**SOLICITATION AMENDMENT**

**MODIFICATION DE L'INVITATION**

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Solicitation remain the same.

Ce document est par la présente révisé; sauf indication contraire, les modalités de l'invitation demeurent les mêmes.

### Instructions:

**Solicitation Closes - L'invitation prend fin**

**at - à** 02:00 PM

**on - le** 2020-09-03

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<th>F.O.B. - F.A.B.</th>
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<tr>
<th>Telephone No. - N° de téléphone</th>
<th>FAX No. - N° de FAX</th>
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<tr>
<td>(613) 858-9358 ( )</td>
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### Delivery Required - Livraison exigée

<table>
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<th>Vendor/Firm Name and Address</th>
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### Delivery Offered - Livraison proposée

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Amendment 005

This amendment serves to publish the Summary of Findings document.
Industry Engagement Process for Surveillance of Space 2 Ground Based Optical Segment (W8474-207923/A)

Summary of Feedback and Outcomes
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1.0 INTRODUCTION

On 4 September 2019, Public Services and Procurement Canada (PSPC) released a Request for Information (RFI) (W8474-207923/A) for the potential procurement of a Ground Based Optical (GBO) System, as part of the Department of National Defence’s (DND) Surveillance of Space 2 (SofS 2) Project.

With this RFI, PSPC sought to:
- inform industry of DND’s SofS 2 GBO requirements;
- obtain industry input for the development and refinement of the technical requirement;
- obtain industry input for the development of the procurement strategy; and
- obtain industry input on the methods of leveraging economic benefit for Canada.

Following the release of the RFI, Canada held an Industry Day that included a mass brief and individual one-on-one meetings with industry members. Questions from both the mass briefs and the one-on-one meetings were posted on buyandsell.gc.ca, along with their respective answers.

This Summary of Findings reflects RFI activities performed and responses received to RFI W8474-207923/A up to 1 May 2020. Note that additional industry engagement activities have been previously captured through RFI W8474-187639/A.

Canada is seeking additional information on GBO systems, hence additional GBO engagement activities will continue to be pursued under tender notice W8474-207923/A, posted on buyandsell.gc.ca. Additional information can be found in Section 5 “Next Steps” below.
## 1.1 Industry Engagement Process

| Industry Engagement | • Posting of GBO RFI: 4 September 2019  
|                     | • Industry Day and mass briefing: 8 October 2019  
|                     | • One-on-one meetings: October 8-9, 2019  
|                     | • RFI Responses Requested: November 12, 2019  
|                     | • Posting of Draft RFP: Anticipated Spring 2021  
|                     | • Will conclude with the issuance of a notice on buyandsell.gc.ca advising industry that the period has ended or, should an RFP be issued, the date of issue of the final RFP. |
| Information Disclosed Under the RFI | Preliminary information on the project background, objectives, and requirement. |
| Participants | Overall, fourteen vendors participated in the RFI process, as well as representatives of Canada, including DND, PSPC, and Innovation, Science and Economic Development Canada (ISED). |
| Participants at the Industry Day | Twelve firms were represented at the Industry Day:  
|                                | • Analytical Graphics Inc.  
|                                | • ABB Inc.  
|                                | • ADGA Consulting Ltd.  
|                                | • Airbus Defence and Space  
|                                | • ExoAnalytic Solutions Inc.  
|                                | • J.T. McGraw and Associates  
|                                | • L3 Harris Technologies Inc.  
|                                | • Lockheed Martin Corporation  
|                                | • MDA Corporation  
|                                | • NorthStar Earth and Space Inc.  
|                                | • Space Strategies Consulting Ltd.  
|                                | • Thoth Technology Inc. |
| Participants at the one-on-one meetings | Eleven firms participated in a one-on-one meeting:  
|                                | • Analytical Graphics Inc.  
|                                | • ABB Inc.  
|                                | • Airbus Defence and Space  
|                                | • ExoAnalytic Solutions Inc  
|                                | • J.T. McGraw and Associates  
|                                | • L3 Harris Technologies Inc.  
|                                | • Lockheed Martin Corporation  
|                                | • MDA Corporation  
|                                | • NorthStar Earth and Space Inc. |
Questions and Answers from Industry

Eighty-seven questions were received from industry for which Canada provided responses and/or clarification.

RFI responses submitted

Five firms submitted responses to this RFI:
- Analytical Graphics Inc.
- Airbus Defence and Space
- Numerica Corporation
- Thoth Technology Inc.
- L3 Harris Technologies Inc.

