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<b>Title - Sujet</b> (LC4ISR) system	
<b>Solicitation No. - N° de l'invitation</b> W8486-200731/A	<b>Date</b> 2020-08-03
<b>Client Reference No. - N° de référence du client</b> W8486-200731	<b>GETS Ref. No. - N° de réf. de SEAG</b> PW-\$\$QD-036-27853
<b>File No. - N° de dossier</b> 036qd.W8486-200731	<b>CCC No./N° CCC - FMS No./N° VME</b>
<b>Solicitation Closes - L'invitation prend fin</b> <b>at - à 02:00 PM</b> <b>on - le 2020-08-28</b>	
<b>Time Zone</b> <b>Fuseau horaire</b> Eastern Daylight Saving Time EDT	
<b>F.O.B. - F.A.B.</b> <b>Plant-Usine:</b> <input type="checkbox"/> <b>Destination:</b> <input type="checkbox"/> <b>Other-Autre:</b> <input type="checkbox"/>	
<b>Address Enquiries to: - Adresser toutes questions à:</b> Briere-Provost, Mathieu	<b>Buyer Id - Id de l'acheteur</b> 036qd
<b>Telephone No. - N° de téléphone</b> (819) 790-1635 ( )	<b>FAX No. - N° de FAX</b> ( ) -
<b>Destination - of Goods, Services, and Construction:</b> <b>Destination - des biens, services et construction:</b>  Specified Herein Précisé dans les présentes	

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<b>Signature</b>	<b>Date</b>

# **REQUEST FOR INFORMATION (RFI) FOR LAND COMMAND, CONTROL, COMMUNICATION, COMPUTERS, INTELLIGENCE, SURVEILLANCE AND RECONNAISSANCE (Land C4ISR) SYSTEM-OF-SYSTEMS (SoS) SUSTAINMENT PROJECT**

## **Part 1 - Introduction to RFI**

### **1. General**

1.1. Industry is being engaged in a consultative process to guide the Options Analysis phase of the Sustainment Business Case Analysis (SBCA) process for the Land C4ISR Sustainment project. This Request for Information (RFI) will also include an Industry Day presentation deck as well as virtual One-on-One meetings.

1.2. This RFI is neither a call for tender nor a Request for Proposal (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.

1.3. 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.

1.4. 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.

1.5. Any discussions on this subject with project staff representing the Department of National Defence (DND), Public Services and Procurement Canada (PSPC), Innovation, Science and Economic Development Canada (ISED) or any other GC representative or other personnel involved in project activities, must not be construed as an offer to purchase or as a commitment by Canada.

### **2. Purpose of RFI**

2.1. With this RFI, Canada is seeking Industry feedback regarding current and innovative marketplace capabilities for the long-term sustainment of the Land Command, Control, Communication, Computers, Intelligence, Surveillance and Reconnaissance (Land C4ISR) System of Systems (SoS), which provides Canadian Army commanders and staff with the information and situational awareness they require to make effective and timely Command and Control (C2) decisions about assigned

forces. The Land C4ISR SoS must accordingly be sustained in accordance with the requirements described in this RFI.

2.2. The objectives of this RFI are to:

- a. Inform Industry of the long-term sustainment requirements of the Land C4ISR SoS;
- b. Solicit feedback from Industry on the long-term sustainment requirements of the Land C4ISR SoS, as described in this RFI;
- c. Obtain Industry feedback on possible long-term sustainment solutions and constraints, including Intellectual Property (IP) rights and supply chain collaboration;
- d. Seek Industry feedback regarding specific DND questions presented at Annex A of this RFI;
- e. Obtain input from Industry on various sustainment models and their respective advantages and disadvantages to satisfy the long-term sustainment requirements of the Land C4ISR SoS;
- f. Inform Industry on upcoming engagement activities in relation to the Land C4ISR Sustainment project;
- g. Seek Industry feedback to help DND to potentially develop a RFP that may be published in the future;
- h. Discuss potential application of Industrial and Technological Benefits Policy and Value Proposition on the Land C4ISR Sustainment project deliverables; and

### 3. **Legislation, Trade Agreements, and Government Policies**

3.1. The following is indicative of some of the legislations, trade agreements and GC policies that may impact any follow-on solicitation(s) related to the long-term sustainment of the Land C4ISR SoS:

- a. Defence Production Act;
- b. Industrial and Technological Benefits (ITB) Policy;
- c. Controlled Goods Program (CGP);
- d. Federal Contractors Program for Employment Equity (FCP-EE); and
- e. PWGSC Policy on Green Procurement.

3.1.1. Industrial and Technological Benefits and Value Proposition. The Defence Procurement Strategy (DPS) applies to the Land C4ISR SoS Sustainment project. As part of the DPS, Canada is seeking information on potential economic leveraging opportunities for the Land C4ISR SoS Sustainment project. Respondents should be

aware that any contracts entered into as a result of any subsequent RFP that may follow this RFI may contain economic benefit requirements, which may include the Industrial and Technological Benefits (ITB) Policy, including Value Proposition. Please refer to Annex B of this RFI for more details on the aspects of Industrial and Technological Benefits and Value Proposition. Under the ITB Policy, companies awarded defence procurement contracts are required to undertake business activities in Canada, equal to the value of the contract. In addition, a core element of the ITB Policy is a rated and weighted Value Proposition. Further information regarding the ITB Policy can be found at [www.ic.gc.ca/itb](http://www.ic.gc.ca/itb).

3.1.2. Controlled Goods Program (CGP). This RFI is not subject to the CGP, however resulting competitive processes will likely be as the Land C4ISR sustainment will require access to controlled goods. Respondents are asked to identify if their responses, or any part of their responses, are subject to the Controlled Goods regulations. Respondents are encouraged to familiarize themselves with the provisions of the CGP at their earliest opportunity. For information pertaining to the CGP, please refer to the PSPC website at <http://www.tpsgc-pwgsc.gc.ca/pmc-cgp/enregistrement-register-eng.html>.

3.1.3. Federal Contractors Program for Employment Equity (FCP-EE). The FCP-EE will apply to the upcoming competitive procurement process. Further details on the FCP-EE will be communicated on the Government Electronic Tendering System (GETS), available at <https://buyandsell.gc.ca/>, as part of the upcoming competitive procurement process.

3.1.4. Green Procurement. Respondents are requested to identify and cost potential areas of development, manufacturing and/or project delivery that leverage environmentally friendly standards and/or processes. For more information on the Green Procurement Policy, consult the Treasury Board Secretariat website (<http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=32573>).

#### 4. **Security Requirements**

4.1. There are no security requirements associated with this RFI, however, there will be security requirements associated with any resulting competitive procurement process. Additional information on the security requirements will be communicated on the GETS.

4.2. It is anticipated that the resulting competitive procurements process(es) will require that the bidder, at a minimum, to hold a valid Facility Security Clearance at the level of NATO Secret and Top Secret, with approved Document Safeguarding at the level of NATO Secret and Production Capabilities at the level of Secret. As for the bidder's personnel, security clearances will range from Reliability Status to NATO Secret clearance. Respondents may familiarize themselves with potential security provisions through the Communications Security Establishment website (<https://www.cse-cst.gc.ca>) and the PSPC website (<http://www.tpsgc-pwgsc.gc.ca/esc-src/index-eng.html>). Any future procurement actions may also include expanded security requirements as mandatory criteria for contract award.

4.3. Additional information on the security requirements will be communicated on the GETS as part of the potential upcoming competitive procurement process. Should Industry require information on personnel and organizational security screening or security clauses, please refer to the Canadian Industrial Security Directorate (CISD), Industrial and Security Program of Public Services and Procurement Canada website available at <http://ssi-iss.tpsgc-pwgsc.gc.ca/index-eng.html>.

4.4. National Security Exception. Due to the nature of Land C4ISR it is imperative that the ability to sustain Land C4ISR remains within Canada. As such, it is anticipated that a National Security Exemption will be sought for future contracts where applicable.

## 5. **Enquiries**

5.1. Respondents with questions regarding this RFI and associated industry engagement activities may direct their enquiries to the Contracting Authority, listed in the next Section. Since this RFI is not a bid solicitation, Canada will not necessarily respond to enquiries in writing or by circulating answers to all Respondents. Further, enquiries received after five days before the closing date of this RFI may not be answered.

## 6. **Contracting Authority**

6.1. The Contracting Authority for the Land C4ISR Sustainment project is:

Mathieu Brière-Provost  
Senior Supply Officer  
Electronics, Munitions and Tactical Systems Procurement Directorate  
Land and Aerospace Equipment Procurement and Support Sector  
Public Services and Procurement Canada  
11 rue Laurier, Gatineau, K1A 0S5

Telephone: (819) 790-1635  
E-mail: [mathieu.briere-provost@pwgsc.gc.ca](mailto:mathieu.briere-provost@pwgsc.gc.ca)

## 7. **RFI Closing Date**

7.1. Responses to this RFI are to be submitted to the Contracting Authority before 1400 hrs (EST) on the RFI Closing Date, as listed in Table 1 below. Respondents are solely responsible for ensuring that their respective response is delivered on time, to the correct person. Responses to this RFI will not be returned to the Respondents.

## 8. Project Schedule

8.1. Table 1 lists key milestones that have been identified for the Land C4ISR SoS Sustainment project. Dates and durations indicated are subject to change. Any changes to the project timeline will be communicated on the GETS, available at <https://buyandsell.gc.ca/>.

Description	From	To
RFI posting date	3 August 2020	11 September 2020
Virtual One-on-One Meetings	26 August 2020	4 September 2020

**Table 1** - Land C4ISR SoS Sustainment Project Schedule

## 9. Structure of RFI

9.1. This RFI is divided into seven Parts, as follows:

- a. Part 1 - Introduction to RFI. Describes the nature and purpose of this RFI, provides key milestones associated with the Land C4ISR SoS Sustainment project, and provides the contact information for the Contracting Authority;
- b. Part 2 - Responses to RFI. Provides instructions to the Respondents and explains how the responses will be handled;
- c. Part 3 - Industry Engagement. Provides information on the virtual One-on-One meetings, and other engagement activities;
- d. Part 4 - Land C4ISR SoS Overview. Provides a general description of the Land C4ISR SoS, including high-level graphical representation;
- e. Part 5 - Sustainment Principles and Objectives. Provides a general description of the four sustainment principles and introduces the concept of Total System Responsibility for the Land C4ISR SoS;
- f. Part 6 - Existing Sustainment Contracts. Provides an overview of the five major contracts as well as the multitude of smaller support contracts that are currently in place to sustain the Land C4ISR SoS; and
- g. Part 7 - Land C4ISR SoS Sustainment Project Overview. Defines the scope (i.e. what is included and what is not included) of the Land C4ISR SoS Sustainment Project and described the project interdependencies, including high-level graphical representations of the Land C4ISR SoS sustainment landscape.

- 9.2. The following Annexes are enclosed with this RFI document:
- a. Annex A - Land C4ISR SoS Sustainment Questions;
  - b. Annex B - Industrial Technological Benefits / Value Proposition;
  - c. Annex C - Additional Land C4ISR SoS Background Information;
  - d. Annex D - Land C4ISR SoS Sustainment Objectives, Metrics and Targets;
  - e. Annex E – DLCSPM Fleet Structure;
  - f. Annex F - SSE 42 and Other Land C4ISR Capital Projects;
  - g. Annex G - Scaled Agile Framework;
  - h. Annex H - List of Abbreviations.

## **Part 2 – Responses to the RFI**

### **10. Instructions**

10.1. Respondents are reminded that this is a RFI and not a RFP. As such, any information provided in relation to this RFI will not be binding upon Canada under any circumstances. In order to avoid undue work by respondents and undue effort by Canada to analyze the responses, respondents are requested to respond to this RFI with relevant information, simply and directly stated. Responses to this RFI will assist Canada in formulating any possible procurement strategy to meet Canada's business and operational requirements. Respondents should feel free to include any comments or concerns with their responses. Canada reserves the right to seek clarification from a respondent on information provided in response to this RFI, either by telephone, in writing, or in person.

10.2. Respondents are asked to provide their comments, concerns and, where applicable, recommendations regarding how the requirements or objectives described in this RFI could be satisfied. Responses to this RFI should also clearly identify any additional information and/or clarifications that respondents suggest be incorporated into any future solicitation documents. Respondents are also invited to provide comments regarding the content, format and/or organization of any draft documents included in this RFI. Respondents should explain any assumptions they make in their responses. Any marketing or promotional information submitted as part of the responses will not be reviewed.

