



## University of Waterloo ITE Canada Outstanding Student Chapter Award Application

The University of Waterloo (“UW”) ITE Canada Student Chapter (“student chapter”) is pleased to submit this report for the Student Chapter Award.

In recent months, the UW ITE Student Chapter has undergone a radical transformation. Although the chapter has enjoyed almost continuous membership since its establishment in 1974, making it one of the oldest student chapters in Canada, recent events caused the chapter to become inactive from 2017 – 2022 (one of them being the global pandemic).

Members of the transportation faculty nominated several students in early 2022 to act as officers in order to encourage undergraduate and graduate students interested in transportation engineering to participate in the chapter’s many well-known activities, such as holding academic seminars, guest lecturers, social events, organizing technical tours and visits, etc. It took great effort to restart the student chapter almost from scratch. As this report shows, the new executive team wasted no time setting up various events for students to deepen their knowledge and appreciation for transportation engineering and planning.

### Chapter Administration

The student chapter has six elected executive positions and two faculty advisors, displayed below in Table 1.

Table 1 – UW CITE Student Chapter Executives

| Position        | Elected Executive Officer          |
|-----------------|------------------------------------|
| President       | Reza Aminghafouri                  |
| Vice-President  | Matea Ceric                        |
| Treasurer       | Lucas Sobreira                     |
| Secretary       | Jeffrey Dai                        |
| Media Director  | Urooj Khan                         |
| Student Liaison | Andres Valencia                    |
| Faculty Advisor | Christian Bachmann (On Sabbatical) |
| Faculty Advisor | Liping Fu                          |

The student chapter has consistently held weekly 12 executive meetings since its reestablishment in September 2022. Meeting details displayed below in Table 2:

Table 2 – UW CITE Student Chapter Meetings

|   |                    |   |                   |    |                   |
|---|--------------------|---|-------------------|----|-------------------|
| 1 | September 29, 2022 | 5 | November 17, 2022 | 9  | January 30, 2023  |
| 2 | October 17, 2022   | 6 | December 6, 2022  | 10 | February 6, 2023  |
| 3 | October 28, 2022   | 7 | January 16, 2023  | 11 | February 13, 2023 |
| 4 | November 10, 2022  | 8 | January 23, 2023  | 12 | February 27, 2023 |



Location: All meetings were held online through Microsoft Teams

Presentation/speaker: all meetings were led by the President and Vice-President, Reza Aminghafouri and Matea Ceric, respectively. These weekly meetings allow each team member to discuss any updates regarding their responsibilities and tasks. Different members are encouraged to provide their inputs regarding event planning, fundraising, and social media activities.

## Networking Events

On October 7<sup>th</sup>, 2022, the UW student chapter held its first event after a 6-year hiatus. The first event was a welcome back event with over 25 attendees. The event was marked by an introduction by Professors Fu and Bachmann to give inspiration to attendees and the benefits of joining ITE as a student member. The event was wrapped up by a Kahoot competition and pizza party to celebrate the reestablishment of the student chapter at the University of Waterloo as well as a networking session for students to meet each other and talk with transportation professors at the University of Waterloo.

The UW student chapter met in person for the first time on February 2<sup>nd</sup>, 2023, following the elections. The event was attended by the entire executive team as well as the chapter advisor. This event allowed the executive team to meet with the broader student chapter team and provided an opportunity for students to interact with the chapter advisor in person.

## Leadership Development

The student chapter has various methods to support leadership development. This includes yearly executive elections, which give members a chance to take on different roles. The Chapter Advisors also meet with students during events and discuss the leadership opportunities available to students within the ITE community. Professor Fu introduced students in his undergraduate and graduate level transportation classes to ITE and explained its benefits and opportunities for students to improve their leadership skills through various roles within the chapter. Professor Fu also highly encouraged the students to attend the TRB conference to improve their technical knowledge and leadership skills through attending various sessions and workshops during the conference. To motivate the students, he generously covered the costs for attending the conference for both ITE grad and undergrad students from iTSS lab group.

The UW student chapter is also fortunate to have many graduate students in executive roles who can share their knowledge with the many undergraduate members of the chapter.

