



Capital Infrastructure Committee

Cycle 5 - Wednesday, June 26, 2024

Start Time: 10:30 a.m.

Participation via TEAMS

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Phone Conference ID: 274 046 922#

Agenda

#	Item	By	Start Time	Length	Action
1.	Call to Order and Land Acknowledgement	RW & Matt Melnyk	10:30	2	
2.	Declaration of Conflict of Interest	RW	10:32	1	
3.	Approval of Agenda (including consent items)	RW	10:33	1	Approval
4.	Business Arising from the Minutes	RW	10:34	1	Information
<u>KEY ITEMS</u>					
5.	<u>Student Alumni Centre Project</u> (including appendices 1-2)	TK/JG/ BC/SJ	10:35	15	Recommendation
6.	<u>Sustainability Update</u> (including appendix 1-2)	JG/SJ/ MQ	10:50	10	Information
7.	<u>2023-24 Review of CIC workplan status update</u>	YR	11:00	5	Information
8.	<u>T3 Capital and Related Projects Update</u> (including appendix 1)	JG/SJ/ EW/GA	11:05	10	Information
9.	<u>Major Capital Projects Update - Facilities Management</u> (including appendices 1-3)	SJ/SS/ JG	11:15	10	Information
10.	Engineering Update - VIDEO	SJ	11:25	5	Information
11.	<u>FCI & Deferred Capital Renewal & Major Maintenance Update</u> (presentation in camera)CI	JG/SJ/ DMc/ MQ	11:30	15	Information

#	Item	By	Start Time	Length	Action
<u>KEY ITEMS (IN CAMERA)</u>					
12.	ITS Major Projects (MP) Update (IN CAMERA) (including appendix 1)	JG/GA	11:45	10	
<u>CONSENT ITEMS</u>					
1 .	<u>Minutes of Previous Meeting - Meeting #4 (2023-24) held on May 2, 2024</u>	RW		5 minutes (if needed)	Approval
1 .	Metrics - <u>Facilities Management</u> - <u>Information Technology System</u>	SJ/ GA			Information
15.	Other Business	RW	11:55	5	
16.	ADJOURNMENT	RW	12:00		

Agenda Legend

RW	Rob Welch	JG	Jennifer Guarasci
SJ	Scott Johnstone	JT	Josh Tonnos
GA	Gemma Ahn	EW	Ed Wall
MQ	Mary Quintana	SS	Susan Strban
YR	Yvonne Roussel	TK	Tim Kenyon
BC	Brad Clarke		

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Report to the Capital Infrastructure Committee

RECOMMENDATION ITEM

TOPIC: Student Alumni Centre Project

June 26, 2024

Tim Kenyon, Interim Provost & Vice-President, Academic

Jennifer Guarasci, Interim Vice-President, Administration

Brad Clarke, Associate Vice-President, Students

Scott Johnstone, Associate Vice-President, Infrastructure & Operations

MOTION

THAT the Capital Infrastructure Committee recommend to the Board of Trustees that the Student Alumni Centre site be reserved as the location for the Brock University Students' **Union (BUSU)'s New Student Centre Project ("Project")**, as further described in Appendix 1, until the end of the 2025 calendar year in order to provide BUSU further time to confirm the construction costs and financing plan for the Project.

EXECUTIVE SUMMARY

1. Rationale

- The Brock University Students' Union is seeking University support to expand the current Student Alumni Centre building, as preliminarily detailed in Appendix 1. BUSU requires evidence of Board of Trustees support in order to expend funds on engaging an architect.
- University leadership is supportive of the project in principle, provided (1) the project is cost neutral to the University; (2) construction presents minimal disruption to University activities; and (3) construction will result in significantly improved spaces/services to students in keeping with Brock and **BUSU's** strategic priorities. University leadership is willing to hold the site for BUSU pending review of the full functional program, construction costs, and financing plan for the Project.
- The identified location for the Project is consistent with the Brock University Campus Master Plan and **supports 'in-fill' priorities to preserve existing** campus green space.
- Board approval of the motion would not commit the University to the project. Once further details regarding the costs and funding are known, University leadership will review and determine whether to present a recommendation to the Board to approve the capital project and any funding implications.

2. Key Background

- BUSU currently licenses the Student Alumni Centre and other service and **'storefront'** spaces from the University. Since 2004, BUSU has been interested in expanding student space on campus. In 2019, BUSU ran a successful referendum to fund the construction and related expenses for a new Student Centre. Further preliminary details regarding the background, student support for the project, and the proposed development are attached as Appendix 1.

- Brock leadership (i.e., the AVP Students and AVP Infrastructure & Operations) has been meeting with BUSU to discuss the project and ensure it is consistent with University interests and capacity. The University's assessment based on information provided to date is that the Project will help address known space needs on campus (e.g., student study and collaboration spaces, equity spaces, social and event spaces, affinity group/club spaces) and that the increased cost to future students by way of the associated student levy is reasonable given the preliminary Project elements. An interim plan has been determined to relocate student activities that will be displaced during construction.
- **Brock's** administration advised BUSU that based on the **University's** current fiscal landscape and existing debt load, Brock does not have the capacity to increase debt financing for this project or support it within its operating budget. BUSU engaged Grant Thornton to develop a financing strategy with potential lenders. Grant Thornton has advised Brock administration that BUSU would be eligible to obtain debt financing on their own without any co-sign or security provided by Brock. Should conditions change and BUSU finds itself unable to secure sufficient debt financing, the project would no longer be feasible.
- The following BUSU representatives have been invited to the meeting to present the details of the project:
 - Robert Hilson, General Manager, BUSU
 - Anusha Pahuja, President, BUSU
 - Carleigh Charlton, Vice-President, University Affairs, BUSU
 - Andrea Lepage, Building Project Lead, BUSU

3. Implications

- There are no budgetary implications to this decision. If passed, the motion will provide BUSU with formal evidence of support in principle for the location of the project, pending further details of the financing and construction plan.
- There are minimal/reasonable operational implications as the University has no capital projects planned for the site and no projects that would otherwise be impacted by this commitment.
- BUSU and Brock considered a range of potential locations for the Project, both in-fill and greenfield. Other options to expand the existing Student Centre were also explored. **In addition to supporting the University's intent to preserve campus green spaces**, the in-fill site and configuration being proposed is preferred for its operational advantages and design flexibility.
- If approval is not given, Brock administration would review Board concerns with BUSU to determine if they can be addressed. If there is no Board support for the Project at all, Brock administration and BUSU would continue to explore ways to expand student spaces within existing buildings and facilities and with existing resources; this approach would face significant constraints.

4. Next Steps

- If the Board approves the motion, BUSU will work with Brock administration to retain an architect to begin the design phase of the Project. Subsequently, BUSU will proceed with steps to secure financing.
- Brock administration will continue to meet regularly with BUSU to support the Project and ensure that outcomes and elements remain aligned with the principles for support set out by University leadership.

5. Background Materials

- Appendix 1 - BUSU Project Overview (10 pages)
- Appendix 2 - [BUSU Slide Presentation](#)

BUSU Project Overview June 2024

Preface

The Brock University Students' Union (BUSU) wishes to develop onto the Student Alumni Centre, providing Brock students with an additional 39,202 gross square feet of new space on campus.

At an estimated \$37 million, this project will include the demolition of the current **campus bar and events space (Isaacs')**, **the construction of a 3-floor Student Centre** integrated into the current Student Alumni Building, with spaces to support the 100+ events BUSU hosts annually, dedicated collaborative and recreation spaces for our students, and the renovation of the existing BUSU offices into dedicated club space for **BUSU's 125+ clubs.**

The new student space will provide opportunities for students to connect, engage, collaborate, relax, have fun, and feel part of the Brock University community.

The Vision

The mission of the Brock University Students' Union (BUSU) is to foster an ever-improving Student Experience that is transformational, enriching, and empowering.

The Student and Alumni Centre (opened 1990) served BUSU and Brock's students for over 30 years. However, the number of undergraduate students on campus has tripled over this time.

BUSU envisions building a *home* for students on campus that will serve the needs of undergraduate students for the next 30+ years. The space will provide opportunities for students to connect, engage, collaborate, relax, have fun, and feel part of the Brock University community.

The new areas envisioned include a *Town Square, Living Room, Recreation Room, Multi-Purpose Spaces, Meeting Rooms, and Office Space.* The new facility would also include Equity Spaces for Brock University to ensure that ALL students feel included.

The current BUSU office space in the Student and Alumni Centre will be converted into **club's space to serve the 125+ BUSU student clubs.**

The building will keep environmental sustainability at the forefront. Including a Cycle Cooperative and Outdoor Recreation space to connect students with the UNESCO Biosphere located on and around the Brock University campus, the Niagara Region and beyond.

BUSU has reviewed the Council of Ontario Universities (COU) space metrics, which note Brock University is well below the Ontario Comprehensive institution average for student **space**. **It is BUSU's vision to not only deliver on what students have identified as a crucial need, but to also help Brock University stay competitive and address a key need for the campus.**

Details

The Brock University Students' Union wishes to build new student space on the central campus site at an estimated cost of \$37 million including the renovation of the existing BUSU offices to Clubs space.

The project involves the demolition of 5,798 square feet of Isaac's and Isaac's restaurant (formally Skybar).

Brock University provided Order of Magnitude Project Budget estimates based on estimates provided by Brock University rostered architect to Quartek Engineering, being \$34,563,906 for 45,000 square feet.

Quartek Engineering has provided an opinion for the probable cost for the renovations of the current BUSU offices, as \$1,350,000. BUSU has included \$2,435,094.00 for these costs.

BUSU will be solely responsible for all capital, financing, and operating costs of the New Student Centre.

The financing term would be 25 years, with the goal of paying the mortgage off in a shorter time frame.

History

BUSU first documented the need for a Student Centre in their 2004-2005 Strategic Plan.

In 2012, BUSU completed a feasibility study with Brock University to construct a new building for the Goodman School of Business and a New Student Centre. The Goodman School of Business decided to move forward with an infill option.

The Brock University undergraduate students voted in a 2019 referendum to financially support the construction of a New Student Centre.

The BUSU completed a feasibility study in 2020 with Brock University to construct the Brock Community and Health Building, which included the Faculty of Applied Health Sciences, Student Wellness and Accessibility Services, and Student Life and Success. The Provincial and Federal Governments decided not to move forward with stimulus funding

In 2021, 86% of students in the BUSU Strategic planning process indicated that BUSU should be responsible for providing space for lounging, events, and studying.

BUSU completed a feasibility study in collaboration with Brock University in 2022 on a New Student Centre. The 2022 feasibility study helped inform the current project.

BUSU has been working with Brock’s Senior Associate Vice-President, Infrastructure and Operations and Associate Vice-President, Students in bi-weekly meetings since October 2023. During this time, an updated DRAFT functional program was developed with the support of Brock’s Associate Director, Space Management & Planning.

The Functional Plan for the New Student Centre can be found in the assembly of documents provided.

In February 2024, BUSU concurrently ran a referendum campaign and survey, in support of this project.

Undergraduate students were asked to vote to allow the modification of the 2019 Memorandum of Understanding. These updates were based on the feedback of Public Accounting firm Grant Thornton’s consultation with the Big Five Banks.

The students approved the modifications to the MOU, with 79.9% voting

‘YES.’ The survey closed on February 15, 2024, with the results sharing the

following:

- 60% of students are dissatisfied with the Lounge space on campus.
- 43% of Students are dissatisfied with the Event Space on campus.
- 40% of Students are dissatisfied with the Collaborative Space on campus.

When asked what BUSU should most prioritize in the development of campus, 37% said Quiet/Study Space, 25% said Lounge space, and 14% said collaboration space.

How did BUSU determine the size of the New Space?

The current 30,000 gross square foot Student and Alumni Centre was opened nearly 34 years ago in September of 1990. The full-time undergraduate population at Brock University has approximately tripled since that time.

If BUSU tripled the size of the current Student and Alumni Centre (30,000 square feet), BUSU would be building an additional 60,000 square feet to total 90,000 square feet.

BUSU is confident that we can provide the spaces that students are calling for in a smaller space and keep the building more affordable for students.

In 2018 BUSU compiled data from other comparable institutions, regarding the size of Student Centres across Ontario. This data showed Brock University is far behind other comparable (or even smaller) institutions.

These data points have been updated as other campuses have since added to their student space, and can be seen in Appendix D.

The COU space metrics show that Brock University is well below the average when compared to other Ontario comprehensive institutions. Brock is also far behind the proposed standards for both Student Activity space and Assembly space.

Combined, this equates to a total of 36,648.96 gross square feet below the COU average, for student space. (Student Activity Space by 1,419 square metres without a grossing factor and assembly space by 709 square metres without a grossing factor.) Calculations for which can also be seen in Appendix D.

BUSU would need to replace the 5,798 square feet of currently used space that would be demolished, which would increase the size of the building to get to the COU Comprehensive Institution average of 42,446.96 square feet.

Working alongside the Library, BUSU would also like to help address the Brock University deficit of Non-Library Study Space and provide a temporary solution for the Brock University deficit of Library Study Space.

To achieve the COU guideline, Brock University or BUSU would have to build 499 square metres, or 5,371.19 square feet of Non-Library study space without the grossing factor, which would equate to 8,593.90 square feet with the grossing factor (1.6).

To achieve the COU guideline, Brock University or BUSU would have to build 2,472 square metres, or 26,608.39 square feet of Library study space without the grossing factor which, would equate to 42,573.42 square feet with the grossing factor (1.6).

To achieve the COU guideline, Brock University or BUSU would have to build 2,971 square metres or 31,979.58 square feet of Study Space (Non-Library and Library space) without the grossing factor, which would equate to 51,167.33 square feet with the grossing factor (1.6)

BUSU is looking to build 39,202 square feet of Net New Space.

Brock University Institutional Planning, Analysis and Performance

Brock University Institutional Planning, Analysis and Performance provided the following observations on Student Engagement as it relates to the New Student Centre:

Brock students tend to rate social interaction and community at elevated levels of satisfaction when compared with students at other universities. Results for opportunities to be involved in social and extracurricular activities are also typically quite positive.

Evaluations of “community” and “sense of belonging” tend to be quite good.

Perhaps related, evaluations of “campus environment” also tend to be quite good.

The National Survey of Student Engagement (NSSE) shows below-average measures of **collaborative learning when compared with “similar” institutions** - most notably for first-year students.

These results have worsened over the past decade, with 2023 responses reflecting a dramatic decline from 2020.

Brock University Institutional Planning, Analysis and Performance also indicated that it should be noted that the results mentioned above are not consistent across the campus; results differ substantially when comparing by Academic Faculty / area of study.

The NSSE Consortium Report indicates that Brock First Year Students ranked the **priority of ‘Improving the quality/availability of student spaces’ #2 in 2023 and ranked this item #1 in 2020, 2017 and 2014.** The NSSE Report also indicates that Brock Fourth Year Students rank **“Improving the quality / availability of student spaces #1 in 2023, 2020, 2017 and 2014.**

The NSSE Consortium Report also indicates that when asked where they have **experienced a sense of community on campus, First Year Students identified ‘Student Activity Space’ (i.e., lounge, cafeteria, pub) #3 in 2023.** This item does not rank in the Top 3 among Fourth Year Students.

BUSU’s 2024 New Student Centre Survey

BUSU plays a vital role in engaging students on campus and delivering the Brock University Undergraduate Student Experience.

Hosting over 112 events in 2023-2024, with over 125 clubs, who themselves hosted over 954 events in 2023-2024, and over 16k followers on Instagram, BUSU plays a key role in connecting students on campus, delivering program that directly supports student retention, and receiving feedback that applies to the greater campus.

The BUSU ran survey, concluded in mid-February of 2024, asked students to rate their satisfaction with various spaces on campus, identify needs, and highlight what could better contribute to their student experience.

Some key results of the survey indicate that:

- 60% of Students are dissatisfied with the Lounge space on campus.
- 43% of Students are dissatisfied with the Event Space on campus.
- 40% of Students are dissatisfied with the Collaborative Space on campus.
- When asked what should be prioritized within campus development, 37% said Quiet/Study Space, 25% said Lounge space, and 14% said collaboration space.

Financing

The New Student Centre Project is anticipated to cost \$37 million, including a renovation of the existing BUSU **offices to Clubs’ space.**

BUSU does not require funding from Brock University to finance the new space on campus. BUSU will finance the demolition, renovation, and new construction with no **“backstopping” required by Brock.**

As approved by students, the New Student Centre building Levy shall be a \$36.50 per credit levy, to be charged until all costs incurred by BUSU in the construction of the new Student Centre, including without limitation all bank financing received, have been paid in full **(the “Initial Levy Period”)**.

The levy could be increased annually up to 5% or CPI (whichever is greater) with approval from the BUSU Board of Directors.

The levy will be charged to all undergraduate students, both full-time and part-time. It shall be charged in all academic sessions and duration. The fee will be mandatory.

The first year of fee collection will occur once the new Student Centre building is complete.

