

Spring/Summer/Fall (5 Trucks)

Tuesday Collection:

- Truck A – Organics + L&Y – 1 **Single** Body Truck (just left side of one-way streets AND return after dumping to collect L&Y all routes);
- Truck B – Organics – 2 or 3 **Split** Body Trucks (two-way streets right side of one-way streets);
- Truck C – L&Y – 1 **Single** Body Truck.

*No spare on Tuesdays if 3 split body trucks are in use.

All Other Collection Days:

- Truck A – Organics/empty – 3 **Split** Body Trucks or use combination single and split body trucks;
- Truck B – L&Y – 2 **Single** Body Trucks (includes supplementary truck for busy spring/fall period).

Appendix A

City and Contractor Garbage Collection Mapping

AECOM

City Garbage Collection Mapping

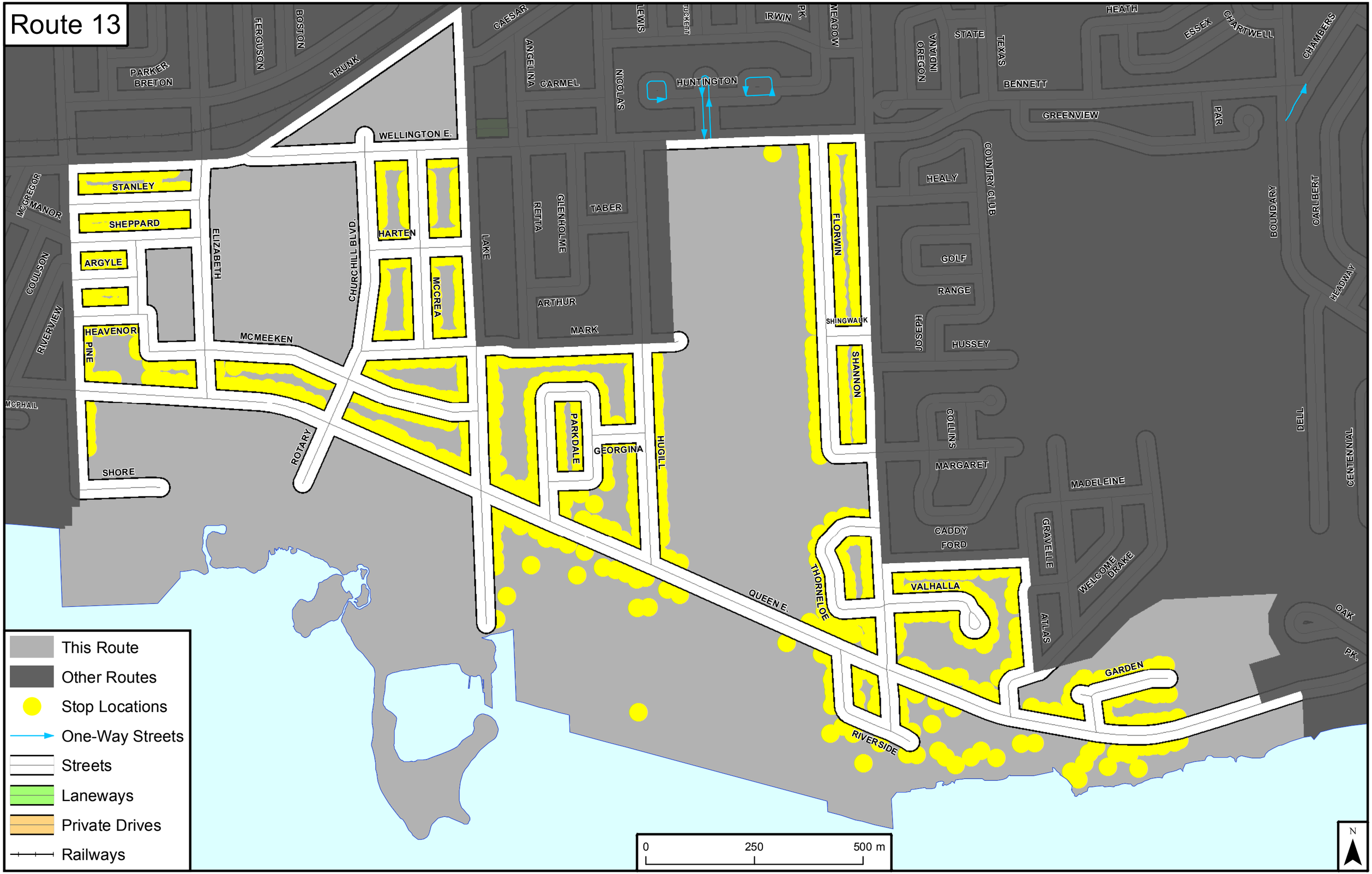
Route 11


S. MARKET
MARKET
ARIZONA
SILVER
BIRCH
TRUNK
OHIO
CAPP
CLEMENT
LEWIS
INDIANA
IDAHO
TEXAS
MEADOW PK.
LORRAINE
ILLINOIS
STATE
IRWIN
OREGON
BENNETT
HUNTINGTON
WELLINGTON E.
CAMBRIDGE
SUTTON
CHARTWELL
EASTERN
BRISTOL
ELAINE
HEATH
ESSEX
BOUNDARY
CHAMBERS
GREENVIEW
PAR
HEALY
COUNTRY CLUB
GOLF RANGE
FLORWIN
SHANNON
SHINGWAUK
JOSEPH
HUSSEY
CARLBERT
HEADWAY
CADDY
COLLINS
MARGARET
FORD
MADELEINE
ATLAS
GRAVELLE
WELCOME
DRAKE
VALHALLA
DELL
OAK PK.
GARDEN
This Route
Other Routes
Stop Locations
One-Way Streets
Streets
Laneways
Private Drives
Railways
0
250
500 m
N

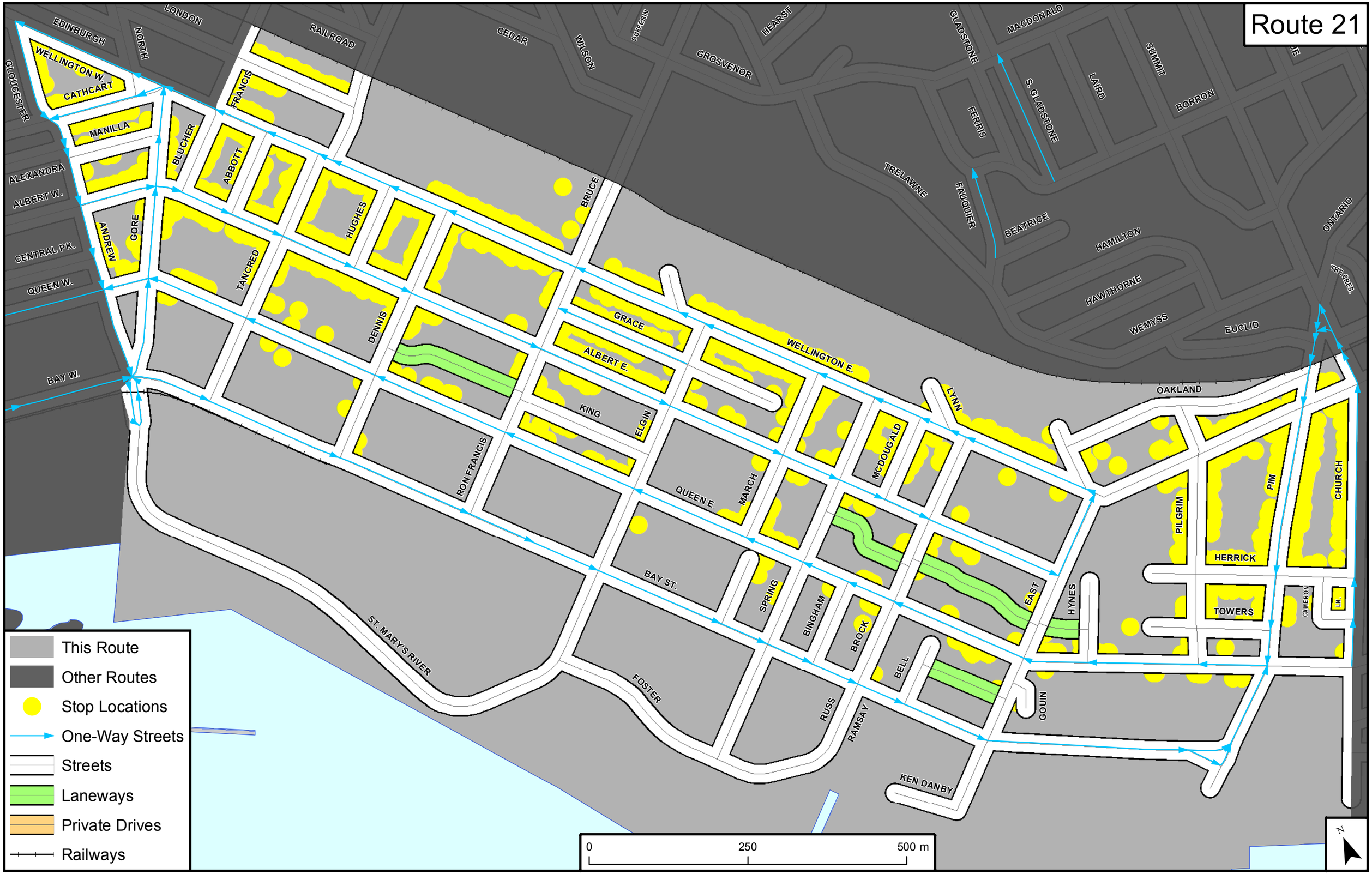
Route 12


MOLOCH
BIRCHLAND
WIRELESS
MARCONI
FIELDS
DANBY
RAVINA
NOSSIS
ORION
BLACK
McNABB
PARKER
ELIZABETH
FERGUSON
BOSTON
CREERY
KINGSMOUNT
BURTON
FAIRMOUNT
MACDONALD
BRETON
TRUNK
LAKE
CAESAR
LEWIS
CAPP
CLEMENT
OHIO
ARIZONA
SILVER
BIRCH
S. MARKET
TUCKETT
ANGELINA
CARMEL
NICOLAS
IRWIN
LORRAINE
MEADOW PK.
SHANNON
INDIANA
IDAHO
TEXAS
ILLINOIS
OREGON
STATE
HUNTINGTON
WELLINGTON E.
CHURCHILL BLVD.
HARTEN
RETTA
GLENHOLME
TABER
ARTHUR
HUGILL
MARK
PARKDALE
FLORWIN
COUNTRY
CLUB
GREENVIEW
BENNETT
HEATH
ESSEX
CHARTWELL
BOUNDARY
BRISTOL
SUTTON
CAMBRIDGE
This Route
Other Routes
Stop Locations
One-Way Streets
Streets
Laneways
Private Drives
Railways
0
250
500 m
N

Route 13


PARKER
BRETON
FERGUSON
BOSTON
TRUNK
CAESAR
ANGELINA
CARMEL
LEWIS
NICOLAS
TUCKETT
IRWIN
PK.
MEADOW
HUNTINGTON
OREGON
INDIANA
STATE
TEXAS
BENNETT
HEATH
ESSEX
CHARTWELL
CHAMBERS
GREENVIEW
PAR
BOUNDARY
CARLBERT
HEADWAY
DELL
CENTENNIAL
WELLINGTON E.
STANLEY
SHEPPARD
ARGYLE
HEAVENOR
PINE
MCMEEKEN
ELIZABETH
CHURCHILL BLVD.
HARTEN
MCCREA
LAKE
RENTA
GLENHOLME
TABER
ARTHUR
MARK
FLORWIN
SHINGWAUK
SHANNON
HEALY
COUNTRY CLUB
GOLF
RANGE
HUSSEY
JOSEPH
COLLINS
MARGARET
MADELEINE
CADDY
FORD
GRAVELLE
WELCOME
DRAKE
ATLAS
OAK
PK.
GARDEN
VALHALLA
THORNELOE
QUEEN E.
RIVERSIDE
PARKDALE
GEORGINA
HUGILL
ROTARY
SHORE
MCPHAIL
MCGREGOR
MANOR
COULSON
RIVERVIEW
This Route
Other Routes
Stop Locations
One-Way Streets
Streets
Laneways
Private Drives
Railways
0
250
500 m
N

Route 21


EDINBURGH
NORTH
LONDON
RAILROAD
CEDAR
WILSON
DUFFERIN
HEARST
GROSVENOR
GLADSTONE
MACDONALD
SUMMIT
GLOUCESTER
WELLINGTON W.
CATHCART
MANILLA
BLUCHER
FRANCIS
ABBOTT
S. GLADSTONE
LAIRD
BORRON
FERRIS
TRELAWNE
FAUQUIER
BEATRICE
HAMILTON
ONTARIO
THE CRES.
HAWTHORNE
WEMYSS
EUCLID
ALEXANDRA
ALBERT W.
CENTRAL PK.
QUEEN W.
ANDREW
GORE
TANCRED
HUGHES
BRUCE
DENNIS
GRACE
ALBERT E.
WELLINGTON E.
LYNN
OAKLAND
BAY W.
KING
ELGIN
MCDOUGALD
PILGRIM
PIM
CHURCH
HERRICK
TOWERS
CAMERON
LN.
HYNES
EAST
RON FRANCIS
QUEEN E.
MARCH
BAY ST.
SPRING
BINGHAM
BROCK
BELL
GOUIN
ST. MARYS RIVER
FOSTER
RUSS
RAMSAY
KEN DANBY
This Route
Other Routes
Stop Locations
One-Way Streets
Streets
Laneways
Private Drives
Railways
0
250
500 m
N

Route 22


OAKWOOD
BLAKE
CURRAN
MACDONALD
BRIEN
CRAWFORD
CAMPBELL
WELDON
LAIRD
BORRON
BELLEVUE
POPLAR
ALWORTH
SUMMIT
GARRISON
HAMILTON
ONTARIO
HAWTHORNE
THE DR.
WEMYSS
PUTNEY
PINE
EUCLID
FOREST
FINDLAY
LABELLE
OAKLAND
PIM
THE
CRES.
WELLINGTON E.
PILGRIM
CHURCH
EDWARD
MANOR
WOODWARD
BIGGINGS
KOHLER
SIMPSON
BISHOP'S
MCGREGOR
VICTORIA AVE.
COULSON
RIVERVIEW
HERRICK
CAMERON
LN.
LEO
UPTON
KENSINGTON
QUEEN E.
GORDON
LUCY
D'YOUVILLE
FRONT
HADLEY
MCPHAIL
SHORE
This Route
Other Routes
Stop Locations
One-Way Streets
Streets
Laneways
Private Drives
Railways
0
250
500 m
N

Route 23


CODY POINT
GRANDRIVER
CHAMPLAIN
MARY'S
GRANDY
WALNUT
SPRUCE
GRAND
GRANITE
REID
ELMWOOD
CAMERON
BLAKE
GREAT NORTHERN
STEVENS
ST. GEORGE'S E.
PARDEE
BIRCH
MAPLE
MCNABB
WILCOX
RAILROAD
FRANCIS
TANCRED
ROSEDALE
ALBERTA
ALGOMA
MELROSE
LONDON
WILSON
CEDAR
DUFFERIN
BRUCE
LANSDOWNE
LAURIER
PL.
SALISBURY
HUGHES
DENNIS
GROSVENOR
HEARST
GLADSTONE
MACDONALD
FERRIS
S. GLADSTONE
LAIRD
SUMMIT
BORRON
TRELAWNE
FAUQUIER
BEATRICE
PIM
HAMILTON
HAWTHORNE
WEMYSS
EUCLID
ONTARIO
OAKLAND
GRACE
RON FRANCIS
KING
ELGIN
ALBERT E.
WELLINGTON E.
LYNN
MARCH
MCDOUGALD
ST. MARY'S RIVER
BAY ST.
SPRING
BINGHAM
QUEEN E.
BROCK
BELL
EAST
HYNES
PILGRIM
HERRICK
TOWERS
CHURCH
WOODWARD
CAMERON
LN.
RUSS
RAMSAY
KEN DANBY
This Route
Other Routes
Stop Locations
One-Way Streets
Streets
Laneways
Private Drives
Railways
0
250
500 m
N

Route 31

This Route
Other Routes
Stop Locations
One-Way Streets
Streets
Laneways
Private Drives
Railways

2ND LINE E.
WHITE OAK W.
WHITE OAK E.
BAINBRIDGE
NORTHERN
W.
CLERGUE
ELM
LANSDOWN GREEN
ANITA
NORTHERN E.
SAGKVILLE
KITCHENER
GRANDVILLE
STRAND
CONMEE
NORTH
HARGREAVES
MORRISON
BEECH
GRAND
ORYME
BYRNE
NELSON
KNOX
GRANGEMILL
GRANDHAVEN
REID
ELMWOOD
VAN DAELE
GRANDVIEW
GRANDMONT
BLOOR
W.
NINO
WILSON
WAWANOSH
CODY
POINT
YORK
CHAMPLAIN
ST. MARY'S
BIRCH
GRANDRIVER
GRANDY
GRANITE
CHESTNUT
WALNUT
SPRUCE
STEVENS
ST. GEORGE'S E.
PARDEE
MAPLE
MCNABB
CHESTNUT S.
WILCOX
SALISBURY
ALBERTA
ALGOMA
GLADSTONE

0 250 500 m

N

Route 32

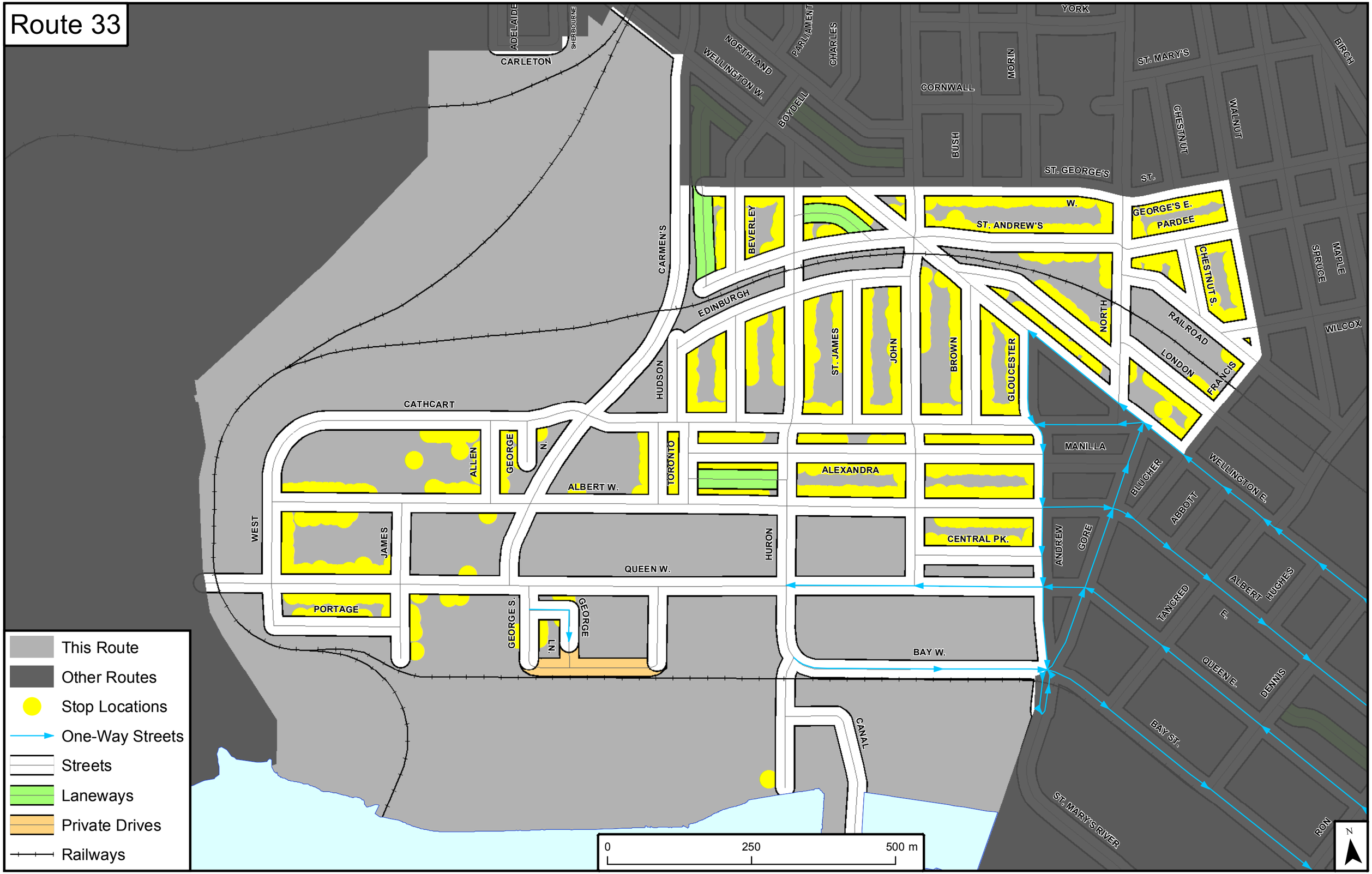
This Route
Other Routes
Stop Locations
One-Way Streets
Streets
Laneways
Private Drives
Railways

