



Government of Canada / Gouvernement du Canada

Public Security Technical Program Call 3 Border and Transportation Security Study No. 2

Centre for Security Science

A Partnership Led by Defence R&D Canada – Centre for Security Science



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Border and Transportation Security Community of Practice: Study No. 2

Video Analytics for Border and Transportation Security—

Indoor and Outdoor Environments

STATEMENT OF WORK (SOW)

1.0 Background

Border and Transportation Security is one of two approved Communities of Practice (CoPs) under PSTP’s Surveillance, Intelligence, and Interdiction (SII) Domain. SII encompasses capabilities that allow Canada to monitor the security environment, understand the threats to national security, and direct an effective and proportionate response to deter, disrupt, or defeat threats to Canada.

Security practices within Canada’s transportation system and across our borders must balance the need to maintain the free flow of trusted travellers and legal trade while providing a strong defence against all external threats. This may include the deployment of countermeasures that range from prevention to mitigation and response.

One of the main goals of PSTP’s Border and Transportation Security CoP is to evaluate, analyze, and implement a variety of technologies that enhance Canada’s capability to undertake surveillance and interdiction along its border. The work is to be conducted in collaboration with the appropriate Government of Canada departments and agencies responsible for regulating borders and transportation corridors, and for interdiction and law enforcement operations. This effort will also be leveraged through the Memorandum of Understanding (MOU) that establishes collaborative Science and Technology (S&T) with the US Department of Homeland Security.

2.0 Objectives

2.1 Main Objective

The primary objective of this work is to support the Border and Transportation Security CoP by leading studies that evaluate the technology readiness levels (TRLs) of Video Analytic technologies and techniques that could be employed to enhance the security of Canada’s borders in a manner consistent with the Government of Canada’s priorities on sovereignty, prosperity, and security¹.

2.2 Complementary Objectives

The main objective is supported by the following complementary objectives:

¹ www.spp-bsp.gc.ca/eic/site/spp-bsp.nsf/eng/home

- To encourage focused national and, potentially, international CoP collaborative efforts at all levels (i.e., municipal, provincial-territorial, federal) on the exploration and assessment of new approaches for the provision of solutions for border security in Canada that respect international laws, environmental issues, protection of natural resource exploitation, and the social, cultural, and economic fabric of First Nations communities.
- To contribute directly to addressing national public safety and security gaps in relation to the surveillance of Canada’s border in conjunction with Government of Canada departments and agencies responsible for national security.
- To recommend technological solutions to border surveillance and interdiction challenges that blend with current doctrine and systems.
- To propose methodology for assessing the performance of Video Analytic systems against the border security challenges listed in 3.1.

3.0 Scope and Tasks

3.1 Scope

This study will focus on the analysis of TRLs for Video Analytic technologies applied to the following border security challenges:

1. Unattended/left-behind baggage detection;
2. Person tracking in non-crowded and crowded environments,;
3. Person-baggage tagging (association) in crowded environments;
4. Object removal detection;
5. Loitering detection;
6. Tail-gating detection; and
7. Camera tampering detection.

3.2 Tasks

1. Critically review, assess, and analyze the current state-of-the-art Video Analytic capabilities (tools combined with techniques) for each of the seven categories listed above and classify them in terms of technology maturity levels (See Section 7, Reference).
2. For each of the technologies identified:
 - a. Assess the expected maturation for each capability to be expected over the next 3 years,
 - b. Develop a set of operational requirements (written in a format and with a technical level of detail as would be required to use directly in an open tendered request for proposals for acquisition).
 - c. Describe key challenges that would need to be overcome to advance the technology readiness into operational use. In addition to performance/reliability, key considerations should include requirements to overcome any legal, cultural, privacy, and ethical issues. For those technologies that have a TRL 5 or higher, i.e., that have been successfully piloted or tested in relevant or operational environments, a more in-depth analysis will be

required with respect to environmental and procedural constraints and conditions that apply or can impact on each. The analysis should include a discussion of automated summarization of archived video tools and their readiness level.