2.0 ACRONYM LIST

CAF  Canadian Armed Forces
COCO  Commercially Owned Commercially Operated
COTS  Commercial off The Shelf
CFB  Canadian Forces Base
DND  Department of National Defence
GBO  Ground Based Optical
GOGO  Government Owned Government Operated
HLMR  High Level Mandatory Requirement
ILS  Integrated Logistic Support
IR  Infrared
ISEDC  Innovation, Science and Economic Development Canada
ITB  Industrial Technological Benefits
PSPC  Public Services and Procurement Canada
R&D  Research and Development
RFI  Request for Information
RFP  Request for Proposal
SBO  Space Based Optical
SoS 2  Surveillance of Space 2
SSA  Space Situational Awareness
SSOC  Sensor Systems Operations Centre
STARS  Sensor Tasking and Reporting System
3.0 SUMMARY OF FEEDBACK AND OUTCOMES

3.1 General

3.1.1 This section summarizes the feedback requested from vendors on various aspects of the GBO Sensor Segment of the SofS2 Project.

3.2 Vendor Capabilities and Experience

<table>
<thead>
<tr>
<th>RFI Section 6.2</th>
<th>Vendors were requested to provide details on their capabilities relevant to delivering a SofS2 GBO solution, and past experience providing clients with GBO sensor solution for space situational awareness (SSA).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feedback</td>
<td>Four of the vendors stated they have capabilities to provide a GBO solution, three of which detailed their experience in providing clients with a GBO sensor solution for SSA, with the fourth stating they are using a GBO system for research and development purposes. A fifth vendor proposed a radar-based sensor in lieu of an optical sensor, though their experience on the processing, tasking, reporting systems are transferrable to a GBO solution.</td>
</tr>
<tr>
<td>Outcome</td>
<td>Canada is satisfied that there are sufficient vendors who are capable of performing the work. No further action is required by Canada following the assessment of these responses.</td>
</tr>
</tbody>
</table>

3.3 GBO Sensor Solution

<table>
<thead>
<tr>
<th>RFI Section 6.3</th>
<th>Vendors were requested to provide details/specifications for their recommended GBO Sensor Solution(s), including: 1. The ability to meet the HLMRs and the other requirements stated within the RFI, and if not, state why and what trade-offs were considered; 2. Solutions to sense local weather conditions and local cloud cover; 3. Required maintenance schedule, particularly the length of time sensors can operate without requiring on-site human intervention; and 4. Solutions to reduce interference of GBO sensors such as infrared sensing, adaptive optics, and dust and humidity mitigation.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feedback</td>
<td>1. Three vendors stated that they can provide a solution that satisfies the HLMRs. A fourth vendor stated that more information was required for HLMR-04 “Information Security” to determine if they could satisfy it. One vendor noted that the requirement to obtain a minimum of 130 tracks per hour per GBO sensor site, alludes to requiring two sensors per site, as 130 tracks per hour only allots 27 seconds per track, and the minimum time requirement to collect a track is 36 seconds. Solutions recommended were varied and included the following possibilities:</td>
</tr>
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</table>
1. Provision of GBO sensors located on selected bases; and
b. A combination of slewing optics and fixed wide field-of-view optics solutions.
c. Access to a global GBO sensor network as a commercial subscription.

Vendors offering commercial SSA data subscription services stated the trade-off as being the immediate availability of SSA data services.

2. Three vendors referred to COTS systems for weather and cloud detection. Two of those vendors referred to the use of Infrared (IR) cloud imaging systems, with one providing a COTS source.

3. One vendor indicated that maintenance requiring human intervention for their R&D system is required once per year. A second vendor stated that on-site maintenance would be required approximately every three months.

4. One vendor indicated that imaging filters, telescope caps, vibration isolation of the mount, and dehumidifiers would be recommended options, but adaptive optics would not be essential. Another vendor indicated their proposed GBO IR sensor would have an ability to track satellites during the day, albeit with a lower apparent visual magnitude. A third vendor proposed both adaptive optics and IR options, but stated these features come with additional performance and complexity issues that would essentially require a case-based optimization.

Outcome 1. Canada is satisfied that there are sufficient vendors who are capable of providing a GBO Sensor solution. The responses offering commercial SSA data service solutions have been reviewed, and as Canada requires full control over the sensors as part of HLMR-05, Responsive Control, Canada continues to consider the government-owned and government operated (GOGO) approach for the GBO System. In regards to HLMR-04, Information Security, Canada will be providing further details in the Draft and Final RFP and is satisfied that GBO solutions provided thus far can be implemented within Canada’s security framework.

