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REQUEST FOR INFORMATION

DEMANDE D'INFORMATION

Comments - Commentaires

Title - Sujet
LAND ISR MOD / MOD RSR de la Force terrestre

Solicitation No. - N° de l'invitation	**Date**
W8476-206262/A	2020-02-19
Client Reference No. - N° de référence du client	**GETS Ref. No. - N° de réf. de SEAG**
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Solicitation Closes - L'invitation prend fin
at - à 02:00 PM
on - le 2020-05-29

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PART 1 – GENERAL INFORMATION

1.1 Purpose and Objectives of Industry Engagement

1.1.1. The purpose of this Request for Information (RFI) is to inform and obtain feedback from industry on possible upcoming procurement processes for the Department of National Defence's (DND) requirement to procure, integrate and support the Land Intelligence Surveillance Target Acquisition & Reconnaissance (ISTAR) capability. This project, which was formerly known as Land Command Support System Intelligence, Surveillance and Reconnaissance (LCSS ISR Mod), is now known as the Land Intelligence Surveillance & Reconnaissance (ISR Mod) project.

1.1.2. Public Services and Procurement Canada's (PSPC) intent from this Request for Information (RFI) is to engage industry in a consultative process by seeking responses to Canada's questions to gain a better understanding of industry's current intelligence, surveillance and reconnaissance (ISR) technical capabilities, sustainment approaches and affordability. The objectives of this iterative consultative process with industry are to:

a) Provide Industry with initial information related to the ISR Mod project;
b) Invite Industry representatives to an Industry Day and to one-on-one sessions;
c) Request Industry's feedback on the planned procurement process;
d) Request Industry to propose network solution(s) that will potentially satisfy ISR Mod project's requirements, using:
   A. Mandatory: DND existing sensors as GFE integrated into a Vendor's proposed network solution (mandatory, as a baseline),
      AND
   B. Alternatively a Vendor's suite of proposed sensors integrated into their proposed network solution;
      OR
   C. Submission of Sensors only: Vendors may submit a single sensor or suite of sensors capable of digitally integrating into a network;
      OR
   D. Submission of Network only: Vendors may submit a Digital Land ISR Network solution only.
e) Request Industry to provide indicative cost estimates for each proposed solution and learn potential sources of supply and industrial capabilities for the proposed ISR mod;
f) Obtain information on the impacts of acquisition restrictions on potential future sustainment requirements - including considerations such as Intellectual Property (IP) rights, supply chain collaboration, etc.;
g) Obtain current market capacity and industry's interest, including feedback on any issues that could impact their ability to bid on a the resulting solicitation or to deliver on the department's requirements; and
h) Inform and engage Industry on the Industrial and Technological Benefits (ITBs) Policy, including Value Proposition (VP).

1.1.3. The objective of requesting industry's proposed technical solutions is to ensure that the Canadian ISR solution for the CAF continues to develop in line with the capabilities of industry, and to be both sustainable and affordable. To ensure that the project proceeds with an achievable scope and budget, the information received from industry will be used to develop costing models based on the equipment and sustainment needs recommended by industry. To facilitate the accuracy of the models, Canada will eventually require detailed performance data on each system component, their sustainment needs, and any integration complexities or constraints that must be considered when scaling the system to meet the various operational scenarios --

including factors such as, but not limited to, multiple simultaneous targets, increased threat frequency, increased coverage areas, and evolving threats.

1.1.4. The objective of requesting indicative pricing of the proposed technical solution is to allow Canada to prepare documentation for further Land ISR Mod Project approval gateways.

1.1.5. Once the acquisition costs and availability of current technology to deliver this project's objective are gathered, Canada may return through an amendment of this RFI with enhanced project scope and requirement details, and will request industry to provide more granular costing information, including the various sustainment activities of the proposed system.

1.1.6. Interested suppliers are encouraged to review the documentation attached to this RFI and to provide written comments or questions to the PSPC Contracting Authority identified at section 1.6.

1.2 Requirement

1.2.1 The Canadian Army (CA) requires the ability to detect, identify, target and track threats or objects of interest within the battlespace. CA commanders need to be able to use this information to array forces, plan operations or counter immediate threats and is critical to mission success while conducting land operations. Solutions, consisting of technologies such as radar, acoustic, electro-optical, radio/electro-magnetic, laser and hyperspectral in configurations, must meet NATO standards and may be incorporated into fighting vehicles, unmanned aerial systems or unattended ground systems as tactically and technologically appropriate. These sensors must be networked into the existing Command & Control (C2) system and used by both the CAF and allied forces. This requires investment into the modernization of the ISR capability.

1.2.2 The Land ISR Mod Project envisions its major deliverables to include:

1.2.2.1 **Land ISR Digitized C2 System:** This C2 network must connect all integral sensors resources, allow the synchronization and coordination of information collection with intelligence exploitation and decision-making activities, while also leveraging ISR information from Joint and allied sources. The C2 system must interface with the Land C2 Battle Management and Joint Fires Systems, both of which are digital software, to integrate sensor information and support the distribution of information and intelligence to support the decision-action cycle of maneuver forces, targeting and joint fires capability. The digitized system must ensure a sensor-to-effector linkage and will incorporate Allied standards for information, communications.

1.2.2.2 **Sensor Hardware and Software:** Upgrade of existing CA sensors, as deemed appropriate, and the procurement of new sensor hardware and software required to meet the CAF operational requirements. This may include new systems or updating of existing systems to improve sensor detection performance and integration within the C2 system.

1.2.2.3 **Training Systems:** Develop and deliver a training system for operators to practice using all Land ISR applications, including the network and all associated sensors -- prior to operating in a live, field environment.

1.2.3 See ANNEX A – ISR MOD DESCRIPTION for more details on this requirement.

1.3 Potential Scope and Constraints

1.3.1 A National Security Exception or National Security Exception – Special Contracting Caveat may be invoked for resulting procurement process(es).

1.3.2 While this RFI is not subject to the Controlled Goods Program, any resulting procurement process will have Controlled Goods Program requirement. For information pertaining to the Controlled Goods Program, please refer to the Public Services and Procurement Canada (http://ssi-iss.tpsgc-pwgsc.gc.ca/dmccgd/ index-eng.html) website.

1.3.3 The Federal Contractors Program for Employment Equity (FCP-EE) will apply to any upcoming procurement process. Further details on the FCP-EE will be communicated on https://buyandsell.gc.ca/ as part of any upcoming procurement process.

1.3.4 There are no security requirements associated with this RFI, however security requirements may be associated with any resulting procurement processes. Additional information on the security requirements, when identified, will be communicated on https://buyandsell.gc.ca/ as part of any upcoming procurement process.

1.3.5 Should industry require information on personnel and organization security screening or security clauses, please refer to the Canadian Industrial Security Directorate (CISD), Industrial and Security Program of Public Services and Procurement Canada (http://ssi-iss.tpsgc-pwgsc.gc.ca/index-eng.html) website.

1.3.6 Any additional information on the potential scope and constraints will be communicated on https://buyandsell.gc.ca/ as part of any procurement process.

1.4 Legislation, Trade Agreements, and Government Policies

1.4.1 The following is a list of some legislation and government policies that will govern the upcoming procurement processes:

a) Defence Production Act (DPA)
b) Controlled Goods Program (CGP)
c) Federal Contractors Program for Employment Equity (FCP-EE)
d) Government Contract Regulations (GCR)
e) PSPC Policy on Green Procurement
f) ITB Policy
g) Software licencing

1.4.2 Any additional information pertaining to Legislation and Government Policies will be communicated on https://buyandsell.gc.ca/ as they become available throughout the period of this RFI or as part of any resulting procurement process.

1.5 Schedule

1.5.1 The following is the tentative schedule associated with both the RFI and potential procurement processes:

a) Release of RFI: 19 February 2020
b) Industry Days: 23 - 25 March 2020
c) Deadline for RFI Submission: 15 May 2020
d) RFI Closing date: 29 May 2020
e) Release 2ND RFI (or Amendment, if required): Summer/Fall 2020
f) Potential release of Draft Request(s) for Proposal (RFP): March – September 2022
g) Potential release of RFP(s): 2024/2025
h) Departmental and Government Approvals: 2025
i) Potential Contract(s) Award: 2026
j) Potential First Delivery: Spring 2027

1.5.2 Any changes to the tentative schedule will be communicated on https://buyandsell.gc.ca/ as they become available throughout the period of this RFI.

1.6 PSPC Contracting Authority

1.6.1 All information, communication or correspondence must be directed to the Contracting Authority ONLY, in writing via email and in either official language of Canada to the PWGSC Contract Authority identified below. No other member or representative of the Government of Canada can be informed, challenged or otherwise communicated with, including carbon copy or blind carbon copy on any verbal, emails or written correspondence regarding this RFI.

Heather Mitchell
Contracting Authority
Public Services and Procurement Canada
Place du Portage, Phase III 8C2, 11 Laurier Street
Gatineau, QC, K1A 0S5
E-mail: Heather.Mitchell@tpsgc-pwgsc.gc.ca
Phone: 819-420-2197

1.6.2 Changes to this RFI may occur and will be advertised on the Government Electronic Tendering System (GETS), https://buyandsell.gc.ca/.

1.6.3 Canada strongly recommends that any interested parties subscribes to receiving automatic updates or changes to this RFI via the e-mail alert service available at https://buyandsell.gc.ca/. Additional information may be found at https://buyandsell.gc.ca/procurement-data/tenders/follow-opportunities.

1.7 Industry Interaction

1.7.1 To ensure a successful procurement process for the Land ISR Mod project, Canada intends to engage industry in a consultative process. The consultative process associated with this RFI includes specific questions aimed to help determine the viability and capabilities of such a scope and may include follow-up questions by means of RFI amendments.

1.7.2 An Industry Day will take place at **13:00 pm EDT on 23 March 2020** at **Place du Portage, Phase IV, 11 rue Laurier in Gatineau, Quebec.** The Industry Day is intended to be an open forum. It will allow Canada to present industry representatives with information about the ISR Mod project and communicate high-level equipment capability and sustainment requirements. It will also provide a venue for industry representatives to ask questions and seek information required to gain a sound understanding of Canada's business needs. Representatives from Public Services and Procurement Canada (PSPC), the Department of National Defence (DND), and Innovation, Science and Economic Development Canada (ISEDC) will lead Industry Day presentations and discussions on procurement requirements, technical requirements, and industrial technological benefits, respectively. Topics for discussion may include potential procurement issues and opportunities for resolution, innovative solutions, and the overall procurement and sustainment strategies.

1.7.3 Attendance via Webex may also be made available upon request in respect of Canada's Green Procurement Policy, and to ensure affordability and maximum participation by industry.

1.7.4 Industry Day will be followed by One-on-One meetings between industry and Canada at the same location in Gatineau, over the period of **24 to 25 March 2020**. These meetings will be an opportunity for industry representatives to provide further information and seek further clarification on all topics associated with the RFI and potential procurement process.

1.7.5 All suppliers interested in attending the Industry Day or One-on-One meetings must notify the Contracting Authority via e-mail no later than **4:00 pm EST on 28 February 2020**. Interested suppliers must indicate in writing the name, position and contact information for each and every participant attending and must indicate if participation will be in person or via video conferencing for the Industry Day, for One-on-One meetings, or both. One-on-One meetings will take place in 30 minute or 60 minute slots between the hours of **8:00 am to 5:00 pm EDT on 24 and 25 March 2020**. Canada will assign final meeting times to Respondents on **3 March 2020**.

Interested suppliers should indicate their preferred time and date when arranging their One-on-One meeting with the project. Meeting times will be allotted in the order of receipt, however if the preferred time is not available, the Contracting Authority will provide alternate times to choose from.

1.7.6 All Questions and Answers throughout the engagement process will be recorded and posted on https://buyandsell.gc.ca/.

1.7.7 Participants will be asked to submit any additional feedback to the industry interaction, in writing, to the PSPC Contracting Authority, identified herein at Section 1.6, on or before 3 April 2020.

1.7.8 Respondents should use the Annexes C through F provided as guides or templates for their response.

1.7.9 All submitted information, comments or questions must be based solely on the documentation herein and industry should not reference any other past procurement process.

1.7.10 Non-attendance at any Industry Day or One-on-One Sessions will not preclude any firm from bidding on this requirement should a follow-on solicitation be issued.

