




City of Richmond

Report to Committee

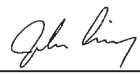

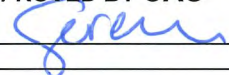
To: Public Works & Transportation Committee **Date:** May 8, 2023
From: Peter Russell **File:** 10-6125-07-04/2023-Vol 0
Director, Sustainability and District Energy
Re: **Circular Procurement Policy Implementation and Progress Update**

Staff Recommendation

That results of the implementation of circular economy criteria into projects and procurement activities, as noted in the staff report titled “Circular Procurement Policy Implementation and Progress Update,” dated May 8, 2023, from the Director, Sustainability and District Energy, be posted online to inform the public.


Peter Russell
Director, Sustainability and District Energy
(604-276-4130)

Att. 5

ROUTED TO:	CONCURRENCE	CONCURRENCE OF GENERAL MANAGER
Finance Department	<input checked="" type="checkbox"/>	
Arts, Culture & Heritage	<input checked="" type="checkbox"/>	
Library	<input checked="" type="checkbox"/>	
Parks Services	<input checked="" type="checkbox"/>	
Recreation & Sport Services	<input checked="" type="checkbox"/>	
Engineering	<input checked="" type="checkbox"/>	
Facility Services & Project Development	<input checked="" type="checkbox"/>	
Public Works Division	<input checked="" type="checkbox"/>	
Fire Rescue	<input checked="" type="checkbox"/>	
Transportation	<input checked="" type="checkbox"/>	
SENIOR STAFF REPORT REVIEW	INITIALS: 	APPROVED BY CAO 

Staff Report

Origin

This report responds to a referral from the February 22, 2021 Council meeting, which requested:

“(2) That Procurement Policy #3104 be reviewed in 18 months, and staff report back..”

This report supports Council’s Strategic Plan 2022-2026 Focus Area #1 Proactive in Stakeholder and Civic Engagement:

1.2 Advocate for the needs of Richmond in collaboration with partners and stakeholders.

This report supports Council’s Strategic Plan 2022-2026 Focus Area #2 Strategic and Sustainable Community Growth:

2.3 Ensure that both built and natural infrastructure supports sustainable development throughout the city.

2.5 Work collaboratively and proactively to attract and retain businesses to support a diversified economic base.

This report supports Council’s Strategic Plan 2022-2026 Focus Area #3 A Safe and Prepared Community:

3.2 Leverage strategic partnerships and community-based approaches for comprehensive safety services.

This report supports Council’s Strategic Plan 2022-2026 Focus Area #5 A Leader in Environmental Sustainability:

5.1 Continue to demonstrate leadership in proactive climate action and environmental sustainability.

5.3 Encourage waste reduction and sustainable choices in the City and community.

This report supports the Richmond Circular City Strategy (RCCS), which Council approved on April 24, 2023. In line with the circular principles incorporated into Procurement Policy #3104, the RCCS is an innovative plan to steer Richmond toward a sustainable, equitable, and low-carbon economy, aiming for 100% circularity by 2050.

Analysis

In February 2021, Council endorsed an updated version of the City’s Procurement Policy #3104, to include circular economy principles. The initiative differentiated the City as a leader in the public sector, by adapting procurement activities to support the organization and the community in moving towards a circular economy. The City’s vision for the circular economy aims to maximize the value of resources by design, through responsible consumption, minimizing waste and reimagining how resources flow in a sustainable, equitable, low-carbon economy.

The City's work is guided by the following principles:

- **Design clean:** design our waste and pollution by prioritizing regenerative resources;
- **Keep using:** keep products and materials in an operational use;
- **Regenerate:** regenerate natural systems and mitigate climate change;
- **Collaborate to co-create:** collaborate to co-create innovation and joint value; and,
- **Maximize value:** maximize economic value for money.

Figure 1: City of Richmond circular economy principles framework



Staff capacity building approach

Since the inception of the City's circular principles, staff have engaged multiple vendors, stakeholders and internal staff to assess the City's current and future capacity to support the transition from a linear to a circular economy. The transition is supported through the setting of short and medium-term milestones that will ultimately lead the City to realize its long-term objective of achieving 100% circularity.

Within the past 24 months, the City has reflected circular economy requirements within the scope of work and/or has evaluated submissions against specific criteria relating to the circular economy in over 100 competitive processes. Staff are currently monitoring and evaluating the outcomes of the following:

- Information Technology (IT): 7 procurement activities
- Professional Services: 18 procurement activities
- Civil Construction and Infrastructure: 23 procurement activities
- Facilities, Maintenance and Operations (FMO): 17 procurement activities
- Fleet: 25 procurement activities

In the initial phase, staff recognized there was a lack of knowledge within the organization on what the circular economy represented or how it could be reflected in the City's day-to-day activities and initiatives. The level of market readiness across the City's supply base was also unknown. Given these factors, staff began integrating qualitative circular criteria into procurement processes in an effort to learn from suppliers, assess supply chain readiness within different supply markets and identify more opportunities to create new circular possibilities through procurement activities. Staff also reviewed circular procurement approaches used by other public and private sector organizations to identify best practices and further refine the City's approach. Responses from bidders were reviewed and shared with City departments to learn what information can be requested and how best to assess and score those responses. Appropriate criteria and guidelines for circular procurement methodologies were developed and more information was made publically available to assist vendors understanding of the City's vision for a circular economy.

The implementation approach encompassed the following (see Attachment 1 for more information):

- **Training, capacity-building, and stakeholder engagement:** Since the inclusion of circular economy goals within the City's Procurement Policy in February 2021, the City has organized numerous training and capacity-building events, including over 40 engagement meetings and 20 informal training sessions. Two internal workshops were held to explore further opportunities and challenges to advancing circular procurement. An intranet page was developed and updated with case studies and metrics to further illustrate circular principles in action.
- **Peer-to-peer and stakeholders collaboration:** City staff identified progressive practices from other leading cities, forging collaborations and participating in numerous circular pilot projects. The City has engaged with sustainability and procurement teams from other local governments and participated in procurement focus groups. In total, 52 peer-to-peer activities were undertaken. Some pilot projects include the Reclaimed Asphalt Pavement initiatives, Total Cost of Ownership in IT, and the Hydrogen Fuels pilot project.
- **Market consultation and supplier's engagement:** Market research was undertaken to identify the relative maturity of supply markets and appropriate specifications to use when procuring innovative circular products and services. The knowledge gained has enabled staff to consider different approaches on how best to implement circular principles in projects (See Attachment 2 – Case 14, 15, 16 and 17 as examples). Consulting with industry representatives in the pre-competitive procurement phase of projects is recognized as a key success factor when developing product and service specifications. Successful market consultation has enabled staff to set more realistic goals, evaluate tangible circular proposals, encourage collaboration with City departments and generate support for future circular initiatives.
- **Questionnaires:** Supported by Sustainability, the Purchasing department piloted the use of supplier questionnaires within some Request for Proposal (RFP) bid documents. The questionnaires were able to solicit qualitative information from bidders relating to products, services and the use of packaging materials. Through the questionnaires, more information on product life-cycles, repair and reuse possibilities, remanufacturing and recycling was able to be obtained, as well as information on the availability of extended warranties and service plans that offer opportunities to maximize the life of assets.
- **Evaluation of Proposals:** Proposals from bidders are routinely assessed according to their ability to meet the City's operational and project requirements. However where practical, supplier proposals are now also assessed against their alignment with the City's circular economy criteria. Information received from bidders relating to the use of environmentally-friendly materials, resource efficiency and circular business practices is now also collected and assessed. Evaluation processes are designed to ensure proposals are assessed on both their economic value and their alignment to circular goals and objectives. Depending on the product or service being procured, staff assign evaluation weightings between 5-10% for circular economy considerations.
- **Preliminary technical specifications:** Staff have developed preliminary requirements for various goods and services procured by the City that reflect specifications relating to life-

cycle costs, repair, reuse, remanufacturing, recycling and the availability of extended warranties.

