

Call for Applications: Automated Sidewalk Winter Maintenance Trial

Application Form

Interested organizations are requested to submit an Application to the City and Exhibition Place by December 18, 2020 at 5pm Toronto time.

Expressions of interest should be submitted in a PDF document via email to automatedvehicles@toronto.ca.

For any questions about the application process, please contact Fahad Khan, Project Lead, at fahad.khan@toronto.ca.

Contact information

1. Organization/company Name: _____
2. Organization/company description: _____
3. Main contact person name and title: _____
4. Main contact person e-mail address: _____

Technology

1. Please provide an overview of your technology (250 words max.)

2. Which of the Innovation Canada [Technology Readiness Levels](#) best describes your technology? (100 words max.)

3. Please provide the dimensions of your technology when operating (LxWxH, cm) and the minimum and maximum snow clearing or salting widths (cm).

4. Please provide the weight of your technology when operating (kg). _____

5. Please describe the level of automation of your technology:
 - a. Which aspects of the dynamic driving task can be done in an automated fashion?

longitudinal vehicle motion control (acceleration/deceleration)

monitoring the driving environment

planning maneuvers/avoiding obstacles

completing a pre-determined route for the purposes of winter maintenance
 - b. Which aspects of the dynamic driving task are done via remote control/teleoperation?
 - c. What sensors does the technology use to sense its environment?

- d. How would you classify your technology according to the [SAE Levels of Automation?](#)
- e. Other comments:

Research and Development Priorities

1. Please indicate which challenges are of most interest to your research and development objectives. Please note, this is to give the City a sense of your testing priorities. The City will work with you to develop a detailed trial plan once your application is accepted. (check all that apply):

A. Navigation and automation:

- i. ☒ Obstacles in path
- ii. ☒ Interaction with other road users (pedestrians, pets, cyclists, etc)
- iii. ☒ Large curve, 90 degree turn in the road
- iv. ☒ Dead end road
- v. ☐ Different speeds of operation
- vi. ☒ Navigating after first snow (lines not visible)
- vii. ☒ Navigating on salt (especially, whether glare from melted salt affects ☒ visibility)
- viii. ☒ Crossing the road

B. Clearing snow/salting on different sidewalk configurations:

- i. ☒ Narrow sidewalk, continuous width (less than 2.5m)
- ii. ☒ Average sidewalk, pinched pedestrian clearway due to obstruction (as ☒ narrow as 1.2m)
- iii. ☒ Monolithic sidewalk (no distance between sidewalk and curb/street)
- iv. ☒ Grass along sidewalk (ensuring to not damage grass)
- v. ☒ Retaining wall along sidewalk (ensuring to not touch the wall)
- vi. ☒ Different pavement surfaces (asphalt, cement, pavers)
- vii. ☒ Lane comparable to a cycle track (1.5-2.0m with curb, barrier or bollards ☒ on both sides)
- viii. ☒ Cycle lane (1.5-2.0m with no curb, barrier or bollards on one side)

C. Service approach:

- i. Clear snow to a range of standards (e.g. bare pavement)
- ii. Communicate information (location, service completed, interactions, etc.) with an end user; nearby road users
- iii. Work in a configuration to clear and salt simultaneously

2. Are there any of the above challenges that your technology would not be able to participate in? Please explain. (250 words max.)

3. Are there any challenges not listed above that you would be interesting in including in the trial? Please explain. (250 words max.)

4. Please indicate which weather conditions are of most interest to your research and development objectives (select all that apply):
- A. A minimum 2cm, 8cm, and 15cm of snow accumulation
 - B. When a freezing rain warning is issued by Environment Canada
 - C. During an active snowfall for a minimum of 30 minutes
 - D. A minimum sustained wind of 25 km/h
 - E. Other (please specify) _____
5. For approximately how many days would you be interested in conducting trials?

Privacy and Cybersecurity

1. Does the technology collect data or information? Describe or attach technical documentation such as flow diagrams or basic technology architecture diagrams.
- A. More specifically, does the technology take photos, video and/or audio?
 - B. Where is collected data stored?
 - C. What are the tamper-proof and cybersecurity measures undertaken to protect this data?
 - D. How long are recordings retained?

2. Does the technology communicate with a central server, other devices, vehicles or infrastructure? Describe.

A. Is this communication wireless? Describe.

Monitoring and Evaluation

1. How will you monitor and evaluate the success of your trial? (250 words max.)

Minimum Requirements Checklist

Please check the boxes below to acknowledge that your organization is prepared to meet the minimum requirements. These minimum requirements will be reflected in the terms of the Licencing Agreement that participants will sign with Exhibition Place to participate in the trial. The final wording in the Agreement may be modified from the above, which is provided for information purposes.

1. The applicant organization is incorporated or is a registered not-for-profit organization.
YES NO

2. The applicant agrees to purchase and maintain, or cause to be maintained, and kept in force, at its sole cost and expense, for the duration of the Term, the following policies of insurance, as issued by an insurance company authorised by law to carry on business in the Province of Ontario and which is in a form acceptable to the Licensor:
 - a. Commercial General Liability Insurance which has inclusive limits of not less than Five Million Dollars (\$5,000,000.00) per occurrence, for bodily injury and property damage resulting from any one occurrence and which extends to include Personal Injury Liability, Broad Form Contractual Liability, Owner's and Contractor's Protective Coverage, Completed Operations Coverage, Employer's and/or Contingent Employer's Liability; and Non-Owned Automobile Liability. The policy shall include a Cross Liability and Severability of Interest Clause and shall name the City of Toronto and the Board of Governors of Exhibition Place as an additional insured;
YES NO
 - b. Standard Automobile Liability coverage with a limit of at least \$2,000,000.00 for all licensed motorized vehicles used during the Term of the Agreement;
YES NO
 - c. Any such another insurance as the Licensor, acting reasonably, may require.
 - d. Other comments:

3. The applicant agrees to share trial results and observations with the City. Aggregate summaries of trial results (not specific to individual participants) will be posted publicly by the City to the [Open Data portal](#). Participants will be asked to share:
- a. Documentation of successes and challenges faced by their technology in each of the trials related to ability to remove snow, spread salt, reliability of technology, performance of sensors in various weather conditions.
YES NO
 - b. Number of hours operating in the trial and number of staff assigned
YES NO
 - c. Reflections on how their technology can meet existing City needs and where it needs to develop further.
YES NO
 - d. Feedback on the application and trial process.
YES NO
 - e. Other information as may be requested by the City.
 - d. Other comments:

4. The applicant agrees to undertake appropriate practices to protect privacy while testing in the public realm. Camera footage of the public realm may include footage of persons, which would constitute personal information. During all trial activities, the participant must:
- a. Take appropriate actions to prevent or minimize the collection, use, retention and disclosure of personal information.
YES NO
 - b. Collect, store, transmit and dispose of any collected personal information in a secure, tamper-proof, cyber-secure setting.
YES NO
 - c. Dispose of any personal information collected within 72 hours of collection.
YES NO
 - d. Other comments: