

Summer 2024 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. These opportunities are paid. The pay rate for the summer 2024 program is \$27.50/hour or \$6,875 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 midnight on Sunday January 28, 2024.

Project title: Cost, Performance, and Emissions Analysis of Sustainable Concrete Alternatives for Sidewalk Construction

Project Background & Overview:

The Streets Design Branch in Engineering Services manages the rehabilitation and construction of the City of Vancouver's street infrastructure. The Asset Management Team manages the full lifecycle (design, construction, maintenance and disposal) of 2100km of sidewalk assets with an estimated replacement value of \$1.1 billion. The sidewalks are designed to provide safe and comfortable pedestrian movement of all abilities. Standards for typical sidewalks are outlined in both the City of Vancouver Engineering Design Manual and the Master Municipal Construction Documents (MMCD). The most common sidewalk treatment in the City is Portland Cement Concrete, which has a lifecycle return of 50 years.

The City has created a Climate Emergency Action Plan (CEAP) to address the climate crisis and target a goal of becoming carbon neutral by 2050. In order to reach the necessary carbon pollution reduction, the City will evaluate the environmental impact of concrete and explore sustainable concrete alternatives in sidewalk application.

Key issues include:

- Concrete releases an extreme amount of CO₂ each year. Concrete is constructed using cement which contributes to 8% of overall global emissions.
- Concrete is generally not recyclable.
- Sidewalks need to be designed with surface slip resistance, durability, strength and provide a reasonable lifecycle return.
- Safety needs to be held paramount and the sidewalk assets need to be cost effective.

Project description

The purpose of this project is to investigate the current environmental impact of the use of concrete in street infrastructure. It is to explore alternative materials that meet the performance requirements of a sidewalk and compare the cost with our standard, Portland

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Cement Concrete. It is to review the City's existing sidewalk network, review the performance of assets using sub-standard materials and propose future projects that provide carbon pollution reduction.

Key areas of investigate are:

- Current carbon emissions associated with the use of concrete in street infrastructure.
- Sustainable alternative materials that meet the performance needs of a sidewalk design.
- Innovative projects that use alternative materials within the industry and provide carbon pollution reduction.

Project scope

The primary activities of the project will include:

1. Literature review of the City's current design standards and maintenance practices for sidewalk assets.
2. Research carbon emissions associated with the production and use of concrete within the City's street network.
3. Desktop study of sustainable alternatives to traditional Portland Cement Concrete and perform a comparison of the following:
 - a. Performance
 - b. Carbon emissions
 - c. Full lifecycle including initial cost and subsequent maintenance costs
4. Research and evaluate 5-10 industry projects that use alternative materials for sidewalks/pathways, either from municipalities or private companies.
5. Research and analyze the risks associated with using sub-standard material within sidewalk application.
6. Evaluate the performance of 5-10 existing City sidewalks that use sub-standard material within sidewalk application. This would include a deficiency walk and report.

Deliverables

- An analysis of the current environmental impact of Portland Cement Concrete within street infrastructure.
- A final report containing a summary of the work completed within the project scope.
- A final report for the online public-facing [Scholars Project Library](#).
- A final presentation to the Streets Design branch.

Time Commitment

- This project will take 250 hours to complete
- This project must be completed between May 1 to August 15, 2024
- The Scholar is to complete hours between 9 am and 5 pm, Monday to Friday, approximately 17 to 20 hours per week.

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Required/preferred Skills and Background

- ☒ Excellent research and writing skills
- ☒ Demonstrated interest in sustainability
- ☒ Familiarity with research methodologies and survey techniques
- ☒ Statistical analysis
- ☒ Excellent public speaking and presentation skills
- ☒ Familiarity conducting focus group research
- ☒ Strong analytical skills
- ☒ Ability to work independently
- ☒ Deadline oriented
- ☒ Project management and organizational skills
- ☒ Strong technical and drafting skills
- ☒ GIS training or experience.
- ☒ Familiarity preparing feasibility studies
- ☒ Experience with financial modelling and analysis, an asset
- ☒ Experience conducting life cycle analysis, an asset
- ☒ Carbon emissions accounting and analysis, an asset

Applications close **midnight Sunday January 28, 2024**

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 23, 2024.

[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>