WHITE OAK W.
BAINBRIDGE
NORTHERN W.
NORTHERN E.
CLERGUE
LANGDON
CRES.
ELM
LENNOX
CONMEE
MARSH
STRAND
NORTH
MORRISON
BYRNE
JOHN
KEHOE
NELSON
WALNUT
KNOX
CARMEN'S
PARLIAMENT
CHARLES
BUSH
BLOOR W.
BIRCH
NORTHLAND
MORIN
YORK
ST. MARY'S
WELLINGTON W.
BOYDELL
CORNWALL
CHESTNUT
BEVERLEY
HURON
ST. GEORGE'S W.
ST.
GEORGE'S

0 250 500 m

N

Route 33


ADELAIDE
SHERBOURNE
CARLETON
NORTHLAND
WELLINGTON W.
PARLIAMENT
CHARLES
BOYDELL
CORNWALL
MORIN
YORK
ST. MARY'S
BIRCH
BUSH
ST. GEORGE'S
ST.
CHESTNUT
WALNUT
CARMEN'S
BEVERLEY
W.
ST. ANDREW'S
GEORGE'S E.
PARDEE
CHESTNUT S.
MAPLE
SPRUCE
EDINBURGH
HUDSON
ST. JAMES
JOHN
BROWN
GLOUCESTER
NORTH
RAILROAD
LONDON
FRANCIS
WILCOX
CATHCART
ALLEN
GEORGE
N.
ALBERT W.
TORONTO
MANILLA
ALEXANDRA
BLUCHER
ABBOTT
WELLINGTON E.
WEST
JAMES
QUEEN W.
HURON
CENTRAL PK.
ANDREW
GORE
TANCRED
ALBERT
HUGHES
E.
PORTAGE
GEORGE S.
LN.
GEORGE
BAY W.
QUEEN E.
DENNIS
CANAL
BAY ST.
ST. MARY'S RIVER
RON
0
250
500 m
N
This Route
Other Routes
Stop Locations
One-Way Streets
Streets
Laneways
Private Drives
Railways

Route 41

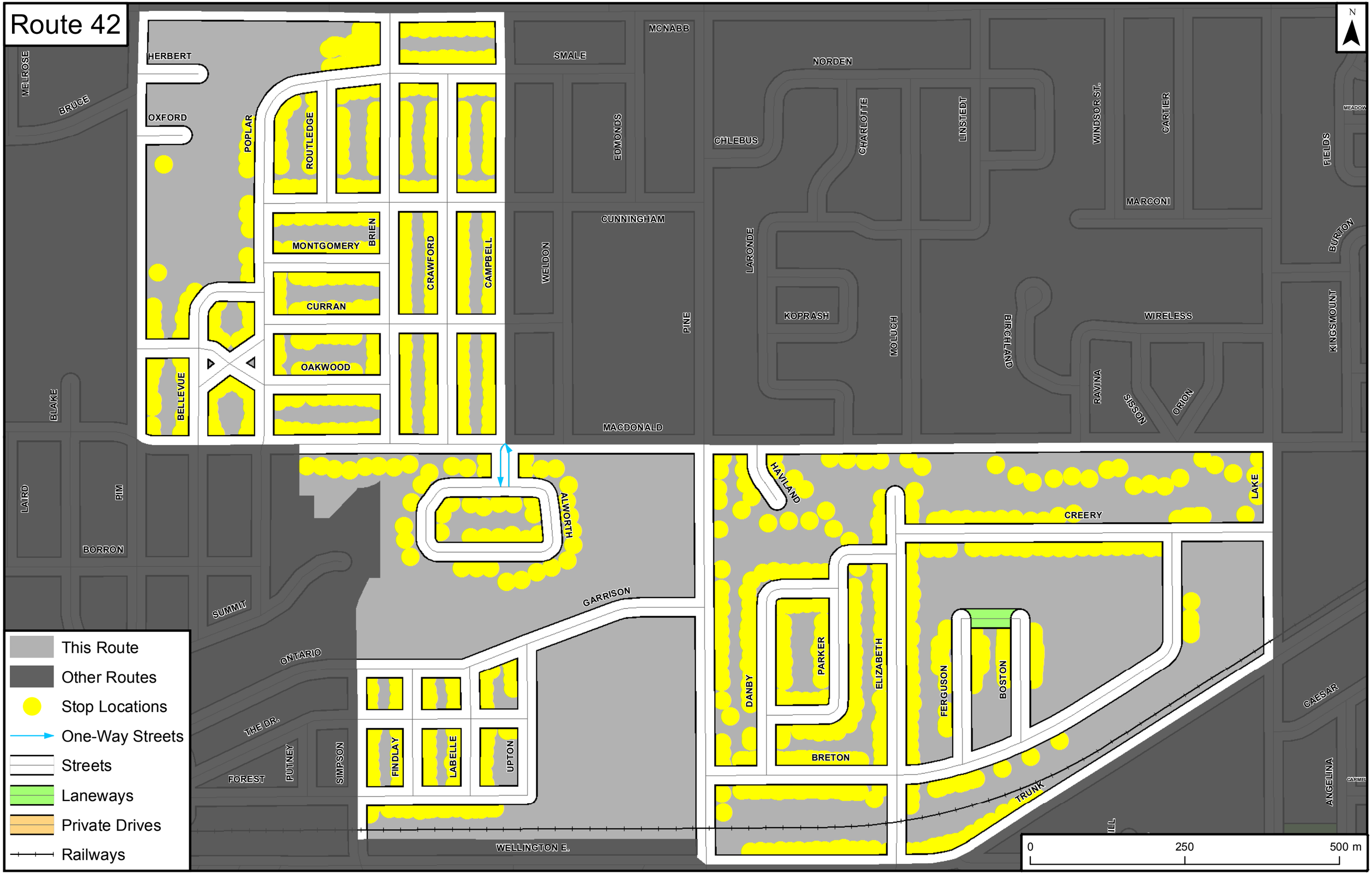
This Route
Other Routes
Stop Locations
One-Way Streets
Streets
Laneways
Private Drives
Railways

GRANDVILLE
ORYME
KENT AVE.
LAURENTIAN
RUSH
MALABAR
PANORAMIC
PRINCETON
PRIMROSE
PLEASANT
OAKBINE
HARDIMAN
LOTHIAN
ELMWOOD
VAN DAELE
WAWANOSH
EAGLE
GEHRIG
TILLEY
DABLON
WILLOUGHBY
PINE
PLAINTREE
PELICAN
PEACOCK
PASSMORE
BLUE JAY
BLAKE
GREAT NORTHERN
CHAMPLAIN
CAMERON
WILLOW
BOEHMER
CALEDON
LESLIE
ALBION
MARWAYNE
ALLARD
CHAPPLE
MCNABB
PRINCESS
PARASOL
KNOX
BEECH
GRAND
GRANGEMILL
GRANDHAVEN
REID
GRANDVIEW
WILSON
GRANDMONT
NINTO
CODY
POINT
GRANDRIVER
GRANDY
GRANITE
STEVENS
ST. GEORGES E.
PARDEE
BIRCH

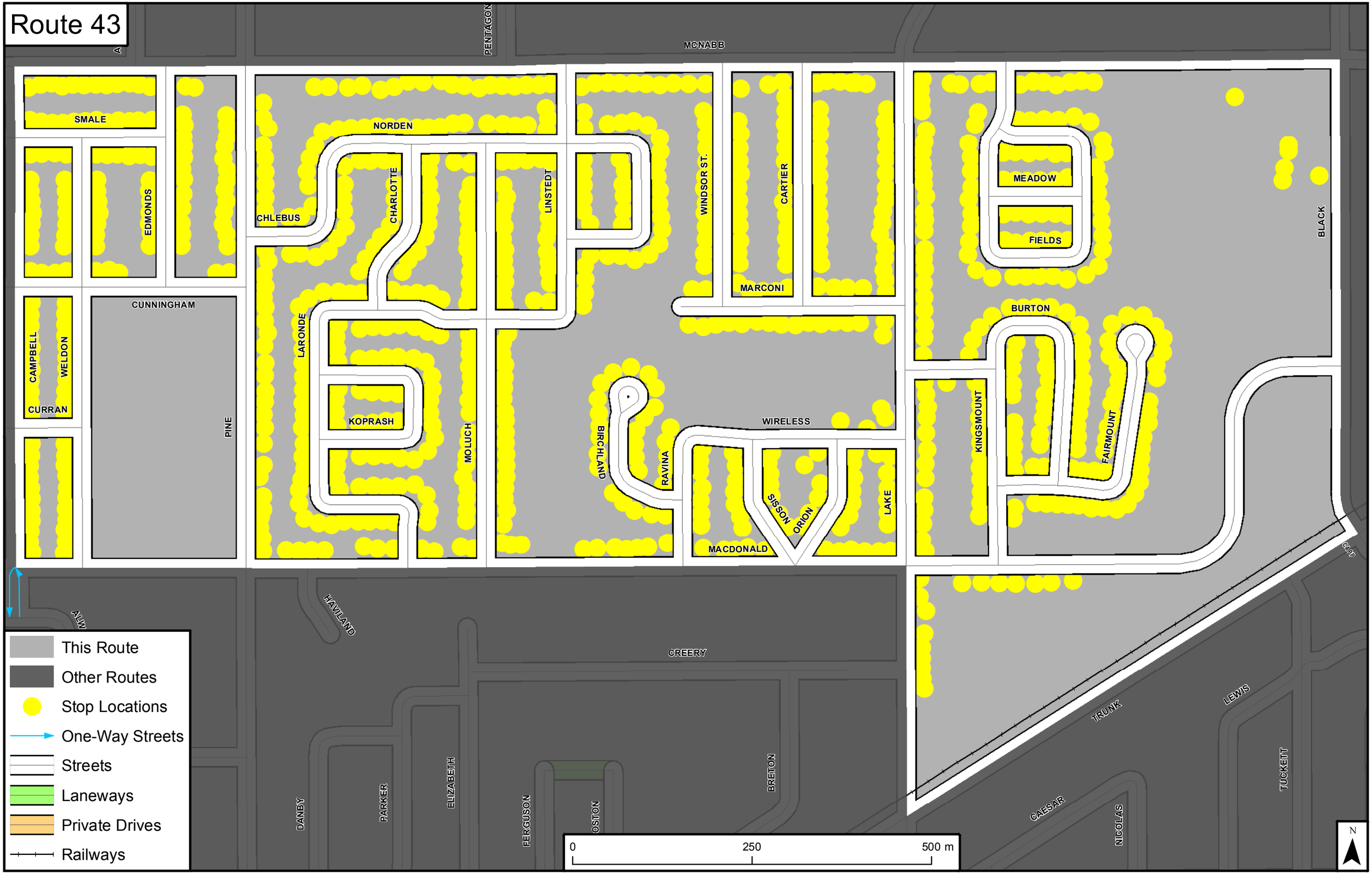
0 250 500 m

N

Route 42


N
HERBERT
OXFORD
POPLAR
ROUTLEDGE
MONTGOMERY
BRIEN
CURRAN
CRAWFORD
CAMPBELL
OAKWOOD
BELLEVUE
MELROSE
BRUCE
BLAKE
SMALE
MCNABB
EDMONDS
WELDON
CUNNINGHAM
PINE
MACDONALD
NORDEN
CHLEBUS
CHARLOTTE
LINSTEDT
WINDSOR ST.
CARTIER
MARCONI
FIELDS
MEADOW
BURTON
LARONDE
KOPRASH
MOLUCH
BIRCHLAND
WIRELESS
KINGSMOUNT
RAVINA
SISSON
ORION
LAIRD
PIM
BORRON
ALWORTH
HAVILAND
CREERY
LAKE
GARRISON
SUMMIT
ONTARIO
THE DR.
FOREST
PUTNEY
SIMPSON
FINDLAY
LABELLE
UPTON
DANBY
PARKER
ELIZABETH
FERGUSON
BOSTON
BRETON
TRUNK
CAESAR
ANGELINA
CARMEL
ILL
WELLINGTON E.
This Route
Other Routes
Stop Locations
One-Way Streets
Streets
Laneways
Private Drives
Railways
0
250
500 m

Route 43


A
PENTAGON
MCNABB
SMALE
EDMONDS
NORDEN
CHLEBUS
CHARLOTTE
LINSTEDT
WINDSOR ST.
CARTIER
MARCONI
MEADOW
FIELDS
BLACK
BURTON
CUNNINGHAM
CAMPBELL
WELDON
CURRAN
PINE
LARONDE
KOPRASH
MOLUCH
BIRCHLAND
RAVINA
WIRELESS
SISSON
ORION
LAKE
MACDONALD
KINGSMOUNT
FAIRMOUNT
CAPP
ALW
HAVILAND
CREERY
DANBY
PARKER
ELIZABETH
FERGUSON
OSTON
BRETON
TRUNK
LEWIS
TUCKETT
CAESAR
NICOLAS
This Route
Other Routes
Stop Locations
One-Way Streets
Streets
Laneways
Private Drives
Railways
0
250
500 m
N

Route 51


WALTERS
2ND LINE W.
COOPER
NICHOL
EDISON
HARE
VIVIAN
CONNAUGHT
WRIGHT
VICTOR
EMMANUEL
PATRICIA
E. BALFOUR
CARUFEL
MCFADDEN
TURNER
PRENTICE
FIRST
DRYDEN
ASQUITH
WILDING
DOUGLAS
WALLACE
MCKENZIE
GOULAIS
YOUNG
LETCHER
DYMENT
GOETZ
GLASGOW
SPADINA
PITTSBURGH
MCALLEN
METZGER
CENTRAL
BONNEY
This Route
Other Routes
Stop Locations
One-Way Streets
Streets
Laneways
Private Drives
Railways
0
250
500 m
N

Route 52


VIVIAN
VICTOR EMMANUEL
PATRICIA
MCFADDEN
TURNER
PRENTICE
CONNAUGHT
WOODCROFT
2ND LINE W.
RAYMOND
CUMBERLAND
HOCKING
DOVERCOURT
KORAH
FARWELL
DEVON
FIRST
SECOND
THIRD
FOURTH
FIFTH
SIXTH
SEVENTH
DOUGLAS
WALLACE
LAURA
MCLEAN
RUTH
ESTELLE
HENRIETTA
MOODY
FRANKLIN
MARETTA
LYONS
This Route
Other Routes
Stop Locations
One-Way Streets
Streets
Laneways
Private Drives
Railways
0
250
500 m
N

Route 53

This Route
Other Routes
Stop Locations
One-Way Streets
Streets
Laneways
Private Drives
Railways

EVERETT
PEOPLES
2ND LINE W.
2ND LINE E.
WHITE OAK W.
HARRY
WHITE OAK E.
BAINBRIDGE
LAURA
ESTELLE
HENRIETTA
SHORT
SHAFER
LENNOX
SWARTZ
RUTH
HOCKING
DEVON
MOODY
SEVENTH
FRANKLIN
DOUGLAS
KORAH
MARETTA
GILLIES
PATRICK
SHERBOURNE
WELLINGTON W.
WALLACE
LYONS
DUNDAS
CONMEE
NORTHERN
NORTHERN E.
CLERGUE W.
LANGDON
GRES.
ELM
ANITA
MARSH
STRAND
BYRNE
NORTH
HARGREAVES
MORRISON
KEHOE
JOHN
CARMEN'S
NORTHLAND
PARLIAMENT
CHARLES
BUSH
BLOOR W.
MORIN
NELSON
KNOX
WALNUT
BIRCH
ADELAIDE
CARLETON

0 250 500 m

N

AECOM

Contractor Garbage Collection Mapping

Contract Area
Monday (South ½)

↑See map for North ½↑

This Route
Other Routes
Stop Locations
One-Way Streets
Streets
Laneways
Private Drives
Railways

0 1,000 2,000 m

N

Contract Area
Monday (North ½)

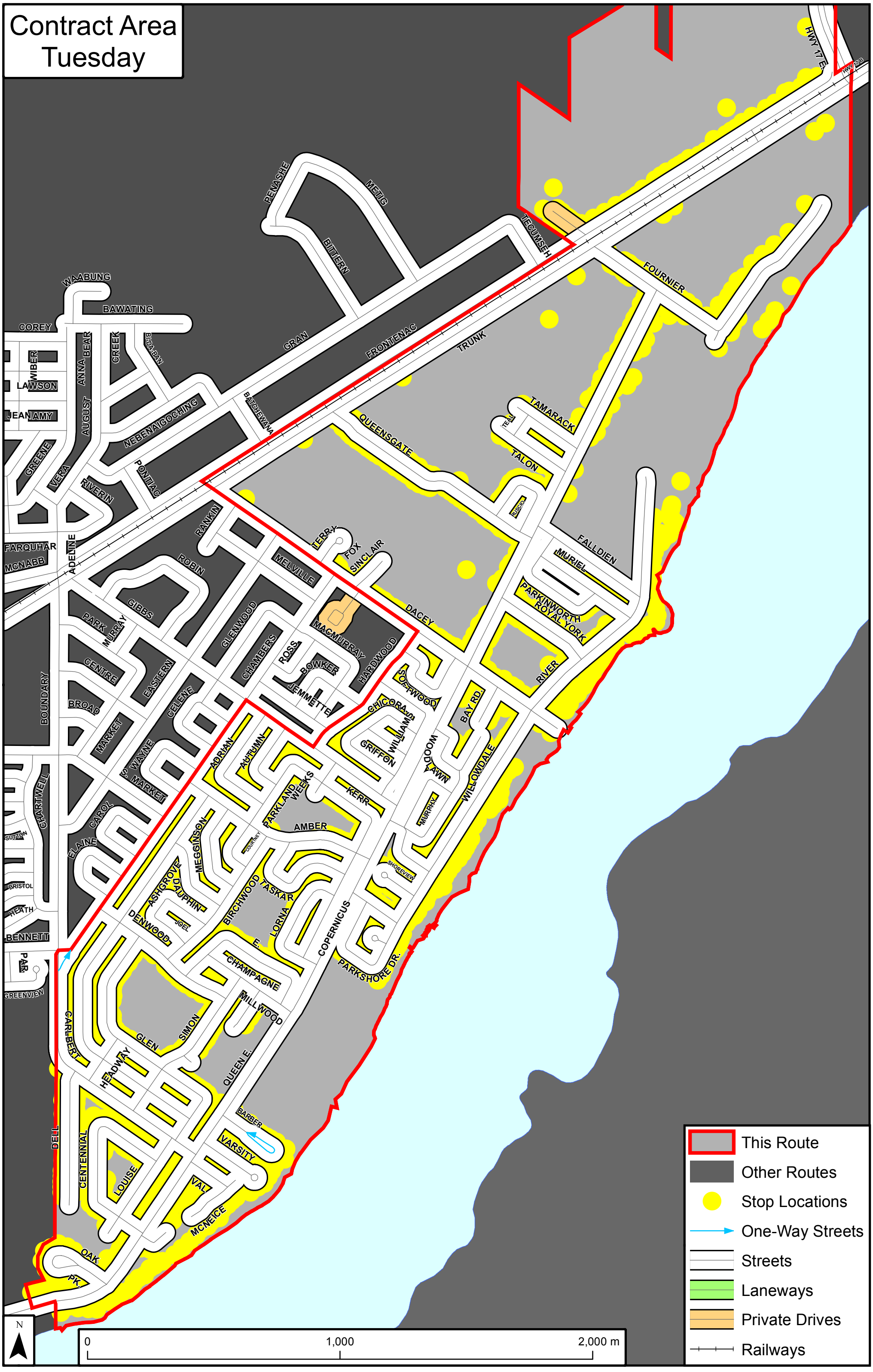
6TH LINE E.
NETTLETON
HARRIS
OLD GOULAIS BAY
OLD HWY 17 N.
OLD POWLEY
DITOMMASO
5TH LINE E.
SCHULTZ
SIDE
WIGLE
4TH LINE E.
WILDERNESS
WHITE PINE
BACKCOUNTRY
GATE
GLENGARY
WISHART
PK.
GREAT NORTHERN
BEAUMONT
GREENFIELD
NOAH
KONKIN
CHATFIELD
3RD LINE E.
INDUSTRIAL
B
A
LANG
QT
FORT
NIAGARA
MARY
LASALLE
SACKVILLE
NORTH
SUPERIOR
NORTHRIDGE
HIGHCREST
RO
VON
DRIVE
IN
PK.
↓See map for South ½↓
BIRKSHIRE
FOXBOROUGH
TUSCANY
MADISON
MARRINGALE
BRIDLEPATH
SADDLE
WINDSOR
OLD GARDEN RIVER
KILLARNEY
NORTHWOOD
TERRANCE
CEDARWOOD
EASTWOOD
SOUTHWOOD
TR.
MILLSTREAM
CRESTVIEW
MILLCREEK