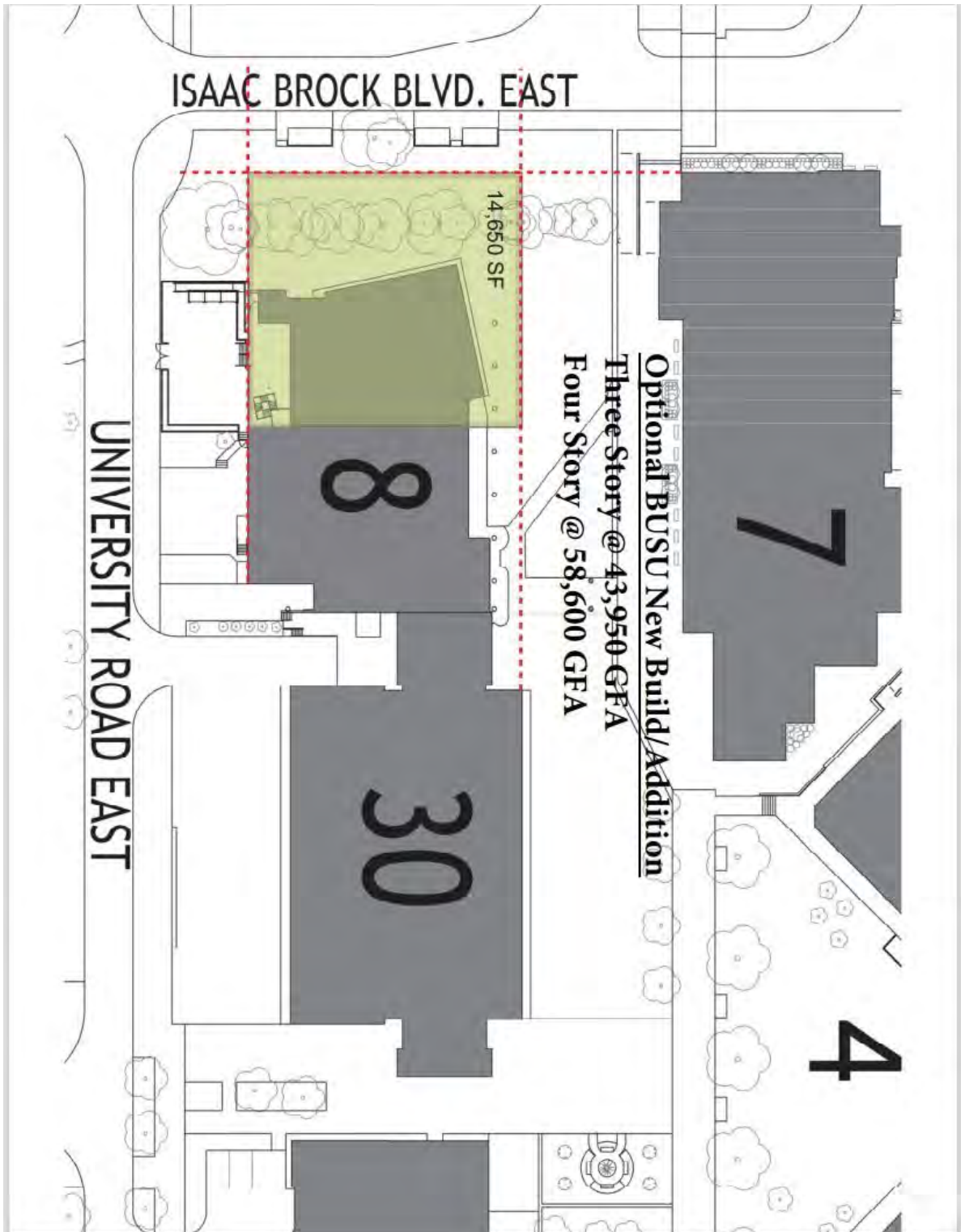
At the end of the ‘Initial Levy Period’ the per credit levy will be reduced to \$8.50 per credit which will be transferred to BUSU to cover the costs of utilities and future maintenance.

The New Student Centre Levy will be used for all costs associated with the creation and maintenance of the new building which will include but shall not be limited to:

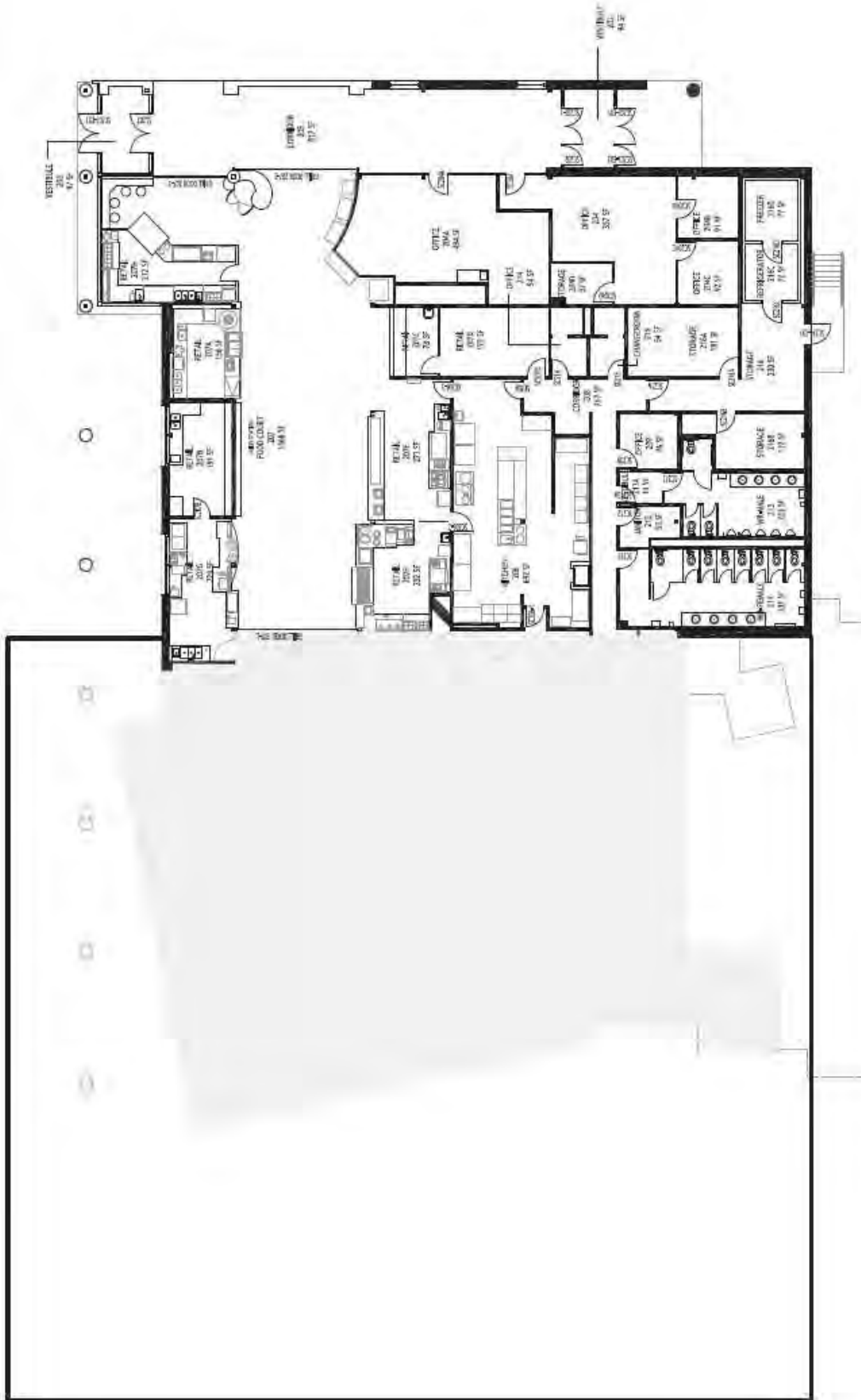
- Hiring an architecture firm
- Associated trades
- Utilities
- Deferred maintenance
- Future expansion

Conclusion

The Brock University Students’ Union would like to move forward with the design and construction of a New Student Centre on central campus in partnership with Brock University to improve the Student Experience on campus and to transform, enrich and empower students for the next 30+ years.



Appendix B



Appendix C



1438 SF

4360 SF

8794 SF

Appendix D

Ontario Student Centre Sizes:

Institution	Gross Square Feet	Student Population*
York	245,000	49,442
Waterloo	195,000	40,996
McMaster	179,000	35,152
Western	110,000	41,945
Windsor	91,000	16,736
Wilfrid Laurier	68,146	20,600
Toronto Metropolitan	66,250	42,401
Carleton	45,000	27,678
Trent	35,000	11,360
Brock	30,000	17,997

*As of July 2023, According to the Ontario Council of University Libraries

BUSU recognizes that these numbers, much like at Brock, reflect spaces that may not be exclusively used by the Student Unions or exclusively for student activity space. These numbers are simply our best data points for comparison.

Calculations for Brock's Student Space Deficit according to the COU data:

Student Activity	-1419 SM
Assembly	-709 SM
Sub-Total	3,404.8 SM
Grossing Factor	1.6
Sub-Total	-2,128 SM
Total	36,648.96 SF

NEW STUDENT CENTRE PROJECT

JUNE 2024



BUSU

BROCK UNIVERSITY
STUDENTS' UNION

AGENDA

- Project Overview
- Space Planning
- Vision
- Project Objectives
- Next Steps
- Q&A



WHERE
HAVE WE
BEEN
WHERE
ARE WE
NOW
WHERE
ARE WE
GOING
WHY
NOW

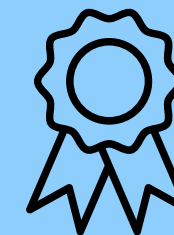
PROJECT OVERVIEW



Construction
of a 3-floor
Student
Centre



Entirely Student
Funded



Working in
partnership with
Brock



Projected to cost
\$37 million



Creation of
39,202 new
gross Sq ft

PROJECT FUNDING

Outlined in the MOU ratified by undergraduate students through referendum:

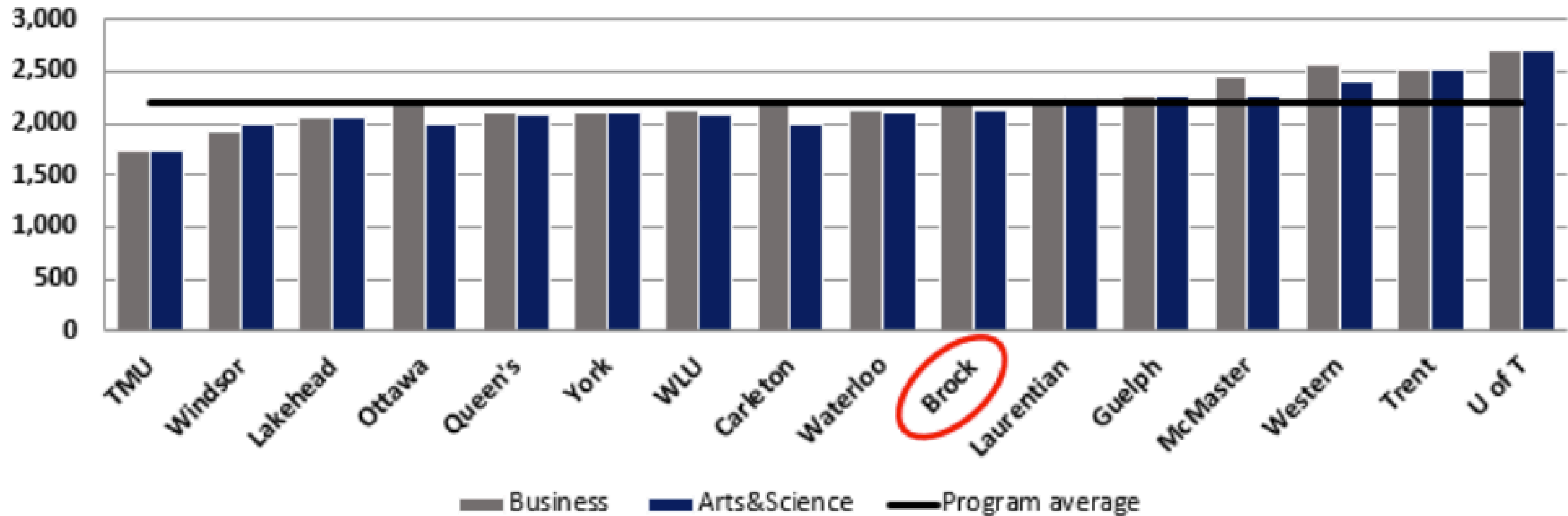
- Mandatory \$36.50 per credit levy
 - Increased annually up to 5% or CPI (whichever is greater) with BUSU Board of Directors approval
- Fee collection begins once new Student Centre building is complete.
- Once all costs incurred during construction have been paid back in full (i.e. bank financing and use of reserves):
 - fee will shift to \$8.50 per credit to cover the costs of utilities and future maintenance.



ANCILLARY FEES

Includes the Zone expansion fee (\$17 per credit) that will conclude prior to the addition of the New Student Building fee

2023-24 Total Ancillary Fees



PROJECT HISTORY



2004-2024

2004: Need for new Student Centre identified in BUSU Strategic Plan

2012: Feasibility Study #1 - New Student Centre & New School of Business

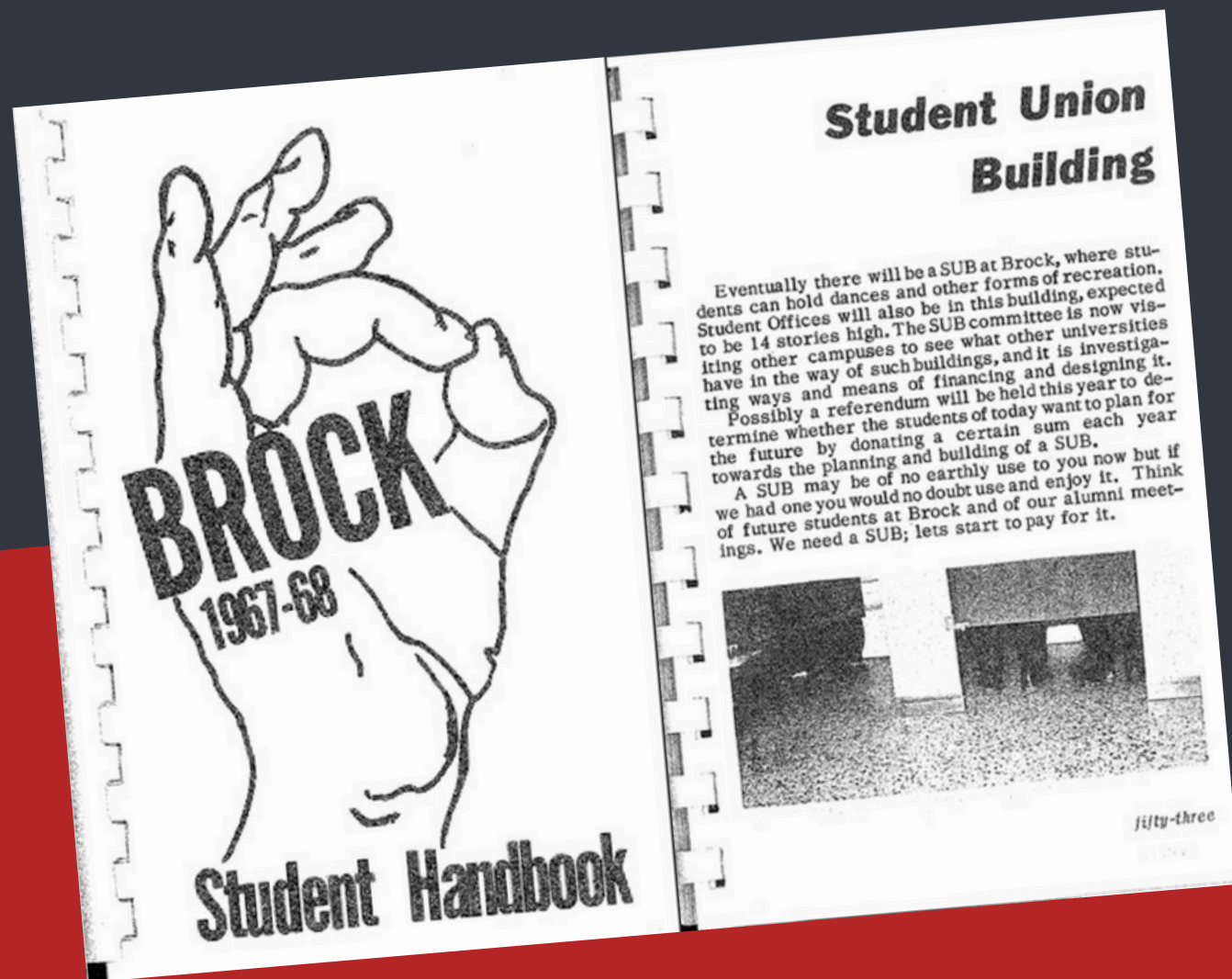
2018: BUSU collects ON Universities Student Spaces' size data

2019: Student Referendum approves MOU

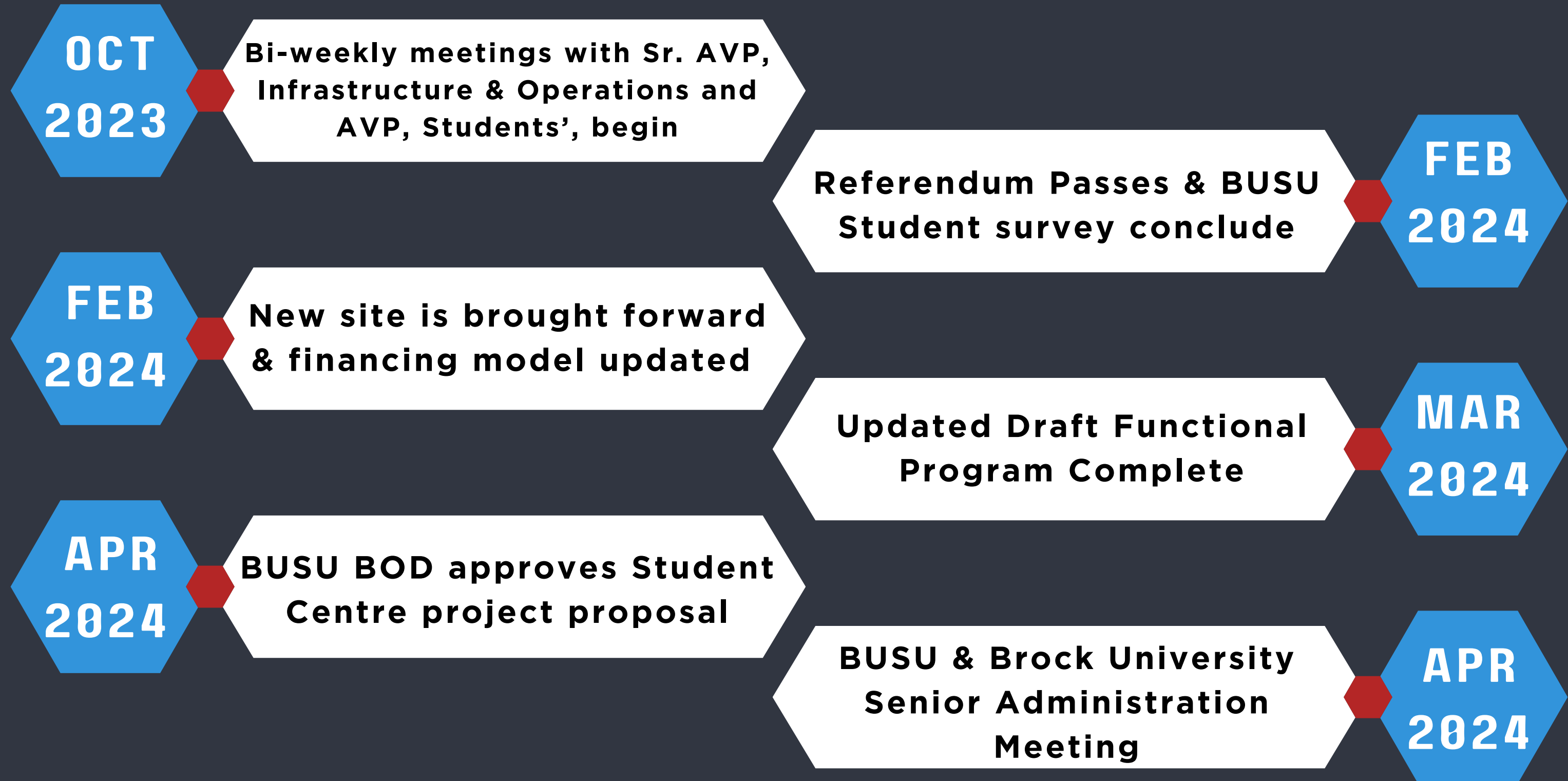
2020: Feasibility Study #2 - Brock University Community and Health Building

