TO:	**CHAIR AND MEMBERS CIVIC WORKS COMMITTEE MEETING ON MARCH 10 , 2020**
FROM:	**KELLY SCHERR, P.ENG., MBA, FEC MANAGING DIRECTOR ENVIRONMENTAL & ENGINEERING SERVICES AND CITY ENGINEER**
SUBJECT:	**REQUEST FOR PROPOSAL (RFP) 20-04 AWARD – SUPPLY & DELIVERY OF ELECTRIC ICE RESURFACERS**

RECOMMENDATION

That, on the recommendation of the Managing Director, Environmental and Engineering Services and City Engineer, the following actions **BE TAKEN**:

a) The switch of ice resurfacers from compressed natural gas models to electric battery powered models to reduce the greenhouse gas (GHG) impact of these units **BE APPROVED**; and

b) Staff **BE DIRECTED** to undertake the following actions:

i. The submission from Zamboni Company Ltd., 38 Morton Ave. E, Box 1388, Brantford, Ontario, Canada, N3T 5T6 **BE ACCEPTED,** for the supply and delivery of up to (6) six battery powered ice resurfacing machines at a unit price of $125,375 each excluding HST;

ii. Civic Administration , **BE AUTHORIZED** to appoint Zamboni Company Ltd., 38 Morton Ave. E, Box 1388, Brantford, Ontario, Canada, N3T 5T6 as the vendor of record for supply and delivery of up to fourteen (14) battery electric ice resurfacers over the next four (4) years at the sole discretion of the City based on performance and price;

iii. Civic Administration, **BE AUTHORIZED** to undertake all the administrative acts that are necessary in connection with this purchase;

iv. Approval hereby given **BE CONDITIONAL** upon the Corporation entering into a formal contract or having a purchase order, or contract record relating to the subject matter of this approval; and

v. That the funding for this purchase **BE APPROVED** as set out in the Source of Financing Report attached hereto as Appendix “A”.

COUNCIL’S 2019-2023 STRATEGIC PLAN

Municipal Council has recognized the importance of Fleet Services and its role as part of service delivery, climate change and asset management in its 2019-2023 - Strategic Plan for the City of London as follows:

Building a Sustainable City
London’s infrastructure us built, maintained, and operated to meet long-term needs of our community

- Maintain or increase current levels of service
- Manage the infrastructure gap for all assets

London has a strong and healthy environment

- Conserve energy and increase actions to respond to climate change and severe weather

Leading in Public Service
Londoners experience exceptional and valued customer service

- Increase community and resident satisfaction of their service experience with the City
- Increase responsiveness to our customers
- Increase efficiency and effectiveness of service delivery

PREVIOUS PERTINENT REPORTS

Relevant reports that can be found at www.london.ca under City Hall (Meetings) include:

- Climate Change Emergency – Update (November 25, 2019 meeting of the Strategic Priorities and Policy Committee, Item # 4.1)
- 2019-2023 Corporate Energy Conservation and Demand Management Plan (October 22, 2019 meeting of the Civic Works Committee, Item #2.8)

BACKGROUND

PURPOSE

The purpose of this report is to provide the necessary background information and seek approval to award a multi-year contract for the supply and delivery of up to fourteen (14) self-propelled, ice resurfacers (Figure 1) over the 2020-2023 period through RFP 20-04. The report also recommends the current natural gas powered ice resurfacing machines be replaced with battery electric powered machines.

Figure 1 – Zamboni Model 450 Electric Ice Resurfacer

CONTEXT

Current Situation

The City currently operates a fleet of 14 natural gas ice resurfacers to service 18 ice pads in municipal arenas and the skating trail at Storybook Gardens. Fleet Services has forecasted that over the next four years, all current Zamboni 445 Model natural gas units will reach or exceed the end of their 10 year optimal life cycle (Table 1). Through consultations with staff from three Service Areas, the approach for the replacement will be to stagger the replacements over the next four year period.

