LOOKNorth
a C-CORE Centre of Excellence

Open Call for Proposals

Unmanned Systems Systèmes Télécommandés CANADA

Detect and Avoid Technology Demonstration and Validation

in Support of BVLOS Operations

Program Description

LOOKNorth and Unmanned Systems Canada (USC) are partnering to build a national cluster of industry and academia to develop the Remotely Piloted Aerial Systems (RPAS) industry in Canada, with a focus on accelerating the commercialization of RPAS-based beyond visual line of sight (BVLOS) remote sensing applications.

LOOKNorth and USC have established a national testbed to collect relevant performance data from flight trials and to evaluate these data using a common risk assessment tool. This national testbed is intended to promote collaboration amongst Canadian companies to create and utilize a common risk model for all flight trials. Over time, the aggregation of data collected during these flight trials, as well as the resulting analyses, will support evidence-based recommendations to Transport Canada to support development of BVLOS regulations. Ultimately, the process will drive development of new markets, attract investment and improve the competitive position of Canadian companies in a global marketplace.

Transport Canada in conjunction with the National Research Council of Canada (NRC) has identified several key areas of technology development and demonstration that are necessary to address potential BVLOS safety issues. One of these areas includes assessing RPAS detect-and-avoid (DAA) technology capability in order to mitigate risk of mid-air collisions with manned aircraft during BVLOS operations in non-segregated airspace.

LOOKNorth and USC are collaborating with Transport Canada and NRC to assess current Canadian capability in these areas. In addition, NRC has expertise and experience in DAA system development and testing to help guide this activity.

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Scope and Intent

The intent of this call for proposals is to address DAA Systems, one of Transport Canada's Research and Development priority areas with respect to BVLOS technology readiness.

LOOKNorth and USC, Transport Canada, and NRC will consider proposals that demonstrate different approaches to DAA (air or ground based, using any suitable type of sensor). Selection of technologies will be made based on responses to the Call for Proposals.

Successful projects will provide data on risk mitigation of specific DAA systems to inform regulators and enable issuance of BVLOS Special Flight Operations Certificates (SFOCs) in the future by testing one or more DAA technologies against the draft Joint Authority for Rulemaking on Unmanned Systems (JARUS) Specific Operations Risk Assessment (SORA) Annex D, ASTM F38 or RTCA -228 DAA performance based standards. Supported technologies will be evaluated against the DAA requirements for the selected standard.

This call is targeted towards Canadian-based small and medium sized enterprises (SMEs) with interest in advancing RPAS into BVLOS operations and applications. The trials are open to all interested companies; however, LOOKNorth funding will only be made available to Canadian SMEs. Respondents may be DAA technology providers or operators of the technology who wish to demonstrate operational capability with a given DAA technology.

Participation in these trials will allow companies to demonstrate the ability of their technology to reduce their operational risk profile. In addition, the data collected during these projects may be used to substantiate the meeting of DAA requirements required for the issuance of future BVLOS SFOCs.

Successful demonstration results will be beneficial in assisting Transport Canada in developing and validating operational and technical DAA performance standards, as well as the associated Means and Methods of compliance related to specific classes of DAA systems.

It is intended that demonstrations will be done at one of two Canadian certified test ranges (Alma, QC or Foremost, AB). The precise definition of the demonstration scenario is still to be

defined and will be done in collaboration between Transport Canada, NRC, LOOKNorth and USC, and the demonstrating companies. It is anticipated that companies should allocate approximately one week at the range to complete the demonstration. The exact duration on the range will depend on the complexity of the actual testing being proposed by the applicant as documented in their DAA test plan. Any costs associated with test range support should not be included in a company's proposal. These will be addressed at a later date when final DAA test plans have been completed.

A Concept of Operations (ConOps) will need to be prepared for the specific routine non-segregated operation that the operator is envisioning, or that the manufacturer is intending their DAA system to be used for. This will help to identify the JARUS SORA Air Risk Class (ARC) and hence the level of DAA required as well as the respective performance requirements.

The companies that are selected for the testing phase will be required to prepare a DAA test plan prior to and DAA test report following the testing for review by Transport Canada and NRC. The specific DAA system will be tested at one of the Ranges to compare the performance of the DAA system against the draft standards.

