

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: Research to quantify the carbon capture of street infrastructure assets

Project Background & Overview:

The Streets Design Branch in Engineering Services at the City of Vancouver manages the rehabilitation and reconstruction of the City's pedestrian, cycling and vehicular infrastructure. Maintaining our concrete and asphalt pavements is crucial to mobility, accessibility and network resilience. However, in an effort to ensure our assets and their lifecycle are sustainable, we continue to look for opportunities to capture the carbon emissions associated with their construction, usage and maintenance. We are looking for the capability to quantify the carbon benefits of implementing and having sustainable street infrastructure assets within the street right-of-way (ROW) (ex. street trees, tree canopies, transit lanes, bike lanes, green infrastructure, etc.) as a means to track our progress towards carbon neutrality. We aim to better measure the necessary steps for us to reach carbon zero goals within our asset management cycle.

Key issues include:

- Concrete and asphalt are carbon intensive materials, and we should work to reduce their use, and/or the extent/frequency of replacement, where possible. Where not possible, we should work to incorporate sustainable street infrastructure assets to reduce the carbon impact of our roads and sidewalks.
- We are currently unable to quantify and track the benefits of our sustainability efforts, nor quantitatively understand their impact on making our streets carbon neutral
- We want to understand the impact of each sustainability street infrastructure asset and compare their contributions to reducing carbon emissions
- Going forward, we want to create a data-driven methodology to selecting sustainability street infrastructure assets on street ROW that can optimize the physical space, budget and carbon outcomes

Project description

This project will explore how to quantify the benefits of sustainable street infrastructure assets on street right of ways, specifically street trees, sidewalks, transit lanes, bike lanes, zero-emission vehicle infrastructure. This will aid to better understand their role in addressing the overall impact and footprint of constructing and maintaining our roads, which are carbon intensive assets.

The Greenest City Scholars project will support the:

Climate Emergency Action Plan – For our 2030 Target of having 90% of people living within an easy walk or roll of their daily needs, we want to account for the carbon saved through walking and rolling and ensure our infrastructure support these active modes of mobility

Climate Emergency Action Plan – In reaching our 2030 Target to have 2/3 of trips in Vancouver to be by active transportation and transit, we want to quantify the carbon reduction of these actions compared to motor vehicles and measure the impact made

Climate Emergency Action Plan – For our 2030 Target to have 50% of the kms driven on Vancouver's roads to be by zero emission vehicle, by quantifying carbon reduction of zero-emission vehicles we can measure the impact and continue to support zero-emission infrastructure (ex. charging stations for EV vehicles to help CoV to reach this target)

Urban Forestry Strategy – To effectively and efficiently expand our urban forest, we can quantify the carbon absorption from Vancouver's urban forest as a means to capture the carbon emissions from our roads and to justify optimal locations for expansion

Rain City Strategy – highlight the positive carbon impacts that green infrastructure can have, and identify locations to encourage the reduction of impervious surfaces

Project scope

The project will focus on a reasonable selection of 4 to 6 assets prioritised in discussion between the Scholar and mentor, The Scholar is not expected to analyze the entire street and sidewalk network but, rather, perform initial analysis on 2 to 3 street segments. One would be a standard street segment with minimal sustainability assets (Grey); another would be street with sustainability assets (Green), and one case in between. Study area of this initial analysis will be determined by both Mentor and Scholar based on findings from earlier research tasks.

Key aspects of the investigation:

1. Conduct an academic literature review of best practices of carbon accounting from Canadian and global peers for each of the 4-6 individual sustainability assets/initiatives on streets ROW and their capacity for carbon reduction (Ex. Street trees helps in reducing carbon emission, the scholar will explore the ways to quantify the carbon capture from street trees. Similarly, compare carbon reduction of alternate modes of transportation such as walking/biking/transit compared to the use of vehicles, etc.)
2. Attend 2-3 short site visits to familiarize the Scholar with typical types of sustainability street infrastructure assets and their various functions within the street right-of-way

SUSTAINABILITY SCHOLARS PROGRAM

3. Review ROW asset inventory to rank and identify the 2-3 street segments to examine for the project. Ranking will be in consultation with the mentor
4. Conduct an analysis to quantify the carbon captured for each sustainability asset on the selected street segments. Compare the carbon reduction capacity between the selected street segments. The process for analysis should be well-defined for future steps to implement on a city-wide scale
5. Conduct an analysis for each of the various sustainability assets and rank their efficiency in carbon capture. This will help identify optimal scenarios in which the City may want to strategically implement these sustainability assets to achieve carbon neutrality
6. (Time permitting) Use pavement condition index (PCI) scores, sidewalk condition data, street tree health/maturity data, distribution of tree canopy coverage, bikeway network and transit networks to help the City identify locations that can advance carbon reduction by implementing urban forestry/green infrastructure, and prioritize walking, cycling and public transportation

Deliverables

- An analysis of carbon reductions for different sustainability street infrastructure assets
- Framework/methodology that can be applied to assess the carbon neutrality of other street segments in the future
- A final report containing a summary of the work completed
- 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.

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
- Strong analytical skills
- Ability to work independently
- Deadline oriented
- GIS training or experience. (not required)
- Familiarity with benchmarking methods and tools

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☒ Familiarity with GHG emissions analysis, carbon accounting, lifecycle cost analysis, and similar activities, 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>