Table 1: Forecasted Replacement Schedule

Vehicle	Quantity	Proposed Replacement Year
2009 ZAMBONI 445	3	2020
2009 ZAMBONI 445	3	2021
2010 ZAMBONI 445	4	2022
2012 ZAMBONI 445	4	2023

Addressing the Need for Action on Climate Change

On April 23, 2019, the following was approved by Municipal Council with respect to climate change:

> *Therefore, a climate emergency be declared by the City of London for the purposes of naming, framing, and deepening our commitment to protecting our economy, our eco systems, and our community from climate change.*

On November 26, 2019, Council approved the development of a Climate Emergency Action Plan (CEAP) to be completed by the end of 2020. Part of the development includes an increased emphasis on the climate change impacts associated with the City's fleet and equipment.

Green Fleet Review and Outcome

The Green Fleet Review process has been in place since 2009 and in the last five years has seen increased activity. The process is used to improve Fleet services and the City's use of fleet and equipment in 4 areas:

1. GHG Emissions Reductions
2. Environmental Considerations
3. Operational Considerations
4. Financial Considerations

The process has been a collective accountability partnership between Fleet Services, Environmental Programs and the Service Areas (customers) with a specific target of building a culture of conservation and an emission reduction framework.

The process has been responsible for many achievements including the implementation of hybrid vehicles, on board GPS and telematics systems, electric vehicle and charging infrastructure, and several anti-idling strategies. More recently the program has expanded to include major initiatives like fuel switching from diesel to compressed natural gas for waste collection trucks, as well as increasing conversion rates from standard gas compact cars and SUVs to Hybrid cars and SUVs.

The process continues to evolve and will be focusing on new strategic priorities in line with the Corporate Energy Management Conservation and Demand Management (CDM) Plan, the development of the Climate Emergency Action Plan (CEAP), and utilizing the upcoming screening Climate Emergency Evaluation Tool (CEET) for many City projects and programs.

Through consultation and discussion with stakeholders in Parks and Recreation, Environmental Programs and Facilities, it is recommended that the City undertake a transition to a fully battery electric ice resurfacer fleet to help meet the climate emergency mandate through the reduction of greenhouse gas (GHG) emissions and improve health and wellness at the City's recreation facilities. This transition to the electric ice resurfacers will also open up future conservation opportunities like roof top solar power generation to support the energy needs for the ice resurfacers.

Staff have reviewed and researched the potential transition toward electrifying the ice resurfacer fleet for over a year. In that time City staff have gained important knowledge and information about the benefits and challenges with the switchover. The justification for this change is contained in Appendix B Green Fleet Review.

DISCUSSION

Purchasing Process and Evaluation

Fleet Planning, through Purchasing and Supply, initiated the proposal process for the Supply and Delivery of Electric Ice Resurfacers on November 25, 2019.

The RFP requested responses from vendors to supply and deliver up to fourteen (14) ice resurfacers over a four year period. The evaluation criteria and weighting provided in the RFP is shown on Table 2.

Table 2: RFP Evaluation Criteria and Weighting

Evaluation Criteria	Weighting
Company Certification, Experience, and Past Performance	10%
Specifications	40%
Efficiency, Safety, and Regulatory Compliance	10%
Service Agreement, Delivery, Training, and Warranty	10%
Options and Innovation	5%
Price	25%
Total	100%

The RFP closed on January 3, 2020, and resulted in three (3) compliant bids to evaluate. Proponents were scored based on the following aspects:

- Vehicle Specification Standards set by the City of London
- 2020 pricing
- Options and efficiency of models proposed
- Battery technologies proposed
- Warranty policies
- Operator and Technician training
- Mechanical service support
- Maintenance and service manuals
- Additional value added features

The evaluation team was chaired by a Purchasing and Supply official and made up of representatives from Fleet Maintenance, Fleet Specialist Technical Training, Fleet Planning and Parks and Recreation (Aquatics and Arenas).

The successful vendor will have a vendor of record contract for a one (1) year period with the option to renew for three (3) additional one (1) year terms at the sole discretion of the City based on performance and pricing competitiveness. The annual option year renewal process also provides the City with greater control, flexibility and accountability from the vendor as contract renewals and future equipment purchases are dependent on continued good performance, service and price competitiveness.