2021: BUSU's New Strat Plan 'enrich' priority

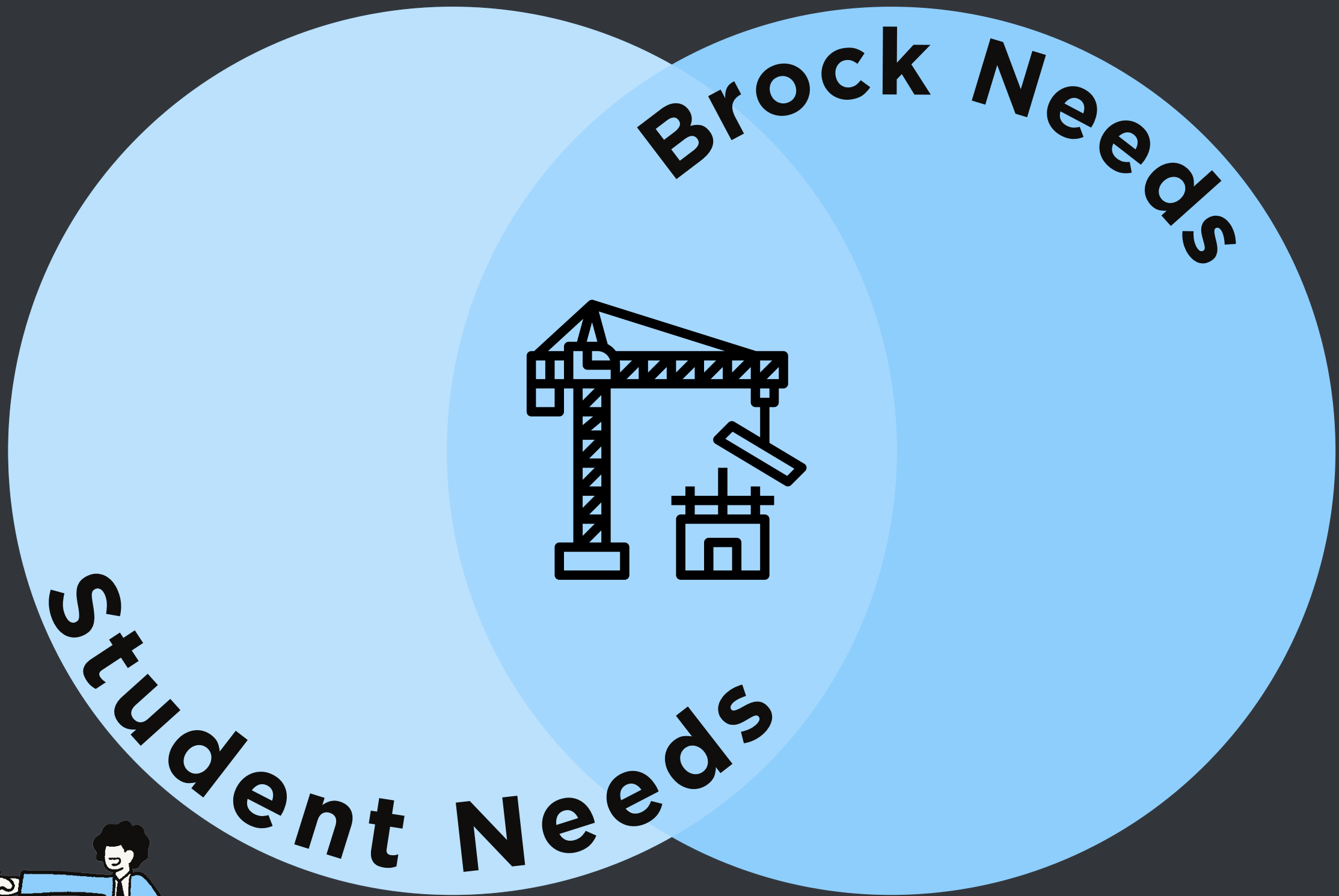
2024: 79.9% 'YES' to updated MOU



RECENT PROGRESS 2023- 2024



BUSU - BROCK PARTNERSHIP



WHY NOW?

SPACE METRICS

Brock is currently 36,648.96 gross square feet below the COU average for student space.

BUSU is looking to build 39,202 square feet of Net new space.

This would bring Brock up to a total of over 69,000 Sq ft.

Institution	Gross Sqft	Student Population*
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TMU	66,250	42,401
Carleton	45,000	27,678
Trent	35,000	11,360
Brock	30,000	17,997

*As of July 2023, According to the Ontario Council of University Libraries

SITE SELECTION:

STUDENT ALUMNI CENTRE SITE



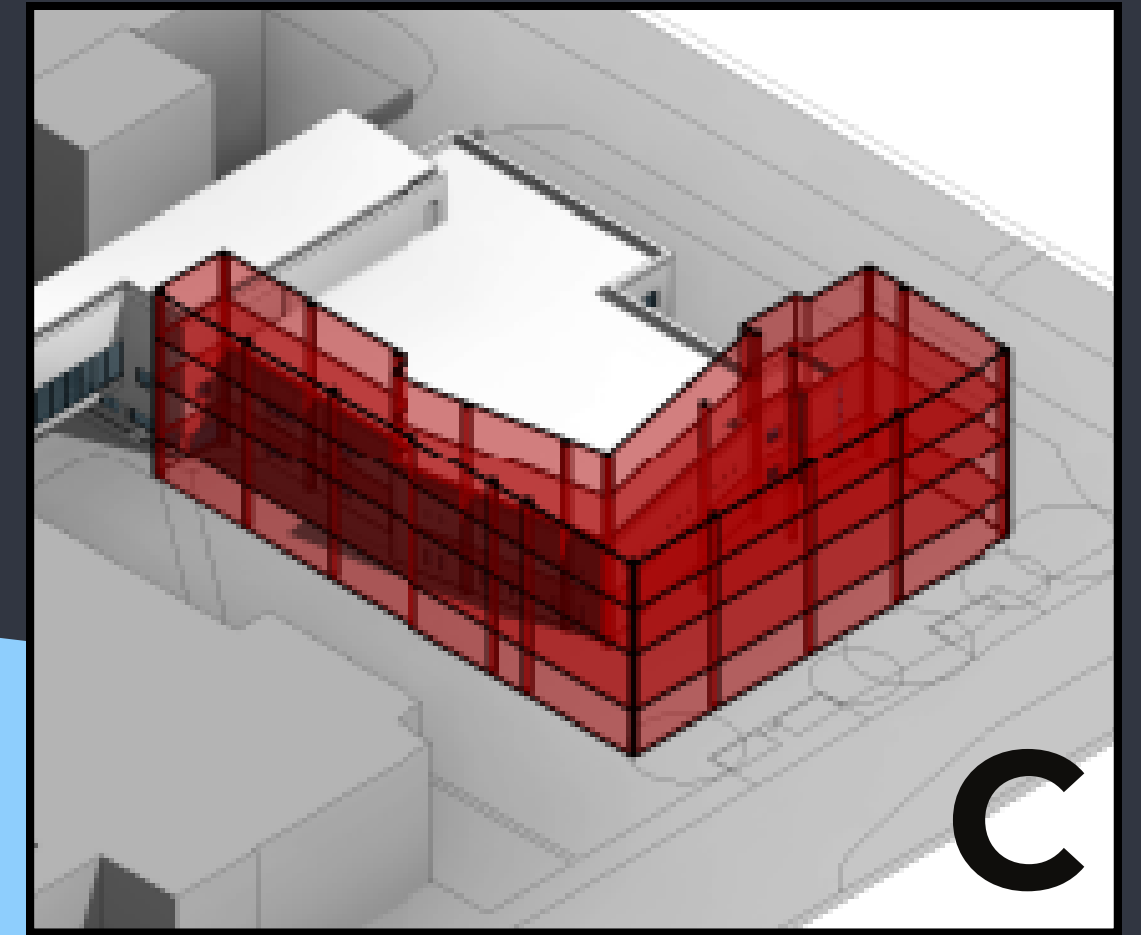
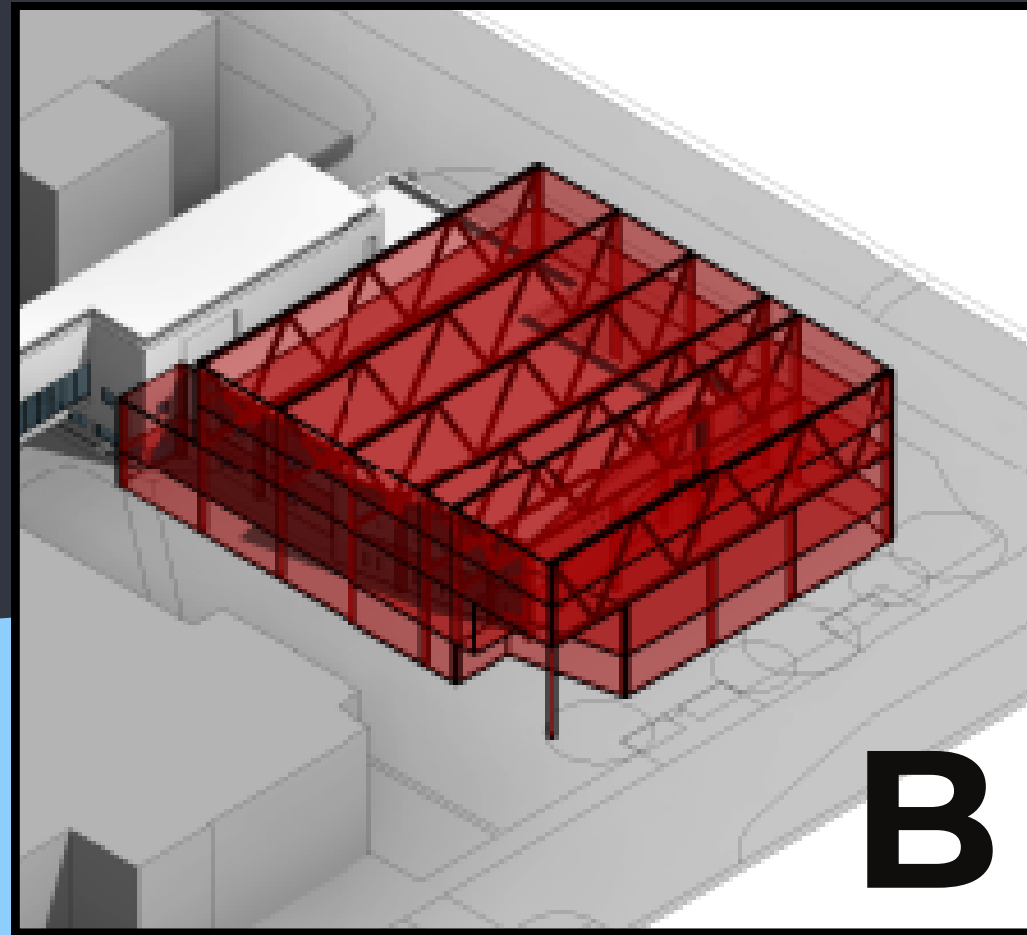
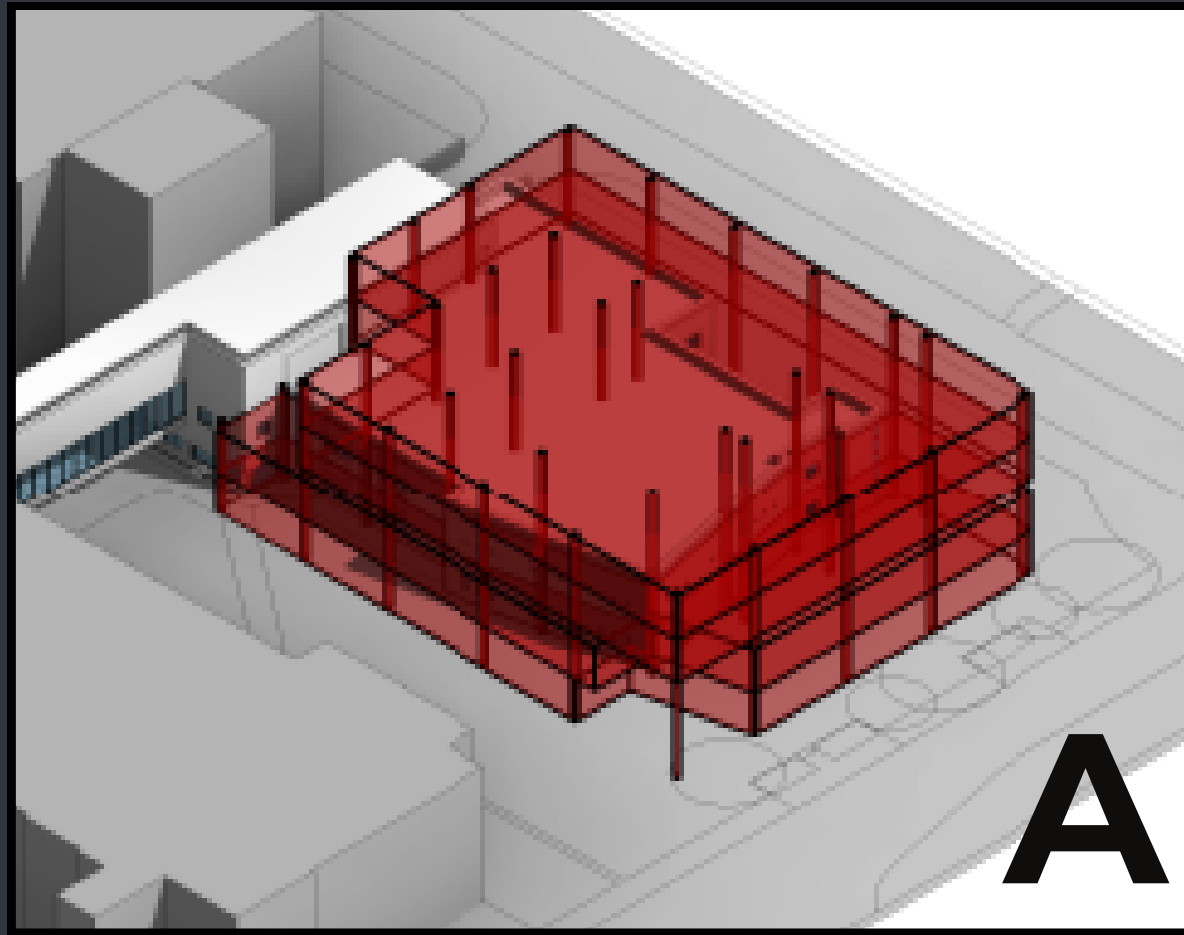
Pros:

- Centralizes programming and services
- Convenient location for students and BUSU
- Allows us to reimagine current space
- Scalability

Cons:

- Loss of programming space for ~2 years
- Noise Disruption

OTHER INFILL OPTIONS EXPLORED:



PROJECT VISION



- **Town Square:** Open event space with seating & video wall.
- **Living Room:** Collaboration area with 24/7 access & essential services.
- **Recreation Room**
- **Creative and Event Space**
- Facilities catering to students' needs:
 - **Equity Spaces**
 - **Commissary Kitchen**
 - **Meeting, Retail, Service Spaces**
- Reimagining the **Brock TV and Clubs Spaces.**



PROJECT OBJECTIVES

Enhancing student experience & promoting a vibrant campus community

Addressing Brock University's space needs

Student retention & making Brock THE #1 choice for future students

Supporting students' academic & personal success

Vibrant campus community & HOME for ALL Brock students

NEXT STEPS JUNE - AUGUST 2024



AUGUST

Retaining an Architect

JUNE 27TH

Board of Trustees

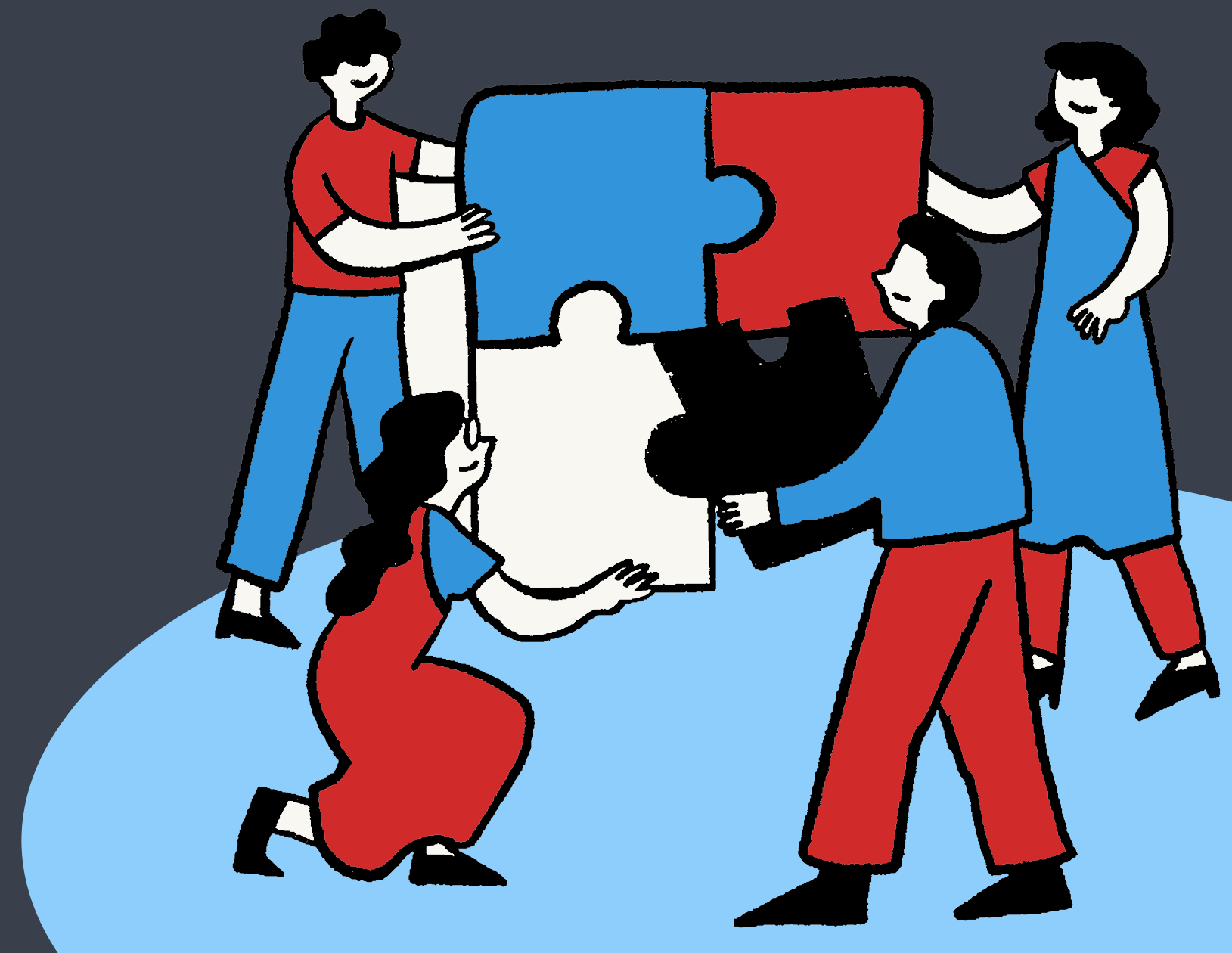
JUNE 26TH

Board of Trustees,
Capital Infrastructure
Committee



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QUESTIONS?