Results and Learnings in the Last 24 Months

The City's efforts implementing circular economy principles in procurement and project activities have been encouraging to date (see more details in Attachment 3):

- **Enhanced circular economy knowledge and capabilities:** Vendors and stakeholders have an increased, but still limited understanding of the circular economy. Technical capabilities vary among suppliers, with some already offering circular solutions, as described in Case 4 - Circular Procurement Strategies for Enclosed Tractors and Flail Mowers and Case 11 - High RAP Pilot Program in City Roadworks (Attachment 2). Other suppliers may require additional support to implement and meet circular requirements. Suppliers have shown a commitments to learning and implementing circular approaches in support of City efforts, as shown in market consultation and Case 1 - Embracing Circularity in Infrastructure: The South Dike Upgrade Project (Attachment 2). Council-supported internal training programs, support, and capacity building have expedited the City's progress in implementing circular approaches in project and procurement activities (see Attachment 6 - Engagement Activity Responses by Staff).
- **Strengthened collaborative processes and stakeholder engagement:** Successful leadership initiatives, as demonstrated in projects like Case 14 - Circularity Integrated into Major Projects and Case 16 - Leading the Way: Project Development Engages with Suppliers and Stakeholders to Foster Circular Innovation (Attachment 2), show that early stakeholder engagement and collaborative activities are essential to identifying common opportunities and creating synergies. As members of the Circular Cities and Regions Initiative and Circular Innovation Council, peer-to-peer and stakeholder collaboration is essential for creating consistency and achieving results. Participation in focus groups, such as Reclaimed Asphalt Pavement, Total Cost of Ownership in IT, EcoHack-a-City, and dialogue around the hydrogen fuels pilot project, provide a platform for building collaboration among City departments and stakeholders. As the result of this participation, staff have developed tools such as a Total Cost of Ownership toolkit.
- **Positive outcomes and cost efficiency in circular procurement:** If carefully planned, implementing circular principles in procurement activities will not necessarily negatively impact costs, as demonstrated in the Reclaimed Asphalt Pavement Pilot Project. Staff observed that by taking a circular economy approach, cost savings can be realized. An example is described in Case 12 - Circular Approach for Synthetic Sports Surfacing Replacement in Hugh Boyd Park. Reusing crumb rubber at Hugh Boyd sports field provided cost savings of \$330,000 compared to new infill and kept 800,000 pounds (363,000 kg) of rubber away from landfills (Attachment 2). Other procurement projects have also identified cost saving opportunities, such as Case 17: Furniture Circular Management. However, additional research and analysis needs to be conducted to assess and analyze potential savings over time (see Attachment 4). Ultimately, the City's Procurement Policy reflects a best value approach that also includes both financial and non-financial considerations.
- **Adapting to its Supply Base:** The inclusion of circular questionnaires in procurement activities has been relatively well-received by suppliers who have responded to bid opportunities advertised by the City. The implementation of circular economy criteria in bid

documents have highlighted a supplier's ability to provide circular opportunities, as demonstrated in Case 7: Circular Economy Principles in E-Scooter Share Procurement. More technological advancements and product/service developments are expected in the coming years when the possibilities for circular solutions are shared and highlighted.

The City's work was validated when the City was awarded the Organizational Environmental Programs Award by the Environmental Manager's Association (EMA) of BC in November 2022 for the implementation of a procurement policy that integrates circular economy criteria into corporate procurement activities. The award recognized the City's leadership in promoting environmental sustainability and corporate accountability.

Staff will continue to incorporate circular principles into selected procurements, ensuring alignment with the City's goals and strategies. Based on key results and learnings identified above, staff will undertake the activities described in the Attachment 4 – Next Steps to further implement circular economy principles through procurement activities.

Next Steps

Staff will continue to incorporate circular principles into selected procurements where feasible, ensuring alignment with the City's goals and strategies. Based on key results and learnings identified above, staff will undertake with current resources the following activities to further implementation of the circular economy principles and criteria integrated into the procurement policy (see more details in Attachment 4):

- **Establishing Metrics and Indicators for Circular Procurement Progress:** Implement key metrics to track circular economy principles in procurement, enhancing transparency and prioritizing long-term adherence to circular practices through progress monitoring and reporting.
- **Pilot Project Implementation:** Staff aim to explore more pilot projects with stakeholders and peers, as they are crucial for capacity building and evaluating progress towards a circular economy, while also enhancing the organization's image and regional reputation for sustainability and innovation.
- **Conducting Material Flow Analysis Study and Life-Cycle Analysis:** Following the October 2022 Council endorsement, a Material Flow Analysis study is in progress to assess Richmond's current circularity level and establish a baseline for circular economy progress, with additional Life-Cycle Analysis studies as needed for complex product opportunities.
- **Fostering Training and Capacity Building Initiatives:** Staff will engage in capacity-building and training alongside leading organizations, while collaborating with suppliers and stakeholders to identify circular procurement opportunities, deliver circular products and services, and refine regulatory references.
- **Advocating for Standardized Circular Metrics at the Regional Level:** Recognizing the need for standardized metrics and accessible measurement tools, advocate for the adoption of regional standardized metrics to ensure adherence to circular economy principles.
- **Engaging with Peer and Industry Working Groups:** Participate in working groups to engage with circular economy stakeholders, identify opportunities, synergies, and

metrics, and foster collaboration that advances circular principles in procurement activities.

Sharing the success stories to lead the pathway toward the circular economy

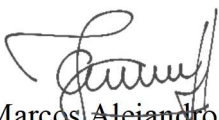
A recommendation is included to post results on the City's website and social media platforms as described in the report, including those that may arise in the future. Showcasing tangible examples of circular strategies in action strengthens the credibility of the City's circular efforts and inspires stakeholders, vendors, and other municipalities to replicate these practices.

Financial Impact

None.

Conclusion

The City of Richmond has made significant strides to incorporate circular economy principles in its procurement activities. However, staff recognize that this is only the beginning of its journey toward achieving 100% circularity by 2050. Numerous vendors and stakeholders have pledged their commitment to promote sustainability and a circular economy. To expedite progress, staff will continue to collaborate with suppliers to maintain dialogue and share experiences, tools and practices that facilitate the adoption of circular outcomes. Fostering ongoing collaboration will enable the expansion of circular principles to a broader range of projects and activities. A key benefit for the City has been the collaborations with peers, other levels of government and different stakeholders to enhance circular procurement practices further and inspire widespread market adoption. With Council endorsement, results will be posted on the City's website and social media, demonstrating the City's commitment to a circular economy. The EMA Award, given to the City for integrating circular economy principles into procurement, highlights the City's leadership in environmental sustainability.