This Route
Other Routes
Stop Locations
One-Way Streets
Streets
Laneways
Private Drives
Railways

0 1,000 2,000 m

N

Contract Area Tuesday



Contract Area
Wednesday (South ½)

↑See map for North ½↑

MOSS
3RD LINE W.
GOULAIS
ALFRED
LAMMING
CHIPPEWA
CENTRAL CREEK
ASSUNTA
POND
KORAH
ROSSMORE
HILLSIDE
PEOPLES
FAIRVIEW
TALLACK
KENT
CRES.
LETHBRIDGE
W. PERTH E.
PERTH
W. DUNROBIN
E.
DUNROBIN
BRAEMAR E.
BRAEMAR
MAYFAIR
BEAUMONT
GREENFIELD
KONKIN
NOAH
BALSAM
CHATFIELD
3RD LINE E.
OLD GOULAIS BAY
BARRETT
SHERBROOK
SHERWOOD
HOLDEN
SILVERDALE
PENNO
SUNNYDALE
ST. PATRICK
BROADVIEW
WESTGATE
COOPER
WALTERS
MORGAN
LANGDON RD.
SYDENHAM
HENRY
CHESHIRE
MURTON
DONCASTER
KINGSFORD
SUSSEX
DONNA
SELBY
NICHOL
EDISON
PRENTICE
BRUNSWICK
HAMPTON
2ND LINE W.
BITONTI
ELLIOTT
POZZEBON
DIANE
HILL
JOHNSON
FARWELL
NOSMO
DAWSON
LIDSTONE
CHURCHILL AVE.
LLOYD
EVERETT
2ND LINE E.
CARMEN'S
WHITE OAK
W.
SHORT
SHAFER
LENNOX
WELLINGTON
VIVIAN
TURNER
FIRST
SECOND

This Route
Other Routes
Stop Locations
One-Way Streets
Streets
Laneways
Private Drives
Railways

0 500 1,000 m

N

Contract Area
Wednesday (North ½)

This Route
Other Routes
Stop Locations
One-Way Streets
Streets
Laneways
Private Drives
Railways

MAKI
AUBIN
MT. PLEASANT
ANICH
BRULE
5TH LINE W.
PEOPLES
OLD GOULAIS BAY
HARRIS
5TH LINE E.
4TH LINE W.
ARONSON
4TH LINE E.
VENN
FOOTHILL
ORIOLE
RANGER
HOOD
MCQUEEN
WARDELL
AVERY
MOSS
LEIGH'S BAY
ALLEN'S SIDE
GOULAIS
KENT CRES.
W. PERTH
E. DUNROBIN
BRAEMAR
TALLACK
GREENFIELD
BEAUMONT
NOAH
KONKIN
CHATFIELD
3RD LINE W.
3RD LINE E.
SHERBROOK
CARPIN
BEACH
ARABIAN
PALOMINO
APPALOOSA
KORAH
ALFRED
LAMMING
COOPER
ASSUNTA
FAIRVIEW
HILLSIDE
SHERWOOD

0 1,000 2,000 m

N

↓See map for South ½↓

Contract Area
Thursday (South ½)

↑See map for North ½↑

This Route
Other Routes
Stop Locations
One-Way Streets
Streets
Laneways
Private Drives
Railways

2ND LINE E
PRINCE
CHARLES
PARTRIDGE
PARKVIEW
BLACK
VIA
COREY
LAWSON
JEAN
WIBER
AMY
MANITOU
GREENE
ANNA
FARQUHAR
VERA
ADELINE
RIVERIN
PONTIAC
WAABUNG
BAWATING
BEAR CREEK
BI-DA-BAN
AUGUST
NEBENAIGOCHING
GRAN
BATCHEWANA
FRONTENAC
MCNABB
SHANNON
TRUNK
ARIZONA
SILVER
BIRCH
IDAHO
CAMBRIDGE
TEXAS
SUTTON
BRISTOL
HEATH
ESSEX
BENNETT
CHARTWELL
BROAD
CENTRE
PARK
MURRAY
GIBBS
ROBIN
RANKIN
DACEY
BOUNDARY
MARKET
EASTERN
GLENWOOD
MELVILLE
TERRY FOX
SINCLAIR
CHAMBERS
ROSS
JEMMETT
BOWKER
MACMURRAY
HARDWOOD
KERR
ELAINE
CAROL
S. MARKET
WAYNE
GELENE
ADRIAN
AUTUMN
AMBER
ASHGROVE
CHICORA
WILLIAMS
DOOLTOS

N

0 500 1,000 m

Contract Area
Thursday (North ½)

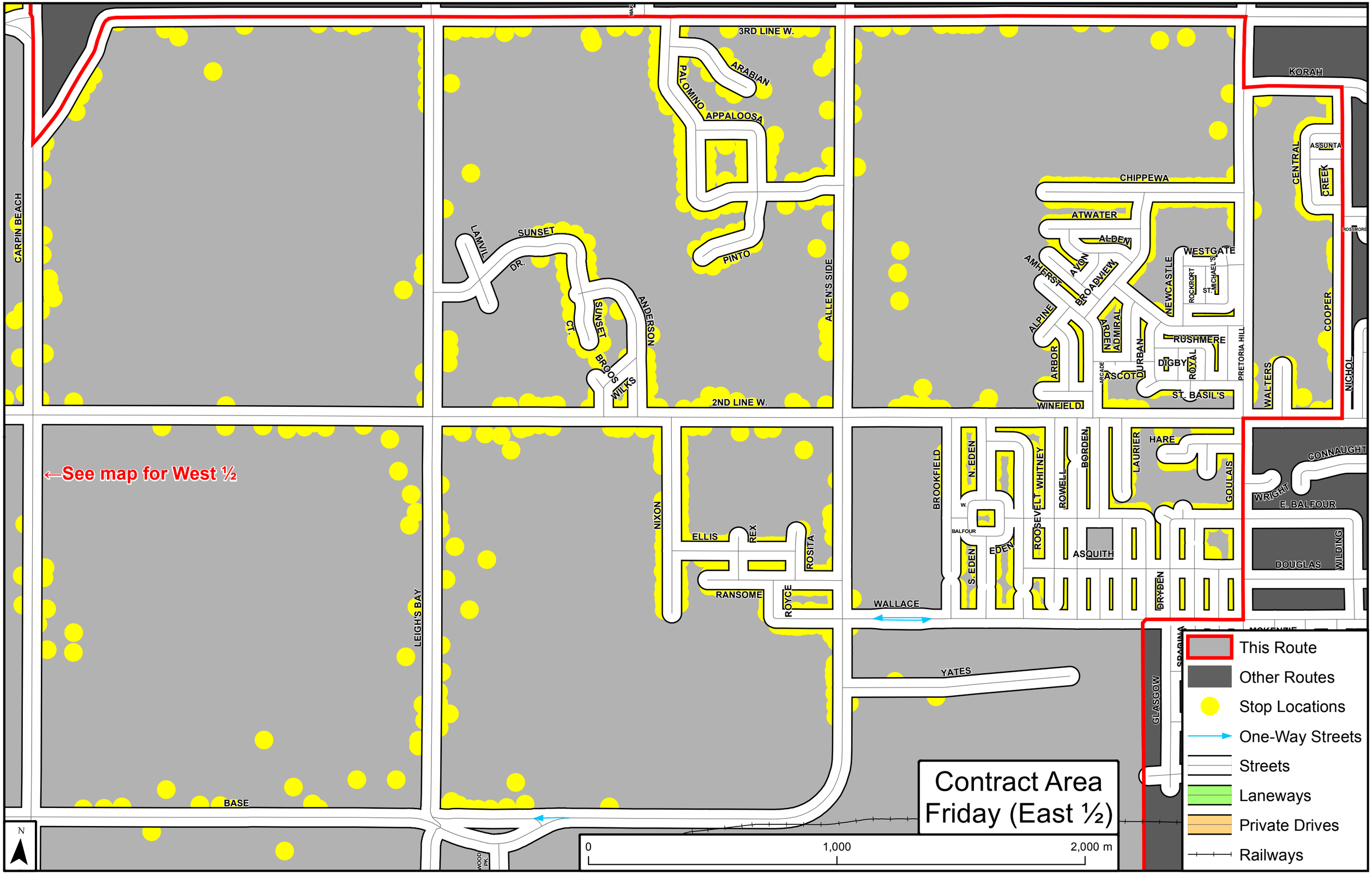
6TH LINE E.
CONNOR
SCHULTZ
SIDE
5TH LINE E.
POWLEY
OLD HWY 17 N.
DITOMMASO
LANDSLIDE
FISH HATCHERY
GREAT NORTHERN
WILDERNESS
WHITE PINE
BACKCOUNTRY
CASE
WIGLE
4TH LINE E.
GLENGARY
GATE
WISHART
PK.
BIRKSHIRE
3RD LINE E.
TUSCANY
FOXBOROUGH
MADISON
MARTINGALE
BRIDLEPATH
OLD GARDEN RIVER
RO
VON
DRIVE
KILLARNEY
SADDLE
WINDSOR
IN
NORTHWOOD
TERRANCE
CEDARWOOD
EASTWOOD
SOUTHWOOD
TR.
MILLSTREAM
CRESTVIEW
MILLCREEK
BLACK
INDUSTRIAL
PK.
2ND LINE E.

↓See map for South ½↓

N

0 1,000 2,000 m

This Route
Other Routes
Stop Locations
One-Way Streets
Streets
Laneways
Private Drives
Railways


3RD LINE W.
ARABIAN
PALOMINO
APPALOOSA
PINTO
SUNSET
LAMVIL
DR.
CT.
SUNSET
BROS
WILKS
ANDERSON
ALLEN'S SIDE
2ND LINE W.
CARPIN BEACH
KORAH
CHIPPEWA
ATWATER
ALDEN
AMHERST
AVON
BROADVIEW
ALPINE
ARBOR
ADMIRAL
ARDEN
ARCADE
ASCOT
DURBAN
NEWCASTLE
WESTGATE
ROCKPORT
ST. MICHAEL'S
RUSHMERE
DIGBY
ROYAL
PRETORIA HILL
ST. BASIL'S
WINFIELD
CENTRAL
ASSUNTA
CREEK
COOPER
ROSSMORE
WALTERS
NICHOL
←See map for West ½
NIXON
ELLIS
REX
ROSITA
RANSOME
ROYCE
BROOKFIELD
N. EDEN
W.
BALFOUR
S. EDEN
EDEN
ROOSEVELT
WHITNEY
ROWELL
BORDEN
LAURIER
HARE
GOULAIS
ASQUITH
DRYDEN
WALLACE
YATES
CONNAUGHT
WRIGHT
E. BALFOUR
DOUGLAS
WILDING
GLASGOW
LEIGH'S BAY
BASE
WOOD PK.
N
0
1,000
2,000 m
Contract Area
Friday (East ½)
This Route
Other Routes
Stop Locations
One-Way Streets
Streets
Laneways
Private Drives
Railways

Contract Area
Friday (West ½)

CREEK
HILL
PRINCE
LAKE
3RD LINE W.
2ND LINE W.
MARSHALL
IRONSIDE
HEYWOOD
MOUNTAINVIEW
DEANS
WALLS SIDE
GAGNON
AIRPORT
BASE
TOWN LINE
CARPIN BEACH
SUNNYSIDE BEACH
SHATRUCK
PARKEWOOD
GAGNON S.
HERKIMER
VICTORIA
ST.
HESS
COTTAGE
NOKOMIS BEACH
RED PINE
PTE. AUX PINS
DALGLEISH
PINE SAND
ALAGASH SHORE
DES CHENES
PTE.
DES CHENES
PTE. LOUISE
HARRIET

See map for East ½ →

This Route
Other Routes
Stop Locations
One-Way Streets
Streets
Laneways
Private Drives
Railways

0 2,000 4,000 m

N

Appendix B

City of Sault Ste. Marie Council Report Re: Blue Box Transition – Municipal Involvement Decision, July 11, 2022

The Corporation of the
City of Sault Ste. Marie

C O U N C I L R E P O R T

July 11, 2022

TO:	**Mayor Christian Provenzano and Members of City Council**
AUTHOR:	**Susan Hamilton Beach, P. Eng.**
DEPARTMENT:	**Public Works and Engineering Services**
RE:	**Blue Box Transition – Municipal Involvement Decision**

Purpose

To update Council on the Blue Box transition and to seek Council approval of staff's recommendation to withdraw from the management of the Blue Box Program beyond September 30, 2023.

Background

Further to the report presented to Council on January 31, 2022 this report provides an update on the City's transition effective September 30, 2023 – the City's approved transition date. All municipal blue box programs in the province will be transitioned over a three-year period and the producer-responsible organizations (PROs) will assume responsibility for all blue box programs effective January 1, 2026. The PROs will also implement changes such as a province-wide common material list, grouping municipalities in catchment areas, and the discontinuation of service to institutions and commercial properties, including our downtown core.

After being approved for transitioning next year, staff submitted details of the existing blue box collection services provided to single family residences, multi-family residential properties, retirement homes, long-term care facilities and public spaces for the PROs' transitioning process. It is important to note the City will remain financially responsible for the current curbside recycling services provided to industrial, commercial and institutional ('ICI') properties per the Blue Box Regulation. The transitioning will not apply to these sectors, and the extent of public space recycling included is to be determined.

The PROs, as led by Circular Materials Ontario ('CMO'), recently issued an offer to municipalities transitioning in 2023 to either remain involved in the management of their blue box programs beyond their transition dates or to withdraw from the blue box program and hand over all responsibility to the PROs. The City's decision regarding our involvement in the blue box program is due no later than July 15, 2022.

Analysis

The PROs goal during the transition period is to maintain the same service that currently exists. To accomplish this, CMO is first approaching municipalities to determine if they want to continue to manage local recycling collection. If a municipality chooses not to continue involvement, then CMO plans to approach GFL to determine if they would like to continue providing the service. If neither party wants to remain involved, then CMO will need to put out a request for proposal for a new service provider.

If a municipality wants to remain involved, they would have to sign a contract with CMO and revise the contract with their current service provider (GFL) based on the requirements determined by CMO in their Master Service Agreement ('MSA'). Upon review of the MSA, there was concern that it shifts the regulatory obligation back onto the municipality which violates the spirit and intent of the Blue Box Regulation. It has been noted in the legal review by Borden Ladner Gervais (BLG) and distributed to municipalities through the Ontario Waste Management Association that the liabilities and risks that municipalities would take on by entering into a MSA with CMO would not be offset by the benefits granted to municipalities as a result of the contract.

Staff has considered the options of staying involved or withdrawing and are recommending that we **withdraw** from management of recycling collection beyond September 30, 2023. Staff reached this conclusion based on a number of factors:

- Municipalities and contractors have a number of concerns with the contract that the CMO is asking municipalities to enter into, including how the costs are determined and penalties for certain components. The program is being rolled out quickly and so, at this point in time, staff are uncertain as to the level of negotiating power any one municipality will have;
- We have extended our contract 1 year with GFL and that contract would likely have to be revised based on the requirements in the MSA the municipality would have to sign with CMO. This would require us to re-negotiate with GFL and there may be financial implications related to those changes that the City would not have control over;
- The recycling program generates a significant amount of public complaints that we would no longer have to address nor have full control to resolve;
- Unlike some other municipalities, we have no physical assets related to recycling and there would be minimal staffing implications or surplus capital if not remaining involved;
- We have one Supervisor dedicated to diversion (ie. recycling, compost, etc.). Removing the recycling component would provide more capacity to prepare for the upcoming provincial requirement to implement an organics collection program and work with the team implementing our biosolids facility (2023 – 2025 and beyond).

Similar to other waste management categories (ie. household hazardous waste), in order to continue the transfer of the blue box service, it is recommended that delegated authority be approved to enter into any agreements with CMO and associated PROs.

As noted in the Background section of this report, Staff must complete the survey by CMO to express our intent to withdraw from this service by July 15th, 2022 if this recommendation is approved by Council.

Financial Implications

Although the City will remain responsible for providing blue box services to the ICI sectors, opting out of the blue box program for residential properties and public spaces is expected to result in a net savings to the municipality. This estimated savings will be brought forward in the 2023 budget deliberations; however, in 2023, the savings will only be effective from September 30, 2023.

The blue box transitioning process and financial details are evolving quickly and staff are still working to fully understand the financial impact to the City. It should be noted that any savings from the recycling transition will likely be required to fund an organics collection program.

Strategic Plan / Policy Impact

This is an operational matter and included in the Corporate Strategic Plan under Service Delivery. The delivery of recycling programs in the province of Ontario is now effected by this new regulation.

Recommendation

It is therefore recommended that Council take the following action:

Resolved that the report of the Director of Public Works regarding Blue Box Transition – Municipal Involvement Decision dated July 11, 2022 be received and that Council approve the City's withdrawal from management of the Blue Box program; further that delegated authority be provided to the Director to enter into agreements needed to continue this transfer of this service.

A delegation by-law will appear on a future Council Agenda.

Respectfully submitted,

Susan Hamilton Beach, P.Eng.
Director of Public Works
705.759.5207.
s.hamiltonbeach@cityssm.on.ca

Appendix C

Source Separated Organics Considerations Memorandum, AECOM, March 10, 2020

AECOM Imagine it. Delivered.

AECOM Canada Ltd.
523 Wellington Street East
Saulte Ste. Marie, ON P6A 2M4
Canada

T: 705.942.2612
F: 705.942.3642
aecom.com

Project name:Biosolids Processing Facility - Source Separate Organics Considerations

Project ref: 60595290

To: Catherine Taddo, P.Eng.

CC: Patty Quackenbush (AECOM)

From: Rick Talvitie, P.Eng.

Date:
March 10 2020

Source Separated Organics (SSO) Considerations Memo

1. Background and Introduction

The City of Sault Ste. Marie (City) has two wastewater treatment plants that generate approximately 10,000 wet tonnes of sewage sludge or biosolids annually. The biosolids are disposed of five days/week in the working face of the City's landfill. This management approach has been challenging primarily due to the semi-fluid nature of the biosolids (i.e. approximately 20-25% solids) and its odour. In addition, the challenges have been exacerbated over time as the proportion of locally generated Industrial, Commercial and Institutional (IC&I) waste exported to a northern Michigan landfill has grown to approximately 75%. This has resulted in significantly reduced quantities of solid waste available for mixing with the biosolids.

A Class EA was completed to address these challenges and recommended the construction of a composting or alkaline stabilization processing facility at the landfill to convert the biosolids to a stable dry material that could be used for landfill cover and/or other beneficial uses. The City is currently in the early stages of the design of a processing facility and a technology/vendor pre-selection process closed in mid -December 2019. That process resulted in the receipt of two vendor submissions each proposing a distinct composting methodology. No submissions were received for alkaline stabilization.

Over the past several years the Province has been actively developing waste management policies and guidance documents with the objective of developing a circular economy with less waste being landfilled. In 2018 the Province released the Food and Organic Waste Policy (Policy) which includes requirements for the collection and processing of source separated organics (SSO) if specified population and population density thresholds are met. The City of Sault Ste. Marie meets the thresholds in the current policy and based on the terms of that policy will be required to collect and process SSO by approximately 2025.

Given that the two vendor submissions received are each proposing composting technologies and given that the City is expected to process SSO by approximately 2025, the City concluded that consideration should be given to expanding the scope of the current biosolids processing facility to potentially include SSO as a feedstock.

The purpose of this Technical Memo is the following:

- identify potential impacts of expanding the current biosolids management facility to include source separated organics; and,
- estimate the quantities of SSO that may be captured in both the residential and IC&I sectors.

2. SSO Characterization

For the purposes of this memo the following definitions will apply which were extracted from the Food and Organic Waste Policy:

Food waste: means the edible parts of plants and animals that are produced or harvested but that are not ultimately consumed.

Organic waste: means inedible parts of plants and animals, as well as other organic material that may be processed along with food waste. Examples of organic waste may include but are not limited to leaf and yard waste, compostable products and packaging, soiled paper, diapers and pet waste.

Although some municipalities that are currently operating SSO programs have included sanitary products such as soiled diapers and pet waste in their programs they are excluded from many existing source separated organics diversion programs. For the purposes of this report it has been assumed that sanitary products including soiled diapers and pet waste will be excluded from the City of Sault Ste. Marie program.

Based on the forgoing, acceptable SSO materials are expected to consist of:

- paper napkins, paper towels
- loose shredded paper
- cotton balls
- greasy pizza boxes
- microwave popcorn bags
- corn stalks
- house plants (soil removed)
- food scraps
- fruit and vegetable peels
- bones, meat and fish
- coffee grounds and filters

3. Potential Impacts of Expanding the Scope of the Biosolids Processing Project to Include SSO

3.1 Planning Requirements (Class EA)

The Biosolids Management Class EA was completed based on a single feedstock consisting of biosolids. The addition of SSO introduces a new feedstock which will increase the capacity of the facility and may alter the impacts that were documented in the original ESR. To address this issue, it is recommended that the City proceed with an addendum to the previously completed Class EA. These planning requirements will delay the implementation of the biosolids project but could potentially be completed in concert with the facility design activities to mitigate timing impacts.

