

2024 CART CODES

HACK HOW WE MOVE



Saturday, February 10th to Sunday, February 11th

Romero Family Classroom – Emera IDEA Building



Norma Eddy Lane, Halifax
Dalhousie University's Sexton Engineering Campus



Hackathon [Website](#) & [Registration](#)

The **Climate Action Research for Transportation** (CART) Network is hosting the inaugural “CART Codes” Hackathon as part of their 5-year Climate Action and Awareness Fund (CAAF) project awarded by the Environment and Climate Change Canada. The event will generate collaboration among computer science, engineering, and planning disciplines. As of 2022, the transportation sector is one of the major sources of Greenhouse (GHG) emissions which comprises 24% of total GHG in Canada. In the face of increasing climate change, federal and municipality have already adopted various climate action policies such as vehicle electrifications, carbon trading, among others to tackle climate change impacts on residents and infrastructures. To strengthen Canada's effort in achieving 2050 net zero emissions, the use of sustainable transportation and tracking individual level carbon footprint are critical. Data collection and evidence-based decision making are more important now than ever to establish benchmarks, quantify progress, and **enact policy**. The complexity of these problems demands collective action to enhance technical capacity of solving climate change challenges and inform proactive decisions and policies at the individual, local, and national levels.

Join like-minded computer science, engineering, and planning students as they **hack for change** during CART Network's **24-hour** inaugural hackathon.

Prizes

The winning teams will receive a cash prize:

1st Prize of \$2,000

2nd Prize of \$1,000

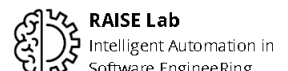
3rd Prize of \$500

Hackers will be given the opportunity to participate in an exciting new learning experience, expand their networks, and advance their careers.

WHY PARTICIPATE IN A HACKATHON?

CART Codes will hack how we move and will focus on climate change action within Nova Scotia by producing valuable data tools to aid in the advancement of activity-based travel data collection and modelling that has already been established by DalTRAC. Hackers will be tasked with developing methods/tools/games/applications. Teams can choose from one of these four streams to develop their solutions:

1. **Mobile Applications Development**
2. **Data Mining & Predictive Modelling**
3. **City Modelling for Urban Games**
4. **Design Your Sustainable City**



HACK & MODEL HOW WE MOVE

Peoples' movements resulting from their travel choice decisions such as mode and route choices, and times of the day of travel have direct impacts on greenhouse gas (GHG) emissions. Tracking carbon footprint can inform individuals on to efficiently plan travel activities to contribute to overall climate change and the enhancement of the quality of life. A tactical tool can provide a platform to understand individuals' current carbon footprint and to test strategies for reduced travel expenses and GHG emissions. Travel expenses can be measured by travel time, fuel costs, among others. Strategies that individuals can consider for testing may include but not limited to:

- **SHIFTING MODES**
- **SHIFTING TO ALTERNATIVE FUELS**
- **EXPERIMENTING WITH NEW ROUTES**
- **MODIFYING DAILY TRAVEL HABITS**

In urban systems, we have millions of decisions to be made. Can we develop an agent-based model to describe home purchasing and renting behaviors. How do we move? How can we plan efficient routes to destinations?

For individuals' evidence-based decision making, how can we train our model/application to give guidance to individuals to enhance their decisions and plans towards low carbon lifestyle. For example, how the application data base can advise better strategies for efficient movements and low carbon footprint that matches the specific needs of the user.

DESIGN HOW WE MOVE

Take a look at what other cities are doing across the globe. How can inventive design solutions generate more walkable community centres and promote sustainable transportation options. Design solutions may include but are not limited to:

- **INTRICATE BICYCLING NETWORK**
- **PEDESTRIAN BRIDGE**

STREAM 1

MOBILE APPLICATIONS DEVELOPMENT

Description: Participants will develop a mobile application (e.g., Android or IOS application) for transportation research

Sample Research Question: How can we track travel or predict travel movements from origins to destinations?

STREAM 2

DATA MINING & PREDICTIVE MODELLING

Description: Participants will develop a tool/method for mining an existing dataset or open-source data and training a predictive model with machine learning for transportation planning.

Sample Research Question: What is the projected adoption of EV's in the next 5 years?

STREAM 3

CITY MODELLING FOR URBAN GAMES

Description: Participants will simulate urban systems (e.g., population, housing, economic activities) and enable users to interact with their surrounding environment with the use of fictitious data.

Sample Research Question: How can we simulate life choices? How can we simulate housing supply on a yearly basis?

STREAM 4

DESIGN YOUR SUSTAINABLE CITY

Description: Participants will develop innovative ideas to reshape the existing transportation system and surrounding built environment with the use of physical or digital models.

Sample Research Question: What types of transformative mobility initiative could be implemented in Halifax to create a liveable and playful downtown? Make a model.

HACKATHON FORMAT

CART Codes will be a fully in-person event hosted on Dalhousie University's Sexton Engineering Campus in the IDEA Building and DalTRAC lab space. Students will work in teams of up to four individuals, which will be identified before the event begins.

Concluding the Opening Ceremonies, hackers will meet in their assigned team to develop an initial pitch to the judges. This will allow hackers to think through the applicability of their idea and receive feedback from judges before they really dive into the project. Each team will be given 3-5 minutes.

Upon completion of the 24-hour hack, teams will present their projects to the judges for evaluation. Each team will be given 8-10 minutes. Following deliberation, awards will be announced during lunch. For a more in-depth itinerary please refer below:

EVENT ITINERARY

Saturday, February 10th, 2024

9:30AM	Registration & Doors Open
10:00AM	Opening Ceremony
11:00AM	Coffee & Team Meeting to Develop Initial Pitch
12:00PM	Initial Pitch to Judges (3-5 minutes per team)
12:45PM	Lunch (provided)
1:45PM	Working Period in Teams
7:00PM	Dinner (provided)
8:00PM	Working Period

***Note:** The DalTRAC Lab space will only remain open until 1AM

Sunday, February 11th, 2024

9:00AM	Breakfast (provided)
10:00AM	Working Period in Teams
1:00PM	Final Presentations to Judges & Deliberation
2:30PM	Awards Lunch

DISCLAIMER

Any data, methods, and tools developed within the hackathon period of February 10th and February 11th, 2024, will be retained by the DalTRAC lab for further use or development. Please note that photography and footage will be taken throughout the *CART Codes* event for marketing purposes. Participation in this event constitutes as consent.

JUDGING CRITERIA

1. Originality & Creativity
2. Application of Theory & Practicality
3. Functionality & Completeness
4. Climate Impacts & Social Implications

A rubric will be made available to all teams at the start of the hackathon.

TECHNOLOGY & DATA

PLEASE BRING YOUR OWN LAPTOP. DalTRAC workstations are available in both labs (B-Building and O'Brien Hall). We will provide access to datasets which may be used to develop your teams' applications. All public resources may be utilized following a responsible usage policy.

CONTACT INFORMATION

Please contact daltrac.comms@dal.ca with any questions.

[REGISTER HERE](#)

