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Bid Fax: (819) 997-9776

LETTER OF INTEREST
LETTRE D'INTÉRÊT

Title - Sujet JDHQSRM	
The Joint Deployable Headquarters Signal Regiment Mod	

Solicitation No. - N° de l'invitation	**Date**
W8486-216408/A	2021-05-07

Client Reference No. - N° de référence du client	**GETS Ref. No. - N° de réf. de SEAG**
W8486-216408	PW-$$RA-057-28219

File No. - N° de dossier	**CCC No./N° CCC - FMS No./N° VME**
057ra.W8486-216408	

Solicitation Closes - L'invitation prend fin

at - à **02:00 PM** Eastern Daylight Saving Time EDT

on - le 2021-08-27 Heure Avancée de l'Est HAE

F.O.B. - F.A.B. Specified Herein - Précisé dans les présentes

Plant-Usine: ☐ **Destination:** ☐ **Other-Autre:** ✔

Address Enquiries to: - Adresser toutes questions à:	**Buyer Id - Id de l'acheteur**
Sparkes, Michelle	057ra

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(873) 455-1558 ( )	( ) -

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Raison sociale et adresse du
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Québec
K1A 0S5

Name and title of person authorized to sign on behalf of Vendor/Firm (type or print)
Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)

Signature **Date**

Canada

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Joint Deployable Headquarters and Signal Regiment capability

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PART 1 - GENERAL INFORMATION

1.1. Purpose

1.1.1. The purpose of this Request for Information (RFI) is to inform Industry of a possible upcoming competitive procurement process for the Department of National Defence (DND) requirement to procure, integrate, and support the modernization of the Joint Deployable Headquarters and Signal Regiment capability.

1.1.2. Public Services and Procurement Canada's intent for this Request for Information is to engage Industry in a consultative process by seeking Industry feedback via the responses to questions identified herein to gain a better understanding of industry capability in achieving the initial operational capability. In addition, Department of National Defence has a requirement to understand the current Industry capabilities, sustainment and affordability of Joint Deployable Headquarter & Signal Regiment on behalf of Canada. The main objectives of this consultative process with industry are to:

    a) Provide industry with initial information on the requirement gathering related to the project;

    b) Invite industry suppliers to request a virtual one-on-one session;

    c) Request industry's feedback on the planned procurement process;

    d) Request preliminary feedback during one-on-one meeting discussions on the information provided and our initial high level requirements;

    e) Request information and feedback regarding indicative cost estimates for proposed solution(s) and learn the capability of industry to satisfy the project requirements;

    f) Obtain information on the impact of acquisition restrictions on the potential future sustainment requirements, including considerations such as Intellectual Property (IP) rights, supply chain collaborations, etc;

    g) Understand industry trends and technical feasibility via feedback on any issues that would impact industry's ability to bid on resulting potential solicitations or to deliver on the department's requirements; and

    h) Inform and engage industry on the Industrial and Technological Benefits Policy, including Value Proposition.

1.1.3. The objective of requesting industry's proposed solutions is to ensure that the Joint Deployable Headquarters and Signal Regiment Modernization (JDHQSRM) project requirement continues to develop in line with the capabilities of Industry. To ensure that the project proceeds with an achievable scope and budget, the information received from Industry will be used to develop accurate requirements mapped to accurate costing models based on the equipment and sustainment needs recommended by Industry. To facilitate the accuracy of the models, Canada requires detailed performance data on each system component, their sustainment needs, and any integration complexities or constraints that must be considered when scaling the system to evaluate various operation scenarios.

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1.1.4. The objective of requesting indicative pricing associated to the proposed technical solution is to ensure a level of accuracy which will allow Canada to prepare documentation for further JDHQSRM project approval gateways. In addition to the various unit costs associated to the suggested solution for items such as, but not limited to, Communication Systems hardware, Command & Control (C2) software, training and simulation software, and equipment, the project needs to obtain from respondents associated costing for activities, reports, and sustainment associated with delivery and maintenance of equipment.

1.1.5. Interested suppliers are encouraged to review the documentation attached to the Request for Information and provide comments and/or questions, in writing, to the Public Services and Procurement Canada Contracting Authority identified herein at section 1.6.

1.2.   Requirement

1.2.1. Current capabilities are ill suited to the mobility required at the Joint Divisional headquarter and tactical level. They require too much time for setup and are too complex to be pan-domain interoperable for autonomous data sharing. Furthermore, the forecasted data exchange requirements of the Army of tomorrow exceeds current capabilities. There is both lack of bandwidth and range to fullfil the needs of key enablers to complete their assigned missions, both current and future. Project deliverables will include:

a)   The next generation of Operation Level Networking to enable a Joint Task Force Headquarters with greater autonomous data sharing;

b)   Applications and Tools to enable C2 across deployed pan-domain forces and Mission Partners; and

c)   Training and Institutionalization of Capabilities enabled by simulations.

1.2.2. See ANNEX A – JDHQSRM Description for more details on this requirement.

1.3.   Potential Scope and Constraints

1.3.1. A National Security Exception and/or National Security Exception – Special Contracting Caveat may apply to these procurement processes.

1.3.2. The Request for Information is not subject to the Controlled Goods Program, however, any additional information and any resulting competitive process will be subject to the program. For information pertaining to the Controlled Goods Program, please refer to the Public Services and Procurement Canada (http://ssi-iss.tpsgc-pwgsc.gc.ca/index-eng.html) website.

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

1.3.4. There are no security requirements associated with this Request for Information, however, there will be security requirements associated with any resulting competitive procurement process. Additional information on the security requirements will be communicated on https://buyandsell.gc.ca/ as part of the upcoming competitive procurement process.

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

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

1.4.   Legislation, Trade Agreements, and Government Policies

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

a)   Defence Production Act (DPA);

b)   Controlled Goods Program (CGP);

c)   Federal Contractors Program for Employment Equity;

d)   Government Contract Regulations (GCR);

e)   Public Services and Procurement Canada Policy on Green Procurement;

f)   Industrial & Technological Benefits (ITB) Policy; and

g)   Software Licensing.

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

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1.5. Schedule

1.5.1. The following is the tentative schedule associated with both the Request for Information and potential competitive procurement process:

    a) Release of Request for Information: May 2021

    b) Industry Day Presentation: May 2021

    c) Virtual One-on-One Meetings for Supplier consultations via teleconference: 15 June -15 July 2021

    d) Deadline for Request for Information Submission: 27 August 2021

    e) Potential Request for Information Amendment - Sustainment Questions: February 2022

    f) Request for Information Closing Date: Summer 2022

    g) Potential release draft Request for Proposal(s): 2023

    h) Potential release final Request for Proposal(s): 2025

    i) Potential Contract(s) Award: 2026

    j) First Delivery / Initial Operating Capability: 2028

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

1.6. PSPC Contracting Authority

1.6.1. All information, communication or correspondence must be directed to the Contracting Authority ONLY. No other member or representative of the Government of Canada can be informed, challenged or otherwise communicated with, including carbon copy or blind carbon copy on any verbal, emails or written correspondence regarding this Request for Information.

1.6.2. Any correspondence must be directed, in writing in electronic format only and in either official language of Canada, to the Public Services and Procurement Canada Contract Authority's positional mailbox identified below, and with "W8476-216408 JDHQSRM RFI" in subject line to ensure delivery:

    Michelle Sparkes
    Contracting Authority
    Public Services and Procurement Canada
    Generic E-mail: TPSGC.PADivisionQD-APQDDivision.PWGSC@tpsgc-pwgsc.gc.ca

1.6.3. Changes to this Request for Information may occur and will be advertised on the Government Electronic Tendering System, https://buyandsell.gc.ca/.

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1.6.4. Canada asks interested parties to visit https://buyandsell.gc.ca/ regularly to check for changes, if any.

1.7.   Industry Interaction

1.7.1. To ensure a successful procurement process for the provision of JDHQSRM, Canada intends to engage Industry in a consultative process. The consultative process associated with this Request for Information includes specific questions aimed to help determine the viability and capabilities of such a scope and may include follow-up questions by means of amendments to this Request of Information.

1.7.2. An **Industry Day Presentation** will be posted on our Buy and Sell website. The Industry Day Presentation will allow Canada to provide industry representatives with information about the project and to communicate high-level equipment capability and sustainment requirements. Representatives from Public Services and Procurement Canada, the Department of National Defence, and Innovation, Science and Economic Development Canada will provide their speaking notes on procurement requirements, technical requirements, and industrial technological benefits, respectively.

1.7.3. Virtual One-on-One meetings between industry and Canada will be held over the period of 15 June to 15 July 2021. Industry will be asked to submit their business presentations and to provide access to any technical demonstrations to reserve a one-hour teleconference with Canada. Industry representatives may ask questions and seek information required to gain a sound understanding of Canada's requirements. Topics for discussion may include potential procurement issues and opportunities for resolution, innovative solutions, and the overall potential procurement and sustainment strategies. Any Supplier questions and Canada's answers will be published on Buy & Sell website following all One-on-One Meetings.

1.7.4. Canada's intent in seeking industry feedback is mainly to solicit feedback and information on the following topics:

a)   Understanding current and future industry capabilities relevant to project platforms and scope;

b)   Obtaining proposed solutions from industry to meet the high level sustainment requirements;

c)   Establishing indicative cost estimates associated with potential solutions;

d)   Discussing potential Intellectual Property rights, supply chain collaboration, etc., which may influence a potentially more comprehensive sustainment;

e)   To understand current market capacity and interest;

f)   Communicating key procurement steps, including development of sustainment options through follow-on Request for Information questions and development of a Draft Requests for Proposals; and

g)   Application of the Industrial Technological Benefits policy including Value Proposition.

