

Report to Council



Date: April 20, 2026
To: Council
From: City Manager
Subject: Annual Update – City of Kelowna and University of British Columbia Okanagan Research Partnership
Department: Partnerships Office - City of Kelowna UBCO Research Alliance

Recommendation:

THAT Council receives, for information, the report from the Partnerships Office dated April 20, 2026, with respect to the Annual Update – City of Kelowna and University of British Columbia Okanagan Research Partnership.

Purpose:

To receive an annual progress update regarding the City of Kelowna UBCO Research Alliance.

Background:

The City of Kelowna and the University of British Columbia Okanagan (UBCO) have a long history of collaboration, which was formally established in 2021 through the Framework for Enhanced Collaboration. This framework introduced the Collaborative Research Fund, with each organization contributing \$100,000 annually to support applied research. During the first several years of this partnership, five research projects were funded.

In 2025, the City and UBCO expanded and further formalized this partnership under the name City of Kelowna UBCO Research Alliance (the Alliance). The Alliance aims to advance City priorities through applied research and innovation and is supported by dedicated staff from both organizations. It operates as a cross-disciplinary platform that fosters collaboration, knowledge exchange, and engagement with external partners to broaden impact.

This year's annual report provides an update on the five legacy research projects, which are now either completed or nearing completion, and introduces four newly funded collaborative research projects. The report also highlights ongoing development of the Research Alliance as the next phase in the evolving applied research partnership between the City and UBCO.

Previous Council Resolution

Resolution	Date
THAT Council receives for information the report from the City of Kelowna UBCO Research Alliance, providing a progress update regarding various collaborative research initiatives.	July 7, 2025

Discussion:

Legacy Research Projects – Annual Update:

During the first several years of the research partnership between the City and UBCO, five research projects were funded. These projects are now referred to as the legacy projects to distinguish them from the newly funded research. To date, one has been completed, three are scheduled for completion in 2026, and one is expected to conclude by December 2027.

Legacy Research Projects - Completed Project:

1. **Biochar Blended Clay Bricks: an Innovative Solution for Landfill Waste:**

This project evaluated the potential to convert wood waste into “biochar bricks” and developed standard techniques to produce them, creating a value-added product that promotes atmospheric carbon capture and sequestration. The research focused on converting wood waste into biochar and incorporating it into different mixtures to determine an optimal mix design that could support the development of sustainable, low-carbon construction materials. This work helped the City explore innovative ways to reduce landfill waste and support low-carbon construction. This project had a budget of \$90,000 and leveraged funding ratio of 3:1. It aligned with Council’s priority of *climate & environment*.

Legacy Research Projects – Nearing Completion:

2. **Assessing the Potential Demand for Alternative Transit along the Rail-Trail Corridor connecting Major Urban Destinations:** This project examines opportunities to improve connectivity between UBC Okanagan, Kelowna International Airport (YLW), and the downtown area along the Okanagan Rail Trail using existing and emerging travel modes. A stated preference survey has been completed, showing strong openness to an Autonomous Transit Service (ATS), which was rated nearly as favourably as driving. A statistical model has been developed to understand the factors influencing ATS adoption, with younger individuals, lower-income residents, bikers, students, and people living or working near the Rail Trail expressing the strongest support.

With data collection and behavioural modelling complete, the project has moved into the simulation phase, which will forecast real-world demand, shifts in mode choice, and potential impacts on travel times and traffic conditions, and may help the City understand how ATS could integrate into the broader regional transportation network. Final project tasks will include cost and transportation network impact assessments and final policy recommendations which are expected to be completed in August 2026. With a budget of \$306,500 and leveraged funding ratio of 3:1, this project aligns with Council’s priorities of *transportation* and *climate & environment*.

3. **EV Charging – Bus Electrification:** This project examines the technological, financial, and environmental feasibility of rapid battery charging infrastructure to support the transition to electric transit and fleet vehicles in Kelowna. Over the past year, travel demand modeling and energy demand analysis have been completed, and a comprehensive life cycle and life cycle cost assessment comparing diesel and battery electric buses has confirmed battery electric buses as the more sustainable alternative.