Marcos Alejandro Badra
Program Manager, Circular Economy
(604-204-8643)

MB:mb

- Att. 1: Implementation Activities
- 2: Circular Procurement Success Stories
 - 3: Key learnings and results from implementing circular principles in corporate procurement and project activities
 - 4: Next Steps
 - 5: Analysis of the last 24 months' request for proposals by sector

Implementation Activities

Integration of circular principles into procurement activities has leveraged City's leadership in a way that is consistent with several existing City strategic sustainability goals including zero-waste, zero-emissions, ecosystem resilience and business mobilization. The engagement approach and earlier market engagement undertaken by staff supported the following benefits:

- Obtaining information on circular business models, an understanding how specific markets are structured and how they operate;
- Learning from suppliers to understand planned circular innovations;
- Increasing trust and credibility with suppliers;
- Creating market conditions to design circular products and services;
- Helping buyers identify opportunities for circularity and innovation;
- Clarifying needs and circular principles application in an appropriate to the context of the request to market players;
- Extending the life of products the City already owns;
- Encouraging the growth of circular supply chains by procuring more circular products, materials and services; and,
- Promoting new business opportunities based on resource-efficient models solutions (e.g. innovative rental systems, systems for sharing products and equipment or systems in which consumers buy the service provided by a product, rather than the product itself).

The implementation approach encompassed the following:

- **Training, capacity-building, and stakeholder engagement:** Since the adoption of the revised Procurement Policy in February 2021, the City has played a lead role in organizing multiple training programs and capacity-building engagements attended by both internal and external stakeholders. In November 2021, staff invited stakeholders to a workshop to identify opportunities and challenges for implementing a circular economy. These capacity-building and stakeholder engagements have enabled staff to obtain feedback from representatives from multiple industry sectors that in turn is helping to inform the City's ongoing circular procurement work. Staff carried out:
 - more than 40 engagement meetings with different internal and external stakeholders representing different industries to identify opportunities and readiness;
 - more than 20 informal training sessions with vendors, stakeholders and suppliers;
 - two internal staff workshops on circular procurement opportunities;
 - the development and update of an Intranet page with case studies to illustrate applications of circular principles in projects.
- **Peer-to-peer and stakeholders collaboration:** Staff have been able to capture promising practices and insights from other cities and jurisdictions. Staff have consistently demonstrated the City's leadership and commitment to circular procurement by bringing together peers and stakeholders, as well as forging vital strategic collaborations within a pre-competitive environment to co-create and identify opportunities for embracing circularity in local and regional markets. As part of peer-to-peer and stakeholder collaboration, the following activities have been undertaken:

- Meetings with sustainability and procurement teams from other local governments, such as Mississauga, Edmonton, Vancouver, North Vancouver, Banff, Guelph, and the District of Peel.
 - Participation in procurement focus groups as part of the Circular Cities and Regions Initiative.
 - Regular involvement with the Circular Innovation Council and its partners.
 - Circular pilot projects: City staff organize and participate in circular pilot projects to assess the impact of circular innovation and create regional references to advance the circular economy. Pilot projects and study cases include:
 - Reclaimed Asphalt Pavement, in collaboration with National Zero Waste Council and Lafarge Canada
 - Total Cost of Ownership in IT organized by Green Economic Canada
 - Hydrogen fuels pilot project and research interviewing 24 industry stakeholders and non-profit organizations
 - Propane project as an alternative fuel, in collaboration with Sierra
 - e-Scooter pilot project to increase low-carbon option in Richmond mobility
 - EcoHack-a-City - Towards a Zero Waste Industrial Sector, co-hosts: District and City of North Vancouver
 - LEED certifications and the circular economy principles
 - CSA Group's Roadmap to Circularity with focus on low-carbon cement
 - Participation in 52 diverse peer-to-peer activities has facilitated the identification of shared opportunities, challenges, and synergies in pursuing the circular economy, fostering a culture of leading by example and embracing experiential learning.
- **Market consultation and supplier's engagement:** Market consultation was key to validate preliminary specifications and requirements for procuring innovative circular products and services. It was vital to consider current supplier business models and product specifications when conducting circular procurement. There was a correlation between the levels of technical specifications and market maturity, with more mature markets offering open specifications and less mature markets requiring guidance on potential solutions and market consultation providing valuable insights into circular opportunities.
- **Questionnaires in the request for proposal:** Request for Proposals (RFPs) incorporated qualitative questionnaires for various products, services, and packaging. Criteria included purchasing items that were durable, repairable, reusable, made with recycled or renewable content, containing less hazardous chemicals, maximizing resource efficiency, and featuring a collection and return system. Packaging specifications were requested to be made from reusable or recyclable materials and free from hazardous chemicals. Materials used in the manufacturing process were to be ideally locally sourced, seasonally, and regeneratively. The questionnaires also encouraged the elimination of problematic or unnecessary packaging through redesign and innovation, replacing single-use packaging with reusable formats or alternative delivery models, and utilizing packaging or plastics that were 100% recyclable with recycled content or sourced from

- renewable feedstock. A relative weighting of between 5% and 10% was typically given to circular performance in evaluating bid submissions. Consideration is routinely given to how well the proposals adhere to circular requirements and principles, including the use of environmentally-friendly materials, promote and resource efficiency, and adopting circular business practices. This evaluation process ensures bid submissions are assessed not only on their economic value but also on their ability to achieve circular goals and objectives.

- **Preliminary technical specifications:** In the initial phase, staff developed preliminary specifications for procurement projects and incorporated qualitative requirements for products or services being acquired. Utilizing more qualitative specifications were able to open up new opportunities for innovative, circular solutions without prescribing specific solutions. These solutions were better suited to meet departments' needs in terms of quality, quantity, and reliability. The use of functional specifications is dependent on a supply market's relative maturity regarding circularity and the complexity of the product or service group. To further encourage circular solutions, procurement activities incorporated the following requirements:
 - Conducting a life-cycle analysis to assess products and service costs throughout the entire lifespan, from production to end-of-life.
 - Promoting repair, reuse, remanufacturing, repurposing, and recycling so that products can be repaired to maximize their length of useful life, reused or shared to maximize product utility, and disassembled and recycled to maintain maximum value of resources for products at the end of their useful life.
 - Requiring an extensive warranty to reduce the need for more resources, inputs, and less frequent replacement.
 - Focusing on service instead of products.
 - Focusing on market dialogue.

Circular Procurement Success Stories

Case 1: Embracing Circularity in Infrastructure: The South Dike Upgrade Project

The South Dike Upgrade project improved the dike structure from No.3 Road to 400m west of No.4 Road. The primary objective was to engage a contractor for structural upgrades, while adhering with all regulatory agency requirements. Key tasks included clearing and grubbing, excavation, placement of dike fill and rip rap armouring, topsoil management and landscaping. Circular economy considerations were incorporated into the procurement process to promote responsible consumption, minimize waste, and create a sustainable, low-carbon economy.

