Opportunities for Innovation:

Applied Research Partnerships between Municipalities and Post-Secondary Institutions

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Key Terms

Applied Research - Applied research is a type of research that attempts to find practical solutions to existing problems. These can include a variety of challenges, such as infrastructure and conservation. This type of research employs empirical methodologies, such as experiments, to develop an understanding of new knowledge. In the context of this report, applied research refers to both work-integrated learning and research services.

Applied Research Partnerships (ARPs) – Partnerships between post-secondary institutions (PSIs) and organizations that utilize applied research to enhance research and development at the organization. Partnerships are hinged on the collaboration between organization employees and PSI faculty and students. Often motivated by the industry's need for innovation, ARPs help provide a space for meaningful collaboration on projects towards enhanced development.[1]

Post-secondary Institutions (PSIs) - Organizations that provide education beyond k-12. PSIs are also known as "higher education" or "tertiary education." Each province and territory ensure that schools and programs meet specific standards. Accredited PSIs can grant certificates, diplomas, degrees, and other qualifications. In Canada, there are 3 different types of postsecondary school, including universities, colleges, and institutes.

Platform – The tools used to deliver and facilitate the programming of city and post-secondary partnerships regarding research services and Work-Integrated Learning.

Programming – The standardization and implementation of work-integrated learning and research service initiatives between cities and post-secondary institutions.

[1] "Guide to Research Partnerships with Canada's Colleges and Polytechnics," Business + Higher Education Roundtable, accesses August 11, 2023. https://bher.ca/sites/default/files/documents/2020-08/Research-Partnerships-Guide-Colleges-Sept.pdf

Research Services (RS) – Describes the relationship between cities and post-secondary institutions, whereby cities leverage post-secondary research capacities (students and faculty) and resources to understand local trends and phenomena. Utilizing RS projects allows for a more in-depth understanding of issues and opportunities regarding community, policy, sustainability, and more at municipalities.

Work-Integrated Learning (WIL) - a form of circular experiential learning. WIL integrates a student's academic training with hands-on experiences in a practical setting. WIL relies upon a strong partnership between the academic institution, the host organization and supervisor, and the student.

Types of work-integrated learning:

- **Applied Research:** Also known as "Community and Industry Research and Projects." In this experience, students are engaged in research occurring primarily within the workplace. This includes consulting on projects, designs, and community-based research.[2]
- **Applied Studies:** These are customized WIL courses that allow students to earn academic credit for combining work (paid or volunteer) and academic studies.[3]
- **Apprenticeship:** These educational programs are typically used for trades credentials. An apprenticeship is a combination of on-the-job paid training by their employer and short periods of classroom learning.[4]

[2] "Work-integrated Learning," CEWIL Canada, accessed July 24, 2023, https://www.cewilcanada.ca/CEWIL/CEWIL/About-Us/Work-Integrated-Learning.aspx?hkey=ed772be2-00d0-46cd-a5b8-873000a18b41
[3] "Applied Studies," University of Lethbridge, accessed July 24, 2023, https://www.ulethbridge.ca/career-bridge/applied-studies
[4] "Work-integrated Learning," CEWIL Canada.

- **Co-operative Education (Co-op):** Students engage in full-time employment opportunities in their field of study. Co-ops range between alternating work semesters with academic semesters, and work placements whose semesters take place back-to-back.[5] Co-ops are generally not for course credit in an academic program and are rather solely a work term for students. In Canada, the completion of three co-op work terms awards students with co-op designations on their degrees, indicating that they are work-ready upon graduating from post-secondary.[6]
- **Field Placement:** Students are enrolled in an intensive short-term practical experience related to their field of study. Field placements may, or may not, require supervision of a registered or licensed professional and the completed work experience hours are not required for professional certification. Field placements account for work-integrated educational experiences not encompassed by other forms, such as co-op, clinical, practicum, and internship.[7]
- **Internships:** Usually offers one discipline-specific, supervised, structured paid or unpaid, and for academic credit work experience or practice placement. Internships may occur in the middle of an academic program or after all academic coursework has been completed and prior to graduation. Internships can be of any length but are typically 12 to 16 months long.[8]
- **Mandatory Professional Practicum/Clinical Placement:** Involves work experience under the supervision of an experienced registered or licensed professional (e.g., preceptor) in any discipline that requires practice-based work experience for professional

[5] "Work-integrated Learning," CEWIL Canada.
[6] "Work-integrated Learning," CEWIL Canada.
[7] "Work-integrated Learning," CEWIL Canada.
[8] "Work-integrated Learning," CEWIL Canada.

licensure or certification. Practicums are generally unpaid and, as the work is done in a supervised setting, typically students do not have their own workload/caseload.[9]

- **Service Learning:** Integrating community service with classroom instruction and critical reflections to enhance the learning experience while also contributing positively to the community. This work is often unpaid and in partnership with a community-based organization, such as charities and non-profits.[10]

1.0 Introduction

As Canada continues to grow its creative and knowledge-based economic sectors, there is increasing importance regarding the relationships between municipalities and their local post-secondary institutions (PSIs). This has led to a rise in programming that focuses on building stronger long-term relationships between cities and local PSIs. For this research paper, we are interested in understanding City-PSI partnership programming that utilizes research services (RS) and work-integrated learning (WIL) to enhance innovation within cities, known as Applied Research Partnerships (ARPs). WIL opportunities offered through City-PSI ARPs provide students with hands-on career training, with the aim of developing and fine-tuning their skills, as well as transferring their academic knowledge to a workplace setting. In relation, RS relationships harness the resources and labour of the PSI, promoting "faculty and students to apply their expertise to city-driven research projects and to co-develop solutions based on community participation and dialogue."[11] For post-secondaries, ARPs create a greater access to

[9] "Work-integrated Learning," CEWIL Canada.
[10] "Work-integrated Learning," CEWIL Canada.
[11] "Researcher-in-Residence program gets early national recognition," Thompson Rivers University, accessed May 3, 2023. https://inside.tru.ca/2022/06/20/researcher-in-residence-program-gets-early-national-recognition/

community as well as provide an opportunity for faculty and researchers to "ground-truth" theoretical work and increase research specialization.[12]

ARPs between cities and PSIs have created unique and innovative program development initiatives, ranging from how projects are proposed, what kinds of projects are taken on, and how applied research is facilitated between cities and PSIs. Program development of City-PSI ARPs looks different for each city, spanning across a multitude of platforms and models. The broad nature of program development brings distinctive opportunities and challenges regarding implementation and facilitation of WIL and RS programs between cities and PSIs. With the considerations of the multiple stakeholders in ARPs, examples and models of City-PSI WIL opportunities are increasing, accounting for the unique needs of both cities and PSIs.

2.0 Models, Approaches, and Program Facilitation

Many PSIs offer applied research programming, including the University of Lethbridge (U of L). However, in the context of City-PSI partnerships, many RS and WIL at PSIs lack a solid established relationship with a city, resulting in limited opportunities for projects and collaborations to flow back and forth. In this model, RS depends on the external partners of the PSI (i.e., municipalities, community members, commercial partners, organizations, etc.) to propose projects to the PSI in order to match their project to a researcher.[13] The projects focus on co-designed and co-led initiatives that seek to address complex issues within communities, providing community partners with the expertise and knowledge to address the issue, empowering researchers to enhance their research interests, and building student workplace and

[12] J.M. Santos, H. Horta, and H. Luna, "The relationship between academics' strategic research agendas and their preferences for basic research, applied research, or experimental development," *Scientometrics* 127, (2022): 4191-4225. https://doi.org/10.1007/s11192-022-04431-5

[13] "Partner with a Researcher," Wilfrid Laurier University, accessed May 9, 2023. https://www.wlu.ca/academics/research/partnerships/partner-with-a-researcher/index.html

research competencies with hands-on experience.[14] Although this example provides access to services, it is limiting in its scope as it is dependent on a one-way relationship. Emerging models of City-PSI ARPs go further, building an understanding of the processes and parameters that make the relationship strong, often addressed and formalized through a Memorandum of Understanding (MoU).

Existing models of successful City-PSI applied research initiatives build upon the need for co-creation in projects, promoting that the students, researchers, and City staff involved are all equal pieces to the development of the project, from its initial ideation to its final outputs.[15] We can use the "Three-Legged Stool"[16] metaphor to portray the importance of the three integral supports - students, faculty, and city staff - to the stability and support of ARPs between PSIs and cities. Approaches to WIL and RS initiatives can take many forms depending on the programming of the City-PSI partnership and who is involved, further accounting for place-based and context-specific development arising from the differed partnerships that exist between cities and PSIs.