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1.7.5. One-on-One meetings will take place in 60 min slots between the hours of 9:00 am and 15:30 pm EDT during the period of 15 June to 15 July 2021 on a first come basis. If one hour is insufficient, any additional Industry Demonstrations may be arranged in 2 hour slots at 09:00 AM or 13:00 PM EDT from 15 to 29 July 2021. Companies may indicate their preferred time and date but reservations will be allotted in the order of receipt. One-on-one meetings may be rescheduled to a mutually agreed date and time, if there are technical issues.

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

1.7.7. Participants will be asked to submit any additional feedback to the Industry Interaction, in writing, to the Public Services and Procurement Canada Contracting Authority, identified within.

1.7.8. Respondents are asked to use the Annexes C through E Response Matrix (in Excel) as provided for their response, supplemented with additional information as needed.

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

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

1.8.   Notes to Interested Suppliers

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

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

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

1.8.4. Respondents may provide documents / information / data collected as commercial-in-confidence (and if identified as such, will be treated accordingly by Canada). However, Canada reserves the right to use the information to assist them in drafting performance specifications and for budgetary purposes in consultation with both national and international stakeholders. Requirements are subject to change, which may be as a result of information provided in response to this Request for Information. Participants are advised that any information submitted to Canada in response to this Request for Information may or may not be used by Canada in the development of the potential

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subsequent any Request for Proposals. The issuance of this Request for Information does not create an obligation for Canada to issue a subsequent Request for Proposals and does not bind Canada legally or otherwise, to enter into any agreement or to accept or reject any suggestions.

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

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

1.8.7. Participation in this Request for Information 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 Request for Information. Similarly, participation in this Request for Information is not a condition or prerequisite for the participation in any potential subsequent solicitation.

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

1.9.   Closing date for the Request for Interest

1.9.1. Respondents are asked to submit their responses to the questions posed in this Request for Information by 1400 EDT on 27 August 2021.

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1.10. Attached Documents (Parts 2 and 3)

1.10.1. Part 2 - Project Information

    a) Annex A – Joint Deployable Headquarters and Signal Regiment Modernization Description

    b) Annex B – Sustainment Information

1.10.2. Part 3 - Response Matrix (Excel)

    a) Annex C – Industrial Technological Benefits and Value Proposition

    b) Annex D1 – Acquisition Costing Requirements

    c) Annex D2 – Annual Sustainment Cost of Proposed Solution

    d) Annex E – High Level Mandatory Requirements and Acquisition Questions

1.10.3. Part 4

    a) Annex F – Glossary of Terms

1.11. Submission of Responses

1.11.1. Respondents are requested to provide their responses electronically only to the Contracting Authority email address identified above. Files must be zipped to ensure email size is under 8 MB or alternatively, must provide the Supplier's Sharepoint link and permission to access.

1.11.2. No physical information of any type will be accepted.

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PART 2 – PROJECT INFORMATION

Annex A – Joint Deployable Headquarters and Signal Regiment Modernization Description

Annex B – Sustainment Information

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ANNEX A – JOINT DEPLOYABLE HEADQUARTERS AND SIGNAL REGIMENT MODERNIZATION DESCRIPTION

1.1.   Overview

1.1.1. The last decade has seen Canada deploy military forces, both domestically and internationally, to meet Government of Canada (GC) objectives. This has included major deployments to Haiti, Iraq and Afghanistan; and domestic operations such as flood relief operations. All of these have been complex operations that have involved deployments of elements from the Royal Canadian Navy (RCN), Canadian Army (CA), Royal Canadian Air Force (RCAF), and Special Operations Command (CANSOFCOM). They also involved other government departments, civilian organizations and most importantly, have been done in co-operation with other countries, organizations and alliance members, such as the UN and NATO. To better manage the complexities of these operations, the Canadian Joint Operations Command (CJOC) provides a single operational level military Command to provide Command & Control (C2) for CAF operations, both domestic and expeditionary.[1]

1.1.2. Canada and its Allies are in a persistent state of competition with adversaries who use all instruments of national power to undermine the international rules-based order.[2] Moreover, operations on todays' modern battlefield have transitioned from analog to digital information and are now conducted in a digitized environment in order to improve the speed, accuracy, and security of shared information. The CAF and CJOC have been increasingly challenged to provide the required C2 tools and systems to successfully manage operations in a rapidly merging pan-domain[3] and contested environment. Using a range of tools, the CAF must develop a sophisticated awareness of the information and operating environment to better predict and respond to crises. It must also be able to connect with allies to facilitate this understanding. In addition, rapidly advancing technology has also made it challenging to keep pace with both adversaries' C2 capabilities and maintaining interoperability with CAF partners, both military and civilian.

1.1.3. It is particularly noteworthy that there are a number of other closely related projects that will deliver strategic to tactical level Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) capabilities that were identified in Canada's Defence Policy Strong, Secure, Engaged (SSE). As key enablers within the C4ISR portfolio, they are intimately interlinked at the capability, project and system level, and all will come from an industrial base where communication technologies continue to rapidly advance. In moving forward, it is considered imperative that we consciously align our projects, integrate across domains, and collaborate with allies and partners to ensure JDHQSRM capabilities are coherent, modern, complete, and interoperable across pan-domain and with our allies. Additionally, following an agile and iterative capability development program in order to optimize capability life span, may prove to be an innovative and cost effective approach to maximizing operational efficiency.

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[1] CANSOFCOM is also a force employer, albeit as an independent Joint Force.

[2] See PFEC

[3] Pan-Domain include traditional domain such as Land, maritime and air domain, and also includes the cyber, space, and information domains. See Pan-Domain Force Employment Concept.

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1.2.   Introduction

1.2.1. The JDHQSRM project will provide CJOC deployable C2 systems and tools, with supporting communication information systems (CIS),[4] to enable Commander CJOC and deployed Joint Divisional level commanders to C2 assigned forces. This deployable C2 system and communication infrastructure will support the execution of all CJOC missions, being domestic or international as dictated by government. This will further enable rapid interoperability with deployed CAF tactical forces, multinational, governmental and public partners, and enable the operational extension of CAF enterprise systems and services. JDHQSRM will provide the general architecture to enable these capabilities and will also specifically focus on equipping and enabling the 1st Canadian Division (1st Cdn Div) HQ and the Canadian Forces Joint Signal Regiment (CFJSR) to plan, deploy and operate these C2 capabilities.

1.2.2. The mission of CJOC is to prepare for and conduct CAF operations to defend Canada, to assist in the defence of North America, and as directed, to promote peace and security abroad.

1.2.3. When mission tasked, CJOC as the single operational level military Command to provide C2 for CAF operations, translates the broad strategic direction provided by the GC and National Defence Headquarters (NDHQ) into operational direction required by the deployed Headquarter (HQ, Theatre Signal Unit (TSU) and tactical forces in order to plan and execute their assigned missions.

1.3.   Missions

1.3.1. The Canadian Defence Policy — Strong, Secure, Engaged — presents the vision and approach to defence by the Government of Canada (GC). "With significant investments in care for personnel and families, equipment and training, and new capabilities, Canada's new defence policy supports Canadian Armed Forces members' dedication and role in making Canada strong at home, secure in North America, and engaged in the world."[5]

1.3.2. Strong, Secure, Engaged specifically states that "At any given time, the Government of Canada can call upon the Canadian Armed Forces to undertake missions for the protection of Canada and Canadians and the maintenance of international peace and stability." Strong, Secure, Engaged ensures the Canadian Armed Forces will be prepared to:

  a) Detect, deter and defend against threats to or attacks on Canada;

  b) Detect, deter and defend against threats to or attacks on North America in partnership with the United States, including through NORAD;[6]

  c) Lead and/or contribute forces to North Atlantic Treaty Organization and coalition efforts to deter and defeat adversaries, including terrorists, to support global stability;

  d) Lead and/or contribute to international peace operations and stabilization missions with the United Nation, North Atlantic Treaty Organization and other multilateral partners;

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[4] Communication Information Systems (CIS) includes, but not limited to, computer software and hardware, telecommunications to connect hardware to form a network, databases and data warehouse, and human resources and procedures.

[5] The Honourable Harjit S. Sajjan, Minister of National Defence, June 7th, 2017.

[6] North American Aerospace Defence Command.

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

f) Provide assistance to civil authorities and law enforcement, including counterterrorism, in support of national security and the security of Canadians abroad;

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

h) Conduct search and rescue operations.

1.3.3. This policy ensures the Canadian Armed Forces will be prepared to simultaneously:

a) Defend Canada, including responding concurrently to multiple domestic emergencies in support of civilian authorities;

b) Meet its NORAD obligations, with new capacity in some areas;

c) Meet commitments to North Atlantic Treaty Organization Allies under Article 5 of the North Atlantic Treaty;

d) Contribute to international peace and stability through:

(1) Two sustained deployments of ~500-1500 personnel, including one as a lead nation;

(2) One time-limited deployment of ~500-1500 personnel (6–9 months duration);

(3) Two sustained deployments of ~100–500 personnel;

(4) Two time-limited deployments (6–9 months) of ~100–500 personnel;

(5) One Disaster Assistance Response Team (DART) deployment, with scalable additional support; and

(6) One Non-Combatant Evacuation Operation (NEO), with scalable additional support.

1.3.4. The capabilities to be provided by the project are applicable to core missions (a) through (h), within his ability to deliver the transport layer for a fully digitalize and interoperable network, that is operationally ready at all times and capable of deployment throughout the full spectrum of operations.