10.3. Use of Responses. Responses to this RFI will not be formally evaluated, nor will they be used for competitive or comparative evaluation purposes. Responses may be used by Canada to further develop or modify the procurement approach, Statement of Work and/or Bid Evaluation Plan for a potential future RFP, as well as any draft documentation contained in this RFI. Responses will not be returned to Respondents. As this RFI is not a bid solicitation, Canada will not necessarily respond to all enquiries in writing, nor circulate all answers to Industry. However, in the event that answers are circulated, Respondents are asked to clearly identify portions of their responses that are proprietary in nature. Canada may edit the responses or request that the Respondents do so, so that the proprietary nature of the responses is eliminated, and the answer can be circulated to Industry.

10.4. Review of Responses. A team composed of representatives of the DND, ISED and PSPC will review all responses received on or before the RFI closing date. Canada may, at its discretion, review responses received after the RFI closing date. Canada reserves the right to hire any independent consultant or to use any Government of Canada (GC) resources that it considers necessary to review any response to this RFI. Not all members of the review team will necessarily review all responses. Contractors involved with the review process will be required to sign a Non-Disclosure Agreement to avoid having their parent company excluded from competing on any RFP that could eventually be published in relation with this RFI.

10.5. Format of Responses. While the format for responses to this RFI is not as rigorous as would normally be for responses to a RFP, Respondents are nevertheless requested to organize their responses, making clear reference to the question numbers.

10.6. To the extent possible, written answers should consist of short paragraphs, bullet points, tables, etc. for each question listed at Annex A of this RFI. Responses are to be submitted electronically by email to the Contracting Authority in either of Canada's official languages, English or French. Written responses are to be submitted using a format that is compatible with the latest Microsoft Office® suite of applications (i.e. Word, Excel or PowerPoint). The cover page is to include the full legal name and address of the respondent; the name and telephone number of the respondent's contact; the date; and the RFI number. If the response includes multiple volumes, each volume is to include a cover page with all of the previously mentioned information in addition to the volume number.

10.7. Response Costs. Any and all expenses incurred in responding to this RFI, including but not limited to expenses incurred for participating in the additional engagement activities are at the Respondents' sole risk and expense. Canada will not reimburse any organization for expenses incurred in responding to this RFI.

10.8. Confidentiality. Respondents are advised that any information submitted to Canada in response to this RFI may be used by Canada in the development of a subsequent competitive RFP, if/as applicable. As such, Respondents should mark any portions of their response that they consider proprietary or confidential. Items that are identified as proprietary will be treated as such except where Canada determines that the item is not of a proprietary nature. Although the information collected may be provided as commercial-in-confidence (and, if identified as such, will be treated accordingly by Canada), Canada may use the information to assist in drafting performance specifications (which are subject to change) and for budgetary purposes. Canada will handle the responses in accordance with the Access to Information Act. The confidentiality of each Respondent will be maintained.

10.9. Fairness Monitor. Canada will engage the services of an organization to act as an independent, third-party Fairness Monitor (FM) for the Land C4ISR Sustainment project. The role of the FM is to provide an attestation of assurance on the fairness, openness, and transparency of the monitored activities. The FM's duties will include, but will not be limited to, observing all or part of the procurement process (including, but not limited to, the engagement and contemplated RFP processes); providing feedback to DND on fairness issues; and attesting to the fairness of the procurement process. For the purpose of carrying out its FM related obligations, the FM will be granted access to industry responses and related correspondence received by DND pursuant to this RFI (any subsequent RFI and any resulting RFP) and may act as an observer at the subsequent follow-up engagement and contracting activities.

### **Part 3 - Industry Engagement**

#### **11. General**

11.1. As previously mentioned, Industry is being engaged in a consultative process to guide in support of the Land C4ISR Sustainment project. This Request for Information (RFI) will also include an Industry Day presentation deck as well as virtual One-on-One meetings.

11.2. Intent. The Land C4ISR Sustainment project team will use information gathered through the virtual One-on-One meetings, as well as from the written responses to this RFI to refine the sustainment requirements and further develop the procurement and sustainment strategy for the Land C4ISR SoS. The overall intent of Industry Engagement is to afford the Land C4ISR Sustainment Project team the opportunity to:

- a. Identify potential solutions to satisfy the Land C4ISR sustainment requirements;
- b. Develop a shared understanding of all Land C4ISR sustainment elements, risks, challenges, and opportunities;
- c. Obtain Industry feedback on possible sustainment requirements, including Intellectual Property (IP) rights, supply chain collaboration, performance incentives, etc.;
- d. Support the development of a comprehensive Land C4ISR SoS sustainment solution in accordance with the SBCA process;
- e. Contribute to the Land C4ISR Sustainment project team's understanding of current Canadian and International market capabilities as they relate to Land C4ISR sustainment; and
- f. Discuss the potential application of the Industrial and Technological Benefits (ITB) Policy on the Land C4ISR Sustainment project and obtain industry feedback for the development of a Value Proposition (VP) strategy that would leverage economic benefits for Canada through this procurement.

11.3. Registration. Industry representatives interested in participating to the virtual One-on-One meetings must register with the Contracting Authority no later than 15 business days after the date of posting of this RFI.

11.4. Participation. Participation to the virtual One-on-One meetings is not a condition or prerequisite for participation in future solicitation process, as the case may be. Industry representatives that do not participate to those Industry Engagement events will remain eligible to submit a response to any future requests relating to the Land C4ISR sustainment requirements.

11.5. Date and Location.

Please refer to Table 1 for details on the date of the virtual One-on-One meetings. The One-on-One meetings will be held virtually. Specifics on the time and the way of communication will be forwarded to Industry representatives whom will have duly registered as per previous paragraph.

11.6. Changes. The scheduling of Industry Engagement activities may change at any point during the process. Except for changes due to unforeseen circumstances, Canada will endeavour to notify interested suppliers using the GETS, available at <https://buyandsell.gc.ca/> a minimum of five (5) calendar days of any schedule changes.

11.7. Communication with Industry. To the extent possible during the consultation process, the Contracting Authority will communicate with registered industry participants through direct email rather than by posting additional notices on the GETS.

11.8. New Information. Any new information or clarification provided by Canada during the virtual One-on-One meetings will be done through updates to the RFI that will be published on the GETS, available at <https://buyandsell.gc.ca/>.

## 12. **Virtual One-on-One Meetings**

12.1. Virtual One-on-One meetings will be held to provide Canada with an opportunity to learn more about the Industry and gather additional information regarding the long-term sustainment of the Land C4ISR SoS. Virtual One-on-One meetings will also allow interested suppliers to seek clarification on the questions provided at Annex A; to expand upon or clarify their responses to this RFI; and to discuss their proposed Land C4ISR long-term sustainment delivery models in more detail. Interested suppliers are invited to refer to Annex A of this RFI for questions Canada is seeking responses to, which will be used as a basis for discussion during virtual One-on-One sessions.

12.2. Meetings Schedule. Timings for virtual One-on-One meetings will be allocated on a “first-come, first-booked” basis, upon registration as previously described. Requests for virtual One-on-One meetings outside of the designated period will be accommodated at Canada’s discretion.

12.3. Media/Press. Members of the media/press are not invited and will not be allowed to participate to any of the virtual One-on-One sessions.

## 13. **Follow-up Consultation**

13.1. Follow-up consultation with Industry may be done to obtain clarification on feedback received during previously mentioned engagement activities. Canada may, at its discretion, contact any respondent to follow up with additional questions or to clarify any aspect of a response, or to provide feedback.

**14. Draft Request for Proposal (RFP)**

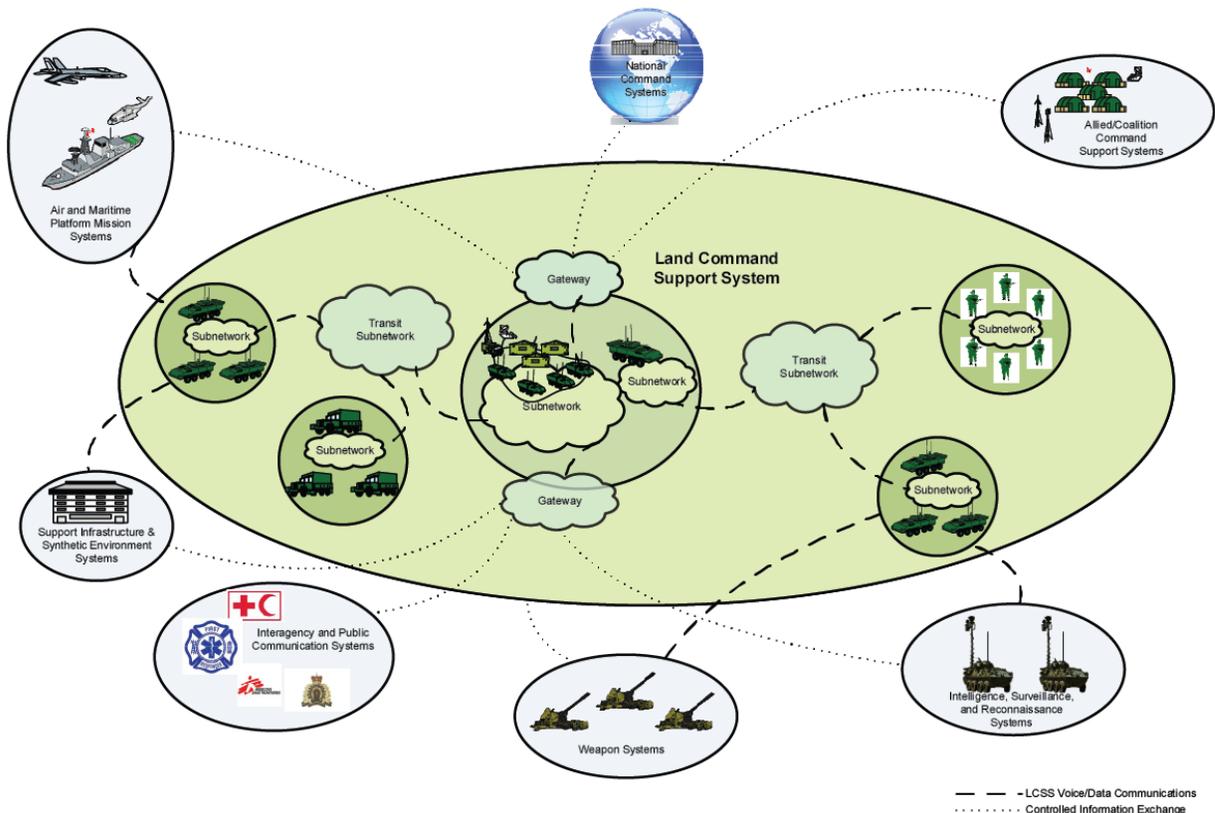
14.1. A draft RFP, possibly including a Statement of Work (SOW) may be released by Canada in due course to further refine the Land C4ISR sustainment requirements; to address Industry concerns; and/or to consider Industry recommendations.

**Part 4 - Land C4ISR SoS Overview**

**15. General**

15.1. The Land C4ISR SoS is a fully integrated, secure network of Tactical Communications (TacComms) systems (i.e. voice and data) that transport Tactical Command, Control and Information System (TacC2IS) services (i.e. specialized software applications) to provide Canadian Army commanders and staff at formation and unit levels with the information and Situational Awareness (SA) they require to make effective and timely Command and Control (C2) decisions about assigned forces and weapon systems engaged in land operations. The Land C4ISR SoS also enables commanders and staff to maintain SA of the battlefield by accessing and analysing tactical information collected by Intelligence Surveillance Target Acquisition and Reconnaissance (ISTAR) systems. Further, the Land C4ISR SoS enables deployed forces to share relevant operational information with other government departments, military forces of other countries, international organizations, non-governmental organizations, private volunteer organizations, and private business ventures.

15.2. A high-level representation of the Land C4ISR SoS is provided at Figure 1.



**Figure 1 - Land C4ISR SoS Conceptual Diagram**

15.3. As can be at Figure 1, the Land C4ISR SoS provides secure communications between the dispersed elements of the Canadian Army. It integrates different types of Radio and Network communication systems and provides the connectivity, resource management, and network services for the movement of information amongst Canadian Army Headquarters (HQs), mobile vehicles, and dismounted soldiers. Typical deployments include line and radio communications systems consisting of highly mobile networks, traditional broadcast radio networks, and high speed local area networks at the tactical level with links and gateways to reach the strategic level, local authorities, allied partners, and joint systems.

15.4. The Land C4ISR SoS enables the Canadian Army's Land Command Support System (LCSS) – depicted as a large green oval – to interconnect with other Canadian Armed Forces (CAF) maritime, land and air platforms (e.g., armoured personnel carriers, rotary-wing aircrafts, fighter jets, soft-skin vehicles, etc.); weapon systems (e.g. infantry, artillery, tanks, gunships, bombers, etc.); sensors (radars, unmanned aircraft systems, electro-optic, infra-red, electronic warfare systems, etc.), military Intelligence nodes (fusion, analysis, etc.), communications centres, command and command complexes, as well as those of allied/coalition partners.