The City of London is under no obligation to purchase a set number of units as part of this contract. The City maintains flexibility for decisions related to models and option choices, replacement cycles and the number of purchases.

Evaluation Results

The evaluation team determined that the bid submission from Zamboni Company Ltd., scored the best and is the recommended proponent.

Zamboni Company Ltd. also provided optional trade-in allowances which will be considered through Fleet Planning and the Manager of Purchasing.

Financial Impact

The recommended bid that met required specifications, terms and conditions was from Zamboni Company Ltd. The purchase of the first three (3) battery powered ice resurfacers and any further units ordered within the first year of the contract will be at

the cost of $125,375 each (excluding HST). The capital replacement budget for ice resurfacers was established for natural gas units estimated at $87,500 each. Current 2020 pricing quotations for natural gas Zamboni replacements is $94,675. Therefore at $125,375 battery electric powered ice resurfacers are 32% higher cost than the natural gas powered machines based on 2020 replacement cost estimates. For these first six units, this premium will be supported through three sources of funding:

1. An additional $20,833 per unit from a designated amount in the Vehicle and Equipment Reserve Fund for climate friendly purchases bringing the total budget to $108,133.

2. Additional contributions to the reserve fund when the replacement of the existing natural gas units was delayed one year as the battery powered units were tested.

3. Surplus funding from other vehicle purchases through the Vehicle and Equipment Reserve Fund (VERF) that were below budget.

The financing for these purchases is funded through contributions from the service areas to the VERF. At the end of the optimum lifecycle of the asset, the VERF has typically recovered the necessary funds to replace the unit. Each unit purchased under the contract with Zamboni Company Ltd is subject to budget approval and will follow the procedures as defined in the City of London's Procurement of Goods and Services Policy.

The Source of Financing Report is attached as Appendix "A".

CONCLUSION

The timing for transition to battery electric ice resurfacers has never been better. The combination of the existing ice resurfacers and natural gas refuelling infrastructure systems at arenas being at end of life and the Council direction to take great action on projects that reduce GHG generation has provided an excellent opportunity to make a fundamental change. The key objectives are to maintain operational performance and continuity, achieve GHG reduction through elimination of the use of fossil fuels, produce cleaner air recreation facilities and provide future opportunities for renewable energy production through solar PV that would create one of the few "Net-Zero" fleet of ice resurfacers in North America. By 2023 London will be one of the first in North America to have near zero emission fleet of ice resurfacers.

In summary, the associated costs of procurement and infrastructure changes will yield a positive benefit-cost ratio, resulting in a simple payback of 17.5 years. However when paired with a renewable energy source (solar PV), the payback is reduced to almost 8 years and GHG emissions are reduced a further 19 tonnes to 230 tonnes annually. This illustrates the critical role and net benefit renewables play in fuel-switching initiatives. This would reduce annual GHG emissions from the City's pools and arenas by 37 percent – a significant reduction measure for the Aquatics, Arenas & Attractions Division of Parks and Recreation.

Subject to Council approval, Fleet Services and Parks and Recreation intend to replace all 14 of their Zamboni ice resurfacers with battery electric units over the next four years. The existing natural gas units have reached and/or exceeded their 10 year optimum service life.

Based on the discussion and analysis above, Fleet Services, in conjunction with Purchasing and Supply, recommend that RFP 20-04 – Supply and Delivery of Electric Ice Resurfacers be awarded to Zamboni Company Ltd. Zamboni scored the highest in the evaluation based on the specified RFP criteria.

This RFP award establishes a vendor of record for the replacements which will be staggered during term of the contract period of one (1) year with an option to extend the

contract for three (3) additional, one (1) year terms at the sole discretion of the City based on performance and competitive pricing.

Staff from Fleet Services, Parks and Recreation and Purchasing believe the recommended vendor and equipment selection provides the best overall value for the City and supports our healthy community strategy and is in line with council's climate emergency declaration and direction to take further action to reduce GHG generation.