3. Produce a comprehensive Study Report that incorporates the findings from tasks 1 and 2 and that includes analysis, recommendations, references, and citations that help compare the various solution options (new capabilities) that are applicable to addressing the seven border security challenge requirements identified above. The report shall contain results of actual vendor or technology evaluation trials conducted and, as a result, the background, methodology, statistical reports, interpretation, conclusions, and recommendations with respect to such evaluation trials.
4. As an annexed component of the Final Report, knowledge gained in this investigation shall be used to develop a *Video Analytics Technology Selection Guide* containing recommended evaluation criteria/metrics and methods to support options analysis for selection of an optimal system.
5. Organize and host a combined workshop, technology demonstration and information session for the CoP to review findings and solicit expert input (resources/provisions shall be allocated in the workplan to ensure participation by a minimum of five expert participants) on the feasibility of various technology options identified by the study. A technology demonstration of a representative Video Analytic system shall be organized for the workshop. If the research finds there are multiple vendors that already have commercially available Video Analytic solutions to the requirements identified above, organize a vendor outreach forum as an adjunct session to the workshop, inviting vendors to present and demonstrate their capabilities directly to the group of experts.

4.0 Deliverables

In alignment with the deliverables stated in the *PSTP Call for Proposals No. 3 Bidder Guidebook (2010–2011)*, the deliverables for PSTP studies include: progress reports (including Study Charter, Quarterly Financial Report, and Interim Progress Report), a Final Report (including Strategic Advisory Note and Capability Roadmap), and communications/presentations (including Quad chart, Fact Sheet and Final Presentation). Further details on these deliverables are provided in the following subsections.

4.1 Study Charter

A signed Study Charter is a key prerequisite to advancing the study. This document must confirm the roles and responsibilities being committed to the study and will contain a summary of the study work plan, milestones, financial plan, resource commitments, and roles and responsibilities of team members.

4.2 Quarterly financial reports and interim progress report

At 90 calendar day intervals, the Contractor will provide quarterly reports that summarize financial and work plan status. The second quarterly report will be replaced with an Interim Progress Report that will include a presentation of a more comprehensive overview of the study's progress to date, and will provide the Contractor with the opportunity to present strategic advice on risks and opportunities that will contribute to maximizing the success of the study. The Interim Progress

Report will be presented to the Study Director, DSTPS, and key sponsor/stakeholders (possibly to include CoP) at a meeting to be held in Ottawa².

4.3 Final Report

The Final Report must document all required and generated foreground information as required by the tasks assigned within the SOW, and will include the following two components as part of the Conclusions and Recommendations section:

4.3.1 Strategic Advisory Note: This deliverable provides a concise strategic perspective on the study to clearly position its role in the overall PSTP program, and proposes the strategy for maximizing its success by identifying any barriers or enablers and recommendations on measures to be taken to maximize benefits of the study to stakeholders. The Strategic Advisory Note can be provided in the form of a letter report (typically less than two pages) or a presentation to be provided at the interim progress review meeting. The presentation would typically be delivered as soon as possible after the study start date, and no later than the interim progress review meeting (to be scheduled at 6 months after the starting date). See Section 4.4.

4.3.2 Capability Roadmap: This deliverable builds on the above advice and is provided upon completion of the study. The Capability Roadmap is a concise document (typically less than three pages and containing a Gantt-chart-like schedule of activities with accompanying text to explain the elements) that provides a time-sequenced and holistic view of the key “capability inputs or issues” that need to be addressed (and by when) in order to ensure the success of the study. The Capability Roadmap intentionally includes elements that are out-of-scope for the study, and must identify key activities (capability changes) that are required to adjust the current (as-is) capability with its associated people, processes, and tools to cause it to change incrementally towards a new (to-be) enhanced capability in the future. A successful Capability Roadmap writing effort will engage subject-matter experts from the technology being inserted and information from the various “lifecycle support” domains (acquisition, maintenance, HR, etc). The Roadmap should also identify the current technology readiness level (TRL) of the technology and how the readiness level is expected to evolve along the timescale of the proposed Capability Roadmap.