1.8 Notes to Interested Suppliers

1.8.1 This RFI is neither a call for tender nor an RFP, and no agreement or contract for the procurement of the requirement described herein will be entered into solely as a result of this RFI. The issuance of this RFI is not to be considered in any way as a commitment by Canada nor as authority to potential Respondents to undertake any work that could be charged to Canada.

1.8.2 This RFI is not to be considered as a commitment to issue a subsequent solicitation or award contract(s) for the work described herein. Canada does not intend to award a contract on the basis of this notice or otherwise pay for the information solicited. Any and all expenses incurred by the Respondent in pursuing this opportunity, including the provision of information and potential visits, are at the Respondent's sole risk and expense.

1.8.3 Any discussions on this subject with project staff representing DND, PSPC, ISEDC or any other Government of Canada representative or other personnel involved in project activities, must not be construed as an offer to purchase or as a commitment by Canada.

1.8.4 Respondents may provide documents, information, or data as “commercial-in-confidence” and, if identified as such, will be treated accordingly by Canada. Assessment of all information provided by suppliers will be reviewed by Canada’s representatives, including contracted resources under non-disclosure agreements. Canada reserves the right to re-use any information to assist in obtaining project approvals and in consultation with both national and international stakeholders. Project requirements are subject to change, which may be as a result of information provided in response to this RFI. Participants are advised that any information submitted to Canada in response to this RFI may or may not be used by Canada in the development of the potential subsequent RFP. The issuance of this RFI does not create an obligation for Canada to issue a subsequent RFP and does not bind Canada legally or otherwise, to enter into any agreement or to accept or reject any suggestions.

1.8.5 Respondents are encouraged to clearly identify in writing if they feel any information shared with Canada is commercial-in-confidence, proprietary, third party, or personal. Please note that Canada may be obligated by law (e.g. in response to a request under the Access to Information and Privacy Act) to disclose proprietary or commercially-sensitive information concerning a Respondent. For more information: http://laws-lois.justice.gc.ca/eng/acts/a-1/.

1.8.6 Respondents are asked to identify in writing if their response, or any part of their response, is subject to the Controlled Goods Regulations.

1.8.7 Participation in this RFI is encouraged but is not mandatory. There will be no shortlisting of potential suppliers for the purposes of undertaking any future work as a result of this RFI. Similarly, participation in this RFI is not a condition or prerequisite for the participation in any potential subsequent solicitation.

1.8.8 Respondents will not be reimbursed for any cost incurred by participating in this RFI.

1.9 Closing date for the Request for Information

1.9.1 Respondents are asked to submit their responses to the questions posed in this RFI by **2:00 pm EDT on 15 May 2020.**

1.10 List of Attached Documents

Part 2
- Annex A – ISR Mod Description
- Annex B – Sustainment

Part 3
- Annex C – Industrial Technological Benefits and Value Proposition
- Annex D – Costing Requirements and Questions
- Annex E – ISR Mod High Level Mandatory Requirements and Questions
- Annex F – ISR Mod Sustainment Questions (to follow via RFI Amendment)

Part 4
- Annex G – Acronyms

1.11 Government Furnished Information

1.11.1 ISR Mod Vignettes have been prepared by the project team (at Appendix 1 to Annex A)and this Appendix will be made available upon request as Government Furnished Information (GFI) at the time of booking One-on-One meetings.

1.12 Submission of Responses

1.12.1 Respondents are requested to provide their responses only to the Contracting Authority identified above, in soft copy only using CD ROMs or DVDs or by using epost connect service.

1.12.2 Paper, fax and e-mail submissions will not be accepted. Because the use of USB thumb drives or memory sticks are not authorized within many Government of Canada departments, Respondents are asked to NOT provide USB drives for any part of their response.

1.12.3 For Respondents choosing to submit using epost Connect for bids, see SACC 2003 Article 8 (2019-03-04) para 2 epost https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual/1/2003/24#submission-of-bids for details.

The email address is tpsgc.dgareceptiondessoumissions-abbidreceiving.pwgsc@tpsgc-pwgsc.gc.ca

The epost Connect system has a limit of 1GB per single message posted and a limit of 20GB per conversation.

PART 2 – ISR MOD REQUIREMENTS

Annex A – ISR Mod Description

- Appendix 1 – Land ISR Vignettes (available upon request from the Contracting Authority, above)
- Appendix 2 – Future ISR Capabilities – Network Connectivity Diagram

Annex B – Sustainment Approach

ANNEX A – ISR MOD DESCRIPTION

Requirements

1.1. Overview

1.1.1 The Canadian Army (CA) requires the ability to detect, identify, target and track threats or objects of interest within the battlespace. CA commanders need to be able to use this information to array forces, plan operations or counter immediate threats and this information-sharing is critical to mission success while conducting land operations. This capability must be nested within the Canadian Armed Forces (CAF), and requires a Land ISR system that can integrate, synchronize and coordinate sensors and sensor information digitally from the Land domain into the Joint and Coalition environments. Currently, the Army has a limited ability to digitally move and share information with other CAF elements (Army, Navy, Air Force and Special Operations Forces), other governmental departments (RCMP) and coalition partners (NATO). A digitized system and modern sensors are necessary to rapidly and accurately share information and manage resources in an increasingly advanced operational environment with new, emerging, threats (e.g. Unmanned Aerial Systems).

1.1.2 The future Land ISR capability needs to have modern sensors capable of detecting, recognizing, identifying, tracking and locating all threats in the land environment in order to inform intelligence requirements, decision making, targeting, brigade manoeuvres, fires and effects. As the Army moves to a modern force structure that utilizes general purpose units capable of conducting everything from brigade manoeuvres to dispersed platoon operations, the Army must be supported by a flexible and scalable, ISR capability that optimizes the use of all sense capabilities. A critical aspect of this capability, is the command andcontrol of the various sensors assets, as well as the ability to rapidly and efficiently share data, information as well as contextual intelligence across the battlefield to support decision making at all tactical levels. As such, future sensors need to support highly mobile and rapidly evolving operations across a dispersed communications network to support decision-making activities to help assure a tactical advantage for friendly forces.

1.1.3 The Land ISR Project seeks to equip the Division and Brigade's associated ISR elements such as, but not limited to, the Brigade Headquarters, the Brigade Surveillance and Target Acquisition Artillery Battery, and the General Support Artillery Regiment with modern equipment and software.

1.2. Introduction

1.2.1 Strong, Secure, Engaged (SSE): Canada's Defence Policy outlines the level of ambition for the CAF and presents a new strategic vision for defence. SSE states that the CAF will be prepared to simultaneously deploy to two different theatres of operation, including one as a lead nation. This predicates the need for the Army to have enough assets to support simultaneous operations of 500 to 1500 personnel in two different operational theatres or one brigade group of up to 4800 personnel. In order to meet the objectives laid out in SSE, Canada needs an agile, multi-purpose, and combat-ready military, operated by highly trained, well led, and well-equipped soldiers. SSE Initiative 42 captures the Government of Canada's commitment to modernize land-based Command and Control (C2), intelligence, surveillance, reconnaissance, and target acquisition systems. The ISR Mod project will deliver on this commitment through the acquisition of a digitized Land ISR system that permits improved sensors asset management as well as the ability to share information to support planning, intelligence, targeting and decision-making of forces operating in a dynamic environment.

1.2.2 The Army is a highly professional force that is agile, scalable, and responsive, providing its Canadian Government with a range of military capabilities on land. The Army operates at the brigade group level, executing joint campaigns with a critical mass of troops on the ground that operate in a combined role to provide the joint force with its requisite firepower, protection, C2, mobility and sustainability. The brigade group is the corner stone of the Army but is only capable of providing the above-mentioned effects if adequately equipped to permit the coordination, synchronization, and application of fires and effects in support to land operations, such as artillery, precision guided munitions, air strikes, and naval gunfire. Land ISR provides the critical capability to find the information, inform the decision making process and facilitates target acquisition for joint effects.

1.3. Missions

1.3.1. The Government of Canada articulates eight core missions that the CAF should be able to undertake for the protection of Canada and Canadians and the maintenance of international peace and stability. These are:

I. Detect, deter and defend against threats to or attacks on Canada;

II. Detect, deter and defend against threats to or attacks on North America in partnership with the United States, including through North American Aerospace Defence (NORAD);

III. Lead and/or contribute forces to NATO and coalition efforts to deter and defeat adversaries, including terrorists, to support global stability;

IV. Lead and/or contribute to international peace operations and stabilization missions with the United Nations, NATO and other multilateral partners;

V. Engage in capacity building to support the security of other nations and their ability to contribute to security abroad;

VI. Provide assistance to civil authorities and law enforcement, including counter-terrorism, in support of national security and the security of Canadians abroad;

VII. Provide assistance to civil authorities and non-governmental partners in responding to international and domestic disasters or major emergencies; and

VIII. Conduct search and rescue operations.

1.3.2. The Army is required to support the CAF's missions by providing land forces capable of supporting the land component's share of these mission sets. As such, ISR capability must be able to detect, identify and track conventional enemy threats to meet core missions I, II, and VI. ISR capability should also be able to detect unconventional evolving threats, such as mini and micro UAS, to meet core missions V and VIII and all ISR capability should be inter-operable with Joint and Coalition forces to meet core missions II, III and IV. Further information regarding the missions is available at Appendix 1 to Annex A which includes a number of vignettes to illustrate how future Land ISR capability would be employed.

1.4. Organization

1.4.1. The Army trains and fights at the brigade group level. The brigade group consists of approximately 4,800 soldiers, organized in eight major units generally including Artillery, Armour, Infantry, Engineer, and Combat Service Support organizations. These units operate together in "battle groups" to provide the joint force with the requisite firepower, mobility, protection, sustainment, and C2 functions to effectively coordinate their employment.

1.4.2. The Army almost always operates with other elements (i.e. Navy, Air Force), in Joint operations or with allies and Coalition partners (e.g. NATO), all of whom bring multiple assets. The ability for land forces to conduct operations is based upon the effectiveness of its decision-action cycle which is reliant on timely and accurate information. The decision-action cycle is the process whereby C2 elements analyze, review and undertake decisions based on the available information regarding friendly, hostile and neutral forces within the operational environment. Modern forces that are able to establish information dominance, may in turn optimize their decision-action cycle and out-perform opposing or belligerent forces. Intelligence, surveillance and reconnaissance (ISR) are core capabilities for collecting information that contributes to an increased understanding of the battlespace which is critical to decision making.

1.4.3. Land ISR is employed in every land operation as it supports commanders, planners, advisors, and operators from the Brigade Group, Battle Group, and down to Combat Team or Company levels. Its primary tasks involve information gathering through active and passive sensing systems, collection of information, analysis of information and dissemination of information. Based on current Army structures, the following Land ISR structure is employed at Brigade and below.

1.4.3.1 Brigade Group.

- G3 Intelligence, Surveillance, Target Acquistion, Reconnaissance Coordination Centre;
- Light Armoured Vehicle Reconnaissance Squadron;
- Acoustic Weapons Locating System (AWLS);
- Electronic Warfare Squadron;
- Medium Range Radar; and
- Small UAS platform(s) with specialized payloads (Blackjack UAS).

1.4.3.2 Battle Group Level. Three Battle Groups per Brigade Group.

- Surveillance, Target Acquisition Coordination Centre;
- Lightweight Counter Mortar Radar (LCMR);
- Persistent Surveillance Suite;
- Mini UAS platform with Electro-Optical/Infra-Red (EO/IR) payloads (RAVEN B UAS); and
- Organic Reconnaissance in Infantry Battalions, Artillery Gun Batteries and Engineer Field Squadrons.