2.1 Researcher-in-Residence Partnership Model

An innovative approach to City-PSI applied research programming is that of Researcher-in-Residence (RiR) initiatives between municipalities and PSIs. Thompson Rivers University (TRU) in Kamloops, BC, employs a postdoctoral fellow to work closely with both the City and the university in the institution's RiR programming. The RiR initiative seeks to work with the

[14] "Partner with a Researcher," Wilfrid Laurier University.
[15] "About Us," CityStudio, accessed May 5, 2023. https://citystudiovancouver.com/what-we-do/

[16] Daniel Samosh, "The Three-Legged Stool: Synthesizing and Extending Our Understanding of the career Advancement Facilitators of Persons with Disabilities in Leadership Positions," *Business & Society* 60, no. 7 (2021):1773-1810. https://doi-org.uleth.idm.oclc.org/10.1177/0007650320907134

City of Kamloops in order to understand their research needs and facilitate quality applied research opportunities. Building a relationship between TRU and the City of Kamloops, the RiR program engages in community-based research initiatives that enable students and faculty to get involved in research that impacts their community. For the City, an RiR partnership is beneficial as it provides access to a wealth of PSI knowledge and resources that are well equipped to address the City's challenges.[17] Facilitation of the RiR program is supported and formalized by the MoU signed between the City of Kamloops and TRU.[18] Establishing the postdoctoral fellow as the point of contact at the university, backed by their team of research assistants, bridges the partnership between the Kamloops and TRU. The channels for relationship-building are personal and collaborative, enhancing the possibilities of new innovations as the partnership between TRU and the City of Kamloops continues to grow and strengthen.

The RiR initiative utilizes a program-based approach to applied research with the City, rather than a project-based approach. A program-based approach intends to create a more sustainable and long-term relationship through thoughtful coordination of projects, including resources and labour.[19] Programmatic relationship building views the projects and collaboration of applied research as an ongoing opportunity for partnership, rather than project-based approaches which usually have a definitive end and are temporally confined. Although predicated on a collaborative and equal partnership, there is a lack of information about the mutual benefits of the TRU and the City of Kamloops ARP. The narrative of the RiR program more so reflects the benefits for the City of Kamloops, as opposed to additionally highlighting

[17] *"Researcher-in-Residence program gets early national recognition," Thompson Rivers University*

[18] "TRU, City, Mitacs launch Researcher-in-Residence program," Thompson Rivers University, accessed May 8, 2023. https://inside.tru.ca/2021/02/05/tru-city-mitacs-launch-researcher-in-residence-program/

[19] TRUResearch, "TRU Researcher in Residence (RiR)" YouTube, January 1, 2022, 4:35 to 4:56 https://www.youtube.com/watch?v=X1H_H5A20-g&ab_channel=TRUResearch

the benefits of an ARP to the researchers, faculty, students, and PSI as well. This appears in contradiction to the program's collaborative approach and business model, seemingly upholding the benefits of applied research for the City and not for the PSI.

The City-PSI partnership at TRU is established as "both a person… and a model."[20] Due to the personalization of the program to an individual researcher, the initiative appears to be limited in the standardization of project development. However, this may potentially increase the flexibility of research projects, accounting for the ebb-and-flow nature of research. In addition, the RiR is granted the freedom and agency to make the programming individually distinct to them, which could be interesting in the long-term of the program if new post-doc fellows enter the role of the RiR, for they have the ability to alter the programming and types of projects developed between the PSI and the City. In other words, the RiR has the ability to make the programming and the development of the initiative unique to themselves. Although individualization of program development is potentially beneficial for the RiR, this could have the possibility of pigeon-holing the research initiatives, whether in research topic and/or project method(s) given the personal interests and research practices of the RiR.[21]

Another consideration that comes to attention regarding the RiR program is the possibly limited resources for the postdoctoral fellow while they facilitate the partnership and programming between the City and the PSI. At TRU, the RiR is supported by five research interns,[22] which brings rise to concerns surrounding labour resources and funding as the intended growth of the initiative continues. For a smaller scale relationship, such as that between one city

[20] TRUResearch, "TRU Researcher in Residence (RiR)," 1:51 to 1:55
[21] John P. A. Ioannidis, "Meta-research: Why research on research matters," *PLOS Biology* 16, no. 3 (March 2018). https://doi.org/10.1371/journal.pbio.2005468
[22] "TRU, City, Mitacs launch Researcher-in-Residence program," Thompson Rivers University

and one PSI, the model works well, as exemplified by TRU. However, for larger scale partnerships that may involve multiple cities and/or multiple PSIs, the programming of an RiR initiative may need to look different and have broader considerations surrounding labour and resources.

There are also potential concerns around the stability of the RiR model, given that post-doctoral fellows often utilize their appointments as a means to continue their search for permanent employment within their chosen field. This on-going potential for instability means that additional programmatic and governance elements are required as a back-stop.

2.2 Third-Party Program Facilitation

Many City-PSI partnership models use platforms for bidding on, proposing, and further matching projects between cities and PSIs. For example, the CivicLabTO (Toronto) program uses the Toronto Collaboration Platform (TOCP) which provides a space for institutions and the City of Toronto to connect, collaborate, and propose research projects.[23] The TOCP was initially programmed for the sharing of City research needs with the PSIs, however, they are now expanding the platform to include research proposals from PSIs to the City. This extends the model's ability for co-creation, developing a more symbiotic and mutually beneficial relationship between the City of Toronto and Toronto PSIs.[24] In addition to the TOCP and CivicLabTO, the City of Toronto formalized the City-PSIs partnership through the Toronto Civic Accelerator Program (TCAP) which, "allow[s] the City to expand the scope and scale of the initial [Invitation to Partner] and to provide additional opportunities for the City to harness the talent and

[23] "About," Toronto Collaboration Platform, accessed May 15, 2023. https://tocp.ecampusontario.ca/#howitworks
[24] "Toronto Collaboration Platform (TOCP)," eCampus Ontario, accessed May 8, 2023. https://tocp.ecampusontario.ca/

innovation of Toronto's strong technology and start-up sector."[25] The CivicLabTO model exemplifies the use of many resources and partnerships in order to accommodate the scale of the City-PSIs partnerships, including partnerships with the Information and Technology Division and the Customer Experience Transformation & Innovation (CXi) program.[26]

Another example of multi-institutional, third-party programming is the Vancouver based applied research initiative CityStudio. CityStudio Vancouver, as one of the Studio collaborations within the broader network of CityStudio Global, offers multiple pathways for collaboration between the City of Vancouver and PSIs located within the region, ranging from first year programming to post-doctoral work. Their model facilitates collaborations on City projects that require services in engagement, data collection, and data analysis.[27] The programming structure of CityStudio provides the ability for project proposals to be approached at different points of entry - by students, City-staff, and faculty – and further ensures that projects are appropriately matched to the corresponding partner. The accepted projects then become a collaborative and co-produced endeavor between the City and the selected PSI partners, with project coordinators and corresponding course-based work that can range across many disciplines.[28] In this model, academic curriculums are heavily incorporated into the WIL experience, creating a shared understanding of the standards of the work between the PSI and the City, embracing a holistic approach to WIL as the curriculum and the City project inform one another.

Third-party platforms that facilitate City-PSI partnerships have their own considerations to be made regarding funding, timing, contracting, and agreements. For example, CityStudio

[25] City of Toronto, Report for Action: Advancing a New Culture of Innovation and Partnership, 2020
[26] City of Toronto, Report for Action: Advancing a New Culture of Innovation and Partnership
[27] "Schools," CityStudio, accessed May 3, 2023. https://citystudiovancouver.com/collaborate/schools/#
[28] CityStudio, *CityStudio* (CityStudio, 2023).

Global identifies that the time needed to launch a CityStudio program can vary depending on the relationships, or lack thereof, between PSIs and municipalities.[29] In order to facilitate and build the long-term partnerships needed for successful programming, CityStudio's contracts are legible for five years with a chance of renewal at the end of the contract. Furthermore, third-party platforms appear to be useful for large-scale partnerships between multiple cities and multiple PSIs, such as the multiple city partnerships exemplified in CityStudio's South Island program.[30] Due to the nature of these partnerships, there would need to be additional considerations for funding and labour resources for projects and program establishment.

The third-party approach creates ease of relationship building between possible multi-municipality and multi-PSI partnerships. Accounting for the many moving pieces within the process of establishing strong connections between a multitude of potential partners, third-party platforms provide the labour and resources needed to program strong relationships. However, there are also fees attributed to the platform's facilitation. For example, CityStudio charges based on initial set-up of the program and then also includes subscription fees for ongoing programming.[31] Ongoing costs raise considerations surrounding sustainable long-term funding, especially accounting for the timeframe needed to build relationships if they are not yet established between cities and PSIs from across a defined region. In addition, funding CityStudio projects is another cost that must be considered on top of the set-up and ongoing costs of the program.[32] With the multiple factors that affect third-party programming of ARPs, it is important

[29] "Our Model," CityStudio Global, accessed May 10, 2023. https://citystudioglobal.com/our-model/
[30] "11th Canadian CityStudio to launch in Southern Vancouver Island, British Columbia," CityStudio, accessed May 10, 2023. https://citystudioglobal.com/11th-canadian-citystudio-to-launch-in-southern-vancouver-island-british-columbia/
[31] "Start a Studio FAQs," CityStudio, accessed May 15, 2023. https://citystudioglobal.com/start-a-studio/
[32] Pillar NonProfit Network, *CityStudio Project*, (London, Pillar NonProfit Network, n.d.) https://pillarnonprofit.ca/sites/default/files/copy_of_ds_2224_-_summary_funding_report.pdf

to consider the place-based contexts of the relationships as well as the resources necessary to supporting third-party facilitation.