## Application of Technical knowledge

The members of the student chapter have been active in the academic community, with several members presenting their research at various conferences. Reza Aminghafouri, UW ITE president, gave a presentation on Advancing Vision Zero Road Safety in the City of Kitchener with Smart City Data at the 2022 CITE Quad conference held in Vancouver. His research involves an innovative methodology that incorporates smart city data, simulation, and operational AI, as well as a traditional network screening study using collision data to

identify high-risk road segments. The goal of this research is to promote Vision Zero: to achieve no road user fatalities or serious injuries.



*Figure 1 – Technical Presentation at CITE 2022*

In addition, Chapter Advisor Professor Fu Liping, Treasurer Lucas Sobreira, and Secretary Jeffrey Dai attended the 2023 TRB conference in January 2023. TRB provided a great opportunity for networking with other members in academia as well as many industry partners at the exhibition.

Professor Fu gave a presentation and presented a poster titled “A Joint Confidence Region Approach to Ranking Hotspot Locations Considering Uncertainty in the Expected Risk Estimates” on behalf of President Reza Aminghafoori who was unable to attend. Reza’s study highlights the importance of considering uncertainty in network screening for crash hotspot identification. By using a frequentist approach and a combination of statistical models, the study was able to estimate the 95% confidence interval of expected crash risk at various locations.

The work developed by Lucas explores the spatial transferability of Direct-Demand (DD) models to other jurisdictions. DD models are used for estimating pedestrian exposure at signalized intersections as a function of land use and socioeconomic attributes. The study shows that there is potential for the spatial transferability of DD models, which may help jurisdictions that lack pedestrian data for jurisdiction-wide volume estimations. The work is titled “Comparing Direct Demand Models for Estimating Pedestrian Volumes at Intersections and Their Spatial Transferability to Other Jurisdictions”.

## New Member Recruitment

The main member recruitment initiative was the welcome back event hosted in October 2022. The executive team reached out to different faculties through friends and faculty connections to spread the word. In addition to the core executive team, seven students were hired as volunteers to form the core leadership team of the chapter. They fill positions in the social media team, a treasurer support, and two event coordinators.

This new team was the result of an election which involved 23 students who submitted applications for the executive team. Out of those students, an election was held with 30 attendees who elected 7 students to form the core executive team.



In addition, the student chapter has leveraged social media and the official website to attract new members. This includes 90 new followers on LinkedIn, 109 followers on Instagram, 42 followers on Facebook, and 19 subscribers on YouTube.

A focus of the student chapter has been to attract more undergraduate students to be involved in ITE, which has previously attracted more graduate students and had a heavy research focus. Currently, there are 95 members on the mailing list, consisting of 25 undergraduate students, 50 graduate students, 7 alumni, 7 faculty members, and 6 non-faculty members. Out of the 95 members, 49 members were added in 2022.



*Figure 2 – Launch Event*

## Diversity and Inclusion

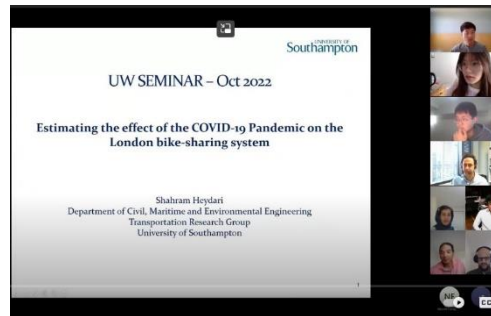
The Women in Transportation Series aims at inviting Women in Transportation International to Waterloo to host a seminar on their work. The student chapter was able to host a seminar on November 25, 2022, with Maria Doyle from Metrolinx, who discussed the inter-disciplinary relationships on complex projects, such as the Scarborough Subway extension and the Yonge North Subway Extension.

The UW student chapter has traditionally catered to the transportation engineering (civil engineering) department at UW. This was one of the key reasons why membership remained low. The new executive team is changing directions by advertising to other faculties such as the Faculty of Environment, as well as the School of Planning. Additionally, seven out of thirteen members of our core team are from non-engineering faculties.

## Training and Professional Development

On the professional development aspect, two academic research seminars were held. Professor Wang Junhua from Tonji University presented a topic regarding Road-Range Level Vehicle Trajectory Tracking Based on mmWave Radar on April 21<sup>st</sup>.

