

# Request for Information

TACTICAL COMMAND & CONTROL  
INFORMATION SYSTEM  
MODERNIZATION PROJECT

AND

TACTICAL COMMUNICATIONS  
MODERNIZATION  
PROJECT

## Version Control

Version	Author	Date	Reason for Changes
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0.3	Major Steve Blais	November 25 <sup>th</sup> , 2020	Review on PSPC and ISED comments. Deletion of comments on 1.1.3 "detailed performance data" and 1.14 "tactical equipment".
0.4	TCM Team Review	Nov 30, 2020	Review and Clean up
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0.8	WO R.M.M Girard	May 10, 2021	Review/update comments from PSPC
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## PART 1 – GENERAL INFORMATION

### 1.1 Purpose and Objectives of Industry Engagement

1.1.1 The purpose of this Request for Information is to inform industry of a possible upcoming competitive procurement process for the Department of National Defence's requirements to modernize, integrate, and support both the Canadian Army's Tactical Communications, as well as its Command & Control Information system under two projects, the Tactical Communications Modernization (TCM) Project and the Tactical Command and Control Information System Modernization (TacC2IS Mod) Project. The Canadian Army will rely on a network composed of software defined bearers provided by the Tactical Communications Modernization project that will support and enable the deliverables of the Tactical Command & Control Information System Modernization Project, with both projects setting the communication and information system baseline for numerous projects to deliver under the Canada's Defence Policy *Strong, Secure, Engaged* Initiative 42.

1.1.2 Due to these projects' close interdependencies, a single RFI is being posted to simultaneously communicate these requirements. This will help realize potential synergies, and to more efficiently gather information from industry. It is also anticipated that this should help inform Canada if it might be feasible to have a common prime sustainment enterprise solution to both sustain and manage the interfaces between the systems delivered by both projects.

1.1.3 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 within, 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 and future industry capabilities, sustainment, and affordability of these Projects on behalf of Canada. The main objectives of this consultative process with industry are to:

- a) Provide industry with initial information on the requirements gathering related to the projects;
- b) Invite industry suppliers to review the Industry Day Presentation and to attend virtual one-on-one sessions;
- c) Request preliminary feedback during one-on-one meeting discussions on the information provided and our initial high level requirements;
- d) Request information and feedback regarding indicative cost estimates for proposed solutions and learn the capability of industry to satisfy the projects' requirements;
- e) Obtain information on the impact of acquisition restrictions on the potential future sustainment requirements, including considerations such as Intellectual Property rights, supply chain collaborations, etc.;
- f) 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;
- g) Request industry's feedback on the planned procurement processes; 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 Canadian Tactical Command and Control Information System Modernization and Tactical Communications Modernization projects' requirements continue to develop in line with the capabilities of industry. To ensure that these projects proceed 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<sup>1</sup> on each system component, sustainment needs, open standard used, and any integration complexities or constraints that must be considered when scaling the systems to evaluate various operation scenarios.

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<sup>1</sup> Performance data: observations, measurements, ratings, analysis, etc., identified during testing of the system.

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 project approval gateways. In addition to the various unit costs associated to the suggested solution for items such as, but not limited to, tactical bearers hardware, bearers' software, training and simulation software, command and control information system, and tactical equipment<sup>2</sup>, the projects need to obtain estimated 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 any questions to Canada, in writing, to the Public Services and Procurement Canada Contracting Authority identified below at section 1.6.

## 1.2 Requirements

Canada has a requirement to acquire a new Tactical Command and Control Information System Modernization capability and a new Tactical Communication Modernization capability, as the current system has reached its end of life.

### 1.2.1 TACTICAL COMMAND & CONTROL INFORMATION SYSTEM MODERNIZATION PROJECT

1.2.1.1 Tactical Command and Control Information System Modernization project will provide modernized equipment and software to increase the speed, accuracy and responsiveness of the planning and coordination of operations in order to better manage the complexities of future Canadian Army missions. To this end, the Tactical Command and Control Information System Modernization project is seeking to deliver a system to meet the following requirements:

- a) Integrated and Interoperable Command and Control System: comprising of hardware, software and communication bearers provided by the Tactical Communications Modernization project. The Tactical Command and Control Information System Modernization will improve response time and precision when coordinating military activities in the land domain;
- b) Tactical Tool Suite: the delivery of digitized equipment to create, sustain, manage and operate a Tactical Command and Control Information System Modernization to coordinate the activities in the land domain, including but not limited to providing the following services: Command and Control Tools, Battle Management System, Common Operating Picture, Automation (Artificial Intelligence), Instant messaging, Voice service, email service, integration of battle tools (Fires, Targeting, Intelligence, Electronic War, etc.), Human-to-Human Collaboration; and
- c) Training Systems: the procurement of realistic, immersive, and accredited simulators and training tools will improve individual and collaborative training. This outcome will increase the generation of staff and operators that will be able to use the system effectively once deployed.

### 1.2.2 TACTICAL COMMUNICATIONS MODERNIZATION PROJECT

1.2.2.1 The current tactical communication capabilities are reaching obsolescence and are ill-adapted to the deployability and mobility required to achieve mission success on a digitized battlefield. They either require too much time for setup and are too complex to operate at the headquarters/mobile domain(s), or are too big and heavy for the dismounted troops. Furthermore, the forecasted data exchange requirement of the army of tomorrow exceeds current capabilities. There is lack of both bandwidth and range to fulfill the needs to provide key enablers to achieve mission success.

1.2.2.2 To this end, the Tactical Communications Modernization project is seeking to deliver a system to meet the following requirements:

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<sup>2</sup> Tactical equipment: Multi-function, reliable, rugged equipment that's designed with frontline performance and agility in mind.

- a) Next generation tactical communication system to support the operational Headquarter, Mobile and Soldier Domain(s) through Software Defined Radios, Secure integration, and modernized waveforms to ensure interoperability with allies;
- b) Delivering a digitized network to enhance the voice and data traffic, provide automation with seamless connectivity between the domains, reduce complexity, and enhance service delivery; and
- c) Training Systems: the procurement of realistic, immersive, and accredited simulators and training tools will improve individual and collaborative training. This outcome will increase the generation of staffs and operators who can effectively use the system once deployed.

1.2.3 See ANNEX A – PROJECTS DESCRIPTIONS for more details on the Projects.

### 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 resulting competitive process may be in the future. For information pertaining to the Controlled Goods Program, please refer to the Public Services and Procurement Canada (<https://www.tpsgc-pwgsc.gc.ca/pmc-cgp/marchandises-goods-nav-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 is no security requirement associated with this Request for Information, however, there may be security requirements associated with any resulting procurement processes. Additional information on the security requirements will be communicated on <https://buyandsell.gc.ca/> as part of any upcoming competitive procurement processes.

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 legislations and government policies that will govern the upcoming competitive procurement processes:

- a) *Defence Production Act*;
- b) Controlled Goods Program;
- c) Federal Contractors Program for Employment Equity;
- d) *Government Contract Regulations*;
- e) PSPC Policy on Green Procurement;
- f) Industrial & Technological Benefits 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 processes.

## 1.5 Schedule

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

- a) Release of Request for Information: 2 November 2021
- b) Industry Day Presentation Release: 2 November 2021
- c) Virtual One-on-One Meetings for Supplier consultations via teleconference:
  - 30 November to 16 December 2021
  - 11 to 27 January 2022
- d) Deadline for Request for Information Submission: 18 March 2022
- e) Potential Request for Information Amendment - Sustainment Questions: June 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 Request for Information.

## 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 Contracting Authority's positional mailbox identified below, and with "W8486-206405 TacC2IS & TCM 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](mailto: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/>.

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 projects and provision of a modernized tactical command and control information system and a modernized tactical communication capability, Canada's intent is 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 for Information.

1.7.2 An **Industry Day Presentation** will be posted on our Buy and Sell website with the RFI documentation. The Industry Day Presentation will allow Canada to provide industry with information about the projects and to communicate high-level equipment capabilities and sustainment requirements. However in lieu of in-person



presentations, 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 within the deck.

1.7.3 The **Industry Day Presentation with Speaking Notes** will be released with the RFI. **Virtual One-on-One Meetings** between industry and Canada will be held over the period **of 2 months, however, no meetings will be held from 17 December 2021 to 10 January 2022.** Industry will be asked to submit their business presentations and to provide access to any of their technical demonstrations in order 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 expertise is mainly to solicit feedback and information on the following topics:

- a) Understanding industrial current and future capabilities relevant to projects' platforms and scopes;
- b) Obtaining proposed solutions from industry to enhance the projects' Preliminary Statements of Requirements, including proposed solutions to high level sustainment requirements that collectively would reflect realistic and achievable 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 Draft Requests for Proposals; and
- g) Application of the Industrial Technological Benefits Policy including Value Proposition.

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 30 November to 16 December 2021 and 11 to 27 January 2022** on a first come basis. If one hour is insufficient, any additional Industry Demonstrations may be arranged in time slots at 09:00 AM or 13:00 PM EDT during the period of **1 to 10 February 2022**. Companies may indicate their preferred time and date but reservations will be allotted in the order of receipt. Companies will be limited to 4 representatives maximum. Companies are invited to request one-on-one meeting times on or before **19 November 2021**. Industry representatives will be requested to provide their company name, representative name(s) and contact information to be posted to buyandsell with company concurrence.

