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## CANADIAN ARMY TACTICAL LAND/LITTORAL VEHICLE REQUIREMENT

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**JCSP 47**

**Service Paper**

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# **CANADIAN ARMY TACTICAL LAND/LITTORAL VEHICLE REQUIREMENT**

## **AIM**

1. The Canadian Armed Forces (CAF) currently does not have the tactical means to conduct land manoeuvre in the Arctic. The purpose of this service paper is to recommend a tactical vehicle platform to the Canadian Army (CA) for procurement that has a land/littoral capability and that can withstand the demands of operating in the harsh conditions of the Canadian North.

## **INTRODUCTION**

2. This service paper will discuss whether or not a military threat is perceived to exist in the Canadian Arctic prior to addressing the CA's ability to operate in the North. To inform this service paper, research was conducted on the current ongoing procurement process of the Domestic Arctic Mobility Enhancement (DAME) vehicle. This vehicle will replace the Bandvagen 206 (BV 206) which was due to be divested over 15 year ago, and also reduce Light Over Snow Vehicles (LOSV) and All-terrain Vehicle (ATV) fleets that the CA requires to conduct operations. DAME is a "medium, semi-amphibious, high mobility," non-tactical land/littoral vehicle that will enable Canada to achieve its strategic goals in the Arctic.<sup>1</sup> An Options Analysis brief for DAME was presented to the Defence Capability Board on 27 January 2021 and the initial delivery of the vehicle is expected during fiscal year 2024/2025.<sup>2</sup>

3. This service paper will weigh tactical military application of DAME, over and above Canada's domestic strategic goals, and recommend changes for consideration to the DAME Statement of Operational Requirements (SOR) so that a vehicle can be procured that meets both domestic and tactical remits for operating in the Canadian Arctic.

## **DISCUSSION**

### **Is there a Perceived Military Threat to the North?**

4. Global warming and climate change have made the Canadian Arctic more accessible than it has ever been. Economic opportunities include vast untapped natural resources and even the potential for both domestic and international tourism. These potential likelihoods have the possibility to present as Canadian safety, environmental, security, and defence challenges.<sup>3</sup>

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<sup>1</sup>Department of National Defence. C.000814, *Domestic and Arctic Mobility Enhancement Preliminary Statement of Requirements*, Version 1.0. Canadian Army – DLR, 09 December 2020. 4.

<sup>2</sup>Department of National Defence. *Domestic and Arctic Mobility Enhancement Defence Capability Blueprint Options Analysis Briefing*. Canadian Army – DLR, 27 January 2021. 6.

<sup>3</sup>Department of National Defence. *Letter of Promulgation – CJOC Plan for the North*. Ottawa: Canadian Joint Operations Command, 25 February 2015. 4.

5. *Strong, Secure, Engaged* acknowledges the Arctic as a defence priority and states, “Canada remains committed to exercising the full extent of its sovereignty in Canada’s North, and will continue to carefully monitor military activities in the region and conduct defence operations and exercises as required.”<sup>4</sup> It also highlights that the Government of Canada (GoC) will invest in CA equipment projects such as “Arctic-capable land vehicles”, in order to improve the CA’s ability to operate in Canada’s remote regions.<sup>5</sup>

6. *Canadian Joint Operations Command’s (CJOC) Plan for the North* in 2015 amplified, “There is no immediate conventional military threat in Canada’s North, nor is the emergence of one likely in the foreseeable future.”<sup>6</sup> This plan viewed the CAF as lead for Northern “defence activities” and as an enabler to support the GoC for the purposes of Arctic “safety and security.” However, it further stated that the CAF must be able to respond to “threats or emergencies.”<sup>7</sup> It is unclear what type of threats CJOC meant, as one of their planning assumptions was, “There is no immediate conventional military threat in the North.”<sup>8</sup> Even if conventional military threats are not deemed imminently likely, as international interest grows with respect to the North, so too will security challenges.<sup>9</sup>