Report to the Capital Infrastructure Committee

INFORMATION ITEM

TOPIC: Sustainability Update

June 26, 2024

Jennifer Guarasci, Vice-President, Administration (Interim)
Scott Johnstone, Associate Vice-President, Infrastructure & Operations
Mary Quintana, Director, Asset Management & Utilities

EXECUTIVE SUMMARY

1. Purpose of the Report

- To provide an annual update on sustainability activities and results across campus.

2. Key Background

- Brock's previous climate action targets (-20% reduction in carbon intensity with respect to 2013 emissions) expired in 2023. A Carbon Reduction Plan was prepared in 2023, identifying overarching strategies that could be used to meet outlined targets and an order-of-magnitude cost to implement. The new targets proposed in the plan are:
 - 75% reduction by 2023, with respect to 2013 emissions
 - Net Zero by 2050, with respect to 2013 emissions
- The annual Waste Audit for 2023 shows 62% of the total waste produced was diverted from landfill. This is 5% less compared to the diversion rate in 2022. Organic food waste remains one of the top areas where significant amounts still go to the landfill. Mixed papers, mixed containers, coffee cups and food wrappers are types of waste that could be diverted more successfully.
- Brock submitted, for the third consecutive year, to participate in the Times Higher Education (THE) Impact Rankings. This ranking is commonly used by prospective students when selecting institutions for higher education. In 2023, Brock ranked among the top 300 universities (among over 1,600 worldwide). For 2024, Brock submitted an additional five categories for a total of 14 (out of 17), the most ever submitted. Results for 2024 THE Impact rankings are expected in June.
- Another submission that was completed this year was for the Association for the Advancement of Sustainability in Higher Education (AASHE). Their Sustainability Tracking, Assessment & Reporting System (STARS) is a comprehensive, stringent program widely used in North America. Brock received a Silver rating in 2021, and

in March 2024 the Facilities Management (FM) team submitted documentation to renew the University's rating. The submission is currently being assessed by STARS technical reviewers. It is expected that the process, including any corrections and/or clarifications, will be completed by July 2024.

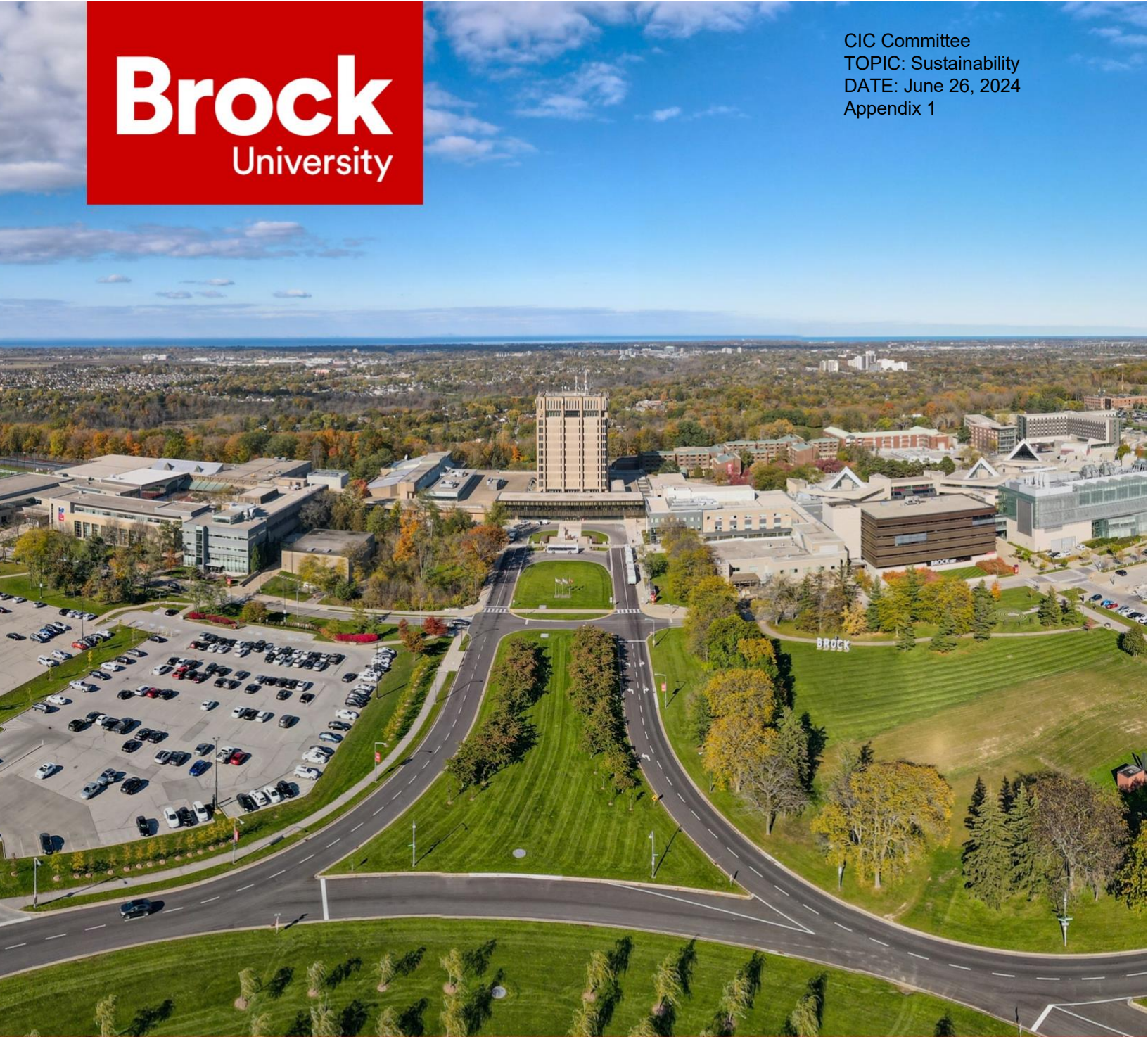
- As part of our "Campus as a Living Lab" efforts, Facilities Management collaborated with students enrolled in course SSAS 5V83. They conducted an assessment and provided recommendations for advancing Brock's sustainability transformation. The executive summary of the report can be found in Appendix 1. Some of the major takeaways were:
 - Brock currently lacks coordination for its sustainability activities, making it crucial to create a position to help coordinate sustainability activities across campus.
 - Increase engagement among students via innovative programs (e.g., student ambassador, cost-sharing with BUSU to expand activities).

3. Next Steps

- In fall 2024, Facilities Management will be preparing the submission for THE Impact Rankings for 2025. We have worked with other stakeholders on campus to support and receive support in collecting data for sustainability-related rankings and for contributing information to other departments (e.g., Goodman School of Business) to enhance Brock's positioning in relevant rankings.
- Facilities Management has been in conversations since early 2024 with Housing Services to launch sustainability competitions among residences. The design and logistics will be finalized in summer 2024 and the first inter-residence sustainability competition is planned for September 2024.
- In summer 2024, Facilities Management will be assessing current waste management efforts and initiatives, including new compliance requirements (i.e., Blue Box Regulation). The intent is to identify changes that can be implemented to increase diversion rates across various Brock facilities and operations.

4. Background Materials

- Appendix 1 – **Energy Conservation and Demand Management Plan 2021-2029**
- Appendix 2 – **Electricity Market (2015-8 report)**



Energy Conservation and Demand Management Plan 2024-2029

LAND ACKNOWLEDGMENT

Brock University acknowledges the land on which we gather is the traditional territory of the Haudenosaunee and Anishinaabe peoples, many of whom continue to live and work here today.

This territory is covered by the Upper Canada Treaties and is within the land protected by the Dish with One Spoon Wampum Agreement.

Today this gathering place is home to many First Nations, Métis and Inuit peoples and acknowledging reminds us that our great standard of living is directly related to the resources and friendship of Indigenous people.



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CONFIRMATION OF APPROVAL BY SENIOR MANAGEMENT

To: Ontario Ministry of Energy

With the issuance of this revised energy conservation and demand management plan (ECDM), Brock University is re-affirming our commitment to energy conservation and sustainable operations. The conservation and demand management plan will be periodically reviewed, revised and updated to meet the dynamics of energy efficiency and conservation while still providing the highest quality experience for the faculty, staff and most importantly the students of Brock University.

Lesley Rigg
President & Vice Chancellor
Brock University

EXECUTIVE SUMMARY

Brock University (Brock) has a track record of using innovative energy solutions and systems resulting in effective energy management. The institution is committed to advancing knowledge in energy management and sharing it with other organizations to accelerate the transition to low-carbon, energy-efficient operations. This approach has allowed Brock to avoid nearly \$2M in energy-related costs while saving over 18MWh and reducing carbon emissions by an estimated 16,400 Tonnes between 2019 and 2024. The measures implemented in the past five years include long-term technical programs, behavioural change initiatives and organizational adjustments to better support energy conservation and efficiency.

Brock is now recognized as a leader in energy among higher education institutions in the province, while our energy initiatives have attracted the attention of international organizations like the International District Energy Association (IDEA). Our institution remains committed to following Ontario Regulation 25/23 under the Electricity Act 1998, which requires all broader public sector (BPS) organizations to report on their annual energy consumption and greenhouse gas (GHG) emissions, as well as update their Energy Conservation and Demand Management (ECDM) plan every five years.

This plan is an update to Brock University's prior ECDM plan and will be utilized from 2024 to 2029 and it includes:

- The University's results on energy conservation and efficiency between 2019 and 2024
- The list of measures implemented to achieve those results, including their cost and lifetime of the solutions
- A list of energy-related measures and initiatives that are planned for 2024 - 2029
- Energy used in years 2022 and 2023



GUIDANCE FROM THE INSTITUTION

Brock University's new **Institutional Strategic Plan, Niagara Roots – Global Reach: Brock University Institutional Strategic Plan 2018-2025**, serves to guide the University into the future by providing a framework of values, priorities, and expectations that are to be upheld and integrated into all Institutional developments. This plan sets out four strategic priority areas to guide the institution's planning and decision making over the next seven years:

- **Providing a transformational and accessible academic and student experience;**
- **Increasing the University's research capacity;**
- **Enhancing the life and vitality of communities across the Niagara Region and beyond;**
- **Fostering a culture of inclusivity, accessibility, reconciliation and decolonization.**

These four priorities influence and contribute to the goals developed in this plan and will continue to be upheld in future versions of the ECDM. Additionally, the Strategic Plan outlines Brock's commitment to human, financial, and environmental stewardship, as it is one of Brock's eight guiding principles. This principle is a similarly strong source of guidance within this document.

The University's current strategic plan, **Niagara Roots – Global Reach**, was implemented in 2018 and was designed to guide the institution until 2025. A revitalized strategic plan aims to help the institution deliver on its mission of supporting students and faculty in the discovery of knowledge through exemplary scholarship, teaching, service and community outreach. The revitalized plan is scheduled to begin implementation to align with Brock's 60th anniversary in September 2024.



OVERVIEW OF ECDM PLAN GOALS

To align with and support Brock University's priorities outlined in its Strategic Plan, the objectives of this ECDM plan have been created and updated in accordance to our commitment to energy management and the priorities of the University.

1. **Generation:** Optimizing processes and increasing the flexibility of on-site energy generation.
2. **Operations:** Incorporating energy conservation and efficiency into all activities.
3. **Procurement:** Leveraging strategic and collaborative procurement opportunities, focusing on best value for energy and carbon related goods and services.
4. **Education:** Elevating efforts towards awareness and engagement of the Brock Community in energy conservation and efficiency.
5. **Buildings:** Improving the efficiency in building operations, modernizing systems and incorporating innovative solutions.

The following goals will guide energy and carbon conservation and efficiency measures:

- a. Demonstrate leadership in energy and GHG emissions management in the sector.
- b. Increase participation of the Brock Community in energy and emission reduction efforts.
- c. Reduce GHG emission by 75%% below 2013 baseline levels by 2030.
- d. Maintain a cost-effective, reliable, and resilient energy supply to campus that incorporates low-carbon solutions.
- e. Leverage big data and innovation throughout all energy management activities.
- f. Improve the operation of existing buildings and design new buildings to be energy efficient while incorporating alternative and low-carbon sources of energy.

The goals and objectives outlined in this plan are applicable to three types of measures—**Technical, Organizational, and Behavioural** – which will ensure that Brock maintains a holistic commitment to sustainability. Brock is committed to sustainability and is aware of its impact on the community, the Niagara Region, Canada and the world.

REPORTING ON RESULTS (2019-2024)

Brock University has implemented and tracked numerous initiatives identified in the 2019 ECDM Plan. Additional measures were also developed and implemented to adjust and better respond to the changing internal and external environments. It was not possible to deploy a renewable energy solution yet, but most of the initiatives undertaken have been successful and some have even transcended the boundaries of Brock, influencing and advancing energy management in the higher education sector.

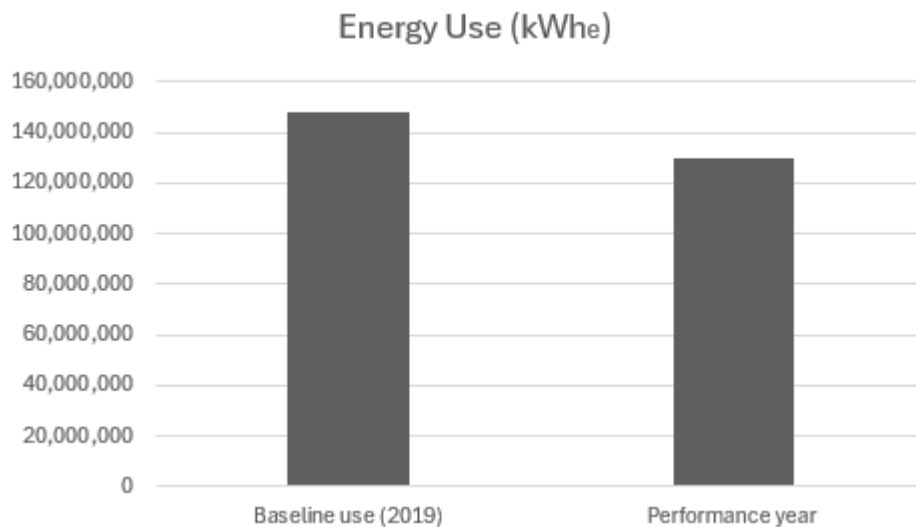


Figure 1. Portfolio-wide energy use analysis


Figure 1 showcases the energy performance of Brock University, using the most up-to-date available energy information. Based on 2019 numbers, Brock University has achieved:


- Over 18,000,000 kWh savings throughout the portfolio
- \$2,177,000 CAD in avoided energy costs
- Energy use intensity [GJ/m²] has decreased by an average of 1.7% between 2019 and 2021 alone
- GHG Emissions Intensity [TCO₂e/m²] has decreased by an average of 9.5% between 2019 and 2021

Over the past 5 years, Brock University has undertaken multiple Technical, Behavioural, and Organizational measures aimed at achieving the results outlined in the previous ECDM Plan. These measures included lighting retrofits, upgrades to mechanical and Heating, Ventilation, and Air Conditioning Systems (HVAC), building & chiller recommissioning, upgrades to the District Energy System (DES), and staff training and awareness on energy use. A summary of the measures that Brock implemented between 2019 and 2024 are outlined in the tables below, with a detailed description of each measure included in the following pages.