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 Part 3 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, or questions must be based solely on the documentation herein and industry should not reference any other past procurement process.

1.7.10 Non-participation at One-on-One Sessions, or Demonstration will not preclude any firm from bidding on these requirements should follow-on solicitations 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 Proposal, 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 within. 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 or 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 any potential subsequent Request for Proposal. 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 Information

1.9.1 Respondents are asked to submit their responses to the questions posed in this Request for Information by 1400 EST **on 18 March 2022**.

## 1.10 Attached Request for Information Documents

### Part 2 -- Project Information

- Annex A – Projects Descriptions
  - Appendix A1 – Mission Scenarios
  - Appendix A2 – Tactical Command and Control Information Systems Modernization System Element and Sub-Systems
  - Appendix A3 – Tactical Communications Modernization Element and Sub-Systems
  - Appendix A4 – Tactical Communications Modernization Network View
- Annex B – Generic Defence Sustainment Information

### Part 3 -- Response Matrix (Excel)

- Annex C – Industrial Technological Benefits and Value Proposition
- Annex D1 – Tactical Command and Control Information System Modernization Acquisition Costing Requirements

- Annex D2 – Tactical Command and Control Information System Modernization Annual Sustainment Cost of Proposed Solution(s)
- Annex D3 – Tactical Communications Modernization Acquisition Costing Requirements
- Annex D4 – Tactical Communications Modernization Annual Sustainment Cost of Proposed Solution(s)
- Annex E1 – Tactical Command and Control Information System Modernization High Level Mandatory Requirements and Acquisition Questions
- Annex E2 – Tactical Communications Modernization High Level Mandatory Requirements and Acquisition Questions

#### **Part 4**

- 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, Respondents must provide the Supplier's SharePoint link and permissions to access.
- 1.11.2 No physical information of any type will be accepted.

## **PART 2 – PROJECTS REQUIREMENTS**

### Annex A – Projects Descriptions

Appendix A1 – Mission Scenarios

Appendix A2 – Tactical Command and Control Information Systems Modernization System Element and Sub-Systems

Appendix A3 – Tactical Communications Modernization Element and Sub-Systems

Appendix A4 – Tactical Communications Modernization Network View

### Annex B – Generic Defence Sustainment Information

## ANNEX A – PROJECTS DESCRIPTIONS

### 1.1 Overview

1.1.1 The Canadian Army requires a modern, integrated and interoperable digitalized communication system capable of supporting networked command and control systems. In recent years, the Canadian Army has been increasingly challenged to provide the required communication systems and command and control tools to successfully manage operations. In *Strong, Secure, Engaged: Canada's Defence Policy*, the Government of Canada commits to the modernization of the land-based Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (*Strong, Secure, Engaged Initiative 42*) and articulates eight core missions that the Canadian Armed Forces must be able to undertake for the protection of Canada and Canadians and the maintenance of international peace and stability. The missions range from lower risk peace operations to high risk scenarios involving full combat and war fighting. As such, the Canadian Army has to be ready to deploy scalable forces, on a domestic or international mission, ready to operate across the Matrix of Competition within a Joint, Interagency, Multinational and Public context.

1.1.2 Currently, the Canadian Army relies on the Land Command Support System, a system that was conceived and designed during the Afghanistan years. The current digital framework which coalition partners are moving towards will enable a standardized set of procedures and rules. If the Canadian Army and Canadian Armed Forces fail to adopt these digital standards, there is a serious risk that it will find itself isolated from its coalition partners with respect to the sharing and transmission of tactical, operational and strategic data.

1.1.3 **The Tactical Command and Control Information System Modernization Project** will deliver on *Strong, Secure, Engaged Initiative 42* by providing the Canadian Army with a robust, flexible, and interoperable Tactical Command and Control Information System Modernization that will be employed in a pan-domain environment.

1.1.4 **The Tactical Communications Modernization Project** will deliver on *Strong, Secure, Engaged 42* by providing the Canadian Army with a modernized, digitalized and improved tactical, voice and data, link radios (bearers), wide area, terrestrial transmission line-of-sight and beyond line-of-sight communication systems that will be employed in a pan-domain environment, and that will support and enable other initiatives from *Strong, Secure, Engaged Initiative 42*.

### 1.2 Introduction

1.2.1 The Canadian Army is a highly professional force that is agile, scalable and responsive, providing the Government of Canada with a range of military capabilities on land.<sup>3</sup> The Army operates at the brigade group level, executing joint campaigns with a critical mass of troops on the ground that are organized in eight major units consisting of Combat Arms, and Combat Service Support organizations. These units, working in a combined role, provide the joint force with requisite firepower, protection, command and control, mobility and sustainability.<sup>4</sup> The brigade group is the corner stone of the Canadian Army and a commander needs to be able to exert rapid and decisive command and control over assigned forces. The last decade has seen Canada deploy military forces, both domestically and internationally, to meet Government of Canada humanitarian and military objectives. This has included major deployments to Haiti, Iraq, Afghanistan; and domestic operations such as the 2010 Winter Olympics and flood relief operations. All of these have been complex operations that have involved joint deployments of elements from the Royal Canadian Navy, Canadian Army, Royal Canadian Air Force and Canadian Special Operations Forces Command, involvement of other government departments and civilian organizations, and most importantly, have been done in co-operation and alliance with other countries and organizations, such as North Atlantic Treaty Organization and the United Nations. The term Joint is used to refer to military operations that involve multiple environments<sup>5</sup>, while Combined is the term used for military operations that involve multiple nations.

1.2.2 *Strong, Secure, Engaged: Canada's Defence Policy* outlines the level of ambition for the Canadian Armed Forces and presents a new strategic vision for defence. *Strong, Secure, Engaged* also states that the

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<sup>3</sup> SSE - Canada's Defence Policy 2017, p. 36.

<sup>4</sup> Ibid, p. 36.

<sup>5</sup> Navy, Army, Air Force.

Canadian Armed Forces will be prepared to simultaneously deploy to two different theatres of operation, including one as a lead nation. This predicated the need for the Canadian Army to have enough assets to support simultaneous operations of 500 to 1500 personnel in two different operational theatres or one brigade group of up to 4800 personnel. In order to meet the objectives laid out in *Strong, Secure, Engaged*, Canada needs an agile, multi-purpose, and combat-ready military, operated by highly trained, well led, and well-equipped soldiers. *Strong, Secure, Engaged* Initiative 42 captures the Government of Canada commitment to modernize land-based command and control system.

1.2.3 The Tactical Communications Modernization and the Tactical Command and Control Information System Modernisation projects' will deliver on this commitment through the acquisition of improved digitalized communications capabilities, including hardware, software, and training systems, that will support the Headquarter, Mobile and Soldier domains to facilitate planning, data transfer, tactical equipment, simulation, and communications infrastructure. This will enhance interoperability within the Canadian Armed Forces, with America, Britain, Canada, Australia, and New Zealand Armies<sup>6</sup>, within North Atlantic Treaty Organization, and other Allies, while assisting the Canadian Army to modernize land-based command and control, intelligence, surveillance and reconnaissance systems.

### 1.3 Missions

1.3.1 The Government of Canada articulates eight core missions that the Canadian Armed Forces should be able to undertake for the protection of Canada and Canadians and the maintenance of international peace and stability. The Canadian Armed Forces will be prepared to:

1. Detect, deter and defend against threats to or attacks on Canada;
2. Detect, deter and defend against threats to or attacks on North America in partnership with the United States, including through North American Aerospace Defence;
3. Lead and/or contribute forces to North Atlantic Treaty Organization and coalition efforts to deter and defeat adversaries, including terrorists, to support global stability;
4. Lead and/or contribute to international peace operations and stabilization missions with the United Nations, North Atlantic Treaty Organization<sup>7</sup> and other multilateral partners;
5. Engage in capacity building to support the security of other nations and their ability to contribute to security abroad;
6. Provide assistance to civil authorities and law enforcement, including counter-terrorism, in support of national security and the security of Canadians abroad;
7. Provide assistance to civil authorities and non-governmental partners in responding to international and domestic disasters or major emergencies; and
8. Conduct search and rescue operations.

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

1. Defend Canada, including responding concurrently to multiple domestic emergencies in support of civilian authorities;
2. Meet its North American Aerospace Defence<sup>8</sup> obligations, with new capacity in some areas;
3. Meet commitments to North Atlantic Treaty Organization Allies under Article 5 of the North Atlantic Treaty;
4. Contribute to international peace and stability through:
  - a. Two sustained deployments of ~500-1500 personnel, including one as a lead nation;

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<sup>6</sup> Five Eyes (FVEY) Community

<sup>7</sup> NATO

<sup>8</sup> NORAD

- b. One time-limited deployment of ~500-1500 personnel (6–9 months duration);
- c. Two sustained deployments of ~100–500 personnel;
- d. Two time-limited deployments (6–9 months) of ~100–500 personnel;
- e. One Disaster Assistance Response Team<sup>9</sup> deployment, with scalable additional support; and
- f. One Non-Combatant Evacuation Operation<sup>10</sup>, with scalable additional support.

1.3.3 Furthermore, Canada and its allies face increasingly dangerous competition from malign and hostile rival powers. “The Pan-Domain Force Employment Concept brings new understanding to the always evolving global order. This competition for greater influence and prosperity can range from benign economic rivalry to intense political warfare, where all means at a nation’s command, short of war, are used to achieve national objectives. Competition can even take the extreme form of armed conflict. Consequently, the Canadian Armed Forces must focus on meeting the broad range of military challenges created by the armed forces of these rival powers.”<sup>11</sup> As such, the Canadian Army needs to be able to understand and meet the complexity of the Pan-Domain Force Employment Concept.