Requirements for tracks per hour, and the minimum track observation time, can be met with the use of multiple sensors per site. However, Canada did not specify the number of sensors in order to not limit the ideas industry could put forward to satisfy the requirements. Canada will leave it to the vendors to determine how to best meet these requirements.

2. Canada is satisfied that there are sufficient vendors who are capable of delivering weather sensing solutions for the GBO sensors. The ability to operate in a partially cloudy environment by making use of technologies
that can determine areas that are free of clouds remains a desirable capability.

3. Canada is satisfied that there are sufficient vendors that can provide GBO sensors that can operate remotely, with infrequent on-site maintenance on the order of months or annually; aside from non-specialist issues such as snow clearing, and building maintenance.

4. Canada is satisfied that there are sufficient vendors that can provide systems to maximize GBO Sensor performances, such as vibration damping and humidity control. Further, Canada is satisfied that there are sufficient vendors that can provide filters and other imaging technologies that can enhance and increase the operational window of the sensor. Canada will continue to consider these capabilities.

### 3.4 GBO Sensor Facilities

**RFI Section 6.4** Vendors were requested to provide details/specifications for their proposed GBO Sensor Facility.

**Feedback** Three vendors proposed the use of prefabricated dome structures to house the sensors.

**Outcome** Canada is satisfied that there are sufficient vendors who are capable of providing an appropriate facility for the GBO Sensor. Canada anticipates that provision of a GBO Sensor facility will be included as part of the requirement.

### 3.5 GBO Sensor Data Processing

**RFI Section 6.5** Vendors were requested to provide a description of their recommended GBO Data Processing Solution(s), including:

1. the bandwidth requirements;
2. whether the processing solutions are expected to be co-located at the GBO sensor sites or centrally at the Sensor Systems Operation Centre (SSOC).

**Feedback** Four vendors indicated that their GBO processing software solutions would meet the requirements stated in the RFI, with three of the vendors offering mature COTS solutions.

1. One vendor indicated that a 20Mbit/s communications line to the GBO sites would be a preferred minimum bandwidth.
2. Four vendors suggested the processing suite be co-located with or in-proximity to the GBO sensors.
<table>
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<tr>
<th>Outcome</th>
<th>Canada is satisfied that there are sufficient vendors capable of providing a GBO data processing system, and that this processing system is to be located at the GBO Sensor sites. Canada will ensure the scope of processing is made clear during requirements development.</th>
</tr>
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</table>

### 3.6 GBO Sensor Tasking and Reporting System (STARS)

**RFI Section 6.6**

Vendors were requested to provide a description of their proposed STARS solution.

**Feedback**

All five vendors stated they can provide a STARS solution. Four of the vendors stated they have currently fielded systems. In some instances the vendor’s solutions also offered analyses features such as conjunction analyses, catalogue development etc. that, despite being outside the scope of features being requested of STARS, indicated the ability to develop a robust STARS solution.

**Outcome**

Canada is satisfied that there are sufficient vendors who are capable of developing the STARS solution. Canada will ensure the scope of the STARS is clear as the requirement is developed.

### 3.7 GBO System Implementation Timelines

**RFI Section 6.7**

Vendors were requested to provide estimated timelines from design to on-site acceptance testing, and any vendor-managed issues that would significantly impact the project.

**Feedback**

Two vendors proposing GBO Systems stated an implementation timeline within 1.5 and 2 years of contract award respectively. Three vendors offering commercial SSA data service options stated that their solutions can be implemented immediately.

**Outcome**

Proposed timelines were reviewed by the project team and will support future project planning.

### 3.8 GBO System Indicative Costs

**RFI Section 6.3**

Vendors were requested to provide costing details of their recommended GBO System solution(s).