3.2 Potential Provincial Policy Changes and Funding

There are several moving parts related to the Province's transition to a circular economy. The Province has, for several years, been actively working to transition the "Blue Box" program from a Municipal to a Stewards responsibility. It is apparent that the Province is struggling with this transition as the initial Blue Box transition plan was inadequate and work on an updated plan is continuing which has resulted in significant delays. The final framework for that program may impact SSO programs particularly in relation to the coordination of SSO collection with blue box materials and residual waste.

As is evidenced by the Blue Box transition, new or modified Provincial programs are often delayed for various reasons which may include overly aggressive schedules, bureaucratic red tape, changes in government and/or government policy, etc. Therefore, there is the potential that the Province may delay implementation of some or all of the Food and Organic Waste Policy mandates. It is also possible a change in Provincial government could result in policy changes which may impact the City of Sault Ste Marie's mandate to collect and process SSO.

Under the present Policy, the City of Sault Ste. Marie modestly exceeds the population and population density thresholds. In addition, in comparison to other similarly sized southern Ontario municipalities, the City faces climatic and cost challenges. The colder climate would require additional protection and cover for processing and storage areas. The cost of processing organics will be comparatively higher and there are no opportunities to partner with other municipalities to achieve economies of scale through a regional processing facility. The availability and costs of required amendments may also be prohibitive. Given the relatively small incremental benefits that Sault Ste. Marie offers to the Province relative to the challenges and costs, it is plausible that any consideration of relaxing or modifying the Policy could potentially impact Sault Ste. Marie and other similarly sized northern communities. Therefore, the early implementation of an SSO program, in conjunction with biosolids processing, could result in the City proceeding earlier than necessary or perhaps proceeding without being mandated to do so.

In addition, oftentimes when the Province mandates municipalities to implement new initiatives they will provide some level of one-time funding to assist with capital costs. The early construction of an SSO processing facility may preclude the ability to take advantage of third-party funding since they are contingent on the planning or design being in early stages.

3.3 Facility Capacity to Accommodate SSO

There are adequate resources and information available to assist in estimating the quantity and capture rate of SSO in the residential waste stream. Conversely however, it is very difficult to estimate the quantity and capture rate of SSO in the IC&I sector. As is evidenced by the current state of IC&I waste management in Sault Ste. Marie (i.e. approximately 75% of waste is being exported to a disposal facility in northern Michigan), the non-residential sector will make waste management decisions primarily based on cost.

Therefore, there are challenges in right sizing a facility in relation to the IC&I sector. In the following sections of this memo the estimated SSO that may be captured in the residential and IC&I waste streams are quantified.

4. Estimated Residential SSO Quantities and Capture Rates

A number of sources are available to assist in estimating the quantity of residential SSO in Sault Ste Marie. Historically a comprehensive residential waste audit was completed in 2006. In addition, there are a number of Ontario Municipalities that have SSO programs in place that have published their SSO data. Our approach was to consider the data from these various sources to develop a reasonable estimate of potential residential SSO processing quantities.

Estimate #1
Based on the results of the 2006 residential waste audit, which included collection and sampling of single family residences during each of the four seasons, approximately 38% of the curbside waste consisted of compostable materials. The average annual quantity of waste collected curbside over the period 2017 to 2019 was 12,098 tonnes. If we assume that 38% of this quantity is compostable the available quantity of curbside SSO is approximately 4,600 tonnes. This represents the residential curbside program and excludes the multi-residential sector. The average annual quantity of waste collected through the multi-residential contract over the period 2017 to 2019 was 2,628 tonnes. If we assume the multi-family residential waste stream is similar to the curbside residential waste stream, there may be an additional 1,000 tonnes available through the multi-residential sector resulting in a total estimated SSO quantity of 5,600 wet tonnes.

Estimate #2
In addition to the foregoing, Stewardship Ontario publishes waste quantities for municipalities that participate in the Datacall. Through that information (refer to the appended table) the per capita quantity of SSO collected varies widely between municipalities from approximately 25kg/person/year to 90 kg/person/year with an average of approximately 50 kg/person/year. In general, the higher per capita SSO capture rates are occurring in municipalities that accept personal hygiene products and pet waste.

The following estimates were developed using the foregoing per capita figures and the City of Sault Ste. Marie 2016 census population:

Low end estimate of SSO to be captured = 25 kg/per cap * 73,368 = 1,834,200kg (approx. 1,800 tonnes)
High end estimate of SSO to be captured = 90 kg/per cap * 73,368 = 6,603,120 kg (approx. 6,600 tonnes)
Average = 50 kg/per cap *73,368 = 3,668,400 kg (approx. 3,700 tonnes).

If we assume there is approximately 5,600 tonnes of SSO available in the residential curbside and multi-family residential waste streams as identified through the waste audit data, the range of quantities presented above would result in the following estimated capture efficiencies:

Low end capture efficiency = 1,800/,5,600 = 32%
High end capture efficiency = 6,600/5,600 = 100%
Average capture efficiency = 3,700/5,600 = 66%

Estimate #3
To provide a further level of confidence with the estimates, we also considered the proportion of SSO waste relative to residential waste generated exclusive of leaf and yard waste. We have excluded leaf and yard waste from the analysis as each municipality is likely unique in terms of the options available to residents to dispose of their leaf and yard waste. As an example, Sault Ste. Marie offers residents a curbside leaf and yard waste program throughout the growing season however there is also a private sector leaf and yard waste depot that is highly utilized by residents. Therefore, the City's collection numbers only represent a portion of this waste stream.

Through the analyses completed for other municipalities with active SSO programs, it was determined that the collected SSO represents between 7% and 23% of the residential waste stream (Note: leaf and yard waste excluded from the calculation).

In applying these percentages to the average annual 2017-2018 waste quantities in Sault Ste. Marie of 30,425 tonnes per year, we obtain the following:

Low end estimate of SSO to be captured = 7% * 30,425 = 2,130 tonnes (approximately 2,100 tonnes)
High end estimate of SSO to be captured = 23% * 30,425 = 6,998 tonnes (approximately 7,000 tonnes)
Average = 14% * 30,425 = 4,260 tonnes (approximately 4,300 tonnes)

Summary

Based on the residential waste audit data, the estimated quantity of residential SSO (single and multi-family) that may be available in the waste stream is approximately 5,600 tonnes. Based on other SSO programs that are operating in the province, approximately 50 kg of SSO is being collected per person, which when applied to the City's population results in 3,700 tonnes of SSO based on the current population. When we considered the average SSO collected in other communities relative to total residential waste (excluding leaf and yard) and applied that proportion to the overall residential waste stream in Sault Ste. Marie (excluding leaf and yard) the estimated SSO was in the range of 4,300 tonnes. Based on this analysis, 4,000 tonnes of SSO may be a reasonable capacity to accommodate the existing population (i.e. midway between the 3,700 t to 4,300 t range).

The values presented above reflect the current population. Population projections have been developed for the ongoing Waste Management Environmental Assessment (EA). The projected population, as presented in the Waste Management EA, has been reproduced in Table 1 below. If we consider a planning period of approximately 20 years, the 2041 projected population, as presented in Table 2, is approximately 86,000. If the 4,000 tonnes identified in the previous paragraph is extrapolated to accommodate 86,000 the resultant capacity for planning purposes is approximately 4,700 tonnes.

Table 1: City of Sault Ste. Marie Population Projections

	2006	2011	2016	2021	2026	2031	2036	2041	2046	2048
Sault Ste. Marie	74948[1]	75140[1]	73368[1]	74527[2]	75686[2]	79931[2]	83270[2]	85969[3]	88755[3]	89895[3]

Notes:
1. *Census Data.*
2. *The City of Sault Ste. Marie Population, Housing and Employment Projections – Commercial and Industrial Land Needs Analysis Report – September 2018 .*
3. *Extrapolated from The City of Sault Ste. Marie Population, Housing and Employment Projections – Commercial and Industrial Land Needs Analysis Report – September 2018*

5. Estimated IC&I SSO Quantities and Capture Rates

Organic wastes are also generated from Industrial, Commercial & Institutional (IC&I) sectors. These sectors include food processing and packaging, hospitals, cafeterias, restaurants, convention centres, supermarkets, food transporters, etc.

As noted previously it is very difficult to quantity the SSO that is available in the IC&I sector as there is no system in place to track IC&I waste quantities and types. Furthermore, it is very difficult to determine what capture efficiency could be achieved in this sector for several reasons:

1. Decisions in is sector are driven by cost. Proponents in this sector will only separate organics if it is cost effective or if they are mandated to do so. Even if they are mandated to do so, effective enforcement will likely be challenging.

2. Secondly, businesses and institutions will ensure their organic waste is collected and delivered to the lowest priced processing facility in the market much like what is currently being experienced with IC&I residual waste today (i.e. 75% of local IC&I waste exported to a northern Michigan landfill).
3. The ICI characterization is highly variable by community.

The Ontario Organic Waste Management Study (OOWM) 2013-2033 report showed a typical waste composition for the IC&C sector as shown in Table 2

Table 2: IC&I Waste Composition

Composition	Percentage (%)
Food Waste	15
Leaf & Yard Waste	2
Paper	3
Wood	1
Garbage and Recyclables	79

As noted previously, in recent years approximately 75% of IC&I waste generated in Sault Ste. Marie is being exported and disposed of in a northern Michigan landfill. Based on historical waste quantities, the estimated IC&I waste disposal quantities are likely in the range of 25,000 tonnes. If we focus on the food waste alone there may be approximately 3,750 tonnes of food waste through the IC&I sector. As noted in earlier paragraphs there may be a significant challenge in achieving significant capture rates in this cost driven sector. As an example, the City of Guelph is currently processing approximately 10,000 tonnes of SSO annually and they estimated that approximately 10% of this quantity is originating in the IC&I sector.

6. Facility Capacity to Accommodate SSO

Based on the analyses completed it is estimated that the City, with fairly aggressive capture efficiency targets, could collect approximately 4,000 tonnes of SSO with the current population and 4,700 tonnes with the projected 2041 population.

It is very difficult to speculate on the quantities that may be collected in the IC&I sector but the City of Guelph has reported that the IC&I sector may represent approximately 10% of the SSO quantity that they process.

A processing capacity of 5,000 tonnes/year is suggested for further discussion on the basis of the following considerations:

- The quantities of SSO available in the IC&I sector are poorly defined and market specific information is difficult and costly to collect.
- The capture efficiency in the IC&I sector is also very difficult to predict as outlined in Section 5.
- The population growth is highly speculative as the City has not experienced any significant growth for many years.
- The suggested 5,000 tonnes/year capacity provides approximately 25% surplus capacity relative to current residential needs which could accommodate future growth and IC&I sector SSO.
- Consideration could also be given to designing the facility to easily accommodate a future phase if desired. This could consist of providing an allowance for expansion in a preliminary design layout; but moving forward with detailed design of the biosolids management facility currently.

APPENDIX
(Municipal Datacall Summary)

RESIDENTIAL ORGANICS
RPRA DATACALL 2018

Municipality	2016 Population	2016 Households	Residential Organics						Residential Diversion			Total Residential Waste Generated	Total Residential Waste Excluding L&Y	Total Residential Waste Excluding L&Y/Blue Box/Other Diverted	Total Residential Waste Disposed	% L&Y of Total Waste	% SSO of Total Waste	% SSO of Residential Waste Excluding L&Y	% SSO of Residential Waste Excluding L&Y/Blue Box/Other Diverted	% Organics of Total Waste
			Yard	Leaves	SSO	SSO/ person (kg)	SSO/HH (kg)	Total Organics	Blue Box	Other Diverted Waste	Total Diverted									
HALTON, REGIONAL MUNICIPALITY OF	548,435	192,977	21,459	11,076	28,325	51.65	146.78	60,860	38,780	16,322	115,962	209,194	176,660	121,557	93,232	15.55	13.54	16.03	23.30	29.09
DURHAM, REGIONAL MUNICIPALITY OF	645,862	227,906	24,889	-	28,446	44.04	124.82	53,335	43,278	68,122	164,735	258,356	233,467	122,067	93,621	9.63	11.01	12.18	23.30	20.64
BARRIE, CITY OF	141,434	52,476	6,107	-	4,667	33.00	88.94	10,774	11,367	7,356	29,497	55,759	49,652	30,929	26,262	10.95	8.37	9.40	15.09	19.32
TORONTO, CITY OF	2,731,571	1,112,929	93,472	-	158,089	57.87	142.05	251,561	95,138	54,011	400,710	791,000	697,528	548,379	390,290	11.82	19.99	22.66	28.83	31.80
GUELPH, CITY OF	131,794	52,092	780	-	10,226	77.59	196.30	11,005	8,139	13,589	32,733	56,717	55,937	34,210	23,984	1.38	18.03	18.28	29.89	19.40
WATERLOO, REGIONAL MUNICIPALITY OF	535,154	203,832	17,709	-	24,767	46.28	121.51	42,476	36,450	41,532	120,458	196,795	179,086	101,104	76,337	9.00	12.59	13.83	24.50	21.58
ORILLIA, CITY OF	31,166	13,477	1,537	-	1,083	34.75	80.36	2,620	3,017	3,113	8,750	13,720	12,183	6,053	4,970	11.20	7.89	8.89	17.89	19.09
YORK, REGIONAL MUNICIPALITY OF	1,109,909	357,084	39,742	-	99,065	89.26	277.43	138,807	65,812	52,291	256,910	380,517	340,775	222,672	123,607	10.44	26.03	29.07	44.49	36.48
HAMILTON, CITY OF	536,917	211,596	12,769	-	13,937	25.96	65.87	26,706	34,341	20,232	81,279	226,428	213,659	159,086	145,149	5.64	6.16	6.52	8.76	11.79
GREATER SUDBURY, CITY OF	161,531	69,152	3,254	-	2,269	14.05	32.81	5,523	11,774	14,200	31,497	70,621	67,367	41,393	39,124	4.61	3.21	3.37	5.48	7.82
ST. THOMAS, CITY OF	38,909	16,586	-	-	4,315	110.90	260.17	4,315	2,096	1,461	7,872	18,560	18,560	15,003	10,688		23.25	23.25	28.76	23.25
OTTAWA VALLEY WASTE RECOVERY CENTRE	43,371	17,492	566	-	3,834	88.41	219.20	4,400	3,253	653	8,306	19,139	18,573	14,667	10,833	2.96	20.03	20.64	26.14	22.99
PEEL, REGIONAL MUNICIPALITY OF	1,381,739	430,180	40,902	6,729	63,219	45.75	146.96	110,849	81,775	75,163	267,787	532,037	484,406	327,469	264,250	8.95	11.88	13.05	19.31	20.83
KINGSTON, CITY OF	123,798	53,518	309	879	3,857	31.15	72.06	5,045	7,987	14,779	27,811	44,537	43,349	20,583	16,726	2.67	8.66	8.90	18.74	11.33
SIMCOE, COUNTY OF	479,650	183,536	8,693	-	12,955	27.01	70.59	21,648	24,831	43,422	89,901	150,853	142,160	73,907	60,952	5.76	8.59	9.11	17.53	14.35
NIAGARA, REGIONAL MUNICIPALITY OF	447,888	183,828	16,172	7,913	12,200	27.24	66.36	36,284	35,855	38,996	111,135	198,921	174,836	99,986	87,786	12.11	6.13	6.98	12.20	18.24
OTTAWA, CITY OF	934,243	373,756	5,054	-	76,571	81.96	204.87	81,626	56,330	12,633	150,589	351,790	346,736	277,772	201,201	1.44	21.77	22.08	27.57	23.20
DUFFERIN, COUNTY OF	61,735	21,918	1,963	266	3,137	50.82	143.14	5,366	5,287	1,167	11,820	20,588	18,359	11,905	8,768	10.83	15.24	17.09	26.35	26.07
					Min	14.05	32.81								Min	1.38	3.21	3.37	5.48	7.82
					Max	110.90	277.43								Max	15.55	26.03	29.07	44.49	36.48
					Avg	52.09	136.68								Avg	7.94	13.46	14.52	22.12	20.96
					Min	27.01	66.36	These values are with highest and lowest two removed										Min	6.98	These values are with highest and lowest two removed	
					Max	88.41	219.20	(i.e. data shaded red)										Max	22.66	(i.e. data shaded red)	
					Avg	49.82	130.28											Avg	14.22		

Appendix D

Summary of Municipal Waste Program Information Memorandum, AECOM, September 20, 2022

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CC: Rick Talvitie, AECOM

Date: September 20, 2022
Project #: 60687313
From: Tara Abernot

Memorandum

Subject: **Sault Ste. Marie Waste Collection Options Study**
Summary of Municipal Waste Collection Program Input

This purpose of this Memorandum is to provide a summary of the waste collection program information received by Municipalities and obtained from Municipal websites and studies. The information summarized on attached Table 1 and Table 2 includes waste types collected, collection frequency, truck types used and collection type (i.e., manual or automated). In addition, several Municipalities provided additional information on their programs which includes information on co-collection of different waste streams in split body vehicles, consideration of automated collection, co-collection and co-mingling of yard waste and organics, and how their garbage set-out limits drive participation in the organics program.

Additional Program Information

1. ***If your Municipality utilizes split body trucks for co-collection of different waste streams, have you had any contamination issues or do you have concerns with contamination? Are the truck waste compartments dedicated to a specific waste type?***

City of Guelph

No issues with contamination really, there are compartments. The same trucks are used (i.e., one week garbage/organics, the next week recycling/organics). The trucks are rinsed after every organics load because it gets dirty but they don't rinse trucks after the garbage/recycling loads. That being said, concern for contamination from remnants are minimal to nothing. In Guelph residents are required to use bags for garbage and recycling materials are usually very dry. When collecting, all the material is compressed to create more collection space, but this will also compact everything together so that when it is tipped, everything should fall out. So most/all material is dumped out onto the tip floor before the truck goes to pick up more. Contamination from residential sorting is a much larger concern.

Region of Halton

Co-collection of recycling & organics, compartments are dedicated to each stream – regular contamination from residential waste set-outs, and occasionally from the collection vehicle if a malfunction occurs.

City of Orillia

We collect dual stream recycling in split body trucks. The fiber stream and container stream are both collected in their own dedicated compartments. We also co-collect garbage and organics/yard waste in the same split body truck. There are again dedicated compartments for each waste.

Region of Peel
Contamination issues have not been a result of the use of split-bodies. Also, the contract requires that any waste collection vehicles used for the co-collection of waste materials require both compartments and hoppers to be liquid leak proof to eliminate contamination. The smaller compartment is typically used for organics collection, however, depending on the other waste stream collected on the truck, the particular route or other operational matters, this may change.

City of Vaughn
The truck waste compartments are dedicated to a specific stream. Contamination is always an issue, especially since Covid and residents not knowing where paper towel/tissues/gloves belong.

Region of Waterloo
- At the curb – staff will sort and put the Green Bin vs Blue Box or Green Bin vs Garbage/Yard Waste materials inside the proper compartment. Possibility of human error, however low chance;
- Within the truck – The split walls may have items seep through – mechanical error, however low chance. There is an opportunity for switching a yard waste vs. garbage truck and staff forget to unload the previous material, and use for the other stream. E.g. Garbage on a Friday, didn't unload and then used for Yard Waste on Monday and didn't realise there was old material on the truck. Human error, however low chance;
- At the transfer station/landfill – Opportunity where staff could open the wrong split compartment, and contaminate by putting Blue Bin materials at organics, or garbage at yard waste. Possibility of human error, however low chance.

2. ***If your Municipality does not currently utilize mechanical collection, is it being considered?***

City of Guelph
We do use mechanical collection but not for yard waste. Paper bags and bins/containers that residents purchase themselves are used so there currently is no bin size regulation.

Region of Halton
Yes. We will be conducting a pilot project in 2023 for consideration in the next collection Contract, as well as EPR transition decisions.

City of Orillia
Mechanical collection could be considered for the City's next collection contract in 2028.

Region of Peel
N/A

City of Vaughn
Mechanical collection is not being considered at this time.

Region of Waterloo
Yes, it is being explored for our future waste collection contract.

3. ***If your Municipality co-collects organics and yard waste is it co-mingled/mixed together? If co-mingled are there any issues with the large fraction of yard waste in the spring and fall? Does it impact your compost mix and create challenges?***

City of Guelph
Organics and yard waste is not co-collected.

Region of Halton
N/A - but we do encourage the collection of pumpkins with the yard waste in the fall with no issues.

City of Orillia
The City of Orillia co-collects yard waste and organics. During the spring and fall our collection contractor will add a truck dedicated to picking up yard waste to manage the increased volumes. Additional planning is required to create more space to accept higher volumes of yard waste at the City's composting facility.

Our organics and yard waste are collected and composted together. I have been with the City of Orillia for just over a year and to this point mixing yard waste along with green bin organics has not created any challenges yet.

The City of Orillia has just one composting facility, so the additional yard waste that is collected in the spring and fall by a dedicated truck is mixed with our green bin organics as well.