1.3.4 The Pan-Domain Force Employment Concept is central to the “How We Fight initiative” and will define how the force-in-being will be employed to contest, confront and - when necessary - combat and prevail against our nation’s adversaries. Pan-Domain Force Employment Concept is providing a new perspective and framework of thinking in this era of dangerous competition.

1.3.5 Canadian Armed Forces Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance projects must be aligned with the Pan-Domain Force Employment Concept principles and be developed and integrated as a whole in order to remain coherent and to ensure our relevance in a time of continual changes. The Tactical Command & Control Information System Modernization and the Tactical Communications Modernization Projects’ capabilities will analyze requirements from pan-domain aspect.

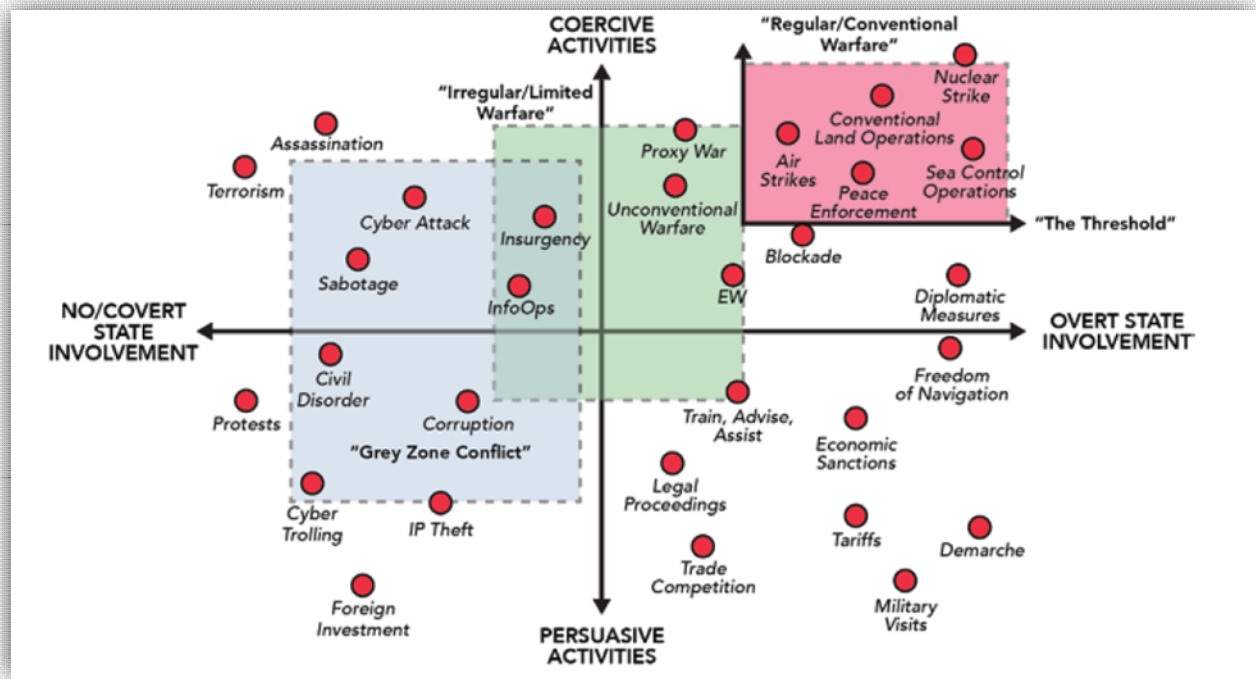
1.3.6 The capabilities to be provided by the Tactical Command & Control Information System Modernization and the Tactical Communications Modernization Projects are applicable to core missions one through eight, within their ability to deliver the transport layer for a fully digitalized and interoperable network, and a command and control system, that are operationally ready at all times and capable of deployment throughout the full matrix of competition. Both projects also need to be able to support the Canadian Army in the range of conflict identified in the Matrix of Competition of the Pan-Domain Force Employment Concept (see Figure 1 below).

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<sup>9</sup> DART

<sup>10</sup> NEO

<sup>11</sup> Pan-Domain Force Employment Concept, 2020, p.12



**Figure 1 - Pan-Domain Force Employment Concept Matrix of Competition**

1.3.7 To deliver these specific operational outputs at the assigned responsiveness levels, the Canadian Armed Forces must possess its own modern digitalized network assets that are operationally ready at all times and capable of deployment in both combat and aid to civil power situations. A baseline scenario demonstrating a brigade group operations in a Warfighting and Peace Support/Asymmetric Operations is available at Appendix 1.

**1.4 Organization**

1.4.1 The Canadian Army is the element responsible for force generating the operational units and forces required to conduct the land based operations necessary to accomplish Canada’s mandate. The Canadian Army trains and operates at the brigade group level within a Joint, Interagency, Multinational and Public context. The brigade group consists of approximately 4,800 soldiers, organized in eight major units generally including Artillery, Armour, Infantry, Engineering, and Combat Service Support organizations. These units operate together in “battle groups” to provide the Joint force with the requisite firepower, mobility, protection, sustainment, and command and control functions to effectively coordinate their employment.<sup>12</sup> In order to accomplish government assigned missions, *Strong, Secure, Engaged* requires that the Canadian Army be an agile, multipurpose, combat-ready force, composed of highly trained, well-equipped women and men.<sup>13</sup> The ability for land forces to conduct successful operations is based upon the effectiveness of its decision-action cycle which is reliant on timely and accurate information. The decision-action cycle is the process whereby commanders assess situations, undertake decisions, and act based on the available information regarding friendly, hostile and neutral forces within the operational environment.<sup>14</sup> Modern forces that are able to establish information dominance, may in turn optimize their decision-action cycle and outperform opposing or belligerent forces.

1.4.2 The Canadian Army almost always operates with other elements (i.e. Navy, Air Force), in joint operations or with allies and coalition partners (North Atlantic Treaty Organization, America, Britain, Canada, Australia, New Zealand Armies, etc.), all of whom bring multiple assets, such as fighter aircraft, Remotely Piloted Aerial

<sup>12</sup> *Strong, Secure, Engaged* - Canadian Defence Policy, 2017, p. 36.

<sup>13</sup> *Ibid*, p. 14.

<sup>14</sup> B-GL-300-001/FP-001, Land Operations, p. 4-30



Systems, ships and submarines, each of which produce effects that can influence the land battlefield. Both the Tactical Command & Control Information System Modernization and the Tactical Communications Modernization projects must produce solutions that not only integrate with these capabilities, but enhance the Commander's decision-making cycle. Modern land operations require intense coordination with all of these elements, allies, and partners to ensure mission success.

1.4.3 To achieve battlefield dominance, operational agility and Joint, Interagency, Multinational and Public interoperability, the Canadian Army relies on flexible, modern and deployable command and control systems. The Land Command Support System is the term used to refer to the command and control systems, and supporting communication infrastructures, used by the Canadian Army for Land operations. Land command support systems have two main sub-components: Tactical Command & Control Information System Modernization component and Tactical Communications component. Tactical Command & Control Information System Modernization includes the software applications, tools and networks that enable Land commanders and staff at all levels to execute the decision-action cycle and exert command and control over assigned forces. Tactical Communications, through the use of radios, satellite systems and other communication systems provide the tactical bandwidth to enable land command and control networks.<sup>15</sup>

1.4.4 Both **Tactical Command and Control Information System** and **Tactical Communication** assets are employed at every level of combined land operations by commanders, planners, advisors, or operators from the Brigade Group to the dismounted soldiers.

1.4.4.1 The Canadian Army in Canada is composed of four Divisions supported by one Regular Brigade and two or three Reserve Brigades. In addition, there exists the Canadian Rangers, schools and training centers spread throughout the country. See Figure 2 below.