1.5. Project Scope

1.5.1. The scope of the ISR Mod project covers the hardware, software, and specialty equipment necessary to implement and train use of a digitized Land ISR system and modern sensors. The ISR Mod project scope will include the following system components:

a) Land ISR digitized C2 System that interfaces with the Land C2 and Battle Management System to integrate sensor information. It also needs to distribute information and intelligence to support manoeuvre forces, targeting and Joint Fires. The digitized system must ensure a sensor-to-effector linkage and will incorporate Allied standards for information, communications;

b) Applications to streamline ISR information, aid in the tactical use of ISR data and the necessary gateways to migrate the information into the Land Battle Management System, Joint Fires and other applicable systems;

c) ISR applications to reduce cognitive load, improve awareness and facilitate information sharing;

d) ISR applications or software to improve sensor efficiency, cross-queuing and maximize sensor performance of both in-service and future systems;

e) Modernization and integration of the existing CAF sensors, both hardware and software, into a unified ISR network;

f) Acquisition of new sensors that address sensor gaps or obsolescence issues with the existing CAF sensor;

g) Integration of the existing and new sensors into the Army armoured fighting vehicle fleet;

h) New UAS platforms to carry sensors that cannot be integrated into existing Army UAS;

i) Ability to carry sensor payloads on specialized armoured vehicles or networking infrastructure that cannot currently be integrated into existing Army armoured vehicles;

j) Specialized communication systems to supplement existing and future communication systems to facilitate information flow;

k) Distributed and networked Training Simulation System; and

l) Initial provisioning of two (2) years spare parts and the establishment of In-Service Support Contracts: repair & overhaul, software upgrades, technical investigations and sparing.

1.6. Role and Function

1.6.1. The role of Land ISR is to provide information regarding the operating environment which includes early warning, threat detection, threat tracking and target acquisition to help friendly forces better understand the operating environment. This information is used to build a comprehensive intelligence picture both in domestic and Joint international operations: enhances command and control capability, is vital to the force protection of friendly forces, and enables effective command support and decision-making. To accomplish all of this, the ISR capability needs to unify ISR information from higher tactical levels with integral information from their operating units, and integrate all into the Battle Management and Joint Fires systems.

1.6.2. As a command support tool, ISR provides many functions but the primary responsibility is to gather information and to be able to blend that information into those systems critical for decision-making and the delivery of effects in the operating environment. To achieve this the ISR Sensors need to be able to Detect, Recognize and Identify (DRI) objects of interest and threats within the brigade area of operations, which could be as large as 100 km x 50 km. The sensors need to be able to provide critical object information such as, but not limited to, the following:

a) 3-Dimensional Location;

b) Size of each object;

c) Composition;

d) Description;

e) Speed and orientation; and

f) Number of objects.

1.6.3. ISR sensor information needs to be both rapidly and easily assimilated and highly accurate. Therefore the Land ISR system must be able to reduce redundant information (e.g. duplicate sensor tracks), facilitate sharing (e.g. using gateways and message formats), and assist in optimizing resource management for both planning and current operations. Concurrently, the Land ISR system must be capable of tracking and geo-locating any object so that when a decision is undertaken, it can be prosecuted quickly and assist in the assessment of the effect(s) to determine if further action is required. It is important to note that this blending occurs in a complex environment where decisions and effects may not be executed by a single entity (e.g. Canadian Sensors networked into a NATO system) so the ISR capability needs to adapt to each mission's requirements.

1.7. Threat Analysis

1.7.1. The success of all operations, particularly in high intensity conflicts, is based on the commander's ability to observe, orient, decide, and act more quickly than the adversary. Brigade Fire and Manoeuvre need to be highly coordinated and well informed to reduce risk during operations. As such, ISR is a critical tool in building situational awareness for informed decision making and targeting. The sensors that are employed by the brigade allow the commander to successfully decide how the brigade will advance and where brigade and joint fires are best employed. As well, ISR provides essential combat information, such as battle damage assessments and terrain information, to allow the commander to understand how the situation has evolve over the course of a battle.

1.7.2. The threats to the brigade that ISR Mod needs to operate in effectively is very broad. The CAF's understanding of the future security environment leads it to believe that future ISR equipment should be capable of conducting operations in a technologically advanced environment against forces that utilize capabilities that can or have the following capabilities:

a) Deny access to GPS capability;

b) Detect and locate radiating sensors (e.g. Radar) or moving sensors (e.g. UAS);

c) Locate, Target and Attack with kinetic effects such as Artillery Fires;

d) Locate, Target and Attack with non-kinetic effects such as Cyber-Attacks, Electro-Magnetic Pulse and Jamming;

e) Operate in both the land and air environments with drones that are small in size, capable of operating at long range with very capable payloads (e.g. EO/IR, Radio Frequency Detection, etc.);

f) Improved camouflage that defeats traditional EO/IR technology;

g) Deny or degrade communication systems and capabilities; and

h) Effective targeting counter-measures (e.g. Laser Dazzling and Active Protection Systems).

1.7.3. As such, the ISR Mod capability needs to be able to:

a) Address future adversaries who could be nation states or, alternatively, terrorist and criminal groups and other non-state actors;

b) Deploy on operations in diverse theatres including but not limited to urban, arctic, forest, jungle or desert terrain;

c) Support Joint and Coalition fires and manoeuvre;

d) Locate and support Targeting of C2 elements, Artillery systems and other high pay-off targets;

e) Assist in force protection through detecting, recognizing and identifying low-level air threats to the brigade such as Mini and Micro UAS, Chemical Biological Radiological Nuclear and Explosive and other conventional threats to the Brigade; and

f) Share Land ISR information in a manner that allows the CAF to maintain security on the information based on partner credentials and operational requirements.

1.8. Concept of Operations

1.8.1. The concept for modernizing and digitizing the Land ISR system is based on advancing on three fronts. The primordial component is the Land ISR Digitized C2 System that will facilitate the coordination and synchronization of information collection, intelligence exploitation and flow of information to support the decision-action cycle of a brigade or division. The digitized C2 system will include decision and planning support applications that can integrate with the Land C2 Battle Management system, ISR information management tools and network communication tools to enable the movement of information across the battlefield, while leveraging existing backbone networks.

1.8.2. The second element is to modernize the current sensors employed by the Land force. The existing capability as outlined in para 1.4.3 represent a significant investment by the CAF and may have relevant capabilities that can still be used in future Land ISR Capability. This industry engagement seeks to understand which of those sensors could be modernized, how they should be modernized and integrated into the new

digitized system. Parallel to the modernization of the existing sensor capability, the CA may be interested in procuring additional sensors to supplement or complement the legacy Land ISR sensor capability as a third element. Collectively this is shown at figure 1 below.

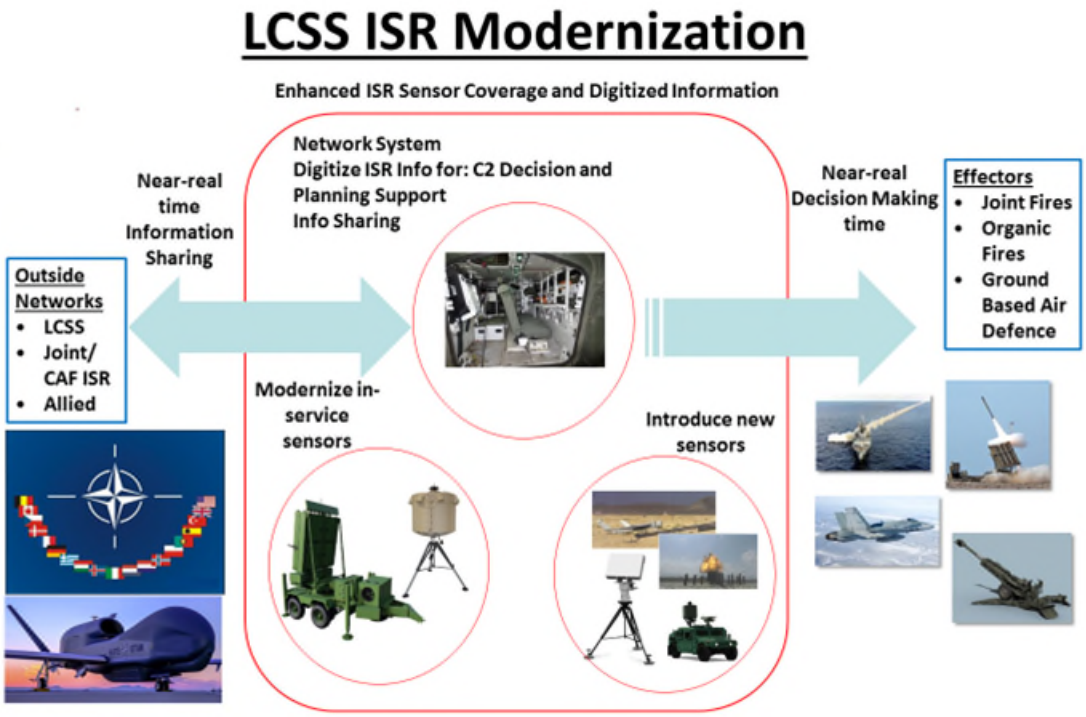


Figure 1. ISR Mod Project deliverables (within the three circles) represent the three main project deliverables and how they need to interact with internal and external forces.

1.8.3. Digitized Land ISR C2 System

1.8.3.1. The future Land ISR C2 System will complement the existing Command and Control Structure. Land ISR assets are managed at the Division and Brigade levels. The Land ISR C2 System will need to be capable of digitally managing the ISR sensors from Higher Command Echelons at Division level down to the Platoon level. This structure will allow commanders at their relevant levels to understand the higher Headquarters' ISR Information Requirements and Collection Plans and facilitate lower Headquarters' ability to integrate their Information Requirements and Collection Plans to satisfy both their own information requirements and the larger ISR collection plan. While these layers are interactive they still need to remain separate and respect each commander's span of control.

1.8.3.2. Beyond the management of ISR resources, the C2 system needs to enable both ISR planning, predictive analysis and operations. Planning tools need to encompass everything from simple trace management to the provision of advice on how best to employ the various sensors during ISR mission analysis. As well, ISR tools should help operators understand and predict hostile intentions, weapon effects, support war-gaming along with other factors to inform decision-making. The Land ISR C2 System must support information flow to improve both situational awareness at every level of command with regards to the status of the sensors, their missions and support optimized dynamic tasking. One of the key objectives for this digitized system would be to ensure that duplicate sensor tracks could be readily and accurately screened out to ensure that the ISR information is presented precisely in an uncluttered manner.

1.8.3.3. Interoperability and integration are essential requirements in operating with other elements and coalition partners. Currently, the CA's ability to operate is limited to reliance upon analog voice communication and manual-entry plotting and tracking methods. This is inadequate as technological trends in recent years within NATO have been moving towards high-speed digitally-enabled data communication with common messaging formats. As an example, sensor information pertaining to targeting should seek to easily merge with the accepted messaging format standards used by the Joint Fires System such as Variable Messaging Format (VMF) 2124, Artillery Systems Cooperation Activities version 7.1 (ASCA 7.1), and ABCANZ Digital Fires Standards. As well, all Land ISR information needs to respect pertinent NATO STANAGs such as STANAG 4559 and 2723.

1.9. Modernized Sensor Suites

1.9.1 The future CA will operate in a number of operational missions but the most challenging missions to accomplish are those that require the Land force to deploy in a rapid and scalable manner. Being able to distribute and concentrate ISR capability to meet this requirement is a significant hurdle and requires a high degree of integration into the vehicle fleet to seamlessly transition from vehicle borne to dismounted operations. The current vehicles systems that the CA employs are the Tactical Armoured Patrol Vehicle, Armoured Combat Support Vehicle, Light Armoured Vehicle 6.0 and the Blackjack Small UAS (or SUAS). As such, the CA is looking to leverage its modern vehicle fleet by integrating sensors wherever possible into the vehicle systems.

1.9.2 The CA operates a number of sensors to gain Situational Awareness in the battlespace. These sensors are both passive (e.g. Acoustics and Electro-Optical) and active (e.g. Radars). For the most part they operate independently and, while some are carried on the vehicles, such as the Blackjack SUAS, most are employed in static deployment arrays utilizing tripods with lengthy deployment times. These sensor suites currently do not meet all of the future operating concept for the CA.

1.9.3 The CA would like to investigate and invest in modernizing its existing sensor suites to improve the overall sensor capability. The aim is to upgrade those systems that are still relevant to the CA to fit the mold of the future army capability by improving their mobility, speed of deployment or extending the range of the sensor capabilities through hardware and software upgrades. The expected outcome is to see a suite of sensors in both Land and Air that support the modular, scalable, approach to conducting ISR missions.