Circular criteria involved a focus on reusing excavated materials, recycling raw materials and low-carbon transportation. Criteria was selected in consultation with the project team and based on the nature of the project. The expected impacts included a greater emphasis on keeping materials onsite and reusing them. The circular criteria contributed 5% to the overall evaluation of proposals. The criteria was assessed was based on the City of Richmond's vision for a circular economy and the assessment process involved analyzing proposals for the proportion of reused products, reused soil, recycled raw materials and low-carbon transportation.

Key learnings from the project include the importance of clear communication and understanding of circular economy principles during the design process. A wrap-up meeting with the contractor and engineer also provided valuable insights for improving the efficiency and effectiveness of future projects in achieving circular economy goals.

Case 2: Integrating Circular Procurement Practices in Municipal Fleet Operations

The Department of Fleet Operations implemented circular procurement practices in the acquisition of two 3/4 ton crew cab pickup trucks for the Parks and Environmental Program Departments. The project aimed to align with the city's Green Fleet Action Plan, which has a target of reducing greenhouse gas emissions by 20% by 2020, using 2011 as the baseline year.

The circular criteria used in the procurement process were based on fuel economy, vehicle emission reductions, long-term parts availability, ergonomics, and safety features. Consultations were held with internal user groups, mechanics, and external vendors to identify circular economy principles that aligned with the project's objectives.

The evaluation process included a mandatory questionnaire covering circular economy principles and practices, emphasizing product quality and safety, recycling and waste reduction, environmental and sustainability performance, product reuse, repair, and remake strategies, and the use of raw materials in the equipment.

Two proposals were received, with one being accepted as it met all requirements and demonstrated adherence to circular economy principles. The winning bid acknowledged the company's adoption of circular economy practices and aligned with the city's efforts to minimize

its environmental footprint and social impact. The evaluation process also considered fuel economy and emission reduction possibilities, which factored into the final decision.

Challenges included the scarcity of supply of units and the lack of understanding of circular economy principles among vendors. To overcome this, staff researched parent companies like Ford and Chevrolet, educated local distributors or dealerships on circular economy principles, and encouraged them to identify specific initiatives for future evaluations.

Case 3: Driving Circular Procurement: Fleet Transformation with Hybrid and Electric Vehicles

Staff implemented circular procurement practices in the acquisition of plug-in hybrid and fully electric passenger sedans and hatchback vehicles. The project aimed to align with the city's Green Fleet Action Plan, which has a target of reducing greenhouse gas emissions by 20% by 2020, using 2011 as the baseline year.

Circular economy criteria used in the procurement process were based on fuel economy, government environmental vehicle emission reductions, long-term parts availability, ergonomics for all body types, and safety features. Consultations were held with internal user groups, mechanics, and external vendors to identify circular economy principles that aligned with the project's objectives.

The evaluation process prioritized PHEV and BEV vehicles that met the circular criteria, such as LED lighting, safety features, and adherence to the BC Environmental Vehicles Emissions reduction requirements. The Fleet department has a robust fuel monitoring system, which allows them to measure the fuel economy, idling, and kilometers traveled by all vehicles. They have observed an approximate fuel and emission saving of over 47% by incorporating these vehicles.

Four proposals were received, with two being accepted. Circular criteria was aligned with the Green Fleet Action Plan, and some circular economy principles were included as mandatory features. The RFQ was completed before the implementation of a specific Circular Economy Questionnaire in the RFQ process.

Challenges included the scarcity of supply of units and the lack of understanding of circular economy principles among vendors. In order to address this challenge, the staff conducted research on parent companies like Ford and Chevrolet, provided education on circular economy principles to local distributors or dealerships, and motivated them to identify particular initiatives for future assessments. The increased cost due to mandatory requirements was factored into the budget, and reduced operating costs on the acquired units improved the Total Cost of Ownership.

Case 4: Circular Procurement Strategies for Enclosed Tractors and Flail Mowers

Fleet Operations implemented circular procurement practices in the acquisition of two enclosed tractors complete with 26-foot reach flail mowers. The project aimed to align with the city's Green Fleet Action Plan, which has a target of reducing greenhouse gas emissions by 20% by 2020, using 2011 as the baseline year.

Circular criteria used in the procurement process were based on fuel economy, government environmental vehicle emission reductions, long-term parts availability, ergonomics, and safety features. Consultations were held with internal user groups, mechanics, and external vendors to

identify circular economy principles that aligned with the project's objectives. Compliance with new bylaws regarding Emission Regulations was also researched.

A Circular Economy Questionnaire was included in the RFQ, covering topics such as parts availability, recycled or sustainably sourced materials, recycling of old equipment, and product reuse repair and remake strategies. The Fleet department has a robust fuel monitoring system, which allows them to measure the fuel economy, idling, and hours used by all vehicles. The units will also be equipped with LED lighting.

Two proposals were received, with one being accepted. The winning bid acknowledged the adoption of circular economy principles and practices, and the evaluation took into account fuel economy and emission reduction possibilities. The vendor met all requirements and was awarded the contract. Their ECO-Blue engine is optimized for fuel efficiency and reduced CO₂ and NO_x emissions.

Challenges included the scarcity of supply of units and limited vendor responses. The selected vendor, New Holland, provided several examples and links to videos showcasing their commitment to circular economy principles. The project demonstrated the successful implementation of circular procurement practices in acquiring vehicles that met operational needs while significantly reducing emissions and contributing to a more sustainable future.

Case 5: Circular Practices in Fuel System Replacement at City Works Yard

Fleet Operations undertook a circular procurement project for the replacement of underground electrical conduit, fuel pumps, installation of rain covers, and related works at the City Works Yard. The project was initiated after the failure of outdated pumps during the November 2021 atmospheric river event.

Western Oil Services, a City Contractor for over 20 years, was chosen as the sole authorized contractor for the Coencorp Fuelling System in British Columbia. The company has demonstrated a strong commitment to environmental concerns and has provided solutions to prevent any events that could impact the environment. The vendor is also required to adhere to stringent oil and gas regulations for installations and maintenance.

As a single-source procurement, there was no point distribution system applied to the contract. However, the City recognized the vendor's background and experience in environmental concerns. The new Veeder Root installed will monitor fuel levels and advise if there are any leaks in the fuel tanks, helping to mitigate any potential environmental impacts.

Challenges, opportunities, and learnings from this project included the importance of educating vendors about presenting their circular economy strategies and sharing this information with the City, potentially through an online platform or training sessions. While this specific procurement did not involve circular criteria evaluation, the project highlighted the importance of working with environmentally responsible vendors and incorporating circular principles in future procurement projects.

Case 6: Dump Body Unit Acquisition and Outfitting

Fleet Operations undertook a circular procurement project for the supply and delivery of one dump body unit and outfitting on a City provided single axle cab and chassis unit. This project

aligned with the City's Green Fleet Action Plan, which aims to reduce greenhouse gas emissions by 20% by 2020 and update the policy to incorporate 2030 targets and new strategies.

Circular criteria for this project was selected based on fuel economy, government environmental vehicle emission reductions, long-term parts availability, ergonomics, and safety features. Internally, consultation with end-user groups, mechanics, and policies like the Green Fleet policy took place. Externally, the City worked with Peterbilt and potential vendors to ensure all requirements were met. The expected impact of including these circular economy principles was the acquisition of vehicles that met operational needs while significantly reducing emissions.