7. *CJOC’s Plan for the North* also talks about “a requirement for deterrence against emerging threats... A consistent presence combined with a demonstrated capability to respond to any threat and operating in the North will form the primary military deterrent option.”<sup>10</sup> It could be argued that operating in the North in this context, to act as a military deterrent, would mean that a force requires a tactical platform to effectively deter a military adversary. However, CJOC clarified their intent, by tasking the CA to conduct operations and exercises that showcase their technical expertise of operating and defending the North; articulating, “Only through visible and sustained presence in the North will the CAF be able to deter the emergence of a military threat in the North.”<sup>11</sup>

8. When appearing before the Standing Senate Committee on National Security and Defence in 2011, Brigadier-General D.B. Millar, Commander Joint Task Force (North)

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<sup>4</sup>Department of National Defence. *Strong, Secure, Engaged*. Ottawa: as represented by the Minister of National Defence, 2017. 90.

<sup>5</sup>Department of National Defence. *Strong, Secure, Engaged*. Ottawa: as represented by the Minister of National Defence, 2017. 102.

<sup>6</sup>Department of National Defence. *Letter of Promulgation – CJOC Plan for the North*. Ottawa: Canadian Joint Operations Command, 25 February 2015. 5.

<sup>7</sup>Department of National Defence. *Letter of Promulgation – CJOC Plan for the North*. Ottawa: Canadian Joint Operations Command, 25 February 2015. 6.

<sup>8</sup>Department of National Defence. *Letter of Promulgation – CJOC Plan for the North*. Ottawa: Canadian Joint Operations Command, 25 February 2015. 16.

<sup>9</sup>Department of National Defence. C.000814, *Domestic and Arctic Mobility Enhancement Preliminary Statement of Requirements*, Version 1.0. Canadian Army – DLR, 09 December 2020. 15.

<sup>10</sup>Department of National Defence. *Letter of Promulgation – CJOC Plan for the North*. Ottawa: Canadian Joint Operations Command, 25 February 2015. 8.

<sup>11</sup>Department of National Defence. *Letter of Promulgation – CJOC Plan for the North*. Ottawa: Canadian Joint Operations Command, 25 February 2015. 33.

stated, “The likelihood of an attack in the high Arctic is as likely as an attack in downtown Toronto.” However, military and strategic studies expert Rob Huebert offered a differing opinion, “We should not have rose-coloured glasses when looking at the issues of the circumpolar North.”<sup>12</sup> Huebert was the only member on the committee that stated that his research has lead him to believe that there is a real and viable military threat to Canada’s North.<sup>13</sup>

9. In 2020, the Minister of National Defence released the *Pan-Domain Force Employment Concept (PFEC)*. Although this document did not state that there is an imminent conventional military threat to the Canadian Arctic, it did stress that the North is becoming increasingly more accessible and that this may in turn result in an increase in international military activity.<sup>14</sup> Another one of CJOC’s planning assumptions in 2015 was, “Due to the protracted transit time of maritime elements, the initial CAF response to a threat or hazard in the North will likely be based on air and land assets.”<sup>15</sup> The CA needs a land/littoral vehicle that is able to meet the GoC’s strategic domestic objectives, and also meet the tactical and operational requirements to combat the military adversary of tomorrow.

### **Current Capability: The BV 206**

10. The BV 206 is a first generation vehicle that was developed by Hagglands (now part of BAE Systems Global Combat Systems) in the late 1970s. The CAF procured the BV 206 in 1983 and employed three variants: the Command Post; the Ambulance; and the Cargo. In the 1990s, the Tube-launched, Optically-tracked, Wire-command (TOW) guided missile variant was also employed.<sup>16</sup> “[The BV 206] has been discontinued by the original equipment manufacturer (OEM) [BAE] who no longer produces the vehicles, nor parts required to maintain an existing fleet resulting in significant capability shortfall.”<sup>17</sup>

11. In 2015, in order to ensure that the CA could continue to meet its operational and GoC mandates, the CA announced a BV 206 Betterment minor capital project which would “extend the capability of [the] reduced BV 206 fleet until [the] DAME project [could] be realized.”<sup>18</sup> The Betterment project involved rationalizing the BV 206 fleet

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<sup>12</sup>House of Commons. Standing Committee on National Security and Defence. *Sovereignty & Security in Canada’s Arctic*, Interim Report, March 2011. 28.