Figure 2 – The Canadian Army across Canada

<sup>15</sup> B-GL-351-002, pp. 2-1; 2-8

1.4.4.2 Brigade Group Level. There are three Battle Groups per Brigade Group as illustrated in Figure 3 below.

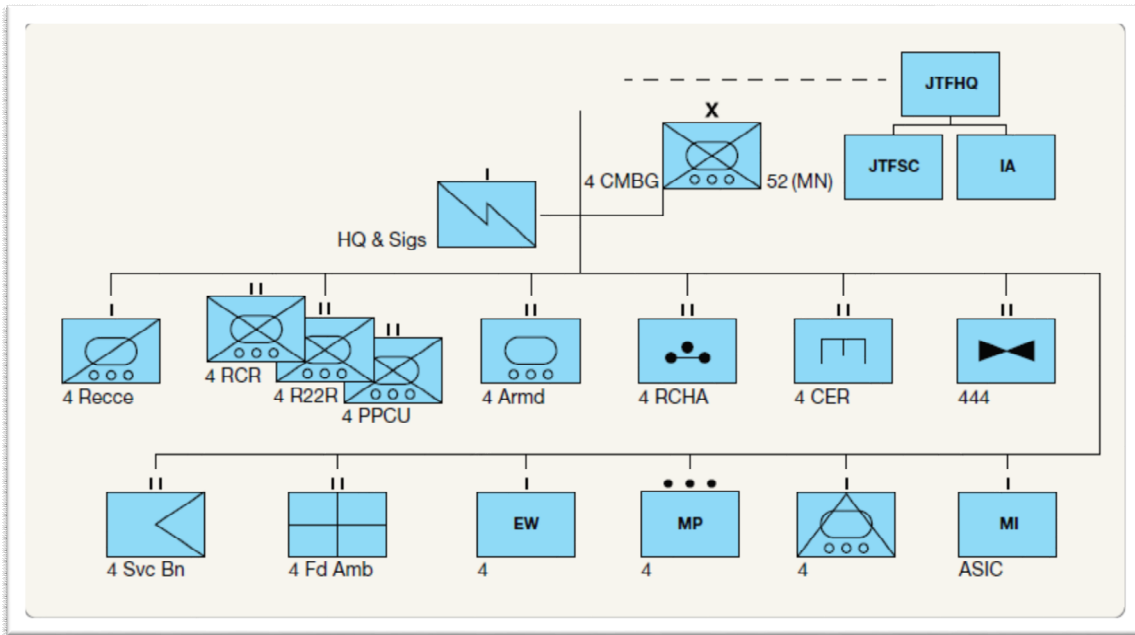


Figure 3 – Typical Brigade Group Composition<sup>16</sup>

1.4.4.3 Battle Group Level.

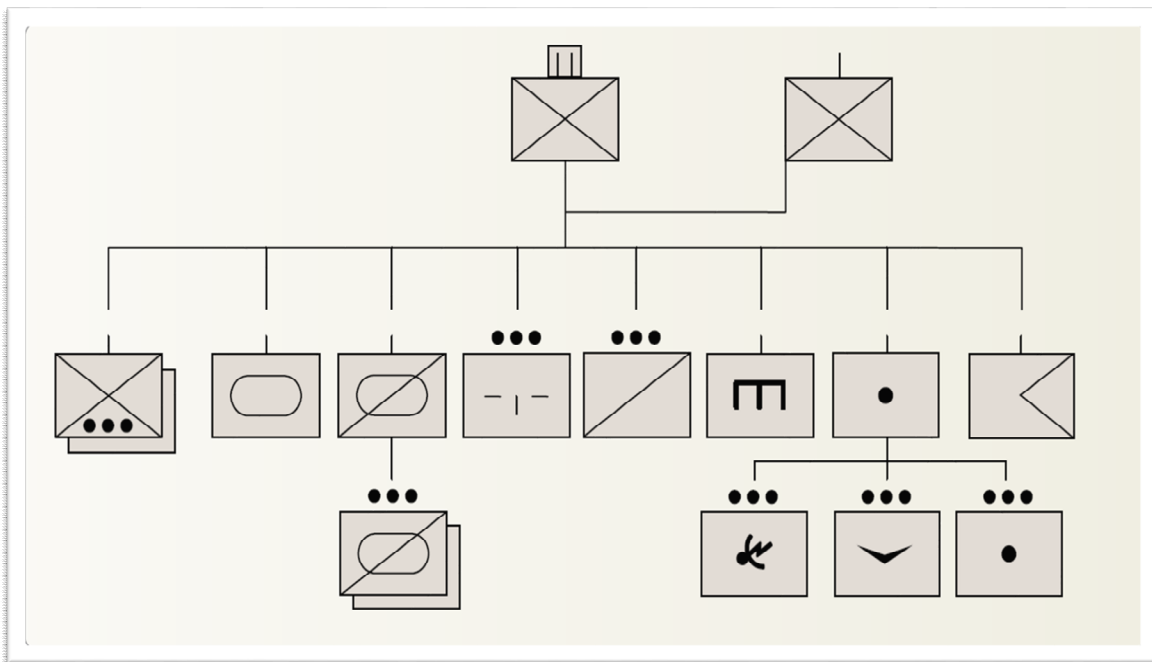


Figure 4 – Typical Battle Group Composition<sup>17</sup>

<sup>16</sup> Symbols found at [http://armyapp.forces.gc.ca/SOH/SOH\\_Content/NATO%20APP-6C%20\(2011\).pdf](http://armyapp.forces.gc.ca/SOH/SOH_Content/NATO%20APP-6C%20(2011).pdf)

<sup>17</sup> Idem

#### 1.4.4.4 Combat Team Level.

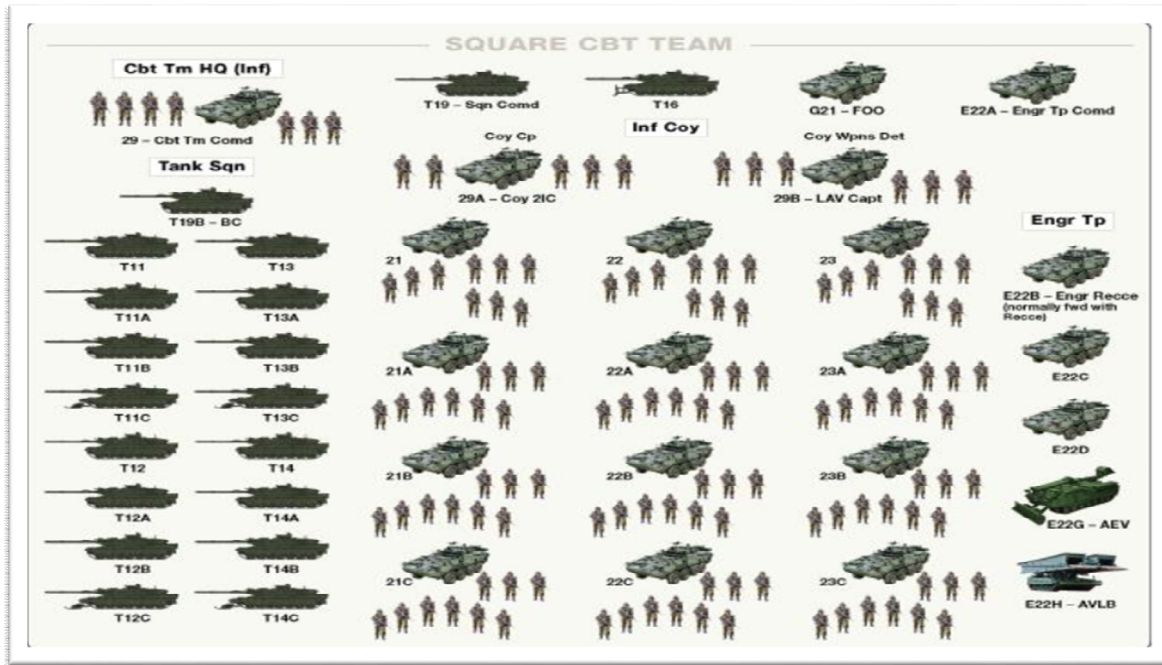


Figure 5 – Combat Team Level

### 1.5 Projects' Scope

1.5.1 The scope for the Tactical Communication Modernization and the Tactical Command and Control Information System Modernization projects covers the hardware, software and specialty equipment necessary to implement command & control and Tactical Communication solutions.

1.5.2 The scope of these two projects includes, inter alia, the following system components:

- An intuitive, integrated, interoperable, and digitalized communication system links to support and enable command and control;
- An intuitive planning and system tools to manage the system;
- The ability to train individually and collectively on these systems and the ability to integrate to the networked training simulation system; and
- Procurement of initial provisioning of two (2) years spare parts and establishment of In-Service Support Contract(s).

### 1.6 Roles and Functions

1.6.1 These Defence projects will be focused on improving Command & Control and tactical communications with an integrated, interoperable, modular, mobile, easily planned, managed and operated digital system, in order to enable and support the planning, coordination and synchronisation of Command and Control on the battlefield.

1.6.2 The cornerstone of a modern, integrated Command and Control system is a digital network. Defence projects' 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 Command and Control, 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

1.7.1 The success of all operations, particularly in high intensity conflicts, is based on the commander's ability to observe, orient, decide, and act more quickly than an adversary. Thus, the command and control 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 Tactical Communications Modernization and Tactical Command and control Information System Modernization projects 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 in the context of the Pan-Domain matrix of competition.

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:

1. 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.
2. 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.
3. 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.
4. 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.
5. 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 Projects' capabilities 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; and
- d) The Canadian Armed Forces must be a force that excels in Joint, Interagency, Multinational and Public operations.

1.7.5 As such, the Projects capability needs to be able to contribute to a force capacity that can:

- a) Address future adversaries who could be nation states or, alternatively, terrorist and criminal groups and other non-state actors;
- b) Support Joint and Coalition Operations; and
- c) Deploy and Scale on operations in diverse theatres including but not limited to urban, arctic, forest, and jungle or desert terrain.