Criteria was evaluated through a mandatory questionnaire included in the RFQ. The winning bid was awarded to the lowest bidder that met specifications, and the vendor's responses to the questionnaire confirmed their commitment to circular economy principles. The main cab and chassis were from Peterbilt, which has clearly defined circular economy and environmental justice programs.

Challenges faced during the project included the scarcity of supply of units and the limited understanding of circular economy principles among vendors. Staff had to research parent companies to find information on circular economy initiatives and then educate local distributors or dealerships on how to respond. City workshops could help vendors identify current initiatives and areas for improvement in their circular economy strategies.

Case 7: Circular Economy Principles in E-Scooter Share Procurement

Transportation aimed to procure a qualified contractor to develop, operate, maintain, and manage a publicly accessible electric kick scooter ("e-scooter") share system for the City's pilot program. The goal is to provide an alternative mode of transportation for residents, reducing automobile use, promoting active transportation and transit use, enhancing connectivity, and allowing multi-modal access to employment, recreation centers, and services.

Circular criteria used in the evaluation process included the nature and variety of circular economy and sustainability opportunities available to the City, the proponent's life cycle program, waste collection and reduction strategies, and energy management and conservation. These criteria were weighted at 5% of the evaluation process.

Six proposals were received, and Lime's proposal included strong emphasis on circular economy principles. Lime outlined that their e-scooters have a lifespan of at least five years, with every component being replaceable. At the end of their lifespan, Lime achieves nearly 100% landfill diversion with its end-of-life partners, recycling more than 96% of the materials.

Lime also utilizes a fleet management system to optimize field tasks, reduce vehicle kilometers traveled, and charges the e-scooters with 100% renewable energy. Lime employs e-vans and e-cargo bikes for collecting, rebalancing, and redeploying e-scooters in dense city areas.

The inclusion of circular criteria demonstrates the City's commitment to sustainability and circular economy principles in its e-scooter share pilot program. The selection of Lime as the contractor for the project ensures that the program will be managed with a strong focus on circular economy principles, such as the extended lifespan and high recycling rate of e-scooters, contributing to the City's overall sustainability goals.

Case 8: Circular Procurement of Vending Machines for Public Recreation Facilities

Recreation and Sport Services aimed to procure an experienced and qualified Vending Machine Contractor to provide commission-based vending services for food and beverages at twelve public recreation facilities. The primary objective was to have an automated and self-sufficient vending machine operation providing nutritional snacks and beverages, including all necessary equipment, supplies, and personnel.

Circular criteria was included in the evaluation process, with a focus on environmental impact reduction, energy management, waste reduction, and other circular opportunities. The circular criteria was weighted at 5% in the RFP. The evaluation committee considered corporate sustainability practices, including energy efficiency, vehicle fuel efficiency, greenhouse gas reductions, recycling and waste reductions, corporate social responsibility initiatives, and circular economy initiatives.

Five competitive bids were received. The inclusion of circular criteria helped one proposal, Compass Group Canada, gain a competitive edge. Compass Group Canada achieved higher scores in corporate sustainability and circular economy practices, displaying efforts to reduce emissions from operations and having a strong corporate profile. The company pledged to reduce CO₂e emissions by 43% by 2025, uses Energy Star machines and LED lighting, plans to phase out bottled water within five years, recycles 100% of cardboard, and employs smart service data technology for increased fuel efficiency.

Challenges identified include the need for a clearer understanding of circular criteria and a process to evaluate and monitor the contractor's efforts in meeting these criteria. By addressing these challenges, the City of Richmond can further promote circular economy practices in its procurement processes and ensure that contractors follow through on their commitments.

Case 9: Circular Criteria in Procurement for Self-Checkout Kiosks at Richmond Public Library

The Richmond Public Library underwent a procurement project for the supply, installation, and support of 10 RFID self-checkout kiosks and associated software for the library's four branches. The procurement objectives aimed to find a competitive supplier capable of fulfilling the project's scope of work.

Circular criteria was included in the procurement process, focusing on the Circular Economy Assessment, which considered recycling programs, reuse and recycling of hardware and hardware components, waste reduction strategies, and energy efficiencies and management. The evaluation process consisted of two phases, with the circular criteria accounting for 5% of the score in Phase 1.

Four proposals were received from Envisionware, Mk, Convergent, and Bibliotheca. The circular criteria did not impact the process or the number of proposals submitted. The proponents responded to the circular criteria without issues, with most offering removal and recycling services for decommissioned hardware and associated parts at a cost.

Circular criteria was assessed by the review panel independently, with scores and comments reviewed by the Buyer. However, circular economy appeared to be an afterthought for most proponents, with responses seeming "stretched" to favor a positive outcome. As the self-

checkout kiosks were new equipment installed last year, the library will follow up on the supplier's commitment to recycling or reuse.

Case 10: High RAP Pilot Program in City Roads

Engineering and stakeholders initiated a high reclaimed asphalt pavement (RAP) pilot program to increase the use of recycled asphalt in municipal roads. The objectives included incorporating high RAP requirements in the annual paving program and seeking qualified contractors capable of delivering high RAP products.

The procurement strategy involved including questions and documents in the RFP to facilitate evaluation based on the ability to successfully deliver high RAP paving services. Award criteria considered the proponent's approach to circular economy considerations with a 5% weighting.

The City has paved a section of a 4-lane arterial road (No 5. Road, between Grandville Road and Blundell Avenue) with high RAP, and has several future locations planned for further application of this technology. This was the first project in Canada to use 40% RAP and has placed the City in a leadership role by engaging the local industry, reducing natural resource and fossil fuel use, and minimizing waste. The accreditation system ensures that the City obtains products that meet its specifications, and quality control is a crucial aspect of meeting these specifications. Based on the results of this pilot project, there is also the potential for cost savings through using high reclaimed asphalt.

Case 11: Circular Approach for Synthetic Sports Surfacing Replacement in Hugh Boyd Park

Parks Planning, Design & Construction initiated a project for Hugh Boyd Park Synthetic Sports Surfacing Replacement, which aimed to replace, recycle, and re-use the existing infilled sports surfacing system. The procurement strategy sought qualified proponents/contractors with the necessary experience, skills, and equipment to remove, clean, and re-install crumb rubber infill.

The contract required the removal and recycling of the existing synthetic turf surface and the installation of new synthetic turf playing field surfacing that meets the most current FIFA Quality Pro synthetic turf product standards. Award criteria focused on sustainability initiatives, energy management, waste reduction, emission reduction, recycling efforts, and preference for recycling and utilizing removed turf surface materials. Additionally, the proponents were required to provide ongoing maintenance and repairs within 48 hours notice, and a warranty of a minimum of 8 years for both labor and materials.

By reusing the existing crumb rubber infill, the life cycle of rubber was extended, preventing it from ending up in landfills and polluting the environment. Reusing crumb rubber at Hugh Boyd sports field provided cost savings of \$330,000 compared to new infill and kept 800,000 pounds (363,000 kg) of rubber away from landfills.