1.10 New Sensors

1.10.1 The CA may replace obsolete sensors with new sensors that improve the operator to sensor ratio. The CA would be seeking to employ an intelligent, mixed sensor fleet that can cross-queue at the sensor and system levels. The sensor mix needs to support the CA's desire to maximize coverage of the battlespace whilst increasing its ability to Detect, Recognize and Identify objects of interest at the maximum possible ranges that technology will allow. These sensors should not reduce the survivability of the platform vehicle and nearby troops with increased battlefield signatures which could increase the risk of being targeted for hostile effects. Ideally, these new sensors also have the same level or, preferably, lower training requirements as current CA sensor systems.

1.10.2 These new sensors should assist the brigade in finding Command and Control elements, Enemy Fires and high value targets. The sensors should enable the brigade to conduct Intelligence Gathering, Surveillance, Target Acquisition and Reconnaissance missions with the view to facilitating Joint Fires and gathering relevant information that will increase situational awareness of the operating environment.

1.10.3 All consolidated elements of the ISR Mod capability will provide:

a) Technical Interoperability within the CAF and a Joint Coalition environment;

b) Operational Interoperability with other CAF elements, Five-Eyes and NATO, to assist in Targeting joint fires and sharing Land ISR information into the Battle Management Systems within the CAF and a joint coalition context;

c) ISR sensor coverage over a 100km by 50km Battlespace with the view to Detecting, Recognizing and Identifying C2 nodes, Enemy Fires and other High Value Targets;

d) Sensor systems in a distributed fashion to support elements as small as a platoon up to a full brigade;

e) Improved situational awareness, enable faster decision making, facilitate more rapid dissemination of a commander's intent and clearance of fires;

f) Training aids to Regular and Reserve Forces across Canada; and

g) Uninterrupted ISR information transmission, regardless of bandwidth limitations in the backbone communication system, to commanders, decision-makers and their staff.

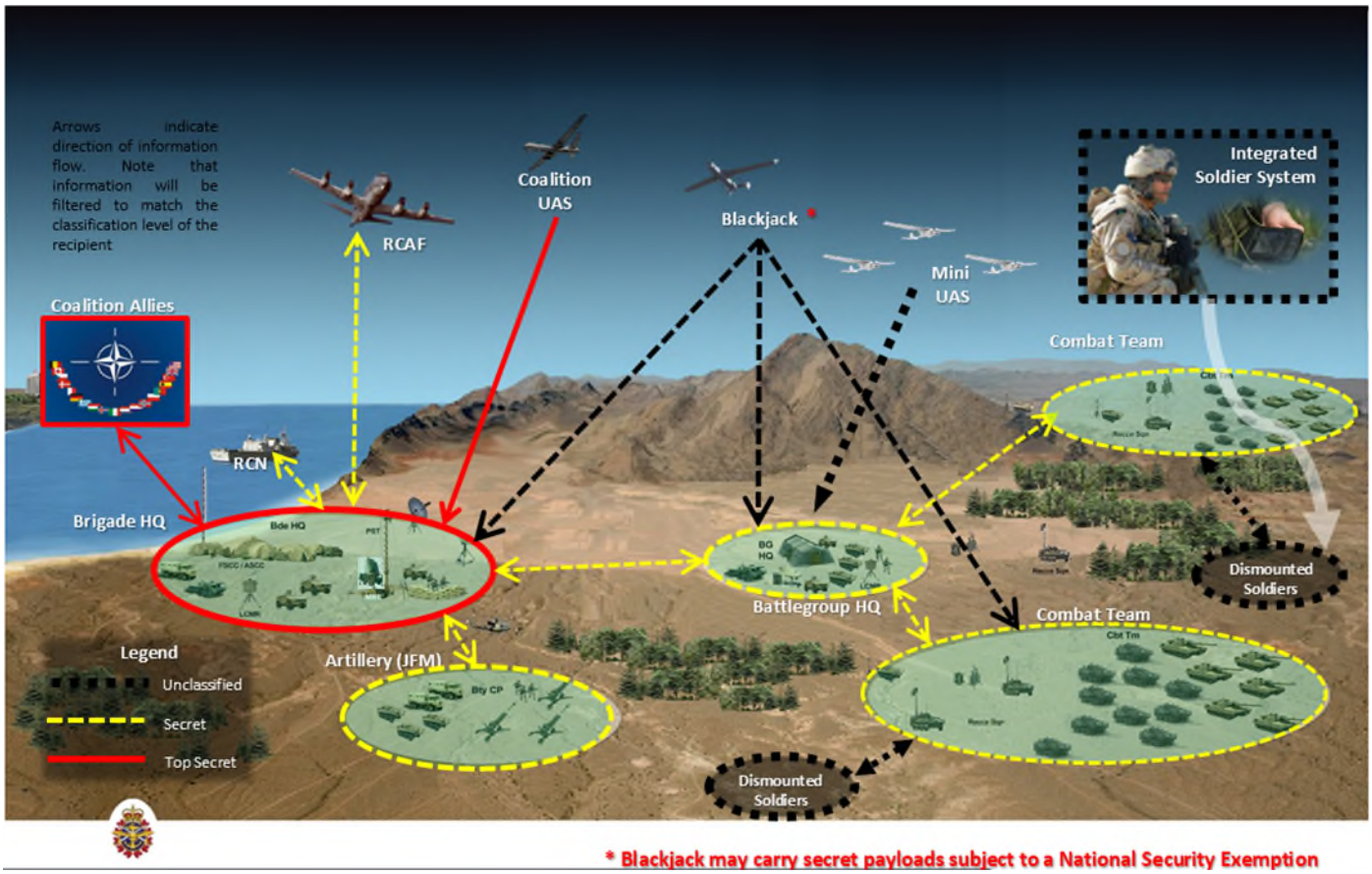
1.11 Government Furnished Equipment (GFE), Government Supplied Material (GSM), or Government Furnished Information (GFI)

1.11.1 ISR Mod specific equipment, systems and software will operate on existing CA platforms and infrastructure. Department of National Defence (DND) may identify -- as GFE, GSM, or GFI -- vehicle platforms, networks and C2 systems required for all ISR Mod equipment. As a reference, the CA tactical and Headquarters' networks are transmission control protocol/internet protocol (TCP/IP) based, with Microsoft Windows as the Operating System, and the tactical bearer extensions are generally low-bandwidth, software-defined data radios. Respondents need only consider all required hardware, software, and integration costs for ISR Mod specific equipment for merging their proposed solution with identified GFE.

Appendix 1 – Land ISR Vignettes (UNCLAS)

Available only upon request from the Contracting Authority

Appendix 2 – Future ISR Capabilities – Network Connectivity Diagram



ANNEX B - SUSTAINMENT

Overview

1.1 The Army Structure of Sustainment – Lines of Support

1.1.1 The Army works from a sustainment continuum that stretches from national resources to the individual soldier. Capabilities along the continuum are organized into layers, most commonly referred to as echelons or lines of support. Although the flow is generally linear, moving from one line of support to the next, the system operates on the principle of flexibility that allows and indeed encourages, the bypassing of lines of support where and when appropriate. The allocation of capabilities within each line conforms to the level of need, the threat as well as the requirement for mobility and protection. The grouping of capabilities into lines of support ensures that each level of command is effectively sustained, but without the burden of holding capabilities better held elsewhere. A line of support may contain a number of sustainment units.

1.2 Lines of Maintenance Support

1.2.1 First Line: a maintenance organization allocated to a unit (i.e. battle group, battalion or regiment). A first line maintenance organization generally performs repairs of limited duration, must have mobility to match the supported unit, and is designed to be the interface with the equipment operators to diagnose faults. ‘Limited duration’ generally refers to repairs that take four or less hours.

1.2.2 Second Line: a maintenance organization allocated to a formation (i.e. brigade or brigade group). A second line maintenance organization is characterized by its ability to perform maintenance tasks of a longer duration than a first line organization. It generally has access to a greater range of parts and tooling. ‘Longer duration’ is generally defined as repairs that take between 4 and 12 hours.

1.2.3 Third Line: a maintenance organization allocated to a base or theatre of operations. Third line maintenance augments second line and can provide support to the Materiel Management and Distribution System (MMDS) through component repair and calibration. At third line, repair facilities are more robust and static in nature and repair resources are dedicated to production rather than battlefield survivability. An example is a maintenance workshop at a theatre base on operations, or base level facilities in Canada.

1.2.4 Fourth Line: a national level maintenance organization. Fourth line support is provided from static facilities outside the theatre of operations. It includes national resources such as 202 Workshop Depot, civilian manufacturers, and contractors.

1.3 Types of Maintenance

1.3.1 Preventive Maintenance. Systematic and/or prescribed maintenance intended to reduce the probability of failure. This includes preventative maintenance servicing by both operators and technicians.

1.3.2 Corrective Maintenance. Maintenance actions carried out to restore a defective item to a specified condition.

1.4 Canadian Armed Forces Maintenance Technicians

1.4.1 Canadian Armed Forces Maintenance Technicians who could be involved in the maintenance of the ISR MOD system (in general terms):

a) **Electronic-Optronic (EO) Technicians:** Inspect, test, identify faults in, adjust, repair, recondition and modify electrical, electromechanical, electronic, electro-optic and mechanical equipment, optical instruments, and control systems for weapons and missiles.

b) **Army Communication and Information Systems Specialist (ACIS) Technicians:** Perform preventive and corrective maintenance on all types of radios, radar and data processing, cryptographic, terminal, audio and video equipment.

1.5 Supply Chain

1.5.1 The Canadian Armed Forces (CAF) has two main supply depots in Canada (Edmonton and Montreal) in which materiel from suppliers arrive and is catalogued. From each of these locations, materiel is shipped to CAF bases for distribution to units who are the end user. In terms of spare parts, there is typically a stock level assigned to each location based on the dependent unit's fleet types, fleet size and training frequency, as well as the type of maintenance that can be performed at that specific unit. The stock levels, totaled across all depots and supply locations, are called scaling. A single supply depot is normally assigned for a significant portion of materiel being shipped to international operations.

1.6 Integrated Logistic Support (ILS)

1.6.1 ILS plans and directs the identification and development of logistic support and system requirements for military systems, with the goal of creating systems that last longer and require less support, thereby reducing costs and increasing return on investments. ILS therefore addresses these aspects of supportability not only during acquisition, but also throughout the operational life cycle of the system. The impact of ILS is often measured in terms of metrics such as reliability, availability, maintainability and system safety.

1.7 Sustainment Requirements – ILS Services

1.7.1 Logistic Support Analysis (LSA). LSA is the process by which the logistic support necessary for a new system/equipment is identified. It is comprised of tasks and actions needed to identify and quantify logistic resource requirements, and to optimize the type, quantity, and distribution of these resources with respect to life cycle costs and availability. LSA will include data associated to preventative and corrective maintenance tasks. Additionally, the resources required to complete the maintenance tasks will be identified. These resources include spare parts, consumables, Special Tooling and Test Equipment (STTE), and personnel.

1.7.2 For a future RFP, support analysis data will be required to be structured as a Logistic Support Analysis Record (LSAR). The LSAR Database normally includes the following items:

a) All components (including repairable parts and consumables);

b) Manufacturer information, total Line Replaceable Units (LRU)/Spares and Unit Costs Estimate;

c) Recommended Spares/Parts. The recommended Spares/Parts will be used to create the Recommended Spares Parts List (RSPL); and

d) Indicate if item is a Maintenance Significant Item (MSI).

1.7.3 The Logistic Support Analysis Data listed below are populated in the LSAR if identified as a Maintenance Significant Item:

a) Failure Rate;

b) Mean Time to Repair (hours);

c) Shelf Life (months);

d) Maintenance Concept; and

e) Preventative Maintenance Frequency.

1.8 Initial Provisioning, Spare Parts, Special Tooling & Test Equipment

1.8.1 Industry will be asked to recommend an initial scaling of spare components and sub-systems, in sufficient quantities to support the determined availability of the fleet. The scaling of spare components and sub-

systems will reflect the data within the LSA. The ISR Mod project is responsible for acquiring the initial spare parts and two (2) years of annual replenishment spares in addition to the test equipment and consumables, which must be sufficient to sustain the CAF during the initial provisioning period of 2 years, based on the scaling agreed upon between the Project Management Office and contractor.

1.8.2 Spare Parts – The initial provisioning period will allow data to be recorded in terms of performance metrics and spare parts usage. This data will be used to properly formulate the basis of the sustainment requirements for the remaining life of the fleet.