15.5. For the purpose of this RFI, the Land C4ISR SoS can be divided into two distinct but related groups: hardware and software.

## **16. Land C4ISR SoS Hardware**

16.1. The hardware portion of the Land C4ISR SoS includes all TacComms installations, equipment, sub-systems and systems required to enable TacC2IS services and to securely interconnect all military platforms used in support of land operations. This however does not normally include the combat platforms themselves, such as armoured or soft-skin vehicles; rotary or fixed-wing aircrafts; naval ships; etc. The management of those combat platforms is typically the responsibility of specific Project Management Offices or Equipment Management Teams (EMT) within DND's Material Group.

16.2. The equipment and systems that make up the Land C4ISR SoS come in all conceivable configurations, from handheld to man-portable to vehicle-mounted to transit-case-fitted to UAV-carried. Virtually all Canadian Army platforms are fitted with communications and information systems (CIS) equipment that enables connection to the Land C4ISR SoS, including line-of-sight and beyond-line-of-sight (BLOS) tactical radios. CIS equipment also include network access units, gateways, routers, servers, wireless LAN radios, data terminals and many others required to support land operations.

16.3. ISTAR systems such as Mobile Electronic Warfare Terminal, Unmanned Aircraft Systems, Lightweight Counter-mortar Radar (LCMR), Medium-Range Radars, and Hostile Artillery Locating / Acoustic weapon locating system are also included in the Land C4ISR SoS.

16.4. Finally, a vast array of cables, wires, installation kits, antennas and ancillaries are also used to interconnect components of the Land C4ISR systems and sub-systems.

## 17. **Land C4ISR SoS Software**

17.1. The software portion of the Land C4ISR SoS includes C2 applications, sensor/intelligence analysis programs, sensor fusion applications, tactical databases, geolocation services, operating systems, standard commercial applications, networking services, and any other software-based capabilities required in support of land operations. SoS is responsible to ensure that Land C4ISR is compatible and interoperable with Canadian Interagency and Public communication systems as well as Allied and Coalition command support system.

## **Part 5 – Land C4ISR SoS Sustainment Principles, Objectives and Challenges**

### **18. General**

18.1. For the purpose of this RFI, the term 'Sustainment' refers to all activities related to the management of equipment, applications, sub-systems, systems, system-of-systems, etc. throughout their life-cycle (i.e. from cradle to grave). Activities related to sustainment include:

- a. Planning (including engineering, development, design, architecture, etc.);
- b. Acquisition (of hardware, software, spare parts, test equipment, tools, etc.);
- c. Integration (testing, verification, validation, etc.);
- d. Deployment (installation, fielding, training, etc.);
- e. Management (maintenance, upgrade, retrofit, repair & overhaul (R&O), logistic support, program management, support to operations and exercises, software licensing, modelling & simulation, etc.); and
- f. Disposal (scrap, sell, divest, etc.).

### **19. Land C4ISR SoS Sustainment Principles and Objectives**

19.1. The ultimate goal of the Land C4ISR Sustainment project is implement a long-term sustainment solution that will deliver performance through innovative and flexible solutions in engineering, integration, system development and support to meet the operational requirements of the Canadian Army while providing value for money and economic benefits to the Canadian people. More specifically, the Land C4ISR Sustainment solution to be implemented will ensure:

- a. Performance - the Land C4ISR SoS remains operationally ready and mission capable;
- b. Flexibility - the Land C4ISR sustainment solution is adaptable and scalable to allow the Land C4ISR SoS to be readily modified to follow technological advances and to remain responsive to changing operational requirements and/or operating budgets;
- c. Economic Benefits - the Land C4ISR sustainment solution leverages industrial benefits from defence procurements to create jobs and ensure economic growth for companies in Canada; and
- d. Value for Money - Land C4ISR sustainment is provided at a price commensurate with the market rate for comparable capabilities.

19.2. For the purpose of this RFI, the above-mentioned sustainment principles and objectives are listed in Annex D. They are identified by a letter linking them to the

appropriate principle (i.e. 'P' for Performance, 'F' for Flexibility, 'E' for Economic Benefits, and 'V' for Value for Money).

## 20. **Land C4ISR SoS Sustainment Challenges**

20.1. Evolving and iterative nature. In consideration of the substantial number of high-tech equipment, sub-systems and systems that make up the Land C4ISR SoS, and given the constantly changing operational requirements as well as relentless technological advances, the Land C4ISR SoS remains in a state of constant evolution, with no end-of-life expected for the foreseeable future. The Land C4ISR SoS must therefore rapidly and continuously adapt to internal and external changes to avoid technological and, most importantly, operational obsolescence. To do so, rapid and repeatable development and procurement processes are required to ensure that frequent and continuous improvements, upgrades, etc. are applied to Land C4ISR SoS hardware and software/firmware. The Land C4ISR SoS is being developed, built and integrated in the "production realm", i.e. there is no down time for the SoS, a permanent status-quo or steady-state is never reached as the SoS is always evolving to keep up with the high-pace of technological and operational changes. The SoS is subjected to continuous engineering, integration and release cycles, with each yearly cycle being accompanied by improvements in several areas at the same time and new capabilities being added and requiring integration.

20.2. Complexity. The complex nature of the Land C4ISR SoS requires multiple contractors and Original Equipment Manufacturers (OEMs) to work hand-in-hand with DND and other GC stakeholders to execute the sustainment program in a deliberate manner, especially the integration aspect.

20.3. C4ISR is everywhere. Just as we have witnessed the rapid expansion of "the Internet of things" within the general population, C4ISR has also become a common theme for most if not all of the combat capabilities being fielded in support of military operations. The majority of new projects include, or depend on high-tech C4ISR components (e.g. vehicles, soldier systems, air defence, command and control, etc.). All land-based platforms essentially have to be integrated within the Land C4ISR SoS.

## 21. **Total System Responsibility (TSR)**

21.1. Given the constantly evolving and complex nature of the Land C4ISR SoS, DND's Director Land Command Systems Program Management (DLCSPM) has been designated as Technical Authority of, and given Total System Responsibility (TSR) for the Land C4ISR SoS. As such, DLCSPM directs the EMT responsible for the life-cycle management of the Land C4ISR SoS, from cradle-to-grave, including architecture, systems engineering and integration, fielding, in-service support, and disposal. Although DLCSPM will remain the Technical Authority for the Land C4ISR SoS, there should be nothing precluding considering other options on how the Design Authority could be assigned or shared between DND and contractors.

## **Part 6 - Existing Sustainment Contracts**

### **22. General**

22.1. As the Technical Authority (TA) for the Land C4ISR SoS, DLCSPM is responsible for the sustainment of all systems, sub-systems, equipment, and components that make up the Land C4ISR SoS. To execute this role, DLCSPM requires the support of contracted services to provide hardware and software/firmware architecture, development, engineering and integration, testing, maintenance, life-cycle material and application management and other services related to the sustainment of all levels of the Land C4ISR SoS, from system-of-systems to systems, sub-systems, applications, equipment, components, etc. as applicable.

22.2. DLCSPM's business plan outlook for the Land C4ISR sustainment program over a 20 years horizon is estimated at \$8B. It is to be noted that this 20 year horizon was used for estimating purposes and may change further to the responses to this RFI. Furthermore, funding allocation is subject to Government of Canada's Parliament approval process, which is completed annually.

### **23. Major Sustainment Contracts**

23.1. The Land C4ISR SoS is currently sustained through five major sustainment contracts as follows:

- a. Weapon System Management (WSM) Contract. Established to provide software development, independent validation and verifications, and task-based Professional Services;
- b. Land C4ISR Engineering and Integration Support Contract (LEISC). Established to provide Land C4ISR systems engineering and integration services;
- c. Land C4ISR Transition Software Support Contract (LTSSC). Established to provide software systems engineering management and software systems requirements and architecture;
- d. Land C4ISR Cyber Security Engineering Support Contract (CSESC). Established to contribute to the Cyber Mission Assurance program for Land C4ISR SoS and provide, amongst other services, Security Architecture and Safeguard Development, Systems Integration and Testing and a Cyber Security Operation Center; and
- e. Intelligence Surveillance Target Acquisition and Reconnaissance In-Service Support Contract (ISTAR ISSC). Established to provide ISTAR systems engineering, integration, testing and other related services.

**24. Smaller Support Contracts**

24.1. In addition of the previously mentioned major sustainment contracts, there are also multiple smaller in-service support (ISS) and Repair & Overhaul (R&O) contracts currently in place to ensure the sustainment of specific sub-systems, equipment or components of the Land C4ISR SoS.

## **Part 7 - Land C4ISR SoS Sustainment Project Overview**

### **25. Project Scope**

25.1. Out-of-Scope. The sustainment of the CAF platforms, weapon systems, sensors and military Intelligence nodes mentioned in Part 4 of this RFI is out-of-scope of the Land C4ISR Sustainment project.

25.2. In-Scope. The communications and information systems (CIS) equipment installed in these platforms, weapon systems, sensors and nodes are in-scope of the Land C4ISR Sustainment project and must therefore be considered as part of the Land C4ISR SoS.

### **26. Sustainment Models**

26.1. The intent is to replace the existing major contracts and smaller support contracts. This may be done via a one-for-one replacement or via other models of replacement. Industry feedback is required regarding sustainment models for the Land C4ISR SoS, including what sustainment activities and/or services can be bundled together, other ways to perform those activities and provide those services, etc.

26.2. DND acknowledges that there are several ways to address the Land C4ISR SoS sustainment requirements. Options could range from a solution based, managed services, government-owned contractor-operated, contractor-owned government-operated, and others. Different models will offer DND an opportunity to compare the associated risks, cash flows, and personnel resource requirements. Respondents should describe their proposed sustainment model(s) in sufficient detail to allow comparison between all proposed models.

### **27. Project Interdependencies**

27.1. As previously explained, the Land C4ISR SoS is in constant evolution and must take into account all legacy Land C4ISR capabilities as well as those currently being fielded, or to be fielded in the coming years. As such, DLCSPM staff collaborates closely with all known DND projects that have a Land C4ISR nexus to both mutually synchronize their respective sustainment requirements; and to ensure that projects' sustainment solution remain aligned with the Land C4ISR SoS long-term sustainment objectives described at Part 5 of this RFI.

27.2. The Land C4ISR Sustainment Project solution must therefore include sufficient "contracting space" to allow for the integration and subsequent support of all existing and upcoming Land C4ISR capabilities, including the six Land C4ISR projects from Strong Secure Engaged Initiative #42 (SSE 42) as well as several other Canadian Army capital projects, as further described at Annex F. Some work related to these 6 projects may be included in the resulting contracts. However these projects will be conducting separate options analysis and industry consultation.

## Annex A

### Land C4ISR SoS Sustainment Questions

#### 1.0 Program Delivery

- 1.1 What does Industry foresee as a suitable program delivery model for the long term Land C4ISR sustainment that adheres to:
  - a. Government of Canada's procurement policies and guidelines;
  - b. Government of Canada to remain the Technical Authority and decision point;
  - c. User community is the CAF deployed domestically as well as internationally.
  
- 1.2 Can Industry sustain and support the following streams to be issued as separate contracts:
  - a. Land C4ISR System of Systems (SoS) architecting, engineering, integration and testing, including baseline and interface management support;
  - b. Land C4ISR Tactical Communications Sustainment Support;
  - c. Land C4ISR Software Sustainment Support;
  - d. Land C4ISR Cyber Security Sustainment Support; and
  - e. Land C4ISR Intelligence Surveillance Target Acquisition and Reconnaissance Sustainment Support.

Note: The other elements of the Land C4ISR programme identified in the DLCSPM Fleet Structure and not covered in the above list will be covered by separate contracts.

- 1.3 DLCSPM Software Engineering Facility:
  - a. Based on the DLCSPM Software Engineering Facility (DSEF) background provided in Annex C of this RFI document, how does Industry foresee the successful implementation of DSEF? Please justify your answer.
  - b. Should DSEF be awarded as a separate stream or as part of one of the five streams listed in question 1.2 above? Please justify your answer.
  
- 1.4 Subject to the Scaled Agile Framework (<https://www.scaledagileframework.com>):
  - a. Can Industry sustain the implementation of this framework for each stream/resulting contract? Please justify your answer.
  - b. For each stream, identify work that is subject and work that is not subject to this framework. Please justify your answer.
  
- 1.5 How does Industry foresee the implementation and management of quality assurance, verification, and validation if:
  - a. All streams are combined into a single contract? Please justify your answer.