Current work focuses on modeling and optimization, including simulation of selected transit routes, infrastructure feasibility, cost and environmental sensitivity analysis, and validation of system performance under different charging and operational scenarios. The findings are expected to support decision-making related to fleet electrification. With a budget of \$198,000 and leveraged funding ratio of 4:1, the project is scheduled for completion by June 2026. This project aligns with Council's advocacy priority for the development of the new **Kelowna Regional Transit Centre** and a fully electric bus fleet, while also aligning with broader **transportation and climate & environment** Council priorities.

4. **Feasibility Study of Solar Energy:** This project examines the technical, economic, and policy feasibility of solar energy adoption in Kelowna, with a focus on informing municipal operations, long-term energy planning, and broader community uptake. Over the past year, a city-wide geospatial analysis of rooftop solar potential has been completed, assessing over 45,000 buildings to quantify technical suitability, total rooftop photovoltaic potential, and long-term economic feasibility under a range of current and projected conditions.

Current work is focused on additional modelling, including utility load forecasting and storage-scenario analysis, to better understand future grid interactions and system integration. Machine learning methods are also being developed to identify existing solar installations, supporting improved planning, validation, and tracking of solar adoption. In parallel, a market research study is underway, with preliminary findings highlighting low historical adoption, limited awareness, and upfront cost as key barriers, alongside emerging opportunities linked to electrification trends. The next phase will focus on completing survey analysis, refining techno-economic and grid interaction scenarios, and translating findings into policy-relevant recommendations and decision-support tools to support the City in advancing solar adoption and informed long-term energy planning. With a budget of \$330,000 and leveraged funding ratio of 11:1, the project is scheduled for completion by August 2026. This project aligns with Council's priority of **climate & environment**.

5. **Sustainable Aquatic Centre Operations:** This project focuses on identifying optimal operational strategies for aquatic centres by examining how disinfectant use, air and water circulation, temperature, and ventilation influence indoor environmental quality, user experience, health outcomes, and energy performance. Over the past year, extensive water and air quality monitoring has been completed, including seven sampling campaigns across partner facilities, with analysis confirming the presence, variability, and drivers of key disinfection by-products (DBPs). Building energy assessments and simulation modeling are underway, with early results identifying pool water heating, ventilation, and dehumidification as the dominant energy demands in indoor pools. Occupant surveys have also been completed at select facilities, providing insights into user satisfaction, health benefits, safety perceptions, and engagement.

The next phase of the project will focus on predictive models for DBPs, health risk assessments, cost-benefit analysis, and the development of optimized operational strategies, culminating in a real-time “ePool” dashboard, to support proactive facility monitoring and smarter facility management. This research may help the City improve the health, energy efficiency and environmental performance of its aquatic centres. With a budget of \$648,000 and leveraged funding ratio of 11:1, this project is scheduled to be completed by December 2027. This project aligns with Council’s priority of *climate & environment*.

New Research Projects:

The City of Kelowna UBCO Research Alliance has recently funded the following four new collaborative research projects.

1. **WildfireCam – Supporting Community Wildfire Preparedness and Resilience:** This project will deploy a network of wildfire detection cameras and support the advancement of AI-driven analytics to enhance early detection and improve wildfire response. With a budget of \$1,254,000 and leveraged funding ratio of 12:1, the project is scheduled to be completed by November 2028. The project aligns with Council priorities of *crime & safety, agriculture & environment*, and the *City of the Future* focus on digital transformation and governance & accountability. It also supports the *Kelowna Fire Department Strategic Master Plan* emphasis on technology and innovation.
2. **Development of a rapid eDNA detection tool to improve invasive mussel biosecurity in BC:** This research project seeks to develop a fast, portable eDNA-based detection tool to strengthen provincial and regional efforts to prevent invasive mussels from entering Okanagan Lake and damaging critical water infrastructure. With a budget of \$512,500 and leveraged funding ratio of 9:1, the project is scheduled to be completed by March 2028. The project aligns with Council’s priority on *economic prosperity*, Council’s advocacy priority of *Okanagan Lake Health*, and the *Climate Resilient Kelowna Strategy* and the *2040 Official Community Plan*, which both emphasize reducing risk of invasive species invasions.
3. **Forecasting Climate Impacts on Drinking Water Source Quality Using Generative AI:** This research will explore how Generative AI could be employed to forecast climate impacts on drinking water quality, informing infrastructure planning and climate adaptation strategies. With a budget of \$195,000 and leveraged funding ratio of 5:1, the project is scheduled to be completed by May 2030. Implementation of the project is contingent on successfully securing additional external funding. This project aligns with the *Healthy City Strategy, Climate Resilience Framework, Water Security Plan, Integrated Water Management Strategy* and *City of the Future: smart city solutions for environmental management*.
4. **A Data-Driven Framework for District Energy System Planning and Implementation in Kelowna:** This project explores a data-driven decision-making framework to support long-term planning and implementation of district energy systems in Kelowna, which could help to identify where systems may be viable, which low-carbon energy sources are most suitable, and how future infrastructure investments can be optimized. With a budget of \$99,750 and leveraged funding ratio of 3:1, the project is scheduled for completion by April 2027. Implementation of the project is contingent on successfully securing additional external funding. The project aligns with Council’s priority of *climate & environment* and the *City of the Future* focus on digital transformation and governance & accountability and supports the *Climate Resilient Kelowna*