1.8.3 Spare Parts Management – The ISR Mod Project is investigating the capabilities of Industry to perform spare parts management, such as warehousing, maintaining and distribution.

1.8.4 Special Tooling and Test Equipment (STTE) – The Original Equipment Manufacturer (OEM) will be expected to identify and provide all STTE required to service, diagnose and repair the fleet as outlined in the LSA.

1.9 Contracted Maintenance and Training Services

1.9.1 Operator Training. When procuring a new fleet or capability, operator training is typically coordinated up front as part of the initial procurement. This allows the CAF to operate the fleets upon initial delivery. Initial Cadre Training is provided by the Contractor to a specific quantity of operators and operator-trainers. Ongoing training on operation of ISR Mod will be provided at the Royal Canadian Artillery School located at Canadian Forces Base (CFB) Gagetown. Ongoing training may also be delivered as part of a long-term support contract if required. The ISR MOD Project is investigating the capabilities of industry to provide ongoing operator training as part of a long-term support contract if required.

1.9.2 Technician Training. When procuring a new fleet, technician training is also typically coordinated up front as part of the initial procurement. This allows the CAF to maintain the fleets upon initial delivery. Initial Cadre Training is provided by the Contractor to a specific quantity of maintainers and maintainer-trainers. Ongoing training on maintenance will be provided by the Royal Canadian Electrical and Mechanical Engineers School and the Canadian Forces School of Communications and Electronics. The ISR Mod Project is investigating the capabilities of Industry to provide ongoing technician training as part of a long-term support contract if required.

1.10 Field Service Representative (FSR)

1.10.1 FSRs are individual technician representatives of a supplier to provide maintenance or training services at a site chosen by the CAF. Depending on the fleet, FSR services may be requested at a variety of CAF locations, potentially world-wide or in theatre of operations.

1.10.1.1 Maintain. FSRs could be employed to carry out maintenance tasks and technical investigations in order to sustain the fleet at the predetermined availability.

1.10.1.2 Train. FSRs could be employed across Canada at the major base hubs to train a predetermined number of operators and/or technicians.

1.10.1.3 Repair and Overhaul. FSRs could be employed across Canada at the major base hubs to undertake or assist in repair and overhaul activities.

1.11 Service Facilities

1.11.1 Similar to FSRs, support could be provided at Contractor facilities. The ISR Mod Project is also seeking information from industry on the capabilities to complete repairs, training, and Repair and Overhaul (R&O) in commercial service facilities both within Canada and internationally.

1.12 Excluded Maintenance Services

1.12.1 Operational requirements dictate that 1st and 2nd line support in expeditionary operations be provided by CAF technicians. Any contracted support in these instances would be from a 3rd line role, providing support from a theatre base of operations. Tasks of such a contractor arrangement could include support to 1st and 2nd line organizations when operational tempo and geography allow.

1.13 Engineering Services

1.13.1 The ISR Mod Project is exploring the capabilities of industry to carry out engineering and technical tasks, which are critical to continuously ensuring availability of the system.

1.13.2 Engineering Services. Work may include modifications, system/sub-system/component reliability assessments or failure analysis. Mechanisms for such tasks might include: Technical Investigation and Engineering Support (TIES) contract; Special Investigations and Technical Studies (SITS) contract; Additional Work Request (AWR); or In-Service Support (ISS) contracts.

1.14 Embedded Contractors

1.14.1 The ISR Mod project is investigating the ability of industry to work embedded in DND facilities in order to enhance communication and provide responsive technical solutions.

1.15 Technical Data Package

1.15.1 Communication. Access to Technical Publications and OEM updates/modifications is critical for the effective management of any fleet.

1.15.2 Provision of Technical Publications. There will be a requirement to provide OEM technical publications such as operator manuals, preventative & corrective maintenance manuals, and available commercial part numbering listings (as procured by OEM).

1.15.3 The ISR Mod Project is investigating the capabilities of industry to provide updates to technical publications over the intended 15-year life-cycle of the proposed solutions.

1.15.4 The ISR Mod Project is investigating the capabilities of industry to provide Technical Drawing Packages.

1.16 Configuration & Obsolescence Management

1.16.1 There will be a requirement to conduct Configuration Management (CM) to establish and maintain consistency of the performance, functional, and construction attributes of the deliverables with the requirements, design, and operational information.

1.16.2 The ISR Mod Project will investigate the capabilities of industry so that Configuration Management services can be provided during the estimated 15-year life-cycle of the proposed solutions.

1.16.3 There may be a requirement to conduct first article inspection and pre-delivery inspections.

1.16.4 There may be a requirement to conduct functional configuration audits and physical configuration audits.

1.16.5 **Obsolescence Management**. There will be a requirement to provide obsolescence management during the initial provisioning period, which is expected to include but is not limited to high risk components/sub-systems list and obsolescence management issues reports (as required). The ISR Mod Project is investigating the capabilities of industry to provide obsolescence management services, to ensure that the effects of obsolescence in terms of equipment support, effectiveness and support costs are mitigated by a combination of reactive and proactive management activities.

1.16.6 **Hardware: Pre-Determined Upgrades**. It is anticipated that it will not be cost effective to maintain a portion of the hardware for the 15-year lifecycle based on low maintainability and changing hardware requirements for the software solutions. The ISR Mod project is investigating the capabilities of industry to provide hardware upgrades at pre-determined intervals for non-maintainable equipment.

1.17 Software

1.17.1 The system will have a software requirement that in itself will be complex due to integration and will require some or all of the aforementioned ILS services throughout its lifecycle. The software for the system must be given due consideration with respect to configuration management, incremental improvements, and obsolesce management such that it is able to keep pace with current technology and user expectations.

1.17.2 Private Cloud-Based Services. While it may not be feasible to have tactical equipment always connected to a private cloud-based services, the ISR Mod team is investigating the ability for industry to provide secure updates for software systems when security concerns permit (e.g. at home within Canada).

1.17.3 Software-as-a-Service (SaaS) Subscription Based Payment Model. It may be desirable for Canada to enter a long-term subscription-based payment model for ISR Mod software to avoid obsolesce issues and to maintain always an up to date software baseline. Canada is investigating the ability of industry to provide ISR Mod software, including updates, at a fixed firm cost over the lifecycle.

1.17.4 Network Architecture. It is anticipated ISR Mod will require access to networked data. The ISR Mod team is investigating the most appropriate network architecture, technical interface, redundancy, and data storage method to reach the desired system availability and uptime.

1.18 Testing

1.18.1 There will be a requirement to prove defined ISR Mod capabilities in a test setting. This may include, but not limited to:

1.18.1.1 DND User Trials - Test & Evaluation to demonstrate that the system meets the requirements and specifications; and

1.18.1.2 Contractor Capability Testing – Testing may include but is not limited to: start-up, operate, conduct various tasks, extreme weather operations.

1.19 Intellectual Property

1.19.1 Canada must have unrestricted ownership rights in any prototype, model, custom or customized system or equipment that is a deliverable under the Contract and must have access to licenses to exercise all Intellectual Property Rights in the Foreground Information for Canada's activities, in accordance with Standard Acquisition Clause and Condition (SACC) Supplemental General Conditions, 4006 – ‘Contractor to Own Intellectual Property Rights in Foreground Information’. Similarly, SACC Supplemental General Conditions, 4003 – ‘Licensed Software’ will be used for software.

1.20 Preliminary Concept of Sustainment

1.20.1 **Maintenance**

1.20.1.1 First line maintenance is performed in expeditionary operations by CAF technicians. Domestically, CAF technicians may be supported by FSRs. Third and fourth line maintenance is anticipated to be conducted by contractor/FSR both domestically and on operations.

1.20.1.2 An initial period of maintenance support to be provided by the Contractor, with an additional support contract to be considered separately over the lifecycle of the ISR MOD system. Maintenance of any simulation system is anticipated to be provided by the Contractor should it have unique maintenance requirements from the ISR MOD system.

1.20.2 **Supply**

1.20.2.1 The ISR Mod project project may acquire two years spares and technical stores to the appropriate CAF depot(s). The depot(s) will hold an additional operational stock of at least 30 days of supply of parts, but options for contractor housing of spares and technical stores delivery will be explored.

1.20.3 **ILS Services**

1.20.3.1 It is expected that configuration management, engineering support, technical data packages, and operator and maintenance manuals will be part of a long-term service contract. Access to data for logistic support analysis will be essential, as will the integration of fleet data with the CAF's SAP enterprise resource planning tool, Defence Resource Management Information System (DRMIS).

1.20.4 **Lifecycle and R&O**

1.20.4.1 The estimated life expectancy of the equipment is currently anticipated at 15 years. To achieve a lifecycle of 15 years, it is expected that non-maintainable hardware be replaced on a 5-year interval.

1.20.5 **Software**

1.20.5.1 The preferred software support system will be a subscription model services that ensures improvements and continued integration with CAF and allied systems over its lifecycle.

1.20.6 **Training**

1.20.6.1 Initial cadre training for both operators and maintenance personnel to be developed and delivered by contractor, with training materials transferred to the CAF to be adapted for our own use. The number of serials will depend on the length and complexity of the training package, but the end state will be achieved when training responsibilities are transferred successfully to Army and/or long-term arrangements are made for contracted training (if needed). Simulators are expected to be part of the training solution for operators and there may be a requirement for at least one maintenance training aid for Canadian Forces School of Communication and Electronics.

1.21 Key Performance Indicators (KPIs) by which sustainment may be measured

1.21.1 Of primary concern is the availability of the ISR MOD system to perform its mission. The following are common metrics that will be considered in the measurement of sustainment system performance. While the metrics below emphasize mean values, other measures of central tendency may be examined (i.e. median, mode) if appropriate.

1.21.1.1 Mean time to repair (MTTR). The mean time to conduct a corrective maintenance action by technicians.

1.21.1.2 Mean operating time between failures (MTBF). For a stated period in the life of a functional unit, the mean value of the lengths of operating time between consecutive failures under stated conditions.

1.21.1.3 Mean downtime (MDT). Downtime consists of all preventive and corrective servicing and repair time plus time awaiting parts or labour and other administrative delays.

1.21.1.4 Uptime. Represents the time the equipment is operated and available for use.

1.21.1.5 Mean time to deliver spare parts (MTTDSP). Mean time from when order placed in DRMIS to delivery of part to appropriate maintenance organization.

1.21.1.6 Mean time between maintenance (MTBM). For a stated period in the life of a functional unit, the mean length of operating time between maintenance. MTBF only considers preventative and

corrective maintenance performed by technicians, not that which is considered operator maintenance.

1.21.1.7 Availability. The probability that an item is in operable and committable state at the start of a mission when the mission is called for at an unknown (random) time. Availability will be quantified availability in three ways:

1.21.1.7.1 Inherent availability: $= \frac{MTBF}{MTBF+MTTR}$

This expression of availability is a characteristic of the equipment being maintained and does not reflect on the maintenance environment.

1.21.1.7.2 Achieved availability: $= \frac{MTBM}{MTBM+MDT}$

This measure reflects the reliability and maintainability of the equipment as it only includes preventive and corrective maintenance activities.

1.21.1.7.3 Operational availability: $= \frac{Downtime}{Downtime+Uptime}$

Operational availability reflects on the maintenance environment as well as the equipment. This is the measure of availability which gives the true availability of the system for operators.

PART 3 – QUESTIONS AND RESPONSE TEMPLATES

1. Respondents should use the following annexes as templates for their response submission. Respondents are encouraged to fill out all response templates and answer all questions as best as possible.

2. The Submission should respond to the following configurations:

    A. Mandatory: DND existing sensors as GFE integrated into a Vendor's proposed Land ISR Network solution (mandatory, as a baseline),
    AND
    B. Alternatively: A Vendor's suite of proposed sensors integrated into their proposed Land ISR Network solution;
    OR
    C. Submission of Sensors only: Vendors may submit a single sensor or suite of sensors capable of digitally integrating into a Land ISR Network;
    OR
    D. Submission of Network only: Vendors may submit a Digital Land ISR Network solution only.