1.4. Organization

1.4.1. To better manage the complexities of the pan-domain operations, CJOC was created in October 2012. CJOC provides a single operational level military Command to provide C2 for CAF operations, both domestic and expeditionary.[7] CJOC translates the broad strategic direction provided

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[7] CANSOFCOM is also force employers, albeit as an independent Joint Force.

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by the GC and NDHQ into operational direction required by the deployed tactical forces[8] to plan and execute their assigned missions.

1.4.2. CJOC HQ, is not a deployable HQ. Instead, CJOC relies on deployable formations and units from within the RCN, CA, RCAF and CJOC itself to provide the deployable JTF HQs. More specifically, the 1st Cdn Div HQ and the CFJSR are both CJOC units that have the mandate to directly force generate a Joint Deployable Headquarters (JDHQ) in support of CJOC operations.

1.4.3. The 1st Cdn Div HQ is organized, manned and tasked especially for expeditionary and short notice operations. Specifically, the 1st Cdn Div HQ is able to support deployment of a JTF HQ, a NEO HQ, DART HQ and a National Command Element (NCE) HQ as required by CJOC Contingency Plans (CONPLANS). These CONPLANS are described below. In general while the CAF, through the Services and CJOC, has the manning capacity to force generate JTF HQs, deployable C2 systems and capabilities are limited and require modernization to enable these HQs to effectively execute their operational roles and responsibilities, especially within a Coalition framework.

1.4.4. The CFJSR is the CJOC unit that has primary responsibility for provision of C2 and Communications support to JTF HQs deployed by the CAF. CA, RCAF, and RCN also have similar units that can provide limited CIS support to Service generated JTFs. The Service CIS Units are primarily focused on providing level 3 tactical CIS support[9], so normally require support and augmentation from CFJSR when supporting a JTF. The project will modernize the communications and network systems used by CFJSR to support a JDHQ.

CONPLAN[10]	Description
JUPITER	CONPLAN JUPITER codifies national responsibilities, procedures and capabilities for the deployment and support of CAF committed to major international operations, up to full-spectrum operations.
RENAISSANCE	CONPLAN RENAISSANCE addresses the conduct of CAF humanitarian and disaster relief operations worldwide, including CAF support to the provision of humanitarian aid within North America. Referred to as DART.
ANGLE	CONPLAN ANGLE describes a "core Joint task force" that is led by Global Affairs Canada (GAC) to deploy on short-notice and assist evacuation efforts of entitled Canadians within an affected nation. Referred to as Non-Combatant Evacuation Operations (NEO).

Table 1: JDHQSRM related CONPLANS

1.4.5. The CAF C2 construct (figure 1) will continue to be based on Joint deployable formation of JTF HQ with subordinate command elements[11] tailored to the operation's needs. The JTF HQ is composed of a NCE that is providing the National Command Authority for deployed Canadian elements, and the Joint Task Force Support Component (JTFSC) that is providing the logistic and CIS integral combat support (CS) to the JTF HQ and the extension of the Command & Control Information System (C2IS) to subordinates Command Elements HQs. Within a Multinational (MN)

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8 Tactical Forces include RCN Ships, Army units and RCAF Squadrons and planes the actual military forces.

9 Level 3 — Tactical/Platform/Mobile: The C2 and communication elements that relates to tactical operations, typically focusing on C2 capabilities on mobile platforms, such as vehicles, planes and individual soldiers.

10 CJOC Website for CONPLANS: http://intranet.mil.ca/en/operations-exercises/conplans.page

11 Subordinate Command Elements: Land Component Command (LCC), Air Component Command (ACC), Maritime Component Command (MCC), and Special Operations Component Command.

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framework (figure 2), the JTF HQ and subordinate Command Elements HQs, which may be led by the Canadian Forces, or by a Mission Partners (MP) within the coalition.
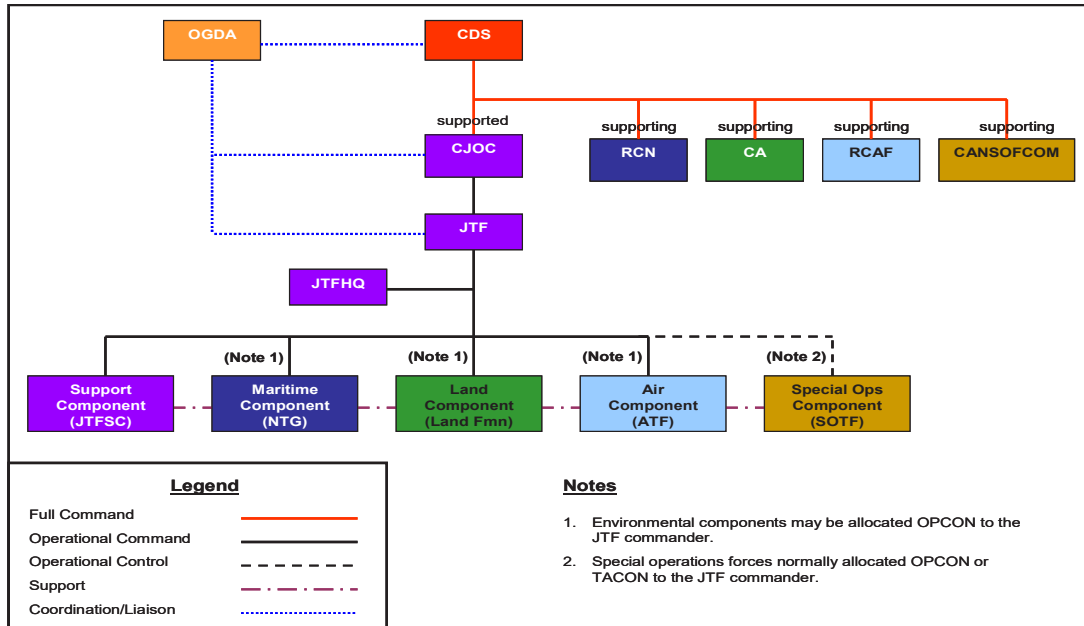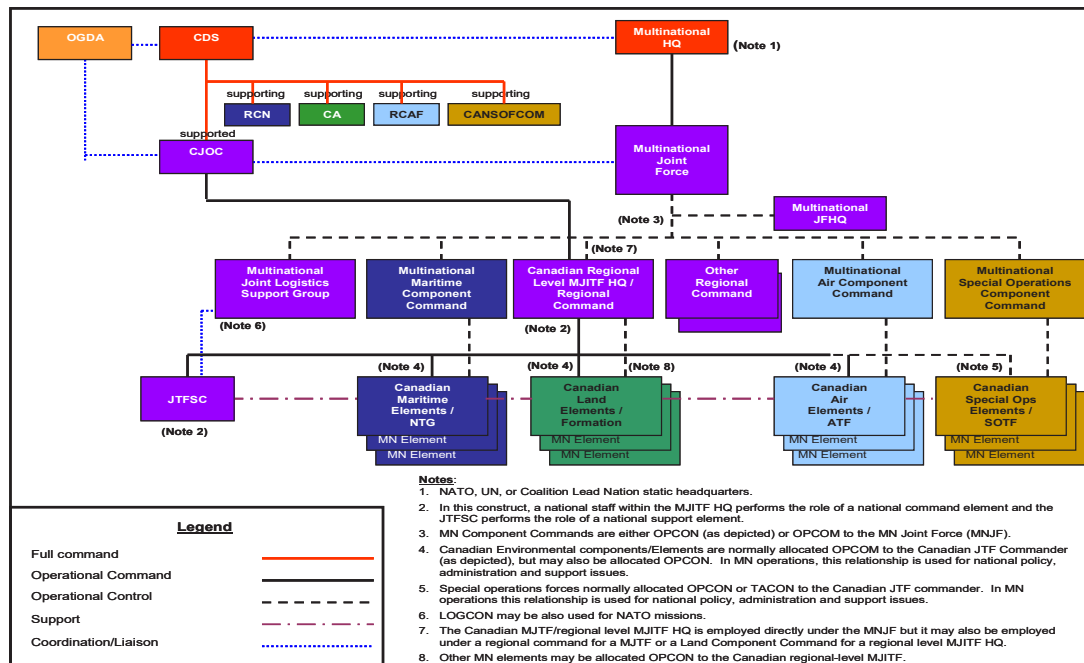

Figure 1: CAF JTF Command & Control construct

Figure 2: Multinational JTF Command & Control construct

1.4.6. A deployed command and JTF HQ require capable deployable C2 system, with supporting communication infrastructure, to effectively exert C2 over assigned forces. C2 systems include the software tools, databases, computers and networks that enable commanders and staff to effectively

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plan, monitor and direct operations. The supporting communications infrastructure includes the radios, satellite communication capabilities, cabling and other communication methods that provide network connectivity to deployed commanders and HQs. Frequently commercial communications links are used to provide required operational connectivity. Critically, the C2 systems and communication infrastructure must enable communication and interoperability back to Canada, amongst all Canadian HQs and units deployed on the operation, as well as providing connectivity and interoperability with JIMP partners. Frequently a JTF may be assigned command or control relationships with JIMP partners, thus the C2 systems must provide the high level of capabilities required to enable successful execution of these relationships.

1.4.7. CONPLAN JUPITER uses the term Theater Signal Unit (TSU) to describe the deployed unit that provides the JTF the C2 and communication support required to exert C2 over deployed forces and to communicate with CJOC and higher coalition HQs.

1.4.8. During recent operations and exercises, such as Op IMPACT (Kuwait),[12] Op UNIFER (Ukraine)[13] and JOINTEX series (NATO),[14] the CAF has struggled to provide the required deployed C2 system and supporting communications infrastructure to fully and effectively support commanders and staffs at the JDHQ. Detailed and specific examples of this are given in the following paragraphs, but some of the key challenges were:

a) **Timeliness and Flexibility:** It has typically required a number of operational rotations to fully deploy and establish required C2 Capabilities; early rotations typically relied on interim C2 capabilities. Similarly, as the mission C2 requirements and relationship changed, an extend planning and implementation period has typically been required to provide the required C2 systems and communication system upgrades;

b) **C2 Systems Services, Integration and Interoperability:** Provision of rich C2 system services to deployed divisional commanders, which are integrated into national enterprise services and interoperable with JIMP partners, has proven to be challenging. C2 system services include capabilities such as secure video teleconferencing (SVTC), email and chat systems and the ability to exchange military plans and a common understanding of the operational situation. This challenge has been exacerbated by the rapid advances in technology: as technology advances there are continually more C2 services that need to be planned, supported, integrated and made interoperable;

c) **Complexity, Training and Support – Enterprise and Deployed System Integration:** As operational requirements and communication technologies have rapidly advanced, C2 system and communication capabilities have also rapidly evolved. This has resulted in the provision of capable, but highly complex, C2 systems. This has further created a requirement for significant adaptation of the operational and technical training and support practices. Specifically, there used to be a fairly clear separation between the services and support provided by enterprise or garrison systems and those services and capabilities provided by deployed systems. The rapid advancement of communication capabilities is erasing this divide. The CAF has been challenged to evolve training and support practices so as best capitalize on these capabilities.

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[12] CJOC Statement of Capability Deficiency — Deployment and Management of Theatre Network 28 Aug 2015 (Draft)

[13] Ibid

[14] JOINTEX 15/TRIDENT JUNCTURE 15 (NATO) POST EXERCISE REPORT 04 August 2016

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1.4.9. By itself, the JDHQSRM project will not be able to resolve all of these issues. Much more so than with other capability types, such as vehicles, rifles or ships, C4ISR capabilities are intimately and massively interlinked at the capability, project and system level. A program approach and view are required to fully understand the context within which the project will deliver. The Joint Capability Framework (JCF), developed as part of the Capability Based Planning (CBP), provides a four levels tiered depiction of C2 and communication systems that provide a useful context to situate the project model. The C2 and communication levels are:[15]

a) **Level 0 – Enterprise:** The C4ISR and communication elements that relate to Enterprise and world-wide (global) capabilities provided in association with Allies;

b) **Level 1 – Theatre:** The C4ISR and communication elements that relates to the strategic-operational level that extends communications from the national strategic elements (GC) and the CDS to all deployed CAF forces and JTF under command of the CDS;

c) **Level 2 – Operational:** The C4ISR and communication elements that relate to the in-theatre communications systems, networks and agreements made by and available to Commanders of CAF forces and JTF deployed for operational purposes; and

d) **Level 3 – Tactical/Platform/Mobile:** The C4ISR and communication elements that relates to tactical operations, typically focusing on C4ISR capabilities on mobile platforms, such as vehicles, planes and individual soldiers. This typically requires decentralized, disruptive tolerant C4ISR systems that do not rely on fixed infrastructure.

1.4.10. As shown in figure 3 below, JDHQSRM's project will primarily focus on delivering capabilities at Level 1 and Level 2. To provide a more complete picture, select key related major capital projects have also been included on this figure. In general ADM (IM) projects, often sponsored by other L1s, implement the Level 0 and the upper elements of the Level 1 capabilities. The lower level capabilities, as they focus more on deployed capabilities and are more closely integrated with weapons systems, are typically implemented by ADM (Mat). The interdependency sections, will provide specific and more detailed description of these interrelationships.

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[15] These definitions are derived from the 2016 version of the Joint Capability Framework (JCF).

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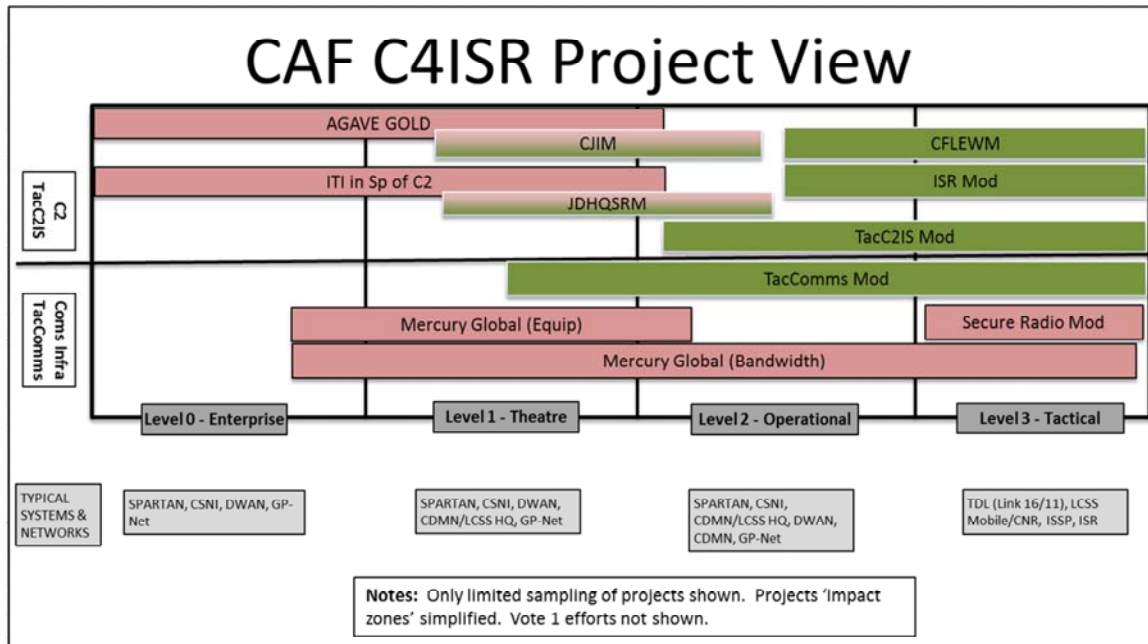
Figure 3: CAF C4ISR Project View.

1.5. Project Scope

1.5.1. The scope of the project includes the deployable C2 systems and tools, with supporting communication information systems to facilitate interoperability with Mission Partners, and where appropriate are compliant with ratified agreements, such as with NATO and FVEY. The scope includes the following system components and capabilities:

   a) Deliver intuitive, integrated and interoperable suite of automated Joint Divisional level C2 applications and tools tailored to key user requirements (i.e. Joint Operational Planning Process, and Joint Common Operating Picture;

   b) Deliver a digitized CAF mission network to enhance the voice and data traffic, provide automation and enhance service delivery that can interconnect with enterprise and coalition C2 systems; and

   c) Deliver Training and Institutionalization of capabilities.

1.5.2. In respect to the project, the desired intent is to take an agile and iterative capability development procurement approach to enable the continual upgrading of capabilities throughout the capability life time. This should provide an improved ability to adapt capabilities as operational conditions and requirements change, and as new technologies become available.

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1.6. Role and Function

1.6.1. The JDHQSRM's project will be focused on improving the deployable JTF communication with an integrated, interoperable, modular, mobile and easily planned, managed and operated digital communication network, in order to enable the planning, coordination and synchronisation of C2 on the battlefield.

1.6.2. The cornerstone of a modern, integrated C2 system is a digital network. The deliverables will need to support and facilitate information exchange in real/near-real time, static or on the move, on high or low bandwidth capacity. The achievement of this will guarantee optimized information exchange to support C2, improved force protection, maximum mobility and increase lethality in support of operational missions.

1.6.3. The implementation of digital standards and memorandums of agreement adopted by allies will improve our interoperability with coalition partners.

1.7. Threat Analysis – Operating Environment

1.7.1. The success of all operations, particularly in high intensity conflicts, is based on the soldier's ability to observe, orient, decide, and act more quickly than an adversary. Thus, the C2 system needs to enable a fast and reliable decision-action cycle.

1.7.2. Based on the Strong, Secure, Engaged policy review, the guidance on the threat environment that JDHQSRM needs to be able to operate in is very broad. The entire operational spectrum of conflict from peace through war must be covered, including potential threats such as terrorism and conventional state actors. The capability will be required to address and operate within the following types of conflicts and threats:

    a) Future adversaries may be nation states or, alternatively, terrorist and criminal groups and other non-state actors;

    b) Future operations may be in far distant theatres or in closer regions to Canada including but not limited to urban, arctic, forest, jungle or desert terrain;

    c) The Canadian Armed Forces must be developed as a balanced force able to shape the environment and/or answer combat challenges that are considered credible priorities;

    d) The Canadian Armed Forces must be a force that excels in Joint, Interagency, Multinational and Public operations; and

    e) The Canadian Armed Forces must continue to operate in degraded, congested, and denied cyber and electromagnetic environments.

1.7.3. The Pan-Domain Force Employment Concept adds that this is an era of dangerous competition. Canada's adversaries present a concerted, sustained and damaging challenge to the International Rules-Based Order upon which the nation's security and prosperity depends. The characteristics of this situation present five imperatives:

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a) We face a continued state of competition, confrontation and, potentially, conflict. We can no longer base our thinking and planning on a simplistic binary conception of war and peace;

b) Our adversaries are challenging us in the cyber, space, and information domains as well as in the land, maritime, and air domains. We must meet this challenge across all domains;

c) Military power alone is insufficient to deter or defeat the aggressive actions of these hostile powers. We must coordinate the military instrument with other instruments of national power;

d) The Canadian Armed Forces cannot deter or defeat the aggression of these powers alone. We must ensure our plans and preparations are tightly connected with those of our North Atlantic Treaty Organization and Five Eyes allies as well as key regional partners such as Japan and South Korea; and

e) This competition is global in nature and will persist over many years. These rival powers threaten us at home and abroad. We no longer have the luxury of treating the defence of Canada as independent from threats elsewhere in the world. We must strengthen North American defences while remaining globally coherent and we must account for the long-term nature of the challenge.

1.7.4. The systems will be supported and maintained by a variety of technicians from the Joint Communities. The trade specifications and in turn the level of training as well as the time to train communications technicians is different, and as result the level of competencies are not the same. This means that the system designers must be sensitive to this reality; and endeavor to ensure that the systems are simplistic enough to enable support, i.e. troubleshooting, etc. to be undertaken by technicians who have different competency levels. The CAF must be prepared to deploy and maintain deployable operational communication systems capabilities with limited human resources. To this end, simplicity and modularity are key capability features this project will be seeking.

1.8.   Concept of Operations

1.8.1. Figure 4 below describes the scope of the project and current operational interoperability and capabilities. The area contained within the dash-dotted lines shows the scope of the project. Within this scenario, the JTF HQ is considered as an Joint Divisional HQ organization that allows the JTF Commander and staffs for deliberate operational planning and orders that directs operational objectives/effects into tactical actions to be actioned by Tactical Commanders within the Joint Operating Area (JOA). These Tactical HQ's may not be collocated, but widely dispersed across the JOA in order to deliver desired effects. The Joint Deployed Mission Network is a huge information hub, where data and information enters, is processed and exist in the form of orders through Operational Actions, mainly executed by the Tactical Commander. The Joint Divisional Headquarters plays an important role to coordinate logistics support across CAF tactical units and between coalitions partners. 1st Cdn Div HQ is the primary organization that required an capability to support the Theater Activation, Theater Opening, and Theater Closing phases; phases that heavily involve logistic support. Currently, CAF do not have an integrated "tactical logistics capabillty" that can seamlessy shared logistic information with coalitions partners.

1.8.2. Althought the Joint Divisional HQ has been historically from past operations a more static HQs, the future operating concept will require the Joint Divisional HQ to be movable within the JOAs

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and potentially being more active in the tactical domains. JDHQSRM project will seek to deliver capabilities that can be movable to type of environments as described in section 1.7.
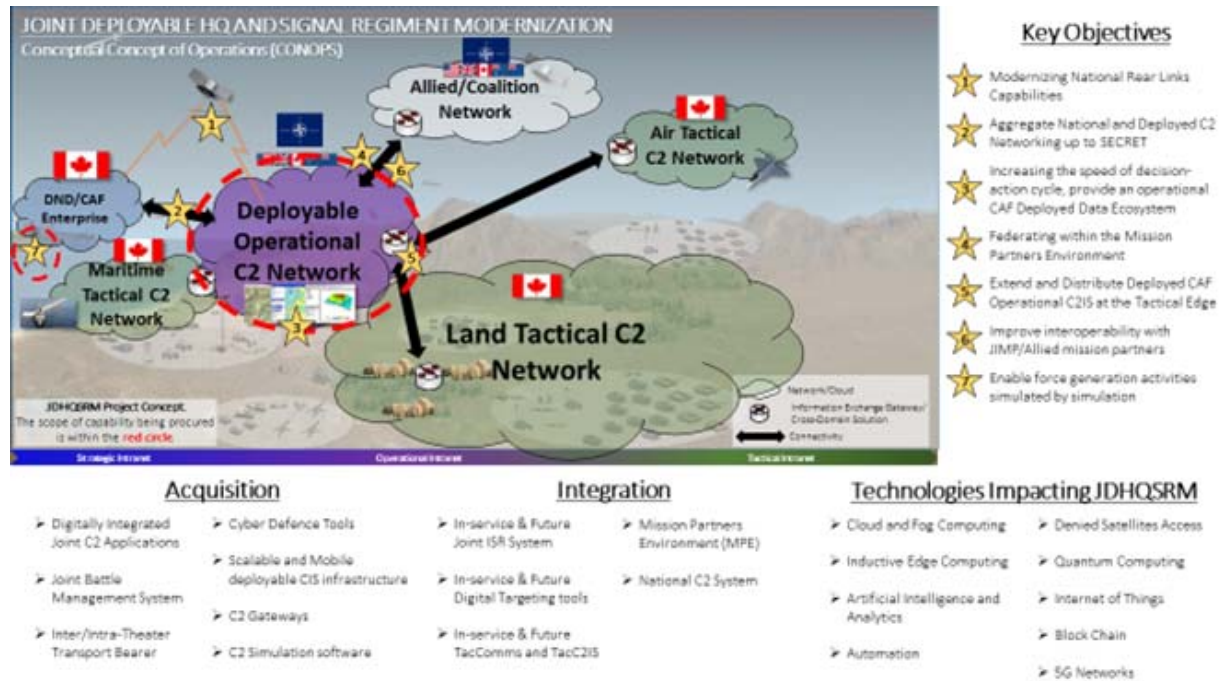

Figure 4: Operational View (OV) JDHQSRM Conceptual CONOPS

1.8.3. To achieve this objective, JDHQSRM project will deliver digitalized capabilities that will support the Joint Deployable Headquarter at the Tier 1 and Tier 2 level, with these capabilities varying depending on the mission type. Furthermore, the project will modernize the Canadian Deployable Mission Networking capabilities (CDMN) to deliver a network capabilities that collectively increase network interoperability across pan-domain and Mission Partners, increase of resiliency through range and bandwidth, operate in satellite-denied environments and provide significant reduction in size, weight and power over legacy systems, thus supporting the Canadian Armed Forces requirements. The highest priority for JDHQSRM project is to deliver the network foundation to fully digitalized Pan-Domain Command Support System.

1.8.4. The JDHQSRM project will deliver capabilities to provide the Canadian Joint Operations Command (CJOC) the ability to support the Canadian Armed Forces in the range of conflict identified by the Pan-Domain Force Employment Concept. Whereas these conflict types are numerous and diversified, three traditional approaches are portrayed: "conventional warfare", "limited warfare" and "grey zone conflict". The project's capabilities must be able to perform under these adversary activities anywhere CAF forces are operating.

1.8.5. JDHQSRM project Communication Systems must support multiple Mission objectives[16] and Joint Operational effects from deliberate planning, targeting cycle, medical support, cyber defence and attacks, etc. To this end, it is important that the capabilities be based on a clear definition of the operational and command requirements. The project technical specifications must align to meet a

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[16] "A Mission Thread (MT) is the description of the end-to-end set of activities and data that are required to successfully execute an element of an operational mission". See Mission Threads And Their Associated Services For Coalition Operations, US CIAV, 2015

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series of principles that are present regardless of whether or not they are explicitly declared by the operational community. These principles are essential to ensure the final systems set the conditions to enable success:

a) Flexibility. Networks must have the ability to be adjusted in scope to meet the changing needs of a mission. A headquarters element cannot be mobile if the CIS footprint cannot be adjusted to match the necessary groupings and arrangements. The primary challenge is adhering to technical regulations in order to maintain security compliance. The networks are episodic, time-bound, and multiply instanced, and therefore must be able to operate and be set-up with a variety of caveats and security levels up to SECRET.

b) Scalability. Headquarters elements are based around a fixed order of battle, but often need to grow or shrink in size and scope. Each situation provides unique challenges, such as the allowance of a foreign national to access CAF networks, or permission of an OGD employee to connect via CAF National Network or shared network resource. Both cases, however, require a change management process that involves multiple strategic stakeholders. The CIS elements must be able adapt to match the staff needs, not the other way around.

c) Security. Security is an obvious overriding principle for management of military networks. Most commonly, security is centered on three areas: Confidentiality, Integrity, and Availability. Operationally sensitive data clearly must not be allowed to leave the network and be absorbed by enemy actors. A balance must be struck, however, between the security of a system and its usefulness and usability (typically contrasting with the principle of simplicity). Most security policies are developed based on best practices and principles, but the elements of risk management are often misplaced, and too heavy an emphasis on certain policies will also introduce human flaws in a system. For example, restrictions on use of USB storage devices without an appropriate alternative will result in users finding creative alternative solutions to digital storage for information mobility – most often an equally or more dangerous one.

d) Connectivity. The ability to connect to a network, whether wired or wireless, local or remote, requires the technical community to agree upon common technical standards such as languages, protocols, applications, and shared services. Within a purely CAF context, this is normally easy, as most of our networks provide a "framework" of requirements and common software that is directed from the top down. When working with OGDs or partner nations, this becomes more difficult. The technical authorities of the networks must be engaged at the earliest phase in order to provide the necessary technical coordination. The CIS elements allows the interconnection of geographically separated forces. Operations exploit information and networking technology to integrate widely dispersed human decision makers, situational and targeting sensors, and weapons into a highly adaptive, comprehensive system.

e) Simplicity. There is an inherent risk during the development of a system that it becomes overly complex for the operator, while sometimes being thought of as simply by the technical community that creates it. Any system that is too difficult to use will inevitably be avoided in its entirety, or at least enough that the system is rendered ineffective. Conversely, there is a possibility that a system becomes too simple to the point where it does not offer any services or solutions beyond any other system, and is simply redundant. System engineers must ensure that the operator community is able to

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competently employ the system with minimal interference or guidance from the technical community, and that the technical community is trained and equally capable of administering the system.

f) Functionality. For a network to be useful, the overlying services and applications must provide the necessary C2 functions for both commanders and staff to work and share information. This can include email, chat, teleconferencing, data management, collaborative tools, or common applications such as tools used by NATO. This can be challenging when the servers and infrastructure to manage these tools are not shared. For this to work in a NATO context, the tool would also need to reach out to a common server to ensure everyone is working off the same information. Successful interoperability requires a chain of dedicated resources and experts to ensure the functions of any network are correct and able to reach necessary data sources.

g) Redundancy. Good redundancy equates to survivability. Networks and systems are prone to failure for a variety of reasons, including natural disasters, power spikes, user error, enemy/belligerent activities, or technical issues. It is essential that alternative systems exist that meet all of the information exchange requirements (PACE – in Army Signals doctrine[17]).

h) Timeliness. The pace of operations dictates a requirement for CIS equipment be ready at any time to support whatever situation manifests. Timelines for network deployment are often delayed by bureaucratic requirements – some of these are necessary and beyond our control, such as satellite access requests which are required by the United States. Other processes exist to satisfy internal stakeholders, such as a Request for Change (RFC). In some cases, several layers of approval must be met before a request can be supported. The timelines associated with rapid deployment of a Joint Task Force HQ to support a CONPLAN JUPITER could take upwards of several months, but this overshadows the need for deployment within an acceptable Notice-To-Move window. CIS elements identified for rapid deployment must be kept in a ready state, with support from stakeholders to enable this.

1.8.6. The Operational Intranet (see Figure 5) will require high capacity bearers to support collaboration and sharing of big data exchanges to enable planning and support Pan-Domain C2 within the JOA. It is also explicit that the network must be Multi-Caveat[18] in order to enable automatic information exchange between Mission Partners within the JOA.

1.8.7. The Joint C4ISR Network View, illustrated in Figure 5, shows the relationship between the various network elements that make up the model. Deliverables from the project are encompassed within the red outlined boxes. In all, systems need to be intuitive, easy to manage and resilient.

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[17] PACE is referred as the Primary, Alternate, Contingency and Emergency communication plan, both for voice and data.

[18] Network must be interoperable with FVEY Mission Partners, NATO, and US forces at minimum.

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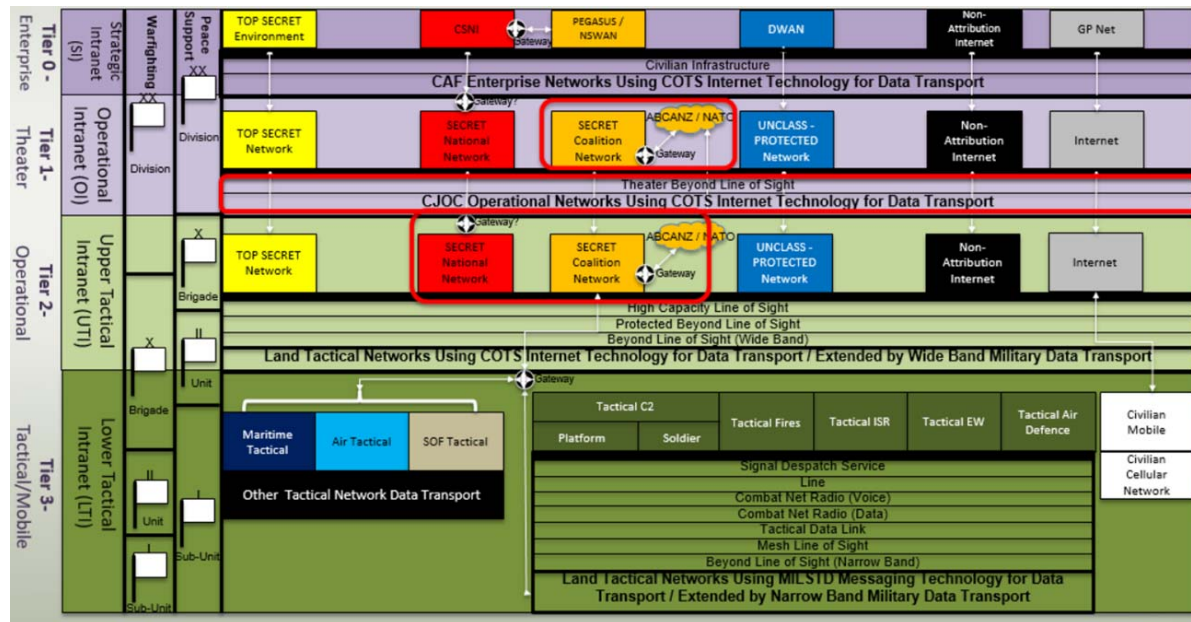
Figure 5: Joint C4ISR Network Framework

1.9. Key capability deliverables

1.9.1. The JDHQSRM's project is providing a secure, robust, and reliable deployable pan-domain communications systems that will give the JDHQ the means to assimilate information and to exercise authority and direct forces over large geographic areas and a wide range of conditions. The project is driven by three discrete deliverables: Digital C2 tools and services, Networking and infrastructure, and Training Simulation tools.

1.9.2. The first category is focused on the C2 Applications and Tools. Its delivery will enable automate C2 and interconnectivity through software applications and/or plugins, which will facilitate the access, integration, and interoperability of all battlespace's information to delivers Joint Functions. This may include the integration of Artificial Intelligence to enable information processing and analysis in support of decision and planning support. This may include: image, video, and data classification; sensor fusion; event detection; system monitoring; logistics optimization; and workflow automation.

1.9.3. The second category of deliverables focuses on the Operational CIS and Transportable Networks that will enable transportable JDHQ to any Deployed Location and establishing the Operational Communication System within a specific JOA. The systems will seek to deliver the big data and voice links bearer, terrestrial transmission line-of-sight and beyond line-of-sight to enable inter and intra-network extension that can operate in a congested electromagnetic environment. These links will enable a secure movement of data and information across the battlefield.

1.9.4. The third category focuses on training systems that will provide modern simulation capabilities, which will allow the CAF to force generate, train, and prepare Force Employers and Generators to deploy on joint operations.

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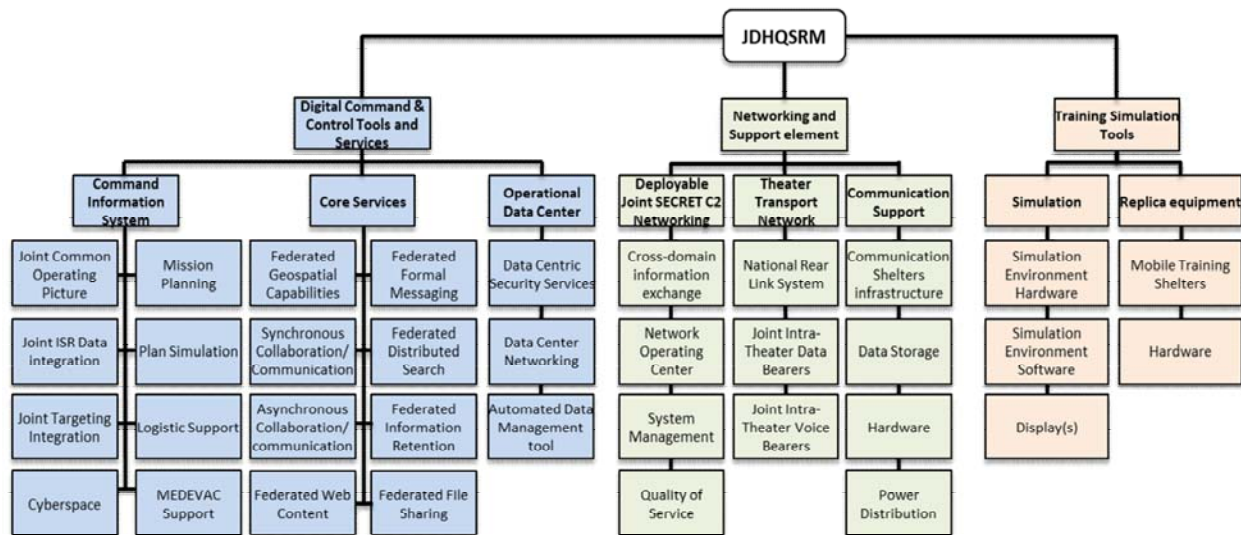
Figure 6: Joint Deployable Headquarters and Signal Regiment Modernization Systems elements

1.9.5. The digital C2 tools and services will provide the core capability (i.e. email, chat, web, file sharing, VoIP, SVTC, directory services, and Geospatial Services), and the joint services to conduct Joint Operations. The Joint Battle Management Systems (JBMS) will enable the Joint Operating Center (JOC) to maintain situational awareness, exploring time and space across the joint forces, and supportive of timely decision making by the Joint Commander. The JBMS will be supported and enabled by an effective Operational Data Center that aggregates information systems that spam from Strategic to Tactical level, to include Mission Partners' information systems, that collect, process, disseminate, or act on information. These capabilities and delivered services, when combined with appropriate human and procedural solutions, will enable the following mission applications:

a) The ability for JDHQ operations staff to monitor, coordinate and direct ongoing Joint operations;

b) The ability to visualize complex operational data in a manner that enables large scale collaboration; i.e. coordination and conferencing activities within the HQ and with higher and lower HQs;

c) The ability for JDHQ staff to develop an integrated and shared Joint Common Operating Picture (JCOP) across pan-domain to include Mission Partners;

d) The ability for JDHQ staff to conduct CAF Strategic and Operational Planning Process in a distributed and digital format, including the integration into Mission Partners and Tactical planning process;

e) The ability to readily pass completed plans to operations staff for execution;

f) The ability for JDHQ staff to use modelling and simulation tools to support plan development and evaluation. Examples of simulation tools include war gaming and logistic simulations;

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g) The ability for JDHQ staff to coordinate pan-domain Fires and Targeting processes, with tools that allow planning, coordination, approval, execution and battle damage assessment of Joint Fires in a coalition environment; and

h) The ability for JDHQ operations and planning staff to access CAF and Coalition enterprise systems required to support operations. Examples of enterprise systems are national targeting databases, strategic teleconferencing systems and enterprises email systems.

1.9.6. The Operational Communication system will provide connectivity throughout the operational are by federating Strategic, Tactical, and Mission Partners' Network to create an effective Joint Operational Communication system to facilitate the exchange of information. Users will have timely, concurrent access to all the information they are authorized to see from a single workstation and single login, thereby significantly shortening the time required to access the system and find, analyze, process, and share critical operational and situational information. The capabilities requires to be built-up or scaled back as required throughout the operation phases. Connectivity to these deployed entities will be achieved via a variety of different means, including satellite communications, strategic radio systems, and the internet. These capabilities will enable the following mission effects:

a) The ability to rapidly distribute and extend CAF Operational Communication Systems and federating to a Mission Partners' Communication systems into a JOA; using existing communications infrastructure, when available;

b) The ability to rapidly support remote user and small headquarters deployments that require connectivity to the Operational Communication System, access to required enterprise and conferencing systems;

c) The ability to be scalable and configurable based on mission requirements;

d) The ability to provide robust, parallel transport layer options to enable continuity of operations under Denied, Disrupted, Intermittent, and Limited network conditions; disconnected units may continue operations and may rapidly rejoin the network when connectivity is restored;

e) The ability to rapidly establish secure, moveable Joint Deployable HQ locations in any type of environment;

f) The ability to operate a deployed network operations center able to coordinate CAF deployed network operations, to include: the conduct of cyber assurance, defense and monitoring activities.

g) The ability to recover from or adjust to misfortune and damage as a result of essential computing, networking and storage components redundancy, and re-configurability;

h) The ability to support operations from a rapid deployment for Humanitarian assistance (i.e. DART and/or NEO operation) to a deliberate long term operation where Canada may be the lead nation. This include the delivery of the Mission Partners' Environment following applicable NATO requirements; and

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    i)   The ability to house and store Communication Systems (i.e.: servers, cryptographic items, processing systems, etc.) in the JOA with appropriate security zoning required for any sensitive and classified equipment's.

1.9.7. The training element will seek to deliver simplified training for users, both individually and collectively, on the use of the equipment and applications and to integrate constructive simulation training services to stimulate training audience. It will leverage existing training infrastructures to support generation and validation. These systems will aim to leverage existing and future operational and training networks that permit soldiers to train at home just as they would fight in operations. A suite of training systems will either replicate or integrate the mission networking and specialty equipment used by JDHQ enablers to plan and direct effects in the tactical battlefield.

1.9.8. The scope for the project covers the necessary hardware, software and equipment capabilities that are required to meet the mandated business needs. The project boundaries are summarily presented in whole or by core capability block in the Boundaries' Section.

1.9.9. The ability for the JDHQ staff to use simulation to simulate training.

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ANNEX B – SUSTAINMENT INFORMATION

1.1.   The Army Structure of Sustainment – Lines of Support

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

1.2.   Lines of Maintenance Support

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

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

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

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

1.3.   Types of Maintenance

1.3.1. Preventive Maintenance. Systematic and/or prescribed maintenance intended to reduce the probability of failure. This includes preventative maintenance servicing by both operators and technicians.
1.3.2. Corrective Maintenance. Maintenance actions carried out to restore a defective item to a specified condition.

1.4.   Canadian Armed Forces Maintenance Technicians

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

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

b)   Army Communication and Information Systems Specialist (ACISS) Techs and Aerospace Telecommunication and Information Systems (ATIS) Tech: Perform preventive and corrective maintenance on all types of radios, radar and data processing, cryptographic, terminal, audio and video equipment.

1.5.   Supply Chain

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

1.6.   Integrated Logistic Support (ILS)

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

1.7.   Sustainment Requirements – ILS Services

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

1.7.2. The support analysis data are required to be structured as a Logistic Support Analysis Record. The Logistic Support Analysis Record Database normally includes the following items:

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

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

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

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    d)   Indicate if item is a Maintenance Significant Item.

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

    a)   Failure Rate;

    b)   Mean Time to Repair (Hours);

    c)   Shelf Life (months);

    d)   Maintenance Concept; and

    e)   Preventative Maintenance Frequency.

1.8.   Initial Provisioning, Spare Parts and STTE

1.8.1. Industry will be asked to recommend an initial scaling of spare components and sub-systems, in sufficient quantities to support the determined availability of the fleet. The scaling of spare components and sub-systems will reflect the data within the Logistic Support Analysis. The project is responsible for acquiring the initial spare parts and two (2) years of annual replenishment spares in addition to the test equipment and consumables, which must be sufficient to sustain the Canadian Armed Forces during the initial provisioning period of 2 years, based on the scaling agreed upon between the project Management Office and contractor.

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

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

1.8.4. Special Tooling and Test Equipment – The Original Equipment Manufacturer will be expected to identify and provide all Special Tooling and Test Equipment required to service, diagnose and repair the fleet as outlined in the Logistic Support Analysis.

1.9.   Contracted Maintenance and Training Services

1.9.1. Operator Training. When procuring a new communication system, operator training is typically coordinated up front as part of the initial procurement. This allows the Canadian Armed Forces to operate the systems upon initial delivery. Initial Cadre Training is provided by the contractor to a specific quantity of operators and operator-trainers. Ongoing training on operation of the delivered system will be provided at the Canadian Forces School of Communication and Electronics located at Canadian Forces Base Kingston. Ongoing training may also be delivered as part of a long-term support contract if required. The project is investigating the capabilities of Industry to provide ongoing operator training as part of a long-term support contract if required.

1.9.2. Technician Training. When procuring a new communication system, technician training is also typically coordinated up front as part of the initial procurement. This allows the Canadian Armed Forces to maintain the systems upon initial delivery. Initial Cadre Training is provided by the

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contractor to a specific quantity of maintainers and maintainer-trainers. Ongoing training on maintenance will be provided by the Canadian Forces School of Communications and Electronics. The project is investigating the capabilities of Industry to provide ongoing technician training as part of a long-term support contract if required.

1.10.   Field Service Representative (FSR)

1.10.1. Field Service Representatives are individual technician representatives of a supplier to provide maintenance or training services at a site chosen by the Canadian Armed Forces. Depending on the fleet, Field Service Representative services may be requested at a variety of Canadian Armed Forces locations, potentially world-wide or in theatre of operations.

1.10.2. Maintain. Field Service Representatives could be employed to carry out maintenance tasks and technical investigations in order to sustain the fleet at the predetermined availability.

1.10.3. Train. Field Service Representatives could be employed across Canada at the major base hubs to train a predetermined number of operators and/or technicians.

1.10.4. Repair and Overhaul. Field Service Representatives could be employed across Canada at the major base hubs to undertake or assist in repair and overhaul activities.

1.11.   Service Facilities

1.11.1. Similar to Field Service Representatives, support could be provided at contractor facilities. The project is also seeking information from Industry on the capabilities to complete repairs, training, and Repair and Overhaul (R&O) in commercial service facilities both within Canada and internationally.

1.12.   Excluded Maintenance Services.

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

1.13.   Engineering Services

1.13.1. The project is exploring the capabilities of Industry to carry out engineering and technical tasks, which are critical to continuously ensuring availability of the system.

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

1.14.   Embedded Contractors

1.14.1. Defence projects will investigate the ability of Industry to work embedded in Department of National Defense facilities in order to enhance communication and provide responsive technical

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solutions, and industry (acquisition or in-service contractors) would need to work effectively with any of DND's embedded contractors.

1.15.   Technical Data Package

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

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

1.15.3. The project is investigating the capabilities of Industry to provide updates to technical publications over the life-cycle of the system.

1.15.4. The project is investigating the capabilities of Industry to provide Technical Drawing Packages.

1.16.   Configuration / Obsolescence Management

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

1.16.2. The project is investigating the capabilities of Industry to provide Configuration Management services over the life-cycle of the system.

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

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

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

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

1.17.   Software

1.17.1. The system will have a software requirement that in itself will be complex due to integration and will require some or all of the aforementioned Integrated Logistic Support services throughout its lifecycle. The software for the system must be given due consideration with respect to configuration

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management, incremental improvements, and obsolesce management such that it is able to keep pace with current technology and user expectations.

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

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

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

1.18. Testing

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

  a) Department of National Defense User Trials - Test & Evaluation to demonstrate that the system meets the requirements and specifications; and

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

1.19. Intellectual Property

1.19.1. Canada must have sufficient Intellectual Property (IP) access to ensure it is able to sustain the fleet throughout its life. Canada intends to use standard acquisition clause and condition 4006 – 'Contractor to Own Intellectual Property Rights in Foreground Information' to achieve this aim. Similarly, standard acquisition clause and condition 4003 – 'Licensed Software' will be used for the software.

1.20. Preliminary Concept of Sustainment

1.20.1. Maintenance:

  a) First line performed in expeditionary operations by Canadian Armed Forces technicians. Domestically, Canadian Armed Forces technicians may be supported by Field Service Representatives. Third and fourth line maintenance is anticipated to be conducted by contractor/Field Service Representative both domestically and on operations.

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

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1.21. Supply

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

1.22. Integrated Logistic Support Services

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

1.23. Lifecycle and Repair and Overhaul

1.23.1. The estimated life expectancy of the equipment to be finalized in Defintion Phase. To achieve maximum lifecycle, it is expected that non-maintainable hardware will be replaced on shorter intervals.

1.24. Software

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

1.25. Training

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

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

1.26.1. Of prime concern is the availability of the delivered system to perform its mission. The following are a few common metrics that we are considering to measure the sustainment system performance. While the metrics below emphasize mean values, other measures of central tendency may be examined (i.e. median, mode) if appropriate.

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

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

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

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

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

1.26.7. Mean time between maintenance (MTBM). For a stated period in the life of a functional unit, the mean length of operating time between maintenance. MTBF only considers preventative and corrective maintenance performed by technicians, not that which is considered operator maintenance.

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

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

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

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

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

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

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

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PART 3 – RESPONSE MATRIX

Respondents should use the following annexes as templates for their response submission.

Annex C - Industrial Technological Benefits and Value Proposition

Annex D1 - Acquisition Costing requirements

Annex D2 – Annual Sustainment Cost of Proposed Solution

Annex E - High Level Mandatory Requirements and Acquisition Questions

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ANNEX C – INDUSTRIAL TECHNOLOGICAL BENEFITS AND VALUE PROPOSITION

1. Industrial and Technological Benefits Policy

1.1.   Application of the Industrial and Technological Benefits Policy

1.1.1. The Industrial and Technological Benefits Policy may be applied on the JDHQSRM project. Engagement with Industry through the Request for Information will help determine the application of the Industrial and Technological Benefits Policy and how Canada could leverage opportunities for economic benefit through this procurement.

1.2.   The Industrial and Technological Benefits Policy including Value Proposition

1.2.1. The Industrial and Technological Benefits 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 Industrial and Technological Benefits Policy encourages companies to establish or grow their presence in Canada, strengthen Canada's supply chains, and develop Canadian industrial capabilities.

1.2.2. The goal of the Industrial and Technological Benefits 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 Research and Development in Canada, to support skills development and training, and to increase the export potential of Canadian-based firms. The Industrial and Technological Benefits Policy includes the Value Proposition, 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 Value Proposition. Value Proposition commitments made by the winning bidder become contractual obligations in the ensuing contract.

1.2.3. For more information about the Industrial and Technological Benefits Policy, please visit www.canada.ca/itb.

1.3.   Key Industrial Capabilities:

1.3.1. To maximize the economic impact that can be leveraged through the Value Proposition, Canada will look to use the Industrial and Technological Benefits Policy to motivate defence contractors to invest in Key Industrial Capabilities. Key Industrial Capabilities 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 Key Industrial Capabilities 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.

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

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1.4.   The definitions for the relevant KICs for this project are:

1.4.1. <u>Cyber Resilience</u>. 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;

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

1.4.3. <u>IT security</u>. 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

1.4.4. <u>Operational technology (OT) security</u>. 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 as an enabling technology; for example, networks may autonomously and dynamically defend against intrusions and repair themselves if disrupted.

1.4.5. <u>Defense Systems Integration</u>. 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, C2 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.

2. Value Proposition Industry Engagement Questions:

2.1.1. Please answer Annex C questions within the Excel Response Matrix provided.

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ANNEX D1 – ACQUISITION COSTING REQUIREMENTS

1.1.   Initial Acquisition

1.1.1. The purpose of the JDHQSRM costing annex is to request indicative costing information from suppliers in order to allow Canada to prepare its documents for the Project Approval. Respondents are asked to:

     a) Provide Indicative pricing - but preferably not to exceed plus or minus 40 percent;

     b) Complete as much information in Excel as possible for the activities within this annex; and

     c) Explain any associated risks with each activity.

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

1.1.3. Once industry's technical capability is clarified, this Request for Information may be amended to request additional comprehension on inherent risk, plus their associated sustainment costs, or to ask additional questions.

1.1.4. Please answer Annex D1 questions within the Excel Response Matrix.

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ANNEX E – HIGH LEVEL MANDATORY REQUIREMENTS AND ACQUISITION QUESTIONS

1.1. High Level Mandatory Requirements

1.1.1. This annex contains the High Level Mandatory Requirements (HLMR) for the JDHQSRM project. Respondents are requested to provide information describing how their proposed solution meets each of the HLMR. The project is predicated on a set of high level functional and performance requirements. The list of HLMR that a proposed system must meet is contained within this document.

1.1.2. Each of the six HLMR are described on Table 2 followed by the detailed requirements questions that can be found in the Excel Response Matrix provided.

High Level Mandatory Requirements		
#	HLMR Theme	Description – Ability to:
1	**Command and Control**	Enable Joint Deployable Commanders in coordinating and directing Joint operations, with the capacity to conduct joint operational planning and plan evaluation through simulation, development, as well as sharing a Joint Common Operating Picture (JCOP), and Operational Objectives with all Tactical Commanders.
2	**Survivability**	Deploy resilient systems with the ability to operate in any geographic location, including extreme climatic environmental conditions, and in a degraded communications environment, without suffering degradation or loss of function, to include cyber defence and resiliencies.
3	**Interoperability**	Seamlessly enable secure and timely information sharing, common processes, and collaborative decision-making between joint (CAF) and with coalition partners (i.e. US, FVEY, NATO), other government agencies (GC), and operational partners (JIMP). Joint Divisonal information to be extendable across joint and mission partners within the Theater of Operations.
4	**Flexibility**	Support the full range of operations of dispersed military elements engaged in multiple military actions within an environmemt having varying bandwidths and experiencing instability.
5	**Upgradability**	Be upgraded or updated over the capability's system life, such that embedded information technology can be kept current and operationally relevant.
6	**Readiness Throughput**	Enable realistic simulation training in a synthetic setting that emulates a coalition environment with a simple and intuitive interface.

Table 2: JDHQSRM HLMRs Description

1.2. Acquisition questions

1.2.1. Please answer Annex E questions within the Excel Response Matrix provided.

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PART 4 – OTHER BUSINESS

Annex F – Glossary of Terms

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ANNEX F – JOINT DEPLOYABLE HEADQUARTERS & SIGNAL REGIMENT MODERNIZATION ACRONYMS

Acronym	In Full
1st Cdn Div	Ist Canadian Division
1st Cdn Div HQ	1st Canadian Division Headquarters
ABCANZ	America, Britain, Canada, Australia, New Zealand
ANOC	Army Network Operations Centre
C2	Command and Control
C4ISR	Command, Control, Communications, Computer, Intelligence, Surveillance and Reconnaissance
CA	Canadian Army
CAF	Canadian Armed Forces
CANSOFCOM	Canadian Special Operations Forces Command
CBP	Capability Based Planning
CDMN	Canadian Deployed Mission Network
CDMN	Coalition Deployed Mission Network
CFJSR	Canadian Forces Joint Signal Regiment
CFJP	Canadian Forces Joint Publication
CFNOC	Canadian Forces National Operations Centre
CIS	Communication and Information System
CJOC	Canadian Joint Operations Command
CONPLANS	Contingency Plans
COTS	Commercial Off the Shelf
CSA	Cyber Security Awareness
CSNI	Consolidated Secret Network Infrastructure
DART	Disaster Assistance Response Team
DC2AI	Defence Command and Control Allied Interoperability
DCO	Defence Cyber Operations
DCO-DS	Defensive Cyber Operations-Decision Support
DCSS	Data Centric Security Service
DEFSOC	Defence Systems Operations Center
DLR	Director of Land Requirements
DWAN	Defence Wide Area Network
FCE	Federated Coalition Environment
FMN	NATO Federated Mission Networking
FVEY	Five Eyes countries include US, UK, Canada, Australia and New Zealand
GAC	Global Affairs Canada
GC	Government of Canada
HLMR	High Level Mandatory Requirement
HQ	Headquarters
IEG	Information Exchange Gateway
IERs	Information Exchange Requirements
ILS	Integral Logistics Support
IM	Information Management
ISTAR	Intelligence, Surveillance, Target Acquisition
IT	Information Technology
ITI	Information Technology Infrastructure
JCOP	Joint Common Operating Picture

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Acronym	In Full
JDHQ	Joint Deployable Headquarters
JDHQSRM	Joint Deployable Headquarters and Signal Regiment Modernization
JDN	Joint Doctrine Note
JIIFC	Joint Information and Intelligence Fusion Centre
JIMP	Joint, Interagency, Military, Public
JOC	Joint Operations Centre
JOINTEX	Joint Exercise
JTF	Joint Task Force
JTF HQs	Joint Task Force Headquarters
LCSS	Land Command Support System
LCSS (2E)	Land Command Support System (Canada-US Eyes Only)
MI3	Military Integrated Information Infrastructure
MCOTS	Military Commercial Off the Shelf
MJITF	Multinational Joint Integrated Task Force
MLVW	Medium Logistic Vehicle Wheeled
MND	Minister of National Defence
MPE	US Mission Partner Environment
MSVS	Medium Support Vehicle System
NATO	North Atlantic Treaty Organization
NCE	National Command Element
NDHQ	National Defence Headquarters
NEO	Non-Combatant Evacuation Operation
NGOs	Non-Government Organizations
NORAD	North American Aerospace Defence Command
OGDA	Other Government Departments and Agencies
OPP	Operational Planning Process
RCAF	Royal Canadian Air Force
RCMP	Royal Canadian Mounted Police
RCN	Royal Canadian Navy
RCP	Recognized Cyber Picture
SCD	Strategic Context Document
SILO	Signals in Land Operations
SOF	Special Operating Forces
SOR	Statement of Requirements
SSE	Strong, Secure, Engaged Defence Policy
TLAN	Transportable Local Area Network
TLAN (U)	Transportable Local Area Network (Unclassified)
TLAN (Z)	Transportable Local Area Network (Classified)
TNOC	Theatre Network Operations Centre
TSU	Theatre Signal Unit
USN	United States Navy
VCDS	Vice Chief of Defence Staff
VIPs	Very Important Persons
WGS	Wideband Global Satellite

Table 3: Acronyms