SUBMITTED BY:	**REVIEWED & CONCURRED BY**
MIKE BUSHBY, BA **DIVISION MANAGER,** **FLEET & OPERATIONAL SERVICES**	**JAY STANFORD, MA, MPA** **DIRECTOR, ENVIRONMENT, FLEET & SOLID WASTE**
RECOMMENDED BY:	
KELLY SCHERR, P. ENG., MBA, FEC **MANAGING DIRECTOR,** **ENVIRONMENTAL & ENGINEERING SERVICES & CITY ENGINEER**	

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Appendix A Source of Financing

Appendix B Green Fleet Review

C: John Freeman, Manager of Purchasing & Supply
Steve Mollon, Manager of Fleet Planning
Barrie Galloway, Manager of Fleet Maintenance
Duncan Sanders Manager of Recreation Operations Parks & Recreation
Sarah Denomy, Procurement Officer

APPENDIX 'A'

#20032

Chair and Members
Civic Works Committee

March 10, 2020
(Award Contract)

RE: Request for Proposal RFP 20-04 Award - Supply & Delivery of Electric Ice Resurfacers
(Work Order 2487230-2487232, 2487368-2487370)
Capital Project ME201901 - Vehicle & Equipment Repl- TCA
Zamboni Company Ltd. - $752,250.00 (excluding H.S.T.)

FINANCE & CORPORATE SERVICES REPORT ON THE SOURCES OF FINANCING:

Finance & Corporate Services confirms that the cost of this project can be accommodated within the financing available for it in the Capital Works Budget and that, subject to the adoption of the recommendations of the Managing Director, Environmental & Engineering Services & City Engineer, the detailed source of financing for this project is:

SUMMARY OF ESTIMATED EXPENDITURES	Approved Budget	Committed To Date	This Submission	Balance for Future Work
Vehicle & Equipment	$5,753,272	$4,516,755	$765,490	$471,028
NET ESTIMATED EXPENDITURES	**$5,753,272**	**$4,516,755**	**$765,490**	**$471,028**
SUMMARY OF FINANCING:				
Capital Levy	$125,000		$125,000	$0
Drawdown from Vehicles & Equipment Replacement Reserve Fund	5,588,225	4,476,708	640,490	471,028
Other Contributions	40,047	40,047		0
TOTAL FINANCING	**$5,753,272**	**$4,516,755**	**$765,490**	**$471,028**

1) **FINANCIAL NOTE:**

Contract Price (6 units @ $125,375 each)	$752,250
Add: HST @13%	97,793
Total Contract Price Including Taxes	850,043
Less: HST Rebate	84,553
Net Contract Price	$765,490

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Jason Davies
Manager of Financial Planning & Policy

APPENDIX B
GREEN FLEET REVIEW

The Green Fleet Review process has been in place since 2009 and in the last five years has seen increased activity. The process is used to improve Fleet services and the City's use of fleet and equipment in 4 areas:

1. GHG Emissions Reductions
2. Environmental Considerations
3. Operational Considerations
4. Financial Considerations

Each of these areas is supported through technical analysis including literature research, interviews, site visits, financial reviews and risk assessment.

GHG Emissions Reductions and Environmental Considerations

The transition to battery electric engines eliminates the GHG produced from burning fossil fuels and eliminates the harmful chemicals produced from unburned fuel. Each unit converted to battery electric will result in a savings of 19 tonnes of GHGs annually (Table B-1). Following the conversion of the entire fleet to battery electric, operational units will mitigate 212 tonnes of GHG emissions annually and contribute to about 25% of the Corporation's overall GHG curtailment target of 900 tonnes annually, 85% of Green Fleet's GHG curtailment target of 250 tonnes annually and avoiding 579 tonnes of cumulative GHG emissions by 2023.