3. It is recommended that the entire RFI and annexes be read before preparing a submission.

Annex C -- Industrial Technological Benefits & Value Proposition
Annex D -- Costing Requirements & Acquisition Questions
Annex E – Land ISR Mod Project High Level Mandatory Requirements & Questions
Annex F -- ISR Mod Sustainment Questions (to follow via RFI Amendment)

ANNEX C – Intelligence Surveillance Reconnaissance Modernization (ISR Mod) Project Industrial and Technological Benefits

Application of the Industrial and Technological Benefits (ITB) Policy

The Industrial and Technological Benefits (ITB) Policy may be applied on the **Intelligence Surveillance Reconnaissance Modernization (ISR Mod) project.** Engagement with industry through the Request for Information (RFI) will help determine the application of the ITB Policy and how Canada could leverage opportunities for economic benefit through this procurement.

The ITB Policy including Value Proposition

The ITB Policy is a powerful investment attraction tool and companies awarded defence procurement contracts are required to undertake business activities in Canada equal to the value of the contract. The ITB Policy encourages companies to establish or grow their presence in Canada, strengthen Canada's supply chains, and develop Canadian industrial capabilities.

The goal of the ITB Policy is to support the long-term sustainability and growth of Canada's defence sector, including small and medium-sized enterprises in all regions of the country, to enhance innovation through R&D in Canada, to support skills development and training, and to increase the export potential of Canadian-based firms. The ITB Policy includes the Value Proposition (VP), which requires Respondents to compete on the basis of the economic benefits to Canada associated with its bid. Winning Respondents are selected on the basis of price, technical merit and their VP. VP commitments made by the winning Respondent become contractual obligations in the ensuing contract.

For more information about the ITB Policy, please visit www.canada.ca/itb.

Key Industrial Capabilities:

To maximize the economic impact that can be leveraged through the VP, Canada will look to use the ITB Policy to motivate defence contractors to invest in Key Industrial Capabilities (KICs). KICs align with Canada's defence policy, *Strong, Secure, Engaged*, and the *Innovation and Skills Plan* by supporting the development of skills and fostering innovation in Canada's defence sector. The KICs represent areas of emerging technology with the potential for rapid growth and significant opportunities, established capabilities where Canada is globally competitive, and areas where domestic capacity is essential to national security.

Based on initial analysis of the ISR Mod project, this procurement encompasses the KICs of **Artificial Intelligence, Cyber Resilience,** and **Defence Systems Integration** where Canada has world leading capabilities. Canada will be seeking to motivate high value economic opportunities and partnerships to support the growth of Canada's defence sector, as well as enhance supply chain participation and skills development opportunities for Canadian industry.

The definitions for the relevant KICs for this project are:

Artificial Intelligence

Artificial Intelligence (AI) spans a range of technologies that allow machines to execute tasks that normally require human intelligence, such as pattern and speech recognition, translation, visual perception, and decision-making. AI develops or draws on disciplines such as search and mathematical optimization, machine learning, deep learning, self-learning, and neural networks. AI can reduce operator workload and automate easily repeatable tasks that otherwise require significant human involvement. AI promises enhanced efficiency in the use of trained personnel, less exposure of humans to dangerous environments, and more rapid responses to changes in the military operating environment. It can also permit the analysis of large volumes of data in support of intelligence analysis,

mission planning and rehearsal, logistics and business management, cyber security and resilience, and many other activities. AI is relevant across a broad set of both defence and non-defence domains.

Cyber Resilience

Cyber resilience spans every element of the domestic commercial, civil and national security sectors and addresses the vulnerabilities created by the expansion of information technology and the knowledge economy. Activities in this segment include design, integration and implementation of solutions that secure information and communications networks. These and other technologies should focus on achieving effective development of the following cyber capabilities:

Information security
The practice of defending electronic and digital data and information from unauthorized access/intrusion, use, disclosure, disruption, modification, perusal, inspection, recording or destruction;

IT security
Secure content and threat management (endpoint, messaging, network, web, cloud), security, vulnerability and risk management, identity and access management and other products (e.g. encryption/tokenization toolkits and security product verification testing), and education, training services and situational awareness;

Operational technology (OT) security
Monitoring, measuring and protecting industrial automation, industrial process control and related systems. Cyber resilience may involve the development of tools and the integration of systems and processes that permit hardening of tactical systems or broader networks, encryption, cyber forensics, incident response, and others. Capabilities developed in this domain may increasingly draw on AI as an enabling technology; for example, networks may autonomously and dynamically defend against intrusions and repair themselves if disrupted.

Defence Systems Integration

Design and integration of complex military systems that hinge on the seamless linking together of multiple sub-systems to yield an effective operational capability. These capabilities span various military platforms and enable the operation and management of weapons, defensive systems, command and control systems, sensors, decision support systems, electronic warfare devices and a platform’s core sub-systems in a tightly coordinated fashion essential under highly stressing combat conditions. These systems need to present information to their operators stemming from multiple sources in a manner that is understandable, secure, and supports decision-making in a complex environment. This definition does not include the various constituent systems (e.g., missile launching systems, radars, electronic warfare systems, etc.) that the work of defence systems integration aims to combine into a cohesive whole. Rather, the definition focuses on the skills and other capabilities needed to perform the integration work, and to create the user interface that is needed in such complex mission systems.

ISR Mod ITB/VP Industry Engagement Questions
Defence Sector:

The ITB Policy seeks to promote economic development and long-term sustainment of Canadian businesses engaged in the manufacturing and delivery of products and services used in government defence and security applications.

1. Based on the project scope put forward by the Department of National Defence, describe what Direct Work activities your company would foresee undertaking in Canada for the production and sustainment of the ISR Mod project? Please specify which of the ISR deliverables your company may provide (digital land ISR network, modernized sensor suites, new sensor suites).
2. What are the highest value areas in which Canadian capabilities could be used to support the ISR Mod system?

Supplier Development:

The ITB Policy seeks to improve the competitiveness of Canadian industry by encouraging Canadian industrial participation and the scaling up of Canadian companies including small and medium-sized businesses (SMB).

3. The ITB Policy requires that at least 15 percent of the contractor's ITB obligation (equal to the value of the contract) be represented by work with Canadian SMBs with less than 250 employees. To what extent can you commit to a SMB requirement of over 15 percent in order to nurture the development of Canadian SMBs within the defence sector (includes both direct work on this procurement and indirect work in other business areas)?

4. As a result of the ISR Mod project, please indicate what new supply chain opportunities could be made available to Canadian suppliers (production and sustainment). Please include in your response information on:

    a. What activities should be perceived as providing the highest value to Canada.
    b. Which opportunities could be specifically targeted at Canadian SMBs.
    c. Supplier development opportunities that could be performed in the KICs identified above.

Skills Development and Training:
The ITB Policy fosters the development and sustainment of a diverse, talented, and innovative Canadian workforce through access to training, education, opportunities and programs.

5. What types of Skills Development and Training investments would produce the maximum benefit for Canadians (defence or commercial sector)?
    a. What Skills Development and Training opportunities are available in the KICs identified above?

    Examples:
        i. Work integrated learning programs (e.g., co-operative education; work placements);
        ii. Apprenticeship programs;
        iii. A new or existing skills development program at or through a post-secondary institution;
        iv. Support for security certifications (e.g.: Top Secret, ITAR) or cybersecurity compliance certifications for Canadian companies, especially small and medium-sized businesses.

Research and Development (R&D):

The ITB Policy promotes scientific investigation that explores the development of new goods and services, new inputs into production, new methods of producing goods and services, or new ways of operating and managing organizations.

6. What direct or indirect R&D investments could Canada motivate Respondents to make as a result of this procurement?

7. Is there potential to develop research consortia or centres of excellence in partnership with Canadian post-secondary or publicly-funded research institutions, and if so, what research areas might your company pursue?
    a. If not, what other research or development partnerships could be formed to support technology development related to the ISR Mod project and/or in the KICs identified above?

8. Is there potential to invest in research and development partnerships with Canadian SMBs and start-up companies, including funding for late-stage R&D and commercialization of innovative products or services?

Export:
The ITB Policy promotes the ability of Canadian companies, including SMBs, to successfully tap into export markets, thereby increasing their productivity, and competitiveness in the global market.

9. Please describe any high value export opportunities from Canada, whether commercial or defence, which could be leveraged as a result of this procurement.

10. Is it feasible to secure sufficient intellectual property rights and an exclusive global product mandate to export from your Canadian-based operations, including subsidiaries and supply chain partners?

Other questions:

11. In addition to the identified KICs above, do you believe any of the following KICs could be applicable to the project deliverables: remotely-piloted systems and autonomous technologies, electro-optical / infrared (EO/IR) systems and sonar and acoustic systems? If yes, why? If there are other relevant KICs which you believe align with the work to be conducted under the ISR Mod project, please indicate these KICs and explain why. (Please see the link in the *Key Industrial Capabilities* section above for descriptions of the KICs.)

12. Comparatively to price and technical merit, the Value Proposition typically has a minimum weight of 10% of the overall bid evaluation. What is your view on the weighting of the Value Proposition for the ISR Mod procurement?

ANNEX D – PROPOSED SOLUTION WITH COSTS

Initial Acquisition

1. Land Intelligence, Surveillance and Reconnaissance Modernization (ISR Mod) indicative costing details from industry is required to allow Canada to prepare its documents for the Project Approval. For each activity, Respondents are asked to:

   a. provide pricing including margins of accuracy -- but preferably not to exceed plus or minus 40 percent;
   b. complete as much information as possible for the activities within this annex; and
   c. explain any associated risks with each activity.

2. Please provide your Land ISR Mod solution for all of Canada's requirements laid out in Annexes A and B at the lowest possible cost breakdown level. If a specific cost element is not provided for any reason, for example because it is included in the price for another item, please provide that explanation within your response.

3. Once industry's Land ISR Mod technical capability is clarified, this RFI may be amended to request additional comprehension on inherent risk, plus their associated sustainment costs, or to ask additional questions.

Table 1 – ACQUISITION COSTS – COMPLETE for EACH PROPOSED SOLUTION

Description	Proposed Solution	Margin of Accuracy (ADD : plus X, minus Y percent for each Price)	Firm Unit Price 0 = No Cost (In Vendor's Currency)
ISR Digitized Network – Software and Hardware system that will enable the digitalization of Sensors information in a joint, coalition environment. Will assist in reducing object tracks from multiple sensor types (e.g. Radar, Acoustic, etc) through either **data fusion** or **track screening** and thereby reducing cognitive load while maximizing situational awareness, efficiency, and accuracy of object information. Outputs from this sensor network must be able to integrate into the Battle Management System, Joint Fires Network and Coalition ISR networks using the appropriate STANAGs and messaging formats. In addition, the software suite must facilitate the analysis, planning, coordination, and real-time operations of ISR assets in support of land operations. (Reference Annex A)			
a) ISR Network Software , indicating risks associated with each cost element and who will assumes each risk.		**plus _____ % minus ____ %**	**$ _____.__**
		plus _____ % minus ____ %	**$ _____.__**
		plus _____ % minus ____ %	**$ _____.__**
		plus _____ % minus ____ %	**$ _____.__**
b) ISR Network Hardware		**plus _____ % minus ____ %**	**$ _____.__**
		plus _____ % minus ____ %	**$ _____.__**
		plus _____ % minus ____ %	**$ _____.__**
*If possible, please include average operating costs - Hourly, Annually...etc. Please provide a detailed response.			
Sensor Equipment and Upgrades – New equipment and upgrades to sensors and supporting systems that will enable ISR Sensors with the capability to detect, recognize, identify, track and locate Objects of Interest within the 100km x 50km brigade battlespace. These must be scalable, modular, and task-tailored to meet the full spectrum of Canadian Army core missions. (Reference Annex A)			
c) Sensor Equipment		**plus _____ % minus ____ %**	**$ _____.__**
		plus _____ % minus ____ %	**$ _____.__**
		plus _____ % minus ____ %	**$ _____.__**
		plus _____ % minus ____ %	**$ _____.__**
		plus _____ % minus ____ %	**$ _____.__**

		plus _____ % minus _____ %	$ _____.__
		plus _____ % minus _____ % plus _____ % minus _____ %	$ _____.__
d) Sensor Upgrades		plus _____ % minus _____ %	$ _____.__
		plus _____ % minus _____ %	$ _____.__
		plus _____ % minus _____ %	$ _____.__
		plus _____ % minus _____ %	$ _____.__
		plus _____ % minus _____ %	$ _____.__
		plus _____ % minus _____ %	$ _____.__
		plus _____ % minus _____ %	$ _____.__
		plus _____ % minus _____ %	$ _____.__
*If possible, please include average operating costs - Hourly, Annually...etc. Please provide a detailed response.			
		plus _____ % minus _____ %	$ _____.__
ANY ADDITIONAL INTEGRATION COSTS Not Specified Above (Please describe clearly)		plus _____ % minus _____ %	$ _____.__
Training Systems – Training Network and Equipment that will provide a scalable solution from Joint to Platoon level that is networkable across geographically dispersed training locations. The training as well as the simulation solutions should allow for individual and collective training that is realistic and immersive, that integrates existing in-service equipment and systems within customizable mission scenarios. (Reference Annex A)			
e) Training Systems		plus _____ % minus _____ %	$ _____.__
		plus _____ % minus _____ %	$ _____.__
		plus _____ % minus _____ %	$ _____.__
		plus _____ % minus _____ %	$ _____.__
f) Simulation Systems		plus _____ % minus _____ %	$ _____.__
		plus _____ % minus _____ %	$ _____.__

g) Initial spare parts and two (2) years of annual replenishment spares		**plus _____ %** **minus ____ %**	$ _____.__
h) Upgrades of Training System to maintain current and align to ISR System		**plus _____ %** **minus ____ %**	$ _____.__
* Include average operating costs - Hourly, Annually...etc. Please provide a detailed response.			