<sup>13</sup>House of Commons. Standing Committee on National Security and Defence. *Sovereignty & Security in Canada’s Arctic*, Interim Report, March 2011. 27.

<sup>14</sup>Department of National Defence. *Pan-Domain Force Employment Concept – Prevailing in an Uncertain World*. Ottawa: as represented by the Minister of National Defence, 2020. 11.

<sup>15</sup>Department of National Defence. *Letter of Promulgation – CJOC Plan for the North*. Ottawa: Canadian Joint Operations Command, 25 February 2015. 16.

<sup>16</sup>Department of National Defence. *BV 206 Tracked Carrier*. Canadian Army. Last modified, 13 December 2017. Accessed online, 06 February 2021. <http://www.army-armee.forces.gc.ca/en/vehicles/bv-206-tracked-carrier.page>

<sup>17</sup>Department of National Defence. C.000814, *Domestic Arctic Mobility Enhancement Business Case Analysis*, Version 1.6. Canadian Army – DLR, 10 December 2020. 4.

<sup>18</sup>Department of National Defence. C.000814, *Domestic Arctic Mobility Enhancement Business Case Analysis*, Version 1.6. Canadian Army – DLR, 10 December 2020. 37.

down to 18 from the 108 vehicles that were originally procured.<sup>19</sup> Reducing the fleet allowed for the divested vehicles to be cannibalized for parts and equipment. In extreme cases, the Department of National Defence (DND) leveraged contracts for civilian companies as well as 202 Workshop Depot (a third line maintenance unit) to manufacture replacement parts for critical items such as engines and transmissions.<sup>20</sup>

12. In its current state, the BV 206 fleet is capable of providing protection to soldiers from the “extreme cold weather conditions”; however, the vehicles are no longer amphibious and therefore they are only able to conduct land/littoral operations in the North in a limited capacity.<sup>21</sup> DND’s *Evaluation of Land Readiness* report from 2016 emphasized, “The lack of a replacement vehicle for the foreseeable future will be a significant constraint on the Army’s responsiveness and capabilities in the Arctic.”<sup>22</sup> DAME aims to address this concern.

### **Current Capability: LOSV & ATV**

13. To supplant the BV 206 fleet, the CA writ large currently maintains 977 LOSVs and 604 ATVs. Roughly one tenth of these vehicles operate in the Arctic on a yearly basis. Both of these vehicle fleets have life cycle durations of under ten years and are purchased under a commercial pattern vehicle fleet procurement process; which means that although they are a cheaper option to purchase at the outset, depending on how many vehicles are written off in a single year, it could be difficult to budget and forecast future spending.<sup>23</sup>

14. LOSVs and ATVs do not have amphibious capability and due to the exposed nature of the operator, they offer very little protection from the weather or the environment.<sup>24</sup> As well, wearing a Department of Transportation approved helmet or even an issued Kevlar helmet is not always possible because if the weather is severe enough, a helmet will interfere with a rider’s thermally protective clothing to the extent that it will compromise the safety of the soldier.<sup>25</sup>

15. The DAME *Business Case Analysis* assesses, “The reliance on the light mobility fleets of LOSVs and ATVs is not capable of achieving the full range of domestic

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<sup>19</sup>Department of National Defence. C.000814, *Domestic Arctic Mobility Enhancement Business Case Analysis*, Version 1.6. Canadian Army – DLR, 10 December 2020. 15.