## 1.8 Concept of Operations

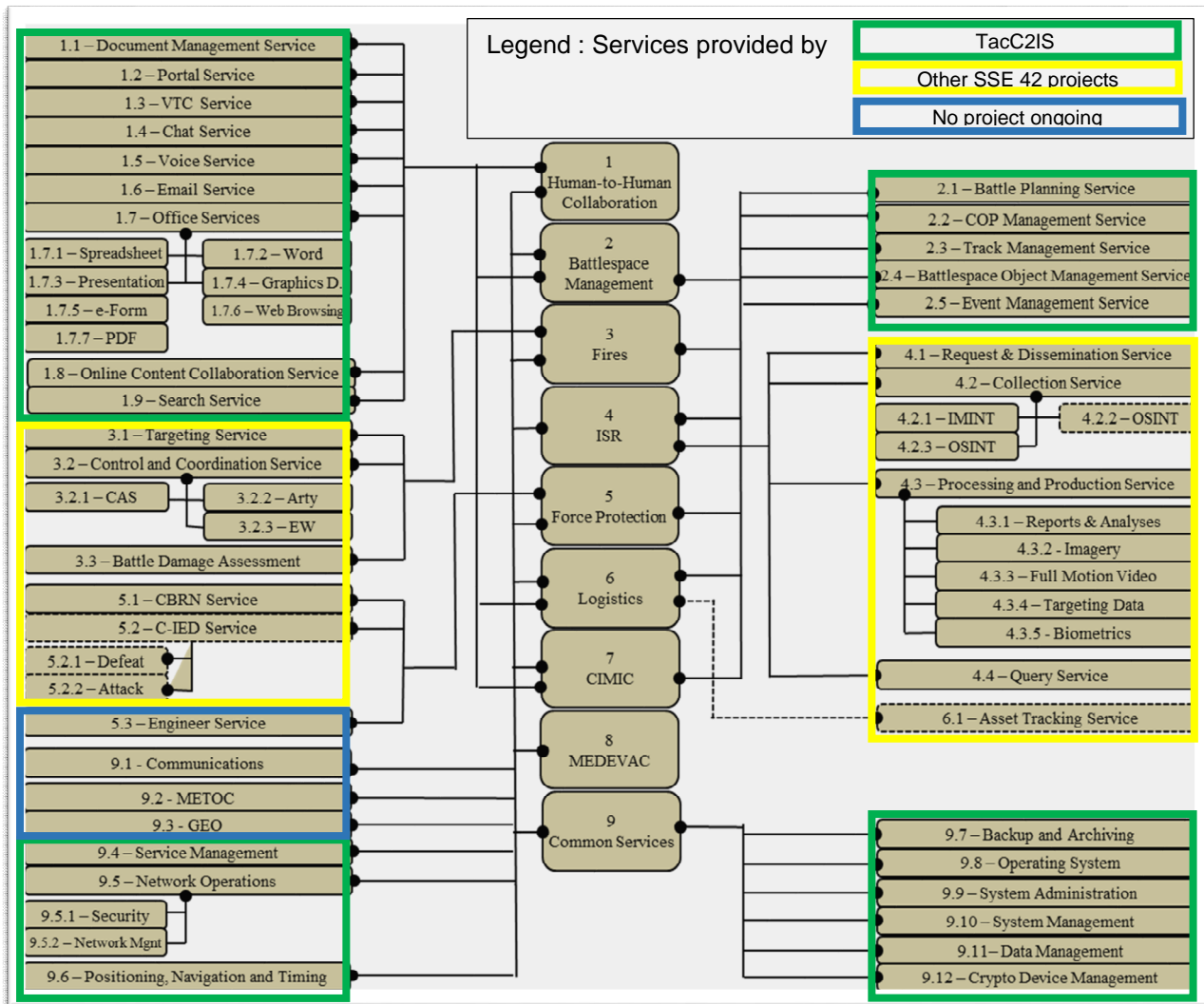
### 1.8.1 Tactical Command and Control Information System Modernization Concept

1.8.1.1 The concept for Tactical Command and Control Information System can be divided in three discrete elements (see Appendices II) that drives the scope of deliverables.

1.8.1.2 The Tactical Command and Control Information System Modernization Component View represent the main deliverable of the Tactical Command and Control Information System Modernization Project. It will include all the components for the system to use, operate, manage and support the Command and Control activities.

1.8.1.2.1 The Hardware element will seek to deliver servers, switches, network equipment, cabling, data terminal, ancillaries' and peripherals which can operate in an emanation control environment. These pieces of equipment will operate in a rapidly evolving environment going from static to mobile mode depending on the situation in the deployed area.

1.8.1.2.2 The Software element will seek to deliver a list of Common Services and User/Management Application and Tools for the tactical units, mounted or dismounted troops, thus ensuring a modernization to the way data is being managed in the operation zone. Examples of those services and applications are depicted in Figure 7 below, but might be expanded within the scope of the Tactical Command and Control Information System Modernization project.



## **Figure 6 – Current Land Command, Control, Communications, Computers, Information, Surveillance and Reconnaissance Service View**

- 1.8.1.2.3 The training element will seek to deliver simplified training for users, both individually and collectively, on the use of the equipment and applications and will integrate constructive simulation training services to facilitate training.
- 1.8.1.2.4 All consolidated elements of the Tactical Command and Control Information System Modernization capability will provide:
- a) The ability to coordinate and direct Land operations;
  - b) The ability to interoperate with military coalition partners, other government departments and other operational partners;
  - c) The ability to rapidly extend and distribute networks;
  - d) The ability to manage deployed network operations;
  - e) The ability to provide Command and Control systems that can support a tactically mobile Brigade Headquarter;
  - f) The ability to operate and coordinate cyber defences to all networks, applications and systems;
  - g) The ability to support a full range of Land operational deployments;
  - h) Enable a rapid and repeatable development and procurement process that enables systems support; and
  - i) The ability to force generate and train staff quickly.

### **1.8.2 Tactical Communications Modernization Concept**

1.8.2.1 The concept for Tactical Communications Modernization can be divided into three discrete elements, encompassed by blue blocks in Appendixes III, which drives the scope of the deliverables.

1.8.2.2 The Tactical Communication System Equipment will be the main deliverable of the Tactical Communications Modernization Project. It includes the bearers which provides the Land Tactical Intranet.

- a) The Upper Tactical Communication Equipment will seek to deliver the high-capacity data and voice link bearers, terrestrial transmission line-of-sight and beyond line-of-sight, which can operate in an emanation control environment.
- b) The Lower Tactical Communication Equipment will seek to deliver a modular and mobile solution for the tactical units, mounted or dismounted troops, and to modernize the enhanced local area network. It will provide medium to low data link and voice communication over short to long range line-of-sight and beyond line-of-sight capabilities, which can operate in an emanation control environment.

The intent of providing a distinction between “Upper Tactical Communication Equipment” and “Lower Tactical Communication Equipment” is not intended to perpetuate the existence of disparate, distinct or separated networks for digital communications in the Land Tactical arena. The representation of *Upper* and *Lower* is intended rather to represent that it is expected that there will be a heterogeneous range of capability within a single unified Land Tactical Digital Network where some nodes may be more privileged than others.

The modernized Tactical Communications capability aims to deliver a holistic system of systems to modernize the Land Command Support System. Priorities will include:

- a) An Integrated, holistic system: In leveraging technical advances, pursuing open standards and allied-driven technical standards, to the extent available, component obsolescence management will be eased, system proprietary components will decrease, open and allied technical standard based components will increase. This will facilitate sustainment, increase the component supply base, and help decrease overall sustainment costs.

- b) **Modernized Interoperability:** The adoption of open standards and architectures will provide the capability and the flexibility to be modular when it comes to bearer systems. With improved standards and architectures, ability to integrate with North Atlantic Treaty Organization allies and other allies will be both robust and redundant, providing interoperability within a combined, joint and interagency environment at the appropriate level of classification.
- c) **Seamless Connectivity:** The tactical communication system will provide a modernized network where the adoption of open standards and architectures will provide the ability to seamlessly connect and share natively digital information in the battlespace. This capability should leverage future technologies to provide robustness through self-healing and self-forming networks and maximize the mobility and flexibility of nodes.
- d) **Training Systems:** with the advancement of technology and increasing in complexity, the procurement of such complex system of systems will require a modernized training and simulation methodology that will improve the current individual and collaborative training.

1.8.2.3 This converged network will provide the commander with an improved ability to exert command and control over the assigned forces and to coordinate with joint/combined unit forces to provide the desired effects on the operational field. The following figure provides an idea of the system construct. The scope of the Tactical Communications Modernization is contained within the outlined red boxes shown in Appendixes IV.

1.8.2.4 The system tools element will seek to deliver radio and frequency management tools at up to the whole-of-network level to facilitate planning, coordination and distribution of tactical communications that will ease the burden on the operator.

1.8.2.5 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 the training audience. It will also leverage existing training infrastructures to support force generation and validation.

1.8.2.6 All consolidated elements of the Tactical Communications Modernization capability will provide:

- a) The ability to achieve Technical Interoperability within the Canadian Armed Forces and a Joint Coalition environment;
- b) The ability to achieve Operational Interoperability within the Joint Canadian Armed Forces and a combined Coalition context;
- c) The ability to support automation of processes;
- d) The ability to establish a fully available digital network;
- e) The ability to improve situational awareness, enable faster decision making, facilitate more rapid dissemination of a commander's intent;
- f) The ability to provide intuitive and ease of use equipment for the operators;
- g) The ability to provide virtual training regardless of infrastructure constraints at Regular and Reserve Force bases across Canada; and
- h) The ability to provide realistic and immersive simulation, by using simulated or in-service equipment in customizable mission scenarios.

## APPENDIX I TO ANNEX A - MISSION SCENARIOS

In a Warfighting scenario, the Brigade Group is considered as a tactical organization, with the need to process operational information for deliberate planning. As such, the Upper/Lower Tactical Intranet demarcation will occur at the Brigade Headquarter. Figure 10 illustrates this scenario. In the Warfighting scenario, the key capabilities and concerns are focused on the Lower Tactical Intranet; i.e. survivability, mobility and scalability. Because the Brigade is most likely to exist within an international construct, interoperability is required at all levels. Rapid digitalization of the systems will provide the ability to automate information exchange, such as: position location information to maintain accurate situation awareness and enable force multipliers, like digital fires, to increase the Brigade lethality.