Lessons learned include the viability of recycling and reusing crumb rubber infill for cost savings and sustainability. However, public perception regarding recycled tire crumb rubber can be controversial. Despite local, provincial, and national health authorities suggesting that recycled crumb rubber is safe for use in artificial turf sports fields, some organizations have concerns about the health and safety related to recycled tire rubber. This may impact future decision-making for its continued use in sports fields.

Case 12: Meetings with Architects and Construction Managers Sparks Circular Ideas for Collaboration

Prior to incorporating circular economy principles into the City's procurement process, meetings were held with 17 proponents, including architects and construction managers. The City's Manager of Capital Buildings Project Development and the Manager of Purchasing led the meeting and posed a question to the proponents:

"The City has declared its support for a circular economy and is looking to collaborate with innovative contractors/architects to achieve those goals. What ideas does your firm have and how should the City change its specifications to reflect a practical and value-added transition to a circular economy?"

The proponents were given time for internal discussions before providing their feedback and answers. This approach allowed the City staff to gauge the level of awareness, understanding, and market readiness for circular economy principles among the proponents.

Out of the shortlisted Architects and Construction Managers, 9 out of 10 Architects and 5 out of 7 Construction Managers provided responses to the question. The various responses showcased the proponents' ideas and suggestions for collaborating with the City to promote a circular economy, such as adopting sustainable materials, designing for disassembly, and prioritizing waste reduction.

One architectural firm, in particular, demonstrated a strong commitment to the circular economy by introducing their Senior Sustainability Consultant. This consultant shared valuable resources, such as research, tools, and insights on design for disassembly. As a result of this presentation, the architectural firm was connected with the staff to explore further collaboration and integration of circular economy principles into the City's projects.

Case 13: Circularity Integrated into Major Projects

The Capital Buildings Project Development has integrated circular economy principles into its Request for Proposals (RFP) for major projects. Vendors were asked to review the City's policy on circular and provide relevant examples of previous projects based on their understanding of the concept.

For the Steveston Community Centre and Library Replacement project, the RFP required vendors to provide relevant project references that achieved a LEED Gold Certification or a higher performing sustainability standard, such as Passive House or Net Zero Carbon. The scope of work for the project required the successful candidate to:

1. Design to achieve LEED Gold certification;
2. Design to meet the City of Richmond's Circular Economy Principles and Criteria; and
3. Design to meet City Building Facilities Design Guidelines and Technical Specifications.

These requirements have elements of circular principles embedded in them, emphasizing the City's commitment to sustainable practices. The successful candidate proposed Integrated Design Process (IDP) meetings as part of their proposal to review and progressively refine Circular Economy goals and targets. They also included a consultant in their project team to design the

building envelope for deconstruction, which extends the lifecycle of the materials used in the project.

As a result of this approach:

1. The City adopted its circular principles and criteria, finding relevant pre-existing requirements that can help create a set of metrics to measure circularity in future projects.
2. Vendors are given the opportunity to learn more about sustainable practices and incorporate them into their proposals, thus promoting a more sustainable and circular economy in the industry.

By incorporating circular principles into the RFPs and project requirements, the City is not only demonstrating its commitment to sustainability but also encouraging vendors to embrace these principles, leading to more environmentally responsible and resource-efficient projects.

Case 14: Circular Principles in Fire Rescue Department's Procurement Activities

The Fire Rescue department's procurement activities prioritize circular economy principles to enhance sustainability and cost-effectiveness. In this case, the City requested a single source supplier to meet their specific requirements. The rationale behind this decision was based on compatibility with existing city equipment, custom-built information systems, and inventory systems, as well as the absence of reasonable alternatives.

The supplier's approach to circular economy is evident in their commitment to reducing waste, reusing materials, and recycling components. Their products are of superior quality, with added value safety and performance features, ensuring a longer life cycle, reduced replacement costs, and lower ownership costs. This directly contributes to the reduction of waste in the city's procurement activities.

Fire hoses supplied by the chosen vendor can be repurposed for various municipal activities after their retirement from the fire service, further supporting the re-use principle. Additionally, aluminum couplings can be removed and recycled when the fire hose is no longer usable.

In their manufacturing facilities, the supplier practices responsible recycling procedures. They reuse water in test tanks, return empty polyester yarn cones for refilling, and use recyclable cardboard for shipping materials. Waste generated during production, such as aluminum and brass chips, is collected and recycled. Furthermore, the supplier has implemented energy-efficient lighting and reuses or recycles pallets received for shipping.

This case study demonstrates how circular procurement principles have been successfully incorporated into the Fire Rescue department's activities, promoting sustainability, cost savings, and responsible use of resources.

Case 15: Leading the Way: Project Development Engages with Suppliers and Stakeholders to Foster Circular Innovation

Project Development demonstrated leadership by proactively engaging with prequalified architects and construction management firms to explore opportunities for implementing a circular procurement approach in harmony with existing sustainability practices. By initiating

this engagement activity, the City communicated its intention to support circular economy initiatives and sought collaboration with innovative professionals to achieve these objectives.

A survey was distributed, asking participants to share their ideas on how the City could adapt its specifications to facilitate a practical and value-added transition to a circular economy. Various responses were received, including suggestions related to LEED, Passive House, and carbon reduction. Respondents emphasized the need for clear definitions and guidelines, such as methods of analysis, reuse examples, and data on material usage.

Quality control checks and cost analyses were recommended to ensure the achievement of circular economy goals. Some respondents noted that LEED was becoming less popular due to its high costs and restrictive nature. They suggested adopting best practices from LEED and other guidelines to develop a more practical approach.

The capability of consultants in the region to support circular economy initiatives was acknowledged, but respondents also identified a gap between political directives and project implementation. They recommended incorporating circular economy considerations at the beginning of the project stage or in the project definition study. This would enable the identification of opportunities and their inclusion in the request for proposals (RFP).

Budget constraints were highlighted as a challenge for incorporating circular economy principles in competitive bidding scenarios. Respondents suggested defining circular economy requirements in the owner's statement of requirements (OSR) and leaving the determination of options to consultants. Conducting a feasibility study in the pre-design stage and adjusting the project budget accordingly could help balance financial value and sustainability goals.

Project Development showcased its leadership by actively involving suppliers and stakeholders in the exploration of circular procurement opportunities. This collaborative approach, coupled with the valuable suggestions provided, can significantly contribute to the City's progress towards achieving its circular economy goals while maintaining a strong focus on sustainability.

Case 16: Furniture Circular Management: Implementing Circular Business Models for Sustainable and Cost-Effective Operations

Project Development demonstrated leadership by proactively implementing circular business models to improve city operations performance and reduce costs. One of the areas where this approach was applied is in the procurement and management of furniture.

Emphasizing the circular economy, the Project Development team utilized existing furniture products in the City's inventory for most reconfigurations. While new materials were occasionally required due to project specifications or insufficient stock, the team also refurbished furniture items, such as chairs, filing cabinets, and panels.

The approach to integrating furniture into the circular economy involved several key steps:

- Inventory management: maintaining an updated list of stock.
- Preventative maintenance: extending product lifetime through proper care.
- Corrective maintenance: repairing products as needed.
- Reuse: redistributing and cleaning products for future use.