2.3 WIL Curriculum Development and Integration

An interesting opportunity arises with WIL in City-PSI partnerships regarding academic curriculum development and integration. Wilfrid Laurier University community partnerships allow for the "Community Service-Learning" (CSL) initiative, wherein students gain hands-on experience through community-based placements and projects that are integrated into a class setting. CSL initiatives design course curriculums specifically around the community partner (e.g., municipalities, non-profits, daycares, etc.) wherein students may engage in weekly placements or work closely with the community partner as a part of the course syllabus.[33] This model of curriculum development builds and bridges academic knowledge with real-time workplace learning over the semester. Although comprehensive, curriculum development through this model may not address the collaborative curriculum building between students, faculty, and city staff that other models utilize, such as CityStudio and TRU's RiR program.

In contrast, CityStudio's curriculum development is dependent on the collaboration and co-development between students, faculty, and city staff for course curriculums. Regardless of who proposes the projects, CityStudio's approach to curriculum development is dependent on co-production and collaboration between all members working on the project. Collaborative curriculum building creates increased motivation and critical thinking for students, while also nourishing space for mutual respect and responsibility.[34] The use of collaborative curriculum

[33] "Community and Workplace partnerships: Courses," Wilfrid Laurier University, accessed May 9, 2023. https://students.wlu.ca/work-leadership-and-volunteering/community-and-workplace-partnerships/community-service-learning/courses.html
[34] Lisa G. Propst, "Promoting Local Community and Global Citizenship through Collaborative Curriculum Building," *Radical Pedagogy* 11 no. 4 (2014).

building and integration in WIL provides students with autonomy over what they want to learn and how they want to learn it, paired with guidance and insight from faculty and City professionals on what is relevant to the workplace.

Currently at the UofL, curricula for WIL vary in design and integration as they are dependent on the faculty supervisor and the student(s) participating in the opportunity. Collaborative curriculum building in community-engaged WIL is beneficial as it creates the self-understanding of students as community members and belonging to the community, therefore creating a greater sense of purpose and enthusiasm in the work that they do.[35] This in-turn produces deeper engagement with the course and its materials, enabling stronger skill-development and understanding of how one's self fits into the work.[36] In contrast, the design and implementation of curricula that are rigid and non-collaborative have the possibility to stagnate innovation and creativity, while also situating student enthusiasm, investment, and motivation for the project in precarity.[37] Considering and understanding the processes of curriculum design are integral in WIL, further shaping the programming of a City-PSIs WIL partnership.

3.0 Scale of City-PSI Partnerships

City-PSI partnerships exist on many different scales in order to appropriately meet the needs of all partners. Depending on the resources needed to conduct applied research, a city may pair with one or multiple PSIs for collaborative projects. A single city-single PSI partnership allows for a strong connection that has the ability to grow through processes of applied research, such as the RiR program at Thompson Rivers University. However, considerations regarding the

[35] Propst, "Promoting Local Community and Global Citizenship through Collaborative Curriculum Building."
[36] Propst, "Promoting Local Community and Global Citizenship through Collaborative Curriculum Building."
[37] "Flexible (vs. Rigid)," Possibilities for Learning, accessed May 10, 2023. https://possibilitiesforlearning.com/curriculum-differentiation/differentiating-the-environment/flexible-vs-rigid/

number of resources and projects available for applied research programming arise as the scale of the relationship increases. More commonly for larger cities and regions, a relationship of multiple cities and/or multiple PSIs exists, such as that of the CityStudio Vancouver and CivicLabTO programming. Though abundant in resources to support applied research projects, large scale City-PSI partnerships often rely on third party platforms for programming, increasing considerations in funding, labour, and program fees. Finally, international City-PSI partnerships and networks have begun to arise, with global collaboration between PSIs and Cities working to address issues or urban development. International partnerships create unique opportunities that apply an innovative and global mindset to urban challenges.

3.1 Single City, Single PSI

On the smallest scale of City-PSI partnerships is the single city - single PSI partnership model. This model relies on the networking between one city and one PSI to perform applied research initiatives. A common model amongst smaller municipalities, single city - single PSI partnerships provide direct access between the municipality and the institution allowing for programming that is directly tailored to each. For example, TRU's Researcher-in-Residence model utilizes a single city – single PSI scale partnership, subsequently strengthening the relationship between the city and the university through place-based programming. Although a helpful model to build a robust relationship and bridge the two organizations together, a single city – single PSI model has access to fewer resources than models at a larger scale with multiple institutions working with municipalities. However, municipal size plays a key role in the scale and programming of the City-PSI relationship and considerations of programming must be well-paired to the size and needs of the city.

3.2 Multi-Institutional, Multi-City Partnerships

For larger municipalities, there is often a need for more resources from PSIs, thus creating a partnership scale that pairs municipalities with multiple institutions to conduct applied research. Multi-institutional partnerships describe the relationships between a municipality and numerous PSIs. City-PSI models that utilize multi-institutional partnerships, such as CityStudio and CivicLabTO, have greater access to post-secondary knowledge and can tailor projects to specific expertise at an institution.[38] These large-scale relationships have a two-way structure between the City and each PSI, however, the PSIs do not appear to have strong relationships between each other. In the current examples of multi-institutional City-PSI partnerships, the city acts as an intermediary in the development and programming of the multi-institutional relationships.

In contrast, ARP programming can also take the form of a multi-city model wherein one PSI provides services to multiple municipalities. For example, CityStudio's South Island program is led by Royal Roads University (RRU) in collaboration with both the City of Langford and the City of Colwood for the Bachelor of Business Administration, providing undergraduate students with hands-on experiences that directly apply to their degree and the workplace.[39] The partnership of this multi-city model is to facilitate WIL for undergraduates as applied projects that seek to understand how to activate public space through design (Langford) and how to transform a bedroom community into a lively community (Colwood).[40] Along with RRU's example, the PSI has also signed an MoU with the City of Langford, formalizing the partnership

[38] "Toronto Collaboration Platform (TOCP)," eCampus Ontario.
[39] "11th Canadian CityStudio to launch in Southern Vancouver Island, British Columbia," CityStudio
[40] "Designing "sticky" cities: business students partner with communities," Royal Roads University, accessed May 15, 2023. https://www.royalroads.ca/news/designing-sticky-cities-business-students-partner-communities

between the City and RRU for a timeline of five years.[41] A multi-city model provides increased opportunities for students and faculty to get involved with City projects and creates a greater capacity for WIL initiatives at the PSI.

3.3 Global Community-PSI Partnership Networks

City-PSI partnerships can also be scaled at an international level, with municipalities utilizing knowledge from PSIs around the globe. The Alliance of Guangzhou International Sister-City Universities (GISU) exemplifies this model of international knowledge exchange and collaboration. GISU is supported by the People's Government of the Guangzhou Municipality (Guangzhou Municipality) and is partnered with twenty universities that represent seventeen countries.[42] The specific aim of the Guangzhou Municipality through the GISU Alliance is to "leverage the academic resources of its members in close collaboration for the sustainable development of our cities."[43] International models of City-PSI partnerships may be of growing importance as cities around the world realize the similarities of the challenges they face, for example regarding population and demographics, food and supply chain considerations, health and wellbeing, technology and innovation, and the growing need for sustainable solutions in urban development. Global networks of City-PSI partnerships, such as the GISU Alliance, open broad channels for sharing knowledge and expertise that can address "local" (though not necessarily unique) issues from many perspectives, enhancing solution-oriented approaches to challenges experienced in many cities.