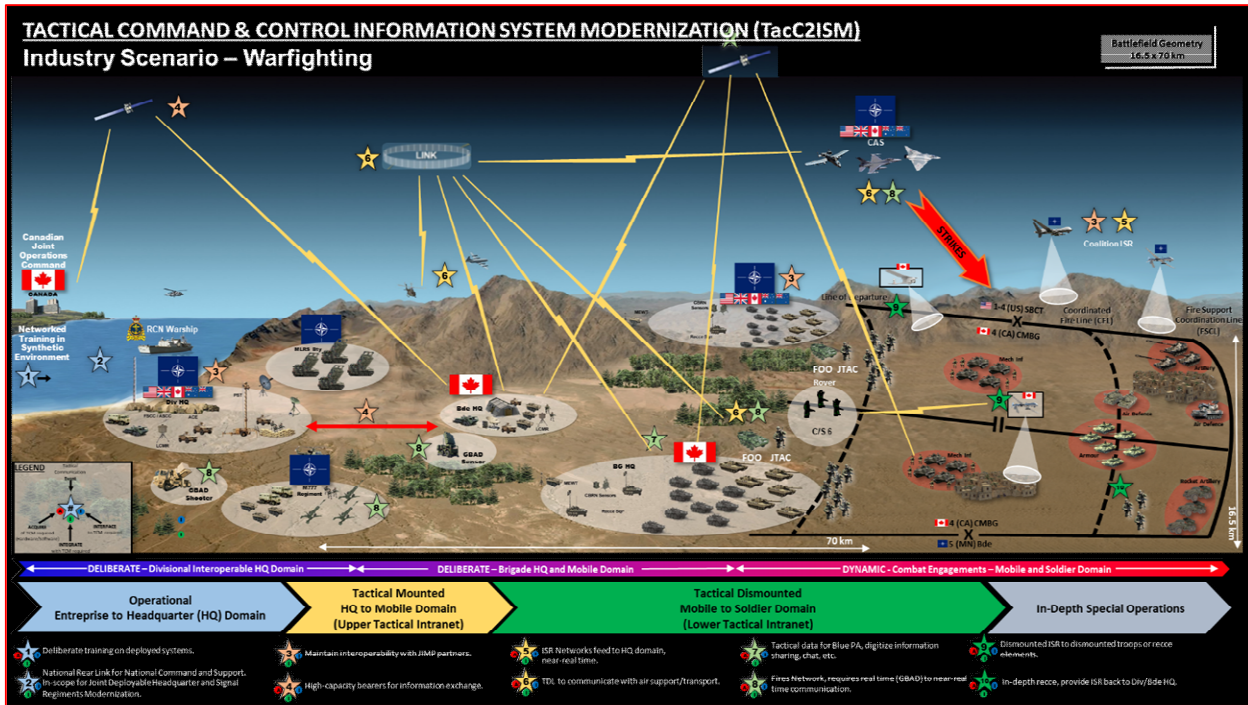


Figure 7 – Warfighting Scenario



In a Peace Support/Asymmetric Operations scenario, the Brigade HQ would reside at the operational level and operate on the Upper Tactical Intranet. The Upper Tactical Intranet / Lower Tactical Intranet demarcation occurs at the Battle Group / Unit level. Figure 11 illustrates this scenario. There is an increased requirement for a Land Command and Control System to support sharing and collaborative big data exchanges at the Upper Tactical Intranet. Interoperability and rapid digitalization are still required.

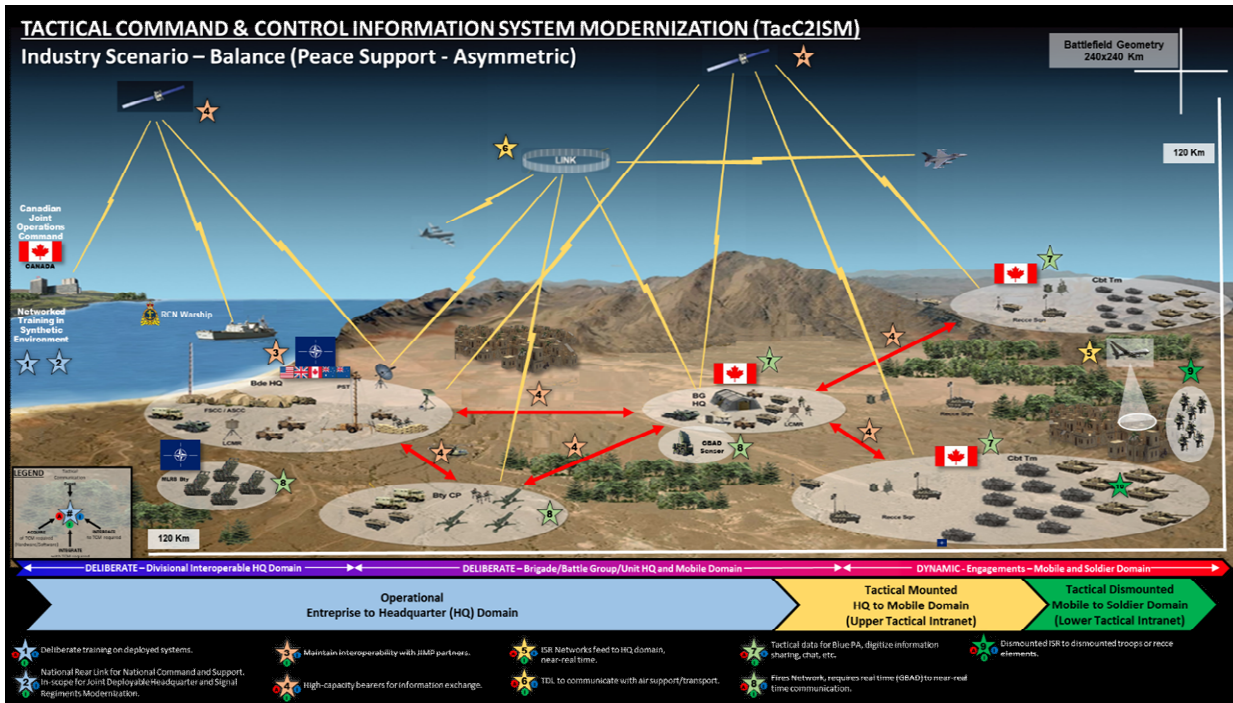
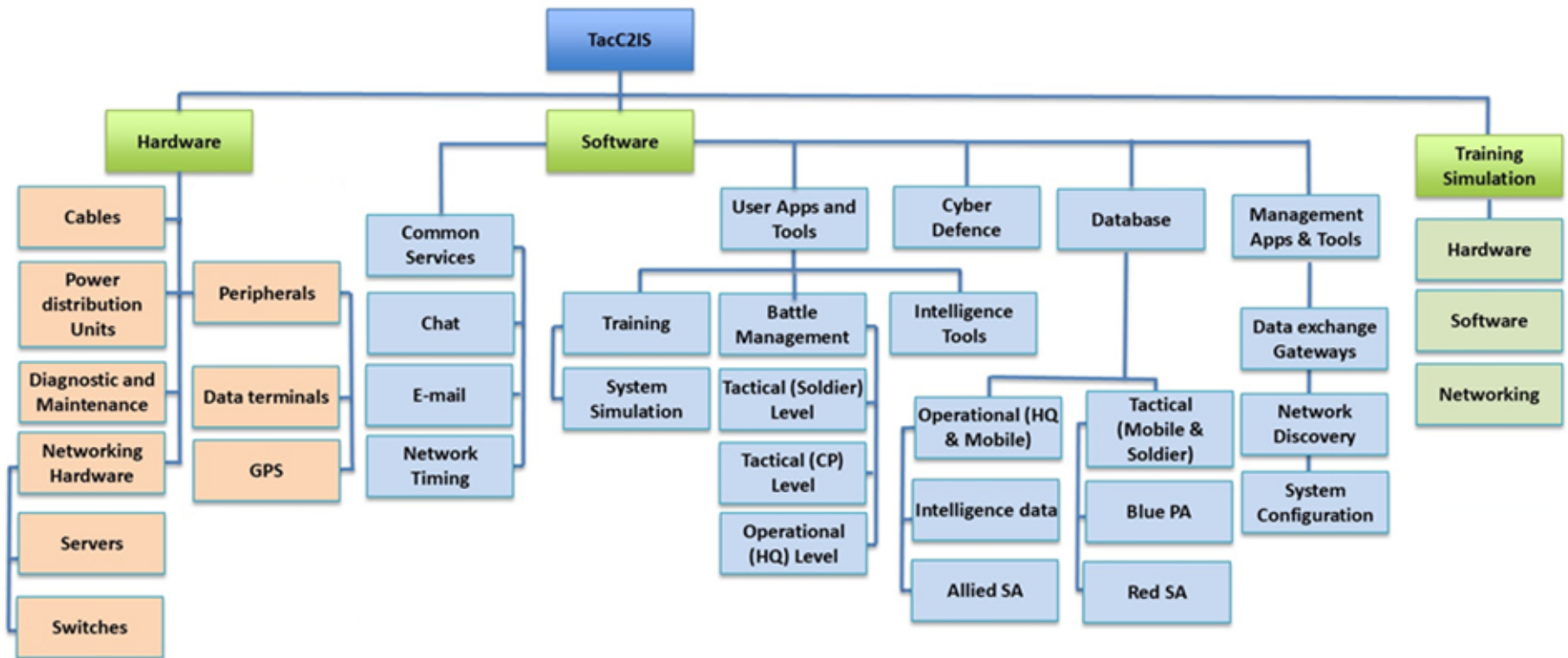
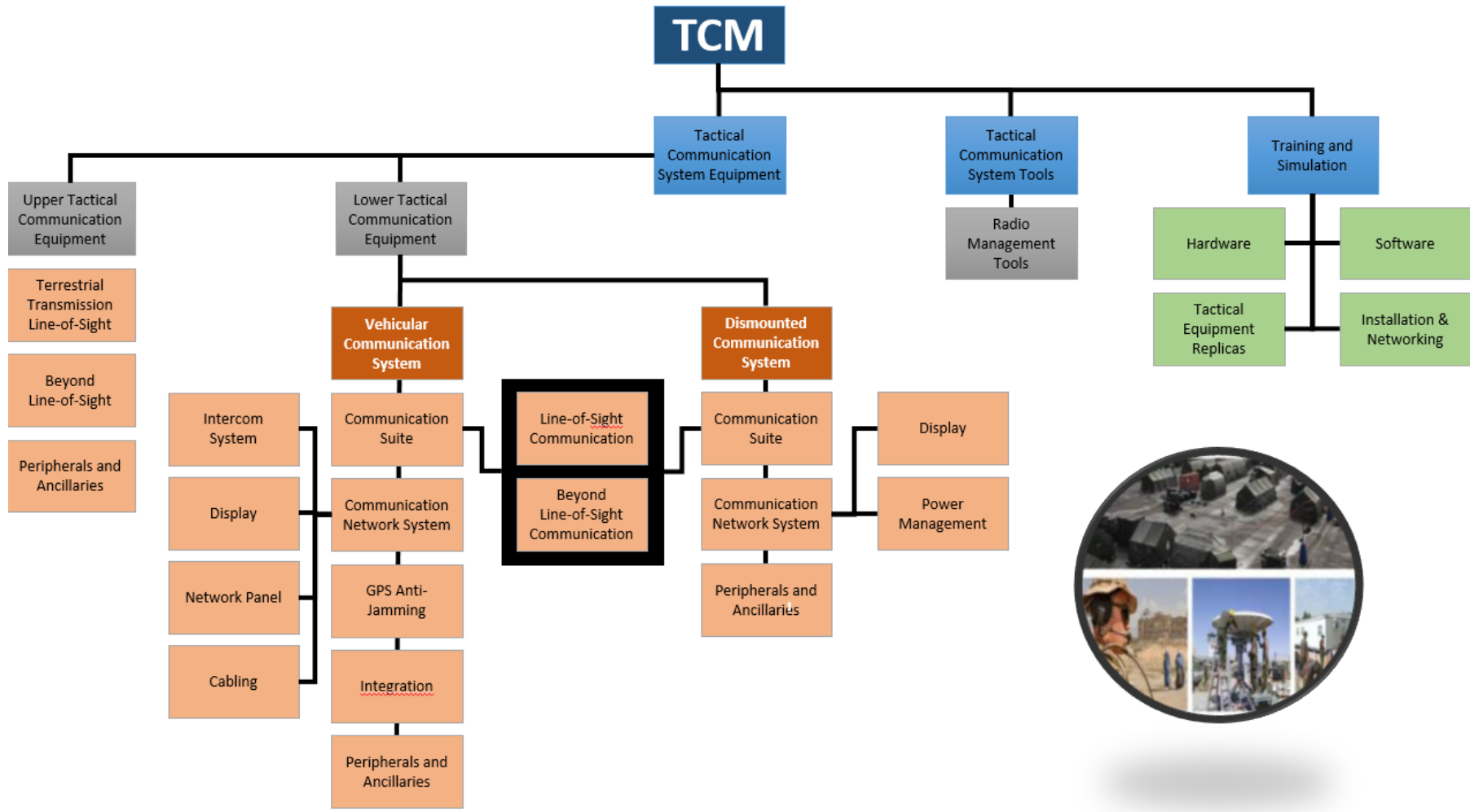