I will just add that I believe it is beneficial for the composting process to mix the two streams together because the SSO is typically high in nitrogen and the yard organics are typically higher in carbon (not including fresh grass clippings) so you are better able to maintain a proper C to N ratio.

Region of Peel
Organics and yard waste are not co-mingled throughout the majority of Peel. However, in the North collection zone, our collection contractor collects cart-based Yard Waste from wheeled containers from some households, which may be co-mingled and collected with Organics. No issues reported on the processing side of things.

City of Vaughn
Vaughan does not co-collect yard waste and organics.

Region of Waterloo
No, they are not collected together.

4. Is your current garbage set-out limit suitable to drive participation in the organics program?

City of Guelph
All houses have an 80 liters organics cart.

Region of Halton
Yes. We reduced the garbage bag limit to 3 and launched the organics program at the same time. We did find that it helped with participation, with a minor increase in illegal dumping at the time however it was short-lived. We are considering further garbage bag-limits in the future as part of our WM Strategy.

City of Orillia
The City uses a partial user pay system where residents receive 20 garbage tags for the year and have to purchase additional tags if needed. There is no limit to the amount of garbage one can put out as long as each bag is tagged. The City of Orillia implemented a clear garbage bag program in February of 2022 where residents must place organics in their green bin. Garbage bags that include over 10% of organics or recycling are not collected.

Region of Peel

The move to bi-weekly garbage collection with weekly organics collection helps drive participation in the organics program. For instance, by the end of the first month of our program changes, we saw increased organics participation from 35% to 50% in January 2016. If you would like additional info on more recent participation levels, please let us know and Peter and his team will help provide an update.

City of Vaughn

Yes out set-out limit of 3 garbage items every other week, does drive residents to recycling and compost better.

Region of Waterloo

In 2017, the Region went from unlimited garbage set out to limits. There was a large increase of Green Bin usage. Attached is an annual report where you can see the tonnage/participation increase:

https://www.regionofwaterloo.ca/en/living-here/resources/Waste-Management/2021_Annual_Waste_Summary-Access.pdf

Currently our limit is four bags/cans bi-weekly. It will be reduced to three bags/cans bi-weekly effective October 17, 2022. Here is a link with more information:

https://www.regionofwaterloo.ca/en/living-here/garbage.aspx#Frequently-Asked-Questions-about-the-garbage-limit-and-why-its-changing

Table 1 - Municipal Waste Collection Information (Single Stream Recyclables Set-Out)

Municipality	Waste Stream Collected	Truck Type	
		Week 1	Week 2
City of Greater Sudbury[1] (Manual)	Garbage	Truck 1 - Single	
	Organics	Truck 2 - Split	Truck 1 - Split
	Recycling	Truck 2 - Split	Truck 1 - Split
	Yard Waste	Truck 3 - Single	
City of Guelph (Automated)	Garbage	Truck 1 - Split	
	Organics	Truck 1 - Split	Truck 1 - Split
	Recycling		Truck 1 - Split
	Yard Waste	Truck 2 - Single	
Halton Region (Manual)	Garbage	Truck 1 - Single	
	Organics	Truck 2 - Split	Truck 1 - Split
	Recycling	Truck 2 - Split	Truck 1 - Split
	Yard Waste	Truck 3 - Single	
Region of Peel (Contract #1)[2] (Automated)	Garbage	Truck 1 - Single	
	Organics	Truck 2 - Single	Truck 1 - Single
	Recycling		Truck 2 - Single
	Yard Waste		Truck 3 - Single
Region of Peel (Contract #2)[2] (Automated)	Garbage	Truck 1 - Single	
	Organics	Truck 2 - Split and Single	Truck 1 - Split
	Recycling		Truck 2 - Single
	Yard Waste		Truck 3 – Split and Single
County of Simcoe[3] (Automated)	Garbage	Truck 1 - Split	
	Organics	Truck 1 - Split	Truck 2 - Split
	Recycling		Truck 2 - Split
	Yard Waste	Truck 2 - Single	
City of Toronto[4] (Automated)	Garbage	Truck 1 - Single	
	Organics	Truck 2 - Single	Truck 1 -Single
	Recycling		Truck 2- Single
	Yard Waste	Truck 3 - Single	
City of Vaughn (Manual)	Garbage	Truck 1 - Single	
	Organics	Truck 2 - Split	Truck 1 - Split
	Recycling	Truck 2 - Split	Truck 1 - Split
	Yard Waste	Truck 3 - Single	

Notes:

1. City of Sudbury collection information obtained from Municipal website and area resident.
2. Region of Peel has two separate collection contracts.
3. County of Simcoe collection information obtained from Municipal website.
4. City of Toronto collection information obtained from Municipal website.

Table 2 - Municipal Waste Collection Information (Dual Stream Recyclables Set-Out)

Municipality	Waste Stream Collected	Truck Type	
		Week 1	Week 2
City of Kingston[2] (Manual)	Garbage	Truck 1- Split	Truck 1 - Split
	Organics	Truck 1 - Split	Truck 1 - Split
	Recycling (Dual Stream)[1]:		
	Blue Box #1	Truck 2 - Single	
	Blue Box #2		Truck 2 - Single
	Yard Waste	Truck 1 - Split	Truck 1 - Split
City of Orillia (Manual)	Garbage	Truck 1 - Split	
	Organics	Truck 1 - Split	Truck 1 - Split
	Recycling (Dual Stream)[1]:		
	Blue Box #1	Truck 2	Truck 2
	Blue Box #2	Truck 2	Truck 2
	Yard Waste[4]	Truck 1- Split	Truck 1 - Split
City of Thunder Bay[3] (Automated)	Garbage	Truck 1 - Split	
	Organics	Truck 1 - Split	Truck 1
	Recycling (Dual Stream)[1]:		
	Blue Box #1		Truck 2
	Blue Box #2		Truck 2
	Yard Waste	4x per Year	
Region of Waterloo (Townships) (Manual)	Garbage	Truck 1 - Split	
	Organics	Truck 1 - Split	Truck 1 - Split
	Recycling (Dual Stream)[1]:		
	Blue Box #1	Truck 2 - Single	Truck 2 - Single
	Blue Box #2	Truck 2 - Single	Truck 2 - Single
	Yard Waste		Truck 1 - Split
Region of Waterloo (Kitchener, Waterloo, Cambridge) (Manual)	Garbage	Truck 1 - Single	
	Organics	Truck 2 - Split	Truck 1 - Split
	Recycling (Dual Stream)[1]:		
	Blue Box #1	Truck 2 - Split	Truck 1 - Split
	Blue Box #2	Truck 2 - Split	Truck 1- Split
	Yard Waste		Truck 2 - Single

Notes:

1. Separate set-out containers used for dual stream recycling (i.e., not in split bin).
2. City of Kingston collection information obtained from Municipal website.
3. City of Thunder Bay information is based on their proposed collection program when organics collection is implemented in 2025.
4. City of Orillia comingles organics and yard waste during collection and composting. Additional trucks are added in the spring and fall dedicated to yard waste pickup only to accommodate increased volumes.

CITY OF SAULT STE. MARIE

WINTER CONTROL

BUDGETING AND OPERATIONAL APPROACH

FINAL REPORT

January 30, 2023

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Executive Summary

Maclaren Municipal Consulting (Maclaren) was engaged by the City of Sault Ste. Marie to review the operational and budget approach to winter control used by the City. This report is the fourth in recent years to deal with winter control.

KPMG conducted a broad Service Review of the City and tabled a report December 12, 2019. That review noted potential cost savings in excess of $1M by adopting the lower levels of service used in other Northern Cities.

Council subsequently approved a $500,000 reduction in the budget for winter maintenance in the 2021 budget. It also requested a review of winter maintenance levels of service which might have led to service level reductions that could off-set the budget reduction. The service level report came to Council July 12th, 2021. It was approved with no reduction of service levels, and that approval was the lense for this review.

Sault Ste. Marie (SSM) is located at the downwind end of the third largest lake in the world, Lake Superior. Snowfall has averaged about 320 cm in recent years, more than other northern cities, and in fact more than most cities in Canada. The climate has tended to stay cold over the winter, but recent years have seen more swings between weather below zero and weather above zero. There is rain each month of the year, so freezing rain is an issue. There are three different microclimates within the city, with a need to respond to the different needs in those three areas.

The City organizes winter maintenance with 103 operators organized in two key groups, one group that has four shifts and handles salting and sanding requirements 24/7, and a second group that handles plowing and other activities with two shifts that work five-day weeks, plus overtime when weekend snow events occur. Sidewalk maintenance, snow removal, hand work, pothole patching and most other work is conducted by this crew.

The crews generally use City-owned vehicles, although there are a few graders and loaders that are leased as well. There are 8 sanders, 5 “combos” (plow trucks that also can sand, 10 plow trucks, 8 graders (one leased) and 11 loaders (4 leased). The sidewalks are maintained by “trackless” vehicles which can articulate (bend) in the middle. There are 18 road plow routes, some plowed by the trucks and some by the graders. The loaders focus on clearing bus stops, laneways and other tight spaces.

There are about 4,000 complaints per year, although the numbers have been lower for the last two winters. Snow removal, including complaints about windrows across driveways, are the largest source of complaints.

There are some opportunities to reduce costs, but most will require some time to realize. The most significant opportunity is to expand the combined plowing and salting/sanding of arterial and collector roads. Historically there were four sanders on duty 24/7 and 18 road maintenance routes (that include plowing) that were maintained by the two-shift crew. There are five of these road maintenance routes this winter that

use a “combo” to provide both the salting/sanding of arterials and the plowing of the same roads, so only one vehicle is required, not two. There are some opportunities to expand this concept in the future. There is some risk in adopting this approach, and the current routes can be seen as a pilot, with further consideration as equipment is replaced.

The development of an anti-icing program (salt or brine distribution before a storm) and a pre-wetting program (applying brine to salt or sand as it is released from a truck) reflects best practices, should reduce the volumes of salt and sand required, and may facilitate scraping snowpack off the roads. Short term the City could establish a brine making facility, acquire a tank trailer or a tank to mount on a plow truck to test the anti-icing approach on various types of roads and in various types of weather. In the short term it can also investigate the options to acquire calcium chloride or magnesium chloride which can operate these programs at lower temperatures. Medium term the city can acquire salt and sand trucks that have prewetting capacity and establish a storage facility for calcium or magnesium chlorides to be used in salt/sand trucks when temperatures are lower. It may take into the longer term before the fleet transitions to allow pre-wetting on all salt/sand trucks. Similarly, covering the sand pile with tarps is the lowest cost approach to ensuring the salt mixed with the sand does not leach out, and can be implemented in the short term.

Very few driveways are cleared as a result of the “two-foot rule” which provides that the City will clear a driveway if a snowpack scraping operation leaves a windrow more than two feet (.6 m) high. But every call requires a visit by supervisors to determine if the windrow is more than 2 feet high and is the result of snowpack scraping. This policy should be eliminated. However, some low-income elderly or disabled residents do have a challenge clearing their driveways. The City should identify the Red Cross or a similar third-party organization that would receive applications and make grants to individuals who are unable to buy services in the market and who are elderly or disabled and unable to clear the snow themselves. The City could provide the grant to a third-party organization which would be responsible for determining whether particular households qualify for assistance.

There are also opportunities to contain future cost increases. The City has an excellent policy that determines which sidewalks are maintained in the winter. Requests to extend coverage to new sidewalks are dealt with each fall. This approach should be continued and might be improved if required by identifying the actual level of foot traffic on sidewalks proposed for winter maintenance.

The City recently conducted a Fleet Review, and its recommendations need to be implemented, particularly the adoption of realistic internal vehicle charge out rates which allow more effective planning and analysis by vehicle users and avoid the year-end adjustments. These charge out rates are an internal accounting/financing mechanism used to reflect the cost of ownership. This approach would improve planning and control but would not reduce costs.

The financial records of winter maintenance are excellent and provide a good picture of costs. However, the budget has been determined to be inadequate. Winter maintenance is strongly influenced by weather conditions, with the result it is easy to blame an overage on some particular event or conditions – and most people accept that approach. However, there was only one year in the last nine when expenditures have been lower than budget, with a range from $10,000 under budget to $1.5M over budget. On average expenditures have been $580,000 over budget. It should be noted that the budget is developed assuming all positions are filled, all year. This has allowed the department to experience savings due to turnovers ('gapping'), the time required to fill vacancies and recently due to the recruitment challenges. Normally we would suggest the budget be based on the 10-year average plus inflation to provide an adequate budget for the future. If the budget continues to provide full funding for all established positions, future budgets need to be increased in some other amount. The budgets for winter maintenance of sidewalks and for hired equipment in particular need to be increased.

Despite deficits that ranged as high as $1.5 million in the past nine years, the winter maintenance reserve fund remains unchanged. The over expenditures in winter control have been absorbed corporately and reserve draws have not been required. Future budget adjustments may present the opportunity for this reserve fund to grow during years of favourable weather conditions.

Recommendations

The following section provides a summary of the recommendations provided in this report.

1. That a salt and sand pre-wetting program be piloted, understanding the full implementation will require some time.
2. That an anti-icing program be initiated.
3. That a brine station be installed as soon as possible. It will be required even if the lower temperature chemicals are eventually acquired.
4. That calcium-chloride or magnesium-chloride supplies and storage systems be investigated.
5. That new salt/sand trucks be ordered with pre-wetting capacity (and capacity to carry front plows and wings).
6. That the current and subsequent winters be used for experimentation when materials can be assembled, even if the program is limited to the use of brine. The test would look at the potential of pre-wetting by spraying materials before loading, and for anti-icing distribution before an event to improve service levels and make it easier to plow roadways. It may be possible to test the use of anti-icing application on residential streets with a view to improving the scraping process and easing the removal of snowpack.
7. That the approach to selection of sidewalks to be maintained be continued, and if pressure to increase sidewalk maintenance continues, be augmented by a criterion related to pedestrian volumes on the sidewalks of concern.
8. That the sand pile be covered with tarps, weighted to resist wind removal, and the tarps be removed to expose enough sand for the next event(s).

9. That the “two-foot rule”, and any associated policy or program to remove windrows after scraping or after plowing be eliminated.
10. That funding be considered to provide a grant be provided to a suitable third party to be distributed to low-income persons incapable of removing windrows.
11. That the Fleet Department initiatives of implementing an FMIS, changing the charge-out approach and advancing the purchase of replacement vehicles be implemented, with implementation over time as required.
12. That enough combos be acquired with the capacity to distribute materials in front of the rear wheels, pre-wet the materials, mount front plows and wings and serve as dump trucks for snow removal and summer use be acquired, and that all new salt trucks have pre-wetting capacity.
13. That trucks (with operators) continue to be rented for snow removal when economic, and part of the increased budget be allocated for this purpose, based on average expenditures before COVID.
14. That the Department work with corporate Human Resources to improve and accelerate the hiring process.
15. Fleet budgeting should be revised to have Fleet target a break-even status and charge realistic rates for the use of equipment. This may require some time to achieve.
16. The Winter Control Reserve Fund should remain in place. It should be recognized that winter control expenditures relate strongly to weather conditions, which are unpredictable.
17. The budget for winter control activities (including street-sweeping in the spring) should be increased recognizing the average deficit of $580,000 in the past 9 years. It should be adjusted each future year to recognize inflation, and any further increase in the lane kms of roads and sidewalks maintained, unless they are maintained on a cost-recovery basis.
18. Within this amount, allocations should be realistic, particularly the allocation of costs to sidewalk clearing and hired equipment.

Mandate

Maclaren Municipal Consulting (Maclaren) was engaged by the City of Sault Ste. Marie to review the operational and budget approach to winter control used by the City. The level of service required was specifically excluded as it was reviewed by Council in 2021. The review was to cover:

1. A more refined budgeting approach, integrating more objective data sources,
2. A more refined operational approach, ensuring the most efficient and effective use of City and third-party service providers,
3. A summary of the approach of other northern cities to budgeting and operations,
4. A summary of the risks and pitfalls experienced by other northern municipalities.

The methodology applied included interviews with management and forepersons to review the operational approach, review of the budget and actual data for recent years, a jurisdictional review of the other cities in Northern Ontario, review of documents and data related to operations, and analysis of the various information sources to derive the conclusions and recommendations outlined.

Context

Sault Ste. Marie (SSM) is a City of 72.000 located at the eastern end of Lake Superior, at the locks that connect Lake Superior to Lake Huron via the St. Marys River. The smaller City of Sault Ste. Marie, Michigan is immediately across the St. Marys River.

Snowfall has averaged about 320 cm in recent years, more than other northern Cities, and in fact more than most cities in Canada. There is considerable lake effects snow as SSM is at the eastern end of Lake Superior, with winds from the west being the norm. The climate has tended to stay cold over the winter, but recent years have seen more swings between weather below zero and weather above zero. Staff has indicated that there are three different microclimates within the city, so different sections may face different conditions.

As shown in Table 1, there is rainfall every month of the year, including January and February, so freezing rain is a hazard throughout the year. Snow generally remains on the ground from the end of November until the beginning of April. Although climate change is resulting in more variation in climate, the table shows that the extremes for high snowfall and deep snow on the ground were all set some time ago. The extremes suggest the potential that SSM could face events with up to 60 cm of snow in one day and snow accumulations of as much as 140 cm, although smaller events are more likely.

Table 1 - Historical Weather Conditions in Sault Ste. Marie

	Jan	Feb	Mar	Apr		Oct	Nov	Dec
Rainfall (mm)	7. 3	5. 2	23. 2	48		97. 1	57. 3	16. 8
Snowfall (cm)	80. 2	52. 4	38. 3	17. 4		5. 2	41. 4	85
Average Snow Depth (cm)	27	32	21	2		0	2	14
Snow Depth at Month-end (cm)	32	28	8	0		0	3	20
Extreme Daily Snowfall (cm)	30. 2	61	42. 8	27		12. 6	37	48. 1
Year	1965	1947	2002	1979		1997	1989	1995
Extreme Snow Depth (cm)	111	117	137	58		8	36	140
Year	1982	1971	1972	1972		1972	1989	1995

Note: Data based on 1981 to 2010 Canadian Climate Normals

KPMG conducted a Service Review that reported December 12, 2019. KPMG noted potential cost savings in excess of $1M annually by reducing service levels for winter maintenance to those used by other municipalities. This recommendation appears to be based on the data and benchmarking contained in the predecessor companion report "KPMG – Municipal Services Profiles Report version II (Dec 5)". This report did establish that SSM spending on roads was higher than that in other municipalities (Greater Sudbury, Thunder Bay, Peterborough, North Bay, Timmins and Sarnia), however there is concern the analysis did not compare "apples to apples". It does not contain any analysis of winter control expenditures separate from other road expenditures, however the report concluded that savings were possible based on service levels being higher than in other municipalities. The KPMG report states, "While the City's maintenance standard for roads will exceed those adopted by certain other municipalities across the Province, the higher standard reflects the **required** (emphasis added) level of service given the City's climatic conditions particularly with respect to winter roads maintenance." Nonetheless, the KPMG report identified the possible savings of greater than $1M annually by reducing the standards for winter maintenance.

After approving a $500,000 reduction in winter maintenance in the 2021 budget reduction, Council requested a review of winter maintenance levels of service which might lead to service level reductions that could off-set the budget reduction. The service level report from staff came to Council July 12th, 2021. The report identified some areas where service levels exceeded those in other municipalities. It also identified sidewalks where SSM provides winter maintenance services, but made it clear it does not clear all sidewalks. There are a specific set of criteria that are used to determine whether particular sidewalks are to be maintained. Requests to extend or reduce service are reviewed against the criteria each fall.

At the conclusion of the discussion Council determined that current service levels should be maintained.

In 2021 SSM also conducted a Fleet Management Study which reviewed the fleet used by Public Works, including that used for winter control. The study recommended reducing the average age of the winter control (and other) fleets, the establishment of a dedicated Fleet Management Information System (FMIS), and the establishment of realistic budgets to achieve these steps.

In 2022 SSM initiated the current review of service delivery options with a view to identifying any available modifications of the service delivery approach that could reduce costs while allowing the target service levels to be achieved.

Service Levels

The Province sets out Minimum Maintenance Standards (MMS). Municipalities are not obligated to meet the minimum service standards, but they are deemed to be meeting their obligations provided they do meet the MMS, which can be useful when processing claims that involve damage to persons or property related to winter conditions.

As mentioned above, service levels were confirmed by Council in July 2021. Guideline W-3 outlines the current service levels for winter maintenance. Council discussion tended to focus on increased service levels, particularly increases to the level of sidewalk plowing, discussion of trail plowing, and more clearing in the downtown area; however, no changes were adopted. The report did note that current service levels are higher than MMS and higher than those used in other cities which generally require a higher volume of snow before plowing residential streets. The report noted that SSM has the highest snow volume of the northern cities, and that the snowpack would be excessive if service levels were reduced.

The standards as adopted by Council meet or exceed the MMS set out by the province. In particular, hills and the downtown are added to the salt/sand routes regardless of the category of road involved. Residential streets (categories 3 to 6) are plowed after a 5 cm snowfall (once the higher-class roads are completed) rather than the 8 to 10 cm required by the province.