<sup>20</sup>Department of National Defence. C.000814, *Domestic Arctic Mobility Enhancement Business Case Analysis*, Version 1.6. Canadian Army – DLR, 10 December 2020. 21.

<sup>21</sup>Department of National Defence. C.000814, *Domestic Arctic Mobility Enhancement Business Case Analysis*, Version 1.6. Canadian Army – DLR, 10 December 2020. 17.

<sup>22</sup>Department of National Defence. 1258-228 (ADM (RS)), *Evaluation of Land Readiness*. Ottawa: as represented by the Assistant Deputy Minister (Review Services), November 2016. 21.

<sup>23</sup>Department of National Defence. C.000814, *Domestic Arctic Mobility Enhancement Business Case Analysis*, Version 1.6. Canadian Army – DLR, 10 December 2020. 44.

<sup>24</sup>Department of National Defence. C.000814, *Domestic and Arctic Mobility Enhancement Preliminary Statement of Requirements*, Version 1.0. Canadian Army – DLR, 09 December 2020. 11.

<sup>25</sup>Department of National Defence. 3350-NUN (Charles Coy), *Post Exercise Report – Operation NUNALIVUT 2019*, 30 April 2019. 43

operations' objectives, particularly in Canada's Northern regions, and therefore is not in adherence with the GoC's strategic goals."<sup>26</sup> The procurement of DAME will not eliminate the requirement for LOSVs and ATVs; however, it will reduce the number of them required to conduct land operations in the Arctic.<sup>27</sup>

### **Future Domestic Capability: DAME**

16. There is currently a capability gap that exists in that the CA does not possess a land/littoral vehicle that can reliably endure the harsh unpredictable operating environment of Northern Canada. *Strong, Secure, Engaged* (SSE) Initiative 43 tasked the CA to, "Acquire all-terrain vehicles, snowmobiles and larger tracked semi-amphibious utility vehicles optimized for use in the Arctic environment."<sup>28</sup> According to the *Preliminary Statement of Requirements (PSOR)*, the DAME project is a vital component to the "GoC's approach to securing Canada's North," and it meets the intent of SSE Initiative 43.<sup>29</sup>

17. The *PSOR* outlines that DAME must be able to withstand the conditions that come with operating in Canada's North, this includes operating over snow and ice; as well as protecting its occupants from extreme weather.<sup>30</sup> The project calls for four different operational suites to be delivered: Command Post; Troop Carrying; Cargo and Equipment Carrying; and Ambulance. In addition, trailers, integrated logistics support (ILS), infrastructure upgrades, and in-service support solutions are also represented in the *SOR*.<sup>31</sup> "The DAME vehicle is intended for Domestic Operations only and is not anticipated to be exposed to conventional military threats."<sup>32</sup>

### **The Argument for a Tactical Land/Littoral Vehicle**

18. To date, the Canadian Arctic has been viewed "as a region of international cooperation;" however, as access to the region becomes more readily available to Arctic and non-Arctic states alike, military interest in the North will follow.<sup>33</sup> The *DAME Business Case Analysis* states that DAME seeks to procure "new vehicles that are both fit

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<sup>26</sup>Department of National Defence. C.000814, *Domestic Arctic Mobility Enhancement Business Case Analysis*, Version 1.6. Canadian Army – DLR, 10 December 2020. 39.

<sup>27</sup>Department of National Defence. C.000814, *Domestic Arctic Mobility Enhancement Business Case Analysis*, Version 1.6. Canadian Army – DLR, 10 December 2020. 44.

<sup>28</sup>Department of National Defence. *Strong, Secure, Engaged*. Ottawa: as represented by the Minister of National Defence, 2017. 37.

<sup>29</sup>Department of National Defence. C.000814, *Domestic and Arctic Mobility Enhancement Preliminary Statement of Requirements*, Version 1.0. Canadian Army – DLR, 09 December 2020. 14.