Figure 8 – Peace Support/Asymmetric Operations Scenario

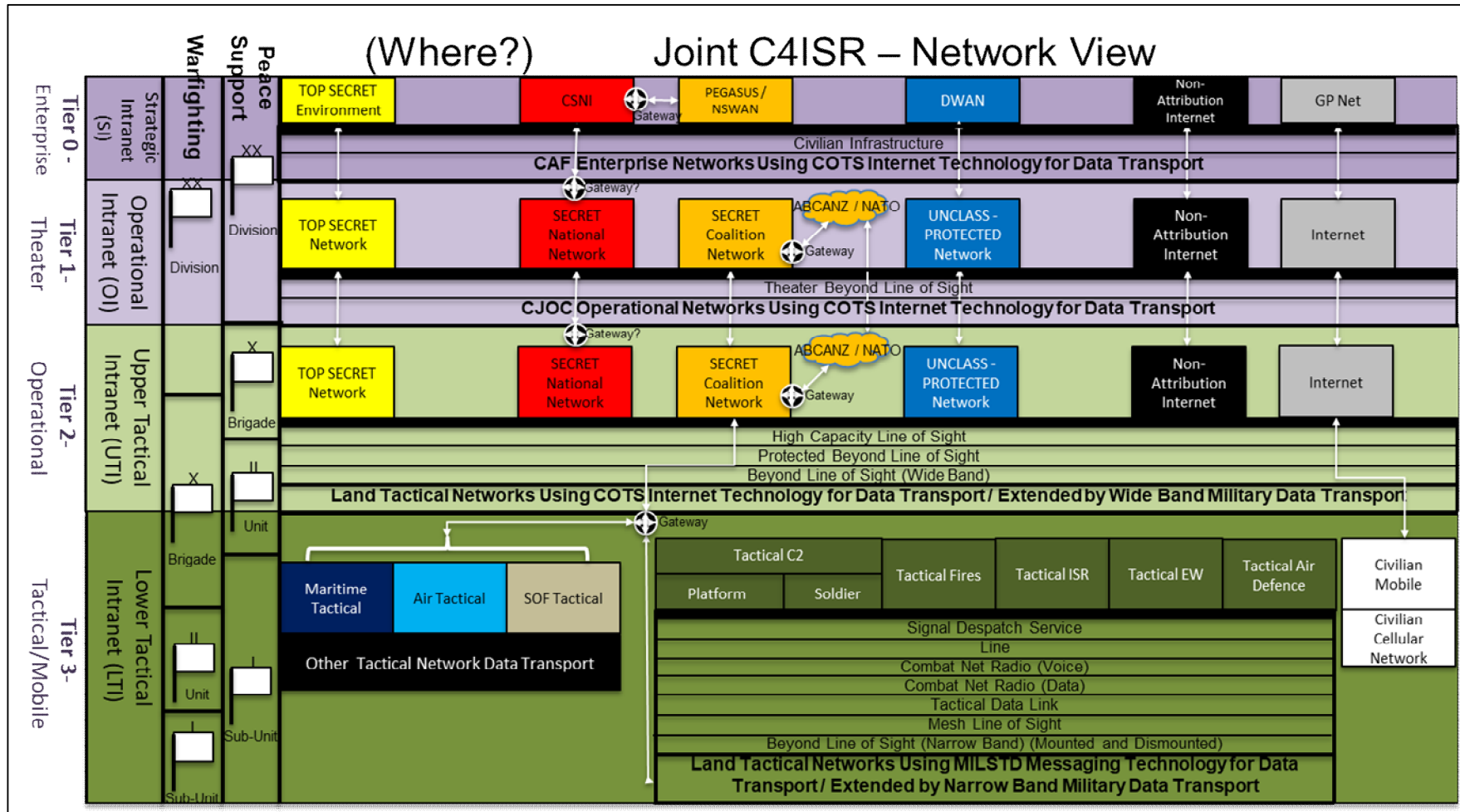
# APPENDIX II TO ANNEX A - TACTICAL COMMAND AND CONTROL INFORMATION SYSTEM MODERNIZATION ELEMENT SYSTEMS AND SUB-SYSTEMS



# APPENDIX III TO ANNEX A - TACTICAL COMMUNICATIONS MODERNIZATION ELEMENT SYSTEMS AND SUB-SYSTEMS



## APPENDIX IV TO ANNEX A - TACTICAL COMMUNICATIONS MODERNIZATION NETWORK VIEW



## ANNEX B – GENERIC DEFENCE 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, Units). 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 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 delivered Defence systems (in general terms):

1. Electronic-Optronic 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.
2. Army Communication and Information Systems Specialist Techs: 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

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 – Integrated Logistic Support 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
- 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 Special Tooling and Test Equipment

1.8.1 Industry will be asked to recommend an initial scaling of spare components and sub-systems, in sufficient quantities to support the determined availability of the fleet. The scaling of spare components and sub-systems will reflect the data within the Logistic Support Analysis. Defence projects are 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 – Defence projects investigate 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 Line Support Analysis.