- b. Each stream is awarded under a separate contract? Please justify your answer.
- 1.6 Subject to the DLCSPM Fleet Structure (Annex E): does Industry:
- a. Agree and support the breakdown and associated grouping of streams? Please justify your answer.
  - b. Suggest an alternative breakdown and/or grouping of streams? Please justify your answer
- 1.7 What level of infrastructure is reasonable for the successful bidder(s) to have in place at day-1 of contract award, 6 months after contract award and any additional period of time, suggested by the Respondent, after contract award? Please justify your answer.
- 1.8 What level of Engineering and Integration facilities infrastructure, based on the information provided in Annex C of this RFI, is reasonable for the successful bidder to have in place at day-1 of contract award and as of 12 months after contract award? Please justify your answer.
- 1.9 How does industry suggest and propose to transition from the current interim sustainment contracts to the long term sustainment contract(s)? How long would be the associated transition period? Please justify your answer.
- 1.10 How does Industry foresee the successful implementation of training for tools developed by the successful bidder(s) under the long term Land C4ISR contract(s)? Please justify your answer.

## 2.0 Contract Delivery

- 2.1 What does Industry foresee as the minimum contract duration to ensure a return on investment to the successful bidder(s)? Please justify your answer.
- 2.2 What does Industry foresee as a suitable contractual delivery model, an associated basis of payment, and a performance based measurement for the long term Land C4ISR sustainment? Please provide a response for a scenario where
  - a. All streams are combined into a single contract. Please justify your answer; and
  - b. Each stream is awarded under a separate contract. Please justify your answer.
- 2.3 Subject to contractual options to extend the term of the contract, what does Industry foresee as:
  - a. The optimal total number of optional years be included in a contract. Please justify your answer.;
  - b. The duration of each optional period. Please justify your answer.; and
  - c. The type of mechanism to be used to evaluate and award optional years. Please justify your answer.
- 2.4 Can industry sustain a model where the successful Joint Venture:
  - a. Is awarded all streams listed in Program Delivery – Question 1.2. Please justify your answer.; and
  - b. Consists of a Joint Venture that identifies a separate legal entity that is specialized in the delivery of a specific stream (as those listed in Program Delivery – Question 1.2 above)? Please justify your answer.
- 2.5 If a contract for delivery of the Land C4ISR long term sustainment program is awarded to a Joint Venture, how many entities and what type of specialities should form part of this Joint Venture? Please justify your answer.
- 2.6 Can Industry implement, manage and support the procurement of future hardware and software required under the long term sustainment contract(s) on DND's behalf? It is to be noted that the procurement process would have to adhere to pre-established rules and guidelines, which will be identified in future RFP(s). Please justify your answer.
- 2.7 To ensure best value to Canada as well as Industry, what would be the optimal RFP evaluation breakdown; out of a 100%, how much would you allocate to technical merit, to price, and to industrial and technological benefits? Please justify your answer.

## Annex B

### Industrial Technological Benefits / Value Proposition

#### Application of the Industrial and Technological Benefits (ITB) Policy

The Industrial and Technological Benefits (ITB) Policy may be applied on the Land C4ISR System-of-Systems (SoS) Sustainment 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 bidders to compete on the basis of the economic benefits to Canada associated with its bid. Winning bidders are selected on the basis of price, technical merit and their VP. VP commitments made by the winning bidder become contractual obligations in the ensuing contract.

For more information about the ITB Policy, please visit [www.canada.ca/itb](http://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 Land C4ISR SoS Sustainment project, this procurement encompasses the KICs of **Cyber Resilience**, **Artificial Intelligence** 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:

### ***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;

#### *Information Technology (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; and

#### *Operational technology 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 Artificial Intelligence (AI) as an enabling technology; for example, networks may autonomously and dynamically defend against intrusions and repair themselves if disrupted.

### ***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.

### ***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.

### **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 high level requirements put forward by the Department of National Defence, describe what Direct Work activities your company would foresee undertaking in Canada for the Land C4ISR SoS Sustainment? Please indicate which systems your response concerns.

### **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).

2. 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)?

3. As a result of the Land C4ISR SoS Sustainment, please indicate what new supply chain opportunities could be made available to Canadian suppliers. 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.

4. 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.

5. What direct or indirect R&D investments could Canada motivate bidders to make as a result of this procurement?
6. 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 Land C4ISR SoS Sustainment and/or in the KICs identified above?

7. 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.

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

**Other questions:**

11. Are there other relevant KICs which align with the work to be conducted for the Land C4ISR SoS Sustainment? If yes, please indicate which KICs should be considered and why. As part of your response, please describe how the proposed KICs would enhance the opportunities that could be leveraged through the Value Proposition for Canadian industry.
12. Comparatively to price and technical merit, the Value Proposition typically has a weight of 10% of the overall bid evaluation. What is your view on the weighting of the Value Proposition for the Land C4ISR SoS Sustainment?

## **Annex C**

### **Additional Land C4ISR SoS Background Information**

Excerpts from various SoW documents, contained in current interim sustainment contracts, have been included in this Annex. These excerpts are strictly used to provide context and background to the RFI questions found in Annex A. There is no obligation or confirmation from DND that this information will form part of future long term sustainment RFPs.

## **Requirement for an Engineering and Integration Facilities**

### **1.0 Scope**

#### **1.1 General**

The Land C4ISR Engineering and Integration Support Contract (LEISC) Support Facilities includes those Contractor facilities, environments, Government Furnished Assets and associated services that are to be used to support the Work of this Statement of Work (SOW). These facilities are divided between facilities that must be in the National Capital Region (NCR) and facilities that can be anywhere in Canada.

### **2.0 LEISC National NCR-Based Facility**

The LEISC NCR-based facility must accommodate:

- a. The Land C4ISR System-of-Systems Integration & Test Environment (SOSITE) Laboratory;
- b. The Land C4ISR Tactical System Integration Laboratory (TSIL) Secure Facility;
- c. The Land C4ISR Tactical System Integration Laboratory (TSIL) Unclassified Facility;
- d. The NCR Facility unclassified communication closet; and
- e. The Land C4ISR Outdoor Integration Compound.

The facility must provide interconnections between all components described above (a thru e) in order to facilitate large-scale testing and operations as well as provide secure unclassified and classified interconnection to outside laboratory in Canada and with allies.

The facility must be located in the National Capital Region as defined by the DND geographic limit of the National Capital region in order to achieve maximize operational effectiveness and program efficiency.

#### **2.1 Land C4ISR System-of-Systems Integration & Test Environment (SOSITE) Laboratory**

##### **2.1.1 Dimensions:**

The SOSITE must have a minimum usable area of 300 m<sup>2</sup>, including at least:

- a. Main Lab: 285 m<sup>2</sup>
- b. Radio Room: 15 m<sup>2</sup>

##### **2.1.2 Power Requirements:**

The SOSITE must provide a minimum of 100KVA (1 transformer) to power 50 racks of tactical network equipment, 160 radios and 50 Data terminals.

### **2.1.3 Cooling/Heating:**

The SOSITE must be provided with:

- a. Sufficient Cooling/Heating to allow for a shirt sleeve work environment when all equipment is fully operational;
- b. Humidity control suitable for operation of all installed equipment; and
- c. Redundancy sufficient to allow HVAC equipment to continue operating at a level that allows all equipment to be operational and meets occupational health and safety workplace limits through any single point of failure mode.

### **2.1.4 Security:**

The SOSITE must meet:

- a. at least the minimum RCMP Secure Room Standard for Level 2 processing; and
- b. be usable as a Tactical EMSEC Zone based on an inspection and written authorization by the TA or a designated representative. The security risk acceptance for activities requiring a Tactical EMSEC Zone remains with DND.

The SOSITE Facility must be connected to the unclassified communication closet.

The SOSITE requires access controlled doors, intrusion alarm in order to meet physical security, asset management and configuration control.

## **2.2 Land C4ISR Tactical System Integration Laboratory (TSIL) Permanent Secure Facility**

### **2.2.1 Dimensions:**

The TSIL Secure Facility main lab must have a minimum usable area of 300 m<sup>2</sup>, including at least:

- a. Server Room of 30 m<sup>2</sup> Server room layout must support secure and non-secure 19" 42U racks with required separations.
- b. Post contract award, this Lab workspace must be authorized in writing by DND as and an EMSEC Zone A: 40 m<sup>2</sup>
- c. General Lab space collocated with the TSIL Secure Facility. This Lab workspace is used for sensitive but unclassified work. This space forms part of the EMSEC Zone inspectable space: 150 m<sup>2</sup>
- d. Reception Zone: 10 m<sup>2</sup>
- e. Secure Conference room: 30 m<sup>2</sup>
- f. Secure Storage: 6 m<sup>2</sup>

### **2.2.2 Power Requirements:**

The TSIL Secure Facility must be provided with a minimum of 200KVA (2 transformers).

The TSIL must also be provided with 100% Generator and UPS Backup. UPS and Generator equipment will be GFE. Integration including automatic transfer switching and meeting all safety and regulatory requirements is the Contractor's responsibility.

### **2.2.3 Cooling/Heating:**

The TSIL Secure Facility must be provided with:

- a. Server room: Minimum dedicated 56 KW (16 Ton) HVAC capacity inclusive of a required backup capability;
- b. Remaining space must have sufficient Cooling/Heating to allow for a shirt sleeve work environment when all equipment is fully operational;
- c. Humidity control suitable for operation of all installed equipment; and
- d. Redundancy sufficient to allow HVAC equipment to continue operating at a level that allows all equipment to be operational and meets occupational health and safety workplace limits through any single point of failure mode.

### **2.2.4 Security:**

The TSIL Secure Facility must meet at least the minimum RCMP Secure Room Standard for Level 2 processing. Post Contract Award, the TSIL Secure Facility must be certified as an EMSEC Zone A based on an inspection and written authorization by DND. The security risk acceptance for the EMSEC Zone remains with DND.

### **2.2.5 Additional:**

The TSIL Secure Facility must additionally provide:

- a. Exterior parking pad (secured) with power and space for 2 x Armored Vehicle;
- b. External connection points (secured) for vehicle connectivity into the Main lab;
- c. External access to roof or antenna connections for a minimum of 12 Antenna mounts;
- d. Lightning protection for all external points; and
- e. Connection to the unclassified communication closet.

## **2.3 Land C4ISR Tactical System Integration Laboratory (TSIL) Unclassified Facility**

### **2.3.1 Dimensions:**

The TSIL Unclassified Facility main lab must have a minimum usable area of 750 m<sup>2</sup>, including at least:

- a. Sensor integration room: 35 m<sup>2</sup>
- b. Indoor storage: 25 m<sup>2</sup>
- c. Two (2) Presentation/simulated Tactical Ops Center Rooms: 100 m<sup>2</sup>each
- d. One (1) unclassified general purpose lab: 75 m<sup>2</sup>
- e. One (1) Office space for 40 permanent and 15 transient Integrated Product Team Members: 350 m<sup>2</sup>
- f. Three (3) conference rooms: 15 m<sup>2</sup>each

### **2.3.2 Power Requirements:**

The TSIL Unclassified Facility must be provided with a minimum of

- a. 50 x 110V 20A circuits
- b. 10 x 220V 50A circuits

### **2.3.3 Cooling/Heating:**

The TSIL Unclassified Facility must have sufficient Cooling/Heating to allow for a shirt sleeve work environment when all equipment is fully operational.

### **2.3.4 Security:**

The TSIL Unclassified Facility is Unclassified but requires access controlled door for asset management and configuration control.

### **2.3.5 Connections:**

The Land C4ISR Unclassified Facility must be connected to the unclassified communication closet.

## **2.4 NCR facility unclassified communication closet**

### **2.4.1 Dimensions:**

The NCR facility unclassified communication closet must provide a minimum area of 10 m<sup>2</sup>.

### **2.4.2 Power Requirements:**

The NCR facility unclassified communication closet must provide at least:

- a. 12 x 110V 20A wall circuits; and
- b. 4 x 220V 50A circuits.

### **2.4.3 Cooling/Heating:**

The NCR facility unclassified communication closet must provide:

- a. Sufficient cooling for 1 x network rack; and
- b. Cooling/Heating for shirt sleeve work environment.

### **2.4.4 Security:**

The NCR facility unclassified communication closet is Unclassified but requires access controlled door(s) for asset management and configuration control.

## **2.5 Land C4ISR Outdoor Integration Compound**

### **2.5.1 Dimensions:**

The Land C4ISR Outdoor Integration Compound must provide a minimum of 1900 m<sup>2</sup> of hardstand, including at least:

- a. Heated temporary shelter(s): 300 m<sup>2</sup>;
- b. Antenna compound: 200 m<sup>2</sup>; and
- c. Space for vehicle and ISO shelter parking: 1400 m<sup>2</sup>.