**Feedback**

Three of the five vendors provided GBO costing as part of their responses. One vendor declined to provide costing, citing the need for more technical details.
### 3.9 Recommendations, Suggestions, and Comments

<table>
<thead>
<tr>
<th>RFI Section 6.3</th>
<th>Vendors were requested to provide any additional recommendations, suggestions and comments.</th>
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<tbody>
<tr>
<td><strong>Feedback</strong></td>
<td>Vendors provided various recommendations and suggestions, including recommending that Canada:</td>
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<td>a. make use of commercial services to obtain SSA data in the short term and avoid the risk of</td>
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<td></td>
<td>potential gap in SSA data, and consider a phased approach, wherein services begin with</td>
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<td>commercial SSA data, with a slow integration of government-owned assets over a period of</td>
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<td></td>
<td>time.</td>
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<td></td>
<td>b. consider a ground based radar solution or ground base radar services;</td>
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<td></td>
<td>c. procure the SSA Sensor processing system and STARS in a single RFP, and the GBO Sensor</td>
</tr>
<tr>
<td></td>
<td>procurement in a separate RFP.</td>
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<tr>
<td><strong>Outcome</strong></td>
<td>Canada has reviewed and considered the responses as follows:</td>
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<tr>
<td></td>
<td>a. Canada will continue to consider a GOGO model as commercial data services do not meet the</td>
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<td></td>
<td>Responsive Control requirement (HLMR-05);</td>
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<td></td>
<td>b. The proposed radar based solution cannot meet key established requirements, in particular</td>
</tr>
<tr>
<td></td>
<td>HLMR-01 and the requirement to obtain a minimum of 130 tracks per hour per GBO site. Canada will</td>
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<td></td>
<td>continue to pursue ground based optical sensors;</td>
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<td></td>
<td>c. Canada has reviewed the suggestion to separate the procurement of the GBO Sensors from the</td>
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<td></td>
<td>procurement of the processing systems and STARS. Canada will procure the GBO System under a</td>
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<td></td>
<td>single RFP, as this poses the least integration, accountability, and schedule risk.</td>
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### 3.10 GBO System Acquisition Model

| RFI Section 6.3 | Vendors were to assume that the GBO System was to be operated under a government owned, |
|-----------------|government operated, and contractor maintained model. Vendors proposing a different approach |
|                 |were requested to describe their approach. |
| **Feedback**    | Responses varied: |
|                 | a. Three vendors stated that they agreed with a GOGO model. |
|                 | b. A fourth vendor stated that, though they can provide all or parts of the system in |
|                 | compliance with a GOGO model, they can also provide |
contractor-owned and operated models, which would have the benefits of rapid implementation.

| Outcome | Canada has reviewed and considered the acquisition models proposed by the vendors, and will continue to consider a GOGO model. |

### 3.11 GBO System Economic Benefits

<table>
<thead>
<tr>
<th>RFI Section 6.13</th>
<th>Feedback was requested on potential for economic leveraging opportunities for ITB objectives related to Direct Canadian Content Value (CCV), Supplier Development, Research &amp; Development, Export and Skills Development and Training.</th>
</tr>
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<tbody>
<tr>
<td>Feedback</td>
<td>Vendors indicated there were opportunities for economic benefits with most vendors noting interest in or links with Canadian industry and academia and potential opportunities for R&amp;D activities and skills development. There appears to be limited direct CCV related to some elements of the ground based optical requirement.</td>
</tr>
<tr>
<td>Outcome</td>
<td>DND has determined that there is no justification to apply a National Security Exception to the GBO requirement. As international trade agreements apply to this requirement, the procurement is not eligible for application of the ITB policy.</td>
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### 4.0 CONCLUSION

Canada would like to thank the interested vendors who participated in the SofS 2 Industry Day as well as those who provided written responses to the SofS 2 RFI W8474-207923/A. The dialogue and feedback obtained via this process, as well as through a previous industry engagement process, RFI W8474-187639/A, has afforded significant progress towards the stated objectives of these engagements.

### 5.0 NEXT STEPS

The SofS 2 Industry Day presentation, questions from vendors and answers provided by Canada, and details on GBO sites that have been chosen or are under consideration have all been made available on buyandsell.gc.ca. Vendors are invited to review this material. Further responses to the original SofS 2 RFI would still be welcome if interested vendors have not yet submitted one, or if new analysis has been completed. Any input provided on the engagement plan proposed would also be appreciated.
Future engagement activities may include:

- notifying vendors of the security requirements that must be addressed in order to access documents associated with the GBO requirements;
- seeking additional information from industry for GBO solutions;
- seeking industry feedback on procurement strategies;
- seeking industry feedback on draft RFP documents, such as draft statements of work, draft evaluation criteria and draft contract terms and conditions.

All enquiries and other communications related to this Industry Engagement process shall be directed in writing as follows:

Contracting Authority:

Alan Chan
Public Services and Procurement Canada

Telephone: 613-858-9358
E-mail: alan.chan@tpsc-pwgsc.gc.ca