TECHNICAL MEASURES

Technical Measure	Lighting retrofits T8 to LED lighting upgrades in various areas across campus (e.g., Ian Beddis Gym, Bob Davis).
Actual Cost	\$35,000 CAD
Annual Savings	Over 414,000 kWh/year while improving the spaces' performance
Lifetime of measure	Estimated 50,000 hours

Technical Measure	<p>HVAC Upgrades</p> <p>Various changes made to the buildings' mechanical systems, as part of regular maintenance and specifically for energy conservation and efficiency purposes. Examples include installing an energy transfer skid in Schmon Tower and adding VFDs on fans and pumps.</p>  <p><i>An HVAC system in the Roy & Lois Cairns Health Bioscience Research Complex.</i></p>
Actual Cost	\$201,500 CAD
Annual Savings	Estimated 254,000 kWh/year
Lifetime of measure	25 years. Estimated 20 years of life for VFDs

<p>Technical Measure</p>	<p>Modernization of the Building Automation System (BAS)</p> <p>Replace outdated hardware and install a new BAS in 10 buildings as part of an annual program. This measure includes new hardware, new graphics and the recommissioning of the control sequences, resulting in improved performance. Using open-source and non-proprietary solutions allow improved compatibility and operation between components.</p>  <p><i>A screenshot of the graphics in the new Building Automation System.</i></p>
<p>Actual Cost</p>	<p>Cumulative cost of nearly \$250,000 CAD since 2019</p>
<p>Annual Savings</p>	<p>Estimated 795,000 kWh/year</p>
<p>Lifetime of measure</p>	<p>Estimated 15 years lifetime for hardware</p>

<p>Technical Measure</p>	<p>Electric Vehicle (EV) Charging Stations</p> <p>Brock installed 22 new EV charging stations on campus; four of these are Level 3 stations. This new infrastructure has influenced the decisions to purchase more EVs (fully electric and hybrid) for Brock's vehicle fleet. In addition, there has been a significant uptake in EVs from the campus community. Given our location (near Hwy 406), it has also become a hub for travelers needing to recharge their vehicles.</p>
<p>Actual Cost</p>	<p>The cost to implement this measure was of \$460,000 CAD and 50% of the cost was funded by the ZEVIP program</p>
<p>Annual Savings</p>	<p>Not applicable</p>
<p>Lifetime of measure</p>	<p>Estimated 15 years lifetime for hardware</p>

Technical Measure	Demand Management Throughout the year Facilities Management makes operational adjustments to reduce the electrical demand from the grid. Some of the activities undertaken include: Increase temperature set points, reduce fans' speed, close outdoor dampers, increase electrical generation, discharge the Thermal Energy Storage tank to reduce chiller load.
Actual Cost	The estimated cost of implementing these adjustments are to be \$65,600 CAD/year
Annual Savings	Nearly \$400,000 CAD/year through diverse demand-related charges and reduced electricity consumption
Lifetime of measure	Permanent

Today **0.0%**
15662 ^(MW)
PEAK DEMAND

Tomorrow **0.0%**
15390 ^(MW)
PEAK DEMAND

Monday **11.8%**
16741 ^(MW)
PEAK DEMAND

Tuesday **29.8%**
17355 ^(MW)
PEAK DEMAND

Wednes... **51.9%**
17770 ^(MW)
PEAK DEMAND

Thursday **59.5%**
19653 ^(MW)
PEAK DEMAND

Friday **54.1%**
20745 ^(MW)
PEAK DEMAND

Live Power Data

Latest Update: 2024-06-08, 09:57:57

Legend: Low Probability (Green), Medium Probability (Yellow), High Probability (Red), Facility Demand (Blue), Hourly ON Grid Demand (Purple), Forecasted ON Grid Demand (Orange), Purchased Power (Grey)

Normal Mode

No Action Required

Peak Occurrence Probability **0%**
Today

Projected Peak Hours **N/a**
Today

Most Recent Hourly Grid Demand of ON **Err (MW)**
Err ET

Demand Shifted **16.38 MW**

GA Saving **\$ 111.1k**


Current Temperature **18 °C**

Current Humidity **64 %RH**

Current Wind Speed **28 km/h**

Top 10 Peak Demand Summary (from May 01, 2024, to today)

Top 10	Date	Peak Hours (EST)	Ontario Demand (MW)	Adjusted AQEW (MWh)	Facility Power Usage (MWh)	On-site Generation		
						Generators (MWh)	Solar Panels (MWh)	Batteries (MWh)
1	2024-06-04	17:00 - 18:00	20694	-	6.35	4.73	0.0033	0.0013
2	2024-05-22	18:00 - 19:00	20436	19779	6.16	4.83	0.0032	0.0012
3	2024-06-05	16:00 - 17:00	20396	-	6.62	4.89	0.0031	0.0013
4	2024-05-21	16:00 - 17:00	20229	19559	6.23	5.01	0.0031	0.0013
5	2024-06-06	17:00 - 18:00	18764	-	5.96	5.03	0.0026	0.0011

<p>Technical Measure</p>	<p>Supervisory Control And Data Acquisition System (SCADA)</p> <p>Facilities Management implemented a customized SCADA system for the DES. The system tracks and trends all the data from the different components of the DES system, allowing Brock to make informed decisions to improve the performance of energy-production operations every day. In addition, it has allowed for improvements in preventive maintenance, increased automation (e.g., automatic start/stop of engines). Use Thermal Energy Storage for demand management, reduce the number of engines running to save natural gas.</p>  <p><i>Screenshot of one of the screens on the new SCADA system.</i></p>
<p>Actual Cost</p>	<p>\$120,000 CAD</p>
<p>Annual Savings</p>	<p>Over 1,400,000 kWh/year</p>
<p>Lifetime of measure</p>	<p>Permanent</p>

<p>Technical Measure</p>	<p>Enhanced Metering</p> <p>Facilities Management has added more sub-meters to the buildings, including electrical, thermal and water meters. All the data from the meters is collected by Brock's SCADA system and used in the EMS. Staff ensures that those meters that have annual calibration requirements are properly serviced to maintain the units' accuracy.</p>
<p>Actual Cost</p>	<p>Estimated \$50,000 CAD</p>
<p>Annual Savings</p>	<p>Not applicable</p>
<p>Lifetime of measure</p>	<p>Permanent</p>

Technical Measure

Energy Management System (EMS)

Brock installed a custom-built EMS that includes multiple modules and sub-systems. The platform was co-developed with a consulting firm and it is now used by multiple higher education institutions in Ontario. The components include: Public-facing dashboards, Utilities Management Dashboards, Utilities' invoice management, RETScreen files, tracking of provincial electrical demand and Sustainability competitions.



Screenshot of the Utilities Dashboard in the BlackPac EMS.



Photograph of the District Energy System's control room.

Actual Cost

This measure was implemented over several years with a total cost of \$240,000 CAD

Annual Savings

Over 1,900,000 kWh/year

Lifetime of measure

10 years

ORGANIZATIONAL MEASURES

Organizational Measure	<p>Incorporate new design parameters in new construction projects</p> <p>Residence 8 building was designed and built with several energy efficiency measures (e.g., LED lights, VFDs) but most notable, it uses medium-temperature water (160 degC) for heating and process loads. These measure will be in place for the life of the building or until the end of the systems' life.</p>
Actual Cost	Not applicable
Annual Savings	Approximately 546,000 kWh/year in Residence 8
Lifetime of measure	Permanent

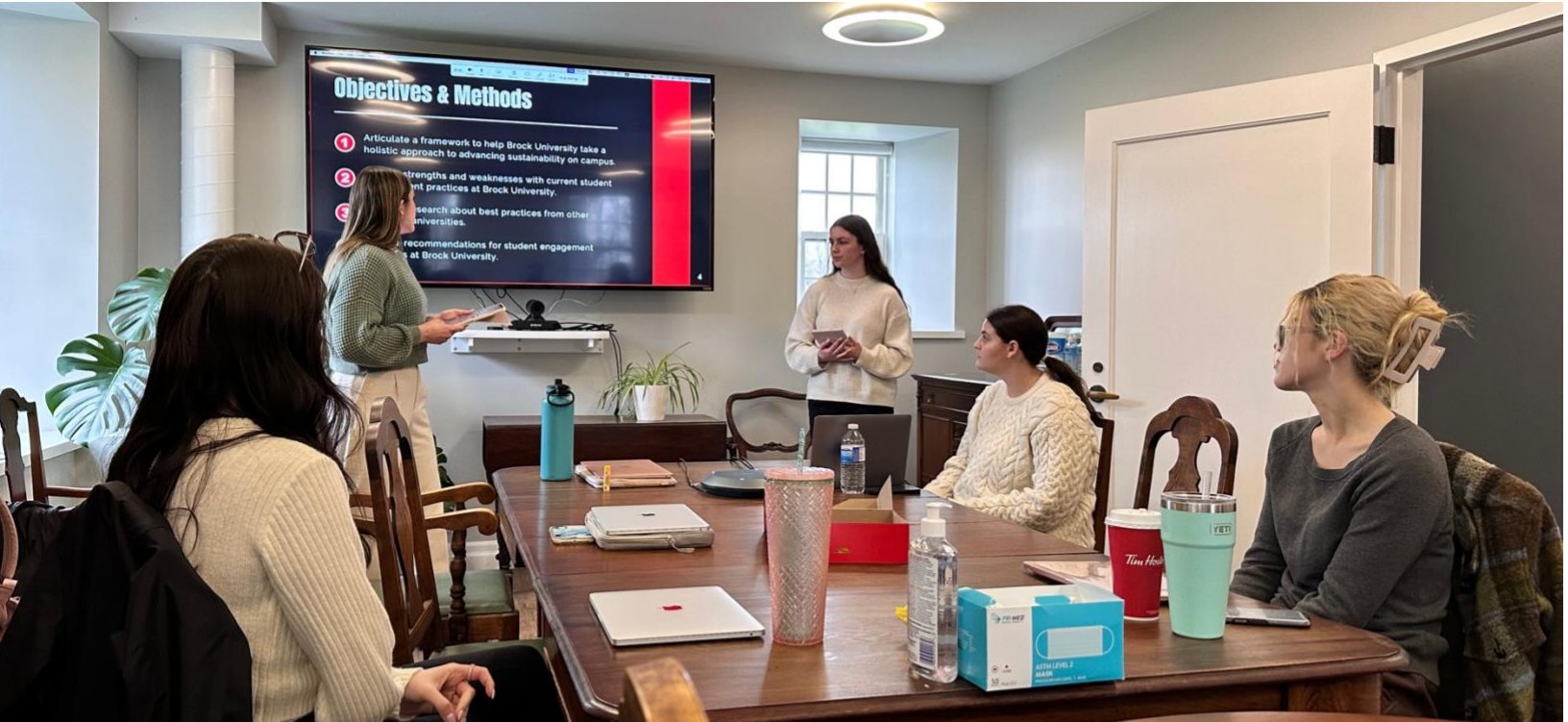
Organizational Measure	<p>Green Rating Systems</p> <p>The Marilyn I. Walker School of Fine and Performing Arts building obtained its LEED® Gold certification under the Building Operations & Maintenance system. The building is also used for teaching higher education students about sustainability.</p>
Actual Cost	The cost for the certification was \$50,200 CAD
Annual Savings	The measures implemented (e.g., constant commissioning) have saved an estimated 17,400 kWh/year
Lifetime of measure	Permanent

Organizational Measure	<p>Training of staff on energy management</p> <p>Several people in Facilities Management staff received formal training in energy-related topics (e.g., RETScreen experts certification, IESO's under their Strategic Energy Management program). In addition, regular training is provided to employees on new technologies, solutions and systems via lunch and learn and site visits.</p>
Actual Cost	Not applicable
Annual Savings	This measure has been implemented over several years, and has saved Brock over 7,000,000 kWh/year
Lifetime of measure	Permanent

Organizational Measure	Voluntary reporting on energy performance (Permanent) Brock University now reports annually to the Times Higher Education (THE) - Impact Rankings and every three years under the Association for the Advancement of Sustainability in Higher Education (AASHE)'s Sustainability Tracking And Reporting System (STARS). Both programs include numerous areas related to energy and GHGs and they have allowed third-party assurance to track progress and performance over time, as well as identifying areas needing improvement.
Actual Cost	Not applicable
Annual Savings	Not applicable
Lifetime of measure	Permanent

BEHAVIOURAL MEASURES

Behavioural Measure	Knowledge transfer Brock provided tours and talks for internal and external stakeholders as part of events (e.g., Wellness Day, International Development Week, etc.), courses (e.g., Masters in Sustainability), for the broader Niagara community (e.g., Niagara Region) and for other higher education institutions. Additional advocacy and awareness were done via presentations at provincial level (i.e., OAPPA) and at the International District Energy Association.
Actual Cost	Not applicable
Annual Savings	Not applicable
Lifetime of measure	Permanent



Behavioural Measure

Sustainability Competitions

One of the components of the EMS include the use of a mobile app called EcoBoss, which enables competitions between individuals or among teams. Available on Apple Store and Android, it allows people to log a wide diversity of sustainability-related actions throughout several days. Many of the actions available to log are related to energy conservation and efficiency (e.g., turning lights off, adjusting thermostats, dressing appropriately for the weather, using the dishwasher with full loads, etc.). The intent is to educate and engage the Brock Community on daily activities that can reduce environmental impacts and adopt them on campus and beyond.

Screenshot of the competition screen on the BlackPac EMS.

Actual Cost

Not applicable

Annual Savings

This measure has been implemented over several years, and has helped Brock save over 1,400,000 kWh/year

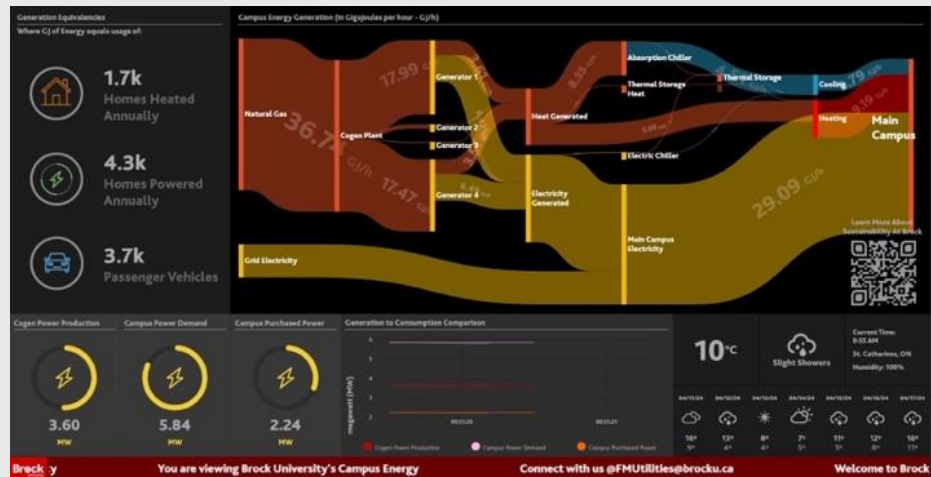
Lifetime of measure

10 years

Behavioural Measure

Public-facing Dashboards

The EMS includes a component devoted to communicating energy performance in real time. The dashboards display: Energy Use Intensity (EUI) per building, equivalencies for savings and electricity generation, a Sankey chart of energy generation at the District Energy System and all its assets, QR codes to sustainability websites and resources and a leaderboard for sustainability competitions. A screen with dashboards was installed in the Rankin Family Pavilion, the busiest area for pedestrian traffic on campus, maximizing its exposure. The moving banner and the dashboard itself has been a major contributor to increasing the number of tours, talks and other knowledge transfer activities.



Screenshot of one of the public-facing dashboards.

Actual Cost

Not applicable

Annual Savings

This measure has been implemented over several years, and has helped Brock save over 2,000,000 kWh/year

Lifetime of measure

10 years

PROPOSED MEASURES FOR 2024-2029

Based on the results from the 2019 - 2024 and their subsequent analyses, new measures have been identified under the 2024 - 2029 ECDM Plan to address the changing environment, new technologies and enhanced targets. Measures that have proven successful will be continued or enhanced while also introducing new measures that respond to technological advancements and innovation that could advance Brock's ambitious carbon and energy targets.

TECHNICAL MEASURES

Based on the results from the 2019 - 2024 and their subsequent analyses, new measures have been identified under the 2024 - 2029 ECDM Plan to address the changing environment, new technologies and enhanced targets. Measures that have proven successful will be continued or enhanced while also introducing new measures that respond to technological advancements and innovation that could advance Brock's ambitious carbon and energy targets.

Technical Measure	Lighting retrofits Lighting upgrades in various areas across campus, including controls (e.g., scheduling) and other measures (e.g., occupancy sensors, daylight harvesting) when viable.
Actual Cost	To be determined
Annual Savings	To be determined
Lifetime of measure	Estimated 50,000 hours lifetime

Technical Measure	DES Electrification This project will allow Brock to minimize the use of natural gas fueled equipment (i.e., cogeneration engines) by using electric boilers installed around campus instead. Some of the boilers are existing units while older units that are at the end of their life will be replaced. This project will also include: Improving the use of the existing Thermal Energy Storage (TES) tank and optimizing the control sequences for the DES to improve heat transfer and energy efficiency across the campus.
Actual Cost	The estimated cost of this project is \$6 million CAD.
Annual Savings	The project could reduce Brock's direct emissions by 67% while resulting in Net Annual Energy Savings of 72,000,000 kWh/year.
Lifetime of measure	Estimated 25 years

Technical Measure	<p>Install heat pumps</p> <p>In the next five years, Brock will install heat pumps in buildings where there's opportunity to recover waste heat. The first two units will be installed as part of the DES Electrification project, commencing operation in 2025. Additional locations will be evaluated to determine the economic and technical feasibility of installing low or high-temperature heat pumps.</p>
Actual Cost	To be determined
Annual Savings	To be determined
Lifetime of measure	Estimated 25 years

Technical Measure	<p>BAS Modernization</p> <p>Facilities Management will continue replacing obsolete hardware (e.g., NCMs) with new controller (e.g., JACE). Whenever needed, sensors and actuators will also be replaced. In addition to the hardware updates, we'll migrate all the buildings that remain in the old Iconics32 or Metasys platforms into Niagara Tridium, integrating all the buildings under the same BAS. When doing the migration, we'll also update the graphics for each building and make improvements on the alarm management. During the migration, we'll conduct a review of the schedules and ensure no overrides have been unnecessarily left in place.</p>
Actual Cost	To be determined
Annual Savings	To be determined
Lifetime of measure	Estimated 25 years

Technical Measure	<p>HVAC Upgrades</p> <p>As equipment reaches the end of its life and/or needs to be replaced, Brock will replace the units with new, more efficient and low-carbon alternatives. This is applicable to equipment such as water heaters, boilers, chillers, etc. and includes fuel switching (to lower-carbon alternatives) but also adding VFDs and other systems that improve the energy performance of the buildings.</p>
Actual Cost	To be determined
Annual Savings	To be determined
Lifetime of measure	Estimated 20 years

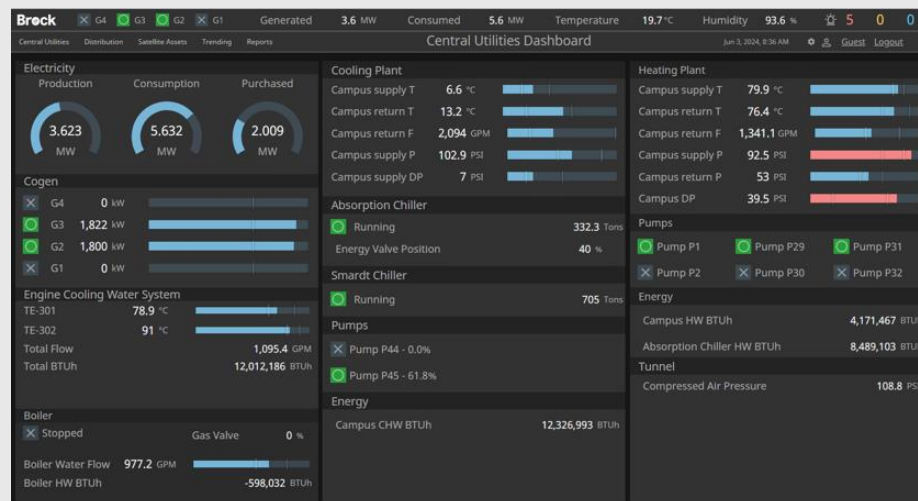
Technical Measure	<p>Energy Management System (EMS) upgrades</p> <p>Brock intends to continue using the BlackPAC EMS, building on current successes and finding opportunities for improvement. Some of the enhancement that are being considered include: Improved reporting capabilities, alarming for energy parameters outside of range (e.g., Energy Use Intensity), building-level analytics, sub-metering of loads using 10% (or more) of a building's energy, connecting water meters and tracking of water consumption.</p>
Actual Cost	To be determined
Annual Savings	To be determined
Lifetime of measure	Estimated 10 years

Technical Measure	<p>Building Retrofits</p> <p>Buildings are a crucial component in achieving energy targets: They create the demand that the DES needs to meet, while also being an integral part of the student experience at Brock. Deferred Capital Renewal and Maintenance (DCRM) is a factor that impact the buildings' energy performance. These are both significant challenges to tackle in the current fiscal environment yet both are intricately linked. Therefore, in the next five years, increased emphasis will be placed on developing projects and programs that address both in a integrative manner. In these energy retrofits, Brock will incorporate other technical, organizational and behavioural measures identified in this plan to maximize the benefits of synergies.</p>
Actual Cost	To be determined
Annual Savings	To be determined
Lifetime of measure	10 years

Technical Measure

Enhancing metering infrastructure

Additional efforts will be invested into adding meters for other utilities that are not currently submeters at the building level. These include chilled water, hot water and domestic water. All the meters installed will be connected into Brock's SCADA system and their data will then distributed for use across other systems, such as the BAS and the EMS (BlackPAC). Furthermore, large loads (e.g., commercial kitchens, chillers) will be sub-metered (electrical and/or thermal) to better track their performance and to be able to improve the tracking and analysis of the data consumption in buildings.