### **2.5.2 Power Requirements:**

The Land C4ISR Outdoor Integration Compound must provide a minimum of:

- a. 14 x 110V 20A circuits; and
- b. 14 x 220V 50A circuits.

### **2.5.3 Security:**

The Land C4ISR Outdoor Integration Compound is unclassified but requires an access controlled gate for asset and configuration control.

The Land C4ISR Outdoor Integration Compound must be continuously fenced except for access controlled gate(s). Fencing must be sufficient to provide for asset and configuration control.

The Land C4ISR Outdoor Integration Compound must be camera monitored for security. Temporary Shelters must be access controlled.

### **2.5.4 Additional:**

The Land C4ISR Outdoor Integration Compound must additionally:

- a. Be used as a Tactical EMSEC and Security Zone by DND for short durations post contract award, the security risk associated with these usages remains with DND; and
- b. Be connected to the unclassified communication closet.

## **3.0 Other LEISC facilities located in Canada**

Other LEISC facilities must be located in Canada and must include:

- a. The Land C4ISR System Vehicle Installation, Integration and Test (VIIT) Lab;
- b. Land C4ISR Equipment and Vehicle Platform Emission Security (EMSEC) and Electromagnetic Environment Effects (E3) Test Lab; and
- c. LEISC Vehicle Compounds.

### **3.1 Land C4ISR System Vehicle Installation, Integration and Test (VIIT) Lab**

Land C4ISR System equipment is installed on numerous platforms, ranging from the soldier to transport-cased equipment the Canadian Army's Main Battle Tank. Platforms may also include headquarters configurations mounted on vehicles, trailers and mock-up vehicle racks for engineering and prototyping work. The VIIT Lab must support the integration and verification of Land C4ISR equipment, cabling and security solutions on a range of tracked, wheeled and static platforms.

#### **3.1.1 Physical Dimensions**

The LEISC VIIT Lab must provide at least 150 square metres of floor space. This space must be sufficiently unencumbered as to allow the movement, positioning and work on at least three Canadian Army vehicle platforms simultaneously.

The VIIT Lab ceiling, for those portions accommodating the vehicle, must measure not less than 7.5 metres in height, sufficient for the clearance of Canadian Army vehicles with antennas installed. The VIIT Lab ceiling in all other areas must be at least 4.1 metres in height.

The VIIT Lab entrance(s) must accommodate, as a minimum, the height of 4.1m and width of 3.5m.

#### **3.1.2 Load Bearing Capacity**

The VIIT Lab floor must support vehicles weighting up of 29,500kg each.

The VIIT Lab must be capable of supporting the drive-in and drive-out of vehicles, without this procedure affecting the use of other parts of the lab.

#### **3.1.3 Electrical Power**

The VIIT Lab must provide a 60A/120 Volt AC electrical power source for vehicles, vehicle air conditioning, Land C4ISR Systems and test equipment so that vehicle engines or generators are not required to be running to support testing inside the lab.

The VIIT Lab must provide electrical power compatible with the power requirement of each type of Land C4ISR equipment on board the vehicles. Current Land C4ISR equipment requires 120 and 240 Volt 60 Hz AC and 28 Volt (nominal) MIL-STD 1275D DC power.

The VIIT Lab must provide power quality management and emergency power, in the event of unplanned power outages, such that support to services is maintained for a sufficient period to execute a controlled shutdown of all equipment and activities in the facility sensitive to power disruption.

### **3.1.4 Ventilation**

The VIIT Lab must include ventilation and exhaust ducting to permit operation of Canadian Army vehicles without compromising air quality.

### **3.1.5 Cabling**

The VIIT Lab must accommodate Land C4ISR cabling between Command Post to be set up and tested.

In the event that a tactical Command Post configuration is to be verified, the VIIT Lab must accommodate Land C4ISR cabling such that Land C4ISR vehicles located outside the Facility can interface to vehicles inside the VIIT Lab.

## **3.2 Land C4ISR Equipment Emission Security (EMSEC) and Electromagnetic Environment Effects (E3) and Vehicle Platform E3 Test Lab and Site**

The Contractor must provide separate Land C4ISR equipment and vehicle EMSEC and E3 test facilities capable of performing TEMPEST, NONSTOP, Electro-Magnetic Interference (EMI), Electro-Magnetic Compatibility (EMC) and Radio Frequency (RF) Safety testing.

### **3.2.1 The Land C4ISR Equipment E3/EMSEC Test Facility Requirements**

The Land C4ISR Equipment E3/EMSEC Test Facility must be electromagnetically shielded with appropriate powerline filtering to achieve compliance with the certification requirements of the Communication Security Establishment EMSEC authority for the conducting of TEMPEST Level 1 tests. This requires an ambient electromagnetic field that complies with CID/09/15A. The Land C4ISR equipment E3 Test Facility must meet all appropriate local building and safety codes for a laboratory test environment including, ventilation, fire suppression, electrical safety and emergency lighting and egress.

#### **3.2.1.1 Dimensions**

The Equipment E3/EMSEC Test Facility test chamber must be sized to accommodate any single Land C4ISR System Element including all necessary clearances as required by MIL-STD-461G, to a minimum area of 15 m<sup>2</sup> and to a minimum height of 3 m.

The Equipment E3/EMSEC Test Facility must include an antechamber adjacent to the test chamber, with a minimum area of 10 m<sup>2</sup>.

### **3.2.1.2 Security**

The Equipment EMSEC and E3 Test Facility must meet at least the minimum RCMP Secure Room Standard for Level 2 processing.

## **3.2.2 Land C4ISR Vehicle E3 Test Facility Requirements**

The Vehicle E3 Test Facility must be electromagnetically shielded with appropriate powerline filtering to achieve an electric field ambient of -110 dBm measured with a 30 kHz intermediate frequency bandwidth (IFBW) from 10 MHz to 100 MHz. The electric field ambient from 100 MHz to 18 GHz must follow the semi-logarithmic straight line from -110 dBm at 100 MHz to - 65 dBm at 18 GHz using IFBW in compliance with MIL-STD-461G, method RE102. The Vehicle E3 Test Facility must meet all appropriate local building and safety codes for a vehicle storage and operation environment including, ventilation, fire suppression, electrical safety and emergency lighting and egress.

### **3.2.2.1 Dimensions**

The Vehicle E3 Test Facility must be sized for one vehicle with the physical dimensions identified in section 3.1.1 and the same load bearing capacity identified in section 3.1.2 except that the height of the shielded test lab ceiling must be a least 3m above the height of a vehicle mounted antenna.

### **3.2.2.2 Ventilation**

The Contractor must provide ventilation and exhaust ducting within the vehicle E3 Test Lab which must permit the continuous operation of vehicles under test without compromising air quality and without exceeding MIL-STD-461G, RE 102 limits for Ground Army applications.

### **3.2.2.3 Security**

The Vehicle E3 Test Lab is Unclassified but requires access controlled door(s) for asset management and configuration control.

## **3.2.3 Open Area Test Site**

It is desirable that the Contractor additionally provide an open area test site for Canadian Army vehicle E3 testing. The open air test site should provide an ambient electric field that does not exceed the MIL-STD-461G, RE 102 limits for 'Ground Army' applications.

If an Open Area Test Site is provided as the vehicle EMSEC and E3 test facility, it must include sufficient shelter to protect test instrumentation and personnel.

Shelters must be access controlled.

### **3.2.4 Land C4ISR E3/EMSEC Test Facilities Common Requirements**

These EMSEC and E3 test facilities must have instrumentation capable of testing to the requirements of the following specifications:

- a. EMSEC In Accordance With (IAW) CID/09/15A, CID/09/14, CNSS Advisory Memorandum TEMPEST 01-02 and NATO TEMPEST Requirements and Evaluation Procedures SDIP-27;
- b. Power Quality, EMI and EMC IAW MIL-STD-1275D, MIL-STD-461G and MIL-STD-464C; and
- c. RF safety IAW Health Canada Safety Code 6 and Canadian Forces Technical Order C-55-040-001/TS-002.

The above specifications that are not publicly available can be provided on demand to bidders with the required Security Clearance and Control Goods Program Registration.

To support this requirement DLCSPM will provide specialized E3/EMSEC test equipment as Government Furnished Equipment (GFE). The Contractor is responsible for storing this equipment in an appropriate storage facility. The Contractor must calibrate and maintain this specialized E3/EMSEC test equipment.

#### **3.2.4.1 Radio Frequency (RF) Transmission Levels**

The Land C4ISR EMSEC and E3 Test facilities must permit transmission of RF signals of up to 50 Watts at discrete frequencies across the High Frequency, Very High Frequency (VHF) and Ultra High Frequency bands without violating Industry Canada spectrum management and telecommunications restrictions.

#### **3.2.4.2 Electrical Power**

Electrical power provided in LCSS vehicles, EMSEC and E3 test labs must be compliant with the power noise spectrum requirements of the specification under which tests are conducted.

The Contractor must provide 60 Hz, 110 V with at least two 15 Amp feed circuits to operate EMSEC and E3 test equipment in each E3/EMSEC test facility.

The EMSEC & E3 test facilities must provide power quality management and emergency power, in the event of unplanned power outages, such that support to services is maintained for a sufficient period to execute a controlled shutdown of all equipment and activities in the facility sensitive to power disruption.

The electrical service must not cause the ambient electrical field of the EMSEC and E3 Test Lab to exceed the MIL-STD-461G, RE 102 limits for 'Ground Army' applications.

### **3.2.4.3 Lighting**

The Vehicle EMSEC and E3 Test Lab must be equipped with lighting to permit testing of vehicles at night. (Note: Fluorescent lighting is not acceptable for this application due to ambient electrical interference.)

### **3.3 LEISC VITT Lab and E3 Test Lab/Site Vehicle Compounds**

The VITT, Vehicle EMSEC and E3 Test Lab/Test Site must include a Vehicle Compound for Canadian Army vehicles awaiting work.

Where LEISC Facilities are co-located, a single compound may service multiple facilities if practicable, otherwise each lab and/or site will require a Vehicle Compound.

It must be possible to move vehicles between the Compound and the supported lab and or site areas without driving on public roads.

Each LEISC Vehicle Compound must accommodate at least eight (8) vehicles.

Each LEISC Vehicle Compound is unclassified but requires an access-controlled gate for asset management and configuration control.

Each LEISC Vehicle Compound must be continuously fenced except for access-controlled gate(s). Fencing must be sufficient to provide for asset and configuration control.

Each LEISC Vehicle Compound must be camera monitored for security.

## **Directorate Land Command Systems Program Management Software Engineering Facility**

### **Background**

The Directorate Land Command Systems Program Management (DLCSPM) Software Engineering Facility (DSEF) was formed to provide an in-house software engineering capability for the Army. Initially, work at the DSEF focused on supporting the computerized fire control systems for the artillery. As the Army's command and control (C2) software has evolved, the DSEF has played a critical role assisting in the integration of the Army's weapons systems into C4ISR systems. A list of recent and current applications and work at the DSEF can be found at Appendix 1. In brief, the DSEF provides the following services to the Land Environment:

- maintaining, adapting, and developing in-service software;
- maintaining, adapting, and developing software for modeling and simulation;
- integrating Commercial off The Shelf software applications with legacy software suites;
- assisting in the integration of new applications into LCSS; and
- providing software testing and independent verification and validation (IV&V) of LCSS related configuration items (CI) from other OEMs.

The DSEF is the Army's internal independent software capability for specific software applications required by the Army, as well as providing fully accredited independent analysis, testing validation and verification of software received by the Army from other vendors and suppliers. DSEF tasks will also include but are not limited to:

- i. DSEF Program Management
- ii. DSEF Software Development Infrastructure Support
- iii. Land C4ISR Product Development
- iv. DLCSPM Collaborative Infrastructure Support
- v. Software IV&V Support for External Non-DND CI Deliverables
- vi. Support Innovation (Products, Tools, Processes)
- vii. Contractor personnel support to DLCSPM and Director General Land Equipment Program Management customers at DND facilities in the NCR in support of the LCSS integrated product team structure.