Sustainment

4. Project cost for activities related to sustainment of ISR Mod equipment described in Annex B

5. Notes:
   a. Please indicate each deliverable and associated costs if applicable in reference to section 1.
   b. For each proposed Solution, include percent accuracy, cost per year to sustain, and anticipated life cycle duration.

Table 2 – SUSTAINMENT COSTS – PROVIDE for EACH PROPOSED SOLUTION

Description		Firm Unit Price per Year 0 = Provide at No Cost
Ongoing Annual Program Management Cost that captures the costs for the following activities, including those listed below. Identify any that do not apply to your Solution:	**Margin of Accuracy (Percent Plus & Minus) for** **A. Plus_____%, Minus_____ %** **B. Plus_____%, Minus_____ %** **C. Plus_____%, Minus _____%** **D. Plus_____%, Minus _____%**	SOLUTION A $ _____.__ /yr (Integrated, existing GFE) over _____ years life cycle SOLUTION B $ _____.__/yr (Integrated, new Suite of Sensors) over _____ years life cycle SOLUTION C $ _____.__ /yr (Individual Sensor(s) only) over _____ years life cycle SOLUTION D $ _____.__ /yr (Digital Land ISR Network Only) over _____ years life cycle
2.1	**Sustainment Requirements – ILS Services**	
	Integrated Logistic Support (ILS) Plan	
	Logistic Support Analysis (LSA)	
2.2	**Configuration Management (CM)**	
	Conduct Configuration Management	
	Conduct First Article Inspection	
	Conduct Pre-Delivery Inspection	
	Conduct Functional Configuration Audit	
	Conduct Physical Configuration Audit	
	Provide updates to technical publications over the entire life cycle of the ISR MOD System.	
2.3	**Obsolescence Management (OM)**	
	High Risk Components / Sub-systems list	

	Obsolescence Management Issues Report (as required)	
	Cost of proposed solution to track KPI performance metrics	
2.4	**Initial Provisioning and Supply Services**	
	Recommended Spare Parts List (RSPL), complete with Production Level 3 Drawings & Part Numbers (as described in DND's reference CFTO D-01-400-002/SF-000 Levels of Engineering Drawings).	
	Spare parts management at commercial facilities and delivery both to Canadian facilities and internationally	
	Warehousing of spare parts at contractor facilities.	
2.5	**Special Tools and Test Equipment (STTE) for the preventive and corrective maintenance the ISR MOD System**	
	STTE requirements / STTE Package	
2.6	**Contracted Maintenance and Training Services**	
	Initial Cadre Training (ICT) – Operator Training (English and French)	
	Initial Cadre Training (ICT) – Technician Training (English and French)	
	ICT Courseware (Operator and Technician). (English and French)	
	Training Aids for Maintenance Training.	
2.7	**Service Facilities**	
	Cost associated with repair and overhaul at contractor facilities.	

2.8	**Engineering Services - list recommended Annual Effort (Days) for Overall Solution's Maintenance**	
2.8.1	**Technical Investigation and Engineering Services (TIES)**	
	Specialized Technicians: Type, Level,	
	Engineer: Type, Level	
Provide any other related labor categories		
2.9	**Fielding and Maintenance support**	
	FSR - Maintain	
	FSR - Train	
	FSR - Repair and Overhaul	
2.10	**Technical Data Package**	
	Operator Manual (English and French)	

	Preventative & Corrective Maintenance Manuals (English and French)	
	Associated costs for Technical Drawing Packages	
2.11	**Software**	
	Licencing / renewal / subscription, including terms	
	Integration or ongoing support costs (as required)	
2.12	**Testing**	
	Support DND-led User Trial	
	Contractor-Led Capability Testing	
	Support DND-led testing	
2.13	**Intellectual Property (if applicable)**	
	Licence to IP rights specified (if applicable)	

2.14	**Other costs that may be relevant to ongoing sustainment of the ISR MOD system as a whole**	
Item, Description, Etc.	Quantity, Hourly, Etc.	Cost
	plus _____ % **minus _____ %**	**$ _____.__**
	plus _____ % **minus _____ %**	**$ _____.__**
	plus _____ % **minus _____ %**	**$ _____.__**
	plus _____ % **minus _____ %**	**$ _____.__**
	plus _____ % **minus _____ %**	**$ _____.__**
	plus _____ % **minus _____ %**	**$ _____.__**
	plus _____ % **minus _____ %**	**$ _____.__**

ANNEX E – LAND ISR MOD HIGH LEVEL MANDATORY REQUIREMENTS & QUESTIONS

Please note, answers to these questions need to reflect (as proposed in Annex D above):

A. Your Solution, “Configuration with GFE”,
   AND
B. Your Solution, “New Configuration”,
   OR
C. Your Solution, “the Sensor(s)”,
   OR
D. Your Solution, “Digital Land ISR Network”.

1. General

This annex contains preliminary HLMRs for Land Intelligence Surveillance and Reconnaissance Modernization (ISR Mod) Project which provide a set of high level functional and performance system requirements. Respondents are requested to provide information describing how their proposed solution meets each HLMR.

Each of the five HLMRs has an opening descriptive followed by the detailed requirements questions.

2. HLMR # 1 Interoperability - Technical

The ISR Mod solution must be able to connect all CAF sensors to Detect, Identify, Target Acquire and Track Objects of Interest on Land and in Air (at low altitude, below 10,000 m above sea level) and make this information accessible to C2 at the Operational and Tactical levels to enable Planning and Decision Making (Please provide responses to para a – e in a tabular format.)

a) Will the system provide accurate situational awareness in near real-time (specify latency time in seconds) of various ISR resources, potential targets and objects of interest?

b) Is your system able to Detect, Recognize, Identify, Track and Locate Hostile Artillery and other Indirect Fires systems and at what ranges?

c) Is your system able to Detect, Recognize, Identify, Track and Locate C2 Nodes? If so what size element (e.g. Platoon, Company, etc) and at what ranges?

d) Is your system able to Detect, Recognize, Identify, Track and Locate other High Value/Payoff Targets and at what ranges? (e.g. Group 1 SUAS Ground Control Stations or Radars)

e) What other targets can your solution Detect, Recognize, Identify, track and locate? At what range and altitude?

f) Will the system be capable of managing ISR assets, target tracks and information passage without degradation in time and accuracy? If there is a degradation what part of the capability degrades? (e.g. object track accuracy, time over network, etc)

g) Does the system use common standards for the storage, dissemination, and retrieving of data and information? If so, which?

h) What type of Tactical Data Link(s) (TDL) are supported by the system (e.g. Link 11/16/22, 11B, Joint Range Extension Application Protocol (JREAP) A, B and C)? How will the TDL information

be shared and integrated into the ISR Mod? Will the exchange of tactical air data be in near-real time among CAF and Allied platforms and sensors?

i) What networking protocols and operating system version(s) (e.g. Windows, Android, etc.) are used for your system?

j) What types of messaging standards are compatible with your system such as Variable Message Format (VMF), Artillery Systems Cooperation Activities (ASCA), etc.? What version(s) of these standards is your system compatible with?

k) Does the system allow the rapid and accurate transfer of information from the network to outside coalition or joint networks with unique security classifications? Does your solution account for Cross Domain Guards required for sensor data, control data or any other data types listed above at (d), (e) or (f) if movement from one security classification to another is required?

l) Can your system support either raw video or data from sensors or both? If so what format and standards are supported? Can your system support data compression to minimize bandwidth requirements?

m) Is your system capable of data forwarding? Can messages be converted between different messaging standards or versions within a standard for forwarding?

n) Is your system operable in both the mobile and static domain? Can it be integrated into a vehicle system without significant modifications to the vehicle? (e.g. compromising armour or other significant hull modifications)

o) Does your system have vehicle integration requirements that are not delivered as part of your solution?

p) The communications infrastructure will be Government Furnished Equipment (GFE), and Respondents need only consider hardware, software and integration costs for ISR Mod specific equipment when it comes to merging with GFE. A list of required interfaces are as follows:

- Consolidated Secret Network Infrastructure (CSNI);
- Land Command Support System (LCSS);
- Indirect Fire Control Software Suite (IFCSS) / Artillery Managed Information System (ArtyMIS);
- Strategic Intelligence Network
- Battle Management System (LCSS)
- Lightweight Counter Mortar Radar (LCMR)
- Hostile Artillery Locating Acoustic Weapons Locating System
- Blackjack Small Unmanned Aerial System (SUAS)
- Light Armoured Vehicle Reconnaissance Surveillance Suite (LRSS)
- Persistent Surveillance Suite
- Raven B Mini Unmanned Aerial System (MUAS)
- Medium Range Radar (MRR)
- Tactical Armoured Patrol Vehicle (TAPV)
- Light Armoured Vehicle 6.0 Observation Post
- Armoured Combat Support Vehicle (ACSV)
- Integrated Soldier System

q) What new sensors will your solution introduce?

r) Which of the above existing CA sensors cannot or should not be integrated into your solution and why?

s) What integration issues should the project be aware of and plan for?

3. **HLMR # 2 Interoperability - Informational**

The solution must be able to display and exchange information, to include Target Acquisition Data, in near real time to the Land Command Support System, Coalition and Allied forces and meet NATO Joint ISR Capability Implementation Plan to enable Joint or Multi-National Operations and targeting for Lethal and Non-Lethal Effects).

a) Which other nations' forces have fielded your systems? For how many years have these forces fielded your systems?

b) Will the system provide battle management capability to accurately display situational awareness in near real-time (specify lag time) of various ISR resources, target tracks and potential targets? Can the system receive these inputs from other nations' systems?

c) Is your solution able to merge, consolidate or screen out duplicate target tracks produced from multiple sensors? If so, is it at the sensor or network level? Is the solution able to display meta-data and sensor information regarding the developed tracks?

d) How much information does the system's provide? Is the information of high fidelity? (e.g. streaming video, 3D imagery, etc) Can the sensors do battle damage assessments? What amount of information will the sensors provide?

e) How does the system enable command and control decisions to support the requirements in the scenarios provided in Appendix 1?[1]

f) Which identified standards (NATO STANAG, MIL-STD, AArtyP, or ADatP) for operational interoperability is the system compliant with? Which other standards is the system compliant with?

g) Can your system display information in both English and French? Is it capable of incorporating other languages into the User Interface and if so, which ones?

h) Which coordinate systems can your system support – for example Military Grid Reference System (MGRS), Universal Transverse Mercator (UTM), Universal Polar Stereographic (UPS), or other? Please specify.

i) Which military symbology standard(s) and version(s) are supported? (e.g. APP 6, MIL-STD-2525, etc.)

j) What additional command support tools does your network solution provide?

k) Does your solution provide planning tools? If so, how do they function?

l) Does your solution provide operational or management tools? If so, how do they function?

m) Does your solution provide predictive analysis tools? If so, how do they function?