<sup>30</sup>Department of National Defence. C.000814, *Domestic and Arctic Mobility Enhancement Preliminary Statement of Requirements*, Version 1.0. Canadian Army – DLR, 09 December 2020. 14-15.

<sup>31</sup>Department of National Defence. *Domestic and Arctic Mobility Enhancement Defence Capability Blueprint Options Analysis Briefing*. Canadian Army – DLR, 27 January 2021. 1.

<sup>32</sup>Department of National Defence. C.000814, *Domestic and Arctic Mobility Enhancement Preliminary Statement of Requirements*, Version 1.0. Canadian Army – DLR, 09 December 2020. 15.

<sup>33</sup>Department of National Defence. C.000814, *Domestic Arctic Mobility Enhancement Business Case Analysis*, Version 1.6. Canadian Army – DLR, 10 December 2020. 9.



for current roles and can adapt to potential future roles of the CA in the GoC's strategic planning for domestic operations, with an understanding that the most likely expansion of operational roles will take place in the Arctic."<sup>34</sup>

19. DAME acknowledges the likelihood of an expansion of operational roles in the Arctic, but it does not address this issue in its *PSOR*. The *PSOR* outlines that the Arctic vehicle will be a non-combat vehicle. "As this capability is intended solely for domestic roles, this vehicle platform will not require tactical protections such as ballistic armour and thermal signature reduction. There will be no requirements for the mounting of weapons systems."<sup>35</sup>

20. Additionally, in the DAME *Business Case Analysis*, one of the fulfillment requirements discussed in the preliminary options analysis was, "The project however can investigate the possibility of a 'fitted for not with' armour solution to assess its feasibility in enabling future modification to allow for deployment in higher threat environments." However, this item was discounted as a requirement.<sup>36</sup>

21. There are commercial off-the-shelf (COTS) options that already exist which meet the requirements for what-right-looks-like for the next CA tactical land/littoral vehicle. A vehicle such as the BV S10 from BAE, which is the next generation improvement to the BV 206S has the same exceptional mobility as the BV 206, including amphibious landing capability.<sup>37</sup> The BV S10 Viking is a tested tactical land/littoral platform and is already in service with the Netherlands, British and Austrian Armed Forces and would require very few modifications to meet CA tactical and operational specifications.<sup>38</sup>

22. If the CA was to pursue a tactical vehicle such as the BV S10, it could choose from CAF pre-existing weapons platforms such as the C16 Automatic Grenade Launcher System (AGLS) or the C6 General Purpose Machine Gun (GPMG) to mount on the vehicle. "The BV S10 can be integrated with weapons ranging from 5.56mm to 12.7mm, as well as a 40mm automatic grenade launcher. The BV S10 offers protection against ballistics and anti-tank mines, while smoke grenade launchers provide additional protection."<sup>39</sup>

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<sup>34</sup>Department of National Defence. C.000814, *Domestic Arctic Mobility Enhancement Business Case Analysis*, Version 1.6. Canadian Army – DLR, 10 December 2020. 6.

<sup>35</sup>Department of National Defence. C.000814, *Domestic and Arctic Mobility Enhancement Preliminary Statement of Requirements*, Version 1.0. Canadian Army – DLR, 09 December 2020. 9.

<sup>36</sup>Department of National Defence. C.000814, *Domestic Arctic Mobility Enhancement Business Case Analysis*, Version 1.6. Canadian Army – DLR, 10 December 2020. 36.