## APPENDIX 1

### List of software and applications supported by DSEF

1. **NATO Armaments Ballistic Kernel (NABK) – SG2 Shareable (Fire Control) Software Suite (S4) Support** – The S4 is a set of coherent cooperative projects that provides ballistics related functionality (trajectory simulation, computation of firing data, etc.) for use in technical fire control systems and laboratory applications within the Ballistics Fire Control Domain. The S4 is written in the Ada programming language with code and processes conforming to the AOP-49 SG/2 Quality System. The foundation of the technology implemented within the S4 is recognized international standards and NATO Standardization Agreements (STANAGS). This DSEF supports the development of the S4. The S4 implements a variety of NATO STANAGs, for example, 4355 and 6022 for artillery fire control and meteorological modelling. This DSEF also supports the development, maintenance and integration of S4 into the Indirect Fire Control Software Suite (IFCSS), and the implementation of interoperability standards as part of the Artillery Systems Cooperation Activities (ASCA), a multi-national operating standard that Canada has recently adopted. The S4 project distributes a new release each year.
2. **Indirect Fire Control Software Suite (IFCSS) / Artillery Management Information System (ArtyMIS) / Fires Acquisition & Targeting Effects System (FATES)** – The DSEF maintains, adapts and develops in-service software for DND's indirect fire weapons systems (field artillery and mortars) using the S4 products to maintain interoperability with allied systems.
3. **DASPM 3** – The DSEF supports the Directorate Artillery Systems Program Management (DASPM) in the software evolution, system integration and testing of DND's indirect fire weapon systems and the sensors which support them (for example, muzzle velocity radars, meteorological sounding systems, and target designators).
  - i. **Engineering Management** – Performs field trial Problem Report investigations; Coordinate position reporting from Digital Gun Management System (DGMS) into LCSS with Application Services Infrastructure Subsystem; LCSS Baseline Coordination for the integration of new IFCSS / DGMS versions.
  - ii. **System Engineering Services** – Provides maintenance support of the Detachment Commanders Display Terminal Image in LCSS and potential release of new Navigational Display Unit (NDU) version; provide support to the Equipment Management Team (EMT) for the testing of the Direct Fire functionality within the DGMS; provide maintenance support of CM/DM firmware/software/images; support Gun Laying Unit Modernization; conduct NDU delivery packaging and re-integration with LCSS; improve the Muzzle Velocity Indicator

(MVI) data processing within DGMS and IFCSS; and provide maintenance support for the resolution of issues interfering with the proper operation of digital fire missions at the gun line.

- iii. **Software Engineering** – Support the implementation of new natures of ammunition within DGMS and IFCSS including support s/w coordination and testing of Precision Guidance Kit within the NABK programme and other Problem Report investigations.
4. **Ballistics Calculator SW (BCS)** – The DSEF maintains, adapts, develops and supports software for DND’s sniper systems across a variety of weapon calibres. The DSEF provides integration expertise and improved accuracy over the software lifecycle using the NABK. The DSEF performs vignette testing and verification. Software maintenance typically includes corrective, adaptive, enhance and preventative maintenance.
5. **Artillery Systems Cooperation Activities (ASCA)** – ASCA is a single program for digital interoperability agreed by all member nations, which supports timely, responsive and effective delivery of indirect fires across the full spectrum of conflict in all coalition scenarios. The interface supports sharing key Fire Support Command and Control information (Target management, artillery target intelligence, fire unit status, fire mission execution, fire planning, geometries (Fire Support Control Measures and Artillery Control Measures)). This DSEF maintains, adapts and develops in-service software for the Artillery Systems Cooperation Activities (ASCA) interoperability gateway and support message transfer between the IFCSS/ArtyMIS/FATES system and coalition partners using the LCSS infrastructure. ASCA uses a set of twenty-six standardized messages.
6. **The Intelligence, Surveillance, and Reconnaissance Applications (ISRA)** – The ISRA team at the DSEF is developing a suite of software applications that supports ISTAR sensor integration into the LCSS, with a mandate to increase the Commander’s battlefield Situational Awareness (SA) and create a network to disseminate, store, retrieve and exploit sensor information. ISTAR assets provide information on the battlespace by employing multiple methods. These include radar (Ground Moving Target Indicating data (STANAG 4607) and Synthetic Aperture Radar imagery), ElectroOptical and Thermal Imagery still imagery (STANAG 4545) and motion imagery (STANAG 4609). A core component of this task is the development and maintenance of the following ISR applications:
  - Coalition Shared Database (CSD): The CSD is a repository to store and disseminate ISR data products
  - Coalition Shared Database Next Generation (CSD-NG): This is a modern implementation of the CSD to store and disseminate ISR data products
  - The Canadian Lightweight ISR Client: provides users with access to the Coalition Shared Database (CSD and CSD-NG)

The DSEF is also responsible for supporting the Multi-Sensor Aerospace-Ground Joint Intelligence, Surveillance and Reconnaissance Interoperability Coalition and deploying ISRA components on the Battlefield Information Collection and Exploitation Systems network.

7. **Chemical, Biological, Radiological, Nuclear (CBRN)** – The DSEF provides software engineering resources for the System of Systems (SoS) testing, integration, field support and validation of various specialized CBRN software CIs, which include specialized tools for CBRN sensor integration and decision support applications and servers.
8. **Geomatics Support to Operations and Training** – The DSEF provides software engineering resources for the Mobile Map Builder, which is a Windows desktop application that can display map data from various data sources such as ArcGIS, MapSpark, MBTiles, etc. Mobile Map Builder allows for the clipping and exporting to several output types such as GeoPackage (.gpk), ArcGIS TilePackage (.tpk), MBTiles, JPEG, GeoTIFF, MBTiles, etc.
9. **Intelligence Collation Environment (ICE)** – The DSEF provides software engineering resources for the Intelligence Collation Environment (ICE), which is a Windows desktop client-server application that allows users to collate and query information from various data sources such as CSD/CSD-NG, Network File Shares, SharePoint, and DDF and to perform analysis and create reports on the data.  
  
ICE is getting support of the Intelligence community as a tool of choice to support the Intelligence process at the tactical level, as well as at the operational and strategic ones.
10. **Multi-Sensor Data Fusion** – The DSEF maintains, adapts and develops middleware software to connect ISTAR sensors to command and control nodes for counter battery missions, surveillance, target acquisition, cross cueing and airspace coordination.
11. **Engineering Command and Control Information System (EC2IS)** – The DSEF maintains, adapts and develops EC2IS for the Combat Engineers. The system features specialist software that facilitates engineering planning and reconnaissance. EC2IS is available in two (2) suites. The Reconnaissance Suite combines a Global Positioning System, laser vector binocular, digital still camera, laptop computer, and custom software to provide an integrated reconnaissance capability. The Command and Control (C2) Suite combines a laptop with specialized combat engineer software.
12. **Tactical Asset Configuration Information System (TACIS)** – The DSEF maintains, adapts and develops TACIS for the accounting and inventory management of software and hardware assets throughout the Canadian Army field force and other supporting CAF and DND organizations. The Contractor is also

responsible for bulk loading of data into the TACIS database (for new equipment to be tracked in TACIS) and the on-going monitoring of TACIS usage and overall system performance.

13. **Variable Message Format Processor**– The DSEF maintains, adapts and develops the variable message format protocol, as specified in MIL-STD-6017, into LCSS through translation services between LCSS XML variable message format and variable message format binary message formats.
14. **DLCSPM Collaborative Infrastructure Support (EIS)** –The Director Land Command Systems Program Management's (DLCSPM) Engineering Information System Collaborative Environment (EIS CE) mission is to provide a secure reliable collaborative environment that enables effective collaboration across engineering and management teams within DLCSPM, the Canadian Armed Forces, and the Industry.

The DSEF operates a highly secure and reliable Information Technology (IT) Engineering Information System Collaborative Environment (EIS CE) that hosts the Engineering System-of-Record (SOR). The EIS CE hosts enterprise software applications to support System Engineering Management using Industry best practices' standards and process frameworks. The CE enables accessibility and collaboration among various stakeholders from DLCSPM, the Canadian Armed Forces, and Industry. The DSEF also manages and supports all necessary hardware and software systems including network appliances, servers and enterprise software applications residing in the Engineering Information System (EIS) network hosted at the DSEF

## Annex D

### Land C4ISR SoS Sustainment Objectives, Metrics and Targets

The Land C4ISR SoS Sustainment solution to be implemented must meet the sustainment objectives and achieve the metrics and targets listed in this Annex. All of the Land C4ISR SoS Sustainment objectives are identified by a letter, linking them to one of the four Land C4ISR SoS Sustainment Principles, as follows

- a. **‘P’ for Performance** including Deployability, Integration and Reliability;
- b. **‘F’ for Flexibility** including System Evolution and Flexibility/Growth Capacity;
- c. **‘E’ for Economic Benefits** including Defence Sector, Research and Development, Supplier Development, Exports, Skills and Training, and Government of Canada Economic Leveraging Tools; and
- d. **‘V’ for Value for Money** including Smart Buyer, Balanced Risk, Efficiency, Incentives, Continuity, and “Should Cost” Determination.

Deployability – Land C4ISR can be deployed to operational theater.		
Requirements	Metrics	Targets
P1 - Canadian and coalition classified and unclassified networks	Speed at which the Land C4ISR systems can be built and deployed.	One week to build and distribute Canadian and coalition classified and unclassified Land C4ISR systems to theatres of operation.
P2 – Land C4ISR continues to support tactically forward deployed units	Provide systems that can support a tactically forward deployed unit that can operate within a conflict zone and can tactically manoeuvre	A robust and resilient Land C4ISR system is available to 100% of operationally deployed forces for all system components in order to operate within a conflict zone and can tactically manoeuvre

<p>P3 – Land C4ISR provides managed communication and voice and data system links</p>	<p>Provide managed communication and voice and data system links between deployed headquarters, vehicles, other platforms and dismounted soldiers</p>	<p>Continually provides integration of voice and data system links by providing system links between deployed headquarters, vehicles, other platforms and dismounted soldiers.</p> <p>Any cyber security threats are dealt with to ensure reliability and availability</p> <p>Able to provide systems in a complimentary and overlapping nature to ensure coverage across the breadth and depth of the operational environment (e.g. Primary, Alternate, Contingency, and Emergency Comms systems)</p>
<p>P4 - Innovative solutions are sought for ease of deployment and transportability</p>	<p>Ease of deployment and transportability effectiveness</p>	<p>Innovative solutions are implemented that facilitate deployment and increase transportability</p>
<p>P5 - Training of system planners, system managers and operators of the Land C4ISR systems</p>	<p>Evaluation of training to system planners, system managers and operators.</p>	<p>Reducing amount of training to systems planners, system managers and operators so they are suitably trained to operate and maintain the Land C4ISR systems while deployed</p>
<p>P6 - Logistic Support is provided to deployed units</p>	<p>Availability of Logistic Support to deployed units, including Field Service Support when required</p>	<p>Logistic Support is provided to deployed units, including required Field Service Support</p>
<p><b>Integration - The ability to provide an integrated Land C4ISR SoS.</b></p>		
<p><b>Requirements</b></p>		
<p>P7 – Land C4ISR Domains are integrated</p>	<p>Levels of integration Distribution of information Information available to Commanders</p>	<p><b>Targets</b></p> <p>All Land C4ISR domains are integrated into a seamless SoS that provides commanders with the information and information services required to make effective and timely C2 decisions about their forces</p>

<p>P8 - The ability to integrate new and upgraded systems and platforms into the Land C4ISR SoS</p>	<p>Levels of integrations</p>	<p>New and upgraded systems and platforms are integrated into the Land C4ISR SoS by the time they reach Initial Operational Capability (IOC)</p>
<p><b>Reliability – Land C4ISR SoS is reliable and functions according to its design.</b></p>		
<p><b>Requirements</b></p>		
<p>P9 - Cyber Security</p>	<p>Neutralisation of cyber threats Levels of cyber monitoring</p>	<p><b>Targets</b> A high level of system reliability is maintained by operating and coordinating cyber defences to all networks, applications and systems</p>
<p>P10 - Land C4ISR SoS reliability</p>	<p>Number of major problems Number of system bugs discovered on deployed systems</p>	<p>Land C4ISR is free of major problems, system failures and software bugs more than 99% of the time or to a realistic target based on C4ISR industry standards.</p>
<p><b>System Evolution – Constantly evolving to adapt to internal and external operational requirements and technological advances.</b></p>		
<p><b>Requirements</b></p>		
<p>F1- System Evolution</p>	<p>Land C4ISR is constantly evolved through baseline releases</p>	<p><b>Targets</b> Land C4ISR is adapted to internal and external operational requirements and technological advances  Minor baseline releases every year and major baseline releases every 2-3 years</p>
<p><b>Flexibility / Growth Capacity – An ability to adapt to change resulting from continuous improvement and technological advances.</b></p>		
<p><b>Requirements</b></p>		
<p>F2 - Rapid and repeatable capability evolution and development process</p>	<p>Enables systems support to all SSE missions and the frequent replacement and improvement of systems to enable continual capability improvement, increases in system holdings and avoid obsolescence</p>	<p><b>Targets</b> Vendor has a methodology in place that supports rapid and repeatable evolution and development through an agile process  Systems are upgraded or replaced every 4-6 years  Obsolescence is avoided</p>