[41] "Royal Roads and Langford Sign Partnership Agreement," Business Examiner, accessed May 15, 2023. https://businessexaminer.ca/victoria-articles/item/royal-roads-and-langford-sign-partnership-agreement/
[42] "Alliance of Guangzhou International Sister-City Universities," University of Padova, accessed May 15, 2023. https://www.unipd.it/en/gisu
[43] "Alliance of Guangzhou International Sister-City Universities," University of Padova

In relation, global networks help to pair and facilitate City-PSI partnerships, such as the UN Environment Programme (UNEP) and the Global Adaptation Network (GAN). UNEP and GAN employ a network that facilitates applied research between PSIs and local communities through the programs' international network.[44] GAN works with the Educational Partnerships for Innovation in Communities Network (EPIC-N) to build local City-PSI partnerships on a global scale, with EPIC networks spanning over a multitude of continents.[45] Although the EPIC Network does not pair international cities with international PSIs, it does create a network wherein there are shared repositories and resources in the network to help address similar challenges regarding social wealth and quality of life faced by a multitude of cities.[46]

4.0 Applied Research Projects

Applied research projects can take multiple forms to address city challenges and research questions. Projects focus on a range of internal communications and best practices, as well as research that is community-focused and provides the city with data that is informed by residents and community members. Research projects that focus on both community-engaged research (CER) and internal corporation processes are built upon co-production, with city staff, faculty, and students working together. The practice of co-production in applied research is helpful to establish a robust project that fulfills the needs of all parties involved in project development. Due to the broad nature of challenges both internally within a city government and the broader community, projects have unique opportunities to span across disciplines and expertise.

[44] "City-University Partnerships," UN Environment Programme, accessed May 15, 2023. https://www.unep.org/gan/what-we-do/city-university-partnerships
[45] "Who's in the Network," Epic-network, accessed May 15, 2023. https://www.epicn.org/whos-in-the-network/
[46] EPIC-N, *Connecting university resources to the needs of local governments and communities to improve the quality of life for all involved* (EPIC-N, 2020). https://www.epicn.org/wp-content/uploads/2020/09/2020-EPIC-N-Brochure-Only_09_18_20.pdf

4.1 Community-engaged Research

A commonality shared in City-PSI partnership applied research is that of community-engaged research (CER). CER projects use the methods of applied research and exercise them in community settings, creating a collaborative research process that promotes principles of "participation, cooperation, social transformation, and knowledge translation."[47] The aims of CER initiatives are to integrate the knowledge, experience, and expertise of community members into research projects throughout their many processes and in-turn aspire for the outputs of research to be useful and mutually beneficial to the community.[48] The methods of CER employ high-levels of in-depth engagement and collaboration, basing projects in equity and co-development that are also co-led by the many actors involved in the research project.[49] CER can take place across many disciplines, for example CityStudio completed projects in public health,[50] activism and advocacy,[51] urban planning and design,[52] public art,[53] and environmental sustainability.[54] Projects employ interdisciplinary approaches that harbour innovation and create a more in-depth and intersectional understanding of issues.

In City-PSI ARPs, CER is a holistic, multidisciplinary practice that helps to inform municipal policy and procedures as it is based in solution-oriented approaches and

[47] "About SFU's Community-Engaged Research Initiative," Simon Fraser University, accessed May 11, 2023. https://www.sfu.ca/ceri/about/about-ceri.html

[48]"Community-Engaged Research," Canadian Science Publishing, accessed May 11, 2023. https://cdnsciencepub.com/authors-and-reviewers/community-engaged-research
[49] "Community-Engaged Research," Canadian Science Publishing
[50] "Service Industry & COVID-19," CityStudio, accessed May 11, 2023. https://citystudiovancouver.com/projects/service-industry-covid-19/
[51] "Reconciliation Calls," CityStudio Vancouver, accessed May 11, 2023. https://citystudiovancouver.com/projects/reconciliation-calls/
[52] "Informobility," CityStudio, accessed May 11, 2023. https://citystudiovancouver.com/projects/informobility/
[53] "Street Art," CityStudio, accessed May 11, 2023. https://citystudiovancouver.com/projects/street-art/
[54] "The Stoop," CityStudio, accessed May 11, 2023. https://citystudiovancouver.com/projects/the-stoop/

methodologies that actively engage with and uphold the knowledge of community members.[55] Projects also seek to ensure that outputs are community focused, often promoting arts-based tools and ideas, such as the use of CER in CityStudio's project "Street Art: Fostering connections and reimagining public space through collaborative community art," which created a project that heavily engaged with residence to understand how they wanted to shape their neighbourhood. An outcome of the Street Art project was a collaborative public art project that sought to provoke feelings of community belonging and connection to place. [56]

Community-engaged research also brings unique challenges in City-PSI partnerships, such as funding considerations, timing (i.e., matching projects with semester time allowances), imposition of research in communities by institutions versus projects being co-initiated by the community, and the negotiation of ownership and intellectual property.[57] To address some of the challenges brought forward regarding community-engaged research in partnerships, PSIs and community partners create policies and reports that enhance accountability and transparency throughout the process, such as Selkirk College's *Primer for Intellectual Property in Applied Research,* which states the parameters and scope for intellectual property for applied research projects.[58]

In addition, the practices of stating project stewardship once the students' semester is over helps to enhance the transparency and accountability of the CityStudio Vancouver projects.

[55] Karen Schwartz, "Community Engaged Research: Student and Community Perspectives," *Partnerships: A Journal of Service Learning & Civic Engagement* 1, no. 2 (Spring, 2010).
[56] CityStudio, *Street Art: Fostering connections and reimagining public space through collaborative community art,"* (Vancouver, CityStudio, 2014), https://citystudiovancouver.com/wp-content/uploads/2018/04/Street-Art-Final-Report-small.pdf
[57] Schwartz, "Community Engaged Research: Student and Community Perspectives."
[58] Selkirk College, *Primer: Intellectual Property in Applied Research* (Selkirk College, n.d.) https://policies.selkirk.ca/media/policiesselkirkca/college/Policy-8815-Primer-for-Intellectual-Property-in-Applied-Research-09.22.pdf

The stewardship statement addresses the complicated timelines of projects when aligning with PSI semesters and establishes how the projects will be looked after for the long-term future either by students or community members. For the long term CityStudio project "Street Art" the statement of stewardship highlights how the long-term community project will be taken care of and by whom once the students have finished their school semester.[59] Through policies, procedures, and collaboration, complexities of CER in applied research can be reduced and transparency, accessibility, and knowledge mobilization increased.

4.2 Internal Corporation Research

In addition to community-engaged research, City-PSI applied research has also been used to address the inner-workings of city government processes to address points of entry for improvement. Whether it be in informing policy work, control and ownership of data, or understanding better processes for procurement,[60] applied research for internal city organization and function helps to the provision of programs and services within a community. In addition, internal applied research can account for the well-being of people both within and outside of the organization, making for a more inclusive and efficient municipal public sector.

CivicLabTO has an extensive collection of projects regarding internal City processes and policy work. Utilizing PSI resources for applied research on projects of this nature increases access to knowledge and labour that may be inaccessible by city staff and provides sufficient improvements and information for city work, communications, and program development. An example of research that addresses internal processes is that of CivicLabTO's "Unsolicited

[59] CityStudio, *Street Art: Fostering connections and reimagining public space through collaborative community art* (Vancouver, CityStudio, 2018). https://citystudiovancouver.com/wp-content/uploads/2018/04/Street-Art-Final-Report-small.pdf
[60] "2021-2022 Research Projects," CivicLabTO, accessed May 12, 2023. https://www.civiclabto.ca/2021-2022research

Proposal – Procurement Processes and Driving Innovation in Toronto."[61] This project between Toronto Metropolitan University and the Strategic Partnerships Office at the City of Toronto focuses on the City's procurement processes and examines how they can be enhanced while maintaining fairness, transparency, and increasing access to equity-deserving groups.[62]

In addition, applied research projects also focus on workplace culture at municipalities and the multiple ways experiences and communication within the workplace can be enhanced. For example, CityStudio Abbotsford and the University of Fraser Valley (UFV) combined efforts to deliver course programming that addressed communication efficiency in a multi-generational workplace. UFV's Communications 380 class (CMNS 380) worked with CityStudio to better understand and integrate strategies of cross-generational communications at the City of Abbotsford.[63] Combined with other applied research initiatives regarding City processes and workplaces, such as how cities manage their data[64] and how to strategize innovation,[65] cities can re-structure and reinvigorate their processes, providing enhanced working environments for employees and more efficient public service provision for community members.

5.0 Knowledge-sharing and Mobilization

The dissemination methods for findings and procedures of practical research vary based on the distinct characteristics of each program and the platform used for facilitation. There are many ways in which knowledge can be integrated within city work and shared with the public,

[61] "2021-2022 Research Projects," CivicLabTO
[62] "2021-2022 Research Projects," CivicLabTO

[63] CityStudio Abbotsford, *2019-2020/2020-2021 Program Review* (Abbotsford, CityStudio, n.d.) https://www.abbotsford.ca/sites/default/files/2022-03/CityStudio%20Abbotsford%202019-2020%202020-2021%20Program%20Review.pdf
[64] "2021-2022 Research Projects," CivicLabTO
[65] CityStudio Durham, "Maturing Our Innovation Strategy," CityStudio Durham, accessed May 17, 2023. https://www.durham.ca/en/citystudio/maturing-our-innovation-strategy-at-durham-region_copy.aspx

ranging from comprehensive public websites, student showcases, and public policy deliberation. Many of the programs utilize public showcases and online repositories to share applied research work, such as CityStudio's HUBBUB showcase series and their several websites that highlight completed projects. In turn, city policies also acknowledge applied research, integrating recommendations and considerations from the research to create more thorough and thoughtful practices. Sharing knowledge with the public about completed projects fosters transparency within the municipality's public sector while also promoting and marketing opportunities for applied research programs.