The City has a sophisticated approach to determining which sidewalks receive winter maintenance. A review is conducted each fall. The review considers the street classification and traffic volumes, school routes, senior citizen complexes, and access to transit routes. About 209 of the 356 km of sidewalks are maintained in the winter. Those that are maintained receive attention within 24 hours, well below the MMS requirement of 48 hours. Bike lanes are not maintained in the winter and are used for snow storage.

Snow removal is generally required due to the high volumes of snow. This occurs when required to maintain sight lines at intersections, to facilitate drainage, and within the downtown core to facilitate access to parking and businesses. Each snow removal in

the downtown area (Queen Street and side streets) generally requires a week after significant events and costs about $80,000. This generally occurs two or three times per year. Many main roads have snow removal, and many intersections require attention by loaders removing snow to restore sight lines.

The main roads (category 2 and 3) are generally plowed and sanded or salted (depending upon the temperature) within 12 hours of the end of a snowfall, and all roads and sidewalks are generally completed within 24 hours.

The policy allows the Deputy Chief Administrative Officer (DCAO) for Public Works or the Director of Public Works, to declare a significant event; this removes the target timeframes for plowing, salting and sanding. The Director may keep equipment off the streets as required by weather conditions.

Summary of Service Levels

- Streets – plowing and sanding within a 12-hour period for arterial and collector streets, and for all streets within 24 hours of the end of an event.
    - Plowing commences after the accumulation of 5 cm of snow
        - The Director may use discretion on the approach, to ensure public and employee health and emergency vehicle access.
        - Streets are normally plowed at night when the parking prohibition is in effect. Parking is prohibited from November 1 to April 30, from midnight until 6 am.
        - Excessive accumulation of snowpack will result in scraping between storms.
    - Sanding and salting may be done 24 hours a day, on a regular or spot basis depending upon conditions.
        - Salt is applied at 132 to 200 kg of salt per lane km, sand at 200 to 700 kg/lane km. Salt is not used if the temperature is (or is forecast to be) below -18 degrees C.
        - High priority streets and hills, then to medium priority streets and residential intersections, then to residential streets without sidewalks.
        - Specific calls or identified conditions will be responded to within 30 minutes when possible.
    - Snow Removal – is carried out to maintain sight lines at intersections, to maintain safe roadway widths, to facilitate drainage, and within the downtown core to facilitate access to parking.
- Sidewalks – Maintained sidewalks are plowed within 24 hours of the end of precipitation. In extreme events, arterial and collector streets are done first.
- Bus stops are cleared within 24 hours.

Service Delivery

Winter Staffing

Winter staffing begins at the start of November and continues until street sweeping is concluded, generally at the end of April or early May.

Management staff includes the Superintendent of Works, 4 area co-ordinators (who workday shifts) and 9 maintenance supervisors.

Historically the roads section of Public Works has been composed of 103 labourer/operator positions, the majority of whom have the DZ license and are able to operate all winter equipment (although some are more experienced than others at the operation of specific pieces).

These staff are allocated as follows:
Sander/Salter Crew – on duty 24/7

- 4 Shift supervisors
- 20 Operators (5 on each shift) – each has a zone (downtown, north, east, west) with priorities in each zone.

Day/Evening Shifts – Monday to Friday

- 54 operators – two crews of 27 (A and B), each shift has:
    - An operator for each of 18 plow routes (including a highway route) with a day and night operator for each route, and with a specific vehicle assigned, plow with wing or grader, to each route.
    - 7 loader operators, each does a bus stop route. Drive trucks for snow removal between events.
    - 1 loader operator for parking lots.
    - This group is generally responsible for snow removal when the roads do not need plowing, with the assistance of hired trucks and operators.
- Crews alternate day and evening weekly,
- The day shift is responsible for responding if needed on weekends

Other crews.

- 9 sidewalk operators – 4 am to noon – each with a trackless vehicle
- 5 lead hands usually two or 3 labourers each (11 total) Monday to Friday days, each with a route - do hand work, stairs, crosswalks, sand bus stops.

The above numbers assume no-one is sick or on Workers Compensation, and that all vacancies are filled (9 during the interviews, 3 subsequently filled). When staffing is short, one or more of the licenced DZ operators what are serving as labourers are generally moved from the labour crews to an operator position as required. There appears to be a problem recruiting staff. The recent Spring/Summer competition which involved approximately 60 applicants resulted in 1 hire due to a variety of reasons including lack of qualifications, timing of offer, higher wages elsewhere, etc. The process takes several weeks, with a review of applications, then testing, then interviewing, and then coming to a decision on hiring. For people from out of town, the

need to make repeated visits to SSM for testing and interviewing is a disadvantage. For those who are unemployed, the process takes so long most will find something else in the meantime. They cannot remain unemployed for two months or longer. The City also faces competition from the steel plant which is currently expanding operations and hiring. Although employment is less secure than it is with the City, the mill pays much more and grants bonuses based on profitability, which have recently been higher than most operators make in a winter.

The staff involved in winter maintenance are full-time, year-round employees, although about 25 have been laid-off each spring, generally for 5 to 8 weeks.

There is a trainer who uses the snow dump properties to help new operators to practice use of graders and plows. There is also a system to measure performance on the job, give Operator internal demerit points when warranted, as well as parallel application of the City's Progressive Discipline Policy.

Complaints

The switchboard is manned 24 hours a day. It handles all Public Works calls and enters them in the work order system which results in a supervisor seeing and investigating the calls related to road conditions. There is a janitor who works the overnight shift and answers calls when they come in.

Table 2 - Total Complaints by Year

	Fall	Winter	Total
2016/17	Not available	2954	2954
2017/18	687	2725	3412
2018/19	538	3804	4342
2019/20	727	3614	4341
2020/21	333	867	1200
2021/22	616	2362	2978

As the data shows, complaints went down significantly in the winter of 2020-2021 (low snowfall), although they increased once again in the winter of 2021/22., which had much higher snowfall.

Table 3 - Average Complaints and Days to Resolve (5 years)

	Fall Complaints	Days to Resolve	Winter/Spring Complaints	Days to Resolve
Sanding	133	1. 9	458	1.7
Salting	1	0. 6	4	1. 7
Plowing	147	5. 6	306	9.0
Snow Removal*	136	4. 4	1059	14.8
Potholes	32	6. 1	308	17.2
Snow Ditching	6	14.0	15	39.0
Winter Drainage	33	N/A	285	N/A
Spring Cleanup	44	4. 7	156	20.2
Grading	16	6. 1	54	6. 3
Winter Damage	38	N/A	96	N/A

* Snow Removal includes most complaints related to windrows across driveways

Snow removal is the largest source of complaints, and they tend to take longer to resolve as they must wait until weather permits, resources are available, and higher priority areas are covered. It should be noted that snow removal complaints declined significantly two years ago, although they increased again last winter. Many of the snow removal complaints related to the removal of windrows from driveways, and most of those were rejected, usually because the windrow did not exceed two feet high.

Requests for sanding and plowing are also major areas of concern. The winter of 2019-2020 brought many requests for additional sanding, but they were resolved in less than a day, a record which has since been maintained. Requests for plowing have been declining in the last five years, as has the time required to respond to requests. There are very few requests for salting, likely because of the 24/7 capacity to salt the major roads, hills and curves.

The other major category of complaints relates to potholes. They peaked in 2019/2020. The days to resolve have been gradually reducing, although they remain high as repairs are highly weather dependent.

Snow Removal.

Snow removal is generally conducted between snow events. The A and B shifts are generally responsible, using two blowers (loaders with blower attachments), one on the street and one in the snow dump to pile the snow. Sidewalk plows and graders assist in lining up snow for the removal operations, and hired trucks are generally used to haul the snow to the snow dumps, although recently there has been less emphasis on hired trucks and more use of the in-house fleet.

Snow removal usually starts in January but could start earlier. It focuses on the downtown areas with business operations and street parking. Crews will also attend to

other areas where sight lines or street narrowing limits mobility or causes safety concerns.

The city has 7 city-owned snow dump locations, which is excellent for a city of this size.

Fleet Services

Winter maintenance vehicles are supported by Fleet Services, which has a supervisor, 8 mechanics, four servicemen and 3 welders. The key pieces of winter equipment are:

Table 4 - Major Fleet Items

	Number	Ave. Hours	Avg 2021 Cost of Maintenance	Spares
Sanders	8	14,663	10,818	3
Combos (sander with front plow and wing)	5	7,009	14,429	0
Plow Trucks (no sander)	10	12,563	22,362	3
Graders (1 leased)	8	3,251	4,851	
Loaders (4 leased)	11	5,182	13,445	3
Blower Attachments	4	1,842	25,094	N/A
Trackless (sidewalk)	12	4,460	4,742	3
Sidewalk Sanders	14	N/A	-	5

There are generally an adequate number of spare vehicles of each type. However, 3 of the sanders are quite old and two others have required expenditures of over $60,000 for maintenance in recent years, suggesting they are problematic. Three of the sanders have underbelly plows and can plow while they sand or salt. Five of the plow trucks have sanders, and two of them are requiring higher maintenance expenditures. Of the remaining 10 plow trucks, two are particularly old and 7 of them have required over $30,000 in maintenance in one year, with two requiring more than $150,000 in maintenance over the last 5 years. The plow trucks are used in the summer as dump trucks. The graders tend to be newer, although the two Volvo graders are approaching replacement. Three of the loaders have required over $125,000 in repairs in the past 5 years. In general, the equipment is not being replaced as required.

Materials

There are three key materials used in winter operations. Salt is used on the arterials and collectors when temperatures are warm enough; generally, above -18 C. Sand is used on residential roads and when temperatures are too low for salt. Sand also includes up to 6% salt which is mixed in to ensure the sand does not freeze in blocks. The salt is stored indoors, but the sand is stored in a large pile outdoors, with the result that rain tends to leach away the salt, and it sometimes requires a second mix of salt so it can be used effectively.

Table 5 - Salt and Sand Used, by Winter

	2017/18	2018/19	2019/20	2020/21	2021/22
Salt	6225 mt.	7551 mt.	8454 mt.	5219 mt.	6593 mt.
Sand	20,515 mt.	26,097 mt.	24,548 mt.	17,410 mt.	19,876 mt.
% Salt	23%	22%	26%	17%	25%

The rates of application for sand and salt are relatively high at 132 to 200 kg of salt per lane km, sand at 200 to 700 kg/lane km, which tend to be higher than other cities.

For pothole repairs, the City has a hotbox and hence uses hot asphalt whenever possible. Even when placed in cold weather, hot asphalt pothole repairs will last much longer that those carried out with cold mix. However, when repairs are carried out in very cold weather, cold mix is used. The table below shows the relationship, which has varied over the years based on weather and the timing of pothole repair requirements.

Table 6 - Pothole Repair Materials

	2017	2018	2019	2020	2021
Hot Asphalt Tonnage Purchased (MT)	7112	6620	5787	7739	7375
Cold Mix Asphalt Purchased (MT)	75	209	192	515	91. 58
Cold Mix %	1%	3%	3%	7%	1%

Weather Conditions

As discussed, actual costs can vary widely, and there is a clear relationship between expenditure levels and weather conditions – which are generally not known when the budget is set. The table below shows the actual snowfall for each of the last five winters., both by winter, and by season. The two can be quite different.

Table 7 - Recent Snowfall in SSM, by Calendar Year and by Season (cm)

Calendar Year	2017	2018	2019	2020	2021
January	104.7	58.0	120.7	80.0	37.0
February	92.9	56.2	115.5	69.2	53.1
March	15.6	17.4	43.6	27.3	32.1
April	3.0	72.0	13.5	17.4	2.7
May	0.0	0.0	9.1	2.0	0.0
October	5.0	2.1	0.2	6.6	0.0
November	43.6	95.3	52.1	25.8	76.8
December	122.0	28.9	75.4	51.8	102.3
Total	386.8	329.9	430.1	280.1	304.0

Season	2017-2018	2018-2019	2019-2020	2020-2021
	374.2	428.7	323.6	209.1

While snowfall is often used as an indicator of winter intensity, it does not capture the effects of freezing rain and rapid temperature fluctuations. Snowfall has exceeded the 320 cm annual average for 3 of the past 4 winters.

The Ministry of Transportation publishes an Ontario Winter Severity Index for each region of Ontario. It is a scale of 0-100 based on a combination of weather factors such as snowfall, temperature, freezing rain and other factors. In the table below we have compared the MTO Winter Severity Index for Sault Ste Marie and the four other MTO contract areas in Northern Ontario.

Table 8 - MTO Severity Index comparison

Winter	SSM	Sudbury	North Bay	Thunder Bay East	Timmins*
2021-2022	92	75	76	70	83
2020-2021	59	48	52	68	66
2019-2020	87	85	76	86	97
2018-2019	79	72	80	69	66
2017-2018	75	56	53	52	50
2016-2017	69	46	52	47	55
Average	77	64	65	65	70

* New Liskeard

The grey shading in the table indicates the highest winter severity index rating for that given year across the five MTO contract areas. Using this data, we can see that in three of the six years the Sault Ste Marie MTO contract area had the highest-ranking winter severity. In addition, of the three years in which SSM was not the highest it was second highest in two of those years. Those years are indicated by a bold font in the table above. SSM has by far the highest average severity rating.

Only in the 2020-21 winter season did SSM not have a significant winter season. This included the year after the budget reduction (2021) and as noted below, actual costs were very low that year, not because of the budget reduction, but because the winter was not very severe. The 2022 calendar year will be much more difficult as the 2021-2022 season had a very high severity rating.

The severity index is also an important factor making comparisons because SSM is dealing with successive winters that exceed those of the other northern cities. The average of the six winter seasons for the SSM contract area is a winter severity index of 77. This average exceeds the actual winter severity index rating of every year but the most extreme year for each of Sudbury (85), North Bay (80) and Thunder Bay (86).

Expenditures

The budget for winter maintenance covers all expenditures in the Roads Division during the period when winter staffing is in effect (generally November to April), including street sweeping and other activities that occur in that period but that have little or nothing to do with snow and ice control. The table below shows the average expenditures by activity over the last 10 years and shows how they have varied year to year.

Table 9 - Average Winter Expenditures - 2012-13 to 2021-22

	Average	Low	High
Salting/Sanding	1,771,880	1,414,842	2,024,990
Street Plowing	1,763,369	987,297	2,503,083
Sidewalks	823,983	540,436	1,094,204
Snow Removal	1,150,874	250,015	1,679,623
Potholes	569,491	390,557	809,106
Drainage/ditches	393,754	197,283	541,363
Sweeping	791,873	618,327	953,409
Other duties	226,810	52,733	500,127
Other items	134,109	70,111	280,980
Recoveries from Clients/Departments	(115,807)	(199,922)	(67,403)
Total Costs	7,510,336	6,145,268	9,179,759

The tables in Appendix A show the actual costs, by winter, for each of the categories identified above. The City budgets and generally records its expenditures by calendar year. Appendix A therefore also includes the expenditures by calendar year, the annual budget figures, and the difference between budget and actual expenditures.

Notwithstanding the impacts of inflation over 10 years (which was generally fairly low), it is clear that expenditures can vary widely, generally as a result of weather conditions. Expenditures have ranged from $6.0M (2021) to $8.9M (2019) per calendar year, a range of 47%. These wide swings make it very difficult to budget.

The budgets have increased by an average of 1.75% per year, while the Consumer Price Index (CPI) has increased by 2.5% on average over the last 10 years. The $500,000 budget reduction in 2021 is roughly equivalent to the 10-year impact of the difference between the rate of budget increase and the CPI.

Despite the budget cut, 2021 saw one of the lowest gaps between spending and budget, with a deficit of only $28,000. This was the result of very favourable weather conditions in 2021, and final figures for 2022 can be expected to exceed budget substantially. Eight of the most recent 9 years show a deficit in winter road maintenance, with expenditures higher than budget. Despite deficits that ranged as high as $1.5 million, and averaging $580,000, the winter maintenance reserve fund remains unchanged. The over expenditures in winter control have been absorbed corporately

and reserve draws have not been required. Future budget adjustments may present the opportunity for this reserve fund to grow during years of favourable weather conditions

Expenditure Details

The table below shows the expenditures by type of spending, rather than by activity.

Table 10 - Spending by Type

	2021	%	2020	%	2019	%	2018	%
Full Time Salaries	2,441,755	33%	2,704,380	33%	2,706,491	30%	2,568,216	33%
Benefits	572,503	8%	558,628	7%	508,256	6%	575,645	7%
City Owned Equipment	2,848,994	39%	3,077,853	37%	3,298,066	36%	2,960,989	38%
Hired Equipment	406,827	6%	513,081	6%	1,246,705	14%	653,901	8%
Operating Supplies	956,284	13%	1,330,875	16%	1,294,208	14%	995,844	13%
Other	89,009	1%	116,886	1%	20,675	0%	69,142	1%
	7,315,372		8,301,703		9,074,401		7,823,737	

Salaries and benefits make up the largest item, at about 40% of expenditures. The cost of city-owned equipment is almost as high, running from 36% to 39% over the period. The cost of this equipment is budgeted based on Fleet Department rates, which have not been adjusted for years, and which are generally too low to cover the costs of acquiring, maintaining and fueling the equipment involved. This results in year-end adjustments to recover the actual costs, making cost management and comparisons to budget difficult during the year.

The costs of hired equipment, on the other hand, varies dramatically. Very few of the equipment suppliers met the COVID requirements set by the City, which reduced use in 2021 (in combination with an easy winter) and COVID requirements continued in 2022. The hired equipment (which generally comes with an operator) is primarily trucks for hauling snow during snow removal, and this has been implemented once again in the winter of 2022-23.

Table 11 - Overtime Costs

	2021 - 22		2020 - 21		2019 - 20
Roadways	506,683		141,043		297,511
Sidewalks	72,845		33,161		45,832
Total	579,528		174,204		343,343

Overtime costs have risen, partly as a result of weather, partly as a result of the reduced use of hired equipment, and partly as a result of vacancies in the complement, requiring

others to work overtime. They can be expected to decline if more hired vehicles are deployed for snow removal and a full complement can be reached.

Jurisdictional Review

The northern communities of North Bay, Greater Sudbury, Thunder Bay and Timmins were used as comparators in this review and were interviewed to determine the approach to winter maintenance specifically focusing on equipment used, approaches to sanding/salting, shift organization, and other work performed for other departments/services.

In the table below, the Financial Information Returns (FIRs) for the comparator communities for 2021 have been displayed using the costs reported for Winter Maintenance and the lane kilometers maintained in winter which are also reported in the FIR data.

Table 12 - 2021 FIR Winter Control Comparison

	Winter Control- Total Spend	Lane Kms	Per Lane Km	MTO Severity Index *
Sault Ste Marie	$8,351,798	1,245	$6,708	77
Greater Sudbury	$18,770,556	3,572	$5,255	64
Thunder Bay	$4,288,726	1,891	$2,268	65
North Bay	$5,160,236	858	$6,014	65
Timmins	$6,496,392	950	$6,838	70
Average of Comparators			$5,094	
Average without Thunder Bay			$6,036	

* MTO Severity Index Average for past 6 winters

The FIR data includes costs reported for wages, contracted services, materials, rents as well interest, amortization, interfund transfers and allocation of program overhead. We can see from the data that SSM exceeds the average of the four northern benchmarks, although it is skewed by the relatively low value in Thunder Bay. The cost per lane km. needs to be compared to the MTO Severity Index which gives an indication of the severity of the average winter in each of the cities. Clearly SSM has the most challenging winters, which is reflected in the cost per lane km.

There is revenue associated with Winter Control of approximately $183,000. With this netted against the total cost, it drops the SSM per lane kms cost to $6,561 and the overall network difference to $1,827,000.

Timmins Public Works did not participate in the survey, so the data below is based on the results of North Bay, Greater Sudbury, Thunder Bay, the Ministry of Transportation of Ontario and other available research.

Table 13 - Equipment Used by Comparators

	SSM	North Bay	Sudbury*	Thunder Bay
Lane Kms Maintained in Winter	1,245	858	3,572	1,891
Sanders	8			9
Plow Trucks (w sander)	5	14	65	
Plow Trucks (no sander)	10			9
Graders	8	1	9	22
Loaders (w wing/plow)	11	1	6	3
Blower Attachments	4			
Trackless (sidewalk)	11	6	29	Yes
Sidewalk Sanders (attachments)	14			
Single Axle Plow Trucks (w Sander)		1		
Backhoe (w plow)		3		
Tractors (w blower/plow)		2		
4X4 Trucks			5	
Other			several small truck plows and loaders	

* Lane Kms Maintained in Winter includes both paved and unpaved (gravel) roads. Sudbury has 618 lane kilometres of gravel roads in its inventory, far more than the other comparators.

In looking at the equipment used by the comparator municipalities, North Bay and Sudbury use combination plow and sanding trucks with less reliance on graders; Thunder Bay has a similar approach to Sault Ste Marie.