Table B-1 Operational GHG Savings Per Contract Year

Year	Number of Units Switched to Electric	Accumulated (Estimated) GHG Savings (tonnes/year)	% of CDM Target (900 Tonnes GHG Annually)
2020	3	58	6%
2021	3	114	13%
2022	4	190	21%
2023	4	212	24%

Furthermore, the move to battery electric powered equipment will enable the City to move to renewable energy sources such as solar PV. This concept is in alignment with a renewable energy feasibility study that is already underway as part of the City's ongoing energy management program in City Facilities – which includes some arenas. If a renewable energy project is ultimately paired with and sized to meet the use associated with the eventual electrification of the City's ice resurfacer fleet, London would create one of the few "Net-Zero" fleet of ice resurfacers in North America. By 2023 London will be one of the first in North America to have a fleet of near zero emission ice resurfacers.

The replacement of 14 natural gas powered pieces of equipment with battery electric units over four years is a significant step forward toward the Corporate targets in the 2019-2023 CDM Plan.

Operational and Financial Considerations

<u>Successful Trials</u>
In September 2019, Zamboni Company Ltd. delivered an electric Zamboni model 450 to the Bostwick Community Centre. Operators were trained on the electric unit and used it daily during the trial period. Positive feedback included; quiet operation, ease of use, easy to handle, charged quickly and the power level was very comparable to the natural gas units. The only negative feedback was the charging time required was more than time available when resurfacing a dual pad rink. This issue was addressed in the specifications of the RFP.

Operational and Mechanical Savings

A comprehensive review of the electric ice resurfacers was conducted by Fleet Planning, in collaboration with Facilities. The estimated operational savings per unit (Table B-2) and per contract year (Table B-3) are found below. The estimates are for a four year period based on current electricity and natural gas rates and the expected maintenance/service/repair cost estimates supplied by the preferred proponent.

Table B-2 Operational Savings per Unit

	Electric	Natural Gas
Average Operating Cost/Year	$3,750	$5,815
Operating Costs for 10 Years	$37,510	$58,145
Total Operating Savings	$20,635	
Savings per year, per unit	**$2,065**	

Table B-3 Operational Savings Per Contract Year

Year	Electric Units In Service	Savings
2020	3	$3,955
2021	6	$8,825
2022	10	$16,240
2023	14	$24,790
Total Operational Savings - 2020-2023		**$53,810**

Note: Operation savings per contract year are based on the full-time operation of 11 ice resurfacers and three spares/standby. Savings also include the Federal Carbon Tax increasing from $30/tonne GHG ($CO_2$) to $50/tonne by 2022.

Infrastructure Benefits

Converting to electric ice resurfacing equipment requires modifications at the arena facilities to set up new battery charging stations, which are safer and less costly than natural gas filling stations. Many natural gas filling stations at the arenas are also reaching end of life and are scheduled for replacement. Fleet Planning and Facilities have coordinated arena replacement schedules to reduce waste, increase efficiencies and minimize operational disruptions and costs.

Expected Extended Lifecycles

The life cycle for current natural gas units is currently ten years based on asset management analysis, experience, condition, technological advancements, wear and tear, mileage, optimum remarketing value, repair costs, and reliability. Electric ice resurfacers are predicted to have an 11 to 12 year lifecycle.

Risks and Challenges

The battery electric powered ice resurfacers are 32% higher capital cost than the natural gas powered machines based on 2020 replacement cost estimates. The electric ice resurfacers also require building modifications to support the charging system.
In summary, the associated costs of procurement and infrastructure changes will yield a positive benefit-cost ratio, resulting in a simple payback of 17.5 years. However when paired with a renewable energy source (solar PV), the payback is reduced to almost 8 years and GHG emissions are reduced a further 19 tonnes to 230 tonnes annually. This illustrates the critical role and net benefit renewables play in fuel-switching initiatives. FCM and Natural Resource Canada (NRCan) funding is currently being pursued to further mitigate these costs.

The battery electric powered equipment requires specific charging procedures to be followed in order to maintain the adequate charging throughout the full operational cycle of flooding the ice rinks. Early testing has helped to identify the best battery system to ensure operational continuity. If procedures are not followed the ice resurfacers would be disabled until sufficiently re-charged.