## **1.9 Contracted Maintenance and Training Services**

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

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

## **1.10 Field Service Representatives**

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. Defence projects also seek information from industry on the capabilities to complete repairs, training, and Repair and Overhaul in commercial service facilities both within Canada and internationally.

## **1.12 Excluded Maintenance Services**

1.12.1 Operational requirements dictate that 1<sup>st</sup> and 2<sup>nd</sup> line support in expeditionary operations be provided by Canadian Armed Forces technicians. Any contracted support in these instances would be from a 3<sup>rd</sup> line role,

providing support from a theatre base of operations. Tasks of such a contractor arrangement could include support to 1<sup>st</sup> and 2<sup>nd</sup> line organizations when operational tempo and geography allow.

### **1.13 Engineering Services**

1.13.1 Defence projects explore 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 contract; Special Investigations and Technical Studies contract; Additional Work Request; or In-Service Support contracts.

### **1.14 Embedded Contractors**

1.14.1 Defence projects will investigate the ability of industry to work embedded in Department of National Defence facilities in order to enhance communication and provide responsive technical 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 Defence projects investigate the capabilities of industry to provide updates to technical publications over the life-cycle of the systems.

1.15.4 Defence projects investigate 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 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 will be a requirement to conduct functional configuration audits and physical configuration audits.

1.16.5 Obsolescence Management. There will be a requirement to provide obsolescence management during the initial provisioning period, which is expected to include but is not limited to high risk components/sub-systems list and obsolescence management issues reports (as required). Defence projects investigate 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. Defence projects investigate 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 management, incremental improvements, and obsolescence management such that it is able to keep pace with current technology and user expectations.

1.17.2 Local/Field Software Updates. There will be a requirement for the system to provide qualified Canadian Armed Forces technicians with the capability to perform software updates to isolated offline system components (that are software updatable) while the system components are deployed to a theater environment.

1.17.3 Private Cloud-Based Services. While it may not be feasible to have tactical equipment always connected to a private cloud-based services, Defence projects investigate the ability for industry to provide secure updates for software systems when security measures permit (e.g. at home within Canada).

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

1.17.5 Network Architecture. It is anticipated Tactical Command and Control Information System Modernization and Tactical Communications Modernization Projects will require access to networked data. Defence projects investigate 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 delivered Defence capabilities in a test setting. This may include, but is not limited to:

1.18.1.1 Department of National Defence User Trials - Test & Evaluation to demonstrate that the system meets the requirements and specifications; and

1.18.1.2 Contractor Capability Testing – Testing could include but is not limited to: Interference, compatibility with allies, level of noise emission, start-up, operation, conducting various tasks, extreme weather operations.

## 1.19 Intellectual Property

1.19.1 Canada must have sufficient Intellectual Property access to ensure it is able to sustain the system 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

1.20.1.1 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 or Field Service Representatives both domestically and on operations.

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

## **1.21 Supply**

1.21.1 Defence projects may 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' SAP enterprise resource planning tool, Defence Resource Management Information System.

## **1.23 Lifecycle and Repair & Overhaul**

1.23.1 The estimated life expectancy of the equipment to be finalized in Definition 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 will depend on the length and complexity of the training package, but the end state will be achieved when training responsibilities are transferred successfully to Army and 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 by which sustainment may be measured**

1.26.1 Of prime concern is the availability of any delivered Defence 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.

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

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

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

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

1.26.1.5 Mean time to deliver spare parts. Mean time from when order placed in Defence Resource Management Information System to delivery of part to appropriate maintenance organization.

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

1.26.1.7 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:

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

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

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

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

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

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

## **PART 3 – RESPONSE MATRIX**

Respondents should use the following annexes provided in Excel for their response submission.

Annex C – Industrial Technological Benefits and Value Proposition

Annex D1 – Tactical Command and Control Information System Modernization Acquisition Costing Requirements

Annex D2 – Tactical Command and Control Information System Modernization Annual Sustainment Cost of Proposed Solution(s)

Annex D3 – Tactical Communications Modernization Acquisition Costing Requirements

Annex D4 – Tactical Communications Modernization Annual Sustainment Cost of Proposed Solution(s)

Annex E1 – Tactical Command and Control Information Modernization System High Level Mandatory Requirements and Acquisition Questions

Annex E2 – Tactical Communications Modernization High Level Mandatory Requirements and Acquisition Questions

## **ANNEX C – INDUSTRIAL TECHNOLOGICAL BENEFITS POLICY / VALUE PROPOSITION**

### **1.1 Application of the Industrial and Technological Benefits Policy**

1.1.1 The Industrial and Technological Benefits Policy may be applied on both the Tactical Command & Control Information System Modernization and the Tactical Communications Modernization projects. 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 & 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](http://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 both the Tactical Command & Control Information System Modernization and the Tactical Communications Modernization projects, 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.

### **1.4 The definitions for the relevant Key Industrial Capabilities for these projects are:**

#### **1.4.1 Cyber Resilience**

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

#### 1.4.2.1 *Information security*

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

#### 1.4.2.2 *Information Technology security*

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

#### 1.4.2.3 *Operational technology security*

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

#### 1.4.2 Defence Systems Integration

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

### 1.5 **Questions**

Please answer Annex C questions for each of the projects within the Excel Response Matrix.

## **ANNEX D – ACQUISITION AND SUSTAINMENT COSTING REQUIREMENTS**

### **1.1 Initial Acquisition**

1.1.1 The purpose of the Tactical Command & Control Information System Modernization and Tactical Communications Modernization projects' costing exercise is to request indicative costing information from suppliers in order to allow Canada to prepare its documents for both projects' approvals. Respondents are asked to

- a) Provide Indicative or Rough Order of Magnitude pricing - but preferably not to exceed plus or minus 40 percent – for each Solution presented;
- b) Complete as much information in Excel as possible for your Solution activities within this Annex; and
- c) Explain any associated risks with each activity.

1.1.2 Please provide your solutions for any combination of Canada's requirements as laid out in Annexes A and B at the lowest possible cost breakdown level. If a specific cost element is not provided for any reason, for example because it is included in the price for another item, please provide that explanation within your 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 provide answers and separate detailed estimates for each of the project cost estimates within the Excel Response Matrix Annexes provided.

### **1.2 Sustainment**

1.2.1 Knowledge of long term sustainment costs are key to delivering affordable Defence systems and high level annual sustainment cost estimates for each proposed solution are now needed for project approvals.

1.2.2 Please answer sustainment questions related to your proposed Acquisition Solutions presented within the Excel Response Matrix Annexes provided.

## **ANNEX E – HIGH LEVEL MANDATORY REQUIREMENTS AND QUESTIONS**

### **1.1 High Level Mandatory Requirements**

Please provide answers within the Excel Response Matrix Annex E provided.

### **1.2 General**

- 1.2.1 These annexes contain the preliminary High Level Mandatory Requirements for both the Tactical Command and Control Information System Modernization and the Tactical Communications Modernization projects which define a set of high level functional and performance requirements. Respondents are requested to provide information describing how their proposed solutions meet each of these requirements.
- 1.2.2 Please answer Annex E questions for each of the proposed solutions within the Excel Response Matrix.



## **PART 4 – OTHER BUSINESS**

Annex F – Glossary of Terms

## ANNEX F – ACRONYMS

ACISS	Army Communication and Information Systems Specialist
AI	Artificial Intelligence
CA	Canadian Army
CAF	Canadian Armed Forces
CAS	Close Air Support
C2	Command and Control
C4ISR	Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance
DND	Department of National Defence
DRMIS	Defence Resource Management Information System
EW	Electronic Warfare
FSR	Field Service Representative
FVEY	Five Eyes countries include US, UK, Canada, Australia and New Zealand
GAJT	GPS Anti-Jam Technology
GFE	Government Furnished Equipment
GFI	Government Furnished Information
GoC	Government of Canada
GPS	Global Positioning System
GSM	Government Supplied Material
HLMR	High Level Mandatory Requirements
ILS	Integrated Logistic Support
IP	Intellectual Property
ISS	In-Service Support
JFM	Joint Fires Modernization
KPI	Key Performance Indicators
LCSS	Land Command Support System
LRU	Line Replaceable Units
LSA	Logistic Support Analysis
LSAR	Logistic Support Analysis Record
MDT	Mean downtime
MMDS	Materiel Management and Distribution System
MOA	Memorandum of Agreement
MSI	Maintenance Significant Item
MTBF	Mean operating time between failures
MTBM	Mean time between maintenance
MTTDSP	Mean time to deliver spare parts
MTRR	Mean time to repair
NATO	North Atlantic Treaty Organization
NORAD	North American Aerospace Defence

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OEM	Original Equipment Manufacturer
PMO	Project Management Office
R&O	Repair and Overhaul
RCAF	Royal Canadian Air Force
RCN	Royal Canadian Navy
RSPL	Recommended Spares Parts List
SA	Situational Awareness
SaaS	Software-as-a-Service
SACC	Standard acquisition clause and condition
SITS	Special Investigations and Technical Studies
SSE	Strong, Secure, Engaged
STACC	Surveillance and Target Acquisition Coordination Centre
STTE	Special Tooling and Test Equipment
TacC2IS	Tactical Command & Control Information System
TCM	Tactical Communication Modernization
TDL	Tactical Data Link
TIES	Technical Investigation and Engineering Support
TST	Time-sensitive targets
VMF	Variable Message Format