4. HLMR # 3 Flexibility

The Land ISR Mod solution must: be scalable, modular, and task-tailorable to enable the CA to meet its core missions; be able to detect, identify and target acquire Mini-UAS and be upgradeable to detect, identify and target acquire emerging threats such as Micro-UAS in the battlespace to increase Situational Awareness and Force Protection; and be able to work in a distributed environment to enable Task Tailoring.

[1] Appendix 1 is only available upon request.

a) Is the system able to manage ISR Assets over a distributed network, being geographical, air or land, and dispersed? How many sensors can the network manage?

b) Can your system communicate over a variety of networks? Please list which ones, such as frequency modulation, very high frequency, ultra-high frequency, Enhanced Position Location Reporting System (EPLRS), local area networks, etc.

c) Is your solution scalable, modular and able to support Platoon up to Brigade and Division level operations?

d) Is your proposed software system an open or closed architecture? Can users share or relay information to other specific identified users connected to the network? Via direct messaging or broadcast only?

e) Is your system scalable to permit interfacing with future sensors?

f) Does your system contain the gateway capability to enable other networks to effectively interface? Which gateways have you successfully developed and implemented? (e.g. Link 11/16/22, VMF, USTMF, ASCA, ABCANZ 2124).

g) In what format(s) is your system capable of sending target information over or interfacing with? (VMF, ASCA, USMTF, etc.)

h) Does your system operate on the move (e.g. Detect Recognize Identify while moving) or require static deployment and employment?

i) Is your system able to Detect, Recognize, Identify and Locate Drones or low flying aircraft? (<1500m above ground level) If so what size of aircraft and at what range? Can it also find their associated ground control stations?

j) Is your system versatile and upgradable either through hardware or software upgrades? If so, what can be upgraded and how are the upgrades conducted? (Please provide this in a tabular format)

k) What sensor systems do your solution currently employ? What types of objects they are capable of detecting, recognizing and identifying? Please indicate with size and range (e.g. Radar, Micro-UAS travelling at >1.5m/s, Detection - 2km, Recognition – 2km, Identification – 1km)

l) Can the sensors be used by dismounted troops? Can they be parachute dropped out of planes? Is there special requirements required to move the sensors around during dismounted operations (e.g. large bulky cases, power requirements, etc) that the Project staff need to be aware of that would impact dismounted operations?

m) What other operations can your system support that you think ISR Mod Project Staff should be aware of?

5. HLMR # 4 Persistent Awareness

The solution must be able to access the network at all times regardless of the geographic location and extreme environmental conditions, in accordance with STANAG 2895, and have a layer of redundancy to ensure ISR coverage in all operating environments.

The solution must incorporate cyber resilience to mitigate risk in a degraded or contested operational environment to protect systems from hostile intrusion or counter ISR activities.

a) How does your system layer sensors to provide coverage over a 100 km x 50 km battlespace? Is there redundancy in the sensor coverage and network?

b) How does the system manage Collection Management and ISR Asset-to-task monitoring? Does the system support dynamic re-tasking?

c) Does the system support target or object handoff or handover between sensors?

d) Does your system have good endurance? What are the typical power requirements to keep the system running over a 96 hour period of operations?

e) How is your system shielded or protected against cyber-attack?

f) How is your system shielded or protected against jamming? (e.g. GPS, EW, etc)

g) Is your system able to operate in all weather conditions? If the system suffers any degradation, please outline what expected level of degradation would be given a set of weather conditions (e.g. snowstorm – 50% reduction in EO/IR range, high winds – UAS cannot operate in wind speeds >35 knots, etc)

h) Is your system able to operate in all environments? (i.e. Deserts, Jungles, etc) Are there special requirements needed by your equipment to operate in these environments? Will the system operate in day or night operation and in battlefield environments of dust and obscurant?

i) What types of sensors does your system employ?

j) What survivability features does your system possess? (e.g. utilizing passive sensor technology to reduce radiation, unmanned sensors to reduce exposures of soldiers, etc).

6. **HLMR # 5 Responsiveness**:
The networked solution must coordinate and optimize the use of integral and ad-hoc Coalition assets throughout the operating environment in order to detect, identify and target threats or items of interest in real time to enable timely responses.

The solution must be able to prioritize and queue objects of interest for system operators to reduce operator fatigue and accelerate both analysis and information prioritization.

a) Will the system support 24/7 operations for extended periods of time? Please specify duration.

b) Will the system operate in a crowded EW spectrum environment? In what frequency bands does your system function?

c) What Electromagnetic Interference (EMI) standard is your system compliant to?

d) What Electromagnetic Compatibility (EMC) standards are your systems compliant to?

e) For which environmental MIL-STDs and STANAGS are your systems qualified to?

f) Does the system display operational and non-operational sensors on the network? What parameters are displayed as part of its status report?

g) Does the system have a machine acknowledgement feature (to reduce retransmission of delivered messages), an operator acknowledgement feature? (e.g.: Acknowledge the receipt of a call for fire or message), or any other features to improve shared situational awareness?

h) Can the network display range bands and radiating/sensing arcs for sensors connected to the network?

i) How much automation does your solution provide?

j) If the system has the ability to update and display network and sensors' "status states" , and what is the latency or refresh rate for updates?

k) Does the system cross-queue and optimize sensor resources?

l) Can the system receive information from Coalition Forces? How are these coalition assets displayed on your solution, including status and location? How is information from the asset displayed?

7. Training

While training is not a high level mandatory requirement, the Project team needs to understand the training systems that could be delivered as part of the system, namely the ability for the ISR training system to provide realistic and immersive simulation by using in-service equipment or copies of the in-service equipment in customizable mission scenarios.

a) Please describe the capabilities of the training system. Is it part of the operational system or is it stand alone? If stand alone, can it connect with users on operations?

b) Can the training system operate on both a classified (LCSS) and lower classification (DWAN) system?

c) Does the simulator or training mode emulate connectivity and inputs from various sensors and other networks?

d) What are the bandwidth requirements for your networked simulation system?

e) What is the user interface for the system? (e.g.: portable laptop, multiple projector, dome, virtual-reality headset, etc.)

f) Does the system provide the necessary control and monitoring capabilities to objectively provide soldier feedback and progression?

g) Is there an embedded user scenario creator?

h) Is there an instructor station or other means by which to run and supervise scenarios?

i) Does the simulator or training mode provide the necessary control and monitoring capabilities to objectively provide operator feedback and a level of measured training progression?

j) What is the average duration of the training package(s) to qualify operator(s) and instructor(s) in various roles in the system (in hours or days please)?

k) What are the minimum required experience and/or knowledge of the trainees required for the proposed training(s)?

l) Are the entities within the sim scalable? Is it able to implement Canadian-specific entities (vehicles, weapons, equipment, etc.) into the environment?

m) Is the simulator able to accurately mimic lethal weapons effects? Can the system simulate battle damage assessments?

n) Does the environment simulate weapons for the purpose of weapons location simulation on the sensor systems?

o) Can the system provide a degree of fidelity so as to provide trainees with the essential cueing relationship between the stimulus attributes and the appropriate responses?

p) Does the system emulate connectivity and inputs from various ground and air-based sensors?

q) Can the simulation tool be used as a mission planner or rehearsal environment?

r) Is there an ability to record and playback training? What is the output file format?

ANNEX F – ISR MOD SUSTAINMENT QUESTIONS (to follow via RFI Amendment)

PART 4

ANNEX G – ACRONYMS

ABCANZ	America, Britain, Canada, Australia, and New Zealand Armies
ACA	Airspace Coordination Area
ACIS	Army Communication and Information Systems Specialist
AGM	Attack Guidance Matrix
AI	Artificial Intelligence
ArtyMIS	Artillery Managed Information System
ASCA	Artillery Systems Cooperation Activities
ASCC	Airspace Coordination Centre
ATACMS	Army Tactical Missile System
ATAK	Android Tactical Assault Kit
ATG	Artillery Tactical Group
AWR	Additional Work Request
BC TAC	Battery Commander Tactical Command Post
BDZ	Base Defense Zone
C2	Command and Control
C4ISR	Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance
CA	Canadian Army
CAF	Canadian Armed Forces
CAS	Close Air Support
CDE	Collateral Damage Estimate
CFB	Canadian Forces Base
CFL	Coordinated Fire Lines
CFTO	Canadian Forces Technical Order
CM	Configuration Management
COP	Common Operating Picture
CO TAC	Commanding Officer Tactical Command Post
CSNI	Consolidated Secret Network Infrastructure
DND	Department of National Defence
DGMS	Digital Gun Management System
DRMIS	Defence Resource Management Information System
DTED	Digital Terrain elevation Data
EMC	Electromagnetic Compatibility
EMI	Electromagnetic Interference
EO	Electronic-Optronic
EO/IR	Electro-Optical/Infra-Red
EPLRS	Enhanced Position Location Reporting System
EW	Electronic Warfare

FFA	Free-fire Area
FOO	Forward Observation Officer
FSCC	Fire Support Coordination Centre
FSCL	Fire Support Coordination Line
FSR	Field Service Representative
FVEY	Five Eyes
GAJT	GPS Anti-Jam Technology
GFE	Government Furnished Equipment
GFI	Government Furnished Information
GoC	Government of Canada
GPS	Global Positioning System
GSM	Government Supplied Material
HAFEZ	Hostile Aircraft Free Engagement Zone
HLMR	High Level Mandatory Requirements
HPTL	High Payoff Target List
HUMS	Health and Usage Monitoring Systems
IFCSS	Indirect Fire Control Software Suite
IFF	Identification Friend or Foe
ILS	Integrated Logistic Support
IP	Intellectual Property
ISEDC	Innovation, Science and Economic Development Canada
ISS	In-Service Support
ISR MOD	Intelligence Surveillance Reconnaisance Modernization
JFM	Joint Fires Modernization
JPTL	Joint Priority Target List
JTAC	Joint Terminal Attack Controller
KIC	Key Industrial Capability
KPI	Key Performance Indicators
LAV-6	Light Armoured Vehicle 6
LAV OPV	Light Armoured Vehicle Observation Post Vehicle
LCSS	Land Command Support System
LRU	Line Replaceable Units
LSA	Logistic Support Analysis
LSAR	Logistic Support Analysis Record
MDT	Mean downtime
METCM	Standard Computer Meteorological Message
METGM	Standard Gridded Data Meteorological Message
METTA	Standard Target Acquisition Meteorological Message
MGRS	Military Grid Reference System
MIDB	Modernized Integrated Database

MLRS	Multiple Launch Rocket System
MMDS	Materiel Management and Distribution System
MOA	Memorandum of Agreement
MSI	Maintenance Significant Item
MTBF	Mean operating time between failures
MTBM	Mean time between maintenance
MTTDSP	Mean time to deliver spare parts
MTTR	Mean time to repair
NATO	North Atlantic Treaty Organization
NFA	No Fire Area
NORAD	North American Aerospace Defence
NSE	National Security Exception
OEM	Original Equipment Manufacturer
OT	Operational Technology
PDF	Portable Document Format
PER	Probable error in range
PGK	Precision Guidance Kit
PGM	Precision guided munitions
PMO	Project Management Office
R&O	Repair and Overhaul
RCAF	Royal Canadian Air Force
RCN	Royal Canadian Navy
RFA	Restricted Fire Area
RFL	Restricted Fire Line
ROZ	Restricted Operating Zone
RPAS	Remotely piloted aerial systems
RSPL	Recommended Spares Parts List
SA	Situational Awareness
SAAFR	Standard Use Army Aircraft Flight Route
SaaS	Software-as-a-Service
SACC	Standard acquisition clause and condition
SITS	Special Investigations and Technical Studies
SSE	Strong, Secure, Engaged
STACC	Surveillance and Target Acquisition Coordination Centre
STANAG	Standardization Agreement
STTE	Special Tooling and Test Equipment
TACP	Tactical Air Control Party
TBA	To Be Annouced
TCP/IP	Transmission Control Protocol / Internet Protocol
TDL	Tactical Data Link

TIES	Technical Investigation and Engineering Support
TLAM	Tomahawk Land Attack Missile
TST	Time-sensitive targets
UAS	Unmanned Aerial System
UPS	Universal Polar Stereographic
USB	Universal Serial Bus
UTM	Universal Transverse Mercator
VMF	Variable Message Format
WinTAK	Windows Tactical Assault Kit