In comparing SSM to Thunder Bay which has more lane kilometers to maintain we see that both have a similar number of sander units and plow trucks without sanders. Thunder Bay uses even more graders than SSM.

Another interesting factor across all municipalities is the lack of single axle vehicles which many municipalities in Ontario find are useful in tight areas such as downtown business districts or older residential areas that were not designed for larger equipment. Graders are used instead in most of the municipalities.

The City of North Bay started a fleet modernization program several years ago which has resulted in more data for decision making and changes in the equipment used in the winter maintenance program. A specific session was organized between City of North Bay fleet maintenance staff and Sault Ste Marie staff as part of this project.

Part of the changes that North Bay Public Works has adopted include switching out the Epoke dump bodies to what is commonly known as U-bodies. The U-body dump boxes have the chain spreader at the bottom of the box for sand and salt applications and when used for heavier construction activities such as hauling materials a steel plate is used to cover the chain mechanism and protect against damage. The combined units in SSM are used as part of the plow/road maintenance groups and service five routes, 2 in the west, 2 in the north-east and one downtown. The material applicators (spreaders) are located in front of the rear wheels to assist in traction for the vehicle in conditions such as hills.

The picture below depicts a typical U-body on a tandem axel chassis with an under-body belly plow plus a wing plow. The material applicator dispenses material behind the belly plow when both are in use.

Note https://equipement-camion.com/en/produits/benne-en-u/

SSM has found the under-belly plow to be ineffective in large snowfalls. Most tandem snowplows have front mounted plows and wings, instead.

The City of North Bay is also conducting two other modernization changes which can both be summarized as purchasing equipment that can be used in multiple applications or seasons. They are adopting the use of more backhoes for turnarounds/cul-de-sacs, laneways and dead ends. North Bay has 3 backhoe routes. They switch operators from Parks in the summer to snow clearing in winter. This is a common practice in many municipalities if they do not switch these staff into arena operations in the winter. North Bay has started using bi-directional blades on the backhoes with one snow blower attachment in winter; it uses the same machines with different attachments in the summer Parks maintenance program. They find that the backhoes are simply easier to maneuver and can pile snow up higher than a truck can. The snow blower is used for snow removal or widening roadways. The excavator attachment stays on during the winter. Thunder Bay also uses front end loaders and backhoes in laneways.

The next modernization change in North Bay is the switching out of graders in the downtown core for front end loaders with blades. The graders have no use in the summer for North Bay, but the front-end loaders can be used in summer operations. For example, they have purchased a material screener attachment so that they can process material for internal applications.

In addition to the types of equipment that are selected/purchased, the comparators also provided information on the techniques that they employ for winter maintenance. The table below captures the information of the comparators versus Sault Ste Marie. We can see from the data below that North Bay and Sudbury perform winter maintenance in a very similar manner; likewise, SSM and Thunder Bay operate similarly. The exception is that all the comparators wet salt or sand before it leaves the truck and SSM does not. This allows the use of lower application rates as the material sticks to the road better.

Table 14 - Approach to Winter Maintenance

	SSM	North Bay	Sudbury	Thunder Bay
Lane Kms Maintained in Winter	1,241	858 kms	3,572	1,891
Salt when plowing	No	Yes*	Yes*	No
Use wing plows	Yes	Yes	Yes	Yes
Use Wingmen	No	No	No	No
Have one or more roll-off trucks	No	8	Yes	Yes
Use sand/sand trucks as dump trucks in summer	Yes	Yes	Yes	Yes
Have an AVL system	Yes	Yes	Yes	Yes
Wet salt or sand before it leaves the truck	No	Yes	Yes	Yes
Apply brine or calcium liquid before event	No	Yes	Yes	No

* Higher class roads (arterials, collectors) are salted when temperatures warrant

One additional aspect to note in the approach to winter maintenance is that while two of the four (North Bay and Sudbury) salt when they plow, which is supported by the combination plow/salt units that they have in their respective fleets, all municipalities apply only sand to Class 4 – 6 roads.

All the comparators use hired equipment as part of the operations, most commonly for snow removal and the hauling of snow. Sudbury uses what they call an Unscheduled Contract that allows them to bring in whatever operated equipment they need to augment winter operations. Thunder Bay will also contract for both operated and non-operated graders and sidewalk plows when needed.

When the comparators were asked about work performed for others, such as the Province, Thunder Bay Public Works confirmed that they do sell winter maintenance services as well as perform work for other departments. Again, this is a similar approach to SSM.

None of the comparators remove windrows from residential driveways under any circumstances. SSM has historically cleared windrows after scraping operations where they exceed two feet (.6 m), if labour and equipment were available.

Table 15 - Plow Routes

	SSM	North Bay	Sudbury
Lane Kms Maintained in Winter	1,241	858	3,572
Number of Plow Routes	18	20	47
Average Lane Kms per Plow Route	68.9	42.9	76.0

In terms of how winter plowing is organized each comparator was, asked to provide their approach to route plowing and the key parameters that were used to design the routes such as predominantly arterial/collector streets grouped together, all residential or mix, factors such as how long before out of sand/salt, etc. Only North Bay provided detail beyond the number of routes and stated routes were established many years ago and remained essentially the same with some tweaks. "The distance of lane km is roughly 80-120km per route (combination plows and grader), whereas the backhoe and tractor routes are significantly less as they basically do laneways and dead-end roads. Each combination plow and grader route will have a mix of road classes (2-5). And North Bay does not maintain any class 1 roadways. When plowing they start with the class 2 and 3 roads before they start the class 4 and 5. They run salt when temperature and weather permits on class 2 and 3 roads, but do not run salt on class 4 and 5 roads. We simply use winter sand on 4 and 5 roads." Sudbury has slightly longer routes on average than SSM.

The survey of comparators also researched alignment on IT management systems used for fleet maintenance, work orders, service requests, GIS, fuel dispensing. The results are illustrated below.

Table 16 - IT Management Systems

	North Bay	Sudbury	Thunder Bay
Budgeting software	Navaline and Questica	CityWorks	SAP
Service Requests	Infor - Public Sector	Oracle	Infor – Public Sector
Work Orders	Infor - Public Sector	CityWorks	Infor - Public Sector
Asset Management	Citywide	dTIMS and CityWorks	
GIS	Internal	ERSI	
Fuel Dispensing	Computrol	Computrol	
Fleet Management	Asset Works	Fleetsoft	

As is evident, each municipality uses its own approach to software and there are few standard systems, although it is worth noting that North Bay and Sudbury have adopted fleet management software.

In order to adhere to MMS practices Section 3.1 weather information is to be consulted a minimum of 3 times daily (24-hour period) between October and April. This data is key for proper planning of patrols, winter operations, and matters of liability. The Ontario Good Roads Association guidelines for patrolling suggest:

- a local weather forecast that includes air temperature, wind direction, speed and dew point,
- a Road Weather Information System (RWIS) or a patrol truck equipped to monitor pavement and air temperature, and to communicate the observed data to operations staff.

Since the creation of this table the Ministry of Transportation for Ontario (MTO) has stated that it will expand the RWIS network across Ontario with 24 new stations with 14 of these in Northern Ontario and 16 new solar-powered mini-stations in remote locations across Northern Ontario. These are to be completed in the fall of 2022. (Source https://www.ontario.ca/page/how-we-clear-ontarios-highways-winter#cochrane_new_liskard). The MTO RWIS system is supposed to be free for access to all Ontario municipalities.

RWIS-based road sensors measure pavement surface and subsurface temperature, presence of road salt, likelihood of frost or snow film, and estimated freezing point of road surface at the sensor location. They are typically coupled with a forecast service. Road surface temperature and forecast are very important for the safe use of anti-icing liquid.

The weather forecasts can estimate the occurrence of falling or drifting snow or freezing rain, but they cannot forecast the freezing point of the road surface.

Mobile RWIS uses remote sensing technology mounted on patrol vehicles, spreaders or other vehicles to measure road surface temperature, barometric temperature, and detect the presence of a snow or ice film (spectral camera). While they can help to extrapolate RWIS site forecasts along a roadway, systems currently available do not directly provide a forecast.

Table 17 - Spectral Camera mounted on Patrol Vehicle

An infra-red thermometer mounted on road vehicles provides a real-time reading of surface temperature (whether pavement or snow on the pavement). The information is useful for adjusting salt application rates and necessary for anti-icing with direct liquid application. It provides information only while the vehicle is traversing the road and so is limited in frequency.

Across Ontario the OGRA MESH winter weather app and a tablet are used by many municipal roads supervisors and patrollers to access forecasts, note access to prove due diligence, and log any site-specific local conditions.

The comparator municipalities consulted for this project relied on the following sources:

- North Bay – Environment Canada forecast data,
- Sudbury - CGS RWIS, MTO RWIS and Wood Weather Forecasting services.
- Thunder Bay - installed 3 Road Weather Information Systems (RWIS) with plan to install 2 more next year for full coverage. An email is generated from these and sent directly to the staff throughout the day. Accuweather road monitoring systems in all trucks and local weather channels.

Biggest Challenges

The answers provided by comparators when asked about what are the biggest challenges, they face was impacted by the COVID pandemic. COVID may have intensified historical issues that were always present in winter maintenance such as:

- availability of your current workforce,
- restrictions required due to COVID for workforce management,
- lack of or inability to attract new staff especially for seasonal, casual or part-time positions,
- supply chain issues and access to parts for equipment,
- increases in contract pricing for hired equipment due to fuel surcharges and insurance increases, and
- expectations of residents for instant service.

However, these are issues that have generally plagued winter operations with the exception of access to labour which does ease in high unemployment areas or cycles. This is an experience that SSM is familiar with as the labour market in SSM is impacted by the success of the steel industry and the circumstances of the local plant.

The City of North Bay was the most helpful in the overall process and offered additional contacts in fleet management to discuss procurement advice, fleet software choices and equipment choices. In addition, North Bay staff have tried different approaches. As mentioned, they have started using more backhoes instead of larger equipment. They have been challenged in finding staff so have tried to use part -time staff in backhoes. However, during the pandemic this has also been a challenge. They have budget room for 4 part-time staff mainly used to cover after hours work. In 2021 they could not find anyone to fill the part-time positions and in 2022 have filled only one position out of four.

Ontario Ministry of Transportation

The Ontario Ministry of Transportation (MTO) has operations through and around the City of Sault Ste Marie and uses private contractors and the City to perform this work. There are staff based in Sault Ste Marie to manage the overall Sault Ste Marie contract area which extends to a much larger area than the municipal boundary. MTO, as part of its commitment in the Connecting the North initiative, has conducted work on highway winter service levels for various areas of the province and more specifically Highways 11 and 17. Of note is the commitment to expand the number of full and mini northern RWIS stations by the fall of 2022.

It has published a technical report on some of its findings and also indicated some additional technical areas in which it will be conducting additional research to improve standards and best practices. The following is an excerpt from this MTO report on the areas that are the most relevant to winter operations in Sault Ste Marie and which may provide some additional opportunities for future cost savings and safety improvements. The MTO has committed to:

a. Review the effectiveness of underbody plows to remove/prevent snowpack.
    - Underbody plows may be able to remove snowpack more effectively. Compared to standard plows, underbody plows can exert better downward pressure, thereby removing snowpack more efficiently.
    - Snowpack on highways can be difficult to remove with regular plows; low temperatures can prevent salt from melting snowpack. Snowpack reduces traction compared to bare pavement.
    - Snowpack can occur in Northern Ontario as low temperatures often prevent salt from successfully removing it. Depending on conditions, salt is less effective in melting snow or ice at or below certain temperatures.
    - Further research is needed to assess the amount of snowpack occurring on Highways 11 and 17 as well as the effectiveness of underbody plows for preventing/removing snowpack.
b. Review the use of unconventional winter equipment.
    - The ministry purchased a Raiko icebreaker in 2017. The Raiko is a snow/ice pack breaker that attaches to the front of a plow truck. It has since been used to remove snow/ice pack from the pavement surface when salt becomes ineffective. When temperatures suddenly and significantly drop following a heavy snow event it is often very difficult to remove snow and ice with conventional methods such as salt and ice blades. This addition has made some noteworthy improvement in achieving bare pavement conditions in some cases. Upon completion of further trials, a decision will be made whether this technology should be implemented more widely.
    - The Raiko icebreaker comes in two main configurations for large plow vehicles (plow trucks/loaders/graders) and smaller version for multi-purpose tractors and sidewalk plows. The large version is approximately $46,000 Cdn plus freight and fabrication of compatible hitch for a total delivery cost of $51,000. The smaller is approximately $20,000. There is

only one Canadian vendor Team Eagle Ltd. Of Campbellford, Ontario which has stock of both sized units (Dec 2022). The vendor says that there are units being used for airport maintenance in Northern Ontario and road maintenance in Sault Ste Maire (USA), and by some of the MTO contract areas.

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c. Investigate the benefits of applying sand treated with liquid calcium or magnesium.
    - Sand can be an effective treatment for Major Highway sections under certain conditions, such as extreme cold weather. Pre-wet sand may be more effective than dry sand in retaining traction on Major Highway sections by increasing the amount of sand that remains on the road during spreading, and from wind and traffic.
    - MTO has an ongoing pre-wet sand trial in Owen Sound. Depending on the results of this trial, this technology could be expanded to Major Highway sections on Highways 11 and 17.
d. Investigate the benefits of pre-wet salt and pre-treated salt.
    - Experience shows that pre-wet salt and pre-treated salt may be effective in reducing the amount of salt that bounces off the pavement during application. This would ensure that more salt remains on roadways to melt snow and ice.
    - MTO is conducting trials using these materials. The results of this trial may identify potential benefits of using of these materials on Highways 11 and 17.
e. Investigate the benefits of a combined salt-sand application, known as "sweet mix".
    - Current practices prescribe either salt or sand application depending on conditions. Sweet mixes may provide the de-icing benefits of salt and the benefits of improved traction from sand before salt has fully melted ice and snow.

- MTO plans to conduct trials using these materials. The results of these trials may identify potential benefits of using of these materials on Highways 11 and 17.

f. Explore new and innovative techniques for highway maintenance in lower temperature conditions.
   - MTO plans to conduct a jurisdictional scan of the latest techniques used in other jurisdictions for winter maintenance in very cold temperature conditions. Supplementing our regular monitoring process of new innovations, a formal review will ensure that MTO's program remains at the cutting edge of highway maintenance techniques.
   - The ministry has also been experimenting with fine graded salt for the past two winters. The supplier of fine graded salt is an out of province supplier, which improves the competition and supply of winter salt. The finer graded salt activates more quickly and helps achieve bare pavement on highways during lower temperatures.

g. Deploy additional winter equipment during severe winter storms when possible.
   - MTO plans to explore the benefits and contractual implications of requiring service providers to deploy more winter equipment during severe storm events where snowfall rates reach a predetermined threshold.
   - During high-intensity snowfalls, road conditions deteriorate faster than under normal- or low-intensity snowfalls. Equipment allotted for passing lanes or truck climbing lanes could be diverted to supplement winter maintenance efforts on the travelled lanes during severe winter storms.

h. Research the efficiency of different equipment complements.
   - MTO plans to conduct research analysis of the efficiencies of combination units versus separate plow and spreader complements. The research would incorporate a review of costs, dead-heading time, reloading time and impacts related to the availability of operators.
   - MTO also plans to conduct research analysis of the opportunities for larger spreaders (e.g., quad axle trucks similar to those used by Highway 407).

The MTO also identified the cost of additional vehicles of various types as follows:

Table 18 - Cost of Equipment, by Type (MTO)

Equipment Type	Estimated Annual Cost per Unit
Plows (with operators)	$185,000
Spreaders (with operators)	$185,000
Combo Units (with operators)	$240,000

These costs are not directly transferable to SSM as the MTO estimates relate to highway conditions and distances. However, they do re-enforce that a combination unit is more expensive than either a plow or a spreader – but the operation of one combo unit is clearly less expensive than the operation of a plow and a spreader.

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Analysis

This section provides an analysis of specific issues, and recommendations that SSM could adopt. Note that there are risks involved in adopting any new approaches, and those risks should be weighed in deciding whether to proceed.

Reducing Salt and Sand Volumes, Pre-wetting and Anti-icing Options

SSM currently sets its sand/salt trucks to distribute 132 to 200 kg of salt per lane km, and 200 to 700 kg/lane km of sand. These volumes are substantially higher than those used in most municipalities. The most important approach to reducing the volumes is to pre-wet the salt or sand before, or as, it is distributed. The other approach that can reduce the required volumes without reducing effectiveness is anti-icing. All northern cities and the MTO use these approaches.

The challenge given SSM's weather is to find an approach to pre-wetting at all temperatures. Calcium-chloride or magnesium-chloride (mixed with water) can be effective at lower temperatures than sodium chloride (rock salt). However, rock salt or brine (salt mixed with water) can be inexpensive and work at temperatures above -14 Celsius, although they are less effective below -7 Celsius. This higher temperature range can be problematic with calcium-chloride in particular, as it can result in slippery roads. However, calcium-chloride can be effective at very low temperatures. Many municipalities have used organic chemicals, such as beet juice, but most have moved away from these chemicals due to clogging of the distributors and the sticky residue left on the ground.

This suggests SSM would be best served by the use of two different wetting materials, regular brine (water and rock salt) to be used when temperatures are or will be above -10 Celsius and calcium chloride liquid or magnesium-chloride liquid to be used when temperatures are below – 7 Celsius and falling.

SSM did attempt to acquire materials to conduct anti-icing at one point in the past but found it difficult to get convenient access to the chemicals involved. A proper salt and/or sand wetting program in SSM would almost certainly require some calcium chloride or magnesium chloride to cover the lower temperature events. However, the use of brine would cover many events and provide a serious test of the potential savings and potential improvements in the level of service. Brine mixing stations can be relatively low cost to install and allow the city to use the salt already on site, although location of the mixer and storage tanks indoors would be required.

It is less certain whether calcium chloride or magnesium chloride mixtures could be obtained with sufficient notice (e.g., for next winter or the winter after) and some attention to vendor development may be required. There is also the potential to test the process using brine first, before moving to the more expensive chemicals

Most municipalities use anti-icing at least on some of their roads, generally bridges, hills and arterials. Anti-icing amounts to distributing a liquid mixture on the roads before a snowfall. Some municipalities use pre-wetted salt for anti-icing, but most use liquid calcium chloride or magnesium chloride which are effective at lower temperatures, but which cost more to purchase. There has been some experience mixing rock salt, magnesium chloride and some organic compounds to achieve a less expensive mixture that still work at lower temperatures. SSM could investigate this option while looking for a permanent supply.

The goal of the process is to deposit materials that will stay on the road (or sidewalk) as the snowstorm begins, both with a view to improving safety (especially on hills and bridges) and creating a liquid layer below the snowpack that will make the snow easier to remove when plowing begins.

The first priorities for anti-icing are the arterials, bridges and hills. However, it may also assist with removal of the snowpack collected on residential roads if plows or graders can more easily detach the snowpack from the roadway.

Pre-wetting the salt or sand or implementing an anti-icing program will require different vehicles than are currently in use. Most municipalities use “combo” trucks that both plow and distribute salt or sand and have tanks to facilitate pre-wetting of the materials distributed. This option is explored later in this paper.

Some municipalities have acquired tanker trucks for the sole purpose of carrying out anti-icing programs. Others have acquired tanker bodies to insert in a drop and go truck chassis. The lowest cost for a test program and the option that might be available at the earliest date would be the purchase of a trailer with anti-icing equipment or anti-icing equipment that could be mounted on an existing truck body, likely a plow truck. Improvement would likely be in service levels and some increased costs may be incurred in the short term, although off-set by reduced material supplies as application rates are reduced.

An implementation program could include:

- Short Term
    - Acquisition of a brine tank and/or brine mixing system
    - Acquisition of a tanker tailer and/or truck mounted tank to use for anti-icing
    - Test the anti-icing process on various road types and in various weather
    - Begin ordering salt/sand vehicles with pre-wetting capacity
- Medium Term (assuming positive results)
    - Acquire calcium chloride or magnesium chloride and storage and dispensing systems
    - Test the effectiveness of pre-wetting salt and sand in various weather
    - Continue ordering salt/sand vehicles with pre-wetting capacity
- Long Term
    - Use anti-icing on all roads where testing indicates positive outcomes

- Use pre-wetting on all sanding and salting operations where testing indicates positive outcomes

Although these recommendations should lead to improved service levels, there are some risks involved, including the expenditures that must be undertaken before the recommendations are fully proven in SSM conditions. It would be appropriate to go slow on the implementation and gain any lessons available from the MTO research on anti-icing and snowpack mitigation.

Recommendations

1. That a salt and sand pre-wetting program be piloted, understanding the full implementation will require some time.
2. That an anti-icing program be initiated.
3. That a brine station be installed as soon as possible. It will be required even if the lower temperature chemicals are eventually acquired.
4. That calcium-chloride or magnesium-chloride supplies and storage systems be investigated.
5. That new salt/sand trucks be ordered with pre-wetting capacity (and capacity to carry front plows and wings).
6. That the current and subsequent winters be used for experimentation when materials can be assembled, even if the program is limited to the use of brine. The test would look at the potential of pre-wetting by spraying materials before loading, and for anti-icing distribution before an event to improve service levels and make it easier to plow roadways. It may be possible to test the use of anti-icing application on residential streets with a view to improving the scraping process and easing the removal of snowpack.

