



City of Richmond

Report to Committee

To: Public Works and Transportation Committee **Date:** August 24, 2018
From: Peter Russell
Senior Manager, Sustainability and District Energy **File:** 10-6125-05-01/2018-Vol 01
Re: **Cultural Centre Equipment Renewal and GHG Emissions Reduction Project**

Staff Recommendations

1. That the equipment renewal and upgrade at the Cultural Centre, as described in the report title "Cultural Centre Equipment Renewal and GHG Emissions Reduction Project" from the Senior Manager, Sustainability and District Energy dated August 24, 2018 be endorsed.
2. The funding of \$500,000 from the Carbon Tax Provision and \$170,000 from the Energy Operating Provision be approved for use to support the completion of the Cultural Centre equipment renewal project, and that the Consolidated 5 Year Financial Plan (2018-2022) Bylaw be amended accordingly.
3. That if incentive funding applications to Fortis BC and/or BC Hydro are successful, the Consolidated 5 Year Financial Plan (2018-2022) Bylaw be amended accordingly and, if applicable, the corresponding internal City funding sources be returned to their source funds.

Peter Russell
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REPORT CONCURRENCE		
ROUTED TO:	CONCURRENCE	CONCURRENCE OF GENERAL MANAGER
Finance	<input checked="" type="checkbox"/>	
Arts, Culture & Heritage	<input checked="" type="checkbox"/>	
REVIEWED BY STAFF REPORT / AGENDA REVIEW SUBCOMMITTEE	INITIALS: 	APPROVED BY CAO

Staff Report

Origin

The purpose of this report is to update Council on a grant application the City submitted to the Federation of Canadian Municipalities' (FCM) Municipal Climate Innovation (MCI) program and to seek support for an enhanced equipment renewal and greenhouse (GHG) emission reduction project at the Cultural Centre.

The enhanced project and grant application supports the following Council 2014-2018 Term Goals:

#4 Leadership in Sustainability:

Continue advancement of the City's sustainability framework and initiatives to improve the short and long term livability of our City, and that maintain Richmond's position as a leader in sustainable programs, practices and innovations.

4.1 *Continued implementation of the Sustainability Framework.*

4.2 *Innovative projects and initiatives to advance sustainability.*

#5 Partnerships and Collaboration:

Continue development and utilization of collaborative approaches and partnerships with intergovernmental and other agencies to help meet the needs of the Richmond community.

5.1 *Advancement of City priorities through strong intergovernmental relationships.*

5.2 *Strengthened strategic partnerships that help advance City priorities*

#6 Quality Infrastructure Networks:

Continue diligence towards the development of infrastructure networks that are safe, sustainable, and address the challenges associated with aging systems, population growth, and environmental impact.

6.1 *Safe and sustainable infrastructure.*

Background

In May 2016 Council endorsed a target of reducing greenhouse gas (GHG) emissions at corporate buildings by 65% from 2007 levels by 2020. To meet this target the City needs to review GHG emissions reduction opportunities when planned equipment renewals occur.

In November 2017 Council endorsed a grant application submission to the FCM MCI program for support funding to help complete a comprehensive equipment replacement and upgrade at the Cultural Centre. The project scope included the integration of a renewable energy system. The grant request was for \$960,000 or approximately 51% of the total anticipated costs.

The City was notified in May 2018 by FCM that it was successful in its application for funding, with the program committing \$750,000 to the project. The FCM program received significant interest from Municipalities across the country, and had more requests for support funding than what was available. The grant program was originally estimated to last for approximately three

years, but was fully subscribed before the end of the first year and was closed in November 2017.

In accordance with Council approvals in November 2017, City staff are now in the process of finalizing a project timeline and a funding agreement with FCM, contingent on further funding be allocated to the project.

Completing this project at the Cultural Centre would reduce the GHG emissions by over 90% and energy use by over 35%. The potential GHG emission reductions at the Cultural Centre are crucial for attaining the City's target as it represents over 6% of the corporate building emissions reduction target.