F3 - Necessary IP rights are retained or acquired	Flexibility and growth capacity are maintained	Growth capacity is possible without being restricted by OEM IP rights.
F4 - Vendor Lock is to be avoided	Maximum flexibility in design of solutions	Flexible solutions can be designed and implemented and are not restricted to a single source of supply or by IP rights.
<b>Scalability – An ability to scale the system to various size of deployment.</b>		
<b>Requirements</b>	<b>Metrics</b>	<b>Targets</b>
F5 – Land C4ISR supports a full range of Land operational deployments	Scalable size of the force being deployed Number of soldiers that can be integrated and supported	Land C4ISR can support a full range of Land operational deployments, from a full Brigade deployment of 4800+ soldiers, to a Company level deployment of 200 soldiers to individually deployed liaison officers
<b>Interoperability – An ability to interoperate with other entities.</b>		
<b>Requirements</b>	<b>Metrics</b>	<b>Targets</b>
F6 – Land C4ISR interoperability with military coalition partners, other government departments and other operational partners	The ability for Land C4ISR interoperability with military coalition partners, other government departments and other operational partners	Land C4ISR systems are interoperable with military coalition partners, other government departments and other operational partners
<b>“Plan B” – Canada’s control over critical elements to allow for contract de-scoping, termination and follow-on solicitation.</b>		
<b>Requirements</b>	<b>Metrics</b>	<b>Targets</b>
F7 - Canada can implement a Plan B	Avoid vendor lock (see F4) <b>Flexible service contracts and procurements tools</b> <input type="checkbox"/> Technical Authority resides within DND Ensuring that there is sufficient redundancy within the program for other critical capabilities	Ensuring the ability to quickly restore or recontract services in the event of a contract failure

**Defence Sector – Supporting the economic development of Canada’s defence sector.**

<b>Requirements</b>	<b>Metrics</b>	<b>Targets</b>
E1 - Enhanced Canadian capability directly related to supporting the Land C4ISR requirement	Direct work commitments of successful Value Proposition (VP) proposal	Level of Direct Work expressed as a percentage of contract value.

**Research and Development – Enhancing innovation through Research and Development (R&D).**

<b>Requirements</b>	<b>Metrics</b>	<b>Targets</b>
E2 - Investment in R&D activities in Canada in Defence Systems and Cyber Security	R&D commitment of successful VP proposal	Level of R&D expressed as percentage of contract value.

**Supplier Development – Promoting the growth and competitiveness of Canadian suppliers, including Small and Medium Businesses (SMB).**

<b>Requirements</b>	<b>Metrics</b>	<b>Targets</b>
E3 - Growth of Canadian supply chains in the defence and commercial sectors and support for SMB	Supplier development and Small and Medium (SMB) commitment of successful VP proposal	Level of supplier development and SMB activities expressed as percentage of contract value.

**Exports – Developing export potential for Canadian firms and increasing access to export markets.**

<b>Requirements</b>	<b>Metrics</b>	<b>Targets</b>
E4 – Promote export opportunities for Canadian firms related to the Land C4ISR system or other systems where possible	Exports commitment of successful VP proposal	Level of export activities expressed as percentage of contract value.

**Skills and Training – Supporting the development of skills and training opportunities to enhance Canadian capability.**

<b>Requirements</b>	<b>Metrics</b>	<b>Targets</b>
E5 - Investments into Skills and Training opportunities to grow Canadian capabilities	Skills and Training commitment of successful VP proposal	Level of Skills and Training expressed as percentage of contract value.

<b>Government of Canada Economic Leveraging Tools – In addition to the Industrial and Technological Benefits (ITB) Policy, there are other tools established to ensure positive economic outcomes from defence procurements, such as the Canadian Content Policy (CCP), the Buy in Canada Policy, or alternative leveraging approaches.</b>		
Requirements	Metrics	Targets
E6 – Should the ITB policy not apply to the Land C4ISR procurement, ISED will work with PSPC to ensure the Land C4ISR project leverages economic benefits	Effective leveraging by an alternative economic leveraging tool	Effective leveraging by an alternative economic leveraging tool.
<b>Smart Buyer – Product knowledge, business acumen, program management expertise and visibility into cost, technical drivers. Enabled through transparency into data.</b>		
Requirements	Metrics	Targets
V1 – Smart Buyer	<p>Knowledge of the technology and products</p> <p>Business acumen</p> <p>Understanding of the Land C4ISR industry</p> <p>Program management expertise</p> <p>Visibility and understanding of costs</p>	<p>The DLCSPM engineering team has acquired in-depth knowledge of the various technologies that make up the Land C4ISR.</p> <p>The Program Management Team has acquired the necessary business acumen and program management expertise as demonstrated by team members' Project Management Competency Development certifications and other accredited training.</p> <p>Members of program management team have been employed at one time in industry and have an excellent understanding of the Land C4ISR industry.</p> <p>Program and contractor costs are clearly identifiable and easily understood.</p>
<b>Balanced Risk – Risk transfer to Contractor matches the responsibility and scope. Risk = Premiums.</b>		
Requirements	Metrics	Targets
V2 – Balanced Risk	Sharing of the risks between Canada and the contractors	<p>Contractors share the risks.</p> <p>Contractors are involved in the design decision making process.</p>

<b>Efficiency – Contractor delivers goods and services at reduced level of effort. Requirement exists both through initial arrangement and continuous improvements.</b>		
<b>Requirements</b>	<b>Metrics</b>	<b>Targets</b>
V3 - Efficiency	Reduced level of effort over time for same services Continuous improvement program	Services are procured at a reduced level of effort over time. A continuous improvement program is implemented.
<b>Incentives – Rewards and remedies to drive desired behavior to deliver on the outcomes identified in this report, and achieve the associated targets.</b>		
<b>Requirements</b>	<b>Metrics</b>	<b>Targets</b>
V4 - Incentives	Incentives and penalties applied as required	A performance based framework is developed and applied to the sustainment contracts.
<b>Continuity – Maintenance of the contractual framework and performance incentives over contract duration.</b>		
<b>Requirements</b>	<b>Metrics</b>	<b>Targets</b>
V5 - Long term commitment	Duration of contracts and procurement agreements	Long term commitment that allows the contractor(s) to go through the learning phase, invest in better processes and obtain a return on their investments.
<b>“Should Cost” Determination – Active “Smart Buyer” efforts must drive towards a clear understanding of the proportion of costs and a recognition of the value of the services.</b>		
<b>Requirements</b>	<b>Metrics</b>	<b>Targets</b>
V6 – “Should Cost”	Understanding of the proportion of costs Recognition of the value of the services	Active “smart buyer” efforts in partnership with industry drive towards a clear understanding of costs and a recognition of the value of the services.

## Annex E

### DLCSPM Fleet Structure

Fleet	Platform
Other	LC4ISR SOS
TacComms	MD Integration
TacComms	Radios and Antenna
TacComms	Batteries
TacComms	Cable and Telephony
TacComms	High Capacity Line-of-Sight
TacComms	Satellite Communications
TacComms	Ancillary Equipment
TacComms	Global Positioning System
TacComms	Tactical Asset Configuration Information System
TacComms	Vehicle Mounted Network and Equipment
TacComms	Test Equipment
TacC2IS	Software Development
TacC2IS	Software Integration
TacC2IS	Tactical Network
TacC2IS	Modelling and Simulation
TacC2IS	Hardware (generic)
TacC2IS	Cyber Security Integration
ISTAR	ISTAR Integration
ISTAR	Data Link
ISTAR	Unmanned Aircraft Systems
ISTAR	Weapon Locating Systems
ISTAR	Geomatics Support
ISTAR	Intelligence, Surveillance and Reconnaissance
ISTAR	Electronic Warfare
ISTAR	Exploitation Tools
ALL	Professional Services Support
ALL	DSEF
ALL	Training & Documentation

## Annex F

### SSE 42 and Other Land C4ISR Capital Projects

Given the number of SSE projects slated to enhance the Land C4ISR SoS, we can expect a large impact on the support contracts as the project teams will look to leverage the integration teams. The SSE projects are still in early phases and have not been fully defined. This causes further complexity when attempting to cost out the future requirements of NP support. Six projects are directly related to Land C4ISR modernization efforts while many others, although not directly related, will likely also require some form of integration into Land C4ISR SoS. DLCSPM is the OPI for all six SSE 42 projects listed in Table 2. DLCSPM is therefore required to provide the project management team for those projects.

Name	Value	IOC	Deliverables
Joint Deployable Headquarters & Signal Regiment Modernization ( <b>JDHQSRM</b> )	\$100-249M	2027/ 28	<ul style="list-style-type: none"> <li>• OP IM/IT interoperability</li> <li>• Apps, networks systems</li> <li>• ADM(IM) Enterprise Ext</li> <li>• 1st Canadian Div &amp; CFSJR</li> <li>• Land-joint integration</li> </ul>
Combined Joint Intelligence Modernization ( <b>CJIM</b> )	\$100-249M	2026/ 27	<ul style="list-style-type: none"> <li>• Deployed Top Secret systems &amp; shelters</li> <li>• International enterprise extension</li> <li>• Joint &amp; Coalition interoperability</li> </ul>
Tactical Command & Control Information Systems Modernization ( <b>TacC2IS Mod</b> )	\$500M-1B	2027/ 28	<ul style="list-style-type: none"> <li>• Tactical IM/IT &amp; Interoperability</li> <li>Apps &amp; Systems</li> <li>Vehicle/Platforms &amp; HQ</li> <li>Brigade and below Joint Integration</li> </ul>
Intelligence, Surveillance and Reconnaissance Modernization ( <b>ISR Mod</b> )	\$100-250M	2027/ 28	<ul style="list-style-type: none"> <li>• Sensors modernisation &amp; Interoperability</li> <li>• Brigade and below Joint Integration</li> </ul>
Canadian Land Forces Electronic Warfare Modernization ( <b>CFLEWM</b> )	\$250-249M	2026/ 27	<ul style="list-style-type: none"> <li>• ECM and EW modernisation</li> <li>• Bridge and below with Joint &amp; Coalition interoperability</li> </ul>
Tactical Communications Modernization ( <b>TacComms Mod</b> )	\$1-5B	2027/ 28	<ul style="list-style-type: none"> <li>• Op &amp; Tactical bandwidth &amp; networks</li> <li>• HQs &amp; Vehicle/Platforms</li> <li>• Radio interoperability</li> </ul>

**Table 2 - SSE 42 Projects**

While not the OPI for the projects listed in Table 3, DLCSPM is nevertheless required to collaborate closely with various Project Management Offices and/or other ADM(Mat) Directorates as applicable to coordinate the integration (into Land C4ISR SoS) of new CIS capabilities being introduced by those projects.

<b>Name</b>	<b>Value</b>	<b>IOC</b>	<b>OPI</b>
Joint Fires Modernization ( <b>JFM</b> )	\$100-120M	2024	DASPM
Ground Based Air Defence ( <b>GBAD</b> )	\$250-499M	2024	DASPM
Individual Soldier System Project Cycle 3 ( <b>ISSP</b> )	\$40-50M	2023	DSSPM
Light Forces Enhancement ( <b>LFE</b> )	\$50-99M	2024	DSVPM
Aerospace Coord Centre Modernization ( <b>ASCCM</b> )	\$50-99M	2020	DLCSPM
LAV Recce Surveillance System Upgrade ( <b>LRSS</b> )	\$500M-1B	2020	DAVPM

**Table 3** - Other (non-SSE 42) Capital Projects

# ANNEX G

## SCALED AGILE FRAMEWORK

1 This Annex provides an overview of the Scaled Agile Framework (SAFe®) methodology used by Directorate Land Command Support Program Management (DLCSPM) for software development. Suppliers interested in providing software development services as part of the Land C4ISR Integrated Product Team (IPT) must therefore use an Agile Framework Development methodology such as SAFe.