Combining Salt and Plow Routes

Historically there have been two different approaches to salting and plowing. There were four salt trucks (and 1 grader) on duty 24/7 through the winter. The four salt trucks respond immediately when snowfall or freezing rain begins, with each taking 1/4 of the city and starting with the arterials, hills and curves. As the event progresses, they will move to dropping salt or sand behind the plows.

There were 18 plow routes, including one focused on the highways. They are staffed on two shifts, Monday to Friday, with the day shift called in when required on weekends. Some beats use trucks, some use graders and some use combination units that can distribute sand/salt and plow. The result of this approach is that two pieces of equipment are required to complete the task of sanding/salting and then plowing. This increases the investment in equipment and operating costs for fuel, maintenance, and operator salaries. Sault Ste. Marie has 5 combination trucks that have salt/sand bins and the upgraded front end required to mount front plows and wings. Five of these “combos” are being used to handle a complete route, both sanding or salting as appropriate and plowing the roads as it sands or salts. Note that with a freezing rain or early in a snowfall, it may just distribute sand or salt, however as snow fall remain on the ground it lowers the plows as well.

This is an approach many other municipalities use, but they generally do not have the volumes of snow experienced in SSM. The new approach can be considered a pilot, and the results should be evaluated before additional routes are converted to this approach.

There is a need to be able to respond quickly when there is freezing rain, or at the beginning of a snowstorm, particularly on the heavily used arterials and collectors, and on residential streets with hills.

As noted in the section on Types of Trucks, new units with strengthened front axels should be considered at the time of sander replacement as they would both do what is required on the routes and be available for snow removal or summer dirt/rock/asphalt loads. They would also need the pre-wetting capacity noted above.

In the short-term, it would be worth developing one route that could be plowed and salted or sanded and plowed at the same time as a pilot project. In the medium-term additional routes can be added. There may be a need to add a fifth combo route to pick up all roads that require an immediate response, although some adjustment of the plow routes run by the other combos may be sufficient.

Recommendation

7. That the use of "combo" units to both salt/sand and plow be continued as a pilot project. Based on the results of the pilot further implementation can be considered.

Expanding Sidewalk Maintenance Criteria

The department considers requests for the maintenance of sidewalks each fall. They are reviewed against the criteria set out in the Sidewalk Snow Plowing policy. The policy outlines several criteria and poses certain questions that could result in a sidewalk not being approved for maintenance. The sidewalk maintenance criteria are generally appropriate and Public Works indicates it plows a smaller proportion of its sidewalks than other northern cities. However, the department receives pressure from citizens and community associations to expand sidewalk plowing. Should this become a concern, one additional criterion should be added to the policy – the extent to which the sidewalk is used as reflected in a pedestrian count to be conducted in September or October. The count could be automated, and some counts should be conducted on sidewalks that are maintained, and that meet the criteria, to establish a baseline of acceptable usage.

The City should also be conscious of the need not to build sidewalks that are not going to be maintained. Both new city sidewalk construction, and Planning Department consideration of subdivision plans that could lead to the construction of new sidewalks, should be cautious; not build additional sidewalks that will receive little use.

Recommendation

7. That the approach to selection of sidewalks to be maintained be continued, and if pressure to increase sidewalk maintenance continues, be augmented by a criterion related to pedestrian volumes on the sidewalks of concern.

Protecting Sand from Rain

The sand that is most frequently used on roads, particularly on residential streets, is initially mixed with 6% of salt (further salt may be added, up to a total of 30% if conditions warrant). The sand is stored in a large pile that is exposed to the elements. Rain and snow melt during warmer winter periods dissolve some of the salt in the sand pile, which does over time result in lower ratios of salt to sand and. some winters, requires the addition of additional salt and a re-mixing of the sand pile.

The simple solution to this issue would be to construct an additional building to store the sand, however the size of the pile involved and the size of a building that would be required makes this an uneconomic option. A more realistic option would be to spread tarps over the pile and to remove the tarps as the pile is used. This would expose the sand in the area currently being used to rain and snow melt – but so section of the pile would be exposed for long enough for this to matter. Using the workers during periods when there is no snow to plow or remove would make this a relatively low-cost option, with only the cost of the tarps involved.

Most municipalities tend to use 2% to 3% mixtures of salt with sand. The department could test using mixtures less than the 6% currently in use to determine if a lower mixture could be used if the pile was generally covered.

Recommendation

8. That the sand pile be covered with tarps, weighted to resist wind removal, and the tarps be removed to expose enough sand for the next event(s).

The “two-foot rule”

The City indicates both in its policies and its publications that it will remove windrows that cross driveways when the windrows result from snowpack scraping and exceed 2 ft (.6m) in height. This approach came from a particularly challenging past winter and does reflect that variations in weather may result in ice on the road that can be removed by graders in large enough chunks they can be difficult for homeowners to handle.

Implementation of this policy is very challenging for homeowners to understand, as they generally do not have the ability to measure the windrow and don’t understand the difference between windrows that result from scraping and windrows that result from ordinary plowing. It is also difficult and expensive for the department, which must respond to each enquiry, inspect the site and determine if some action is required and, if required, direct a front-end loader to the site. The City also ends up competing with private sector firms who charge homeowners to clear driveways, and who generally have more appropriate equipment for this purpose. The approach can also result in

inequities, when one driveway is cleared as a result of a complaint and another with similar conditions is not.

In summary, the program is difficult, expensive and inequitable. It should be eliminated and replaced with something directed at residents disabled by age or infirmity who do not have the capacity to handle windrow removal, and who do not have the means to purchase assistance to clear their windrows. This need could best be met by providing a grant to a third-party organization such as the Red Cross which could serve to evaluate applications.

The use of anti-icing distributions on residential streets may also assist in the scraping process and may allow smaller chunks to be removed.

Recommendations

9. That the “two-foot rule”, and any associated policy or program to remove windrows after scraping or after plowing be eliminated.
10. That funding be considered to provide a grant be provided to a suitable third party to be distributed to low-income persons incapable of removing windrows.

Fleet Changes

A number of changes in the Fleet Department are expected that will impact road maintenance, generally positively. The adoption of a Fleet Management Information System (FMIS) will help both fleet and roads know the status of their equipment and develop schedules for maintenance and licensing inspections and activities. The adoption of realistic vehicle cost charges, that recognize the cost of capital, operating and maintenance activities, will be of great assistance as Roads currently receives a substantial adjustment at the end of the year to reflect the actual costs. Most importantly, earlier replacement of vehicles will provide an opportunity to change the types of vehicles ordered and reduce the vehicle down-time and potentially the requirements for spare vehicles.

Right fitting a vehicle for the job(s) they will be used for is critical. As discussed above, some new trucks should be purchased as combos, with the capacity to distribute materials in front of the rear wheels, pre-wet the materials, mount front plows and wings and serve as dump trucks for snow removal and summer use. All new sanders should be equipped with pre-wetting capacity.

Options related to sidewalk plows should also be explored, in particular, the potential to use tractors for at least part of the fleet. Tractors can be far less expensive than trackless units and still have extensive possible summer uses. The key challenge is that most tractors are a little wider than most sidewalks requiring modification of the plow blades to either shorten them or provide an angled return on the inside that will run over typical near sidewalk landscaping. There may be an opportunity to introduce a small number of tractors into the sidewalk fleet for use on particular routes where the size is not a major issue.

Recommendations

11. That the Fleet Department initiatives of implementing an FMIS, changing the charge-out approach and advancing the purchase of replacement vehicles be implemented, with implementation over time as required.
12. That enough combos be acquired with the capacity to distribute materials in front of the rear wheels, pre-wet the materials, mount front plows and wings and serve as dump trucks for snow removal and summer use be acquired, and that all new salt trucks have pre-wetting capacity.

Equipment Rental

The major use of rental equipment has been for snow removal. Rental rates, including the operator, run from $60 to $126 per hour for tandem or tri-axle trucks. The cost of City employees and vehicles exceeds the low end of this range, and the vehicles available for use by employees are usually only tandems, sometimes with diminished capacity. On the other hand, the high end of the range exceeds the cost of using City staff, even on overtime.

Many of the equipment rental agencies did not meet the City's requirements for vaccination during COVID. That made it relatively easy to remove the $500,000 budget cut implemented by Council from the equipment rental budget, knowing that during COVID conditions it would be even harder to rent equipment. That is one of the major reasons the over-time budget has increased, despite the shift system. Staff have been called in to assist with snow removal on overtime. Hiring trucks to remove snow as part of the snow removal process is generally less expensive and the ability to attract tri-axle vehicles at relatively low rates is particularly attractive. We understand that hired equipment has been used for snow removal in the current winter.

Recommendation

13. That trucks (with operators) continue to be rented for snow removal when economic, and part of the increased budget be allocated for this purpose, based on average expenditures before COVID.

Recruiting

The winter control operations were down 9 staff during the summer and are still down 6 staff members. This is partly a result of market conditions. With the mill hiring and, recently, contractor hiring, there are often better, at least short term, options for people looking for work, particularly those with a DZ license.

The City has a particular disadvantage in that it can take three months to hire someone. The need is posted, and the applicant responds. The application is reviewed to see if the individual has the basic position requirements. Then the applicant must go through two rounds of testing, which generally require attendance in SSM – which can be challenging for applicants from outside the area. Then they need to go through interviews. Then a decision is required on whether to hire the individual, the decision

must be communicated, and the individual must respond. That process can take up at least three months – before the individual gives notice to any current employer. There are benefits to a City job. It is generally secure, has good benefits, and has some potential for advancement. But anyone who is unemployed can't last the three-month hiring process, and for employed persons, other employers are likely to respond more quickly.

Recommendation

14. That the Department work with corporate Human Resources to improve and accelerate the hiring process.

Financial Changes

The financial system in SSM has some best practices in place. It captures both the activities undertaken (e.g., plowing, sanding/salting, pothole patching, etc.) and the item that contributed to the cost (e.g., compensation, city vehicles, rented vehicles, materials, etc.). This does allow the capture of the information provided in the tables earlier in this report. There are some areas where the financial system or, more importantly, the financial reporting, could be improved:

- Fleet does charge by the hour for the use of vehicles. However, as discussed above, these charges should be more realistic to avoid the need to carry out major adjustments after the end of the fiscal year to allow Fleet to "break-even". The Fleet Review did give recommendations on the methodology and principals to be used to adjust the rates and, it may be that implementation must be tied to the implementation of a new FMIS, however some interim adjustments could be considered.
- The hired equipment budget is currently set based only on what the City is actually paying on leases, without allowance for hired equipment to assist with snow removal. It needs to be increased to allow the use of hired trucks for snow removal. This change is being implemented in the current winter.
- Snow cleaning at bus stops is set up as a separate account. This may be useful as a cost allocation measure, but the account could be a sub-account under sidewalk plowing and rolled up for most purposes. Most on right-of-way costs ae not allocated to specific beneficiaries (buses, trucks, cars, etc.) and there would be no gain from charging transit for snow clearing at bus stops. No change is suggested.
- Actual expenditures for winter control are influenced by the service levels approved, and by the service delivery approach in place. When these two factors are fixed, expenditures will vary greatly based on the weather, and not based on administrative or even Council decisions.
- Eight of the most recent 9 years show a deficit in winter road maintenance, with expenditures higher than budget. Despite deficits that ranged as high as $1.5 million, and averaged $580,000, the winter maintenance reserve fund remains unchanged. The over expenditures in winter control have been absorbed corporately and reserve draws have not been required. Future budget

adjustments may present the opportunity for this reserve fund to grow during years of favourable weather conditions

- Given the substantial overspending in the past, a realistic budget for winter control needs to be established and amended from year to year recognizing inflationary impacts and any growth in the km of road and sidewalk maintained. This report has identified some potential improvements in winter control activities, some of which could result in cost reductions, but only after the required funds are invested.
- The budget is developed assuming all positions are filled, all year. This has allowed the department to experience savings due to turnovers, the time required to fill vacancies and recently due to the recruitment challenges. This "under budget" performance can be expected to continue in the future as all positions will never be filled throughout the year. Normally we would suggest the budget be based on the 10-year average plus inflation to provide an adequate budget for the future. However, if the budget continues to provide full funding for all established positions, it may be appropriate to use another figure.
- The winter reserve was set up at $900,000 after a particularly difficult winter. The reserve should continue in place but be used to off-set actual costs of winter maintenance from year to year relative to a realistic budget– having any surpluses added to the reserve, and any deficits covered by the reserve.
- Some improvements in operational approach are possible as discussed above, but they will take time to implement, and will require some commitment of capital funding.
- This budget should be adjusted in future years to account for inflation and any changes in service levels or service delivery approach that are approved for implementation. As the actual costs are based on the adjusted Fleet costs at the end of each year, it should also allow for the realistic allocation of Fleet costs, whether this is done throughout the year as adjusted rates or carried out as adjustments at the end of the year.
- The current review of service delivery approaches has identified some changes that could improve service delivery, and reduce costs, however they will take some years to implement.
- The budget for winter sidewalk maintenance has been unrealistic for years, resulting in consistent deficits annually. The revised budget should provide realistic estimates for each sub-account, based on the historical averages.
- The inclusion of street sweeping expenses as a "winter control" expenditure is unusual. Most municipalities end winter staffing earlier (end of March through April 15) and carry out street sweeping as a summer activity. However, the financial system does clearly distinguish costs by activity, and the Financial Information Returns (FIRs) often used for inter-municipal comparisons, clearly distinguish Winter Control activities from other Road Activities. As long as street sweeping is not in the FIR winter control category and all inter-municipal comparisons are done on an activity basis (plowing, salting/sanding, snow removal, etc.) then the inclusion of street sweeping in the winter activities should not be significant.

Recommendations

15. Fleet budgeting should be revised to have Fleet target a break-even status and charge realistic rates for the use of equipment. This may require some time to achieve.
16. The Winter Control Reserve Fund should remain in place. It should be recognized that winter control expenditures relate strongly to weather conditions, which are unpredictable.
17. The budget for winter control activities (including street-sweeping in the spring) should be increased recognizing the average deficit of $580,000 in the past 9 years. It should be adjusted each future year to recognize inflation, and any further increase in the lane kms of roads and sidewalks maintained, unless they are maintained on a cost-recovery basis.
18. Within this amount, allocations should be realistic, particularly the allocation of costs to sidewalk clearing and hired equipment.

Appendix A

Table 19 - Historical Winter Expenditures by Winter Season

	2021 - 22	2020 - 21	2019 - 20	2018 - 19	2017 - 18	2016 - 17	2015 - 16	2014 - 15	2013- 14	2012 - 13
Salting/Sanding	1,955,652	1,420,262	1,790,936	1,932,556	1,730,341	1,414,842	1,876,179	1,820,973	2,024,990	1,752,070
Street Plowing	1,994,384	987,297	1,946,414	2,503,083	1,927,630	1,779,315	1,287,737	1,847,094	1,794,451	1,566,291
Sidewalks	1,094,204	859,230	923,907	969,353	898,968	647,046	540,436	800,362	793,763	712,559
Snow Removal	1,606,592	654,926	911,093	1,679,623	858,681	1,442,814	250,015	1,662,017	1,303,804	1,139,172
Potholes	716,676	531,190	635,645	592,880	550,283	653,270	809,106	402,072	413,229	390,557
Drainage/ditches	379,911	393,510	480,975	541,363	431,976	197,283	353,682	366,786	524,874	267,183
Sweeping	953,409	911,517	953,073	810,494	921,622	618,327	657,798	731,612	731,130	629,752
Other duties	154,191	479,076	121,769	180,962	217,187	192,949	500,127	52,733	91,856	277,251
Other items	179,688	280,980	121,325	106,900	201,284	101,178	70,111	102,520	90,077	87,027
Funded	(67,403)	(96,192)	(108,857)	(137,456)	(148,647)	(111,492)	(199,922)	(98,977)	(106,409)	(82,715)
Total Costs	8,967,304	6,421,796	7,776,280	9,179,758	7,589,325	6,935,532	6,145,269	7,687,192	7,661,765	6,739,147

Table 20 - Historical Winter Expenditures by Calendar Year

	2021	2020	2019	2018	2017	2016	2015	2014	2013
Salting/Sanding	1,652,494	1,870,559	1,812,287	1,695,754	1,719,428	1,852,163	1,584,013	1,814,276	2,156,124
Street Plowing	1,534,456	1,630,803	2,505,253	1,970,105	1,817,000	1,579,792	1,341,132	2,040,395	1,643,912
Sidewalks	1,031,089	886,673	951,682	935,067	742,479	661,504	557,883	826,014	763,198
Snow Removal	816,934	895,810	1,672,886	922,275	1,327,003	416,233	1,279,779	1,494,090	1,189,549
Potholes	431,444	814,012	547,073	566,932	572,049	730,790	554,758	440,428	372,076
Drainage/ditches	350,887	577,949	542,953	428,897	186,569	230,148	440,211	516,620	338,771
Sweeping	897,667	1,059,836	815,503	918,270	634,926	667,537	665,440	736,803	650,336
Other duties	337,668	323,929	118,256	195,505	185,759	356,661	336,432	45,476	146,254
Other items	262,733	242,131	108,508	190,933	115,130	76,116	87,118	106,539	80,854
Funded	(79,662)	(101,809)	(128,794)	(140,916)	(127,158)	(185,563)	(121,342)	(100,613)	(102,218)
Total Costs	7,235,710	8,199,893	8,945,607	7,682,822	7,173,185	6,385,381	6,725,424	7,920,028	7,238,856

Table 21 - Historical Winter Budgets, by Calendar Year

	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013
Salting/Sanding	1,616,937	1,701,931	1,727,202	1,663,389	1,629,371	1,602,884	1,528,546	1,508,590	1,498,850	1,170,370
Street Plowing	1,824,315	1,661,294	1,928,828	1,689,658	1,634,385	1,401,964	1,303,141	1,224,473	1,148,000	1,179,620
Sidewalks	584,639	539,119	542,393	539,708	539,753	532,951	483,725	510,468	514,505	523,050
Snow Removal	1,073,717	1,061,941	1,390,448	1,328,171	1,290,443	1,272,144	1,155,435	1,342,835	1,307,420	1,365,500
Potholes	663,910	717,378	721,828	666,070	641,556	631,752	560,540	550,317	556,025	573,560
Drainage/ditches	352,696	354,055	361,150	359,292	345,615	340,909	306,728	301,821	304,560	312,970
Sweeping	973,196	870,553	935,471	929,658	897,415	888,263	821,785	812,871	817,570	833,940
Other duties	222,933	220,274	222,283	220,604	212,429	208,176	177,282	172,847	175,325	182,930
Other items	95,526	116,397	117,284	116,545	113,060	111,190	97,606	95,655	96,745	95,090
Funded	(205,083)	(35,330)	(35,111)	(35,290)	(36,019)	(36,476)	(39,789)	(40,084)	(40,000)	(39,820)
Total Costs	7,202,786	7,207,612	7,911,776	7,477,805	7,268,008	6,953,757	6,394,999	6,479,793	6,379,000	6,197,210

Table 22 - Difference between Budget and Actual, by Calendar Year

Negative (bracketed) numbers indicate spending exceeds budget

Under (Over)	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013
Salting/Sanding	TBD	49,437	(143,357)	(148,898)	(66,383)	(116,544)	(323,617)	(75,423)	(315,426)	(985,754)
Street Plowing	TBD	126,838	298,025	(815,595)	(335,720)	(415,035)	(276,651)	(116,659)	(892,395)	(464,292)
Sidewalks	TBD	(491,970)	(344,280)	(411,974)	(395,313)	(209,528)	(177,780)	(47,415)	(311,509)	(240,148)
Snow Removal	TBD	245,007	494,638	(344,715)	368,169	(54,859)	739,202	63,056	(186,670)	175,951
Potholes	TBD	285,934	(92,184)	118,997	74,623	59,703	(170,250)	(4,441)	115,597	201,484
Drainage/ditches	TBD	3,168	(216,799)	(183,661)	(83,282)	154,340	76,579	(138,390)	(212,060)	(25,801)
Sweeping	TBD	(27,114)	(124,365)	114,155	(20,855)	253,337	154,248	147,431	80,767	183,604
Other duties	TBD	(117,394)	(101,646)	102,348	16,924	22,417	(179,379)	(163,585)	129,849	36,676
Other items	TBD	(146,336)	(124,847)	8,037	(77,873)	(3,940)	21,489	8,537	(9,794)	14,236
Funded	TBD	44,332	66,698	93,504	104,896	90,683	145,773	81,258	60,613	62,398
Total Costs	TBD	(28,098)	(288,117)	(1,467,802)	(414,814)	(219,426)	9,614	(245,631)	(1,541,028)	(1,041,646)