

Summer 2025 Sustainability Scholars Program Internship Opportunity

The UBC Sustainability Hub is pleased to offer current UBC graduate students the opportunity to work on sustainability internship projects. Successful candidates work under the guidance of a mentor from the partner organization, and are immersed in real world learning where they can apply their research skills and contribute to advancing sustainability across the region. The pay rate for the summer 2025 program is \$31.25/hour or \$7,812.50 for a 250-hour project.

- Visit the [Sustainability Scholars Program website](#) to learn [how the program works](#) and to [apply](#).
- Be sure to review the application guide on the Apply page to confirm your eligibility before applying.

Applications close at 11:59 pm on Sunday January 26, 2025.

Project title: Research to evaluate the carbon footprint of green infrastructure construction materials

Project Background & Overview:

Urban sustainability is increasingly dependent on the integration of green infrastructure, which plays a pivotal role in climate adaptation by managing rainwater, mitigating urban heat islands, and enhancing biodiversity. However, the construction of these green assets often involves materials with significant embodied energy—encompassing the energy required for extraction, processing, manufacturing, and transportation. Recreating nature-based systems in urban environments delivers many community benefits that improve our environment and citizens' well being, and by analyzing the overall sustainability of such projects we can improve our implementation techniques as we scale up the use of green infrastructure as one of our important actions to prepare for the effects of climate change.

As we continue to develop our urban environment, we need to better understand the balance between the lifecycle energy consumption of common construction materials and their environmental benefits when deployed in green infrastructure to support decision-making in design and constructing the public right-of-way. Municipalities strive to make environmentally friendly choices in design and construction but frequently revert to traditional methods due to a lack of common understanding and practical alternatives. Currently, the City of Vancouver does not evaluate the carbon footprint of common construction materials used in public spaces or have a method to consider substituting greener alternatives for standard materials. The research will investigate and provide a recommendation on how new technologies, rethinking existing materials, or recycling construction waste can be assessed and utilized in the future.

Project description

The focus will be on optimizing materials commonly selected for use in green infrastructure assets to reduce carbon emissions, extend life cycles, assess durability, and minimize construction waste within the public realm. Additionally, the study will identify barriers to

reusing materials, such as reusing existing soil, fill or aggregates, including issues related to storage, lead times, maintenance, and government regulations.

Research Question: What are the most effective strategies for substituting traditional construction materials with lower-carbon, durable and reusable alternatives in municipal public realm green infrastructure projects?

By addressing these key issues, the project aims to contribute to the broader goal of sustainable urban development, ensuring that green infrastructure not only provides environmental benefits but also aligns with the principles of energy efficiency and resource conservation.

Project scope

1. Background Research:

- a. **Review COV Standards:** Examine [City of Vancouver \(COV\) standard GI details](#) and construction methods to understand materials and emissions.
 - i. List standard materials used in Rainwater Tree Trenches, Bioretention Systems, and Infiltration Trenches.
- b. **Research Best Practices and Innovative Alternatives:** Study Green Infrastructure practices and designs from other municipalities or countries to identify 3 to 5 commonly used alternative materials.
- c. **Develop knowledge:**
 - i. **Interviews:** Conduct a minimum of 2 interviews with COV Green Infrastructure and/or industry experts to better understand material installation methods and their benefits. The project mentor will help the Scholar identify relevant staff in the Green Infrastructure Branch, City Operations, and the Planning, Urban Design, and Sustainability Branch.
 - ii. **Site Visit:** Attend at least 3 locations with a Green Infrastructure expert to review the green infrastructure design and materials used. Potential sites include Sunset Park, St George Rainway, Woodland & 2nd Ave, Cambie Gardens, and the Cambie & 31st Ave Boulevard Improvement.
- d. **Create methodology:** Establish a comparable method to best evaluate materials considering (but not limited to) characteristics such as emissions, lifecycle cost, durability, and upcycle potential.

2. Analysis:

- a. **Material Comparison:** Conduct a comparison of the carbon footprint for typical materials currently in use, and innovative materials the City should consider in future designs, focusing on emissions, lifecycle cost, durability, and upcycle potential, selecting approximately 3 to 6 materials for analysis.
- b. **Output:** Create a spreadsheet with the findings and create visual graphics to illustrate results. Use clear and impactful graphics to present findings, making the data accessible to a broader audience.

3. Report:

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- a. **Final Report:** Provide recommendations for the Green Infrastructure Branch, including an evaluation of how to embed consideration of materials' carbon footprint in the design process and its application in future designs.
4. **Additional Research (time permitting):**
 - a. **Weighting Methodology:** Apply a weighting methodology to findings based on interviews with subject experts for a more quantitative analysis. Compare to the cost of no action or business as usual.
 - b. **Material Rating:** Use material evaluations to rate current Green Infrastructure assets and suggest designs for future assets. This could be incorporated into the spreadsheet.
 - c. **Additional Assessments:** Consider assessing 1-4 more COV materials or proposed alternatives.
 - d. **Pre-Cast Solutions:** Research proprietary (off-the-shelf) products by manufacturers to determine if pre-cast solutions are more sustainable.

Deliverables

- A final report containing a summary of the work completed and recommendations on how the Green Infrastructure Branch can better understand and evaluate emissions of their assets.
- A presentation outlining the scholar's analysis and recommendations to the Green Infrastructure branch.
- A final report for the online public-facing [Scholars Project Library](#).

Time Commitment

- This project will take 250 hours to complete.
- This project must be completed between May 1 to August 15.
- The Scholar is to complete hours between 9 am and 5 pm, Monday to Friday, approximately 17 to 20 hours per week.

Required/preferred Skills and Background

- Excellent research and writing skills
- Demonstrated interest in sustainability
- Strong analytical skills
- Ability to work independently
- Deadline oriented
- Project management and organizational skills
- Demonstrated experience in detailed design and construction
- Familiarity with benchmarking methods and tools
- Familiarity preparing feasibility studies
- Design and layout skills, an asset
- Experience or familiarity with GHG emissions/carbon accounting
- Familiarity or interest in Green Rainwater Infrastructure implementation

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Apply here: [Click here to apply](#)

Contact Karen Taylor at sustainability.scholars@ubc.ca if you have questions

Useful Resources

We are holding a special **resume preparation workshop for prospective Scholars** on January 21, 2025.

[Click here for details and to register.](#)

Below are some links to useful resources to help you with your resume and cover letter (there are many more online). Some of these resources also provide information on preparing for your interview.

<https://students.ubc.ca/career/career-resources/resumes-cover-letters-curricula-vitae>

<https://www.grad.ubc.ca/current-students/graduate-pathways-success>

<https://www.grad.ubc.ca/cover-letter-cv-resume-templates-ubc-career-services>