Screenshot of a data-intensive dashboard on SCADA system. Additional data points and screens will be added when adding metering infrastructure.

Actual Cost

To be determined

Annual Savings

To be determined

Lifetime of measure

Permanent




ORGANIZATIONAL MEASURES

Organizational Measure	<p>Incorporate new design parameters in projects</p> <p>Moving forward, Brock will not be replacing building equipment like-for-like. Consideration will be given to more energy efficiency solutions and systems using non-fossil fuels. The life cycle (operational cost, maintenance requirements, etc.) will be reviewed when choosing new equipment. This approach will be applicable to capital projects (e.g., a new building) and to maintenance/repair projects (e.g., replacing a leaking hot water heater).</p>
Actual Cost	To be determined
Annual Savings	To be determined
Lifetime of measure	Permanent

Organizational Measure	<p>Seek LEED Certification (Building Operations and Maintenance) for existing buildings</p> <p>Brock has a large number of existing buildings. In order to ensure they are operated and maintained in a sustainable and energy-efficient manner, we'll strive to get more facilities rated under LEED®: Building Operations and Maintenance. Additional benefits will be achieved on space performance and supporting the academic mission of the institution (e.g., a well lit and ventilated space is more conducive to learning).</p>
Actual Cost	To be determined
Annual Savings	To be determined
Lifetime of measure	10 years

Organizational Measure	<p>Explore new/upcoming low-carbon technologies</p> <p>Brock will consider the use of new and upcoming technologies as they become available. The stage of a technology will be considered (e.g., early stages vs. mature) but it will not be immediately ruled out based on its stage of development. When evaluating the use of new technologies, the financial feasibility and other added values (e.g., increased safety, value as a tool for teaching/learning) will also be studied. Some technologies that will be looking into are blackwater heat recovery, ground-mounted solar PV, heat pumps and Artificial Intelligence algorithms (e.g., machine learning).</p>
Actual Cost	To be determined
Annual Savings	To be determined
Lifetime of measure	Permanent

<p>Organizational Measure</p>	<p>Campus as a Living Lab</p> <p>Facilities Management will continue collaborating with faculties and departments across Brock and beyond (e.g., Niagara College) to show real-life examples to illustrate processes, showcase technologies and solve problems faced in our community. This could take the form of: Presentation in courses, students conducting research/projects on Brock's systems and operations, sharing data with researchers (e.g., machine learning), etc.</p>  <p><i>Learning about native species and biodiversity on campus.</i></p>
<p>Actual Cost</p>	<p>To be determined</p>
<p>Annual Savings</p>	<p>To be determined</p>
<p>Lifetime of measure</p>	<p>Permanent</p>

<p>Organizational Measure</p>	<p>Consider alternative/innovative methods to address capital limitations</p> <p>Energy conservation and efficiency are closely linked to Deferred Capital Renewal and Maintenance (DCRM): Obsolete infrastructure limit the integration of new technologies as much as they impact the energy efficiency of a building itself. However, the backlog of DCRM for Brock is very significant and it is difficult for the institution to tackle these under the current model. Therefore, we will assess using other funding models for building or campus-wide energy projects that address DCRM. Examples of models and methods that will be considered and/or undertaken include but are not limited to: Energy performance contracts, outcome-based projects using CCDC14 and Energy As A Service (EaaS).</p>
<p>Actual Cost</p>	<p>To be determined</p>
<p>Annual Savings</p>	<p>To be determined</p>
<p>Lifetime of measure</p>	<p>10 years</p>

BEHAVIOURAL MEASURES

Behaviorial Measure	<p>Knowledge transfer</p> <p>Brock will continue to share energy and carbon-related knowledge acquired and/or developed at the institution with internal and external stakeholders to promote the advancement of energy efficiency and conservation in the institution and beyond. This engagement will take the form of active participation in the Ontario Association of Physical Plant Administrators (OAPPA), presenting at international energy conferences and hiring of co-op students.</p>
Actual Cost	To be determined
Annual Savings	To be determined
Lifetime of measure	Permanent

Behaviorial Measure	<p>Education and engagement on energy conservation and efficiency</p> <p>Efforts will continue to educate students, faculty and staff about energy conservation and efficiency. We envision continuing with competitions that include energy-saving activities and placing increased emphasis on competitions in residences. The efforts will now expand to include energy conservation in laboratory areas where Facilities Management has no operational control. This is particularly important since laboratory equipment tends to be used intensely and is typically energy-intense.</p>
Actual Cost	To be determined
Annual Savings	To be determined
Lifetime of measure	Permanent

Behaviorial Measure	<p>Public-facing Dashboards</p> <p>The Energy Management System (EMS) will continue to evolve. We will add enhanced functionality, making them more interactive and increasingly available (e.g., sharing real-time energy information via a public website). Adding new utility meters will create opportunities for additional activities (e.g., energy treasure hunt) and will allow the creation of new, better dashboards. We will install additional monitors across campus, showcasing the public-facing dashboard, but this time focusing on locations where people spend time waiting and would be more inclined to look at the dashboard more attentively (e.g., lobbies, near elevators).</p>
Actual Cost	To be determined
Annual Savings	To be determined
Lifetime of measure	10 Years

RENEWABLE ENERGY GENERATION FACILITIES

Brock University does not currently have any renewable solution. The institution is not currently using ground source heat pump technologies, solar energy or heat pump technology. In the past five years, Facilities Management evaluated several renewable energy options, but these were ultimately not deemed suitable for Brock. Some of the options considered were: Solar thermal on the roof of Walker Complex to heat the pool and displacing natural gas with 5% hydrogen as a fuel for the cogeneration system. As technologies continue to evolve, we will revisit these solutions and will continue searching for alternatives that are applicable to Brock's operations.

FEATURED PROJECTS AND INITIATIVES

CAMPUS AS A LIVING LAB

Brock University fosters the use of the campus, including buildings, systems, District Energy System (DES) and other operations as part of the student experience. There are numerous examples of collaboration between Facilities Management, students, faculty and staff. From undergraduate students visiting the DES to learn about thermodynamic cycles and chemical reactions (e.g., heat absorption via Lithium Bromide in absorption cooling), to graduate students making strategic recommendations on advancing sustainability, the campus provides a plethora of opportunities to learn and apply knowledge via real-life activities on campus.

MARILYN I. WALKER SCHOOL OF FINE AND PERFORMING ARTS IS NOW LEED® Gold BUILDING

This building has become a staple in downtown St. Catharines. Originally housing the Canada Hair Cloth Company, the building was built in 1884, and was renovated in 1911 before being modernized by Brock in 2013. A new milestone was achieved in 2022 when the building received a Gold rating under the Leadership in Energy and Environment Design (LEED®)'s Operations & Maintenance rating system.



Some of the elements that allowed the building to achieve this target were: Preserving a large amount of the 1884 building (e.g., brick façade, wood flooring, pressed tin ceiling tiles), the addition was built on a brown site, ongoing commissioning via de Building Automation System (BAS) for energy efficiency, use of heat recovery ventilators, outstanding performance on indoor environmental quality, access to public and active transportation systems, and high water efficiency. The building is used as a living lab for teaching students about sustainability.

BROCK'S ENERGY MANAGEMENT SYSTEM (EMS)

The data collected by the SCADA system, the new meters installed, and the BAS created an opportunity to harness the power of big data analytics. In 2021, Brock installed an EMS which includes a set of comprehensive components: Public dashboards, utility management dashboards, sustainability competitions, automated bill collection, provincial peak tracking and RETScreen files for the building fleet. All the components are geared to improving energy management and promoting engagement.

The public-facing dashboards are shown on a screen at Rankin Family Pavilion, one of the highest traffic areas on campus. The dashboard has QR codes that lead to energy and sustainability websites and has fun easy-to-understand units (e.g., hours of gaming, CN Towers powered-equivalent). The utility management dashboards are more technical and are used by Facilities Management staff to track performance. The sustainability competitions are held via an app that participants download from their phones.

This measure leverages on technology and data, but at the same time it is strongly geared to raising awareness and engaging the Brock Community in energy and water conservation and efficiency, among other behavioural changes that would minimize the university's environmental footprint. We believe behavioural change and participation is of the utmost important to tackle societal challenges and while technology is part of the solution, people's actions should also be part of the solution. This measure is meant to support this approach.



DISTRICT ENERGY SYSTEM'S SUPERVISORY AND DATA ACQUISITION (SCADA) SYSTEM

The District Energy Efficiency Project (DEEP) laid the foundation for innovation and progress. The control system was vastly outgrown by the new systems and equipment, leading to the need to install an industrial grade solution to operate and monitor the District Energy System (DES). The chosen solution was a SCADA system, named Ignition.



It meets the strict operational parameters of the new equipment while also allowing Brock to exploit new functionality available because it is highly customizable. The SCADA system also collects thousands of data points and allows for increased automation (e.g., start and stop of engines, setting electricity import targets) and has resulted in reduced shut-downs, improved preventive maintenance and enhanced operations. In turn, the SCADA system also became a critical part of other data-driven initiatives undertaken at Brock University.

TRACKING PROGRESS VIA VOLUNTARY REPORTING



Brock University now voluntarily reports under the Times Higher Education (THE) - Impact Rankings Association for the Advancement of Sustainability in Higher Education (AASHE)'s Sustainability Tracking And Reporting System (STARS). While both these reporting programs include all the United Nation's Sustainable Development Goals, they require submitting data on energy consumption, energy use intensity, greenhouse gas emissions and other metrics related to energy. The results have helped identify gaps and areas needing improvement as well as providing a benchmark to track progress over time.



Brock Earns Silver STARS Rating

THURSDAY, FEBRUARY 11, 2021 | By eharper



Blog Contributor: Mikellena Nettos

Brock recently held two Focus on Learning sessions to provide an "Introduction to Sustainability at Brock" for staff and faculty on January 28 and February 3. The main purpose of these sessions was to share our recent accomplishments related to [Sustainability at Brock](#). If you have not already heard, Brock recently obtained a [Silver rating from our first-ever STARS assessment by the Association for the Advancement of Sustainability in Higher Education \(AASHE\)](#)! The Sustainability Tracking, Assessment & Rating System (STARS) is a transparent, self-reporting framework for colleges and universities to measure their sustainability performance administered by AASHE.

Times Higher Education (THE) Impact Rankings



Brock was ranked in the top 300 of nearly 1,600 universities from 112 countries around the globe in the Times Higher Education (THE) Impact Rankings!

Appendix A

2022 and 2023 Reports

2022 DATA

Portfolio Manager Property ID	Property Name	Address	Property GFA - Self-Reported (m ²)	Natural Gas Use (GJ)	Site EUI (GJ/m ²)	Total (Location-Based) GHG Emissions Intensity (kgCO ₂ e/m ²)	Electricity Use – Grid Purchase (kWh)
25466028	Hamilton Campus	1842 King Street East, Hamilton L8K 1V7	6729	7299	1.52	57.9	810327.9
25466029	John Decew School Brock Research & Innovation Centre (BRIC)	130 Lockhart Drive, St. Catharines L2S 3A1	1604	947.7	1.02	33	190975
25466030	Main Campus - 573 Glenridge	573 Glenridge Ave, St. Catharines L2S 3A1	2979	1228.8	1.07	25.9	546077.9
25466031	Main Campus - Core Campus	1812 Sir Isaac Brock Way, St. Catharines L2S 3A1	210451	436754.8	2.25	105.7	10014675.6
25466032	Main Campus - East Academic 1	460 St David's Road, St. Catharines L2S 3A1	675	293.4	0.83	25	74641
25466033	Main Campus - East Academic 2	460 St David's Road, St. Catharines L2S 3A1	675	556.5	1.13	43.8	57396
25466034	Main Campus - East Academic 3	460 St David's Road, St. Catharines L2S 3A1	675	554.8	1.34	45.4	97555
25466035	Main Campus - Gateway Suites Residence	49 John Macdonnell Street, St. Catharines L2T 4E4	3675	346.7	0.5	7.9	415700.9
25466037	Main Campus - International Complex	4 John Macdonell Street, St. Catharines L2S 3A1	4280	1363	0.8	19.7	570620.9
25466038	Main Campus - Quarryview	5 John Macdonell Street, St. Catharines L2T 4E4	10773	3163	0.43	15.8	417915
25466039	Marilyn I Walker School of Fine and Performing Arts	15 Artists Common, St. Catharines L2R 4H8	8826	7592.7	1.36	47.1	1222591.5

2023 DATA

Portfolio Manager Property ID	Property Name	Address	Property GFA - Self-Reported (m ²)	Natural Gas Use (GJ)	Site EUI (GJ/m ²)	Total (Location-Based) GHG Emissions Intensity (kgCO ₂ e/m ²)	Electricity Use – Grid Purchase (kWh)
25466028	Hamilton Campus	1842 King Street East, Hamilton L8K 1V7	6729	3352.7	0.73	26.8	431481
25466029	John Decew School Brock Research & Innovation Centre (BRIC)	130 Lockhart Drive, St. Catharines L2S 3A1	1604	748.3	0.67	25.1	92771.7
25466030	Main Campus - 573 Glenridge	573 Glenridge Ave, St. Catharines L2S 3A1	2979	1136.5	1.04	24.3	548870
25466031	Main Campus - Core Campus	1812 Sir Isaac Brock Way, St. Catharines L2S 3A1	210451	428556.5	2.2	103.7	9651927.5
25466032	Main Campus - East Academic 1	460 St David's Road, St. Catharines L2S 3A1	675	290	0.86	24.9	80652
25466033	Main Campus - East Academic 2	460 St David's Road, St. Catharines L2S 3A1	675	540.7	1.05	42.2	46299
25466034	Main Campus - East Academic 3	460 St David's Road, St. Catharines L2S 3A1	675	526.3	1.27	43	92022
25466035	Main Campus - Gateway Suites Residence	49 John Macdonnell Street, St. Catharines L2T 4E4	3675	389.1	0.46	8.1	362056
25466037	Main Campus - International Complex	4 John Macdonell Street, St. Catharines L2S 3A1	4280	1405.3	0.82	20.3	585585.6
25466038	Main Campus - Quarryview	5 John Macdonell Street, St. Catharines L2T 4E4	10773	3601.6	0.47	17.9	420724
25466039	Marilyn I Walker School of Fine and Performing Arts	15 Artists Common, St. Catharines L2R 4H8	8826	7762.7	1.39	48.2	1243675.3
25466040	Schmon Pkwy Building	3401 Schmon Pkwy Thorold, L2V 5A8	8044	2145	1.03	19.4	1712611.5

Appendix B

Notes for the 2024-2029 ECDM Plan

NOTES FOR THE 2024-2029 ECDM PLAN

The implementation and staging of any of the proposed measures is subject to change in response to resource availability, technical feasibility, institutional priorities, or needs.

Estimated Cost of Proposed Energy Measures:

- All costs presented are high-level estimates, developed by Brock University using case-studies, consultant reports, data from current or past projects, feasibility studies, and engineering best practices;
- The costs calculated remain vulnerable to error and are subject to change due to unforeseen existing conditions, inflationary factors, and variations in details of the actual project scope;
- Costs presented as a range are meant to capture typical variations directly associated with the performance requirements (e.g., targeting different levels of a LEED® rating system), which will be determined by appropriate representatives from Brock on a project-by-project basis.

Estimated Annual Savings of Proposed Energy Measures:

- Savings identified in the plan represent a high-level estimate, developed by Brock University using case-studies, consultant reports, data from current or past projects, feasibility studies and engineering best practices;
- The estimates presented remain vulnerable to error and are subject to change due to unseen existing conditions, inflationary factors and variations in details of the actual project scope;
- Staging of the measures (e.g., year occurring, buildings) will affect the estimated annual savings. The estimates presented on the plan refer to a measure once fully deployed;
- Estimated savings are not to be used in the development of measurement and verification plans. A suitable measurement and verification approach, preferably in conformance with the International Performance Measurement and Verification Protocol (IPMVP) must be determined on a project-by-project basis;
- Using this document as a guide, Brock will refer to the goals presented to aid future development and monitor progress;
- The lifetime of a measure might be revised (i.e., extended or reduced) depending on the success achieved once the measure is implemented;
- Brock's efforts toward enhanced energy conservation, efficiency, demand management, and carbon reduction will not be limited to the measures identified above. Additional and/or different measures and projects supporting our institutional energy objectives will be incorporated/undertaken whenever feasible.

Appendix C

Glossary of Terms

GLOSSARY

Baseline - A minimum or starting point used for comparisons

Charter – A written constitution or description of an organization's functions

Chiller - A machine for cooling something, especially a cold cabinet or refrigerator

Co-generation - The generation of electricity and useful heat jointly, especially the utilization of the steam left over from electricity generation for heating

DEEP – District Energy Efficiency Project

District energy loop - The Hot/Chilled water distribution system that supplies heat or cooling to the connected buildings on campus

District energy System (DES) - The systems that generate the heating and cooling for the district energy loop. Eg. Chillers, boilers, etc.