5.1 Online Repositories

Many third-party platforms, like CivicLabTO and CityStudio, utilize online repositories to share applied research projects, often including in-depth summaries and project reports embedded in the websites. CityStudio Vancouver, Durham, Montreal, North Vancouver, and Oslo all have comprehensive online repositories through which they share their projects. The formatting of sharing includes a project summary, who was involved (i.e., the PSI, the students, and the City department), and can include a full project report that outlines further project considerations (i.e., funding, stewardship, constraints, etc.).[66] Project-sharing in this form allows for a thorough summary of the work that outlines all aspects of the project, creating transparency and broad understandings of the research project and how it contributes to work within the City. Hosting project dissemination through public online repositories increases access to information

[66] CityStudio, *Street Art: Fostering connections and reimagining public space through collaborative community.*

that is often shrouded by paywalls and other constraints in academic methods of knowledge-sharing.[67]

Free and open-access information is increasingly important, both within and outside of academia, as it broadens who can use data. This is especially important when policies seek to be informed by research, as it creates a greater understanding outside of academia of how policies and public processes are developed and what they entail.[68] A lack of transparency and openness can instill skepticism and a lack of trust in those who wish to get involved in projects and programming,[69] therefore increasing the need for open information not only for project dissemination, but also to market the programming to prospective stakeholders (i.e., cities, PSIs, students, etc.)

Although many platforms and websites are thorough in their methods of knowledge-sharing, others practice more limited methods and formats. For example, CivicLabTO and the TOCP provide very limited information on the completed projects between PSIs and the City of Toronto. These repositories only offer a brief summary of the project, including the City of Toronto department and the PSI partner.[70] In comparison to the online repositories of CityStudio, CivicLabTO and the TOCP lack the same scope and thoroughness when sharing their projects, including some completed project websites void of any information.[71] However, CivicLabTO does have extensive sharing of their 2021 Summit programming, with free access to the online

[67] Josef Schmied, "Popular digital knowledge dissemination platforms: Evaluating the pragmatic professional credibility from Wikipedia to Academia.edu and ResearchGate," *Journal of Pragmatics* 180, (July 2021): 187-202
[68] Schmied, "Popular digital knowledge dissemination platforms: Evaluating the pragmatic professional credibility from Wikipedia to Academia.edu and ResearchGate."
[69] Denise Linda Parris et al., "Exploring transparency: a new framework for responsible business management," *Management Decision* 54, no. 1 (2016): 222-247
[70] "Plausible Futures: What economic and labour market trends might the City see over the next three to five years?" eCampus Ontario, accessed May 23, 2023. https://tocp.ecampusontario.ca/plausible-futures/
[71] "Data for Equity," eCampus Ontario, accessed May 23, 2023. https://tocp.ecampusontario.ca/data-for-equity/

sessions with information about the programming and collaboration between the City of Toronto and Toronto PSIs. Although the sessions are comprehensive, CivicLabTO does not appear to have a strategic marketing strategy paired with them, like CityStudio does.[72]

Included in online repositories are news articles on City and PSI websites, which share information regarding City-PSI ARPs. Multiple city and PSI websites contain sections wherein information about applied research programming is shared. Online articles through city and PSI websites are mostly helpful to understanding some of the programming of the ARP and programming, however, the articles often fall short on providing specific and comprehensive project information. For example, TRU's articles on their Researcher-in-Residence (RiR) program describes the programming and funding of the initiative, however it does not outline project outputs of the initiative itself.[73]

In order to provide comprehensive information surrounding the programming and outputs of City-PSI applied research, platforms provide both an understanding of how applied research is programmed, project methods, outputs, and dissemination. CityStudio Vancouver utilizes this approach with a robust explanation of the programming and project descriptions that create a well-rounded picture of CityStudio's Vision and goals. Representing information this way also creates a deeper understanding of the significance of applied research to both Cities and PSIs, furthering the program's marketing and business case objectives.

5.2 ePortfolios

Not all teaching and learning experiences are equally effective at assisting students in retaining, integrating, and transferring their knowledge. Therefore, incorporating high-impact

[72] "Sessions," CivicLabTO, accessed May 24, 2023. https://www.civiclabto.ca/2021sessions
[73] "TRU, City, Mitacs launch Researcher-in-Residence program," Thompson Rivers University

practices (HIPs) is essential for postsecondary institutions to incorporate into the student experience. One of the eleven HIPs identified is an ePortfolio.[7475] An ePortfolio functions as a digital area where you can store proof of your educational and/or professional accomplishments. Over time, the student gathers their efforts into a virtual portfolio, aiming to reflect on their accomplishments, establish links between educational moments, and distribute their work. Digital portfolios serve purposes for learning, evaluations, and career progression.[76]

An academic ePortfolio is a compilation of a student's best work, encompassing coursework-related materials such as essays, posters, videos, etc. Academic ePortfolios have the capacity to encapsulate diverse aspects of a student's life, including volunteer commitments, employment exposure, extracurricular engagements, and more. Digital portfolios essentially serve to document and make evident the trajectory of student learning, allowing students to demonstrate aspects of their knowledge acquisition that often go unseen by others.[77] The University of Waterloo recognizes three types of ePortfolios, including:

1. Assessment ePortfolios: the viewers are of this ePortfolio are internal to the postsecondary institutions to assist in the institution's outcome evaluations.

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[74] AAC&U. "High-Impact Practices." AAC&U. Last modified August 31, 2021. https://www.aacu.org/trending-topics/high-impact.

[75] Centre for Teaching Excellence. "High Impact Practices (HIPs) or Engaged Learning Practices | Centre for Teaching Excellence." University of Waterloo. Accessed July 21, 2023. https://uwaterloo.ca/centre-for-teaching-excellence/support/integrative-learning/high-impact-practices-hips-or-engaged-learning-practices.

[76] "EPortfolios: Purpose & Composition | Writing and Communication Centre." University of Waterloo | University of Waterloo. Accessed August 9, 2023. https://uwaterloo.ca/writing-and-communication-centre/resources-eportfolios-purpose-composition.

[77] "EPortfolios Explained: Theory and Practice | Centre for Teaching Excellence." University of Waterloo | University of Waterloo. Accessed August 9, 2023. https://uwaterloo.ca/centre-for-teaching-excellence/catalogs/tip-sheets/eportfolios-explained-theory-and-practice.

2. Learning ePortfolios: this form is meant to be created by and for the student to assist them in providing contemplative narratives about their academic experiences and drawing connections between different learning experiences.
3. Career/ Transfer ePortfolios: this form allows students to showcase their coursework, extracurriculars, and work-experience to demonstrate their learning achievements to potential employers or when transferring to further higher educational programs. [78]

ePortfolios foster learning by offering students a virtual platform and a chance to engage in the celebration of both academic and workplace endeavors. The University of Waterloo incorporates the use of ePortfolios into both course-based and WIL programs. PebblePad is a virtual tool used by the University of Waterloo, and several other institutions, designed to enhance integrative learning in higher education by helping students connect classroom learning with real-life experiences.[79] It supports students in planning, recording, reflecting, and curating their learning experiences, allowing them to create ePortfolios, blogs, and collections of their work. Instructors can use PebblePad to create templates and workbooks with multimedia content, prompts, and questions for students. The tool also includes an assessment space that facilitates formative and summative assessment, enabling self and peer review, feedback, rubrics, and grading, including involvement from external assessors.

The University of Waterloo expresses that the efficacy of ePortfolios as instruments for learning stems from the ability of ePortfolios to aid students in constructing their own

[78] "EPortfolios: Purpose & Composition | Writing and Communication Centre." University of Waterloo | University of Waterloo. Accessed August 9, 2023. https://uwaterloo.ca/writing-and-communication-centre/resources-eportfolios-purpose-composition.
[79] "About PebblePad." PebblePad Implementation Project. Last modified April 1, 2019. https://uwaterloo.ca/pebblepad-implementation-project/about-pebblepad

understanding, bringing to light concealed facets of the learning journey, and empowering students with control over their learning and career development, thereby nurturing their motivation to learn.[80] This is due to the dual nature of ePortfolios, which encompasses both concrete outcomes by sharing tangible work, and incorporates an ongoing process of self-reflection. In contrast to typical Learning Management Systems (LMS) for e-learning,[81] such as Moodle, ePortfolios give students increased autonomy and enduring control over their shared materials, design, and intended audiences. Within an academic setting, the LMS is overseen and controlled by the instructor, dictating access, tool permissions, and related aspects. Typically, as courses draw to a close, student access to the LMS diminishes, while ownership of ePortfolios remains with the students even after their time in post-secondary concludes.[82]

5.3 Showcases, Summits, and Speaker Series

In addition to online repositories and ePortfolios, applied research opportunities may include project showcases that allow students to talk about their projects and share them with stakeholders, city staff, and PSI faculty. Furthermore, projects and research may be discussed and presented through summits, such as that of CivicLabTO, to address and share the challenges facing the city and how cities and PSIs can work in collaboration to find solutions for them. In many instances, the mode of communication is important to develop in-depth understandings of

[80] "EPortfolios Explained: Theory and Practice | Centre for Teaching Excellence." University of Waterloo | University of Waterloo. Accessed August 9, 2023. https://uwaterloo.ca/centre-for-teaching-excellence/catalogs/tip-sheets/eportfolios-explained-theory-and-practice.
[81] "learning management system (LMS)," TechTarget, accessed August 29, 2023. https://www.techtarget.com/searchcio/definition/learning-management-system
[82] "EPortfolios Explained: Theory and Practice | Centre for Teaching Excellence." University of Waterloo | University of Waterloo. Accessed August 9, 2023. https://uwaterloo.ca/centre-for-teaching-excellence/catalogs/tip-sheets/eportfolios-explained-theory-and-practice.

concepts presented within research. Showcases, summits, and speaker series all heavily employ oral communication and face-to-face conversation, including some written and visual aids, to explain applied research projects. This is a valuable form of communicating projects, as it provides a greater depth of understanding as people are able to talk-through ideas and ask questions, reducing the likelihood of misunderstandings.[83] Furthermore, the sharing of research information is unique to each applied research program and partnership; however, they are similar in that they provide space to further pursue innovation and problem-solving within cities through dynamic conversations and knowledge dissemination.

CityStudio's international programming of the student showcase, HUBBUB, creates a space for networking and project-sharing between cities, PSIs, and students. HUBBUB showcases encourage innovation and ingenuity through the opportunity for student projects to win awards that are adjudicated by faculty, city staff, and CityStudio alum.[84] Adjudication of the projects allows for students, faculty, and city staff to engage with the projects critically, enhancing reflection and presenting new avenues through which projects can be built-upon. In addition, the HUBBUB showcases present a distinct opportunity for CityStudio affiliates to network, creating increased access to PSI talent for the city and prospective employment for students. In addition, the showcases provide the opportunity for interaction between students and subject matter experts, thereby increasing the value and evidence of student knowledge.[85]

[83] Meredyth Krych Appelbaum and Joanna Musial, "Students' Perception of Value of Interactive Oral Communication as Part of Writing Course Papers," *Journal of Instructional Psychology* 34, no. 3 (Fall 2007): 131-137. https://digitalcommons.montclair.edu/cgi/viewcontent.cgi?article=1040&context=psychology-facpubs
[84] "CityStudio Presents HUBBUB," CityStudio Vancouver, accessed May 25, 2023. https://citystudiovancouver.com/hubbub/
[85] Appelbaum and Musial, "Students' Perception of Value of Interactive Oral Communication as Part of Writing Course Papers."

CivicLabTO's approach to presenting applied research work took the form of an online Academic Summit series in 2021. The Summit, hosted by York University, focused on a series of discussions and sessions that allowed for City of Toronto staff, faculty, and students to discuss the challenges facing Toronto and the work that PSIs and the City have done in collaboration to address them.[86] The sessions and series of the CivicLabTO Academic Summit presents a platform wherein the City and PSI collaborators are equals in the discussions and knowledge-sharing. This is an important aspect in the mutual understanding of City-PSI partnerships, that no one party holds power over another, and that the relationship exists on an equal platform. The programming of the Summit allows for thorough collaboration and knowledge-sharing without hierarchy, respecting the intentions and processes of co-creation in City-PSI ARPs. In addition, similar to the HUBBUB showcases, the robust discussions and interactions facilitated through the Summit Series created dynamic social co-ordination that furthered the explanations and understandings of the applied research projects.[87]

5.4 Public Policy and Practice

Another output of applied research is that of public policy considerations. An important aspect of the knowledge-sharing for applied research between cities and PSIs is how the findings and information can be integrated into public policy or contribute to the development of best practices. For example, CivicLabTO's project with the City of Toronto and Toronto Metropolitan University (TMU) "Socio-demographic characteristics & COVID-19" informed Toronto Public Health on social inequities that correlate to COVID-19 incidence, furthering the

[86] "2021 CivicLabTO Academic Summit: Collaborating on Renewal and Resilience," CivicLabTO, accessed May 25, 2023. https://www.civiclabto.ca/about-civiclabto-academic-summit
[87] Appelbaum and Musial, "Students' Perception of Value of Interactive Oral Communication as Part of Writing Course Papers."

promotion of equity for a more effective public healthcare system.[88] Well-informed decision-making is crucial in governance, especially regarding public well-being, and can be further enhanced by using in-depth research. This is a beneficial approach to decision-making and public policy because it creates a sturdy background on which to address challenges and issues within cities.[89]

Furthermore, applied research can help inform internal municipal processes and can contribute to building best practices. Research that is applicable to city government workplaces can streamline processes, such as municipal ownership of creative space,[90] and can create a more equitable and inclusive workplace. For example, CityStudio Vancouver's project "Engaging with Vancouver Millennials" developed in-depth market research and trend analyzation to improve City of Vancouver public engagement strategies with Millennials.[91] Improvement in both policy and best practices can be nurtured by integrating research findings into municipal processes and decision-making. Furthermore, research into how governments and the public sector function can point out key areas that need to be improved or modified. In turn through these internal changes and solutions, provision of public services can be enhanced, creating a stronger public sector that can better serve stakeholders and community members.[92]

[88] "Research Partnerships with Post-Secondary Institutions," City of Toronto, accessed May 23, 2023. https://www.toronto.ca/business-economy/partnerships-sponsorships-donations/partner-2/additional-programs/post-secondary-partnerships/research-partnerships-with-higher-education-institutions/
[89] Andrew D. Oxman et al. "A framework for mandatory impact evaluation to ensure well informed public policy decisions," *Viewpoint* 375, no. 9712 (January 2010): 427-431
[90] "2021-2022 Research Projects," CivicLabTO, accessed May 25, 2023. https://www.civiclabto.ca/2021-2022research
[91] "Engaging With Vancouver Millennials," CityStudio Vancouver, accessed May 25, 2023. https://citystudiovancouver.com/projects/engaging-with-vancouver-millennials/
[92] Teresa Curristine, Zsuzsanna Lonti and Isabelle Journard, "Improving Public Sector Efficiency: Challenges and Opportunities," *OECD Journal on Budgeting* 7, no. 1 (2007): 161-202 https://www.oecd.org/gov/budgeting/43412680.pdf

6.0 Applied Research Business Cases

In order to expand City-PSI applied research programming and gain additional funding, it is important to market and create a strong business case for the programs. Business cases for ARPs between cities and PSIs are built upon the understood benefits of collaboration to address issues within the city. Furthermore, an aim of the marketing strategies toward the city side is the increased access to PSI knowledge, labour, and talent. This is an effective sell for a city to have increased access to PSI resources in order to inform public sector work. In addition, the appeal of WIL is targeted towards students offering work experience that will have them ready to enter a career once they are finished their studies. Although the benefits of WIL are overwhelmingly marketed to cities and students, faculty and PSI staff are often left out of discussions programming and WIL benefits.

CityStudio Global identifies the benefits for the multiple stakeholders that are involved in applied research and WIL opportunities: municipal governments, academic institutions, instructors, communities, and students. For municipal governments, CityStudio addresses the benefits that applied research offers additional labour, knowledge, talent-retention, and increased opportunities for experimentation and innovation.[93] For PSIs, applied research can support the development of the institution's reputation, attract and retain more students, and provide local opportunities for research, further boosting their level of competition with other PSIs.[94] CityStudio outlines the attractions to students by describing WIL and experiential learning as an asset due to its opportunities for community-building, networking, and building career-ready students.[95] Applied research marketing also builds off the idea of programming and project

[93] "Partner Benefits," CityStudio Global, accessed May 25, 2023. https://citystudioglobal.com/
[94] "Partner Benefits," CityStudio Global
[95] "Partner Benefits," CityStudio Global

development that is co-created, promoting that all parties will have an equal share of input at every stage of the process, as exemplified through CityStudio's model.[96]

However, the marketing of applied research often strongly panders to PSIs, municipal governments, and students, leaving a large and necessary sector out of programming discourse – faculty and PSI staff. Although CityStudio Global outlines benefits for faculty through their model (i.e., local research opportunities, connection to the municipality, etc.)[97] there is not a high-level of incentive to address the issues that are felt by PSI staff when undertaking WIL opportunities with students. *Critical changes for successful cooperative education* addresses that "academic staff involved in cooperative education programs have reported that they feel that their workload is high and is undervalued," as well as rising concerns of time and access to resources.[98] Acknowledging that faculty and university staff are critical to the programming and support to students who are engaging in WIL, there needs to be more thorough considerations that ensure faculty capacity to take on WIL students. Along similar lines, considerations for how the time and resource demands of WIL and ARPs are managed by municipal staff, who are increasingly facing constraints, needs to be carefully considered.