TC and NRC will participate in the technical review of submissions to help select the applicants that will proceed to the testing phase. The exact number of systems selected for testing will be based on a variety of factors, including but not limited to: the quality of proposals, the diversity of approaches, and the amount of funding available to support the proposed demonstrations.

Eligibility

Proposals will be accepted from project teams led by Canadian SMEs to help rapidly advance the commercialization of BVLOS operations.

All proposed projects considered for funding must demonstrate a strong commercialization component. BVLOS application trials target technology solutions at a technology readiness level (TRL) in the range of TRL 5 – 7

http://esto.nasa.gov/files/trl_definitions.pdf

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Successful proposals should address “benchmarks” for expected and desired outcomes. This should include but not be limited to new products/services, incremental revenue, new employment and investment potential from a successful demonstration.

For BVLOS concepts of operations projects, the following conditions apply:

- LOOKNorth will fund up to 50% of eligible costs, to a maximum of $25,000 of LOOKNorth funds per project.
- Selected SMEs may be eligible for IRAP support; please contact your local ITA or call 1-877-994-4727 for more information.
- Detailed cost eligibility guidelines can be found in the CECR program guide at this link: http://www.nce-rce.gc.ca/_docs/guides/CECR/ProgramGuide-2016-GuideProgramme_eng.pdf
- All proposed projects considered for funding must demonstrate a strong commercialization opportunity for the proposing company.
- Projects should meet the schedule documented below.

General Instructions

Data and Intellectual Property

Any intellectual property developed as a result of a funded project shall belong exclusively to the Proponent. There is, however, an explicit requirement to share safety case data for the collective benefit of developing evidence-based recommendations to Transport Canada for BVLOS regulations.

- All applicants must agree to make their pre-flight profiling data and results of their flight tests, including operational missions, available for input into the testbed and risk evaluation tools.
- All applicants must agree that their results may be shared among Transport Canada/NRC and industry cluster participants.
- Proprietary and commercially sensitive information will remain protected.

Submission Instructions

Interested proponents must complete the proposal template, located here:

> https://www.looknorth.org/cms_content/files/files/Investment%20Proposal%20Template%20-%20FIN.pdf.

Full instructions for completing the application are included with the Proposal template.

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As well, proponents must complete a preliminary Environmental Assessment Checklist, located here on the LOOKNorth website:

https://www.looknorth.org/cms_content/files/files/LN-EAP&Checklist-Fillable.pdf

Proponents are asked to note the following important dates:

- Announcement Date for Call for Proposals – April 26th, 2019
- Proposal (Including ConOps) Submission Deadline – May 24th, 2019
- Expected Decision Date of Selected Applicants – June 21st, 2019
- Submission of DAA Test Plan – August 9th, 2019
- Test Readiness Review – No later than September 13th , 2019
- Completion of DAA Testing – Exact testing dates to be coordinated between all stakeholders
- Submission of DAA Test Report – December 20th, 2019

***Note:** It is the applicant's responsibility to obtain from Transport Canada any SFOCs required to conduct the testing at the range. Completion of the testing will not automatically result in future SFOCs.

Questions or Clarifications

Please submit enquiries and requests for clarifications to Neil Cater – Operations.

Email: neil.cater@c-core.ca

Tel: (709) 864-7808

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About LOOKNorth

LOOKNorth is a Centre of Excellence for Commercialization and Research (under Canada's Networks of Centres of Excellence program), hosted by C-CORE. LOOKNorth's Investment Program fosters and supports innovation in remote sensing technologies and applications, assists Canadian satellite SMEs to define and successfully execute missions relevant to industry and communities, fosters advances in Canada's UAS sector - particularly Beyond Visual Line of Sight (BVLOS) operations, and helps build capacity in remote sensing technologies and services in Canada's North.

About Unmanned Services Canada

Unmanned Systems Canada is a federally registered not-for-profit association established in 2003 which represents the Canadian unmanned systems community. With over 500 members, USC has played a pivotal role in establishing the Canadian Unmanned Aerial Systems (UAS) industrial sector in Canada. Since 2007 when USC initiated UAS regulatory development with Transport Canada, as the co-chair of the regulatory working group, it has promulgated best practices which have been in use by Canadian industry for the past four years. During those years, operating only within Visual Line of Sight, approximately 1000 new businesses have been created, developing and leveraging UAS technology for a wide range of applications.