Strategy and the Strategic Energy Management Plan which emphasize low-carbon and renewable energy sources across the City.

City of Kelowna UBCO Research Alliance:

The City of Kelowna UBCO Research Alliance aims to enhance and coordinate applied research efforts between the City and UBCO to drive meaningful community impact. Since the previous annual update in July 2025, UBCO has committed to extending its annual contribution of \$100,000 to the Alliance through 2029. Combined with the City's contribution, this renewed commitment enables the Alliance to continue exploring new opportunities and advancing research initiatives supported through the Collaborative Research Fund. Newly funded research projects reflect cross-organizational engagement, with projects being led by staff from three different City divisions, which helps maintain a balanced and strategically aligned portfolio.

Also in 2025, a Joint Adjudication Group (JAG) was established to serve as the formal review and decision-making body for the Collaborative Research Fund within the Alliance. Comprised of senior staff and subject matter experts from both the City and UBCO, the JAG evaluates all research proposals submitted to the Alliance, ensuring they align with Council priorities, City operational needs, and UBCO's academic strengths. By applying a consistent evaluation framework, the JAG helps ensure that funded projects advance shared priorities and strengthen the long-term research partnership between the City and UBCO.

In the upcoming year, staff from both organizations will continue advancing the evolution of the partnership. Newly funded projects will be supported as they initiate their research programs, with ongoing coordination to ensure operational needs and academic goals for both organizations remain aligned. The Alliance will also explore opportunities to expand engagement across City divisions and UBCO faculties, strengthen communication channels, and identify new project opportunities that could be considered under the Collaborative Research Fund. Additionally, staff will consider opportunities for enhanced storytelling and public communication to help build broader community awareness of the Alliance's contributions.

Conclusion:

The City of Kelowna UBCO Research Alliance continues to demonstrate strong momentum, with the past year bringing increased engagement from the research community and a growing portfolio of impactful projects. This sustained collaboration has further strengthened relationships across both institutions and deepened shared understanding of how to effectively leverage expertise and resources to advance mutual priorities.

Internal Circulation:

Communications
 Finance
 Strategic Transportation Planning
 Infrastructure
 Facilities
 Energy Management
 Climate Action and Environment
 Fire Department
 Utility Services
 Landfill & Compost Operations

Considerations applicable to this report:***Existing Policy:***

Imagine Kelowna:

Principle 1: Collaborative

A community where people of all backgrounds work together to meet collective challenges.

Principle 2: Smarter Support innovation that helps drive inclusive prosperity.

Financial/Budgetary Considerations:

Commencing with the 2022 budget, each party began contributing \$100,000 annually to the partnership. Funding is allocated to projects evaluated and approved by the Joint Adjudication Group pursuant to the Collaborative Research Agreement.

Project proposals that demonstrate significant funding leverage from additional sources or partners are prioritized for funding. Depending on the project type and associated funding criteria, leverage ratios can range from 2:1 to substantially higher, maximizing the impact of municipal and university contributions.

Considerations not applicable to this report:

Legal/Statutory Authority:

Legal/Statutory Procedural Requirements:

Consultation and Engagement:

Communications Comments:

Submitted by: K. Brunet, Partnerships Development Coordinator

Approved for inclusion: M.Kam, Partnerships Office Director

cc:

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