4.4 Presentation and Communication of Results

Presentation(s): As part of the PSTP mandate, the communication and transfer of knowledge is a fundamental component of building the Canadian S&T community. The contractor will present the Final Report and its conclusions to the Director, DSTPS and the CoP at a study closure meeting in Ottawa during the last 15 working days of the study. The contractor may also be invited to present the Final Report and its conclusions at the annual Public Security S&T Summer Symposium, which is usually held in June of each year. Preparation of presentation materials (typically a 20-minute PowerPoint briefing) is part of the Final Report deliverable; however, presentation of these results at the annual Symposium is subject to receiving an invitation by the Symposium planning committee. Funding for participation in the Symposium, should it be required, will be covered through another contract mechanism and should be excluded from the Project Budget.

Workshop and Demonstration (if applicable): Presentation of the results should be followed by a workshop to discuss the feasibility of some of the technologies reviewed in the study. If possible, a live demonstration should be arranged at the presentation/workshop venue.

² Travel expenses for this meeting are included in the budget for the study and should be planned at the onset.

Fact Sheet and Quad Chart: All PSTP studies are required to provide a Fact Sheet and Quad Chart. A one-page Fact Sheet (in both official languages) on the study and its results must be submitted at the end of the study. A one-slide Quad Chart summarizing the project objectives, team members, general approach, and expected outcomes must be provided and presented at the project kick-off meeting. An updated version is to be re-submitted with the Final Report. Templates will be provided for both of these deliverables at contract start date.

4.5 Milestones

The start date is forecasted for approximately 1 July 2011. All studies must not exceed 9 months duration from date of contract issue. For example, a start date of 1 July 2011 would mean a finish date of 31 March 2012.

DOCUMENT/PRESENTATION	DUE DATE
Study Charter	A critical prerequisite document to enable provision of funding. A signed final version must be provided to study team members at contract start-up. Target date for a signed charter is 4 weeks after project implementation workshop.
Quarterly Progress Reports	Due approximately 3 months after contract award. Exact date to be determined in consultation with Technical Authority. Second quarterly report to be replaced by Interim Progress Report.
Interim Progress Report & Presentation	Due approximately 4-6 months after contract award. Exact date to be determined in consultation with Technical Authority.
Strategic Advisory Note	Presentation due at Interim Progress Review meeting. Updated version must be included in Final Report.
Final Report & Presentation	Final draft due 15 working days before contract completion date. Revised Final Report due on contract completion date. Presentation of report and overview of findings due within 15 days prior to contract completion date.
Updated Fact Sheet and Quad Chart	First draft of Quad Chart due at project kick-off meeting. Final draft of Quad Chart and Fact Sheet due 15 working days before contract completion date.

Except for the Fact Sheet, deliverables will be accepted in either official language, and must be formatted in Microsoft Word, PowerPoint®, or Excel (Office 2003 version). The Fact Sheet must be provided in both official languages.

One hard copy and one CD electronic copy of the Final Report must be delivered to the Technical Authority for review and acceptance 15 calendar days before the contract completion date.

5.0 Meetings

A project kick-off (also known as “start-up”) meeting will be provided as soon as possible following the contract start date, to introduce all project team members and review the charter and workplan prior to initiation. This meeting can be held via teleconference arrangement.

Progress Meetings – in addition to the deliverable schedule for quarterly reporting and presentations listed in Section 4, it is expected that the contractor will participate in frequent and regular working meetings and task progress updates using the most efficient techniques available, given the location of study team participants (teleconferencing, online collaboration tools, etc).

6.0 Travel

Any travel required by this study must be approved by the Technical Authority and must adhere to the [Treasury Board of Canada Secretariat Travel Directive](#)³.

7.0 Supporting Documentation

Border & Transportation Security Community of Practice Summary and PSTP Call for Proposals No. 3 Bidder Guidebook (2010–2011) <http://www.css.drdc-rddc.gc.ca/pstp/proj-prop/index-eng.asp>

³ English http://www.tbs-sct.gc.ca/pubs_pol/hrpubs/TBM_113/menu-travel-voyage-eng.asp
French http://www.tbs-sct.gc.ca/pubs_pol/hrpubs/TBM_113/menu-travel-voyage-fra.asp