EUI – Energy Use Intensity. Can be defined as the measurement of a building's annual energy consumption relative to its gross square footage

ECDM – Energy Conservation and Demand Management

Embedded Energy Manager - A position funded through the IESO and Save on Energy program whose mandate is to conserve energy

Energy Performance Scorecard - Part of the ECDM that is updated on a yearly basis to show progress against the goals laid out in the ECDM

Energy Transfer Skid - A heat exchanger/pump package designed to transfer heating from the district energy loop to the building for heating purposes

ESRC – Environmental Sustainability Research Centre

Experiential Training – Learning involving or based on experience and observation
Feasibility study - An assessment of the practicality of a proposed plan or method
FM – Facilities Management

HVAC – Heating, Ventilation, and air conditioning

Industrial Conservation Initiative - (ICI) is a form of demand response that allows participating customers to manage their global adjustment (GA) costs by reducing demand during peak periods. Consumers with an average peak demand of above 1 MW and up to and including 5 MW are eligible to opt-in to the ICI

LED – Light-Emitting Diode

LEED Certification – Leadership in Energy and Environmental Design which shows that a building was built aimed at achieving high performance in human and environmental health, location and transportation, sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality

Low-flow technology – Toilets, shower heads, and faucets that reduce the flow rate of water and reduce water usage

Procurement - The action of obtaining or procuring something

Retrofit - Add (a component or accessory) to something that did not have it when manufactured

Sustainability – Development that meets the needs of the present without compromising the ability of future generations to meet their own needs

Variable Frequency Drive – A type of motor controller that drives an electric motor by varying the frequency and voltage supplied to the motor

Brock University

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SSAS 5V83

CATALYZING BROCK UNIVERSITY'S SUSTAINABILITY TRANSITION

April 15, 2024

Prepared by:

Rebecca Anderson, Allegra Caballero,
Alison Laurie, Bridget Matthews, and
Jordan McNeillie

Executive Summary

This document presents the findings of an independent research study conducted by students in the Brock University Master of Sustainability program. This year, a five-year memorandum of understanding between Facilities Management and the Environmental Sustainability Research Centre (ESRC) has ended with no replacement or clear steps forward for a university sustainability plan. To address this, our study uses a systems thinking approach to analyze Brock University's current initiatives and sustainability initiatives at peer universities to make recommendations that can catalyze Brock University's sustainability efforts. Brock University is currently a leader on energy efficiency, but we propose to expand the University's vision for sustainability to be more holistic, with stronger engagement with students, staff, and faculty. This project addresses the key research question: how can Brock University achieve a sustainability transformation, and what might be the benefits of this transformation?

Methods

Data were gathered from ten Canadian universities through an online search. Current Brock University practices were reviewed through online searches and discussions with key staff members. A brief overview of systems thinking in operations management is also included, which provides insights into the benefits of adopting a systemic approach to increase the efficiency and adaptability of operations in a changing environment.

Findings

Why Sustainability?

Brock University is committed to integrating the Sustainable Development Goals (SDGs) in its activities and one of the university's guiding values is "sustainable, accountable, transparent stewardship" (Brock University, 2021). Striving for a more sustainable campus overall will increase the well-being of the campus community, help the university make good on its commitments, and can set Brock University up to be a leader in sustainability beyond its current leadership in energy.

Big Takeaway

Brock University lacks coordination for its sustainability activities, so a crucial medium-term recommendation is to create a position to coordinate sustainability activities across campus. In the short-term, two actions would be transformative: Brock University should initiate a student ambassador program and gain access to the Green Levy Fee administered by the Brock University Students' Union (BUSU). These two actions would catalyze student awareness and engagement in sustainability activities and provide a funding mechanism to coordinate and expand these activities.

Approach and Campus-Wide Coordination

This study finds that Brock University is a leader in sustainable energy practice among Canadian universities, but is not yet a leader in sustainability – and this is what we hope to

achieve. Our overarching recommendation is for Brock to use a systemic approach to thinking about sustainability – and one core component of that is to build relationships and find ways for the campus community to be involved in ongoing awareness-raising and planning activities toward sustainability. A crucial recommendation is the creation of Brock’s own sustainability office to provide coordination of sustainability activities campus-wide. This report provides advice on the key responsibilities of the office, a possible organizational structure, and potential sources of funding.

Student and Campus Engagement

Student engagement can be the core driving force behind successful campus sustainability. Strategies such as contests, waste reduction methods, student ambassador programs, in-course projects, and transportation initiatives. Key recommendations include:

- Running residence and/or campus-wide competitions that focus on the reduction of energy, waste, and water consumption, in addition to implementing programs to help students properly reuse, dispose of, and rehome unwanted items.
- Implementing student ambassador programs and project opportunities to allow students to engage in sustainability initiatives on campus while expanding their networks, building their resumes, and developing new skills.
- Adopting ride-share or e-scooter share programs to increase transportation sustainability on campus.

Key Next Steps for the Coming Year

Our report outlines various steps that Brock University can take in the coming year to increase student engagement and enhance sustainability initiatives on campus. Key recommendations include:

- Adopting a systems thinking approach to campus operations
- Establish a dedicated sustainability office
- Implement the findings from this study to enhance student engagement

Conclusion

This report provides insights about implementing best practices in sustainability and student engagement at universities across the country. The findings from this study can help to reimagine current sustainability initiatives on campus, increase student engagement, enhance students’ experiences on campus, and benefit the institution’s finances, public image, and contribution to the SDGs. By adopting the recommendations we suggest, we envision that Brock University will continue to succeed not only as an energy innovation leader, but also as a sustainability leader in Canada.

ADD TO 24/25 WORKPLAN																			
COMPLETED																			
2023-24 CAPITAL INFRASTRUCTURE COMMITTEE WORK PLAN										Academic & student experience	Research	Community engagement	Inclusivity, accessibility, reconciliation and decolonization	General institutional advancement	Financial sustainability				
TITLE	LEAD	CYCLE	ACTION (Info, Rec or Dec)	TYPE (Key, Consent)	ATTENDING	BRIEF SUMMARY	OUTCOME SOUGHT	NOTES											
FORESIGHT (based on people strategy (i.e. where are we headed, what is on the horizon))																			
Utilities Portfolio Update	J. Guarasci S. Johnstone	2	Info	Consent	M. Quintana	Provide an update on the performance and strategies for natural gas, electricity, water and carbon.	Report on results, present strategies to contain operational costs, identify upcoming risks and opportunities.							x					
Brock Land Use Master Plan	J. Guarasci S. Johnstone	2	Info	Key IC					x					x					
Campus Space Plan - Final Report	J. Guarasci S. Johnstone	3	Info	Key		To provide the Committee with updates on the University's plan for land usage, consistent with the Committee Charter and reporting requirements.	For information and feedback.	also to FPI	x				x						
2023-24 BUFP Audited Financial Statements	L. Wells / J. Tonnos	1												x					
Sustainability Update	J. Guarasci S. Johnstone	5	Info	Key	M. Quintana	Update on current initiatives and results achieved on sustainability and environmental topics.	Increase awareness of sustainability and climate change as an opportunity for Brock to differentiate and attract/retain talent.			x				x					
OVERSIGHT (current topic; reviewing topic to make things look good)																			
2022-23 Capital Infrastructure Committee Work Plan	Chair S. Johnstone	1	Dec	Key		Inventory of reports brought to the Committee over the next cycle.	To assist CIC in meeting their Charter obligations.			x				x					
2023-24 Review of CIC workplan status update	S. Johnstone	5	Info	Key															
2024-25 Capital Plan	L. Wells J. Tonnos J. Guarasci S. Johnstone	2, 4	Dec	Key		To provide Committee members with the final 2024/25 Capital Plan for approval for the period. These projects facilitate the University's mission of leadership, innovation and excellence in learning, teaching, research, scholarship, and creativity across disciplines. A snapshot of 5 year long-term capital plan by area: ITS, Campus, Ancillary Services.	Approval of the following years Capital Plan within the fiscal framework.	also to FPI		x				x					

Metrics		1, 2, 3, 5	Info	Consent		An update on the activities in FM and ITS.	Provide the Committee with information on the summary of activities in FM and ITS.				X			
T1/T2/T3 Financial Update on Capital and Related Projects	L. Wells/J. Guarasci S. Johnstone J. Tonnos E. Wall G. Ahn	1, 3, 5	Info	Key	S. Strban	To provide the Committee with updates of the active Capital and Related Projects, consistent with the Committee Charter and reporting requirements. The number of projects, area and the remaining dollars to spend.	For information and feedback.		X		X			X
Major Capital Projects Update - FM	J. Guarasci S. Johnstone	1, 2, 3, 5	Info	Key	S. Strban	General reporting on schedule and budget for all current major capital projects.	Update provided for information only.		X	X	X			X
Burlington Campus Updates	J. Guarasci S. Johnstone	3	Info	Consent IC		General reporting on schedule and budget.			X	X			X	X
Litigation Update	C. Colebatch S. Johnstone	1	Info	Key IC		update on litigation concerning Lockhart Drive lands	litigation concerning Brock lands			X				X
Five Year Long-Term Capital Plan Outlook - FY2023-2024 to 2027-2028	J. Guarasci S. Johnstone	1	Info	Key										
ITS Major Projects (MP) Updates:	J. Guarasci G. Ahn	2,3,5	Info	Key IC		Updates on key projects across ITS that have a direct impact on Brock University	Inform the committee on the progress of key projects and initiatives across Brock.		X					X
<i>HINDSIGHT (historical reporting)</i>														
Energy Conservation and Demand Management - Annual Update & Scorecard	J. Guarasci S. Johnstone D. McArthur M. Quintana	3	Info	Consent	D. McArthur M. Quintana	Update on KPIs related to energy and carbon, including regulatory changes (e.g., program changes, reporting requirements).	Inform about progress on institutional plans, targets and mandatory requirements related to energy and carbon.							X
FCI & Deferred Maintenance Update	J. Guarasci S. Johnstone D. McArthur M. Quintana	5	Info	Key	D. McArthur M. Quintana	Present current and past status of Brock's assets and their condition.	Identify needs and provide situational awareness of facilities' condition and deferred maintenance.		X	X				X

Report to the Capital Infrastructure Committee

INFORMATION ITEM

TOPIC: T3 Financial Update on Capital and Related Project Plan

June 26, 2024

Josh Tonnos, Chief Financial Officer & Associate Vice-President, Financial Services
Scott Johnstone, Senior Associate Vice-President, Infrastructure and Operations
Gemma Ahn, Associate Vice-President & Head of Information Technology Services

EXECUTIVE SUMMARY

1. Purpose of the Report

- Provide the Capital Infrastructure Committee with the trimester three update of the Capital and Related Projects, consistent with the Committee Charter and reporting requirements.

2. Key Background

- Currently there are 89 open projects: 47 FM, 11 Residence and Ancillary, and 31 ITS. **Appendix 1 - Figure 1** illustrates the activity with respect to the number of projects.
- A breakdown of the Facilities Management, Residence and Ancillary, and Information Technology Services projects by category identifies a total of \$36 million dollars remaining to spend.
 - The FM project funds remaining to spend is \$23.7 million, such as the Research Farm (\$8.4 million), District Energy System Electrification (\$5.7 million), and 3401 Schmon Parkway (\$0.9 million fit-up funds available from the external financing obtained to purchase the property).
 - The Residence and Ancillary funds remaining to spend is \$4.4 million, such as the Residence Infrastructure Renewal (\$0.9 million).
 - The ITS project funds remaining to spend is \$8.3 million, such as the Student Information System (\$1.3 million), Burlington Bateman ITS (\$1.5 million), and the Learning Management System (\$0.2 million).

Appendix 1 - Figure 2 illustrates the activity with respect to the type and dollar amount of projects by FM, Residence and Ancillary, and ITS.

3. Next Steps

- As this report serves as an update on project activity, the next step will be another update of capital and related projects to be presented in Cycle 1.

4. Background Materials

- Appendix 1 - T3 Financial Update on Capital and Related Project Plan (1 page)

Figure 1: Status of Capital Projects as of April 30, 2024

	Facilities Management	Residence and Ancillary Services	Information Technology Services
Total projects open to April 30, 2023	74	13	41
Projects opened to April 30, 2024	6	2	0
Projects closed/completed to April 30, 2024	33	4	10
Total projects open to April 30, 2024	47	11	31

Figure 2: Capital and Related Project Summary (By Category) (000's)

Project	Revenue / Funding	Spending to April 30, 2024	Remaining to Spend
Facilities Management			
AODA* Projects	330	79	251
Above surface/sub surface utilities, drainage, roads, parking lots, sidewalks	1,064	130	934
Audits and studies	800	397	403
Buildings	8,599	3,874	4,725
Energy conservation and demand management	7,374	1,307	6,067
Major capital projects	9,462	145	9,316
Vehicles and equipment	722	232	490
FM - surplus/deficit	1,529	-	1,529
Total Facilities Management	29,879	6,163	23,715
Ancillary Services			
Above surface/sub surface utilities, drainage, roads, parking lots, sidewalks	415	311	105
Adaptations/renovations and major renewal projects	551	55	496
Buildings	6,980	3,901	3,079
Ancillary - surplus/deficit	683	-	683
Total Ancillary Projects	8,629	4,266	4,363
Information Technology Services			
Enterprise software projects	9,124	5,995	3,130
Hardware evergreening projects	1,939	529	1,410
Hardware growth projects	2,189	100	2,089
IT infrastructure projects	1,803	370	1,433
IT - surplus/deficit	194	-	194
Total Information Technology Services	15,249	6,994	8,255
Total Capital and Related Projects	53,757	17,424	36,333

*AODA -Accessibility for Ontarians with Disabilities

Report to the Capital Infrastructure Committee

INFORMATION ITEM

TOPIC: Major Capital Projects Update - FM

June 26, 2024

Jennifer Guarasci, Vice-President, Administration (Interim)
Scott Johnstone, Associate Vice-President, Infrastructure and Operations
Susan Strban, Director, Capital and Financial Management, Facilities Management

EXECUTIVE SUMMARY

1. Purpose of the Report

- The purpose of this report is to provide Committee members with an overview of key Facilities Management (FM) and Ancillary Services projects aligned with the University's strategic priority of ***offering a transformational and accessible academic and university experience***.
- These projects, as well as others that FM is working on, all continue to enhance and strengthen the University's environment and help facilitate the University's mission of leadership, innovation and excellence in learning, teaching, research, scholarship, and creativity across disciplines.

2. Key Background

- There are currently three active major capital projects underway:
 - Major upgrades to the District Energy System (DES), including a new boiler, heat pump, piping retrofits and overall optimization of control sequences to reduce Brock's carbon emissions by up to 67% and save \$5M in carbon costs by 2030.
 - Design of Engineering space at 3401 Schmon Parkway, including administrative offices and support space, teaching labs, graduate student space needs, and research labs.
 - Construction of a Research Farm on Merrittville Highway, including greenhouses, screen houses, an aviary, a vineyard, and a research facility.

Projects	Budget
District Energy System Electrification	\$ 6,500,000
Engineering at 3401 Schmon Parkway	\$ 1,049,692
Research Farm	\$ 8,412,285

- Project details follow in Appendices 1 to 3
- Market conditions continue to have a significant impact on Brock projects, including those identified above.

3. Next Steps

- Continue to manage the construction process and to identify and mitigate any potential risks where possible to maintain project budget and schedule.

4. Background Materials

Appendix 1 - District Energy System Electrification (1 page)

Appendix 2 - Engineering at 3401 Schmon Parkway (1 page)

Appendix 3 - Research Farm (1 page)

Appendix 1 - District Energy System Electrification

Project Status Update

Project Description:
 The District Energy System (DES) Electrification includes installing an electric boiler at Welch Hall, installing a heat pump in CAIRNS, recovering heat waste from the CAIRNS- steam boiler for mechanical equipment, piping retrofits at Schmon Tower, Decew Residence, Welch Hall, Thistle Complex and Student Centre to supply the DES, and the optimization of control sequences DES and satellite generation assets. The goal of the project is to reduce Brock's carbon emissions by up to 67% thus reducing future costs of carbon by more than \$5M by 2030.

Impact: Students, faculty, staff, and the Brock community.

Status/Issues:
 Equipment has been ordered.

Upcoming Milestones:
 Delivery of equipment and construction mobilization.

Schedule

	Original	Current
Engineer	March 2023	March 2023
Retain Contractor(s)	March 2024	May 2024
Construction Commencement	April 2024	May 2024
Substantial Performance	March 2025	March 2025

Budget

Budget	\$6,500,000	
Actuals	\$807,880	
Commitments	\$1,679,988	
Forecasted Future Spend	\$4,012,132	
Total Projected Cost (estimate)	\$6,500,000	
Variance to Budget	\$0	0.0%

Note: Project funding is current and prior years capital (\$3.6M) and a grant from the Ministry of Environment (\$2.9M).

Project Team

Facilities Management Engineer General Contractor	Drew Cullen, Manager, District Energy Equinox Strategies Inc. Modern Niagara
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Appendix 2 – Engineering at 3401 Schmon Parkway

Project Status Update

Project Description:
 The property at 3401 Schmon Parkway provided the opportunity for Brock to consider various options to accommodate its short-term and future space needs, including those of the Yousef Haj-Ahmad Department of Engineering. A feasibility design was prepared demonstrating scalable options to meet Engineering’s needs for administrative office and support space, teaching labs, graduate student space needs, and research labs. Further detailed development of phased designs is underway.

Impact: Students, faculty, staff, and the Brock community.

Status/Issues:
 Architect has been retained.

Upcoming Milestones:
 Continue with detailed design of phase 1.

Schedule

	Original	Current
Retain Architect	November 2023	November 2023
Retain General Contractor	TBD	TBD
Construction Commencement	TBD	TBD
Occupancy	August 2025	August 2025

Budget

Budget/Funding	\$1,049,612	
Actuals	\$64,631	
Commitments	\$984,981	
Forecasted Future Spend	\$0	
Total Projected Cost (estimate)	\$1,049,612	
Variance to Revised Budget	\$0	0.0%

Note: Project funding is from external financing obtained to purchase the property. Project budget is still being developed.

Project Team

Facilities Management Engineering Dept Architect General Contractor	John Rizzo, Senior Project Manager Shahryar Rahnamayan Architects Tillman Ruth Robinson Inc. TBD
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Appendix 3 – Research Farm

Project Status Update

Project Description:

The Clean Agriculture for Sustainable Production (CASP) Field Infrastructure will be a world-leading, farm-based research centre. This Research Farm will provide researchers with the facilities required to: i) advance clean plant research and sustainable agriculture from the fundamental stages of innovative, tissue-culture based plant propagation in protective settings to applied field research for high throughput sequencing-based screening for pathogens; ii) propagate plants free from disease in natural and mixed agricultural settings; iii) understand these interactions at the landscape level; and iv) apply this knowledge to urban areas and other ecosystems.

Impact: Students, faculty, staff, and the Brock community.

Status/Issues:

Architect has been working with researchers to continue with design.

Upcoming Milestones:

Finalize design and begin equipment selection.

Schedule

	Original	Current
Retain Architect	January 2024	January 2024
Retain Contractor	TBD	TBD
Construction Commencement	TBD	TBD
Substantial Performance	TBD	TBD

Budget

Budget	\$8,412,285	
Actuals	\$75,899	
Commitments	\$313,281	
Forecasted Future Spend	\$8,023,106	
Total Projected Cost (estimate)	\$8,412,285	
Variance to Budget	\$0	0.0%

Note: Project budget excludes \$499k of in-kind contributions.