Analysis

The Cultural Centre is viewed as a long term essential facility for the southeast Arts and Cultural District of Minoru Park that is planned on being retained and enhanced, as indicated in the recent Minoru Park Vision Plan report. The Cultural Centre was constructed in 1992 and some of its major mechanical systems and equipment have reached their end of life and are scheduled to be replaced. The proposed equipment renewal and GHG emissions reduction project includes the upgrade and replacement of aging mechanical systems and the incorporation of a renewable energy system. This project met FCM's MCI program criteria readily, whereby an existing project could benefit from additional funding to significantly reduce GHG emissions and provide greater long term environmental benefits.

Council previously approved minor capital projects for some of the needed equipment replacement at the Cultural Centre in 2017 with a total of \$450,000 in funding. Soon after, the MCI program was announced allowing the City to consider the approved capital funding as City contribution for the FCM MCI program application. The City has the opportunity to enhance the original minor equipment replacement projects and complete the full replacement and renewal of major mechanical equipment at the Cultural Centre. The expanded project is in line with the objectives of the City's High Performance Building Policy, which includes focus on continued improvement, optimization of energy use in existing City buildings, and moving towards net zero energy and GHG emission corporate buildings.

The enhanced project plan at the Cultural Centre includes the following general scope of work;

- Replace the large chiller plant and mid-efficiency boilers with an outdoor 4-pipe air source heat recovery chiller and high efficiency condensing boilers;
- Replace the interior perimeter radiant panel heating system with variable air volume (VAV) terminal reheat units, to reduce the heating system supply temperature and improve interior thermal comfort;
- Install heat reclaim capacity in the main air-handling units to reduce waste heat;
- Add variable speed drives on the heating and cooling loop pumps and supply fans to reduce electricity use; and
- Install new domestic hot water tanks with connections to the new high efficiency condensing boilers.

The enhanced project as outlined above is expected to reduce GHG emissions at the Cultural Centre by over 90% and energy use by over 35%. The GHG emissions reduction are equal to over 250 tonnes of CO₂e annually, or equal to taking 75 Richmond vehicles off the road. The conventional energy use at the facility will be reduced by over 1.0 gigawatt hour annually, or equal to the annual energy consumption of 25 Richmond homes. The emissions and energy reductions will also provide the City with approximately \$35,000 annually in cost avoidance savings, based on carbon credit and energy utility costs.

As a base case estimate, the City projected that the GHG emissions reductions and energy savings from completing the renewal and replacement of the current equipment with similar technology and systems would be minimal, with reductions of approximately 17% in GHG emissions and 11% in energy use at the facility. The base case project would have had an estimated budget of \$1,025,000, and would have achieved approximately \$15,000 annually in cost avoidance savings. A project with the base case level of emissions reduction and energy savings would not have qualified for support funding through the FCM's MCI program.

The payback on the incremental funding required (\$95,000) to complete the proposed comprehensive project as compared to the base case estimate is approximately 4.5 years.

The City is also applying to Fortis BC and BC Hydro to support the project through their incentive programs, and will know shortly if further incentive funding will be provided to this project. If successful, the funding from Fortis or BC Hydro could be used to offset the City's additional capital contribution, further improving the project's business case.

Financial Impact

The City will receive \$750,000 from FCM to support the completion of this project. Current approved capital funding is \$450,000. The total estimated cost to complete the project is \$1,870,000.

Staff recommend that an additional \$500,000 in capital funding be allocated from the Carbon Tax Provision and \$170,000 in capital funding be allocated from the Energy Operating Provision, and that the Consolidated 5 Year Financial Plan (2018-2022) Bylaw be amended accordingly.

Conclusion

The completion of this project will replace and upgrade aging mechanical infrastructure at an important civic facility with significant funding support from FCM's MCI program, and will help the City achieve its ambitious GHG emissions reduction target of 65% reduction in corporate building emissions by 2020. Through the implementation of these types of deep GHG emissions reduction and energy savings projects at existing facilities, the City of Richmond will provide further needed services to its growing community while reducing its overall environmental footprint.



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