### 1.1 Scale Agile Framework

1.1.1 For Land C4ISR SoS sustainment purposes, SAFe is broken down into three levels as illustrated in Figure 2 below.

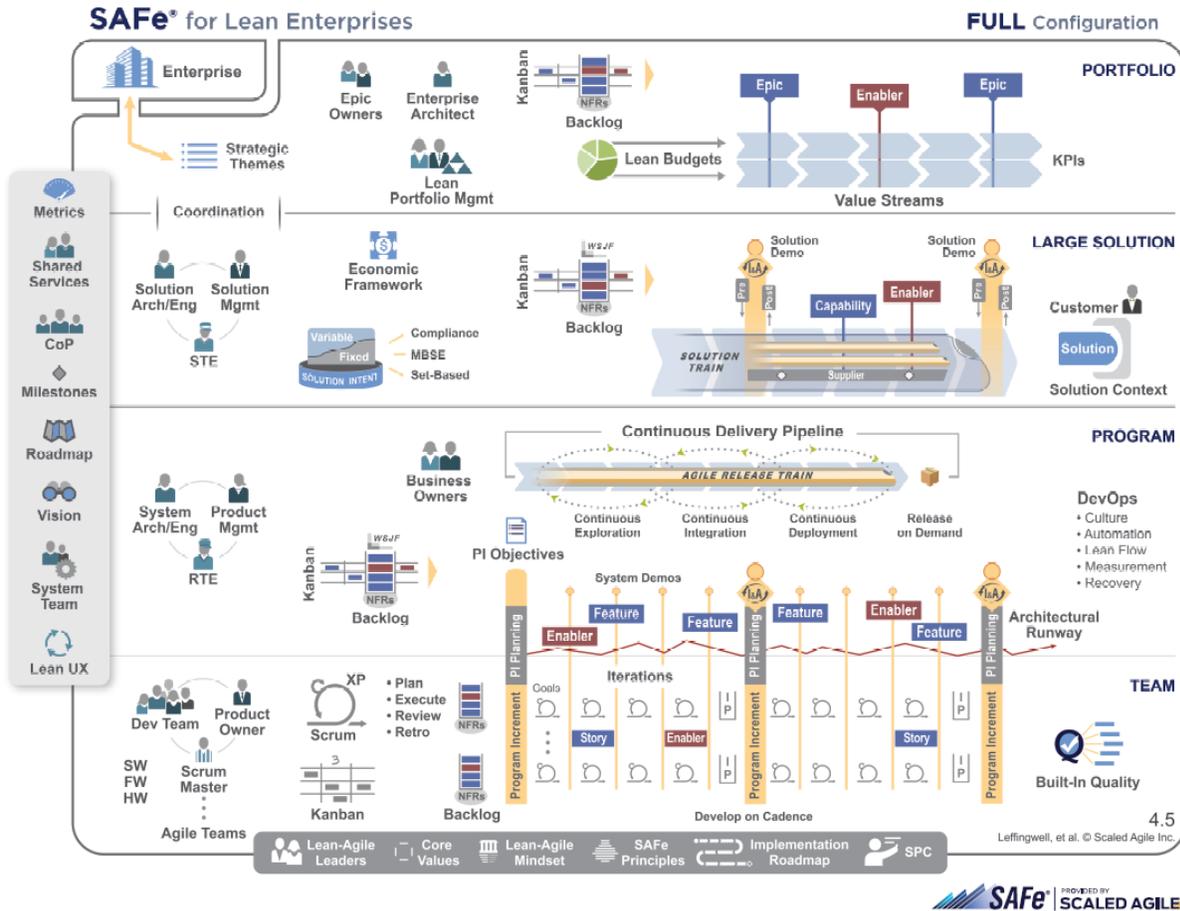


Figure 2 - SAFe® v4.5 Diagram

- 1.1.2 For Land C4ISR SoS sustainment purposes, the following levels are agreed upon notions:
- a. Portfolio: Longer-term Strategic Themes, Epics, and Enablers are defined providing guidance and boundary of focus for the Value Streams. In the context of the Land C4ISR System, the Portfolio level sets the priorities for the Value Streams over a period of 1-5 years IAW the Army's desired managed readiness cycles. This is decided at the IPT Working Groups.
  - b. Large Solution: Each Value Stream within the Portfolio constitutes a Large Solution. The Large Solution Train is comprised of a number of Agile Release Trains (ARTs) and Suppliers (if required). At the Large Solution level, the Portfolio level Epics and Enablers are decomposed into a prioritized Large Solution Backlog of Capabilities and Enablers for consumption by the ARTs. In the context of the Land C4ISR System, the Large Solution level sets the priorities for the ARTs over a period of 6-12 months.
  - c. Program/Team: Each ART is comprised of a Program that can consist of one to many Teams. At the Program/Team level, henceforth referred to as the ART level, the Large Solution Capabilities and Enablers are further decomposed into a backlog of prioritized Features and Enablers for consumption by the Teams. In the context of the Land C4ISR System, the ART level sets the priorities for the Teams over one or several Program Increments (PIs) of fixed duration, typically 12 weeks per PI.

## **1.2 Land C4ISR SoS Integrated Product Team**

- 1.2.1 Currently, the Land C4ISR SoS Integrated Product Team (IPT) consists of DLCSPM as the chair along with the OEMs of the major In-Service Support Contracts; the Land C4ISR Engineering and Integration Support Contract (LEISC), Land C4ISR Transition Software Support Contract (LTSSC), Cyber Security Engineering Support Contract (CSESC), Weapon System Management (WSM) and the ISTAR Support Contract.
- 1.2.2 The IPT will meet regularly to discuss work and overall direction of the Land C4ISR System.
- 1.2.3 Further detailed information on SAFe® process including definitions on key terminology can be found on the SAFe® website <https://www.scaledagileframework.com/about/>.

## 2 General Requirements

### 2.1 Value Streams/Agile Release Trains

- 2.1.1 When the Longer-term Strategic Themes, Epics, and Enablers are defined at the IPT working group, the teams will utilize this information to guide their decisions on what is included in the Value Streams and Agile Release Trains.
- 2.1.2 Work under this PWS will be formulated at each of the planning sessions prior to the start of each Planning Increment (PI) or Agile Release Train (ART). Each PI/ART will run for a twelve (12) week cycle with six (6) two (2) week sprints.
- 2.1.3 The planning session, will involve all of the teams working on software development to determine their capacity for the upcoming PI and agree to what work elements or stories can be accomplished during the PI and each sprint. The planning sessions will involve both Contractor and DLCSPM personnel. The sessions will take into account the Value Streams and will be used to confirm how the PI and ART relate back to the following Land C4ISR Objectives and System Level Operational Requirements:
- Dismounted Voice and Data Integration Within the Mobile Domain
  - Enhanced Battlegroup Command Post Operating in Close Engagement
  - Tactical Coalition Interoperability
  - LCSS Mobile Support of Specialist Platforms
  - HQ Solution Architecture Evolution
  - Active Cyber Defence
  - User Sustainability
  - Android HHDT
  - Federated Mission Network Compliance
  - System Evolution;
  - Flexibility, Growth Capacity and scalability;
  - Integration;
  - Reliability.
- 2.1.4 The outcome from the PI will form the ISTAR deliverable to the IPT, highlighting the agreed to level of effort and schedule for the duration of the PI.
- 2.1.5 The Contractor will be responsible to record key decisions and conversations from the planning session and provide a Record of Discussion. The Record of Decision must include details of the agreed upon work, illustrated via a story board. It must also highlight the stretch goals, risks, concerns and assumptions made at the planning session. The Contractor and Technical Authority will approve/agree to the final content of the report.

### **3 Performance Management**

Below are some metrics that DND is contemplating. Industry feedback would be appreciated on these metrics as well as additional metrics that can be used in this Framework.

#### **3.1 Schedule Performance Index – Story Points**

- 3.1.1 Objective – Track scheduled performance versus actual performance using story points with the aim of continuously improving estimating team capacity.
- 3.1.2 At each planning session stories will be weighted and given a score based on the level of effort expected to be required to complete the story. During the planning session stretch goals will also be indicated and weighted. These are story lines that do not expect to fit within the current PI but could substitute another story or be moved forward if expectations are exceeded.
- 3.1.3 At the end of the PI the Contractor will provide DND a report on planned, stretch and actual story points completed during the PI.

#### **3.2 Test Case Pass Rate**

- 3.2.1 Objective – To track the quality of the solution based on the percentage of passed test cases.
- 3.2.2 The Contractor must track and report at the end of each PI the test case pass rate. This is calculated by  $\text{Test Case Pass Rate} = \frac{\text{Number of Passed Test Cases}}{\text{Total Number of Executed Test Cases}}$ .
- 3.2.3 The individual test plans will be agreed upon by DND and Contractor personnel with both parties being witnesses to the test itself, unless otherwise authorized by the TA.
- 3.2.4 The Test Case Pass Rate value should continuously improve as the project progresses or at the very least stay consistent.

#### **3.3 Defect Density**

- 3.3.1 Definition – A defect is a bug identified by testing during PI and can be linked to the new feature implementation. A bug reported outside this context, such as a SPR reported by use of the software during operation, or an old SPR against the software is not considered a defect.
- 3.3.2 Objective – This measurement is to track the progression of the quality of product code under development. The goal is to see a steady decline in the defect density number which would indicate an increase in the quality of the code being developed.

3.3.3 The Contractor must monitor and report on Defect Density. Indicated by the number of defects found in the software product per size of code. The formula to report on is:  $\text{Defect Density} = \text{Total Number of Defects} / \text{Story Points}$ .

### **3.4 Escaped Defects**

3.4.1 Objective – This measurement tracks the number of bugs that are missed during internal testing and the release environment. The overall goal is to continuously decrease the amount of escaped defects to increase user satisfaction with the end product.

3.4.2 The Contractor will ensure each escaped defect identified is tracked and analysed to prevent similar issues from occurring in the future.

## Annex H

### List of Abbreviations

<b>Abbreviation</b>	<b>Description</b>
ADM(IM)	Assistant Deputy Minister (Information Management)
ADM(Mat)	Assistant Deputy Minister (Materiel)
AI	Artificial Intelligence
ART	Agile Release Trains
ArtyMIS	Artillery Management Information System
ASCA	Artillery Systems Cooperation Activities
BLOS	Beyond-Line-of-Sight
CAF	Canadian Armed Forces
C2	Command and Control
C4ISR	Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (System)
CBRN	Chemical, Biological, Radiological, Nuclear
CGP	Controlled Goods Program
CIS	Communications and information systems
CI	Configuration items
CSD	Coalition Shared Database
CSD-NG	Coalition Shared Database Next Generation
CSESC	Cyber Security Engineering Support Contract
DASPM	Directorate Artillery Systems Program Management
DGMS	Digital Gun Management System
DLCSPM	Director Land Command Systems Program Management
DND	Department of National Defence
DPS	Defence Procurement Strategy
DRP	Defence Renewal Plan
DSEF	Directorate Land Command Systems Program Management Software Engineering Facility
E3	Electromagnetic Environment Effects
EIS	DLCSPM Collaborative Infrastructure Support (EIS)
EC2IS	Engineering Command and Control Information System
EIS CE	Engineering Information System Collaborative Environment
EMC	Electro-Magnetic Compatibility
EMI	Electro-Magnetic Interference
EMSEC	Equipment and Vehicle Platform Emission Security
EMT	Equipment Management Teams
FCP-EE	Federal Contractors Program for Employment Equity
FM	Fairness Monitor
GC	Government of Canada
GDMS-C	General Dynamics Mobile Systems Canada
GETS	Government Electronic Tendering System

GFE	Government Furnished Equipment
HQs	Headquarters
ICE	Intelligence Collection Environment
IFBW	Intermediate frequency bandwidth
IFCSS	Indirect Fire Control Software Suite
IOC	Initial Operational Capability
ILS	Integrated Logistic Support
IP	Intellectual Property
IPT	Integrated Product Team
ISED	Innovation, Science and Economic Development Canada
ISS	In-service support
ISTAR	Intelligence Surveillance Target Acquisition and Reconnaissance
ISTAR ISSC	Intelligence Surveillance Target Acquisition and Reconnaissance In-Service Support Contract
IT	Information Technology
ITB	Industrial and Technological Benefits
IV&V	Independent verification and validation
KICs	Key Industrial Capabilities
Land C4ISR	Land Command, Control, Communication, Computers, Intelligence, Surveillance and Reconnaissance
LCMR	Lightweight Counter-mortar Radar
LCSS	Land Command Support System
LEISC	Land C4ISR Engineering and Integration Support Contract
LTSSC	Land C4ISR Transition Software Support Contract
NABK	NATO Armaments Ballistic Kernel
NATO	North Atlantic Treaty Organization
NCR	National Capital Region
NP	National Procurement
OEMs	Original Equipment Manufacturers
PI	Program Increments
PSPC	Public Services & Procurement Canada
R&D	Research and Development
R&O	Repair and Overhaul
RF	Radio Frequency
RFI	Request for Information
RFP	Request for Proposal
SA	Situational Awareness
SoS	System of Systems
SMB	Small and Medium-Sized Businesses
SOR	System-of-Record
SSE	Strong, Secure, Engaged (Canada's Defence Policy, June 2017)
STANAG	Standardization Agreement (NATO)
TA	Technical Authority
TACIS	Tactical Asset Configuration Information System

TacC2IS	Tactical Command, Control and Information System
TacComms	Tactical Communications
TSIL	Tactical System Integration Laboratory
TSR	Total System Responsibility
VHF	Very High Frequency
VP	Value Proposition
VIIT	Vehicle Installation, Integration and Test
WSM	Weapon System Management