Project Team

Facilities Management	Braden Day, Project Manager, CPPM
Research	Sudarsana Poojari, Principal Scientist & Jim Willwerth, Assistant Professor
Architect	Cianfrone Architect Inc.
General Contractor	TBD

Report to the Capital Infrastructure Committee

INFORMATION ITEM

TOPIC: FCI & Deferred Capital Renewal & Major Maintenance Update

June 26, 2024

Jennifer Guarasci, Vice-President, Administration (Interim)

Scott Johnstone, Senior Associate Vice-President, Infrastructure & Operations

EXECUTIVE SUMMARY

1. Purpose of the Report

- The purpose of this report is to provide an annual update on Brock's Facility Condition Index (FCI) & Deferred Capital Renewal and Major Maintenance (DCRM) data.
- In doing so, this report seeks to raise awareness regarding the need to continue investing in the renewal of Brock's infrastructure and buildings.

2. Key Background

- 'Deferred Capital Renewal & Major Maintenance' (DCRM) refers to the backlog of unfunded major maintenance and renewal projects (meant for the restoration of facilities that have reached the end of their life cycle or have become obsolete) that have been deferred to future budgets.
- The 'Facility Condition Index' (FCI) is a benchmark used to assess the current and projected condition of a building or facility. FCI is calculated by dividing DCRM (i.e., needs over the next 5 years) by the Current Replacement Value (CRV) of the facility or group of like facilities (e.g., Residences). The higher the FCI, the worse the condition of an asset is deemed to be.
- In 2024, the Ontario Association of Physical Plant Administrators (OAPPA) adopted the following grid to define FCI levels:
 - 0% to 10% - Good
 - 10% to 15% - Fair
 - 15% to 30% - Poor
 - 30% to 60% - Critical
 - 60% to 100% - Crisis
- The following table summarizes the recent data on key indicators as defined above with respect to Brock.

Date	May-19	May-20	May-21	May-22	May-23	May-24
FCI	0.2	0.22	0.26	0.22	0.25	0.23
DCRM Value	\$195,205,345	\$295,129,561	\$330,020,597	\$314,788,542	\$385,390,312	\$388,018,864
CRV Value	\$999,281,238	\$1,343,481,892	\$1,253,424,861	\$1,434,413,001	\$1,531,324,047	\$1,717,352,100
	FY 19/20	FY 20/21	FY 21/22	FY 22/23	FY 23/24	FY 24/25
DCRM - Annual Capital Budget	\$6.0M	\$3.0M	\$9.1M	\$8.9M	\$9.2M	\$4.1M

- Here, we can see that:
 - FCI has fluctuated over this time period since 2019.
 - DCRM has generally increased, with the exception of the time period from 2021 to 2022.
 - CRV has generally increased, with the exception of the time period from 2020 to 2021.
 - The DCRM annual capital budget has fluctuated in accordance with the University’s budgetary needs in any given year.
- Even though the CRV has increased through new construction and inflation, the DCRM has continued to accumulate due to constraints in the capital budget.
- Brock’s DCRM is expected to reach \$824 million by 2034 (assuming a \$60 million investment over the next 10 years, as outlined in the University’s current Fiscal Framework). This concerning situation is not unique to Brock, as universities across the province work to avoid a scenario where numerous core assets (i.e. classrooms, labs, buildings) would be unusable.
- This situation is compounded by the current political climate, as capital renewal and DCRM often rely on dedicated funding from the provincial and federal governments. These sources are becoming increasingly essential given the University’s broader financial situation and competing budgetary priorities.
- The Canadian Association of University Business Officers (CAUBO), in its report titled “Point of No Return”, identified risks associated with unchecked DCRM. These include: negative impact to reputation (e.g., service disruptions), detriment to the student experience, higher costs to repair (i.e., emergency repairs being more expensive than planned repairs), health and safety risks to people and animals, as well as externally imposed regulatory influences. Furthermore, studies have shown that when a building’s deferred capital renewal or maintenance problems are left unattended for too long, at times the only cost-effective solution becomes the demolition and replacement of a building.
- Leveraging current and future carbon reduction projects to access federal funding (i.e., Canada Infrastructure Bank) could prove an effective approach

to unlock resources to address DCRM, which will be explored over the coming months.

3. Next Steps

- Continue to monitor the situation closely, including through Campus Building Assessments, which assess all buildings and infrastructure on a five-year rotation.
- Over the next three months, investigate alternative funding mechanisms (e.g., Energy as a Service) to leverage different needs while addressing DCRM, the findings of which will be reported back to this Committee before the end of 2024.

4. Background Materials

- None



MINUTES OF MEETING #4 - CYCLE 4 (2023-2024)

CAPITAL INFRASTRUCTURE COMMITTEE

THURSDAY, MAY 2, 2024, 11:00 AM

IN PERSON (SANKEY CHAMBER) AND REMOTELY VIA MICROSOFT TEAMS

MEMBERS

PRESENT: Rob Welch (Committee Chair), Kevin Magee (Vice-Chair), Mark Arthur, Anteneh Ayanso, Nyarayi Kapisavanhu, Kristian Knibutat, Brian Lang, Anne McCourt, Matthew Melnyk, Anusha Pahuja, Lesley Rigg

REGRETS: Stephanie Thompson, Debbie Zimmerman, Tim Kenyon (resource)

KEY

RESOURCE: Jennifer Guarasci, Scott Johnstone, Michelle McGinn, Yvonne Roussel, Meaghan Rusnell, Margaret Thompson

ALSO

PRESENT: Invited staff members during specific agenda items and other members of the Brock community

1. Call to Order

The Committee Chair welcomed members and staff, called the meeting to order and provided a land acknowledgement.

2. Declaration of Conflict of Interest

There were no conflicts of interest declared to any matter on the Agenda.

3. Approval of the Agenda

The Committee Chair referred members to the Agenda and confirmed that there were no items to be lifted from the consent portion.

On a motion by Trustee Lang, seconded by Trustee Arthur and carried, it was

RESOLVED that the Agenda, including consent items, be approved.

4. Business Arising from the Minutes - None

5. 2024-2025 Capital and Related Projects Plan

[A Decision Item *TOPIC: 2024-2025 Capital and Related Projects Plan* dated May 2, 2024 had been posted with the meeting materials together with Appendix 1 - 2024-25 Capital and Related Projects Plan.]

The Vice-President, Administration introduced the Report and provided highlights of the proposed plan. During discussion, the Associate Vice-President, Operations and Infrastructure clarified a matter raised regarding the classification of deferred capital renewal and maintenance projects.

On a motion by Trustee Magee, seconded by Trustee Arthur and carried, it was

RESOLVED that the Capital Infrastructure Committee approve the Fiscal Year 2024-2025 Capital and Related Projects Plan presented in Appendix 1 of the Report to the Committee, subject to funding approval from the Board of Trustees.

6. In Camera Record of Proceedings of the Previous Meeting - *In camera*
[The confidential Record of the *In camera* Session of the previous meeting had been posted with the meeting materials.]

The confidential Record of the *In camera* Session from the previous meeting held on March 6, 2024 had been approved by consent.

7. Minutes of Previous Meeting
[The Minutes of the previous meeting had been posted with the meeting materials.]

The Minutes of the previous meeting held on March 6, 2024 were approved by consent.

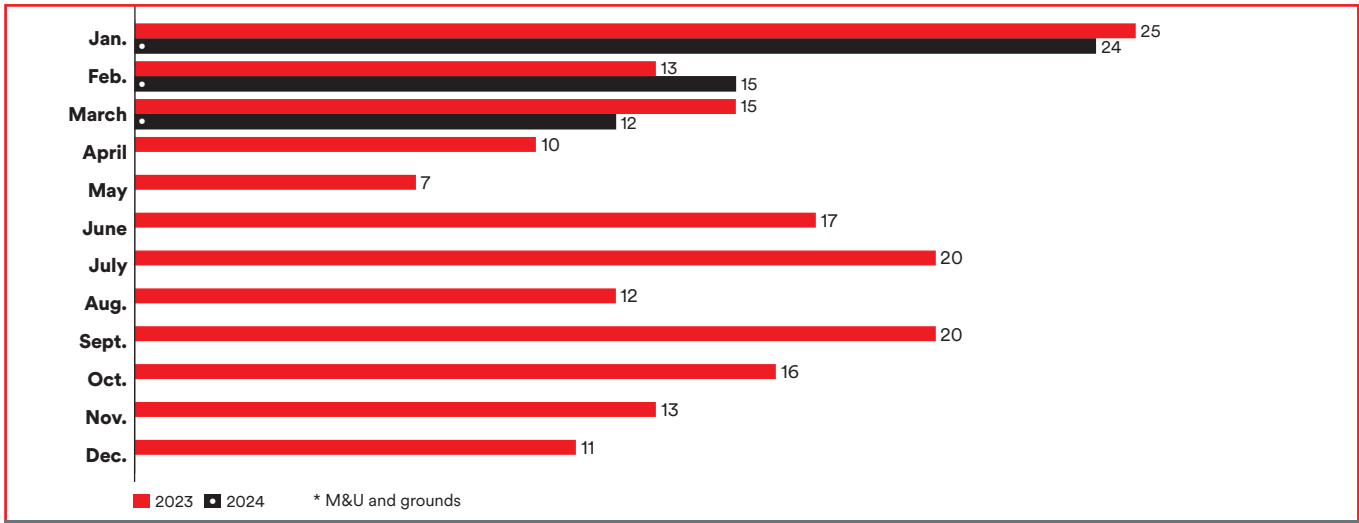
8. Other Business - None

9. Adjournment

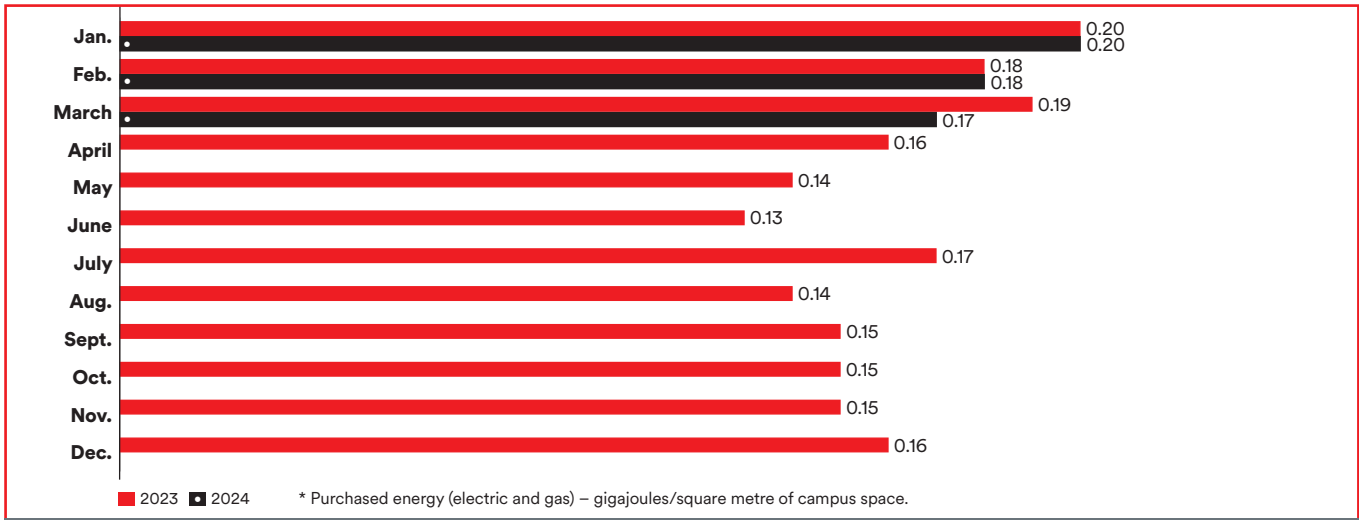
The meeting adjourned at 11:16 a.m.

Facilities Management scorecard

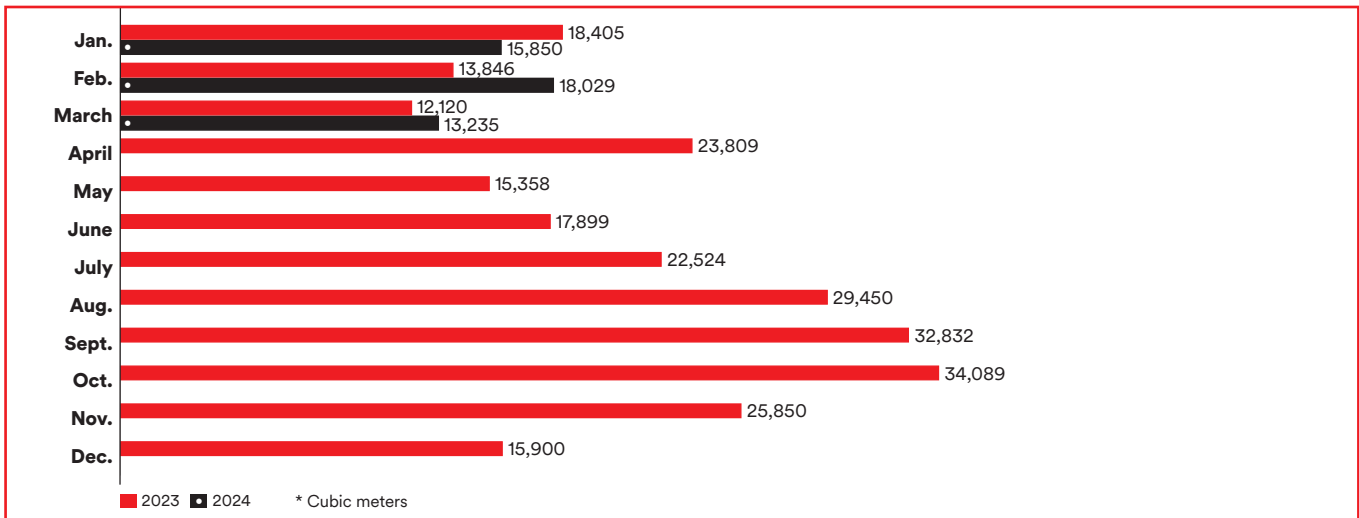
Number of emergency/after hour call-ins*



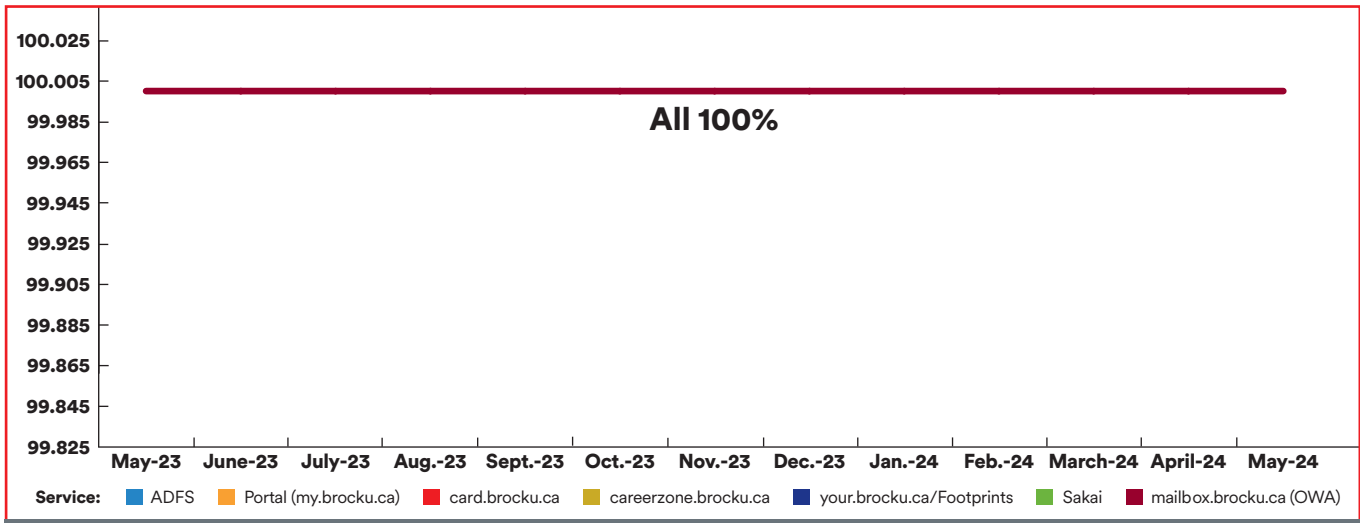
Energy intensity (GJ/M2)*



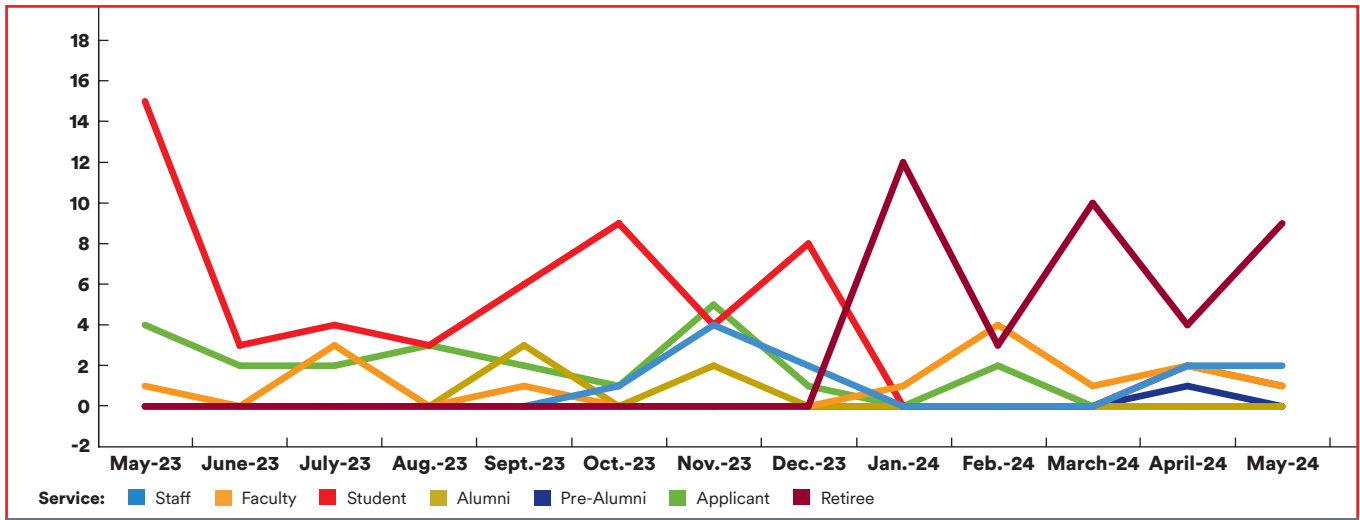
Water consumption (M3)*



Web application availability (May 2023 to May 2024)



Compromised accounts (May 2023 to May 2024)



Firewall threats by month (May 2023 to May 2024)