- Repurposing: modifying products for new functionalities.
- Refurbishing: remanufacturing products to optimize their lifetime, such as reupholstering, repainting, or cleaning.
- Recycling: recovering the value of components and materials for use in new products.

The refurbished items proved to be significantly more cost-effective and required less lead time. For example, the average cost of a new upholstered chair was \$602.20 with a 3-4 week lead time, while a refurbished chair cost \$230.00 with only a 1-week lead time.

By embracing circular business models, Project Development has exemplified leadership in improving City operations performance and reducing costs. This approach, coupled with the efficient use of resources, supports the City's progress towards achieving its circular economy goals.

Case 17: King George Park Synthetic Turf Replacement

The project at King George Park involved the removal, disposal, and recycling of materials from the existing infilled synthetic turf system, as well as the supply and installation of a new thermoplastic elastomer (TPE) infilled synthetic turf and underlayment shock-pad system. Constructed in 2008, the artificial turf field at King George Park has exceeded its expected lifespan and now requires replacement to maintain minimum safety levels for operation.

In line with the City's circular economy vision, AstroTurf West outlined several initiatives for the King George Park project. The company uses a fuel-efficient fleet from 2018 and employs new equipment and technologies to clean and reuse existing turf infill. Furthermore, AstroTurf West will recycle the existing artificial turf locally by partnering with Fernwood Recycling Ltd., a company in Victoria, BC. The plastic-based turf fibers will be repurposed into composite fence posts for agricultural and landscaping applications. This circular approach demonstrates a commitment to sustainable procurement and resource efficiency in the development and maintenance of the City's parks.

Key learnings and results from implementing circular principles in corporate procurement and project activities

The City's efforts to implement circular economy principles in procurement and project activities have led to encouraging results to date and learnings, which can be summarized as follows:

- Vendors and stakeholders have an emerging and limited understanding of circular economy:** Many vendors and stakeholders have a limited understanding of the opportunities presented by circular business models, often equating circularity solely with recycling. To address this issue, City staff have been proactive in providing information to City suppliers when requested.
- Early market consultation is critical to achieve success implementing circular principles and criteria:** Engagement and market consultation with suppliers has helped them to better understand how to meet the City's expectations and goals. Dialogue with stakeholders helped identify quick wins and build momentum for implementing circular approaches.
- If carefully planned, cost impacts can be mitigated:** The inclusion of circular economy criteria did not always translate to higher prices for products and services. In many cases, suppliers already had existing infrastructure making it relatively easy for suppliers to propose circular products and services.
- The inclusion of circular economy criteria has promoted circular solutions and products:** Through the City's procurement processes, it has become apparent that some suppliers are currently capable of providing circular opportunities that meet the City's requirements during the design stage. Furthermore, the implementation of circular approaches has been applied at the system level, supplier level, or product level, depending on the market's maturity in embracing circularity. This has led to the identification of new and innovative solutions to procurement to advance circular principles in the City's operations.
- Successful implementation of circular questionnaires in procurement activities:** The inclusion of circular questionnaires has been refined over time. Feedback and responses from suppliers has been helpful to adopt a more systematic approach to promoting circular principles. The questionnaires included inquiries about circular performance, sourcing of products and materials, and corporate circularity, as well as qualitative data to be considered when procuring goods and services with circular business models when possible.
- The circular economy approach has identified some potential cost savings:** The City has identified potential cost savings through the implementation of circular principles, particularly in reducing waste and maximizing the use of resources. While further data collection is necessary to establish an objective baseline for quantifying these savings, early indications suggest that circular approaches have the potential to reduce total costs. By embracing circularity, the City can reduce the environmental impact of its operations while also promoting economic efficiency and innovation.
- Suppliers demonstrated commitment to learning and implementing circular approaches in support of City efforts:** Suppliers have showed interest adopting circular approaches when providing products and services to the City. Response rates to

- advertised City procurements are unchanged. Moreover, some suppliers are proactively engaging City staff to share innovative opportunities for implementing circular principles, and showcasing their results.
- **Internal training, support, and capacity building proved crucial in identifying opportunities and implementing circular approaches in project and procurement activities:** As a result of the actions implemented, City staff developed a guide to support staff in integrating circular criteria into procurement activities. Workshops and meetings have identified champions and early adopters. These efforts have proven to be effective to encourage more staff to consider more sustainable and circular possibilities, fostering a culture of collaboration and continuous improvement.
- **Early stakeholder engagement and collaborative activities proved crucial in identifying opportunities and creating synergies:** Early engagement with stakeholders and vendors has encouraged more participation from suppliers to help advance City goals e.g. through issuing requests for information, conducting Life Cycle Assessments (LCAs) and business cases, and other research to determine the feasibility of promising circular initiatives.
- **Peer-to-peer and stakeholder collaboration as a critical action to create consistency and drive positive results in implementing circular criteria into projects and procurement:** This approach has significantly aided staff to learn and apply promising practices used other cities and jurisdictions. Staff have consistently showcased the City's leadership and commitment to circular procurement by bringing together peers and stakeholders, as well as building essential relationships to embrace circularity at a local and regional level.
- **Technical capability varies among suppliers, with some already offering circular solutions, while others need more support:** The number of suppliers providing circular solutions varies depending on the sector. The City's market for circular economy solutions is still in its early stages, and as such, suppliers may have a limited understanding of circular possibilities. However, markets are evolving and innovating, with new suppliers entering existing suppliers and adapting to the shift towards circularity. Staff recognize the value in identifying potential suppliers who have necessary expertise and experience in circular solutions and notifying them of potential bid opportunities and the demand for circular solutions.
- **Demand for products offering circular solutions** Contract requirements should be future-proofed to take advantage of these advancements and ensure that circular solutions remain relevant over time. It is important to identify suppliers who are innovative and forward-thinking in their approach to circularity, as well as those who have experience in developing and implementing circular solutions. Circular requirements may bring together suppliers from different subsectors in a new way, which can facilitate innovative circular solutions. Staff plan to set up regular meetings, training and support, and creating opportunities for joint problem-solving.

Next Steps

Staff will continue to incorporate circular principles into selected procurements where feasible, ensuring alignment with the City's goals and strategies. Based on key results and learnings identified above, staff will undertake with current resources the following activities to further implementation of the circular economy principles and criteria integrated into the procurement policy:

- **Establishing Metrics and Indicators for Circular Procurement Progress:** Develop and implement key metrics and indicators to measure and track the advancement of circular economy principles in procurement activities. These indicators will ensure circularity remains central to the procurement process, identify areas for improvement, and prioritize long-term adherence to circular practices. Moreover, monitoring and reporting progress will enhance transparency and traceability.
- **Sector-Specific Pilot Project Implementation:** Staff plan to investigate opportunities for additional pilot projects in collaboration with stakeholders and peers. Increased market engagement and collaborative pilot projects are essential for building capacity and assessing progress towards a circular economy. Successful examples will demonstrate the economic benefits and positive impact on the organization's image and regional standing as sustainable, responsible, and innovative.
- **Conducting Material Flow Analysis Study and Life-Cycle Analysis:** In accordance with the October 2022 Council endorsement, work is underway to develop a baseline analysis of Richmond's current circularity level through a Material Flow Analysis study. This study will establish a baseline for measuring progress towards a circular economy. Due to the complexity of circular opportunities among various products, complementary Life-Cycle Analysis studies may also be required.
- **Fostering Training and Capacity Building Initiatives:** Staff will continue to participate in internal and external training and capacity-building opportunities in collaboration with peers and leading organizations. Attendance at working group meetings and provision of informed input will facilitate the identification of circular procurement opportunities. Capacity building efforts must also extend to suppliers and stakeholders to enable the delivery of more circular products and services, as well as the refinement of regulatory references.
- **Advocating for Standardized Circular Metrics at the Regional Level:** Recognizing the need for standardized metrics and accessible measurement tools, advocate for the adoption of regional standardized metrics to ensure adherence to circular economy principles.
- **Engaging with Peer and Industry Working Groups:** Actively participate in peer and industry working groups to connect with a diverse range of circular economy stakeholders, identify common opportunities, synergies, metrics, case studies, pilot projects, and outcome-based indicators. This engagement will foster collaboration and promote the advancement of circular economy principles within procurement activities.