Although the buy-in for faculty to WIL may be limited in some programs, WIL nonetheless appeals to students, PSIs, and cities to address a range of needs. Setting up students with the skills and networking opportunities that ready them for entering the workforce, WIL allows students to test prospective employment opportunities and see themselves stepping into a possible career post-graduation. In tandem, access to talent and funding helps to fulfill the needs

[96] "About CityStudio Vancouver," CityStudio Vancouver, accessed June 8, 2023. https://citystudiovancouver.com/what-we-do/
[97] "Partner Benefits," CityStudio Global
[98] Miriam Weisz and Sandra Smith, "Critical changes for successful cooperative education," *Higher education in a changing world, Proceedings of the 28th HERDSA Annual Conference* (July 2005): 605-615

of cities and expand their capacity for internal and community research, further increasing public sector capacity to provide better public service and grow their economic sector. For PSIs, strong WIL and applied research programs set them apart from other PSIs, continuing the business case that will draw students to the institution in order to participate in WIL.[99]

7.0 Funding City-PSI Partnerships

The prospect of cities and PSIs doing research together increases the opportunities for municipal projects to be funded through academic channels, such as those from the Natural Sciences and Engineering Council of Canada (NSERC) and the Social Sciences and Humanities Research Council (SSHRC). Connections to funding broadens the possibilities of applied research programming, increasing abilities for both cities and PSIs to access the resources needed for projects that have larger budgetary considerations. Much of the current funding for applied research is project-based, leaving few options for program-development funding options. Funding opportunities for applied research occur at many different times throughout the year. This is an important consideration to make when aligning projects with funding and grant proposals, ensuring that the applications and project proposals are met by deadlines.

7.1 Mitacs

Although program development funding is limited, there is an increasing opportunity to fund City-PSI partnership development through Mitacs. Mitacs acts as a bridge-builder in partnerships, focusing on program-based funding opportunities that create a basis for a long-term and sustainable partnership such as that of TRU's RiR initiative.[100] Notable applied research

[99] "Partner Benefits," CityStudio Global
[100] "Municipal innovation – Mitacs case study: Researcher in residence model," posted by Mitacs Canada, November 28, 2022, video, 47:30. https://www.youtube.com/watch?v=hi17oE6m04w

programs between cities and PSIs with funding from Mitacs are TRU's RiR initiative and the Toronto Collaboration Platform (TOCP).[101][102] Both approaches are focused on programming quality applied research opportunities, and in turn build stronger relationships between cities and PSIs. As Mitacs grows its work with municipalities, it appears to be increasingly funding program development between cities and local PSIs, creating research-informed policy decisions and improved workplaces that can more efficiently serve their communities.

The Mitacs model for program development focuses on the placement of a student intern with a municipality to work closely with them on a project either focused on innovation (project pilot) or applied research (project to inform policy or internal municipal infrastructure).[103] To begin a project with Mitacs, the corporation must invest a minimum sum of $5000, however the average municipal investment with Mitacs is approximately $30,000. This initial investment by the City accounts for half of the project funding, with Mitacs accounting for the other half. [104] In addition, Mitacs helps to address the barriers municipalities experience that limit innovation, such as budgetary restrictions.[105]

Through the Mitacs model, innovation is one of the main priorities, enlisting talent from PSIs to help inform policies and drive creativity within cities. An in-person student internship helps bridge the gap between the City and the PSI as the program requires a faculty supervisor and a workplace supervisor, ensuring that programming is beneficial to all parties involved.

[101] "Municipal innovation – Mitacs case study: Researcher in residence model."
[102] "Mitacs Model of Municipal Innovation Series of Webinars "Open Innovation Challenge" Model," posted by Mitacs Canada, April 14, 2023, video. https://www.youtube.com/watch?v=MdjsZtB0uAI
[103] "Mitacs Model of Municipal Innovation Series of Webinars "Open Innovation Challenge" Model," 16:54
[104] "Mitacs Model of Municipal Innovation Series of Webinars "Open Innovation Challenge" Model," 16:38
[105] "Mitacs Model of Municipal Innovation Series of Webinars "Open Innovation Challenge" Model."

Mitacs provides support and facilitation for long-term relation-building between corporations and PSIs, promoting innovation that is ongoing at multiple levels.

7.2 Additional Funding Sources

- Internal institution awards, such as the RBC Agility WIL award offered in 2022.[106]
- Spencer Foundation Research-Practice Partnership (RPP) Grants Program[107]
    - Intent to Apply forms are accepted once yearly, between mid-September to late-October; with the full application closing in late-November. This grant supports collaborative and participatory education research projects with project budgets of up to $400,000 and for durations of up to three years. The Research-Practice Partnership program seeks proposals for research and related activities aimed at fostering collaborative partnerships between academic researchers and education practitioners. Principal Investigators (PIs) and Co-PIs applying for a grant are required to hold a doctorate or possess relevant professional experience. The PI must be affiliated with a non-profit or public institution that will administer the grant, and at least one Co-PI should come from another member organization. Proposals are accepted from both the U.S. and international entities, with submissions and budgets in English and U.S. Dollars.

[106] "RBC Agility Award." Welcome to the University of Lethbridge | University of Lethbridge. Accessed August 9, 2023. https://www.ulethbridge.ca/agility/rbc-agility-award.

[107] "Research-Practice Partnerships: Collaborative Research for Educational Change." The Spencer Foundation. Accessed August 9, 2023. https://www.spencer.org/grant_types/research-practice-partnerships.

- Canada Foundation for Innovation College Fund[108]
  - The College Fund provides assistance to initiatives that boost the capabilities of Canadian colleges to engage in applied research and technological advancement. It also encourages collaborations that result in creative solutions, products, processes, or services addressing the societal, business, health, or environmental requirements of Canadian industries or communities. The deadline to submit notices of intent is April 7th and the final deadline to submit proposals is June 7th each year. Proposals can include funding requests between $60,000 to $1 million.

- Government programs, grants, and tax-benefits, such as:
  - ECO Canada[109]
    - Wage subsidies to eligible employers looking to hire students for co-operative placements in environmental jobs in science, technology, engineering, arts, mathematics, or business.
  - Apprenticeship Job Creation Tax Credit (AJCTC)[110]
    - Employers and businesses that hire and train apprentices may be able to access tax credits.

[108] "College Fund." Canada Foundation for Innovation. Last modified May 24, 2023. https://www.innovation.ca/apply-manage-awards/funding-opportunities/college-fund.

[109] "ECO Canada | SWILP Student Assessment." Environmental Careers Organization of Canada | ECO Canada. Accessed May 8, 2023. https://eco.ca/coop-program

[110] Employment and Social Development Canada. "Tax Deductions for Employers of Apprentices." Canada.ca. Last modified May 26, 2022.

- Canada Summer Jobs Wage Subsidy (CSJ)[111]
  - Employment and Social Development Canada Division provides wage subsidies to employers from not-for-profit organizations, the public sector, and private sector organizations with 50 or fewer full-time employees, to create quality summer work experience for young people aged 15 to 30.

8.0 Memorandums of Understanding

Memorandums of Understandings (MoU) are an agreement between two corporations in partnership that outline the parameters of the partnership. For City-PSI partnerships, MoUs strengthen the relationship and expand the abilities for applied research and co-created project initiatives. TRU's Researcher-in-Residence program was strengthened by the signing of an MoU with the City of Kamloops, creating more direct access to for both the organizations. MoUs also address important partnership considerations and outline the intentions of each partner. For example, the Students Nova Scotia (StudentsNS) nonprofit alliance signed an MoU with the province of Nova Scotia to build a relationship of transparency and address concerns between both organizations.[112]

In addition, MoUs can be signed between organizations and PSI faculties to produce programming and partnership. For example, the University of Alberta's (U of A) Faculty of Law signed an MoU with the Judge Advocate General (JAG) of the Canadian Armed Forces. The

[111] Employment and Social Development Canada. "Canada Summer Jobs Wage Subsidies." Canada.ca. Last modified March 9, 2023. https://www.canada.ca/en/employment-social-development/services/funding/canada-summer-jobs.html

[112] StudentsNS, *The Memorandum of Understanding: Student Recommendations for a Sustainable University System in Nova Scotia* (Halifax: StudentsNS, 2023). https://static1.squarespace.com/static/5c8fe398809d8e5b9847fe6e/t/5cf00f9258b92b0001febd1a/1559236501781/StudentsNS-MOU-Online.pdf

MoU between the two parties created the ability to establish an internship course that creates in-depth and hands-on experience for law students in their field of study.[113] An agreement between U of A and the JAG creates a strong partnership that is tailored to the specific needs of both signers. The U of A and JAG MoU is a strong partnership, exemplifying how the public sector and government organizations can partner with PSIs to deliver programming that is beneficial to both the organization, the PSI, and students. Formalizing the relationship between cities and PSIs through an MoU, provides a broader space and scope for program development between the two parties.