Professor Shahram Heydari from Southampton University discussed the Effect of the COVID-19 Pandemic on the London Bikesystem on October 24, 2022. Both seminars were well attended with students and the Chapter Advisor engaging in meaningful dialogue with the guest speakers.



*Figure 3 – Professor Heydari's Seminar*

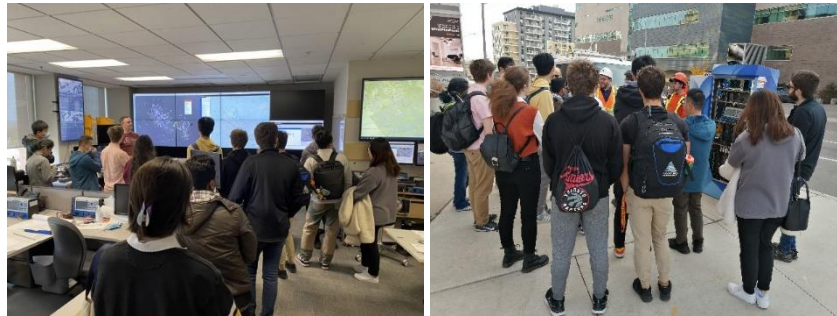
On the training side, the student chapter organized an ArcGIS tutorial on February 10, 2023. Master of Environment student Jason Skidmore held a one-hour tutorial on ArcGIS. This event was attended by 32 students across many faculties and was comprised of an introduction to the software, its applications in transportation engineering and an exercise for students to develop a model with ArcGIS Pro. Numerous ITE Waterloo Chapter leadership team members were present to assist Jason in helping students learn ArcGIS and successfully complete the exercise. This event resulted in success with students asking for further information about ArcGIS and sparked further interest from students for future events.



*Figure 4 – ArcGIS Tutorial*

## Field Trips/Technical Tours

A field trip to the Region of Waterloo Traffic Control Center was organized on November 4th. This successful event involved 46 attendees who went to learn about how the Region manages their traffic systems. The field trip involved two parts: first, a visit to the traffic control center with a lecture on traffic management operations; and second, going to the field and seeing traffic management systems in-person. The technical team explained the detail of the steps for collecting data and the students also had the opportunity to see the main traffic equipment such as controllers, detectors, etc. and ask their technical questions.



*Figure 5 – Traffic Center Tour*

## Service Project

The student chapter has already submitted intent to collect parking data for an ITE project and is currently finalizing the locations to begin data collection. This project is to compile data for different land uses and the UW student chapter is aiming to collect data at locations on and surrounding the UW campus. Volunteers have already been gathered and are just waiting on final approval from ITE international.

## Summary and Future steps

In Summary, the UW ITE chapter completed eleven different events and activities in 2022 after almost five years of inactivity to increase the knowledge, network, and soft skills of students in the field of transportation. A summary of these events is listed below in Table 3.

Table 3 – Summary of Student Chapter Events

| Date              | Event Type             | Description   |
|-------------------|------------------------|---|
| April 21, 2022    | Academic seminar       | Presentation by Prof. Wang Junhua from Tongji University  |
| June 1, 2022      | Technical presentation | Attendance of CITE Quad conference                        |
| October 7, 2022   | Networking/social      | First social event to kick off the start of the chapter   |
| October 24, 2022  | Academic seminar       | Presentation by Prof. Heydari from Southampton University |
| November 4, 2022  | Technical tour         | Region of Waterloo Traffic Control Center tour            |
| November 24, 2022 | Election               | Executive team and volunteer committee member election    |
| November 25, 2022 | Industry talk          | Women in Transportation- Maria Doyle                      |
| January 2023      | Technical presentation | Attendance of TRB Annual conference                       |
| February 2, 2023  | Team social event      | UW ITE student in-person team social event                |
| February 10, 2023 | Tutorial               | ArcGIS tutorial held by Jason Skidmore                    |
| TBD               | Service project        | Parking Data Collection project for ITE international     |

The UW ITE student chapter looks forward to its next operating year, with collaboration events with other student chapters and ITE sections on the horizon, as well as participation in ITE events such as the Trafficbowl. The student chapter will also aim to participate in industry projects and contribute meaningfully to the community.