Analysis of the last 24 months' request for proposals by sector where circular criteria was implemented.

Information Technology (IT)

- Data Storage Solution and Services
- Provision of Telecommunications Services
- Network Hardware
- Video Detection System Hardware, Software and Services
- Supply and Delivery of Computer Equipment and Related Services
- RFID Self-Checkout Hardware, Software and Services
- Load Balancer Hardware including Support and Maintenance Services

Professional Services

- Prequalification for Architectural Consulting Services
- Transportation Improvement Programs 2020
- Consulting Services for Materials Flow Analysis
- Provision of Consulting Services for a Land Subsidence Study
- Services of a Mechanical Consultant for City of Richmond Facility Projects
- Prequalification for Pre-Construction and Construction Management Services for City of Richmond Building and Facility Projects
- Architectural Services for the Steveston Community Centre and Branch Library
- Consulting Services for Lansdowne Major Park Master Plan
- Steveston Community Park Playground and Outdoor Washroom Consulting Services
- Terra Nova Rural Park Historical Assets Program Plan
- Consulting Services for Green Fleet Action Plan 2030
- Consulting Services for West Cambie Neighborhood Park
- Provision of Engineering Consulting Services for Emergency Water Supply Plan Update
- Steveston Highway and No.3 Road & Steveston Highway and Gilbert Road Drainage Pump Station Upgrades
- Hydrogeological and Biophysical Assessment for Richmond Nature Park
- Provision of Consulting Services for a Land Subsidence Study
- Capstan Station Integration - development of conceptual designs
- Pre-Construction Services for the Steveston Community Centre and Branch Library

Civil Construction and Infrastructure

- Provision of Dewatering Services
- Design of Westminster & Cambie Rd Intersection Improvements
- Construction Services for No. 9 Road South Dike Upgrades
- 2021 Asphaltic Concrete Paving
- Supply and Installation of Conduits & Water Service Pipes Using Trenchless Technology and Other Related Civil Works
- Construction Services for River Road Sidewalk between No. 6 Rd and Burdette Street
- Conceptual Design of Gilbert Road Drainage Pump Station
- South Arm Community Park Playground Design-Build Services

- Talmey Neighbourhood School Park and Garnet Tot Lot Playground Design-Build Services
- Odlin Park Playground Design-Build Services
- Garden City Lands Screening Contractor
- McKim Way District Energy Distribution Piping Rehabilitation
- Steveston Community Park Playground and Outdoor Washroom Consulting Services
- Construction Services for Steveston Highway and No.3 Road & Steveston Highway and Gilbert Road Drainage Pump Station Upgrades
- Provision of Public E-Scooter Share Pilot Project
- Supply and Installation of LED Street Name Signs
- Odlin Park Playground Design-Build Services
- Talmey Neighbourhood School Park and Garnet Tot Lot Playground Design-Build Services
- Hydrogeological and Biophysical Assessment for Richmond Nature Park

Facilities, Maintenance and Operations (FMO)

- Rental of Coveralls and Related Services
- On Call Collection of Hazardous Materials
- Garden City Lands Screening Contractor
- McKim Way Distribution Piping Rehabilitation
- Car Seat Recycling Services
- MacDonald Beach Vegetation Planting Services
- Vending Machine Services for Public Recreational Facilities
- On-Call HVAC Service Provider
- Mattress and Upholstered Furniture Recycling Services
- Furniture Solutions and Management Services
- Supply and Delivery of (1) One 6500KG GVW Cutaway Van with Dual Rear Wheels
- Roll-Off and In-Ground Container Collection and Recycling/Disposal Services
- Garbage and Cardboard Containers and Collection Services at City Facilities
- Baseline Evaluation Test
- Tent and Event Supplies Rentals for Various City Events - BL

Fleet

- Supply and Delivery of Hybrid Minivans
- Supply & Delivery of One (1) Street Flusher Body on a City Provided Cab and Chassis
- Supply and Delivery of Two (2) 3/4 Ton Crew Cab Pick up Trucks
- Supply and Delivery of One (1) Conventional Zero Clearance Track Type Excavator
- Supply and Delivery of (1) One 6500KG GVW Cutaway Van with Dual Rear Wheels
- Supply and Delivery of One (1) Sewer Vacuum Combo Unit on a City Provided Cab and Chassis
- Supply and Delivery of One (1) Conventional Zero Clearance Track Type Excavator
- Supply and Delivery of Two (2) Dump Bodies and Outfitting on City Provided Tandem Cab and Chassis
- Supply and Delivery of Two (2) Conventional Zero Clearance/Zero Tail Swing Track Excavators

- Supply and Delivery of Two (2) Enclosed Tractors complete with 26 foot Reach Flail Mower
- GPS/AVL Pilot Project
- Supply and Delivery of Plug-In Hybrid and Fully Electric Passenger Sedans and Hatchback Vehicles
- Supply and Delivery of multiple plug-in hybrid and/or fully electric crossover vehicles
- Supply and Delivery of One (1) Forestry Aerial Lift Chipper Body with Boom and Smart PTO System on a City Provided Cab and Chassis
- Supply and Delivery of one (1) Mini Sweeper
- Supply and Delivery of one (1) 15,000 lb Fully Enclosed Exterior Fork Lift
- Supply & Delivery of Two (2) Two Ton Crew Cab Dump Trucks
- Supply & Delivery of One (1) Skid Steer Loader with Rubber Tracks
- Supply and Delivery of one (1) Dump Body Unit and Outfitting on a City Provided Single Axle Cab and Chassis
- 2023 Short Term Rental Vehicles
- Supply and Delivery of Fully Electric High Roof Van
- Supply and Delivery of Two (2) Two Ton Crew Cab Dump Trucks
- Supply & Delivery of One (1) Skid Steer Loader with Rubber Tracks
- Supply and Delivery of one (1) Dump Body Unit and Outfitting on a City Provided Single Axle Cab and Chassis
- Supply and Delivery of Six (6) Hybrid and/or Fully Electric Crew Cab Pickup Trucks
- Supply and Delivery of Multiple Four (4) Cylinder Hybrid Minivans
- Supply and Delivery of One (1) Fully Electric Bus
- Supply & Delivery of one (1) enclosed tractor complete with 16' (foot) flail mower