9.0 Guidelines and Precautions for ARP Development

Due to the many contexts in which City-PSI partnerships can exist that are dependent on the history and politics of the past relationships, it is important to guide applied research by a general, but flexible, framework for integration. Building guidelines for successful ARPs between cities and PSIs is MetroLab Network's ten key principles for program success:

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1. **Embrace the idea of the city as a "living lab" and the university as a research & development resource** where faculty and students can work on policies and technologies that will enhance quality of life and advance the understanding of cities and urban science.
2. **Formalize a partnership between your city and university with a memorandum of understanding** that includes a commitment to jointly undertake "research, development, and deployment" (RD&D) projects.

[113] "Faculty of Law to sign Memorandum of Understanding with Judge Advocate General," University of Alberta, accessed May 30, 2023. https://www.ualberta.ca/law/about/news/2017/10/memorandum-of-understanding.html

3. **Assign a lead point-of-contact [PoC] at the city** who is responsible for managing the innovation partnership. The PoC should have a multi-agency purview, rather than sitting in a particular city agency. The PoC should be a policymaker with a research perspective.
4. **Identify problems that need to be solved and opportunities for innovation** by conducting an internal review of city agencies and by surveying constituents for their areas of importance, concern, and frustration.
5. **Assign a lead point-of-contact at the university** who is responsible for managing the innovation partnership. The PoC should have a multidisciplinary purview, rather than sitting in a particular university department. The PoC should not be a full-time researcher and should have experience in policy.
6. Survey faculty and students for interest in working on urban science matters. **Form a multi-disciplinary network managed by the university point-of-contact.** Create a student club focused on urban science.
7. **Find the intersection between city priorities and university expertise.** Connect city policymakers with university researchers to undertake RD&D projects in these areas. **Identify metrics that will define success on these efforts.**
8. **Arrange regular, predictable, monthly meetings between the city and university points-of-contact** at which they track progress on existing RD&D efforts and identify new opportunities.
9. In addition to seeking Federal, State, and Local governmental support, **approach your local business and philanthropic community to support your RD&D efforts,** given a shared interest in improving quality of life in the city.
10. **Engage local community groups as partners** to ensure that projects have their support and include their feedback.

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A more in-depth analysis of a developing City-PSI partnership can be found in the 2019 University of British Columbia (UBC) report, "Understanding the City-University Research

[114] "10 Principles for Successful City/County-University Partnerships," MetroLab Network, accessed May 9, 2023. https://metrolabnetwork.org/primer/

Partnerships between UBC and the City of Vancouver," which outlines additional considerations for City-PSI partnerships as that of UBC and the City of Vancouver (CoV) continues to grow. The report describes the benefits and constraints throughout the collaborative process and their building of a research partnership after signing a Memorandum of Understanding (MoU). Building the report with both UBC and CoV input, the author lists the various benefits, areas of improvement, and constraints throughout the process and provides recommendations for the partnership as it moves forward. The UBC report states:

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Benefits

- Mutual trust between collaborative partners as a result of having built and maintained long-term professional relationships over time.
- Researchers' flexibility in adjusting to particular needs of municipal staff while staying within a project's budget.
- High return on investment of collaborations, which offered good value for relatively little funding, at times allowing municipalities to leverage funding from other sources through a small contribution to a larger pool of funds.

Areas of Improvement

- Increase leadership commitment from both city and university.
- Create longer-lasting impacts from the project outcomes.
- Produce more practice-oriented deliverables.
- Initiate more long-term collaborations.
- Ensure sufficient financial and human resources.
- Ensure appropriate communication.
- Reduce administrative challenges at CoV.

Barriers that Prevented Collaboration

- Lack of awareness of potential partners for collaboration.
- Tension between city and university partners in expected duration of collaborations.
- Lack of financial and human resources.
- Difficulty in generating ideas and matching municipal needs with UBC research capacity.
- Lack of clarity around municipal public procurement processes.

Recommendations

1) **Introduce formal processes to help identify overlapping research needs and interests between city and university.**
    - Mirror the matchmaking process of the Greenest City Scholar program, i.e., city collects research needs from across its departments, and university similarly compiles project ideas from across campus and proposes possible matches.
    - Ensure a steady flow of city-relevant research outcomes to municipalities to increase staff's awareness of research capacity at university.
2) **Increase efforts to facilitate connections between prospective collaborators.**
    - Renew commitment to collaborate between city and university, focusing on more specific, targeted subject matter than the relatively broad 2010 MoU.
    - Organize regular "mixer" events to bring together university faculty and city staff.
    - Invite university faculty as guest speakers to city-internal lunch-and-learn talks, and likewise invite city staff to similar events at university.
3) **Involve dedicated full-time project manager**s.
    - Project managers help ensure that research partnerships are kept alive and move forward, and they facilitate better communication between collaborators.
4) **Increase available funding for research collaborations.**
    - University and city could foresee specific funds for research collaborations, possibly allocated through competitive processes.
5) **Include elements of co-creation.**
    - Shape research collaborations jointly as early on as possible in the process of collaborating to ensure buy-in from all project partners.
6) **Develop clear administrative pathways to research partnerships and showcase successful project outcomes.**

- Develop clear administrative processes and templates (i.e., procurement, legal agreements) for setting up city-university collaborations.
- Showcase successful experiences of collaboration and relevant outcomes.

7) **Produce deliverables that are both policy-relevant and publishable.**
   - Ensure final deliverables are policy-relevant to maximize usefulness for city.
   - Identify an appropriate research question at the outset of a project to facilitate academic publishing efforts.
8) **Collect information about research collaborations systematically.**
   - Set up administrative processes within both city and university to report relevant partnerships and establish a joint database of collaborations.
   - This would facilitate future research and evaluation efforts to increase and continuously improve research collaboration.

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Although important considerations, it is necessary to address that the UBC findings may not be generalizable to every City-PSI partnership as there are many different contexts in which these relationships exist. As previously stated, City-PSI partnerships are unique to the cities in which they are situated and appear to have developed in a multitude of ways. Going forward it will be important to consider how a City-PSI partnership would be established in the Lethbridge context, considering and learning from the history, politics, and past collaborations between Lethbridge's PSIs and the City of Lethbridge.

10.0 Conclusion

Partnerships between municipalities and PSIs allow for unique conditions wherein innovation and development can be harboured. The city has higher access to knowledge and skills from the PSI, creating opportunities to tackle intricate challenges within the community or

[115] University of British Columbia, *Understanding the City-University Research Partnerships between UBC and the City of Vancouver* (Vancouver: University of British Columbia, 2019)

within the organization itself. Students and PSIs also receive important opportunities to engage with the city through applied research initiatives, such as WIL opportunities and research services. Development of partnerships and applied research programming is dependent on the distinct contexts that exist between the city and PSIs, as well as the needs of both organizations. These are furthered through considerations around curriculum development/integration and the type of work needed to fulfill the city's project requirements. Although there are many considerations in regard to program development, applied research affords the opportunities for hands-on experience and valuable transfer of knowledge between academics and the workplace.

To further develop relationships between cities and PSIs, considerations surrounding scales of partnerships, funding, and formalized agreements, such as MoUs. City-PSI partnerships create a greater access to external funding for cities as they can utilize the pathways through the PSIs for project and program funding. In addition, formalizing the partnership through MoUs outlines the scope and parameters of the City-PSI relationship, allowing for programming that is informed and collaborative through the inclusion of both parties. Another consideration regarding a formal partnership is the scale of the partnership and what organizations/institutions will be involved. The scale of partnerships between PSIs and cities determines the access to expertise and the opportunities to address multiple challenges within the city.

Finally, using models and considerations from other applied research programming between cities and PSIs, we can better understand how to build a model of WIL and research services with the City of Lethbridge. Growing the current state of applied research at the city will enhance the access to labour, talent, and funding from the PSIs and in turn will create opportunities to provide better service to the community itself. In addition, students at the PSIs

will benefit from hands-on learning within the city on projects that help them to envision a long-term goal and possible future career opportunities.

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