<sup>37</sup>*BV S10 Brochure*. BAE Systems Hagglunds. 2016. Accessed online, 07 February 2021. 1. <https://www.baesystems.com/en/product/bvs10>

<sup>38</sup>Army Recognition. "BV S10 Viking BAE Systems Amphibious All-Terrain Vehicle". *Global Defence & Security News* (17 July 2020). 1. [https://www.armyrecognition.com/united\\_kingdom\\_british\\_army\\_light\\_armoured\\_vehicle/bvs10\\_bvs\\_10\\_viking\\_amphibious\\_all-terrain\\_armoured\\_vehicle\\_data\\_sheet\\_description\\_information\\_uk.html](https://www.armyrecognition.com/united_kingdom_british_army_light_armoured_vehicle/bvs10_bvs_10_viking_amphibious_all-terrain_armoured_vehicle_data_sheet_description_information_uk.html)

<sup>39</sup>Army Recognition. "BV S10 Viking BAE Systems Amphibious All-Terrain Vehicle". *Global Defence & Security News* (17 July 2020). 1.

23. A tactical land/littoral vehicle is not only a vehicle that can be employed in the Arctic, it also has the ability to operate in desert and jungle conditions. The BV S10 Viking can operate in temperatures ranging from -46 degrees Celsius to +46 degrees Celsius, which is the same requirement that is outlined in the DAME SOR.<sup>40</sup> From a CAF perspective, in 2002, the CA proved the versatility of the BV 206 when they were employed on Operation ANACONDA in Afghanistan.<sup>41</sup> The CA should re-evaluate the DAME SOR and make changes to reflect the requirement for tactical options to be assessed as the CA will be in need of a tactical land/littoral vehicle prior to the DAME estimated project close-out in fiscal year 2027/2028.

## CONCLUSION

24. The DAME project's mandate ties into PFEC by improving the CA's capability to traverse the Canadian Arctic by land, and to demonstrate the CA's ability to effect combined operations in defence of North America.<sup>42</sup> Although, the DAME project has been architected to fulfill the requirements of SSE Initiative 43, it behooves the CA to ensure that a land/littoral vehicle is procured that meets the requirements of operating in both a domestic and tactical capacity. Procuring a domestic vehicle that lacks the capability to add armour or mount weapons will result in the necessity to procure a second platform, likely under significant time constraints, due to the ever-evolving military dynamics on the world stage. This will only be further compounded by the inevitable international freedom of manoeuvre that comes with Arctic accessibility. The CA must be able to meet a military adversary on land in the Canadian Arctic and this can only be achieved by procuring the appropriate tactical land/littoral vehicle.

## RECOMMENDATION

25. The CA needs a tactical land/littoral vehicle; however, attempting to modify the DAME SOR at this juncture in the procurement process to add the requirements necessary for the CA to operate tactically in the North would likely be viewed as an unintended requirements consequences and not viable based on the funding envelope provided by SSE. The CA should return to the CAF and request augmentation to their funding for this project in order to modify the DAME SOR to include optional armour mounting brackets, thermal signature reduction and weapons mounting capabilities. A COTS option already exists in the BV S10, and has been procured by FVEY and NATO allies.

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[https://www.armyrecognition.com/united\\_kingdom\\_british\\_army\\_light\\_armoured\\_vehicle/bvs10\\_bvs\\_10\\_viking\\_amphibious\\_all-terrain\\_armoured\\_vehicle\\_data\\_sheet\\_description\\_information\\_uk.html](https://www.armyrecognition.com/united_kingdom_british_army_light_armoured_vehicle/bvs10_bvs_10_viking_amphibious_all-terrain_armoured_vehicle_data_sheet_description_information_uk.html)

<sup>40</sup>Department of National Defence. C.000814, *Domestic and Arctic Mobility Enhancement Preliminary Statement of Requirements*, Version 1.0. Canadian Army – DLR, 09 December 2020. 15.

<sup>41</sup>Erica Brown. "A Soldier's Story". *Chatham Daily News* (31 August 2002). <https://search-proquest-com.cfc.idm.oclc.org/docview/352806621?pq-origsite=summon>

<sup>42</sup>Department of National Defence. C.000814, *Domestic Arctic Mobility Enhancement Business Case Analysis*, Version 1.6. Canadian Army – DLR, 10 December 2020. 14.

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